

SUPERFUND

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# MODESTO GROUNDWATER SUPERFUND SITE

Modesto, California

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## Quarterly Operations and Monitoring Report Groundwater Treatment and Soil Vapor Extraction Remediation Systems

### Third Quarter 2012

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Contract No. W91238-07-D-0006  
Task Order 0004

NOVEMBER 2012



November 15, 2012

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Superfund Site, Modesto, California  
Quarterly Operations and Monitoring Report, Third Quarter 2012**

Dear Mr. Mackenzie:

Enclosed is the Quarterly Operations and Monitoring Report, Third Quarter 2012. Text and appendices are provided on a compact disk included at the end of the report.

If you have any questions or comments, please call me at (530) 893-9675.

Sincerely,

A handwritten signature in blue ink that reads "Scott Dressler".

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**QUARTERLY OPERATIONS AND MONITORING REPORT  
GROUNDWATER TREATMENT AND SOIL VAPOR  
EXTRACTION REMEDIATION SYSTEMS  
THIRD QUARTER 2012**

**MODESTO GROUNDWATER SUPERFUND SITE  
MODESTO, CALIFORNIA**

**November 2012**

**Contract W91238-07-D-0006  
Delivery Order No. 0004**

Prepared for:  
U.S. Army Corps of Engineers  
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**MODESTO GROUNDWATER SUPERFUND SITE  
QUARTERLY OPERATIONS AND MONITORING REPORT  
GROUNDWATER TREATMENT AND SOIL VAPOR  
EXTRACTION REMEDIATION SYSTEMS  
THIRD QUARTER 2012**

This report was prepared by URS Group, Inc. (URS) staff under our supervision. Interpretations, conclusions, and recommendations in the report are based on background information, design basis, and other data furnished to URS by the United States Environmental Protection Agency, United States Army Corps of Engineers, and/or third parties. URS has relied on this information as furnished and is neither responsible for nor has confirmed the accuracy of this information. Our experience and professional judgment governed the data interpretation, conclusions, and recommendations presented in the report.



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**LIST OF ACRONYMS AND ABBREVIATIONS**

bgs	below ground surface
BOD	biochemical oxygen demand
City	City of Modesto
CPT	cone penetrometer test
CSIA	compound-specific isotope analysis
DCE	dichloroethene
DO	dissolved oxygen
DQO	data quality objectives
EPA	United States Environmental Protection Agency
FB	field blank
FD	field duplicate
GAC	granular-activated carbon
gpm	gallons per minute
GWTS	groundwater treatment system
LCS	laboratory control sample
LD	laboratory duplicate
LDC	Laboratory Data Consultants
LGAC	liquid-phase granular-activated carbon
MB	method blank
MCL	maximum contaminant level
MDL	method detection limit
mg/L	milligram per liter
msl	mean sea level
MS/MSD	matrix spike/matrix spike duplicate
MWH	MHW Americas, Inc.
mV	millivolt
NS	normal sample
O&M	operation and maintenance
ORP	oxidation-reduction potential
PARCC	precision, accuracy, representativeness, completeness, and comparability
PCE	tetrachloroethene
P&ID	process and instrumentation diagram
ppbv	parts per billion by volume
PQL	practical quantitation limit
protocol	United State Environmental Protection Agency Technical Protocol
QA	quality assurance
QC	quality control

**LIST OF ACRONYMS AND ABBREVIATIONS (Continued)**

qPCR	quantitative polymerase chain reaction
RPD	relative percent difference
SAP	sampling and analysis plan
scfm	standard cubic feet per minute
SM	standard method
SOP	standard operating procedure
SVE	soil vapor extraction
TB	trip blank
TCE	trichloroethene
TDS	total dissolved solid
TOC	total organic carbon
TSS	total suspended solid
URS	URS Group, Inc.
VC	vinyl chloride
VGAC	vapor-phase granular-activated carbon
VOC	volatile organic compound
work plan	Modesto Groundwater Superfund Site Natural Attenuation Screening Evaluation Work Plan
µg/L	micrograms per liter
3Q12	third quarter 2012

## 1.0 INTRODUCTION

This third quarter 2012 (3Q12) Quarterly Operation and Monitoring (O&M) Report for the Modesto Groundwater Superfund Site covers the reporting period of July 1 through September 30, 2012, and describes the monitoring and sampling program, summarizes the performance of the systems, and provides results of routine system operations. This report also summarizes the preliminary results for natural attenuation evaluation screening. The remainder of this section provides an overview of the site history and report organization.

### 1.1 Site History

The City of Modesto (City) is in Stanislaus County, California, and is approximately 80 miles southeast of Sacramento (Figure 1-1). The Modesto Groundwater Superfund Site is in a commercial area on McHenry Avenue, south of Orangeburg Avenue, behind Halford's Cleaners (941 McHenry Avenue).

In 1984, through routine sampling of water supply wells, the City discovered contamination in Municipal Well 11 (Figure 1-2) at the corner of Magnolia and Mensinger avenues. Laboratory analysis of the Municipal Well 11 sample collected in 1984 indicated tetrachloroethene (PCE) in excess of the federal and state maximum contaminant level (MCL) of 5 micrograms per liter ( $\mu\text{g/L}$ ). PCE is an industrial solvent commonly used in dry cleaning and was found to have originated at Halford's Cleaners, approximately 1,000 feet away from Municipal Well 11.

Municipal Well 11 was taken out of service by the City in 1984 and reactivated in April 1987 when levels of PCE and other chlorinated solvents were not detected at concentrations above MCLs. In February 1989, Municipal Well 11 was again taken out of service after PCE concentrations exceeded the MCL a second time. The well remained out of service until the City installed a wellhead granular-activated carbon (GAC) treatment system in May 1991. The GAC system reduced the PCE concentration to below the MCL before the water entered the public supply system. Municipal Well 11 was returned to service in June 1991 and operated until October 1995, when the City indefinitely deactivated the well because naturally occurring uranium was detected above the MCL of 20 picoCuries per liter.

The Modesto Groundwater Superfund Site was placed on the United States Environmental Protection Agency's (EPA's) National Priorities List on March 31, 1989. In December 1989, the EPA's Emergency Response Section collected soil and soil vapor samples in the vicinity of Halford's Cleaners. Fifteen monitoring wells were installed and were sampled from 1992 to 1998. Based on the data obtained, the EPA selected the technology for treatment and removal of the contamination. A soil vapor extraction (SVE) system and a groundwater treatment system (GWTS) were installed on May 16, 2000, and June 12, 2000, to remediate the source area and contain the groundwater contamination plume.

Results from a site investigation conducted in 2007 and from a soil vapor rebound test conducted from late November 2006 through January 2007 identified significant vapor mass at the northwestern corner of the Halford's Cleaners building and possibly extending underneath the building (see *Soil Vapor Extraction System Optimization and Enhancement Methods, Modesto Groundwater Superfund Site* [MWH Americas, Inc. (MWH), 2008] for summary results). Initial sub-slab vapor sampling in buildings at and near the source area in February 2008 confirmed that high concentrations of PCE in vapor (up to 20,000 parts per billion by volume [ppbv]) were present under the concrete slab foundation of the Halford's Cleaners building (MWH, 2010a). An SVE optimization plan was implemented in November 2008, which included stopping extraction from SVE-01 and continued monitoring of PCE concentrations. Three additional SVE wells (SVE-02, SVE-03, and SVE-04) were installed within what is considered to be the source area and connected to the SVE system for extraction. The existing SVE well (SVE-01) was taken offline and has been used as a monitoring point since.

The groundwater monitoring well network was expanded in 2008 and in 2011. In 2008, 16 additional groundwater monitoring wells were installed to evaluate the lateral and vertical extents of the groundwater plume. Section 2.3 of the *Quarterly Operations and Monitoring Report, Fourth Quarter 2008* (MWH, 2009) describes a dense non-aqueous-phase liquid investigation (none was reported). Nine additional wells were installed in 2011 to help delineate the lateral and vertical extent of the PCE concentrations in groundwater that exceed the MCL. These installations are described and the well construction and boring logs are provided in the letter report *Groundwater Monitoring Well Installations, Modesto Groundwater Superfund Site* (URS Group, Inc. [URS], 2011a).

To address the PCE concentrations in groundwater that were migrating further downgradient, a cone penetrometer test (CPT) investigation was conducted in 2011 to identify an optimal location for an additional interim extraction well. A new extraction well (EW-02) was installed in the area of high PCE concentrations in groundwater approximately 300 feet south of Halford's Cleaners and brought online in September 2012.

Two other PCE groundwater plumes, herein referred to as the Elwood's and McHenry Village plumes, have been identified within 1 mile of the Halford's Cleaners site. The Elwood's plume is the more significant because of its close proximity to the Halford's plume and the potential for commingling of the groundwater plumes. The source area of the Elwood's plume is approximately 2,100 feet (0.4 mile) south of Halford's Cleaners near the intersection of Morris and McHenry avenues. PCE has been detected at concentrations as high as 11,000 µg/L in samples from nine shallow monitoring wells at this location. The wells were originally installed to monitor a fuels release from a nearby 7-11 convenience store, which has subsequently closed with regard to fuels cleanup. Elwood's Dry Cleaners was identified as a responsible party for PCE contamination discovered in groundwater samples from the fuels site. The wells were last sampled in fall 2005 and subsequently several have been destroyed. PCE was detected in the southernmost well at 8,100 µg/L in September 2005. To characterize downgradient portions of the plume, grab groundwater samples were collected from exploratory direct-push borings installed in 2002 or 2003. The borings were located at distances up to approximately 2,100 feet (0.4 mile) from Elwood's plume (MWH, 2010b). Three wells were installed between the Halford's plume (Modesto Groundwater Superfund Site) and the Elwood's plume in 2011. The two A zone wells indicate that the Halford's plume is defined to the south in the A zone; however, the concentrations at the B zone well exceeded the PCE MCL, indicating that there may be commingling of the Halford's and Elwood's plumes in the B zone.

The McHenry Village PCE plume is approximately 4,650 feet (0.9 mile) north of Halford's Cleaners, at the intersection of McHenry and Briggsmore avenues. PCE from the McHenry Village site has impacted nearby Municipal Well 21. PCE is being actively remediated at this site and has been monitored in groundwater since approximately 1998 in several monitoring wells, including more recently in seven deeper wells screened in the equivalent to the B zone hydrostratigraphic interval. The most recent groundwater monitoring data from September 2008 show that PCE is present at concentrations as high as 64 µg/L in the deepest monitoring wells screened approximately 120 feet below ground surface (bgs). Thus, the vertical extent of the McHenry Village plume is not defined. Water levels from shallow monitoring wells at other cleanup sites in the region confirm the overall southeastern flow direction observed in the A and B zones at Halford's Cleaners. As such, it appears unlikely that PCE from the McHenry Village plume is affecting areas of the aquifer impacted by the Halford's release a mile south (MWH, 2010b).

## **1.2 Report Organization**

This report is organized as follows:

**Section 1.0** provides a brief history of the Modesto Groundwater Superfund Site.

**Section 2.0** describes the remedial systems.

**Section 3.0** describes the sampling programs.

**Section 4.0** provides performance evaluations for the GWTS and SVE system, including a groundwater capture zone analysis. This section also summarizes results of sampling for natural attenuation evaluation screening.

**Section 5.0** summarizes results and provides recommendations for the GWTS and SVE system O&M programs and the natural attenuation sampling.

**Section 6.0** provides an analytical data quality review.

**Section 7.0** lists reference information for documents cited in this report.

Tables and figures are provided at the end of the report. The report is supported with the following appendices, which are provided on a compact disc at the end of the report:

**Appendix A** provides process and instrumentation diagrams (P&IDs) for the GWTS and SVE system.

**Appendix B** provides laboratory analytical data tables.

**Appendix C** provides a laboratory data validation report.

**Appendix D** provides system uptime logs.

**Appendix E** provides O&M process logs.

**Appendix F** provides operational history, including a brief discussion of the routine and non-routine O&M performed on the GWTS and SVE system.

**Appendix G** provides historical data, as follows:

- G-1 Well Construction Details
- G-2 Groundwater Monitoring Well Table Elevations
- G-3 Searchable Historical and Current Analytical Data
- G-4 Historical PCE Concentration Trends in Groundwater Monitoring Wells
- G-5 PCE Mass Removed by the Groundwater Treatment System
- G-6 PCE Mass Removed by the Soil Vapor Extraction System

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## 2.0 DESCRIPTION OF REMEDIAL SYSTEM

The Modesto Groundwater Superfund Site GWT and SVE systems are located behind Halford's Cleaners and between an auto repair shop and Season's Lodge (Figure 2-1). The SVE and GWT process equipment is contained within two metal storage containers in a fenced and locked compound.

### 2.1 Groundwater Treatment System

The GWTS includes two operable extraction wells (EW-01R and EW-02), an equalization tank, particulate filters, an air stripper, two liquid-phase GAC (LGAC) vessels, one vapor-phase GAC (VGAC) vessel, and two ion exchange units, as well as piping and control systems. Appendix A includes GWTS P&ID diagrams.

Extracted groundwater is pumped from the equalization tank through the air stripper for primary treatment of PCE. The treated water is then pumped from the air stripper sump through the LGAC vessels to remove remaining PCE concentrations. The V GAC vessel treats the air stream from the air stripper. The ion exchange units are installed in series after the LGAC vessels and treat a slip stream of the total system flow to remove low levels of naturally occurring uranium from the groundwater before discharge to the City's sewer collection system. The design flow rate of the system is 50 gallons per minute (gpm).

The components of the GWTS except the VGAC vessel are contained in an 8.5- by 8.5- by 20-foot metal storage container. The VGAC vessel is located next to the container within the fenced compound. A secondary containment unit is located underneath the storage container. Any water draining into the secondary containment is manually pumped to the equalization tank to be treated before it is discharged to the sewer. Additional information about the GWTS is available in the *Groundwater Treatment System and Soil Vapor Extraction System Operation and Maintenance Manual, Modesto Groundwater Superfund Site* (O&M Manual) (URS, 2010a), which details the operating equipment (manufacturers, models, standard settings, inspection frequency, troubleshooting, etc.).

The groundwater monitoring network consists of 40 wells located throughout the site in residential and business communities (Figure 2-2). Table G-1 (Appendix G) includes well construction details.

### 2.2 Soil Vapor Extraction System

The SVE system includes three online extraction wells (SVE-02, SVE-03, and SVE-04), a blower, a condensate collection drum, air filters, silencers, one 2,000-pound VGAC vessel, conveyance piping, control systems, and an air conditioning unit. Appendix A includes SVE system P&ID diagrams.

The SVE system is operating parameters are controlled by the local programmable logic controller on site to allow for continuous, 24-hour operation. Its design flow rate is 180 standard cubic feet per minute (scfm). Extracted soil vapor passes through an air-water separator liquid that accumulates in the condensate collection drum is pumped to the equalization tank in the GWTS for treatment before discharge to the sewer.

The aboveground system components (except the VGAC vessel) are contained within an 8- by 8.5- by 12.75-foot metal storage container. The vapor GAC vessel is located next to the container within the fenced compound. Additional information about the SVE system is available in the O&M Manual (URS, 2010a), which details the operating equipment in the SVE trailer (manufacturers, models, standard settings, inspection frequency, troubleshooting, etc.).

The three extraction wells in operation (SVE-02, SVE-03, and SVE-04) are located approximately 3 to 5 feet from the northwestern corner of Halford's Cleaners in the alley north of the building, within what is considered to be the source area. Nine monitoring points surrounding the SVE wells (including three offline SVE wells) are sampled quarterly. Figure 2-3 shows the locations of the SVE wells, the vapor monitoring wells, and the conveyance piping configuration.

### 3.0 SAMPLING AND MONITORING PROGRAM

Sampling and monitoring at the Modesto Groundwater Superfund Site is performed in accordance with the *Sampling and Analysis Plan, Modesto Groundwater Superfund Site* (SAP) (URS, 2010b). Table B-2 (Appendix B) includes sample locations and associated analytical test methods, phase (water, vapor, etc.), frequency, and date of sampling activity.

The quarterly sampling program consists of two types of sampling: site sampling and system sampling. The second round of sample collection for natural attenuation evaluation screening was also performed in 3Q12 and is described in this section.

#### 3.1 Site Sampling and Monitoring

Site sampling to monitor groundwater includes collecting groundwater samples from the network of 40 groundwater monitoring wells and 1 groundwater extraction well for analysis by EPA Method E524.2. Site sampling to monitor the vadose zone includes collecting vapor samples from the three operating SVE wells, three offline SVE wells, and six vapor monitoring locations for analysis by EPA Method TO15. Subsections 3.1.1 and 3.1.2 describe sampling of groundwater and vapor wells, respectively, during 3Q12. Section 3.1.3 describes natural attenuation evaluation screening sampling.

##### 3.1.1 Groundwater Sampling and Monitoring

URS measured depths to groundwater on August 2, 2012, and collected groundwater samples August 6 through 10, 2012. Depth-to-water measurements and groundwater samples were collected from 40 groundwater monitoring wells during the quarter to evaluate changes in the depth to water, the influence of groundwater extraction on the PCE plume and estimate the extent of contamination, horizontal flow directions, and groundwater capture (groundwater that flows into the extraction well). Figure 3-1, which shows a times series plot of groundwater elevations at six wells around the site, indicates that the groundwater elevation at the site has risen since 2010. As shown in Figure 3-1, the 3Q12 water level measurement at MW-12A was anomalously low; therefore, it was not used for contouring.

Groundwater elevations are also used to evaluate potential vertical groundwater flow directions and to develop groundwater elevation contour maps. Depth to groundwater was measured from the top of casing using an electronic water level meter.

Groundwater samples were collected starting with the least contaminated groundwater monitoring well and continuing in order to the most contaminated groundwater monitoring well; the order of sampling is established using previous quarterly analytical results. Groundwater samples were collected using low-flow purge methods in 14 monitoring wells and using three-volume purge-and-sample methods in MW-03A and the 25 most recently installed monitoring wells. Samples from the extraction well were collected from sample port number 1 (SP-01) at the GWT system influent and analyzed for volatile organic compounds (VOCs) using EPA Method E524.2.

The SAP describes sampling procedures. Water purged from the groundwater monitoring wells was transferred through a bag filter into the GWTS equalization tank.

### 3.1.2 Soil Vapor Sampling and Monitoring

Soil vapor samples were collected from SVE and vapor monitoring wells on August 8 and 30, 2012, using 400-milliliter Summa canisters. Samples were analyzed using EPA Method TO15. Soil vapor sampling was conducted in accordance with the sampling procedures in the SAP.

### 3.1.3 Natural Attenuation Evaluation Screening

Natural attenuation evaluation screening sampling was performed to evaluate the potential that natural attenuation is occurring at the site. The second of two rounds of sampling was performed during 3Q12. The well array for Round 2 consisted of 11 monitoring wells: five in the A zone (MW-04A, MW-05A, MW-08A, MW-15A, and MW-20A) and six in the B zone (MW-04B, MW-17B, MW-20B, MW-24B, MW-25B and MW-28B). These samples were analyzed for the following:

- Alkalinity (Method SM2320)
- Nitrate, sulfate, and chloride (Method E300.0)
- Ferrous iron (Standard Operating Procedure [SOP] 575)
- Ethane, ethene, methane, acetylene and carbon dioxide (Method RSK-175)
- Total organic carbon (Method E415.3)
- Sulfide (Method SM4500-S2)
- Fatty acids (Method 300.0 M)
- Haloacetic acids (Method E552.2)

During Round 2, a subset of the well array was also analyzed for targeted anaerobic bacteria (CENSUS) and compound-specific isotope analysis (CSIA) for carbon isotopes only.

## 3.2 System Sampling and Monitoring

Sampling and monitoring of the GWTS and SVE system at the Modesto Groundwater Superfund Site were performed in accordance with the City of Modesto Conditional and Revocable Groundwater Discharge Permit Number GW 98-3 (City of Modesto, 2010) and the SAP (URS, 2010b). Generally, two categories of samples are collected from the remedial systems: compliance monitoring and performance monitoring. Compliance monitoring samples are collected to satisfy regulatory requirements; performance monitoring samples are collected to assess the contaminant removal process of the remedial systems.

### 3.2.1 Groundwater System Sampling and Monitoring

Compliance monitoring samples for the GWTS are collected monthly and quarterly from the extraction well and system effluent during periods when the system is operating. System effluent samples are analyzed monthly for VOCs (Method 524.2), total dissolved solids (TDS) (Method 2540C), total suspended solids (TSS) (Method 2540D), biochemical oxygen demand (BOD) (Method 5210B), and quarterly for total uranium (Method D5174). Performance samples are collected monthly to monitor and assess the performance and efficiency of the air stripper, LGAC, and ion exchange media. The GWTS

performance monitoring samples are collected from the carbon influent, carbon mid-bed, post carbon/pre-ion exchange, and ion exchange mid-bed and analyzed for VOCs (Method 524.2). Figures 1-1 and 1-2 in Appendix A illustrate the sampling port locations for the GWTS. Appendix B presents analytical data tables.

### **3.2.2 Soil Vapor System Sampling and Monitoring**

Only system performance samples are collected at the SVE system. These samples are collected at the pre-GAC and stack sample ports to monitor VGAC usage. Samples are collected monthly for analysis by EPA Method TO15. Figure 1-3 in Appendix A illustrates the sampling port locations for the SVE system.

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## 4.0 PERFORMANCE EVALUATION

Sections 4.1 and 4.2 discuss site and system performance evaluations, respectively, based on current and historical analytical results. The site performance evaluation estimates the extent of contamination. System sampling helps evaluate the remedial progress of the GWTS and SVE system.

The second round of sampling for natural attenuation evaluation screening was performed in 3Q12. Section 4.3 discusses those results.

Section 6.0 provides a summary of the quality assurance (QA) and quality control (QC) results for the samples collected during 3Q12. Appendix B provides a complete set of validated analytical data for groundwater and soil vapor samples collected during the 3Q12 reporting period. Appendix C includes the laboratory data validation reports for this reporting period's analytical data.

### 4.1 Site Performance

Sections 4.1.1 and 4.1.2 provide 3Q12 results of the groundwater and soil vapor well sampling events, respectively. Figure 4-1 shows a stratigraphic conceptual model. Section 4.1.3 presents an analysis of vertical gradients, and Section 4.1.4 provides a capture zone analysis.

#### 4.1.1 Groundwater Monitoring and Sampling Results

Based on water levels measured on August 2, 2012, groundwater elevations ranged from 46.92 feet mean sea level (msl) at MW-21A to 50.73 feet msl at MW-11A in the A zone. An anomalously low water elevation of 44.22 feet msl was measured at MW-12A. Figure 3-1 shows the water elevation trend at MW-12A and the anomalous elevation in 3Q12. This measurement was not used for contouring. The groundwater elevation at MW-20A was approximately 1 foot higher than expected in comparison to water levels in nearby A zone wells; however, based on 3Q12 water elevations in other A zone wells, the MW-20A elevation was within a reasonable range and, therefore, it was retained as one of the water elevations used for contouring. The MW-20A groundwater elevation results in a slight mounding that is not typical of the A Zone potentiometric surface (Figure 4-2).

Groundwater elevations ranged from 47.05 feet msl at MW-19B to 49.11 feet msl at MW-29B in the B zone; and 42.36 feet msl at MW-17C to 43.78 feet msl at MW-04C in the C zone. Comparing 3Q12 and 2Q12 water levels, water elevations decreased an average of 0.92 feet in A zone wells across the site; water elevations decreased an average of 0.674 foot in B zone wells across the site; water elevations in C zone wells increased an average of approximately 5.8 feet across the site. Appendix G presents historical and current water level measurements and analytical data.

Potentiometric surface data, groundwater flow directions, and PCE concentration data for the A, B, and C zones are shown on Figures 4-2, 4-3, and 4-4, respectively. Potentiometric contours indicate that groundwater in the A and B zones flows southeast and east-southeast, respectively, across the site. EW-01R operated at an average of approximately 46 gpm during 3Q12; however, this well was turned off several times during 3Q12 during the installation of EW-02 and the associated piping and infrastructure. EW-01R was shut down and EW-02 brought online on September 13, 2012, at 46 gpm. The average hydraulic gradient parallel to the direction of regional groundwater flow in the A zone was approximately 0.0013, or approximately 6.9 feet per mile. The average horizontal gradient in the B zone was approximately 0.0011, or 5.7 feet per mile. Groundwater in the C zone was flowing southwest (Figure 4-4) with a horizontal gradient of approximately 0.0010, or 5.2 feet per mile.

The primary gradient in the A zone across most of the site is southeast, which is consistent with previous quarters. The B and C zone gradients have been variable. The gradient in the B zone was southeast in 4Q10 through 2Q11 and during 4Q11 through 2Q12, and east-southeast during 3Q10, 3Q11, and 3Q12. The more easterly flows during the 3Q10 and 3Q11 may have been the result of increased pumping at municipal wells during the dryer months of the year.

The 3Q12 horizontal gradient in the C zone was southwest. In general, the gradient direction in the C zone has been observed to be more westerly during the third quarters (either southwest or south-southwest) and more easterly during the fourth and first quarters (southeast or south-southeast). Flow in the C zone has been variable during the second quarters: west in 2Q09, south-southwest in the northern site and southeast in the southern site in 2Q10, and south-southeast in 2Q11 and 2Q12. As discussed in previous groundwater reports for the site, the gradients in this deeper zone are strongly influenced by regional supply well pumping that increases during the spring and summer months (MWH, 2010a). Pumping histories from January 2000 through August 2009 for City supply wells surrounding the site are compiled in *Groundwater Remediation Optimization Methods, Modesto Groundwater Superfund Sites* (MWH, 2010b), provided in Appendix B.

To evaluate the potential hydraulic influence on the extents of PCE plumes from operation of City of Modesto Municipal Water Supply Wells No. 6 and No. 7, URS installed transducers in six A zone, five B zone, and three C zone monitoring wells from June 28 through December 7, 2011. Evaluation of the data collected using the transducers indicated that municipal well pumping has a greater effect on C zone water levels than on A or B zone levels, and pumping at these municipal wells increases the prevailing downward gradient between the A zone and B zone and between the B zone and the C zone. Increases in the downward gradient can result in downward migration of PCE beneath portions of the site.

The southern portion of the plume is most likely to be influenced by municipal well pumping because Municipal Wells 6 and 7 are southeast and southwest, respectively, of the southern boundary of the plume. Municipal Well 7 may be impacted by PCE contamination before Municipal Well 6 because Municipal Well 7 operates at approximately twice the pumping rate of Municipal Well 6, and the B zone plume appears to be closer to Municipal Well 7. Additional details on this evaluation are provided in the *Interpretation of Local Groundwater Level Changes and Influences from City of Modesto Municipal Water Supply Wells Nos. 6 and 7 Technical Memorandum* (URS, 2012a).

#### 4.1.1.1 PCE

In 3Q12, PCE was detected at concentrations exceeding the MCL of 5 µg/L at EW-01R and 19 monitoring wells. The distribution of PCE concentrations greater than 5 µg/L in groundwater is illustrated with isoconcentration contour lines (lines of equal concentration) on Figures 4-2 and 4-3 for the A and B zones, respectively. There are no PCE isoconcentration contours in the C zone on Figure 4-4 because there were no detections at the C zone wells that exceeded MCLs. The distribution of PCE concentrations is also illustrated on generalized geologic cross-sections that dissect the site along northwest to southeast (Figure 4-5) and west to east (Figure 4-6) lines. Table B-3 (Appendix B) includes current quarterly groundwater monitoring well analytical results. Figures G-4(a) through G-4(an) (Appendix G-4) show PCE time series plots for each monitoring well for the period from February 1992 through 3Q12.

## A Zone

As depicted on Figure 4-2<sup>1</sup>, the PCE MCL plume is approximately 1,700 feet long parallel to the primary gradient and 1,200 feet wide in the east-west, cross-gradient direction. A CPT investigation performed during June 2012 provided additional data with which to define plume boundaries. Figure 4-2 shows locations of the June 2012 CPT boreholes and the associated PCE concentrations. Data from CPT-11 indicate that the MCL plume around MW-23A is separate from the MCL plume surrounding the site. The PCE concentration (41 µg/L) at MW-23A exceeded the MCL (5 µg/L) in 3Q12. Data from the 2012 CPT investigation indicates that the large MCL plume is defined to the west; however, the small plume encompassing MW-23A is undefined to the northwest and southwest. PCE concentrations at MW-21A (0.7 µg/L) and MW-22A (no detection) indicate that the A zone plume is bounded to the south.

3Q12 PCE concentration at MW-04A (1,200 µg/L) was consistent with concentrations previous to 1Q12, which have exceeded 500 µg/L since 2000. 1Q12 and 2Q12 results from MW-04A were anomalously low: the PCE concentration at MW-04A decreased from 2,200 µg/L in 4Q11 to 130 µg/L in 1Q12 and 71 µg/L in 2Q12. The time series trend at MW-04A shows that PCE concentrations fluctuate frequently decreasing in the first and or second quarters at MW-04A (Figure G-4 [d]). The concentrations changes may indicate that 1Q12 and 2Q12 decreases and subsequent increase to 1,200 µg/L may be part of the normal fluctuations with a decreasing overall trend in PCE concentration in this area.

The long axes of the A zone plume with concentrations between 5 and 50 µg/L and greater than 1,000 µg/L parallel the primary groundwater gradient direction. The western extent of the 5 to 50 µg/L portion of the plume was drawn farther east than depicted in previous quarters because of the June 2012 CPT data. Specifically, PCE was not detected at CPT11 (Figure 4-2). A smaller MCL plume was drawn encompassing MW-23A with 41 µg/L PCE in 3Q12. The portion of the plume that had HydroPunch sample concentrations greater than 1,000 µg/L encloses an area that is approximately 750 feet in the east-west direction and less than 200 feet in the downgradient direction. However, there are concentrations greater than 100 µg/L downgradient from the CPT investigation locations beyond the location of MW-20A where the concentration of PCE at MW-20A was 190 µg/L in 3Q12 (Figure 4-2). The east-west orientation of high concentrations and concentrations less than 50 µg/L in both the larger A zone plume and small plume surrounding MW-23A may be the result of three potentially interacting components: hydrostratigraphy, influences of municipal well hydraulic gradients, and/or a secondary source of PCE. These components are described in greater detail in the *Implications of Results from the Cone Penetrometer Testing (CPT)/HydroPunch Investigation, Modesto Groundwater Superfund Site, Technical Memorandum* (URS, 2011b).

The 1,000 µg/L PCE isoconcentration contour is bounded to the southwest by the concentration at MW-06A (5.2 µg/L in 3Q12 and less than 100 µg/L since 1Q04) and 2012 CPT21 (160 µg/L) and to the east by the concentration at MW-12A (20 µg/L in 3Q12 and less than 50 µg/L since 3Q01) and 2012 CPT15 (6.2 µg/L). The 6,300 µg/L PCE concentration at 81 to 83 feet bgs at location CPT6 suggests that the extent of the 1,000 µg/L PCE concentrations may be farther west; however, the highest PCE result from samples collected from 2012 CPT21, which was located adjacent to CPT6 and included a sample from the 81 to 83 feet bgs interval, was 160 µg/L (Figure 4-2). Stepout locations CPT23 and CPT11 had

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<sup>1</sup> Groundwater analytical results from the HydroPunch groundwater samples collected during the CPT investigation of May 2011 are posted on Figure 4-2 and have been used along with the monitoring well data to contour PCE concentrations in the A zone. The CPT investigation was performed to identify the optimal location for an A zone extraction well near the highest PCE concentrations that had been known historically on site at MW-04A (URS, 2012f).

high results of 9.2 µg/L and less than the detection limit, respectively, indicating that PCE concentrations exceeding 1,000 µg/L in the A zone are defined. The *Final Letter Report, Additional CPT/HydroPunch Investigation* (URS, 2012b) documented results of this investigation.

PCE concentrations at MW-13A and MW-14A have fluctuated seasonally (Figures G-4[q and r]) from just above to below the PCE MCL, resulting in changes in the shape of the A zone plume several times annually. In 3Q12, PCE concentrations were 2.1 µg/L at MW-13A and 2.5 µg/L at MW-14A (both below the MCL). In previous reports (e.g., MWH, 2010a), concentration fluctuations at these wells were attributed to potential influences from pumping of municipal supply wells to the west or northwest, perhaps from Municipal Well 8, 14, or 17 (Figure 1-2). MW-23A is also located to the west of the site. Municipal well pumping may be the cause of or may have contributed to the PCE concentration at MW-23A (41 µg/L). PCE was detected in Municipal Wells 14 and 8, located 2,375 feet (0.45 mile) west and 5,320 feet (1.0 mile) west-southwest of Halford's Cleaners. Municipal Wells 8 and 14 have been offline since 2007 and 2006, respectively (MWH, 2010b); however, the plume may have been drawn toward Municipal Wells 8 or 14 before they were shutdown. Municipal Well 17, which has remained in consistent operation, could have hydraulic influence on the plume because it has a 4-foot-long screened interval approximately 25 feet lower than the screened zones of MW-13A, MW-14A, and MW-23A; however, it is located more than 3,500 feet northwest of the monitoring wells and data are insufficient to determine whether the hydraulic influence of pumping at Municipal Well 17 is affecting the PCE plume. Municipal Wells 6 and 7, alternatively, are located closer to the plume than Municipal Wells 14 and 17 and are operating consistently; the *Interpretation of Local Groundwater Level Changes and Influences from City of Modesto Municipal Water Supply Wells Nos. 6 and 7 Technical Memorandum* (URS, 2012a) indicates that water levels at some A zone monitoring wells had slight responses when Municipal Wells 6 and 7 were operating. Municipal Well 6 is screened in the A and B zones and, though Municipal Well 7 is screened below the A zone (in B zone), pumping at Municipal Wells 6 and 7 may be affecting the A zone plume.

Another possible contributor to the PCE concentrations detected at MW-23A may be the sewer line. Discharges from Halford's Cleaners to the sewer line have been identified as a source of contamination to the subsurface. Sewer lines located near the former Elks Club and Halford's Cleaners were sampled during August 1985 (MWH, 2010b). A PCE concentration of 1040 parts per million was reported in a sewer sediment sample collected at the manhole where the north-south sewerline intersects with east-west sewerline beneath Griswold Avenue. It is possible that PCE flowed down-sewer to that intersection and leaked from the sewer along Griswold Avenue resulting in the high concentrations exceeding 1000 µg/L in HydroPunch samples collected along the east-west sewerline that is perpendicular to the southeast hydraulic gradient of the A zone. Westerly flow and releases along the Griswold Avenue sewerline may account for the PCE concentrations between 5 and 50 reported in the western wells such as MW-23A (Figure 4-2).

The PCE concentration at EW-01R in August 2012 was 98 µg/L (25 percent lower than the concentration of 130 µg/L in 2Q12).

## **B Zone**

Figure 4-3 depicts the B zone PCE plume and potentiometric surface contours. In 3Q12, PCE was detected above the MCL at 10 of the B zone wells. The plume is approximately 2,600 feet long parallel to the primary gradient direction (northwest/southeast) and 1,900 feet wide. Concentrations increased in 3Q12 to greater than the MCL at MW-04B (22 µg/L) and MW-09B (14 µg/L). The PCE plume in the B zone is undefined in the western, northern, and southeastern directions (Figure 4-3).

Data from the B zone wells installed in 2011 indicate that the axis of the 50 to 99 µg/L plume trends northwest to southeast. The highest concentration of PCE in the B zone (79 µg/L) was reported at MW-25B, which is approximately 1,500 feet southeast of the source area, and decreased from 120 µg/L in 2Q12 at the same well. Therefore, the plume with concentrations greater than 100 µg/L encompassing MW-25B in 2Q12 was eliminated. However, the 3Q12 concentration of 24 µg/L at MW-16B increased from 8.8 µg/L in 2Q12 and is the highest reported at that well since its installation in 2008. This concentration increase may be due to pumping from Municipal Well 6, which increases pumping during the summer months. The PCE concentrations of 79 µg/L at MW-25B and 24 µg/L at MW-16B indicate that the plume remains undefined in the south and southwestern directions, and there is still the possibility that the plume is commingled with the Elwood's plume in the B zone.

The B zone plume shape has likely been influenced by pumping at municipal wells. The *Interpretation of Local Groundwater Level Changes and Influences from City of Modesto Municipal Water Supply Wells Nos. 6 and 7 Technical Memorandum* (URS, 2012a) indicates that water levels at most B zone monitoring wells had slight responses when Municipal Wells 6 and 7 were operating. The maximum observed water level changes were 0.24 and 0.19 feet at MW-09B and MW-17B, respectively, when pumping at Municipal Well 6 was evaluated and 0.19 and 0.32 feet at MW-16B and MW-19B, respectively, when pumping at Municipal Well 7 was evaluated. Municipal Well 6 is screened in the A and B zones and Municipal Well 7 is screened in B zone; therefore, pumping at Municipal Wells 6 and 7 may be affecting the B zone plume.

## C Zone

Figure 4-4 shows groundwater elevation contours for the C zone and PCE concentration data. There were no detections of PCE exceeding the MCL in 3Q12 among the samples from the five wells screened in the C zone, consequently, no PCE plume is shown on Figure 4-4. However, concentrations of PCE at MW-16C increased from no detection in 2Q12 to 4.9 µg/L in 3Q12. As is likely for the increasing PCE concentration at B zone well MW-16B, the increase at MW-16C may be due to pumping from Municipal Well 6, which increases pumping during the summer months. The last reported and only detection from the C zone wells that exceeded the MCL was 8.7 µg/L at MW-04C in 4Q08.

### 4.1.1.2 Other VOCs

Benzene was not reported in any samples in 3Q12. There were no detections at any wells during the 2Q10, 4Q10, or 4Q11 events. Benzene concentrations exceeded the MCL during the 3Q10, 1Q11, 2Q11, 3Q11, 1Q12, and 2Q12 sampling events.

The only VOC concentration that exceeded its MCL during the 3Q12 sampling event was 1,2-dichloroethane reported at MW-15A at 0.7 µg/L. The MCL of 1,2-dichloroethane is 0.5 µg/L.

Halford's Cleaners likely is not the source of the benzene or 1,2-dichloroethane concentrations in groundwater because these VOCs have not been detected at MW-01A, MW-05A, or MW-08A—the wells located nearest to Halford's Cleaners. For that reason, no further speculation about the sources of these VOCs in the monitoring wells at this site is provided, as this report is an evaluation of the contamination from Halford's Cleaners.

### 4.1.2 Soil Vapor Sampling Results

Samples were collected from the three operating SVE wells on August 8, 2012. Analytical results listed in Table B-3 (Appendix B) are summarized below and posted on Figure 4-7:

- SVE-02 (screened interval 7 to 12 bgs): PCE concentration increased from 270 ppbv in 2Q12 to 380 ppbv in 3Q12.
- SVE-03 (screened interval 13 to 23 bgs): PCE concentration remained the same in 3Q12 as 2Q12 at 220 ppbv.
- SVE-04 (screened interval 28 to 38 bgs): PCE concentration increased from 22 ppbv in 2Q12 to 35 ppbv in 3Q12.

Comparison of 3Q12 to 2Q12 soil vapor monitoring well PCE sample results shows an increase at six wells, a decrease in two wells, and the sample from one well continued to have a concentration less than the detection limit.

The highest concentration detected in a soil vapor monitoring well was 370 ppbv at OSVE-10, a 5-foot-deep well located within the building footprint of Halfords' Cleaners (Figure 4-7). PCE concentrations detected at soil vapor monitoring wells screened deeper than 16 feet ranged from not detected to 140-ppbv.

#### 4.1.3 Analysis of Vertical Groundwater Gradients

Vertical gradients were calculated using 3Q12 data at one well pair with screen intervals in the A zone, seven well pairs with screens in the A or B zones, and at five well pairs with screens in the B or C zones (Table 4-1). For comparison, Table 4-1 also lists vertical gradients calculated for last quarter and last year.

There was a potential for a downward gradient within the A zone between MW-21A and MW-22A. Six of the seven A zone–B zone well pairs and all five of the B zone–C zone well pairs indicated a potential for a downward gradient. Results for only one well pair between the A and B zones indicated a potential for an upward gradient. The downward gradients were likely impacted by pumping from municipal wells, which increases during the summer months. Excluding the well pair MW-21A and MW-22A, which had not been installed in 3Q11, the same number of well pairs had a potential for downward gradient in 3Q11. Figure 4-5 uses arrows to show directions of vertical gradients for some of these well pairs.

#### 4.1.4 Extraction Well EW-01R Capture Zone Analysis

Figures 4-5 and 4-8 show estimates of groundwater plume capture from extraction well EW-01R. Two lines of evidence (groundwater elevation contours developed based on 3Q12 data and particle tracks developed with the site's groundwater model [MWH, 2010b]) were used to estimate the extent of capture presented on Figure 4-5 and projected onto Figure 4-8.

Groundwater elevations calculated from water levels measured at A, B, and C zone wells during 3Q12 were contoured using the Natural Neighbor function in ArcGIS 10 and adjusted using professional hydrogeologic judgment. A curved line consisting of the estimated stagnation points is the empirical capture zone illustrated in purple on Figure 4-8. A new and expanded transient groundwater flow model for the site and surrounding region was developed to support the *Groundwater Remediation Optimization Methods, Modesto Groundwater Superfund Site* (MWH, 2010b), provided in Appendix B. The A zone capture zone estimated with the model's simulation of EW-01R pumping at 50 gpm is illustrated on Figure 4-8 as the sweep of groundwater flow lines toward the well based on backward particle tracking (i.e., particles released at the well and modeled backwards to determine their starting points). The actual average operating flow rate at this well in 3Q12 was 46 gpm. The average operating flow rate is calculated by dividing the volume pumped from the well during the quarter by the operating time.

The horizontal estimates of capture for EW-01R, based on the two lines of evidence, are in good agreement. The downgradient extent of capture is interpreted to be within 10 feet of MW-04A (Figure 4-8).

Figure 4-5 shows an estimate of the vertical extent of capture by EW-01R. The downgradient extent of capture depicted in profile view (downgradient from MW-04A) is based on the empirical and modeled lines of evidence. The vertical capture zone extent below the screen of EW-01R is an estimate based on water level data, modeling, and vertical gradients. The groundwater model results suggest (1) there is an upward vertical gradient beneath the extraction well and (2) groundwater entering the bottom portion of the well's screen may originate from the B zone sands (MWH, 2010a). Vertical gradients calculated using 3Q12 groundwater elevation data from wells near EW-01R (MW-04A, MW-04B well pair [Figure 4-5] and MW-08A, MW-09B well pair [not shown on figure]) were downward from the A to the B zone. There was also a downward gradient between MW-4B and MW-4C. These downward gradients conflict with the model's prediction of upward vertical capture of groundwater at EW-01R. Therefore, the estimated capture zone has been drawn to just at the bottom of the screened interval of EW-01R, and not deeper into the B zone sands.

## **4.2 System Performance**

System compliance and performance samples were collected to evaluate the effectiveness of the remedial systems. Water, vapor, and media samples were collected according to requirements in the SAP (URS, 2010b) and the City of Modesto Conditional and Revocable Groundwater Discharge Permit (Permit Number GW98 3) (City of Modesto, 2010). Treatment system effluent samples collected during the reporting period for vapor emissions and sewer discharge were below maximum allowable discharge limits.

### **4.2.1 Groundwater Treatment System Results**

During 3Q12, the GWTS operated for approximately 1,741 hours (out of 2,208 hours possible during the quarter), an uptime of approximately 79 percent. Figures D-1 through D-3 (Appendix D) present system uptime logs and graphical representation of the GWTS operation time.

The GWTS treated a total of approximately 3.79 million gallons of water and removed approximately 6.45 pounds of PCE during this reporting period. To date (since August 2001), the system has treated approximately 199 million gallons of water and removed approximately 518 pounds of PCE. Figure 4-9 illustrates the cumulative PCE mass removed by the GWTS.

The influent PCE concentrations were 740, 97, 110  $\mu\text{g/L}$  during July, August and September, respectively. The July sample result represents the PCE concentration from development activities at newly installed EW-02. August and September sample concentrations represent results from pumping at EW-01R. Samples were also analyzed for uranium. Table B-4 (Appendix B) provides a summary of treatment system analytical results for 3Q12. Table 4-2 summarizes PCE results for 3Q12.

### **4.2.2 Soil Vapor Extraction System Results**

During 3Q12, the SVE system operated for 2,208 hours (out of 2,208 hours possible during the quarter), an uptime of 100 percent. Figures D-4 through D-6 (Appendix D) present monthly system uptime logs and graphical representation of the SVE system operation time.

The SVE system operated at an average flow rate of 129 scfm and removed approximately 3.0 pounds of VOCs during this quarter. To date (since June 2011), the total cumulative VOC mass removed through

September 6, 2012, is approximately 3,465 pounds. Figure 4-10 illustrates the cumulative PCE mass removed by the SVE system.

The influent PCE concentrations ranged from 190 to 650 ppbv during the reporting period. Monthly SVE system samples collected in SUMMA canisters were sent to the EPA Region 9 laboratory in Richmond, California, for VOC analysis. Table B-3 (Appendix B) provides a summary of SVE treatment system analytical results; Table 4-3 provides PCE results for this reporting period.

### **4.3 Results of Sampling for Natural Attenuation Evaluation Screening**

Two rounds of sample collection for natural attenuation evaluation screening were performed during 2Q12 and 3Q12. In accordance with the *Modesto Groundwater Superfund Site Natural Attenuation Screening Evaluation Work Plan* (work plan) (URS, 2012c), groundwater samples were collected from five A zone monitoring wells (MW-04A, MW-05A, MW-08A, MW-15A, and MW-20A) and five B zone monitoring wells (MW-04B, MW-17B, MW-20B, MW-25B, and MW-28B). The work plan presents the rationale for the selection of each location. In addition to the array of wells sampled in 2Q12, the B zone monitoring well, MW-24B, was sampled in the 3Q12 round because of the potential that natural attenuation by degradation was the cause of concentration differences between this well and the nearest B zone wells. After the 2Q12 sampling round, the technical memorandum, *Summary of Preliminary Results of Sampling for Natural Attenuation Screening, Modesto Groundwater Superfund Site and Recommendations Based on the Results* (URS, 2012d) was prepared and submitted for review. The draft technical memorandum, *Results of Sampling for Natural Attenuation Evaluation Screening, Modesto Groundwater Superfund Site and Recommendations Based on the Results* (URS, 2012e) describes the results, interpretations, and recommendations of the evaluation of both sampling rounds (2Q12 and 3Q12) and was submitted for review in November 2012. This section summarizes these findings.

All normal samples were collected and analyzed as described in the work plan. All analytical results have been fully validated. Section 6.0 provides details of the QA/QC assessment of the data from this evaluation.

The objective of the two rounds of sampling and analysis identified in the work plan is to evaluate whether one or more destructive/transformational natural attenuation processes are active in the PCE plume. Following the evaluation of data from both rounds, the objective has been attained.

Analyses performed on both rounds of normal samples provided results for inorganic analytes, total organic carbon (TOC), carbon dioxide, dissolved gases including acetylene, volatile fatty acids, haloacetic acid, and VOCs. Table 4-4 provides the analyte list with normal sample numbers and QC samples. Dissolved oxygen (DO), oxidation-reduction potential (redox), temperature, and pH were also measured in the field for all samples with a flow-through cell that was calibrated in accordance with the SAP (URS, 2010b). The average of two rounds of natural attenuation screening parameter data and PCE concentrations in wells sampled are shown on Figure 4-11 for the A zone and on Figure 4-12 for the B zone. Tables 4-5a and 4-5b present the parameter measurements obtained from each well in each round of sampling (2Q12 and 3Q12, respectively). Parameter data for volatile fatty acids, haloacetic acids, and acetylene are not shown on the figure because all results from both rounds of samples are less than their respective detection limits (see MDLs in Table 4-4). During the second round of sampling, samples were collected for quantification of several species of VOC-degrading bacteria and for CSIA in PCE to evaluate evidence of fractionation caused by degradation.

**Biodegradation Screening.** As stated in the work plan data quality objectives (DQOs), the potential for anaerobic biodegradation in the site's PCE plume was evaluated by comparison of geochemical parameter results with numerical criteria from the EPA Technical Protocol (protocol) (Wiedemeier et al, 1998).

“Weighting values” obtained from average parameter results are listed as points with the numerical criterion for each parameter in Tables 4-5a and 4-5b; the sum of the points for the parameter average for each well are interpreted as shown in Table 4-6. The interpretation of point totals for all wells in the evaluation are lower than the “action level” value of 6 identified in the work plan DQOs (URS, 2012c), and therefore, the average of parameter values suggest inadequate evidence of anaerobic biodegradation at any well included in the evaluation. After the first round of natural attenuation sampling, there was some evidence to suggest biodegradation may be occurring in some areas of the PCE plume (e.g., MW-4A area). However, the averages of protocol parameter results are less encouraging than the first round results (URS, 2012d).

**Evaluation of Modesto Groundwater Geochemical Parameters.** The condition that creates the greatest obstacle to biodegradation beneath the site is oxidizing (aerobic) conditions. To degrade PCE by reductive dechlorination to trichloroethene (TCE), cis-1,2-Dichloroethene (cis-1,2-DCE), vinyl chloride (VC), and ethene, groundwater must have anaerobic conditions indicated by concentrations of: oxygen less than 1 milligram per liter (mg/L) and preferably less than 0.5 mg/L; nitrate less than 1 mg/L; and sulfate less than 20 mg/L. With the exception of sulfate concentrations in several B zone wells, mean parameter values indicate oxidizing conditions across the site. For all wells, the pH is just slightly higher than neutral and is compatible with microbial bioattenuation of site constituents. Reported temperatures are also within the range that would support microbial bioremediation. Other monitored parameters, such as temperature, pH, carbon, alkalinity, and carbon dioxide concentrations, are within ranges that would allow for microbial remediation to occur.

A necessary component of biodegradation of PCE and its daughter products is availability of hydrogen, which may be produced by bacteria separate from the bacteria species available for the dechlorination reactions. This first step of hydrogen production is the anaerobic fermentation of an organic compound, such as hydrocarbons or sugars. If no organic material is indigenously available to ferment, then the availability of hydrogen limits biodegradation by dechlorination. Concentrations of benzene, toluene, ethylbenzene, and xylenes and TOC are low, indicating insufficient hydrogen production in the PCE plume.

After the first round of sampling in 2Q12, the potential that biodegradation may be occurring was greatest in groundwater at MW-04A (URS, 2012d). TCE and cis-1,2-DCE, daughter products of PCE degradation, had been detected at the well, and in 1Q12, the cis-1,2-DCE concentration was greater than the concentration of TCE, which suggested degradation of TCE to cis-1,2-DCE. The detection of methane in the 2Q12 round sample suggested that methanogenic bacteria, which could degrade chlorinated ethenes (e.g., PCE, TCE), are present near the well. However, methane was not detected at the well in the second sampling round and the inconsistent presence of methane suggests that there are insufficient bacteria to degrade PCE.

Methane concentrations were greater in more B zone wells (MW-04B, MW-17B, MW-24B, MW-25B, and MW-28B) than A zone wells (MW-04A and MW-05A). However, all methane concentrations detected were one-tenth or less of the concentration (0.1 mg/L) that indicates concentrations sufficient for methanogenic bacteria to aid in biodegradation (Wiedemeier et al, 1998).

**Bacteria Analysis.** The molecular tool, quantitative polymerase chain reaction (qPCR), was used on five normal samples and two field duplicate (FD) samples collected in 3Q12 at the site. To quantify the potential dechlorinating populations at the site, a number of quantitative polymerase-chain reactions (qPCR CENSUS) analyses were performed. A standard PCR is a laboratory method that amplifies a genetic sample. The sample itself is not altered during the PCR process. Instead, a series of chemical steps simply multiplies the volume of the initial sample, providing an increased quantity of genetic material that is identical in chemical composition to the original sample. A standard PCR reaction has the capability of

determining if a specific type of organism is present in an environment. For example, *Dehalococcoides* is a bacterial genus capable of dechlorinating PCE to ethene. A standard PCR reaction, using proper molecular probes, can determine if *Dehalococcoides* is present in an aqueous or soil sample taken from a PCE-contaminated site. However, a standard PCR cannot determine the number of the target organisms, such as *Dehalococcoides*, that are in an environment.

A qPCR is a well-established, modified form of a PCR reaction. In qPCR, a special molecular probe is created to amplify a specific genetic sequence from the target organism. This probe is added to a test tube, which also contains purified DNA that was isolated from an environmental sample. What differentiates qPCR from a standard PCR is that as each target genetic sequence is copied, a discrete amount of a fluorescent marker is released into the test tube. The concentration of this fluorescent marker is continuously measured as the initial sample is replicated. Thus, at the end of the qPCR process, the final amount of fluorescent marker released into the test tube medium from the probe can be used to back calculate the number of gene copies in the original sample. The number of gene copies is then related to the number of target organisms in the initial sample. Thus, qPCR is a quantitative analysis, as opposed to a qualitative one. If a standard PCR is a molecular copy machine, then qPCR is a molecular copy machine with a counter built in.

The bacterial species selected for quantitation by qPCR are: *Dehalococcoides ethenogenes*, *Dehalobacter*, *Desulfomonas*, *Desulfitobacterium*, and methanotrophic bacteria, the first four of which are known to fully or partially dechlorinate PCE or its potential daughter products TCE and cis-1,2-DCE. DNA probes for *Dehalococcoides*, *Dehalobacter*, *Desulfomonas*, *Desulfitobacterium*, and methane-oxidizers were selected to identify plume microbiology and specifically to quantify potential populations of dechlorinating bacteria. Each of these populations has a role in regards to dechlorination; however, the precise role is somewhat different for each of these groups of microbes. *Dehalococcoides* is the only genus identified as being capable of fully dechlorinating PCE to ethene. *Dehalobacter* and *Dehalococcoides* are both obligate dechlorinators, and this activity is their only means of survival. Members of the *Desulfitobacterium* genus are capable of partial reductive dechlorination of PCE to TCE to cis-1,2- DCE. However, members of this genus are also capable of utilizing a number of non-chlorinated compounds as an energy source and, thus, are not required to perform dechlorination reactions for survival. Methane-oxidizing bacteria are capable of undertaking the aerobic metabolism of TCE and cis-1,2- DCE. However, as with the members of the *Desulfitobacterium* genus, methane-oxidizers are also capable of utilizing other compounds for growth.

The only monitored populations present in any substantial levels (greater than  $1 \times 10^4$  cells/milliliter) in the subsurface were *Desulfitobacterium* and the methane-oxidizing bacteria. Although methane-oxidizers can metabolize chlorinated compounds under the aerobic conditions present at this site, they have been reported only to act upon TCE and cis-1,2-DCE, which are not detected in any quantity at this site. Furthermore, methane-oxidizers have not been shown to dechlorinate PCE, the compound found at this site, under aerobic conditions. The second most abundant population occurring in groundwater at the site, members of the *Desulfitobacterium* genus are capable of partial reductive dechlorination of PCE. However, the daughter products of this metabolism, TCE and cis-1,2-DCE, have been detected in only a few wells and generally at concentrations of less than  $1 \mu\text{g/L}$ .

These factors, coupled with the absence of any significant populations of the dechlorinators (*Dehalobacter* and *Dehalococcoides*), coupled with site geochemistry, such as the absence of significant quantities of PCE-dechlorination daughter products (particularly TCE and 1,2-cis DCE) and the presence of clearly aerobic environmental conditions, strongly suggest that biological dechlorination is not occurring to any substantial degree at this site.

**Abiotic Degradation Screening.** Destruction or transformation of PCE and TCE can occur abiotically, via hydrolysis, dehydrohalogenation, and oxidation. Destruction of PCE and TCE via these reactions has been observed to occur generally under aerobic groundwater conditions (typically, greater than 1 mg/L of DO) and, the latter of these mechanisms is well known to be responsible for the degradation of cis-1,2-DCE and VC to nontoxic constituents including carbon dioxide (CO<sub>2</sub>), water (H<sub>2</sub>O), and chloride (Cl) (Wiedemeier, et al., 1998). Recent literature indicates that destruction of PCE and TCE occurs under abiotic reductive pathways (under anaerobic conditions) and may be a significant cause for plume degradation, which is often overlooked (Brown, 2006).

Abiotic degradation does not typically follow the dechlorination sequence that biodegradation follows. PCE, TCE, cis-1,2-DCE, and VC can be degraded directly to chloroacetic acid, acetic acid, acetylene, and ethene, respectively, under abiotic mechanisms. To evaluate the potential for abiotic degradation in the plume, analyses of the potential degradation products were performed in both sampling and analysis rounds. The results for acetic acid, haloacetic acid, ethene, and acetylene analyses during the natural attenuation evaluation do not suggest that abiotic degradation is occurring at any of the well locations sampled in the PCE plume. Analytical results for all potential abiotic degradation products were not detected for all samples collected for the analyses. Therefore, the results indicate that abiotic degradation of PCE is not occurring at the site.

**CSIA.** This method of analysis determines the difference between the stable isotope ratios <sup>13</sup>carbon/<sup>12</sup>carbon in a degradable compound (e.g., PCE, between several locations in a groundwater plume). An increasing trend in the ratio from source area downgradient has been shown to indicate degradation is occurring and to distinguish degradation/transformation from non-destructive natural attenuation processes (Hunkeler et al., 2008). A total of 11 samples (9 normal and 2 FDs) were collected for analysis of the fraction of <sup>13</sup>carbon and <sup>12</sup>carbon isotope during the second round of sampling for natural attenuation at the site. In the work plan (URS, 2012c), CSIA analyses for <sup>37</sup>chlorine -<sup>35</sup>chlorine ratios were planned; however, during the evaluation of the first round results, it became evident that the chlorine ratios would not provide sufficient additional information regarding degradation to warrant the additional analytical costs. Therefore, no CSIA of stable chlorine isotope ratios were performed.

This distinction of degradation processes from sorption, dilution, and dispersion processes is possible because the lighter of the two carbon isotopes (<sup>12</sup>carbon) is preferentially used in the degradation/transformation to a daughter VOC or chloroacetic acids or acetylene; therefore, the parent compound (e.g., PCE) is left with a greater proportion of the heavier isotope after degradation, whether the degradation is biologically mediated or abiotic. This mechanism is isotope fractionation, and during degradation, the <sup>13</sup>carbon/<sup>12</sup>carbon ratio should increase from the source area to parts of the plume downgradient along the flow path from the source area. To evaluate fractionation, samples were collected upgradient, near the source area (MW-05A and MW-04A) and downgradient along the axis (MW-08A, MW-20A, MW-17B, MW-20B, MW-24B, MW-25B, and MW-28B) of the contaminant plume for quantifying the ratios of carbon stable isotopes. Quantifying the ratios of isotopes of carbon and comparing the ratios to a carbon isotope standard has been used to identify degradation/transformation; ratio differences are preceded by the <sup>13</sup>δ symbol (Hunkeler et al., 2008). CSIA was proposed for the site because identifying the mechanism for degradation whether under biotic or abiotic pathways, if it were occurring, would have been important for considering the feasibility of remedial alternatives (e.g., monitored natural attenuation).

Samples collected from the site were analyzed by Zymax Forensics using a gas chromatographic-isotope ratio mass spectrometer. PCE results in all samples occur within a narrow range of δ<sup>13</sup>C -27.1 per mil (0/00) to -28.8 0/00, excluding the trip blank (TB) which had no detected PCE. The only hydrocarbon compound analyzed for carbon isotopes was PCE because TCE and cis-1,2-DCE were detected in too few samples to be used to identify ratio trends. Isotope forensic professionals at Zymax Forensics recommend

that fractionation resulting in a  $\delta^{13}\text{C}$  change of at least 2 ‰ is necessary between the source area and downgradient samples to interpret degradation of PCE has definitely occurred. For the Modesto Groundwater Superfund Site, the change is 1.7 ‰, and, therefore, the conclusion is that substantial biodegradation is not occurring in the plume.

**Attainment of DQOs.** The work plan DQOs (URS, 2012c) presented an analytic approach to attain the goals of the investigation. The analytic components and decisions reached for the natural attenuation evaluation with investigation results are:

- If the total weighting value from comparison of geochemical parameters, DO, oxidation-reduction potential (ORP) and dissolved gases (ethene, ethane) to the EPA protocol criteria is 6 or greater at a well location, there is at least “limited” evidence that biodegradation can occur in the plume at the location; however, degradation by abiotic or chemical degradation is not precluded.

Decision: Total weighting or scoring values based on averages of geochemical parameters indicated less than “limited” evidence of biodegradation at most locations within the plume.

- If ethene, ethane, methane, chloroacetic acid, or acetylene is detected in groundwater samples from a well without TCE, DCE, or VC, natural abiotic degradation of PCE is occurring or has occurred in the plume at the well location.

Decision: The compounds ethene, ethane, chloroacetic acids, and acetylene were not detected in any samples. Therefore, there is no evidence that natural abiotic degradation is occurring at the site. Methane was detected at seven of the sampled well locations; however, concentrations were orders of magnitude less than the 0.1 mg/L criterion that would suggest biotic or abiotic degradation was occurring.

- If DO is less than 1 mg/L and/or ORP is less than 50 millivolts (mV), conditions are favorable for biotic degradation to occur under anaerobic conditions at the well and use of qPCR to identify and quantify dehalogenating or sulfur-reducing bacteria are warranted.

Decision: Five wells were selected for qPCR analysis on the basis of favorable ORP measurements, detectable sulfide concentrations, and methane concentrations.

- If DO is greater than 5 mg/L and/or ORP is greater than 50 mV, conditions are probably not favorable for degradation to occur under anaerobic conditions, and tests to identify and quantify dehalogenating or sulfur-reducing bacteria are not warranted.

Decision: DO and ORP of five monitoring wells sampled in the first natural attenuation evaluation sampling round were unfavorable for anaerobic degradation and were not sampled for bacterial analysis.

- If *Dehalococcoides* spp. are identified as abundant (greater than 1,000 cells per milliliter) bacterial species at a well, reductive dechlorination is probably occurring in the plume at that location.

Decision: Neither *Dehalococcoides* spp. nor other dechlorinating bacteria were identified at greater than 1,000 cells per milliliter in any of the wells' samples; therefore, reductive dechlorination of PCE is unlikely to be occurring to a substantial degree at the locations in the plume that were sampled

- If one round of geochemical data and/or other degradation indicator results (e.g., ethene, ethane, acetylene, fatty acids, and haloacetic acid) suggest that PCE has been degraded at or downgradient from a source area, samples will be collected for CSIA in or near the source area and at locations in the plume downgradient from the source area.

Decision: The geochemical and other degradation indicator results did not suggest that PCE was being degraded in the plume, and this was confirmed by CSIA results.

- If CSIA results indicate that the <sup>13</sup>carbon/<sup>12</sup> carbon ratios in PCE in a sample from a well are greater than those in PCE in previously analyzed samples from solvent manufacturers, then degradation of PCE has occurred in the plume at that location. This comparison will require expert input from the laboratory performing the CSIA.

Decision: The isotope fractionation ratios from the source area are  $\delta^{13}\text{C}$  -27 to -29 ‰ similar to ratios obtained from manufactured PCE and, therefore, unlikely to represent fractionation of PCE caused by degradation.

- If isotopic analyses indicate that <sup>13</sup>carbon/<sup>12</sup> carbon ratios in PCE are greater downgradient from the Halford's Cleaners source area than near the source area, then natural degradation of PCE along the flow path is occurring. This comparison will require expert input from the laboratory performing the CSIA.

Decision: The <sup>13</sup>carbon/<sup>12</sup> carbon fractionation ratios for PCE in all groundwater samples obtained from the site occur in a range less than 2 ‰. This range is too narrow to definitively support the interpretation that fractionation has occurred through degradation of PCE.

Having reached these decisions through the analytical approach, the goal to resolve the problem of whether natural attenuation processes are destroying or transforming PCE to non-toxic constituents in the Modesto Groundwater Superfund Site has been attained. There is no evidence that natural attenuation processes are destroying or transforming more than insignificant quantities of PCE.

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## 5.0 RECOMMENDATIONS

This section provides a summary of observations and recommendations for the GWTS and SVE system. Also provided is a summary of recommendations for natural attenuation evaluation sampling.

### 5.1 GWTS – Summary Observations and Recommendations

The PCE MCL plume is only partially captured in the A zone (Figures 4-5 and 4-8). Based on 3Q12 data, the known extent of the plume is approximately 1,200 feet wide (east-west) and 1,700 feet long in the A zone (Figure 4-2) and approximately 1,900 feet wide and 2,600 feet long in the B zone (Figure 4-3). The A and B zone plumes are shown overlain on Figure 5-1.

Data collected in 3Q12 and in previous quarters and from the 2012 CPT investigation indicate that PCE concentrations are defined in the A zone except to the northwest and southwest of the small PCE plume encompassing MW-23A. Concentrations at MW-13A and MW-14A, located at the western portion of the plume, have historically fluctuated above and below the MCL from quarter to quarter (Figure G-4q and r [Appendix G]). Concentrations at both these wells decreased to less than the MCL in 3Q12. The PCE concentration at MW-23A exceeded the MCL in 3Q12. Two additional wells are recommended: one northwest and one southwest of MW-23A to address these data gaps. These wells would also address the areas to the west of MW-13A and MW-14A, which exceed the MCL usually at least once annually and last exceeded the MCL in 2Q12.

The PCE MCL plume in the B zone is undefined to the west, north, and southeast. Concentrations at MW-25B (south portion of the plume) and MW28B and MW-29B (west portion of the plume) all have exceeded the PCE MCL since their installation in September 2011, and the PCE concentration at MW-09B (located in the northern portion of the plume) fluctuates quarterly from just above to just below the MCL (14 µg/L in 3Q12). Therefore, five additional monitoring wells are recommended: two wells to the south and one well each to the north, northwest, and west to define the extent of concentrations exceeding the MCL in these directions.

There were no detections of PCE exceeding the MCL in wells screened in the C zone in 3Q12, and concentrations in this zone have been less than the MCL since 1Q09. Therefore, no additional wells are recommended in the C zone. However, the PCE concentration at MW-16C increased from no detection in 2Q12 to 4.9 µg/L in 3Q12, likely because of the effect of municipal well pumping on C zone water levels. Therefore, the flow rates at Municipal Wells 6 and 7 should be decreased to reduce potential for affecting PCE plume migration, and PCE concentrations should continue to be monitored at Municipal Wells 6 and 7 (URS, 2012a).

The current GWTS (extraction well EW-01R and new extraction well EW-02) was designed as an interim measure with an objective of source control and mass removal within the northern portion of the groundwater plume where PCE concentrations in shallow zones have historically been the highest (MWH, 2010b). PCE concentrations in groundwater have migrated from the source horizontally and downward into the A, B, and C zones. A groundwater investigation was performed during May and June 2011 to identify the optimal location for an A zone extraction well near the highest PCE concentrations identified on site at MW-04A (URS, 2012f). EW-02 was installed near MW-04A, which was identified as the optimal location to extract groundwater with the highest PCE concentrations at the site, and brought online September 13, 2012.

Groundwater analytical results from the HydroPunch groundwater samples collected during the May/June 2011 CPT investigation indicated that the 1,000 µg/L PCE plume is larger than depicted in previous quarterly reports, and its long axis trends (approximately 750 feet from east to west) and almost

perpendicular to the primary southeast gradient direction in the A zone (URS, 2012f). Because the vertical and horizontal extents of the PCE concentrations exceeding 1,000 µg/L in the A zone were not defined with the data from the May/June 2011 CPT investigation, additional groundwater samples were collected in June 2012 from locations to the west, southwest, east, and south using CPT technology. Results from that investigation indicate that the vertical and horizontal extents of the PCE concentrations exceeding 1,000 µg/L in the A zone are defined. In addition, the large MCL plume is defined to the west; however, the small plume encompassing MW-23A is undefined to the northwest and southwest. These data are documented in the *Final Letter Report, Additional CPT/HydroPunch Investigation* (URS, 2012b).

The installation of EW-02 is a continuation of the remediation efforts needed for the site. In addition to the operation of this well, the additional monitoring wells recommended in this section are needed to define the boundaries of the A and B zone PCE contamination in groundwater, after which additional groundwater extraction wells may be needed to prevent downgradient migration of the plume. These alternatives are being evaluated in the draft feasibility study (URS, pending).

## **5.2 Soil Vapor Extraction – Summary Observations and Recommendations**

The SVE treatment system's 3Q12 average influent sample concentrations were higher than the 2Q12 average. Monthly samples entering the treatment system had PCE concentrations of 190, 500, and 650 ppbv in July, August, and September, respectively. Concentrations at all three operating extraction wells were higher in 3Q12 than in 2Q12. The total PCE mass removed increased from 0.34 pound in 2Q12 to 3.0 pounds in 3Q12.

The SVE system was installed to address soil gas concentrations at the source of the site contamination. The objective of SVE is to eliminate the source for groundwater contamination by removing contaminant mass in the vadose zone. A secondary objective would be to reduce or eliminate human health risk due to shallow soil gas and vapor intrusion.

Soil vapor concentrations and mass removal rates curves for the SVE system have become asymptotic (Figure 4-10). The system has become inefficient. Good engineering practice dictates that shutdown of extraction wells is warranted; however, the system has been operated principally to reduce the risk to building occupants that could be posed by PCE vapor intrusion from the vadose zone. If well shutdown and rebound monitoring are implemented, monitoring of indoor air concentrations should also be undertaken to assure indoor air risk does not reach unacceptable levels.

## **5.3 Recommendations for Natural Attenuation at the Site**

In the light of the interpretation of natural attenuation results, URS recommends that no further investigation of natural attenuation by degradation be conducted at the Modesto Groundwater Superfund Site unless aquifer conditions are modified to encourage the growth of dehalogenating bacteria.

Due to the strongly aerobic nature of the groundwater at this location, and the subsequent lack of an indigenous dehalogenating microbial population, it will be very difficult to stimulate such biologically mediated dechlorination. If natural attenuation were to be considered for a long-term remedial component in addition to extraction, treatment, and discharge, two goals must be met:

1. First, site conditions must be converted from the current state of being strongly aerobic to a state of being strongly reduced. This conversion can be accomplished through the addition of high levels of easily degraded organic materials such as vegetable oil, another carbon substrate, or zero-valent iron. Depending on the choice of amendment, multiple applications may be required.

2. Second, the microbial community present and active at the site must be driven into a more reduced state, after which augmentation of the aquifer with a population of known dechlorinators may be required. There are commercially available products available for this purpose. However, as they are not indigenous to the site, these “foreign” microbial populations are likely to be outcompeted by native species. Therefore, as with the geochemical amendments, any microbial amendments must be monitored and maintained. If biostimulation and or bioaugmentation are to be considered for the site, laboratory bench-scale and/or field pilot-scale treatability studies are recommended to evaluate the effectiveness of these approaches.

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## **6.0 QUALITY CONTROL SUMMARY REPORT**

### **6.1 Introduction**

This section summarizes QA and QC results for the samples collected and data generated during the period of July through September 2012 (3Q12) at the Modesto Groundwater Superfund Site, Modesto, California. Sampling activity protocols are provided in the SAP (URS, 2010b) and work plan (URS, 2012c). Based on the data review, all data collected during this period are of known and acceptable quality in relation to the DQOs of this project. All data are considered usable as qualified for the intended purposes, except one E552.2 result.

Between July 19 and September 6, 2012, field samples, FDs, and field QC samples were collected for groundwater and air samples. Water samples were collected from the GWT system and existing monitoring wells. Air samples were collected from the GWT and SVE systems. Table B-1 (Appendix B) lists contaminants of concern at the Modesto Groundwater Superfund Site. Table B-2 (Appendix B) lists samples submitted for chemical analyses. Analyses performed include the following:

Site and system sampling and monitoring analyses:

#### **ALS Laboratory**

- TDS by Standard Method (SM) 2540C: 3 normal samples (NS)
- TSS by SM2540D: 3 NS
- BOD by SM5210B: 3 NS
- VOCs in water by EPA Method 524.2: 9 NS, 1 FDs, 3 TBs, and 1 matrix spike/matrix spike duplicate (MS/MSD)

#### **Eurofins Laboratory**

- VOCs in air by EPA Method TO15: 6 NS

#### **EPA Region 9 Laboratory**

- VOCs in air by EPA Method TO15: 18 NS and 2 FD
- VOCs in water by EPA Method 524.2: 40 NS, 4 FD, 2 TB, 1 field blank (FB) and 3 MS/MSDs

#### **GEL Laboratories, LLC**

- Total uranium by American Society for Testing and Materials D5174: 10 NS, 1 FD, and 3 MS/laboratory duplicates

Natural attenuation analyses:

#### **EPA Region 9 Laboratory**

- Dissolved gases and carbon dioxide by RSK-175: 11 NS, 1 FD, 1 TB, and 1 MS/MSD

- Anions by E300.0 : 11 NS, 1 FD, and 2 MS/MSD
- TOC by E415.3: 11 NS, 1 FD, and 2 MS/MSD
- Alkalinity by SM2320B: 11 NS, 1 FD, and 2 laboratory duplicates (LDs)
- Sulfide by SM4500-S2: 11 NS, 1 FD, and 1 LD

#### **EMAX Laboratories**

- Acetylene by RSK-175: 11 NS, 1FD, 1 TB, and 1 MS/MSD
- Fatty Acids by E300.0 M: 11 NS, 1FD, and 1 MS/LD

#### **Test America Laboratories, Inc.**

- Haloacetic Acids by E552.2: 11 NS, 1 FD, and 2 MSs

#### **Microbial Insights**

- Targeted anaerobic bacteria (CENSUS): 5 NS and 2 FD

#### **Zymax Forensics**

- CSIA(SW8260B): 9 NS, 1 TB, 2 FD, and 1 MS/MSD

Sample results are summarized in Table B-3 (Long-Term Monitoring and SVE) and Table B-4 (GWTS) (Appendix B).

Analytical chemistry services are provided by the ALS Laboratory in Kelso, Washington, Eurofins Laboratory (formerly Air Toxics, Ltd) in Folsom, California, EPA Region 9 laboratory in Richmond, California; GEL Laboratories, LLC, in South Carolina; EMAX Laboratories in Torrance, California; Test America Laboratories, Inc. in Irvine, California, Microbial Insights in Rockford, Tennessee; and Calscience Environmental Laboratories as a subcontractor to Zymax Forensics in Escondido, California. All laboratories are certified by the California Department of Health Services through the Environmental Laboratory Accreditation Program to perform hazardous waste analyses.

All EPA Region 9 analytical results were validated by Laboratory Data Consultants (LDC) using the criteria established in the SAP, analytical methods, and EPA Region 9 laboratory SOPs as well as the National Functional Guidelines for Superfund Organic Methods Data Review (US EPA, 2008). The sample results validated by LDC were validated electronically. The URS project chemist reviewed all remaining data using criteria established in analytical methods and the laboratories SOPs. Appendix C provides data validation reports and qualified data tables. Several data validation flags were used in the validation process. The definitions of these qualifier flags are:

U Indicates the compound or analyte was analyzed for but not detected at or above the reported quantitation limit.

UJ Indicates the compound or analyte was analyzed for but not detected at or above the stated limit. The sample detection limit is an estimated value.

- J Indicates the analyte was positively identified; the associated numerical value is an approximate concentration of the analyte in the sample.
- R QC indicates that the result is not usable. The presence or absence of the compound or analyte cannot be verified or the reported result is compromised as to be unusable.

## 6.2 Data Quality Objectives

DQOs are qualitative and quantitative statements that specify the quality of the data required to meet the goals of site investigations and support decisions made in remedial response activities. Data quality was assessed in terms of its precision, accuracy, representativeness, completeness, and comparability (PARCC). These criteria are briefly defined in the following sections. The results of the field and laboratory QC checks are evaluated against the DQOs, and the quality of the data is assessed according to the PARCC parameters. QC sample results that fall outside of these criteria serve to signal the production of unacceptable or biased data that could result in the implementation of corrective action or the qualification of data.

### 6.2.1 Precision

Precision is a measurement of mutual agreement among individual measurements of the same property, usually under prescribed conditions. Data evaluated to assess precision consist of results from the analysis of FD pairs and MS/MSD samples. The precision measurement is established using the relative percent difference (RPD) between the duplicate sample results, and is expressed as:

$$RPD = \frac{|X_1 - X_2|}{[(X_1 + X_2) / 2]} \times 100$$

where:

$X_1$  and  $X_2$  represent the individual concentrations of the target analyte in the two replicate analyses.

### 6.2.2 Accuracy

Accuracy is defined as the proximity of the mean of a set of results to the true value. Accuracy is assessed through the evaluation of initial and continuing calibration data, as well as laboratory control sample (LCS) recoveries, surrogate standard recoveries, and MS recoveries, which are expressed as a percent recovery according to the following equation:

$$\text{percent recovery} = \frac{(\text{spiked sample conc.} - \text{sample conc.})}{\text{known conc. of spike}} \times 100$$

### 6.2.3 Representativeness

Representativeness is defined as the degree to which sample data accurately and precisely represent the characteristics of the site, parameter variations at a sampling point, or environmental conditions. Representativeness, in terms of sample integrity for this investigation, was qualitatively evaluated based on the analysis of TBs, FBs, and method blank (MB) samples. In addition, sample collection and handling methods and the cooler receipt forms were reviewed to confirm that samples were received under proper storage conditions.

#### **6.2.4 Completeness**

Two types of completeness have been evaluated for this project. Analytical completeness is the number of unqualified results related to the total number of results reported, expressed as a percentage. The analytical completeness goal is 90 percent. Technical completeness is the number of valid results related to the total number of results reported, expressed as a percentage. The technical completeness goal for this project is 95 percent.

#### **6.2.5 Comparability**

Data comparability is achieved by using standard analytical methods and reporting limits, and by using standard units of measurements, as specified in the methods. Comparability is a qualitative parameter.

### **6.3 Quality Control Results**

The following sections summarize the data review process and results in terms of PARCC criteria, as defined in Section 2.2.5 of the SAP. Appendix C provides qualified data based on this review process.

#### **6.3.1 Precision and Accuracy**

Precision and accuracy were evaluated based on the results of QC samples collected by the field team and QC samples that originated in the laboratory. The calculated RPD for MS/MSDs and FD pairs provided information on the precision of sampling and analytical procedures. MS/MSD analyses were associated with all samples for this sampling event. All data were reviewed for accuracy based on the surrogate spike, MS/MSD, and LCS percent recoveries. In addition, initial and continuing calibration data were reviewed for analytical accuracy. The criteria used for the evaluation are provided in the quality assurance project plan in the SAP (URS, 2010b). Data validation findings are provided in Appendix C. FD results are included in the results summary table (Tables B-3 and B-4) in Appendix B.

#### **6.3.2 Representativeness**

Representativeness was evaluated through the analysis of FB, TB, and MB samples. Additionally, sample collection and handling methods and the cooler receipt forms were reviewed. All sample bottles were received in good condition and the chain-of-custody documents agreed with the sample labels.

TBs are required to accompany each cooler of aqueous samples sent to the laboratory for analysis of VOCs. One TB accompanied each cooler for each of the sampling dates. Tables B-3 and B-4 (Appendix B) list TB detections.

FBs are used to determine if potential sample contamination has occurred during the sample collection process. FBs are analyzed using the same analytical procedures as the associated samples. Table B-3 (Appendix B) provides FB detections.

MBs are processed through the same analytical procedures as the associated samples. MBs are analyzed with each batch of samples to provide information on contamination originating in the analytical process. MB detections are indicated in the data validation report provided in Appendix C.

#### **6.3.3 Completeness**

Completeness of data was evaluated by assuring that all analytical requests were met, samples were received in proper condition, and all analyses were performed within the appropriate holding times.

Overall analytical completeness (93.8 percent) exceeded the project goal of 90 percent. Overall technical completeness for this data set (greater than 99 percent) exceeded the project goal of 95 percent. Refer to Appendix C for a breakdown of completeness by method.

#### **6.3.4 Comparability**

Comparability was evaluated for this sampling event by analyzing all samples according to the specified EPA analytical methods, which use standard units of measurement. Necessary sample dilutions, due to the presence of elevated target compound concentrations, did not affect data usability and comparability. Results for some analytes are reported below the practical quantitation limit (PQL) but above the method detection limit (MDL). The “J” flag has been applied to results reported between the MDL and the PQL.

#### **6.4 Summary of Data Reliability**

Based on this evaluation, all data collected during this period are of known and acceptable quality in relation to the DQOs of this project. All data are considered usable as qualified for the intended purposes, except one rejected result for Method E552.2 for sample MW-25B-3Q12 due to a low MS recovery.

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## **TABLES**

**Table 4-1. Vertical Gradients, Third Quarter 2012**

Well No.	Monitoring Zone	Groundwater			
		Elevation (feet msl)	3Q12 Vertical Gradient	2Q12 Vertical Gradient	3Q11 Vertical Gradient
MW-21A	A	46.92	-0.0188	0.0023	not applicable <sup>a</sup>
MW-22A	A	47.67			
MW-04A	A	49.03	-0.0109	0.0008	-0.0085
MW-04B	B	48.31			
MW-08A	A	49.16	-0.0077	0.0009	-0.008
MW-09B	B	48.59			
MW-10A	A	48.86	-0.0066	0.002	-0.0074
MW-10B	B	48.31			
MW-16A	A	47.43	-0.0008	-0.0008	0.0002
MW-16B	B	47.39			
MW-17A	A	48.54	-0.0075	0.0006	-0.0087
MW-17B	B	48.15			
MW-19A	A	47.04	0.0002	-0.008	-0.0199
MW-19B	B	47.05			
MW-20A	A	49.58	-0.0261	-0.0014	-0.0084
MW-20B	B	47.59			
MW-4B	B	48.31	-0.0546	0.0058	-0.0426
MW-4C	C	43.78			
MW-10B	B	48.31	-0.0741	0.0015	-0.0605
MW-10C	C	43.36			
MW-16B	B	47.39	-0.0442	-0.0006	-0.0388
MW-16C	C	43.09			
MW-17B	B	48.15	-0.0622	0.0017	-0.0099
MW-17C	C	42.36			
MW-20B	B	47.59	-0.0575	0.0063	-0.0472
MW-20C	C	42.36			

<sup>a</sup> wells not installed in 3Q11

msl = mean sea level

3Q12 = third quarter 2012

positive gradient = upward

negative gradient = downward

**Table 4-2. GWTS Sample Results: July - September 2012**

Sample Port	Location	Sample Date	Sample Code	pH	PCE (µg/L)
SP-01	GWTS Influent	7/18/2012	N	7.70	740
		8/8/2012	N	7.44	97
		8/8/2012	FD		110
		9/6/2012	N	7.14	98
SP-03	Carbon Influent	7/18/2012	N	8.21	7.1 J
SP-04	Carbon Mid Bed	7/18/2012	N	8.05	0.25 J
SP-05	Post Carbon Pre-Ion Exchange	7/18/2012	N	7.75	<0.5
SP-07	GWT Effluent	7/18/2012	N	8.02	<0.5
		8/8/2012	N	8.16	<0.5
		9/6/2012	N	7.92	0.11 J

FD = field duplicate  
GWT = groundwater treatment system  
J = estimated value  
N = normal sample  
PCE = tetrachloroethene  
µg/L = micrograms per liter  
< = less than

**Table 4-3. SVE System Sample Results: July - September 2012**

Sample Port	Location	Sample Date	Sample Code	PCE (ppbv)
SP-11	SVE Pre-GAC	7/18/2012	N	190
		8/8/2012	N	500
		9/6/2012	N	650
SP-12	SVE Stack	7/18/2012	N	2.6
		8/8/2012	N	1.6 J
		9/6/2012	N	<2.6

GAC = granular activated carbon  
J = estimated concentration  
N = normal sample  
PCE = tetrachloroethene  
ppbv = parts per billion by volume  
SVE = soil vapor extraction  
< = less than

**Table 4-4. Analytical Methods and Sample Numbers from the Natural Attenuation Screening Evaluation of the Modesto Groundwater Superfund Site**

<b>Analyte</b>	<b>Analytical Method</b>	<b>MDLs</b>	<b>Number of Normal Samples</b>	<b>Quality Control Samples</b>
Chloride, nitrate, and sulfate	E300.0	0.5 – 2.5 mg/L	21	2 FD, 4 MS/MSD
Sulfide	SM5400	0.50 mg/L	21	2 FD, 2 LD
Total organic carbon	E415.3	0.25 mg/L	21	2 FD, 4 MS/MSD
Ferrous iron	SM3500D/ Method 8146 <sup>a</sup>	10 mg/L 0.3 mg/L	10/11	2 FD, 1 MS/MSD
Alkalinity	SM2320	5 mg/L	21	2 FD, 13 LD
Ethene, ethane, methane, and carbon dioxide	RSK-175	0.6 µg/L 1,500 µg/L	21	2FD, 2MS/MSD, 2 TB
Acetylene	RSK-175	1 µg/L	21	2 FD, 1 MS/MSD, 2 TB
Haloacetic acids	Method 552	0.1 – 0.49 µg/L	21	2FD, 2 MS/MSD
Low-level volatile fatty acids	300.0 (M)	0.05 – 0.2 mg/L	21	2FD, 1 MS/LD
Carbon isotopes in PCE	GC-IRMS (SW8260B)	0.5 – 1 µg/L	9	2 FD, 1 TB
Targeted anaerobic bacteria	qPCR (CENSUS)	0.1 cells/mL	5	2 FD

<sup>a</sup> Method for ferrous iron changed in second round to achieve lower detection limit.

FD = field duplicate  
 GC-IRMS = gas chromatograph-isotope ratio mass spectrometer  
 LD = laboratory duplicate  
 MDL = method detection limits  
 mg/L = milligrams per liter  
 mL = milliliter  
 MS/MSD = matrix spike/matrix spike duplicate  
 PCE = tetrachloroethene  
 qPCR = quantitative polymerase chain reaction  
 TB = trip blank  
 µg/L = micrograms per liter

Table 4-5a. Scoring of Groundwater Parameters Indicative of Natural Attenuation, Second Quarter 2012, Modesto Groundwater Superfund Site

Parameter	Units	Expression Value	Potential Points	MW4A	Points	MW4B	Points	MW5A	Points	MW8A	Points	MW15A	Points	MW17B	Points	MW20A	Points	MW20B	Points	MW25B	Points	MW28B	Points
Dissolved Oxygen	mg/L	<0.5	3	NM		NM		NM		NM		NM		NM		NM		NM		NM		NM	
Dissolved Oxygen	mg/L	>1	-3	7.07	-3	5.59	-3	8.05	-3	7.88	-3	6.73	-3	6.32	-3	6.6	-3	5.84	-3	5.23	-3	5.91	-3
Nitrate	mg/L	<1	2	11.06		3.8		26		4		14		4.2		11		4.9		4.3		4.8	
Iron II	mg/L	>1	3	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Sulfate	mg/L	<20	2	32.95		5.5	2	38		38		43		19	2	54		11	2	12	2	15	2
Sulfide	mg/L	>1	3	0.645		ND		ND		0.64		ND		0.55		ND		0.55		ND		ND	
Methane	mg/L	>0.1	2	0.0012		ND		ND		ND		ND		0.0014		ND		ND		0.0009		0.0007	
Redox	mV	<50	1	-16.5	1	154		186		167		164		73		155		135		108		113	
Redox	mV	<-100	2	NM		NM		NM		NM		NM		NM		NM		NM		NM		NM	
pH		5<pH<9	0	7.095		7.28		6.96		7.2		7.17		7.03		7.06		7.37		7.36		7.16	
Total Organic Carbon	mg/L	>20	2	1.52		1.4		0.46		0.4		0.44		7.3		2.5		0.75		0.44		0.39	
Temperature	C	>20	1	21.385	1	21.57	1	19.07		20.94	1	21.91	1	19.8		22.23	1	21.56	1	20.87	1	19.96	
Carbon dioxide <sup>a</sup>	mg/L	84	1	24.05		4.9		37		40		42		16		28		6.5		6.3		10	
Alkalinity <sup>a</sup>	mg/L	720	1	237		130		370		400		360		210		410		180		190		220	
Chloride <sup>a</sup>	mg/L	140	2	50.85		14		75		63		70		50		66		22		27		37	
Volatile fatty acids	mg/L	>0.1	2	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
BTEX	mg/L	>0.1	2	ND		ND		ND		ND		ND		0.0033		ND		0.0003		ND		ND	
Ethene/Ethane	mg/L	>0.01	2	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Ethene/Ethane	mg/L	>0.1	3	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
cis-1,2-Dichloroethene <sup>b</sup>		note 3	2	37.05	2	0.5	2	ND		2J	2	1	2	ND		ND		ND		ND		ND	
trans-1,2-Dichloroethene			0	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
1,1-Dichloroethene		note 1	2	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
TCE <sup>b</sup>		note 2	2	4.2	2			5J	2	4J	2	0.25J	2			1	2	1	2				
PCE			0	635.5		4.4		92		29		ND		20		160		65		120		43	
vinyl chloride			2	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
<b>Totals</b>					<b>3</b>		<b>2</b>		<b>-1</b>		<b>2</b>		<b>2</b>		<b>-1</b>		<b>0</b>		<b>2</b>		<b>0</b>		<b>-1</b>

<sup>a</sup> The "expression values" for carbon dioxide, alkalinity, and chloride concentrations are 2X background concentrations assuming MW-15A results represent background conditions.

<sup>b</sup> Includes highest historical result.

BTEX = benzene, toluene, ethylbenzene, and xylenes

C = Celsius

DCE = dichloroethene

J = estimated value

mg/L = milligrams per liter

mV = millivolt

ND = not detected

NM = measurement does not meet criteria for this parameter

PCE = tetrachloroethene

TCE = trichloroethene

> = greater than

< = less than

Note 1: points awarded if it can be shown to be a daughter product of TCE.

Note 2: points awarded if it can be shown to be a daughter product of PCE.

Note 3: points awarded if it can be shown to be a daughter product of TCE. If cis is greater than 80% of total DCE, it is likely a daughter product of TCE.

Table 4-5b. Scoring of Groundwater Parameters Indicative of Natural Attenuation, Third Quarter 2012, Modesto Groundwater Superfund Site

Parameter	Units	Expression Value	Potential Points	MW4A	Points	MW4B	Points	MW5A	Points	MW8A	Points	MW15A	Points	MW17B	Points	MW20A	Points	MW20B	Points	MW24B	Points	MW25B	Points	MW28B	Points
Dissolved Oxygen	mg/L	<0.5	3	NM		NM		NM		NM		NM		NM		NM		NM		NM		NM		NM	
Dissolved Oxygen	mg/L	>1	-3	7.75	-3	5.92	-3	5.61	-3	4.94	-3	4.58	-3	6.19	-3	7.87	-3	6.77	-3	6.06	-3	6.62	-3	7.96	-3
Nitrate	mg/L	<1	2	22		4.5		8.1		1.3		18		6.5		11		5.1		5.2		4.2		4.9	
Iron II	mg/L	>1	3	0		0.03		0		0.03		0		0.01		0.01		0.03		0.02		0.25		0.03	
Sulfate	mg/L	<20	2	63		7.8	2	53		31		52		27		57		12	2	12	2	12	2	15	2
Sulfide	mg/L	>1	3	0.67		0.9		ND		0.92		ND		1.1	3	0.67		ND		0.59		ND		2.2	3
Methane	mg/L	>0.1	2	ND		0.0007		0.002		ND		0.016		0.0011		ND									
Redox	mV	<50	1	-25	1	83		150		85		101		77		72		45		55		96		83	
Redox	mV	<-100	2	NM		NM		NM		NM		NM		NM		NM		NM		NM		NM		NM	
pH		5<pH<9	0	6.82		7.61		6.49		6.83		6.84		6.93		ND		7.68		7.54		7.51		7.44	
Total Organic Carbon	mg/L	>20	2	0.94				0.6		0.47		0.57		0.54		0.75		0.45		0.62		0.26		1	
Temperature	C	>20	1	20.7	1	21.83	1	21.05		26.91	1	31.03	1	21.08	1	22.03	1	21.69	1	20.98	1	22.94	1	21.51	1
Carbon dioxide <sup>a</sup>	mg/L	≥84	1	44		6.5		88		50		53		20		38		6.7		7.8		6.7		11	
Alkalinity <sup>a</sup>	mg/L	≥720	1	420		150		460		440		430		290		440		180		190		180		220	
Chloride <sup>a</sup>	mg/L	≥140	2	99		18		80		38		64		73		68		22		27		25		38	
Volatile fatty acids	mg/L	>0.1	2	ND		ND		ND		ND		ND		ND		MD		ND		ND		ND		ND	
BTEX	mg/L	>0.1	2	ND		ND		ND		ND		ND		ND		MD		ND		ND		ND		ND	
Ethene/Ethane	mg/L	>0.01	2	ND		ND		ND		ND		ND		ND		MD		ND		ND		ND		ND	
Ethene/Ethane	mg/L	>0.1	3	ND		ND		ND		ND		ND		ND		MD		ND		ND		ND		ND	
cis-1,2-Dichloroethene <sup>b</sup>		note 3	2	1.1	2	ND		ND		ND		ND		ND		MD		ND		ND		ND		ND	
trans-1,2-Dichloroethene			0	ND		ND		ND		ND		ND		ND		MD		ND		ND		ND		ND	
1,1-Dichloroethene		note 1	2	MD		ND		ND		ND		ND		ND		MD		ND		ND		ND		ND	
TCE <sup>b</sup>		note 2	2	1.2	2	ND		ND		ND		ND		ND		MD		ND		ND		ND		ND	
PCE			0	1200		22		51		9.2		ND		45		190		65		64		79		38	
vinyl chloride			2	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
<b>Totals</b>					3		0		-3		-2		-2		1		-2		0		0		1		3

<sup>a</sup> The "expression values" for carbon dioxide, alkalinity, and chloride concentrations are 2X background concentrations assuming MW-15A results represent background conditions.

<sup>b</sup> Includes highest historical result.

BTEX = benzene, toluene, ethylbenzene, and xylenes

C = Celsius

DCE = dichloroethene

J = estimated value

mg/L = milligrams per liter

mV = millivolt

NM = measurement does not meet criteria for this parameter

ND = not detected

PCE = tetrachloroethene

TCE = trichloroethene

> = greater than

< = less than

Note 1: points awarded if it can be shown to be a daughter product of TCE.

Note 2: points awarded if it can be shown to be a daughter product of PCE.

Note 3: points awarded if it can be shown to be a daughter product of TCE. If cis is greater than 80% of total DCE, it is likely a daughter product of TCE.

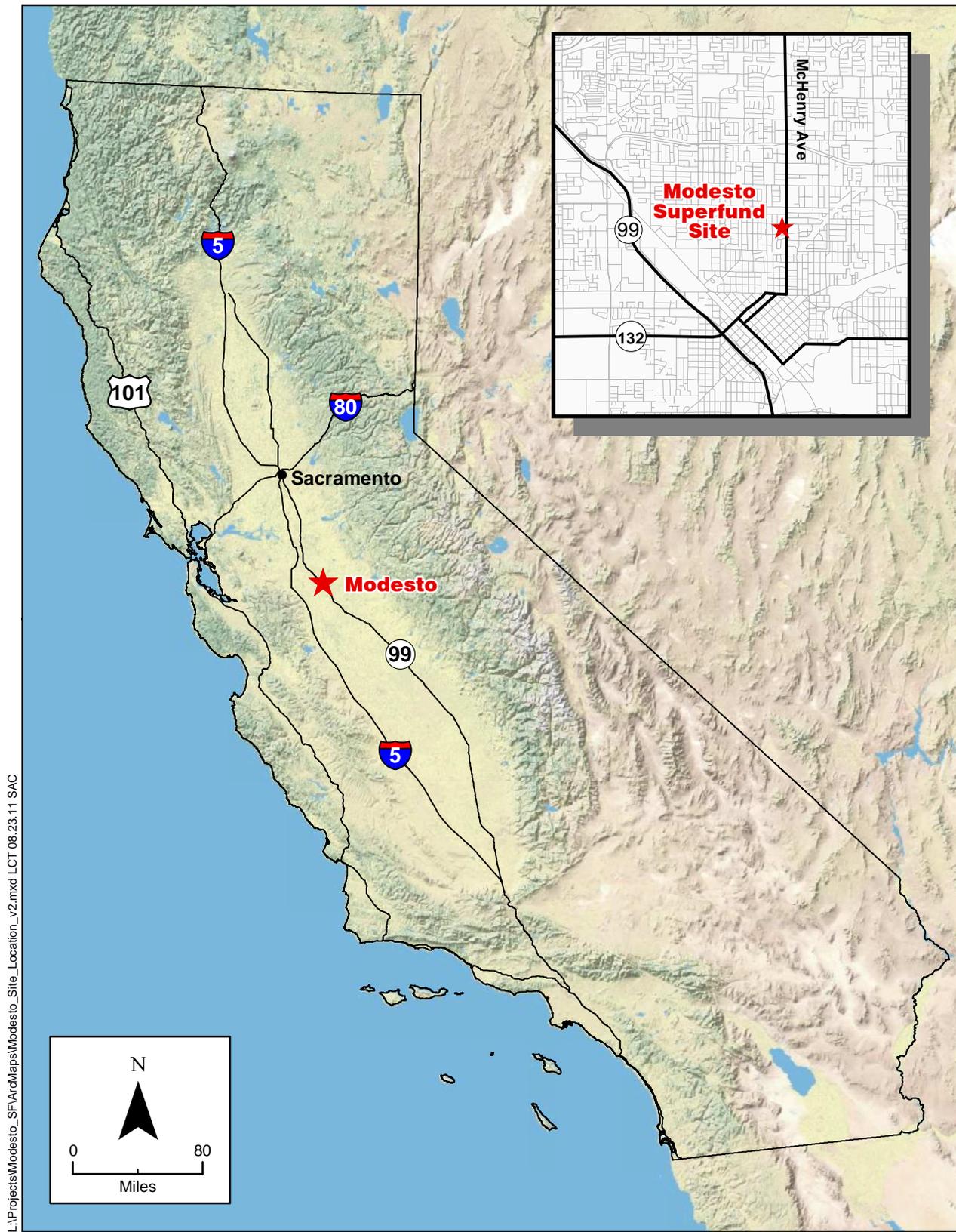
**Table 4-6. Interpretation of Points Awarded During Screening Step**

<b>Sum of Points</b>	<b>Interpretation</b>
0 to 5	Inadequate evidence of anaerobic biodegradation <sup>a</sup> of chlorinated organic compounds.
6 to 14	Limited evidence for anaerobic biodegradation of chlorinated organic compounds.
15 to 20	Adequate evidence for anaerobic biodegradation of chlorinated organic compounds.
>20	Strong evidence for anaerobic biodegradation of chlorinated organic compounds.

<sup>a</sup> Biodegradation = reductive dechlorination

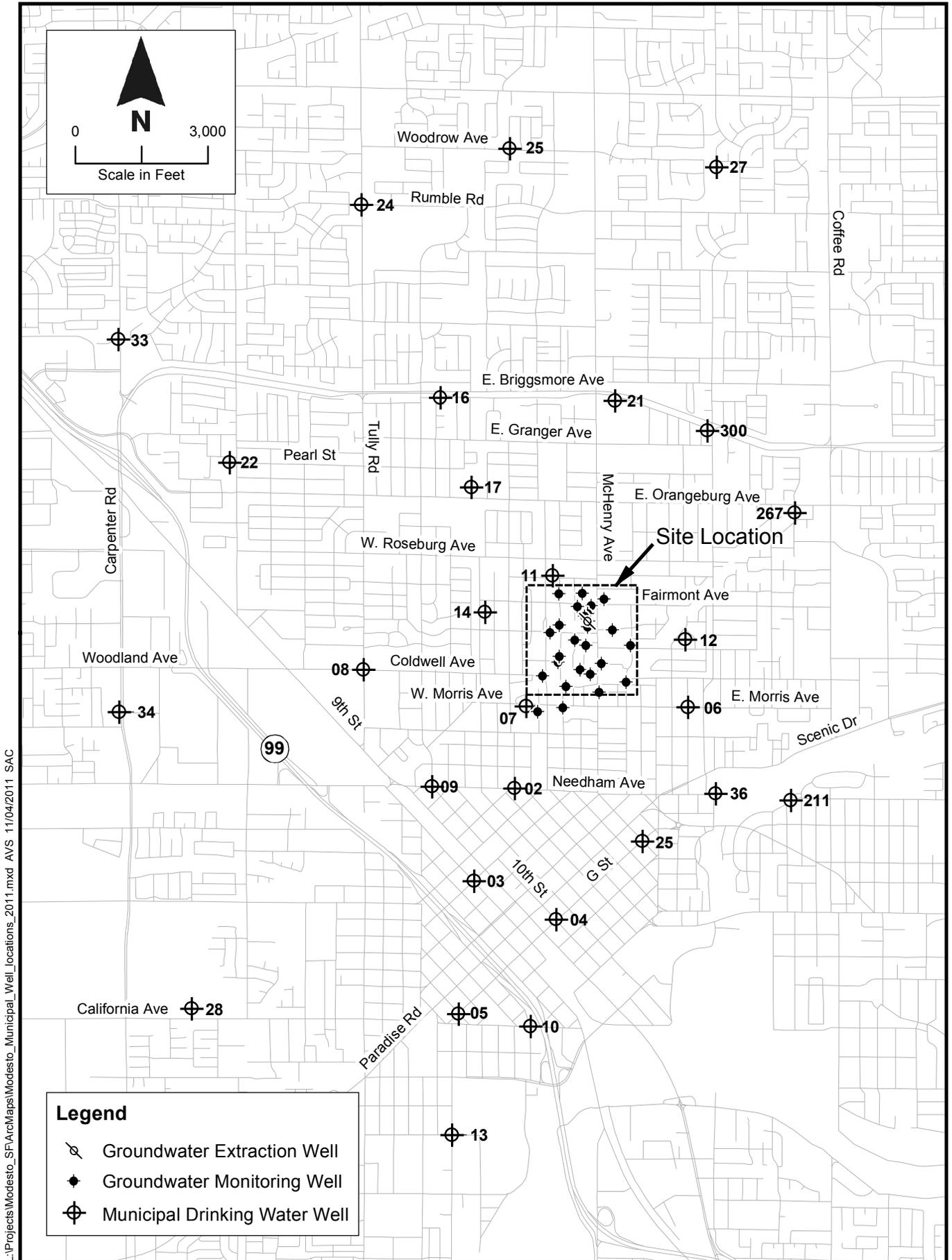
> = greater than

## **FIGURES**

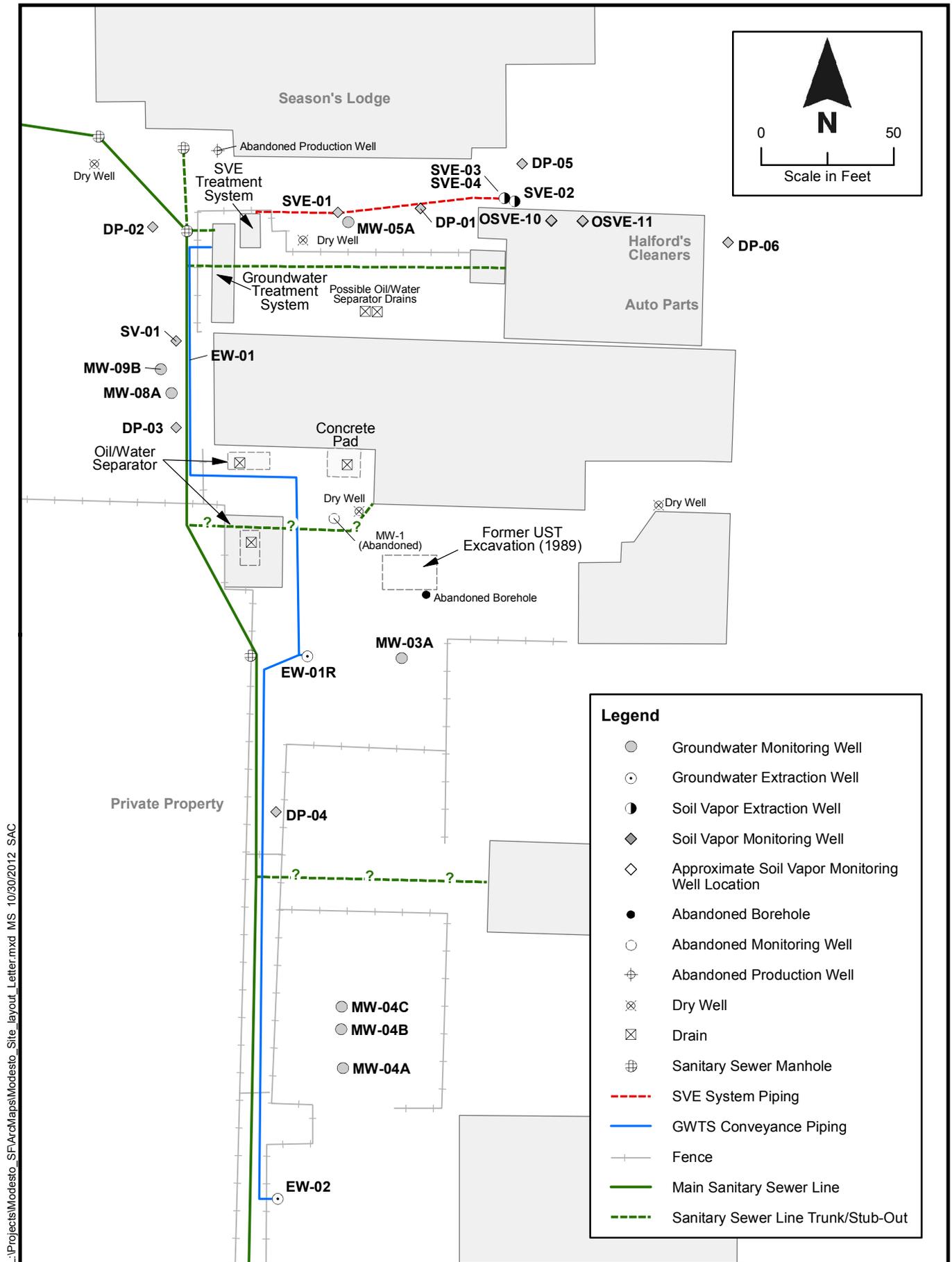


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**Figure 1-1. Site Location, Modesto Groundwater Superfund Site, Modesto, California**

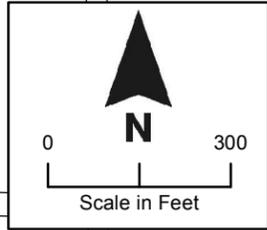


**Figure 1-2 Municipal Well Locations,  
Modesto Groundwater Superfund Site**



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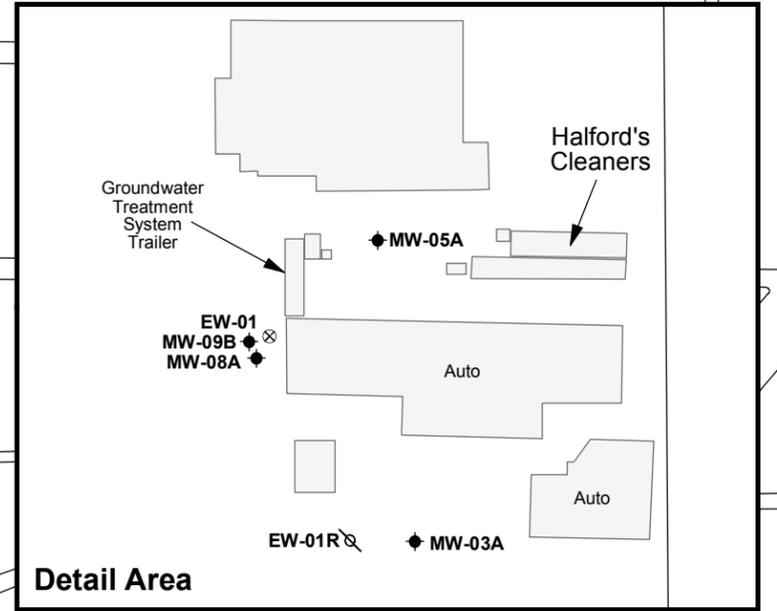
**Figure 2-1. Site Layout  
Modesto Groundwater Superfund Site**



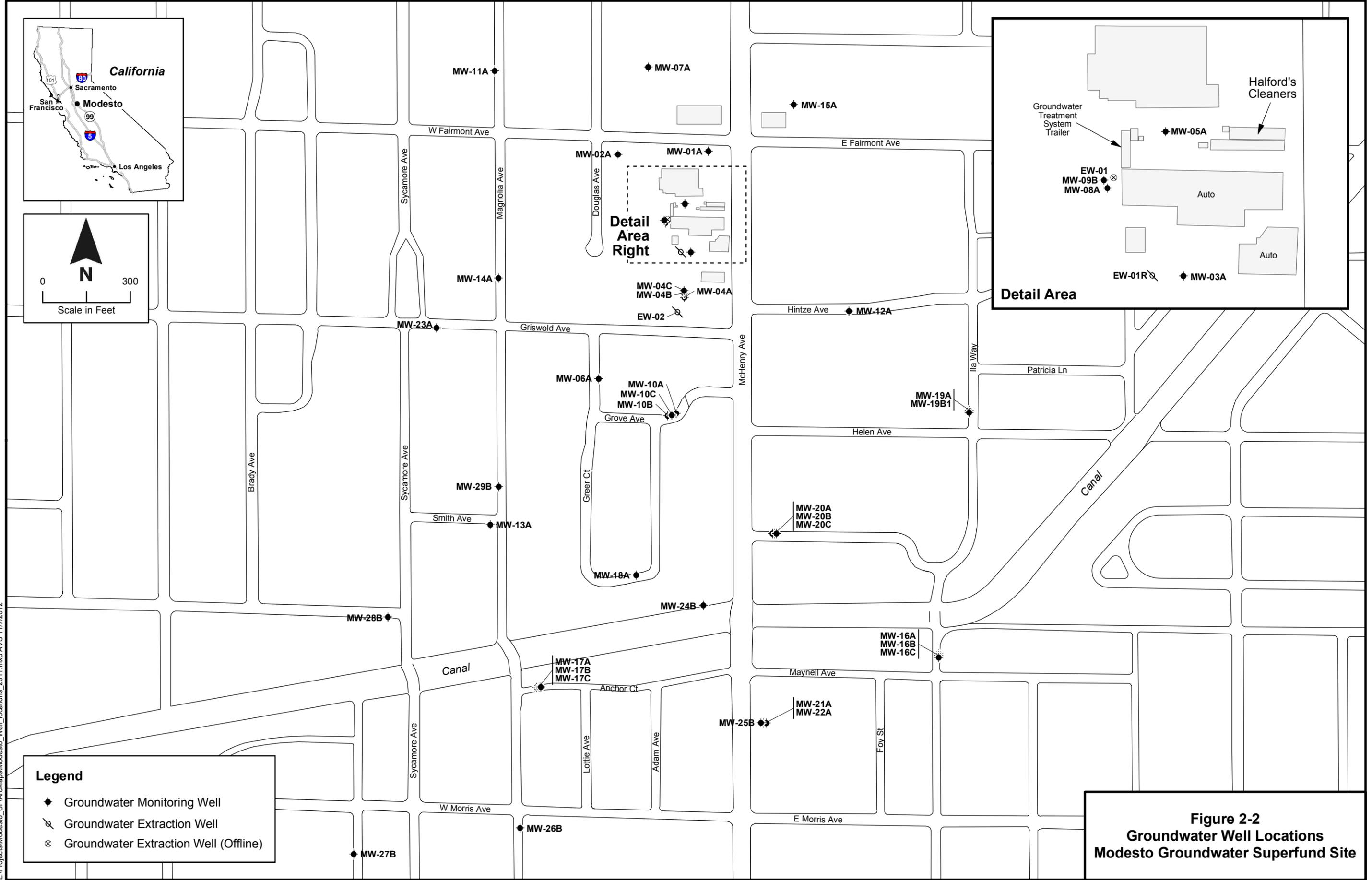
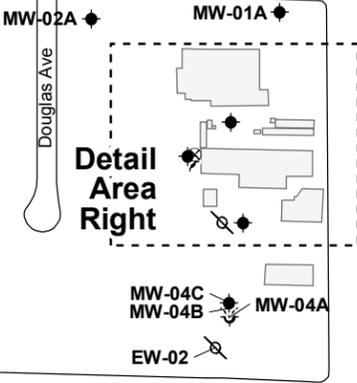
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**Legend**

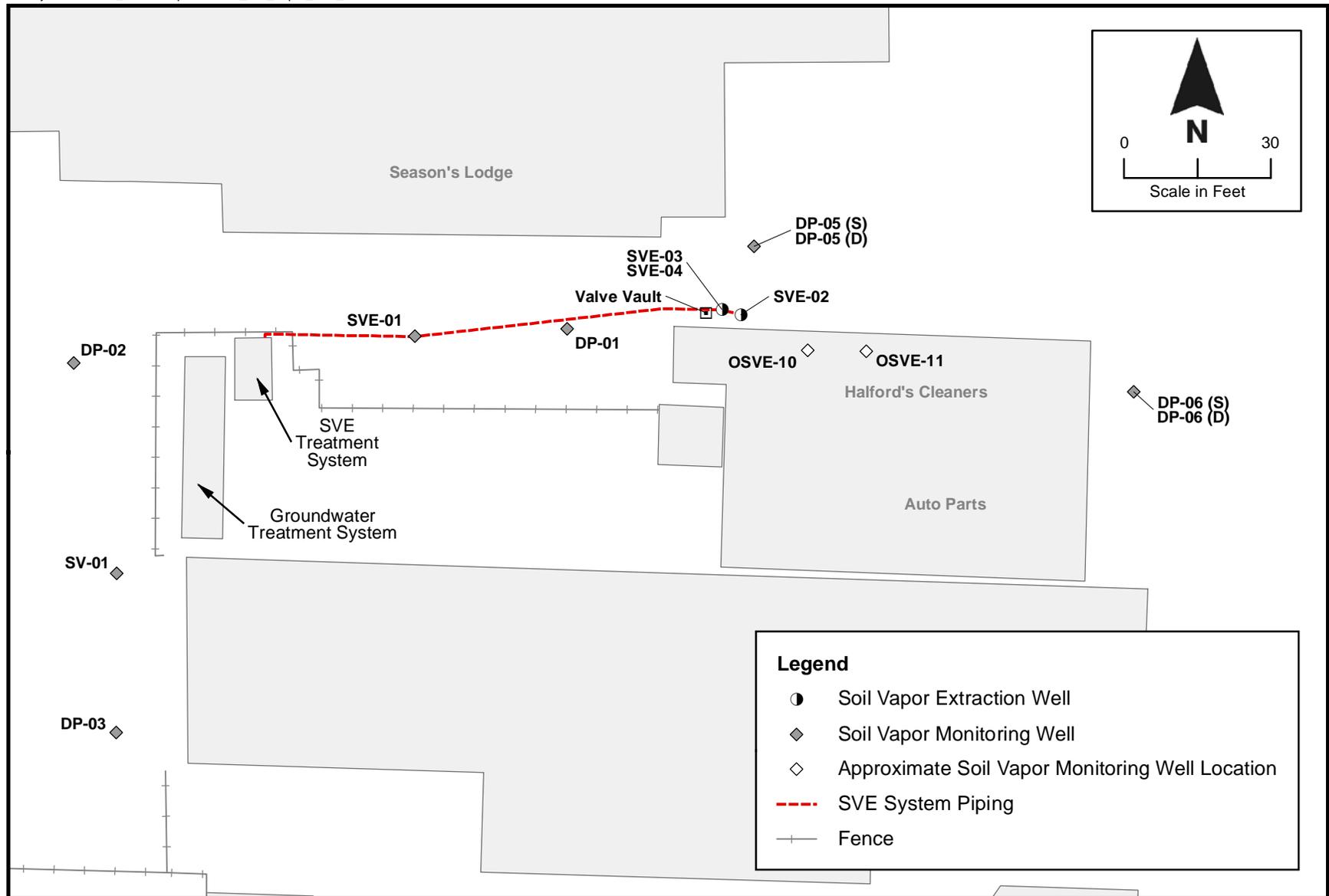
- ◆ Groundwater Monitoring Well
- ⊗ Groundwater Extraction Well
- ⊗ Groundwater Extraction Well (Offline)



**Detail Area Right**

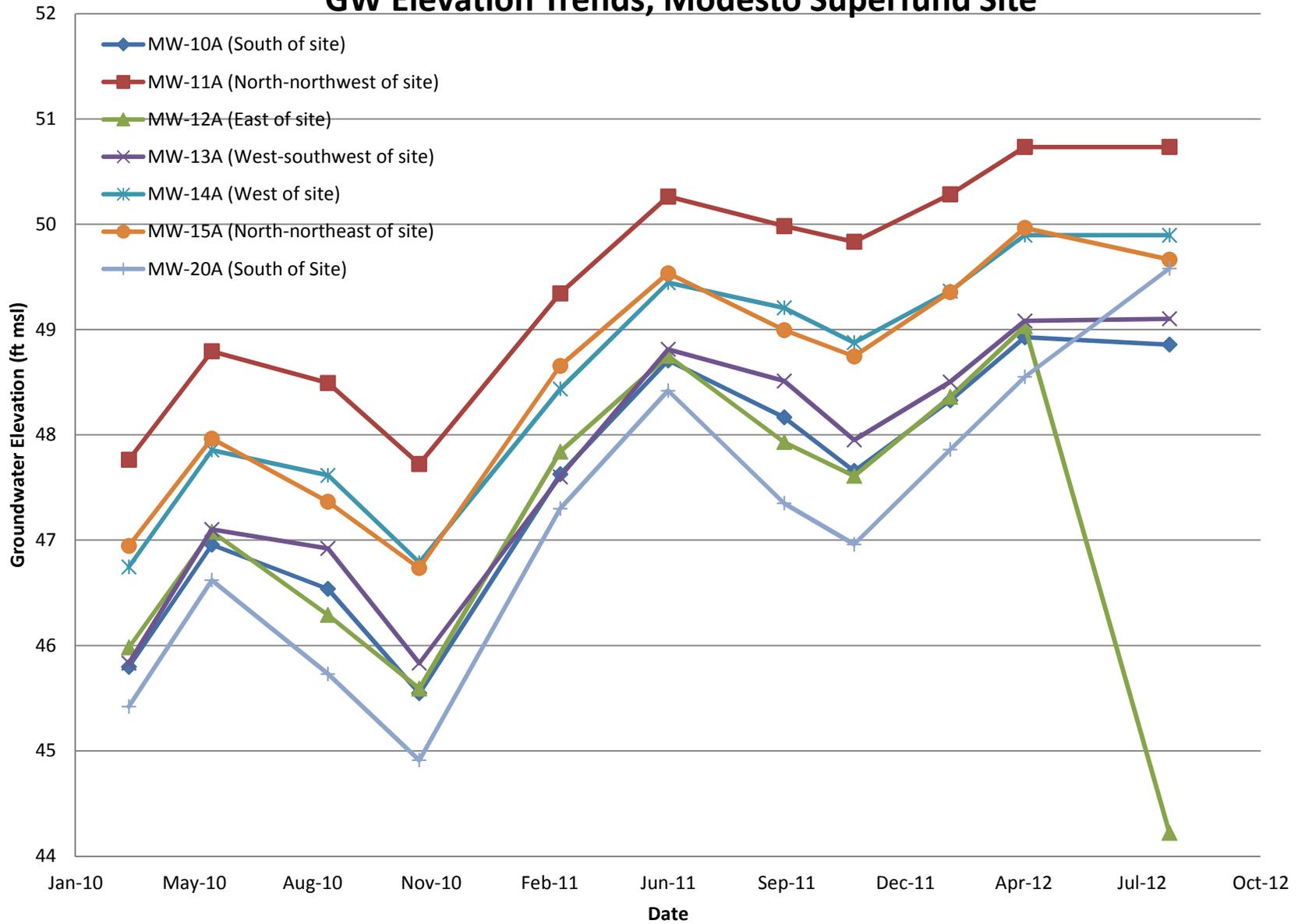


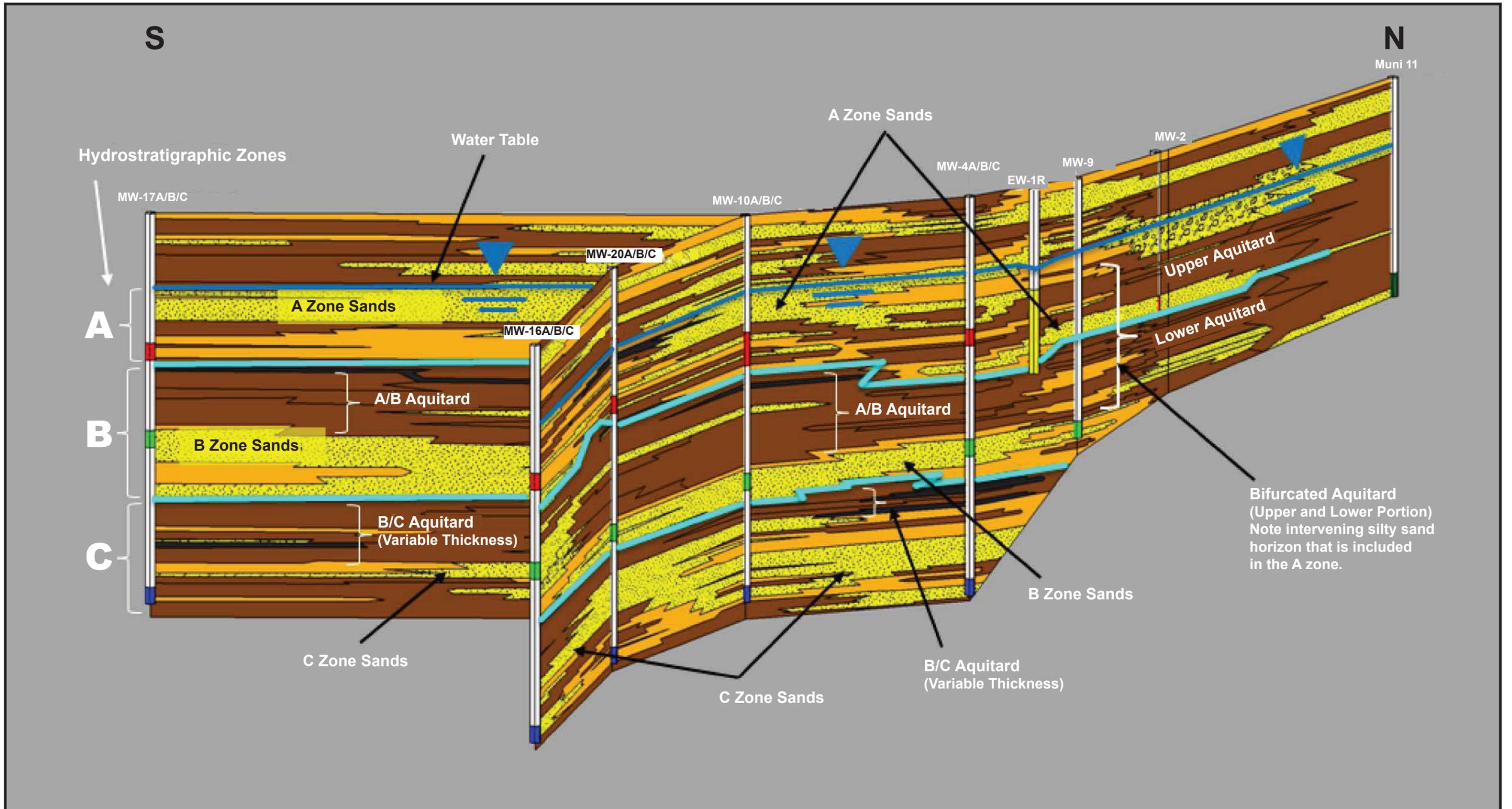
**Figure 2-2  
Groundwater Well Locations  
Modesto Groundwater Superfund Site**



**Figure 2-3. Soil Vapor Well Locations, Halford's Cleaners Area, Modesto Groundwater Superfund Site**

**Figure 3-1**  
**GW Elevation Trends, Modesto Superfund Site**

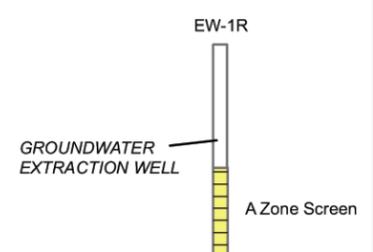
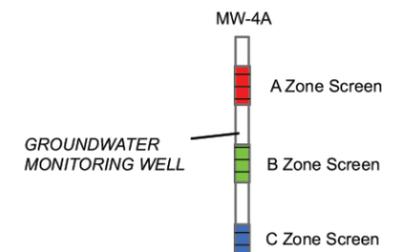




**LEGEND:**

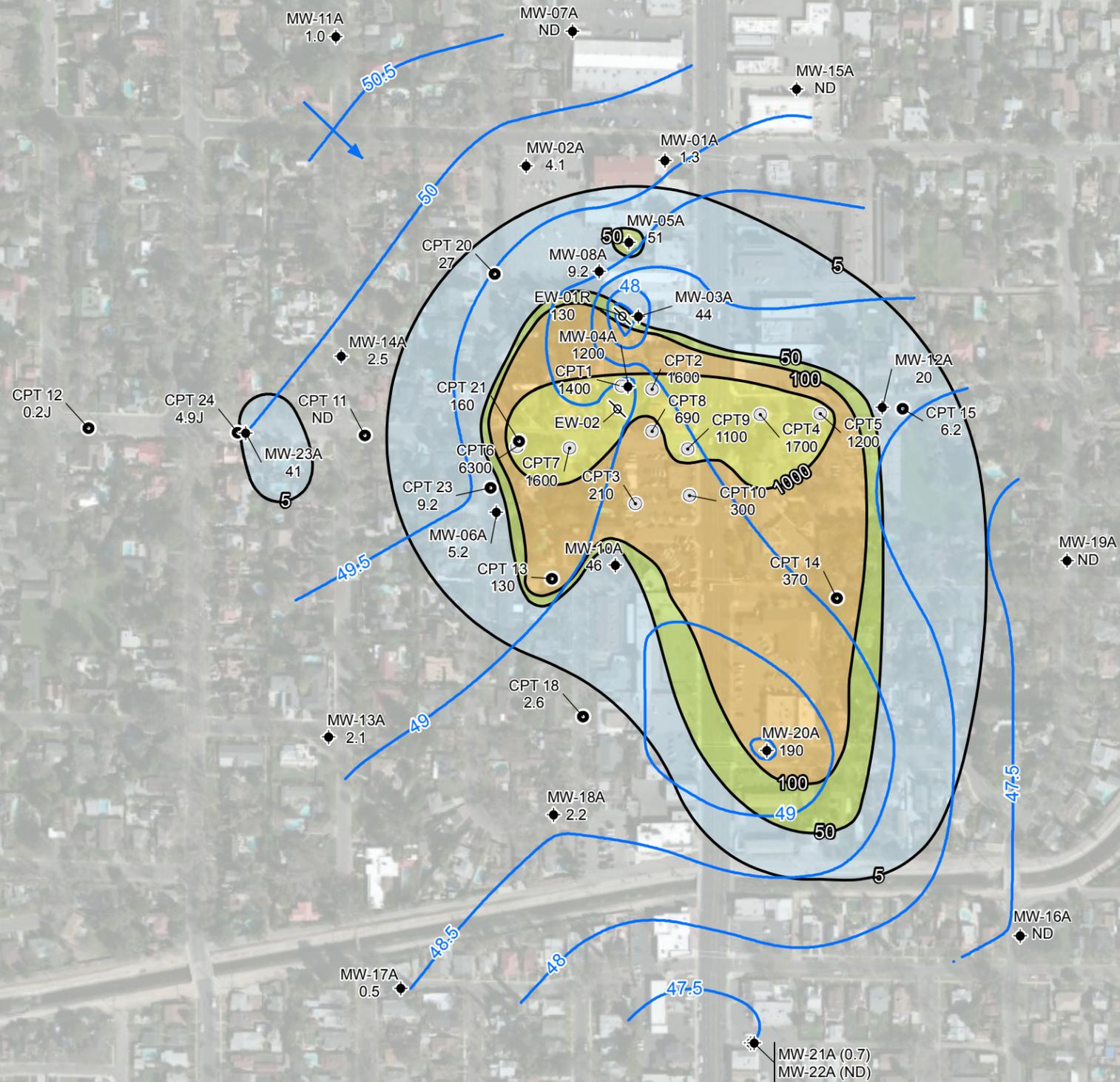
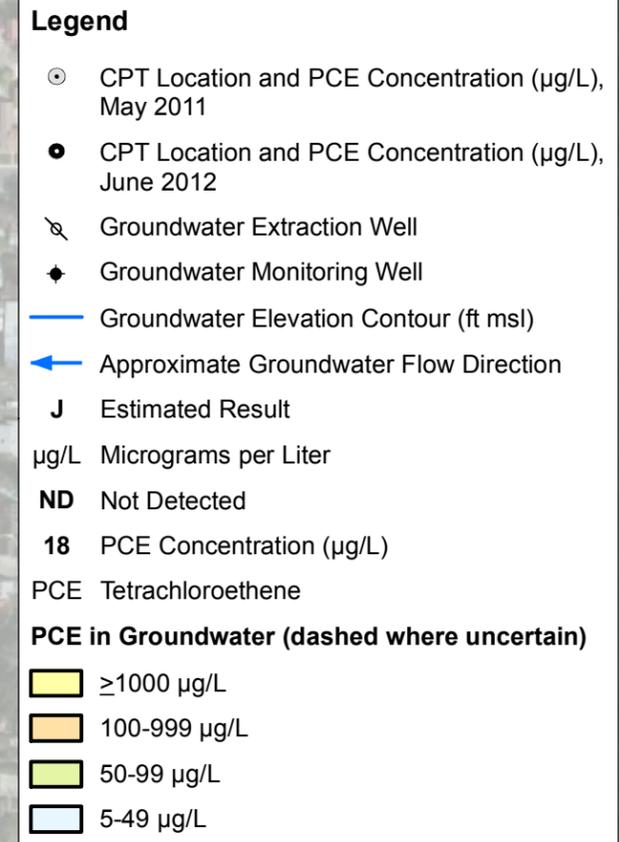
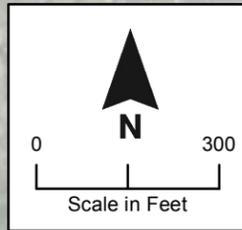
- SAND
- SILTY SAND
- SILT
- CLAY

WATER TABLE SURFACE (A Zone)



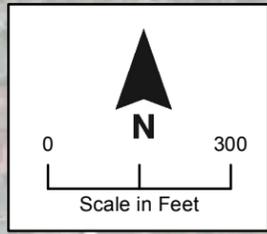
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**Figure 4-1**  
**Stratigraphic Conceptual Model**  
**Modesto Groundwater Superfund Site**



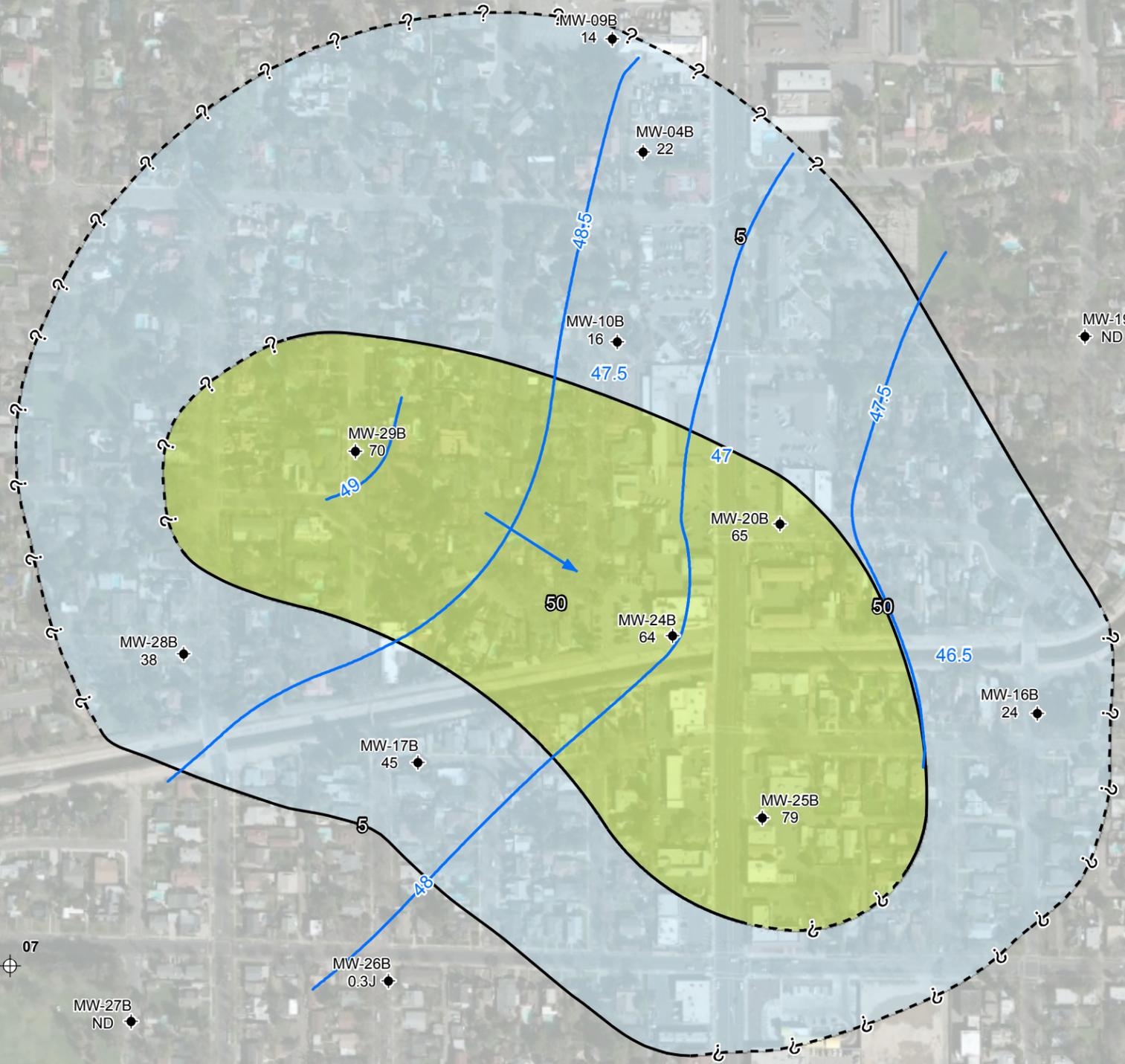
**Figure 4-2**  
**Groundwater Potentiometric Surface**  
**and PCE in A Zone Groundwater**  
**Third Quarter 2012**  
**Modesto Groundwater Superfund Site**

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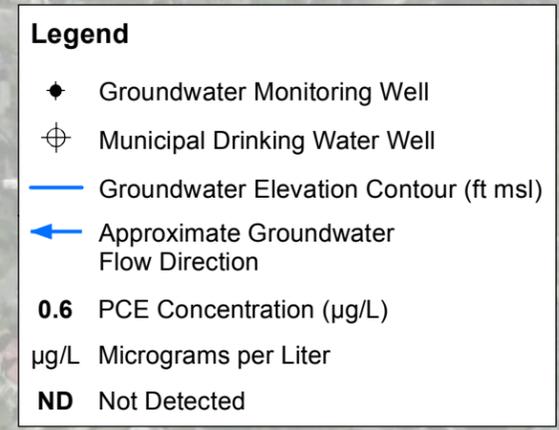
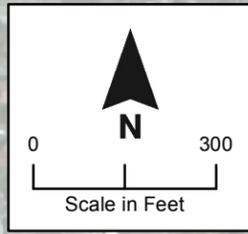
**Legend**

- ◆ Monitoring Well
- ⊕ Municipal Drinking Water Well
- ← Approximate Groundwater Flow Direction
- Groundwater Elevation Contour (ft msl)
- J Estimated Result
- µg/L Micrograms per Liter
- ND Not Detected
- 18 PCE Concentration (µg/L)
- PCE Tetrachloroethene
- PCE in Groundwater (dashed where uncertain)**
- ≥100 µg/L
- 50-99 µg/L
- 5-49 µg/L



**Figure 4-3**  
**Groundwater Potentiometric Surface**  
**and PCE in B Zone Groundwater**  
**Third Quarter 2012**  
**Modesto Groundwater Superfund Site**

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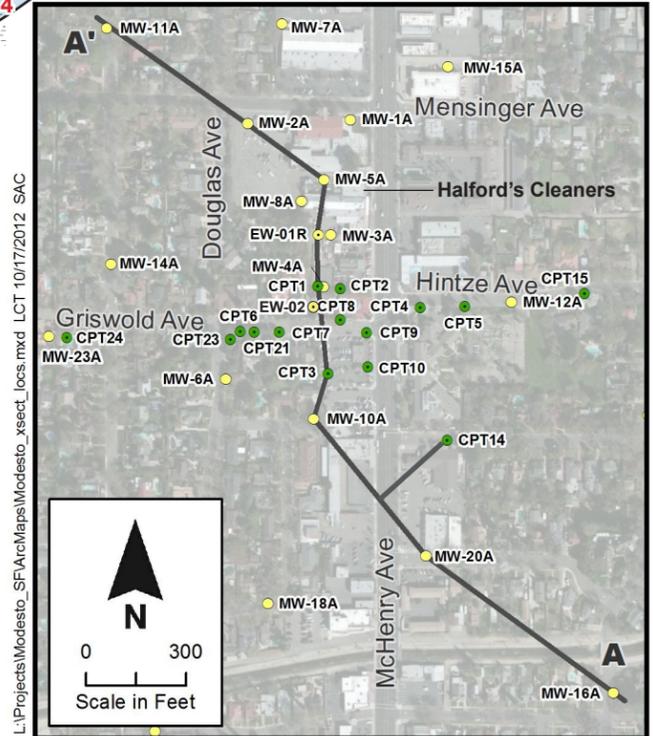
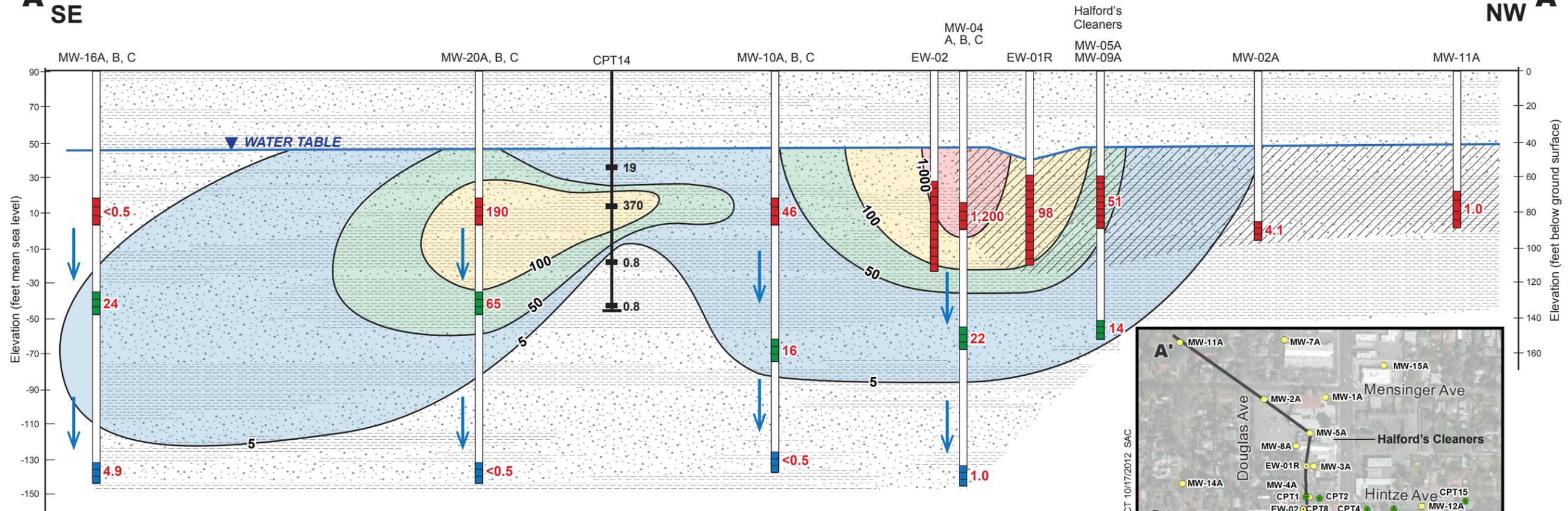


**Figure 4-4**  
**Groundwater Potentiometric Surface**  
**and PCE in C Zone Groundwater**  
**Third Quarter 2012**  
**Modesto Groundwater Superfund Site**

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**A SE**

**NW A'**

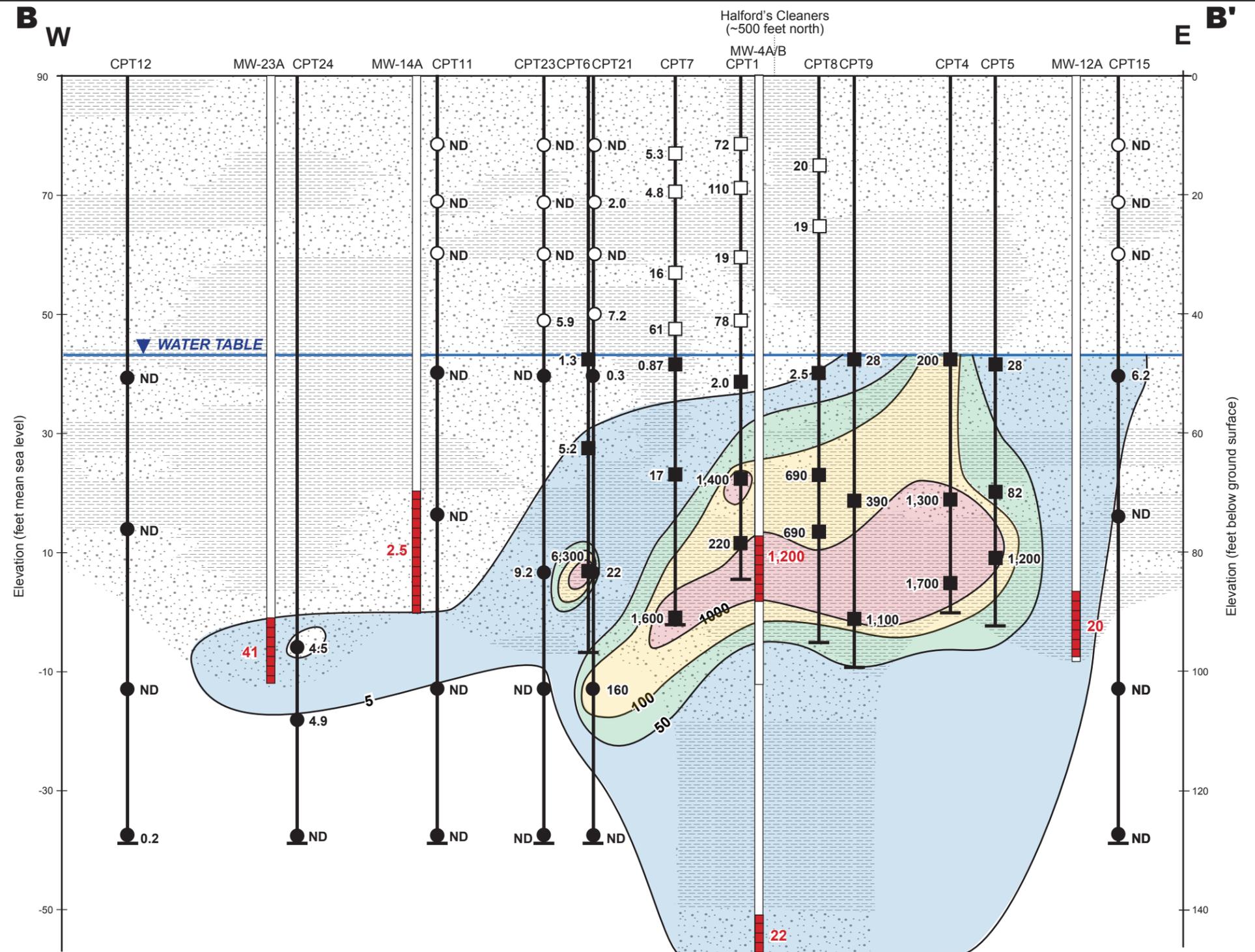
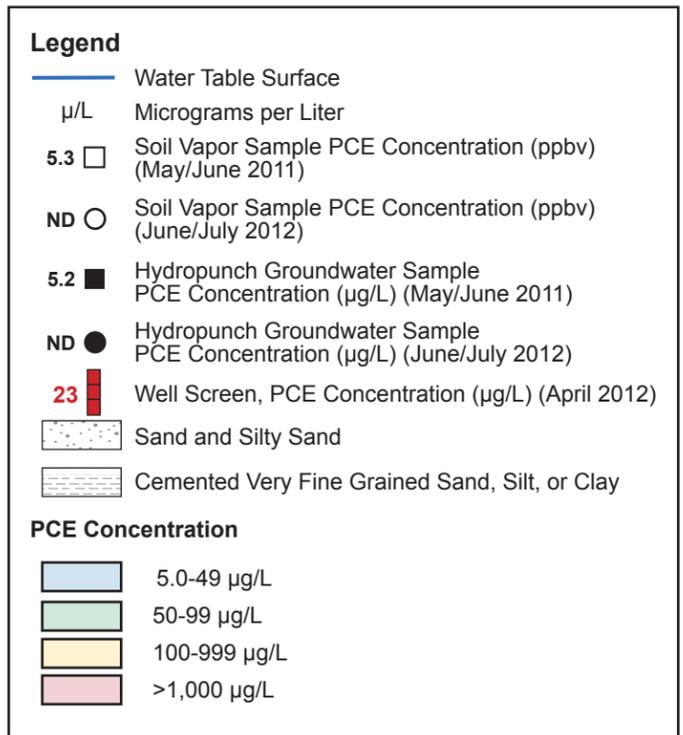
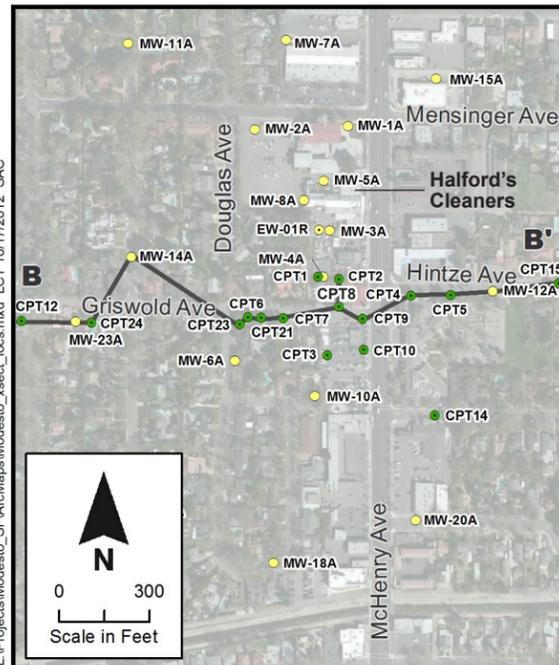


**Legend**

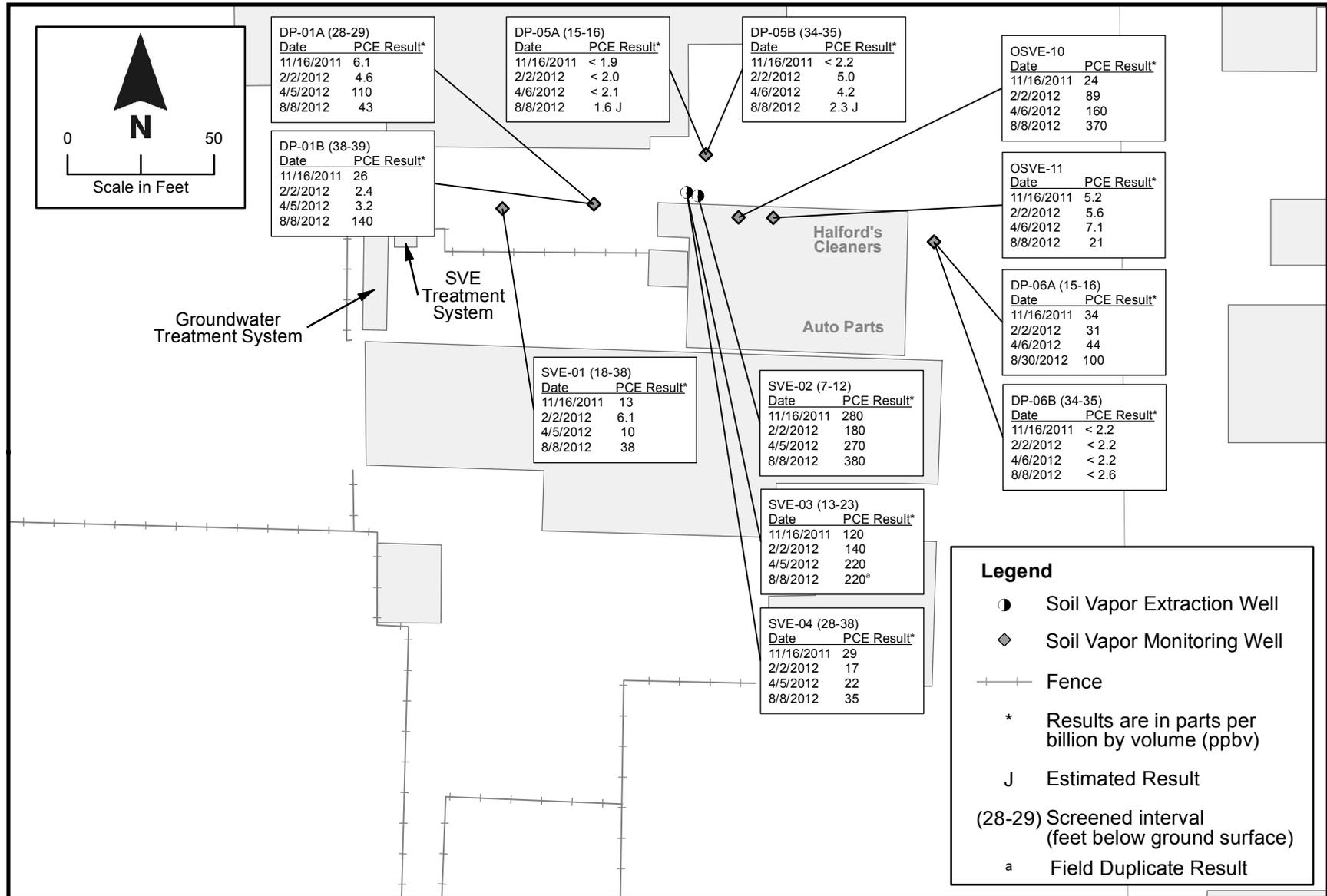
- |     |  |  |                                |  |  |  |              |
|-----|--|--|--------------------------------|--|--|--|--------------|
| µ/L | Micrograms per Liter   |  | A Zone Screen                  |  | Water Table Surface                            |  | 5.0-49 µg/L  |
| 5.2 | Hydropunch Groundwater Sample PCE Concentration (µg/L) (May/June 2011) |  | B Zone Screen                  |  | Sand and Silty Sand                            |  | 50-99 µg/L   |
| 23  | PCE Concentration (µg/L) (April 2012)                                  |  | C Zone Screen                  |  | Cemented Very Fine Grained Sand, Silt, or Clay |  | 100-999 µg/L |
|     | Direction of Vertical Gradient   |  | EW-1R Interpreted Capture Zone |  | ≥1,000 µg/L                                    |  |              |



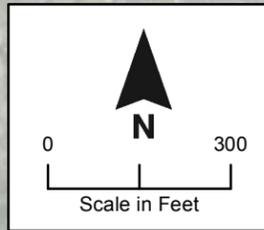
**Figure 4-5**  
**Cross-Section A-A'**  
**Extraction Well EW-1R**  
**Estimated Capture Zone**  
**Third Quarter 2012**  
**Modesto Groundwater Superfund Site**



**Figure 4-6**  
**Cross-Section B-B'**  
**Third Quarter 2012**  
**Modesto Groundwater Superfund Site**



**Figure 4-7. Soil Vapor Analytical Results, Fourth Quarter 2011 through Third Quarter 2012 Modesto Groundwater Superfund Site**



**Legend**

- CPT Location and Tetrachloroethene Concentration (µg/L), May 2011
- ⊗ Groundwater Extraction Well
- ◆ Groundwater Monitoring Well
- ← Approximate Groundwater Flow Direction
- Empirical Capture Zone
- Groundwater Elevation Contour (ft msl)

µg/L Micrograms per Liter

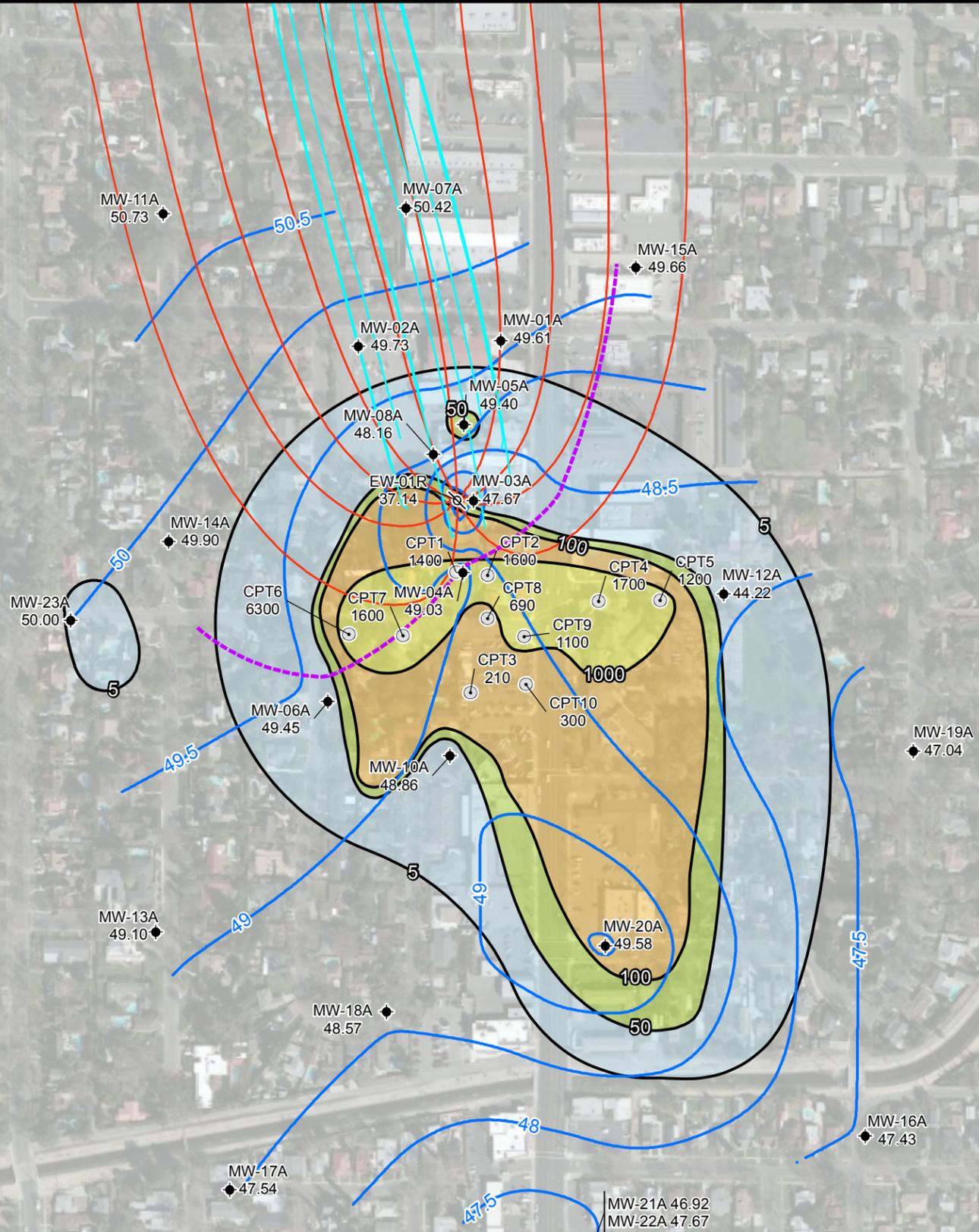
**47.93** Groundwater Elevation (feet mean sea level)

**Particle Pathlines**  
Source: Groundwater Remediation Optimization Methods (MWH, 2010)

- A Zone Sands Pathline
- A/B Aquitard Pathline

**PCE in Groundwater (dashed where uncertain)**

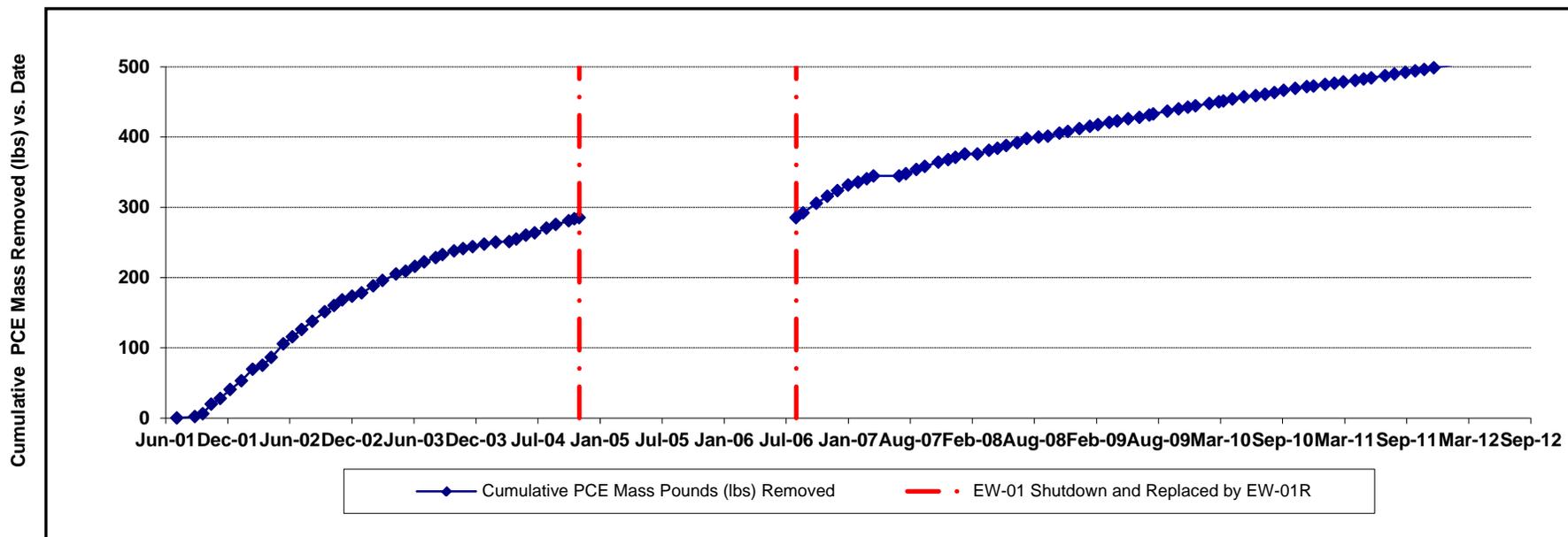
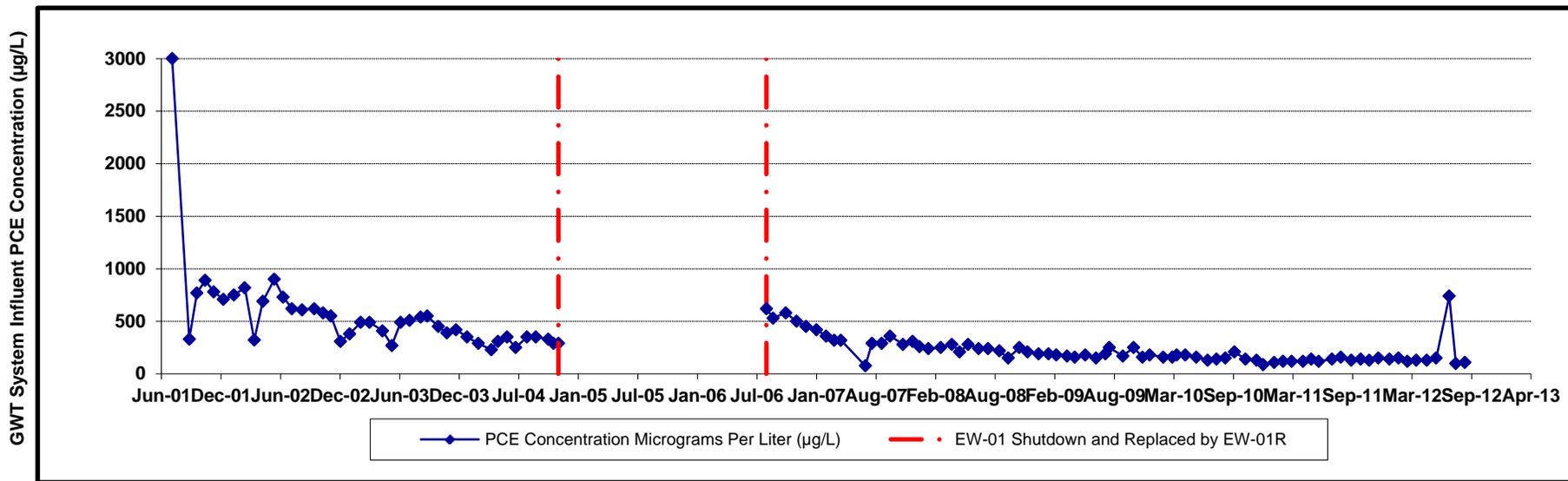
- ≥1000 µg/L
- 100-999 µg/L
- 50-99 µg/L
- 5-49 µg/L



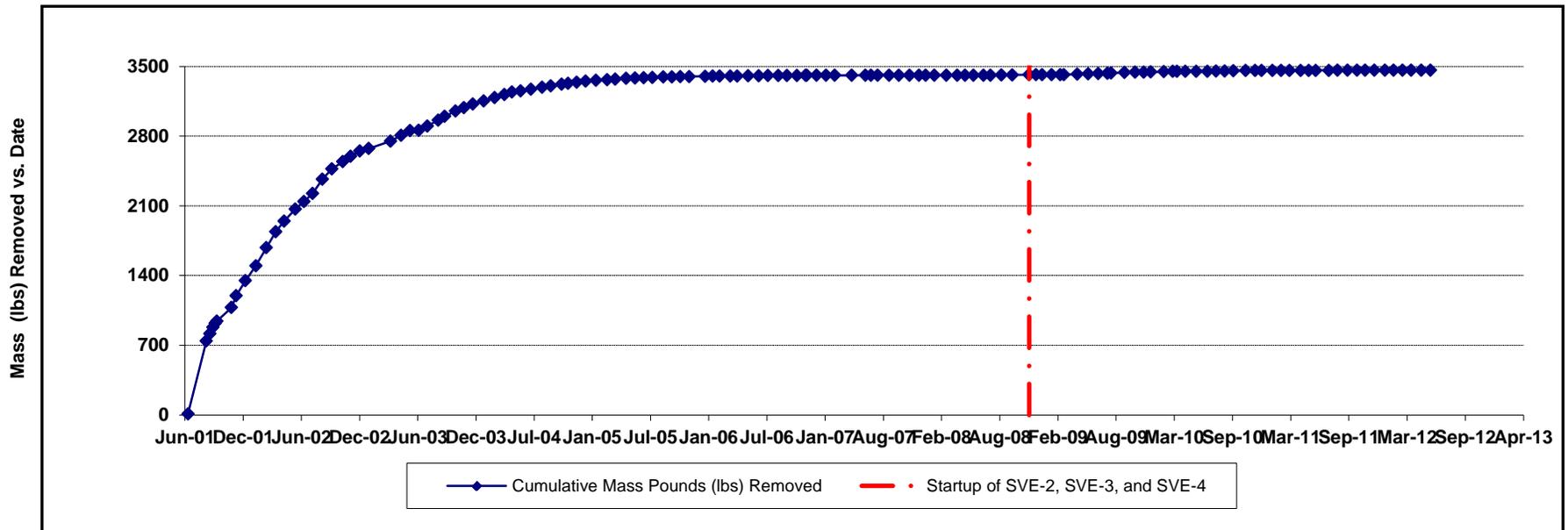
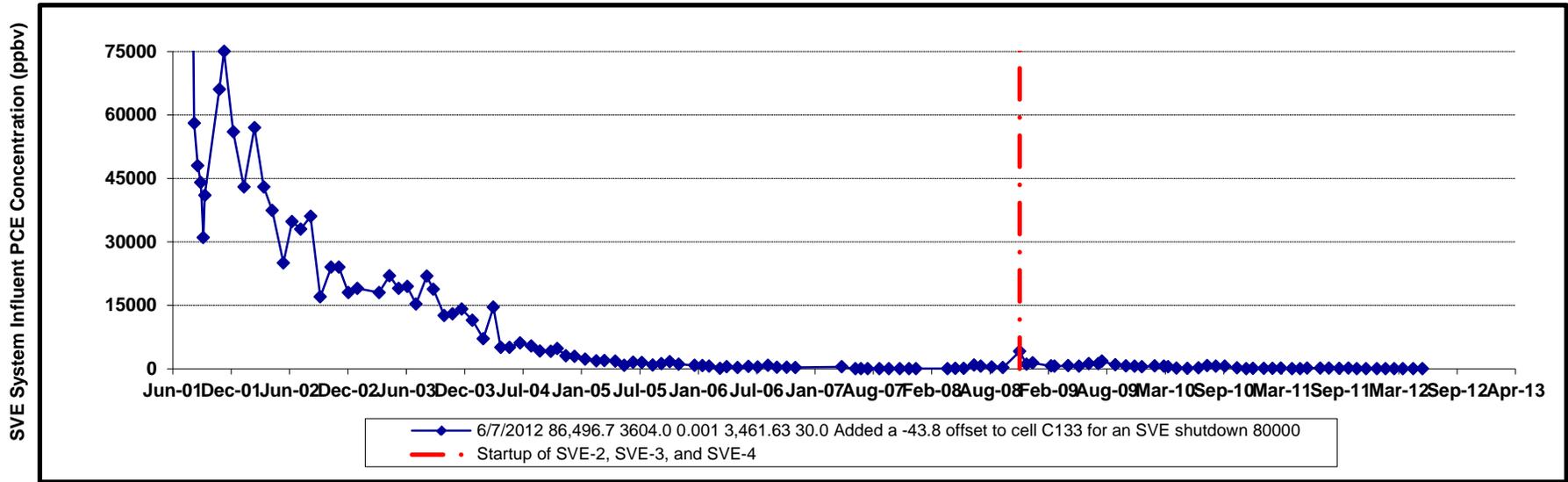
EW-01R was not operating during 2Q12 water level measurements.

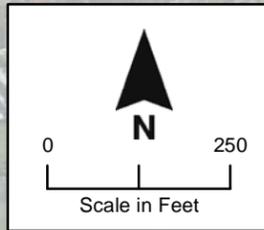
**Figure 4-8**  
**A Zone Extraction Well EW-01R**  
**Horizontal Capture Analysis**  
**Third Quarter 2012**  
**Modesto Groundwater Superfund Site**

**Figure 4-9**  
**Cumulative PCE Mass Removed by the Groundwater Treatment System**  
**Modesto Groundwater Superfund Site**



**Figure 4-10**  
**Cumulative Mass Removed by the Soil Vapor Extraction System**  
**Modesto Groundwater Superfund Site**





MW-05A		
DO	mg/L	8.05
Nitrate	mg/L	26
Iron II	mg/L	ND
Sulfate	mg/L	38
Sulfide	mg/L	ND
Methane	mg/L	ND
Redox	mV	186
pH	-log [H]	6.96
TOC	mg/L	0.46
Temperature	C°	19.07
Carbon dioxide	mg/L	37
Alkalinity	mg/L	370
Chloride	mg/L	75
BTEX	mg/L	ND
PCE	ug/L	92
Other VOCs <sup>a</sup>		ND

MW-15A		
DO	mg/L	6.73
Nitrate	mg/L	14
Iron II	mg/L	ND
Sulfate	mg/L	43
Sulfide	mg/L	ND
Methane	mg/L	ND
Redox	mV	164
pH	-log [H]	7.17
TOC	mg/L	0.44
Temperature	C°	21.91
Carbon dioxide	mg/L	42
Alkalinity	mg/L	360
Chloride	mg/L	70
BTEX	mg/L	ND
PCE	ug/L	ND
Other VOCs <sup>a</sup>		ND

MW-08A		
DO	mg/L	7.88
Nitrate	mg/L	4
Iron II	mg/L	ND
Sulfate	mg/L	38
Sulfide	mg/L	0.64
Methane	mg/L	ND
Redox	mV	167
pH	-log [H]	7.2
TOC	mg/L	0.4
Temperature	C°	20.94
Carbon dioxide	mg/L	40
Alkalinity	mg/L	400
Chloride	mg/L	63
BTEX	mg/L	ND
PCE	ug/L	29
Other VOCs <sup>a</sup>		ND

MW-04A		
DO	mg/L	6.39
Nitrate	mg/L	0.12
Iron II	mg/L	ND
Sulfate	mg/L	2.9
Sulfide	mg/L	0.62
Methane	mg/L	0.0012
Redox	mV	-8
pH	-log [H]	7.37
TOC	mg/L	2.1
Temperature	C°	22.07
Carbon dioxide	mg/L	4.1
Alkalinity	mg/L	54
Chloride	mg/L	2.7
BTEX	mg/L	ND
PCE	ug/L	71
Other VOCs <sup>a</sup>	ug/L	0.8 J

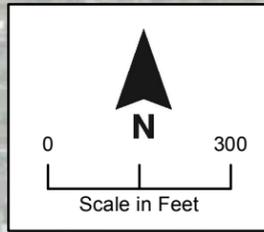
MW-20A		
DO	mg/L	6.6
Nitrate	mg/L	11
Iron II	mg/L	ND
Sulfate	mg/L	54
Sulfide	mg/L	ND
Methane	mg/L	ND
Redox	mV	155
pH	-log [H]	7.06
TOC	mg/L	2.5
Temperature	C°	22.23
Carbon dioxide	mg/L	28
Alkalinity	mg/L	410
Chloride	mg/L	66
BTEX	mg/L	ND
PCE	ug/L	160
Other VOCs <sup>a</sup>		ND

**Legend**

- Groundwater Extraction Well
- Groundwater Monitoring Well
- Monitoring Well Sampled in Natural Attenuation Screening Evaluation
- Groundwater Elevation Contour (ft msl)
- ← Approximate Groundwater Flow Direction
- 18 PCE Concentration (µg/L) in Second Quarter 2012
- ND Not Detected
- J Estimated Result
- PCE Tetrachloroethene
- µg/L microgram per liter
- mg/L milligrams per liter
- <sup>a</sup> Potential degradation products of PCE
- BTEX Benzene, Toluene, Ethylbenzene, Xylenes
- C° Degrees celsius
- DO Dissolved Oxygen
- log [H] Negative log of molar concentration of hydronium ions
- TOC Total Organic Carbon
- PCE in Groundwater (dashed where uncertain)**
- ≥1000 µg/L
- 100-999 µg/L
- 50-99 µg/L
- 5-49 µg/L

**Figure 4-11**  
**A Zone Monitoring Well**  
**for Natural Attenuation**  
**Screening Evaluation**  
**Modesto Groundwater Superfund Site**

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MW-28B		
DO	mg/L	5.91
Nitrate	mg/L	4.8
Iron II	mg/L	ND
Sulfate	mg/L	15
Sulfide	mg/L	ND
Methane	mg/L	0.0007
Redox	mV	113
pH	-log [H]	7.16
TOC	mg/L	0.39
Temperature	C°	19.96
Carbon dioxide	mg/L	10
Alkalinity	mg/L	220
Chloride	mg/L	37
BTEX	mg/L	ND
PCE	ug/L	43
Other VOCs <sup>a</sup>		ND

MW-04B		
DO	mg/L	5.59
Nitrate	mg/L	3.8
Iron II	mg/L	ND
Sulfate	mg/L	5.5
Sulfide	mg/L	ND
Methane	mg/L	ND
Redox	mV	154
pH	-log [H]	7.28
TOC	mg/L	1.4
Temperature	C°	21.57
Carbon dioxide	mg/L	4.9
Alkalinity	mg/L	130
Chloride	mg/L	14
BTEX	mg/L	ND
PCE	ug/L	4.4
Other VOCs <sup>a</sup>		ND

MW-20B		
DO	mg/L	5.84
Nitrate	mg/L	4.9
Iron II	mg/L	ND
Sulfate	mg/L	11
Sulfide	mg/L	0.55
Methane	mg/L	ND
Redox	mV	135
pH	-log [H]	7.37
TOC	mg/L	0.75
Temperature	C°	21.56
Carbon dioxide	mg/L	6.5
Alkalinity	mg/L	180
Chloride	mg/L	22
BTEX	mg/L	0.3
PCE	ug/L	65
Other VOCs <sup>a</sup>		ND

MW-25B		
DO	mg/L	5.23
Nitrate	mg/L	4.3
Iron II	mg/L	ND
Sulfate	mg/L	12
Sulfide	mg/L	ND
Methane	mg/L	0.0009
Redox	mV	108
pH	-log [H]	7.36
TOC	mg/L	0.44
Temperature	C°	20.87
Carbon dioxide	mg/L	6.3
Alkalinity	mg/L	190
Chloride	mg/L	27
BTEX	mg/L	ND
PCE	ug/L	120
Other VOCs <sup>a</sup>		ND

MW-17B		
DO	mg/L	6.32
Nitrate	mg/L	4.2
Iron II	mg/L	ND
Sulfate	mg/L	19
Sulfide	mg/L	0.55
Methane	mg/L	0.0014
Redox	mV	73
pH	-log [H]	7.03
TOC	mg/L	7.3
Temperature	C°	19.8
Carbon dioxide	mg/L	16
Alkalinity	mg/L	210
Chloride	mg/L	50
BTEX	mg/L	0.0033
PCE	ug/L	30
Other VOCs <sup>a</sup>		ND

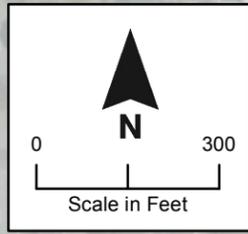
**Legend**

- Groundwater Monitoring Well
- Monitoring Well Sampled in Natural Attenuation Screening Evaluation
- Groundwater Elevation Contour (ft msl)
- Approximate Groundwater Flow Direction
- 140** PCE Concentration (µg/L) in Second Quarter 2012
- J** Estimated Result
- PCE Tetrachloroethene
- µg/L microgram per liter
- mg/L milligrams per liter
- <sup>a</sup> Potential degradation products of PCE
- BTEX Benzene, Toluene, Ethylbenzene, Xylenes
- C° Degrees celsius
- DO Dissolved Oxygen
- log [H] Negative log of molar concentration of hydronium ions
- TOC Total Organic Carbon

**PCE in Groundwater (dashed where uncertain)**

- 100-999 µg/L
- 50-99 µg/L
- 5-49 µg/L

**Figure 4-12  
B Zone Monitoring Well  
for Natural Attenuation  
Screening Evaluation  
Modesto Groundwater Superfund Site**

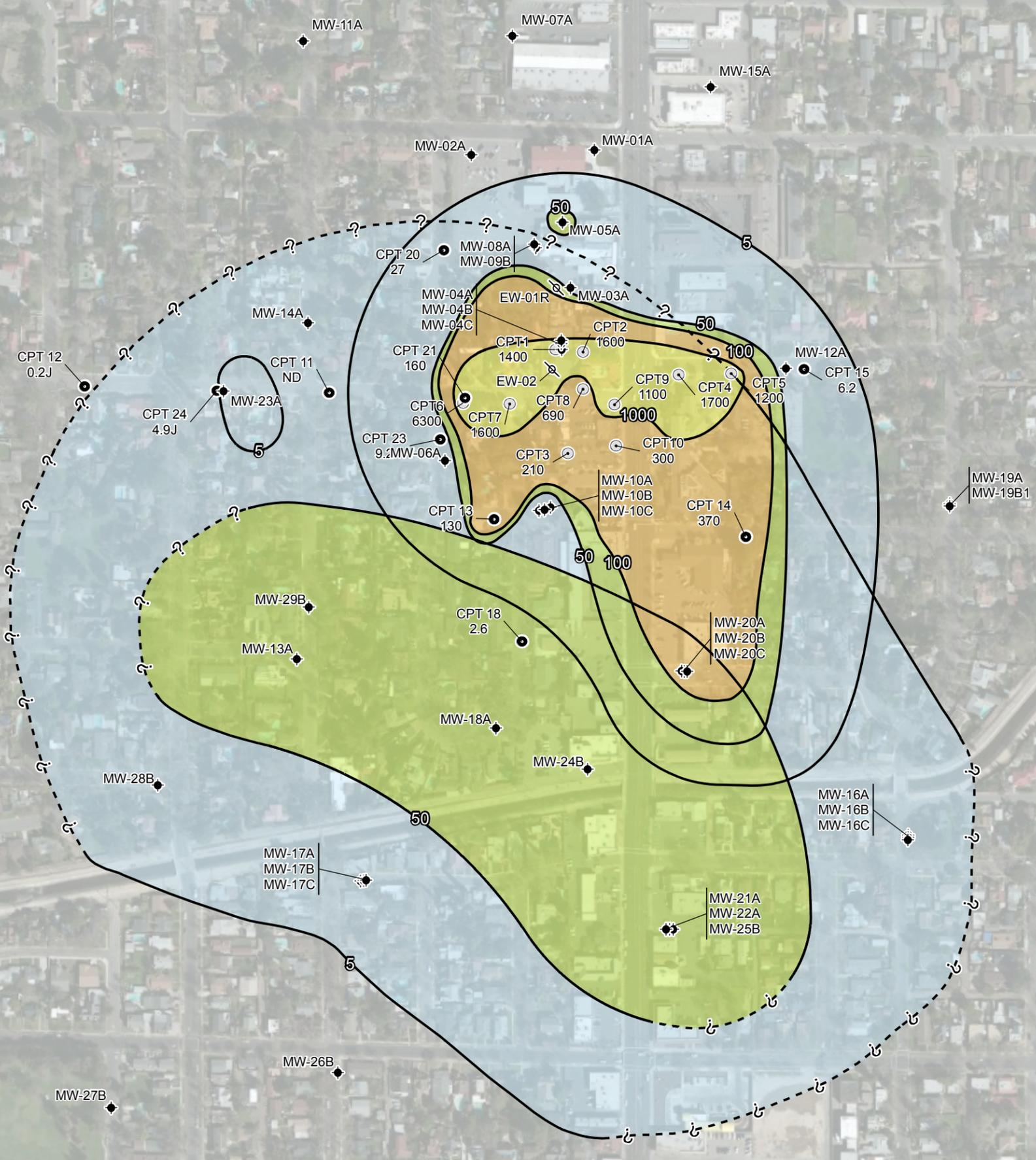


**Legend**

- CPT Location and PCE Concentration (µg/L), May 2011
- CPT Location and PCE Concentration (µg/L), June 2012
- ⊗ Groundwater Extraction Well
- ◆ Groundwater Monitoring Well
- Groundwater Elevation Contour (ft msl)
- ➔ Approximate Groundwater Flow Direction
- J Estimated Result
- µg/L Micrograms per Liter
- ND Not Detected
- 18 PCE Concentration (µg/L)
- PCE Tetrachloroethene

**PCE in Groundwater (dashed where uncertain)**

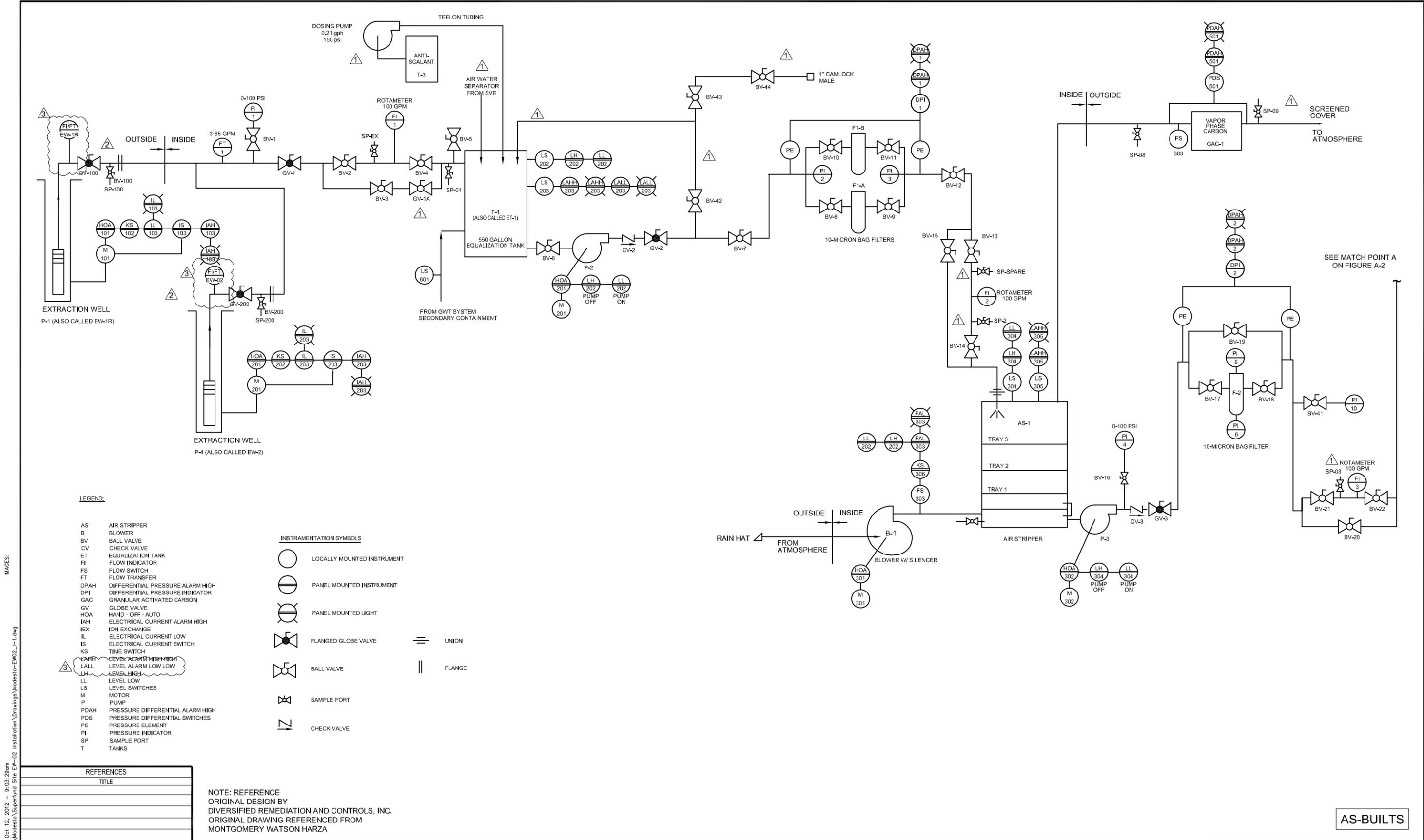
- ≥1000 µg/L
- 100-999 µg/L
- 50-99 µg/L
- 5-49 µg/L



**Figure 5-1  
PCE Composite Plumes  
A and B Zones  
Third Quarter 2012  
Modesto Groundwater Superfund Site**

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**Appendix A**  
**Treatment System Process and Instrumentation Diagrams**



**LEGEND:**

- AS AIR STRIPPER
- B BLOWER
- BV BALL VALVE
- CV CHECK VALVE
- ET EQUALIZATION TANK
- FI FLOW INDICATOR
- FS FLOW SWITCH
- FT FLOW TRANSFER
- DPAH DIFFERENTIAL PRESSURE ALARM HIGH
- DPI DIFFERENTIAL PRESSURE INDICATOR
- GAC GRANULAR ACTIVATED CARBON
- GV GLOBE VALVE
- HOA HAND-OFF-AUTO
- IAH ELECTRICAL CURRENT ALARM HIGH
- IEX ION EXCHANGE
- IL ELECTRICAL CURRENT LOW
- IS ELECTRICAL CURRENT SWITCH
- KS TIME SWITCH
- LALL LEVEL ALARM LOW LOW
- LH LEVEL HIGH
- LL LEVEL LOW
- LS LEVEL SWITCHES
- M MOTOR
- P PUMP
- PDAH PRESSURE DIFFERENTIAL ALARM HIGH
- PDS PRESSURE DIFFERENTIAL SWITCHES
- PE PRESSURE ELEMENT
- PI PRESSURE INDICATOR
- SP SAMPLE PORT
- T TANKS

**INSTRUMENTATION SYMBOLS**

- LOCALLY MOUNTED INSTRUMENT
- PANEL MOUNTED INSTRUMENT
- PANEL MOUNTED LIGHT
- FLANGED GLOBE VALVE
- BALL VALVE
- SAMPLE PORT
- CHECK VALVE
- UNION
- FLANGE

REFERENCES
TITLE

NOTE: REFERENCE ORIGINAL DESIGN BY DIVERSIFIED REMEDIATION AND CONTROLS, INC. ORIGINAL DRAWING REFERENCED FROM MONTGOMERY WATSON HARZA

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5				5			

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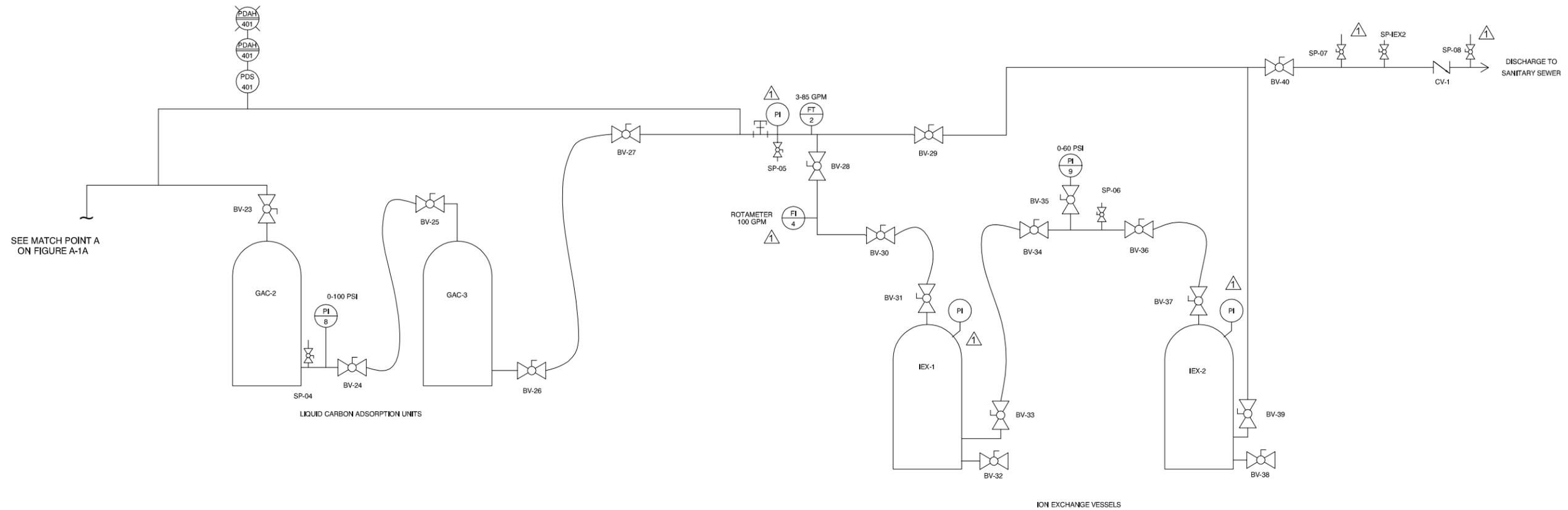
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	CONTRACT/TASK ORDER NO. 03AA14C1
<b>GROUNDWATER TREATMENT P&amp;ID</b>	SHEET NO. <b>1-1</b>

PLOT BY: DAVID LARSON - Oct 12, 2012 - 9:03:29am  
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PLOT BY: ROBERT\_P\_TAYLOR - Mar 19, 2010 - 11:38:02am

DRAWING: T:\current-work files\Modesto\drawings\

DRAWING: 031910-Modesto\_1-2.dwg



**LEGEND:**

- AS AIR STRIPPER
- B BLOWER
- BV BALL VALVE
- CV CHECK VALVE
- ET EQUALIZATION TANK
- FI FLOW INDICATOR
- FS FLOW SWITCH
- FT FLOW TRANSFER
- DPAH DIFFERENTIAL PRESSURE ALARM HIGH
- DPI DIFFERENTIAL PRESSURE INDICATOR
- GAC GRANULAR ACTIVATED CARBON
- GV GLOBE VALVE
- HOA HAND - OFF - AUTO
- IAH ELECTRICAL CURRENT ALARM HIGH
- IEX ION EXCHANGE
- IL ELECTRICAL CURRENT LOW
- IS ELECTRICAL CURRENT SWITCH
- KS TIME SWITCH
- LAHH LEVEL ALARM HIGH HIGH
- LH LEVEL HIGH
- LL LEVEL LOW
- LS LEVEL SWITCHES
- M MOTOR
- P PUMP
- PDAH PRESSURE DIFFERENTIAL ALARM HIGH
- PDS PRESSURE DIFFERENTIAL SWITCHES
- PE PRESSURE ELEMENT
- PI PRESSURE INDICATOR
- SP SAMPLE PORT
- T TANKS

**INSTRUMENTATION SYMBOLS**

- LOCALLY MOUNTED INSTRUMENT
- PANEL MOUNTED INSTRUMENT
- PANEL MOUNTED LIGHT
- BALL VALVE
- SAMPLE PORT
- CHECK VALVE

**REFERENCES**

TITLE

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RPT	03/19/10
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APPROVED BY:	

**URS**  
 2870 Gateway Oaks Drive, Ste. 150  
 Sacramento, CA 95833-3200  
 TEL: (916) 679-2000  
 FAX: (916) 679-2900

**MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA**

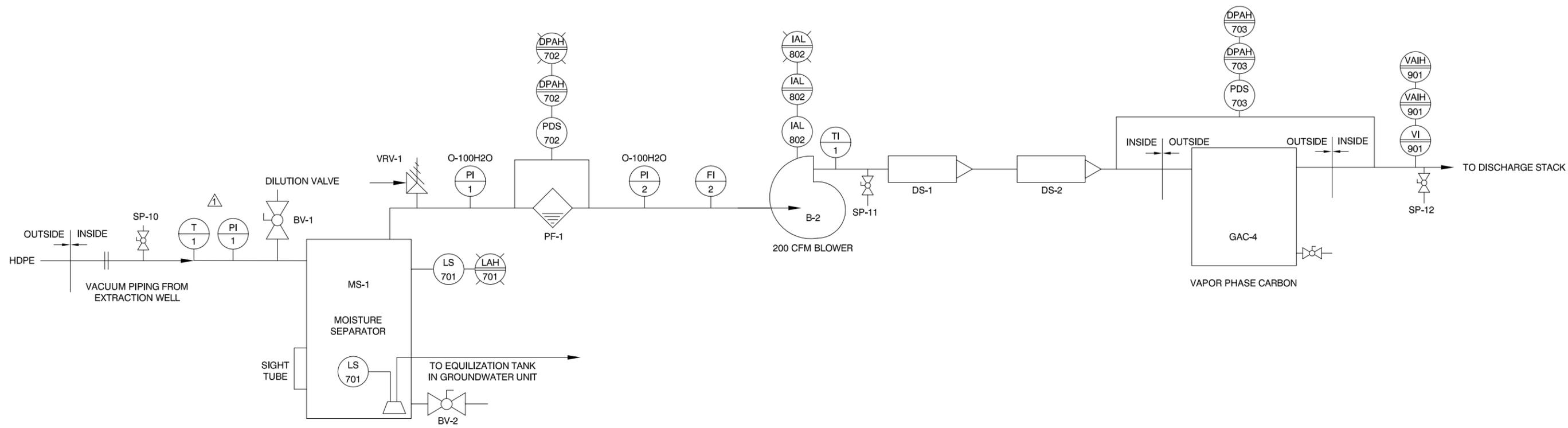
**GROUNDWATER TREATMENT P&ID**

JOB NO.  
 PROJECT  
 SHEET NO.  
**1-2**

PLOT BY: ROBERT\_P\_TAYLOR - Mar 19, 2010 - 11:38:49am

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DRAWING: 031910-Modesto\_1-3.dwg



- KEY**
- A ALARM, ACTIVATED
  - B BALL, BLOWER
  - C CARBON, CONTROL
  - D DISCHARGE, DIFFERENTIAL
  - F FILTER, FLOW
  - G GRANULAR
  - E ELECTRIC CURRENT
  - I INDICATOR
  - L LEVEL, LIGHTING, LOW
  - M MOTOR, MOISTURE
  - P PANEL, PARTICULATE, PORT, POWER, PRESSURE R RELIEF
  - S SAMPLING, SENSOR, SEPARATOR, SILENCER, SWITCH
  - T TEMPERATURE, TRANSFORMER
  - V VALVE, VACUUM, VOLATILE ORGANIC COMPOUND

- NOTES:**
1. ALL VACUUM PROCESS PIPING IS 4" Ø SCH80 PVC
  2. DISCHARGE STACK IS 8" Ø SCH80 PVC

REFERENCES
TITLE

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RPT		03/19/10
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APPROVED BY:		

**URS**  
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 Sacramento, CA 95833-3200  
 TEL: (916) 679-2000  
 FAX: (916) 679-2900

**MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA**

**SOIL VAPOR EXTRACTION P&ID**

JOB NO. \_\_\_\_\_  
 PROJECT \_\_\_\_\_  
 SHEET NO. **1-3**

**Appendix B**  
**Laboratory Analytical Data Tables**

<b>Table B1</b>	<b>Site Contaminants of Concern</b>
<b>Table B2</b>	<b>Sample Cross Reference</b>
<b>Table B3</b>	<b>Results Summary for Long-Term Monitoring and Soil Vapor Extraction, Third Quarter 2012, Modesto Superfund Site</b>
<b>Table B4</b>	<b>Results Summary for the Groundwater Treatment System, Third Quarter 2012, Modesto Superfund Site</b>

TABLE B1

SITE CONTAMINANTS OF CONCERN  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

Contaminant of Concern	Discharge Limit
Tetrachloroethene (PCE)	0.5 µg/L
Toluene	15 µg/L
Uranium, total	20 pCi/L
pH	5-12

**Notes:**

µg/L - micrograms per liter

pCi/L - picoCuries per liter

**TABLE B2**

**SAMPLE CROSS REFERENCE  
MODESTO GROUNDWATER SUPERFUND SITE  
MODESTO, CALIFORNIA**

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Analytical Method
7/18/12	SVE Pre GAC-0703	1207025-01	NS	TO-15
7/18/12	SVE Stack-0703	1207025-02	NS	TO-15
7/18/12	SVE Pre GAC-0703DUP	B2G0043-DUP1	DUP	TO-15
8/6/12	MW-28B-3Q12	014JH-1	NS	CENSUS
8/6/12	MW-25B-3Q12	014JH-2	NS	CENSUS
8/6/12	MW-25B-3Q12	1208014-01	NS	524.2
8/6/12	MW-25B-3Q12	1208014-01	NS	300.0
8/6/12	MW-25B-3Q12	1208014-01	NS	415.3
8/6/12	MW-25B-3Q12	1208014-01	NS	2320B
8/6/12	MW-25B-3Q12	1208014-01	NS	4500-S2
8/6/12	MW-25B-3Q12	1208014-01	NS	RSK-175
8/6/12	MW-28B-3Q12	1208014-02	NS	524.2
8/6/12	MW-28B-3Q12	1208014-02	NS	300.0
8/6/12	MW-28B-3Q12	1208014-02	NS	415.3
8/6/12	MW-28B-3Q12	1208014-02	NS	2320B
8/6/12	MW-28B-3Q12	1208014-02	NS	4500-S2
8/6/12	MW-28B-3Q12	1208014-02	NS	RSK-175
8/6/12	MW-2A-3Q12	1208017-03	NS	524.2
8/6/12	MW-19A-3Q12	1208017-09	NS	524.2
8/6/12	MW-19B-3Q12	1208017-10	NS	524.2
8/6/12	MW-1A-3Q12	1208017-11	NS	524.2
8/6/12	MW-9B-3Q12	1208021-04	NS	524.2
8/6/12	MW-7A-3Q12	1208021-12	NS	524.2
8/6/12	MW-86A-3Q12	1208021-13	FD	524.2
8/6/12	MW-11A-3Q12	1208021-15	NS	524.2
8/6/12	MW-13A-3Q12	1208021-17	NS	524.2
8/6/12	MW-14A-3Q12	1208021-18	NS	524.2
8/6/12	MW-25B-3Q12MS	B2H0023-MS1	MS	300.0
8/6/12	MW-25B-3Q12MSD	B2H0023-MSD1	MSD	300.0
8/6/12	MW-25B-3Q12MS	B2H0026-MS1	MS	524.2
8/6/12	MW-25B-3Q12MSD	B2H0026-MSD1	MSD	524.2
8/6/12	MW-9B-3Q12MS	B2H0031-MS1	MS	524.2
8/6/12	MW-9B-3Q12MSD	B2H0031-MSD1	MSD	524.2
8/6/12	MW-25B-3Q12MS	B2H0032-MS1	MS	RSK-175
8/6/12	MW-25B-3Q12MSD	B2H0032-MSD1	MSD	RSK-175
8/6/12	MW-28B-3Q12MS	B2H0058-MS1	MS	RSK-175
8/6/12	MW-28B-3Q12MSD	B2H0058-MSD1	MSD	RSK-175
8/6/12	MW-25B-3Q12MS	B2H0090-MS2	MS	415.3
8/6/12	MW-25B-3Q12MSD	B2H0090-MSD2	MSD	415.3
8/6/12	MW-25B-3Q12DUP	B2H0093-DUP1	DUP	2320B
8/6/12	MW-25B-3Q12	H064-06	NS	RSK-175
8/6/12	MW-25B-3Q12	H064-06	NS	M300
8/6/12	MW-28B-3Q12	H064-07	NS	RSK-175
8/6/12	MW-28B-3Q12	H064-07	NS	M300
8/6/12	MW-25B-3Q12	MW-25B-3Q12	NS	EPA 8260B
8/6/12	MW-28B-3Q12	MW-28B-3Q12	NS	EPA 8260B
8/6/12	MW-28B-3Q12	440-19934-7	NS	552.2

**TABLE B2**

**SAMPLE CROSS REFERENCE  
 MODESTO GROUNDWATER SUPERFUND SITE  
 MODESTO, CALIFORNIA**

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Analytical Method
8/6/12	MW-25B-3Q12	440-19934-6	NS	552.2
8/7/12	MW-17B-3Q12	014JH-3	NS	CENSUS
8/7/12	MW-4A-3Q12	014JH-4	NS	CENSUS
8/7/12	MW-96A-3Q12	014JH-5	FD	CENSUS
8/7/12	MW-4B-3Q12	1208017-01	NS	524.2
8/7/12	MW-4B-3Q12	1208017-01	NS	300.0
8/7/12	MW-4B-3Q12	1208017-01	NS	415.3
8/7/12	MW-4B-3Q12	1208017-01	NS	2320B
8/7/12	MW-4B-3Q12	1208017-01	NS	4500-S2
8/7/12	MW-4B-3Q12	1208017-01	NS	RSK-175
8/7/12	MW-4C-3Q12	1208017-02	NS	524.2
8/7/12	MW-4A-3Q12	1208017-04	NS	524.2
8/7/12	MW-4A-3Q12	1208017-04	NS	300.0
8/7/12	MW-4A-3Q12	1208017-04	NS	415.3
8/7/12	MW-4A-3Q12	1208017-04	NS	2320B
8/7/12	MW-4A-3Q12	1208017-04	NS	4500-S2
8/7/12	MW-4A-3Q12	1208017-04	NS	RSK-175
8/7/12	MW-302-3Q12	1208017-05	TB	524.2
8/7/12	MW-302-3Q12	1208017-05	TB	RSK-175
8/7/12	MW-402-3Q12	1208017-06	FB	524.2
8/7/12	MW-8A-3Q12	1208017-07	NS	524.2
8/7/12	MW-8A-3Q12	1208017-07	NS	300.0
8/7/12	MW-8A-3Q12	1208017-07	NS	415.3
8/7/12	MW-8A-3Q12	1208017-07	NS	2320B
8/7/12	MW-8A-3Q12	1208017-07	NS	4500-S2
8/7/12	MW-8A-3Q12	1208017-07	NS	RSK-175
8/7/12	MW-17B-3Q12	1208017-08	NS	524.2
8/7/12	MW-17B-3Q12	1208017-08	NS	300.0
8/7/12	MW-17B-3Q12	1208017-08	NS	415.3
8/7/12	MW-17B-3Q12	1208017-08	NS	2320B
8/7/12	MW-17B-3Q12	1208017-08	NS	4500-S2
8/7/12	MW-17B-3Q12	1208017-08	NS	RSK-175
8/7/12	MW-24B-3Q12	1208017-12	NS	524.2
8/7/12	MW-24B-3Q12	1208017-12	NS	300.0
8/7/12	MW-24B-3Q12	1208017-12	NS	415.3
8/7/12	MW-24B-3Q12	1208017-12	NS	2320B
8/7/12	MW-24B-3Q12	1208017-12	NS	4500-S2
8/7/12	MW-24B-3Q12	1208017-12	NS	RSK-175
8/7/12	MW-15A-3Q12	1208017-13	NS	300.0
8/7/12	MW-15A-3Q12	1208017-13	NS	2320B
8/7/12	MW-17C-3Q12	1208021-06	NS	524.2
8/7/12	MW-26B-3Q12	1208021-08	NS	524.2
8/7/12	MW-15A-3Q12	1208021-09	NS	524.2
8/7/12	MW-15A-3Q12	1208021-09	NS	415.3
8/7/12	MW-15A-3Q12	1208021-09	NS	4500-S2
8/7/12	MW-15A-3Q12	1208021-09	NS	RSK-175
8/7/12	MW-17A-3Q12	1208021-10	NS	524.2
8/7/12	MW-6A-3Q12	1208021-11	NS	524.2

**TABLE B2**

**SAMPLE CROSS REFERENCE  
MODESTO GROUNDWATER SUPERFUND SITE  
MODESTO, CALIFORNIA**

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Analytical Method
8/7/12	MW-10A-3Q12	1208021-14	NS	524.2
8/7/12	MW-12A-3Q12	1208021-16	NS	524.2
8/7/12	MW-15A-3Q12	H064-01	NS	RSK-175
8/7/12	MW-15A-3Q12	H064-01	NS	M300
8/7/12	MW-17B-3Q12	H064-02	NS	RSK-175
8/7/12	MW-17B-3Q12	H064-02	NS	M300
8/7/12	MW-24B-3Q12	H064-05	NS	RSK-175
8/7/12	MW-24B-3Q12	H064-05	NS	M300
8/7/12	MW-4A-3Q12	H064-08	NS	RSK-175
8/7/12	MW-4A-3Q12	H064-08	NS	M300
8/7/12	MW-4B-3Q12	H064-09	NS	M300
8/7/12	MW-4B-3Q12	H064-09	NS	RSK-175
8/7/12	MW-8A-3Q12	H064-11	NS	M300
8/7/12	MW-8A-3Q12	H064-11	NS	RSK-175
8/7/12	MW-92A-3Q12	H064-12	FD	M300
8/7/12	MW-92A-3Q12	H064-12	FD	RSK-175
8/7/12	MW-17B-3Q12	MW-17B-3Q12	NS	EPA 8260B
8/7/12	MW-24B-3Q12	MW-24B-3Q12	NS	EPA 8260B
8/7/12	MW-4A-3Q12	MW-4A-3Q12	NS	EPA 8260B
8/7/12	MW-8A-3Q12	MW-8A-3Q12	NS	EPA 8260B
8/7/12	MW-96A-3Q12	MW-96A-3Q12	FD	EPA 8260B
8/7/12	MW-24B-3Q12	440-19934-5	NS	552.2
8/7/12	MW-4A-3Q12	440-19934-8	NS	552.2
8/7/12	MW-4B-3Q12	440-19934-9	NS	552.2
8/7/12	MW-8A-3Q12	440-19934-11	NS	552.2
8/7/12	MW-92A-3Q12	440-19934-12	FD	552.2
8/7/12	MW-17B-3Q12	440-19934-2	NS	552.2
8/7/12	MW-15A-3Q12	440-19934-1	NS	552.2
8/8/12	MW-20B-3Q12	014JH-6	NS	CENSUS
8/8/12	MW-80B-3Q12	014JH-7	FD	CENSUS
8/8/12	MW-20A-3Q12	1208021-01	NS	524.2
8/8/12	MW-20A-3Q12	1208021-01	NS	300.0
8/8/12	MW-20A-3Q12	1208021-01	NS	415.3
8/8/12	MW-20A-3Q12	1208021-01	NS	2320B
8/8/12	MW-20A-3Q12	1208021-01	NS	4500-S2
8/8/12	MW-20A-3Q12	1208021-01	NS	RSK-175
8/8/12	MW-20B-3Q12	1208021-02	NS	524.2
8/8/12	MW-20B-3Q12	1208021-02	NS	300.0
8/8/12	MW-20B-3Q12	1208021-02	NS	415.3
8/8/12	MW-20B-3Q12	1208021-02	NS	2320B
8/8/12	MW-20B-3Q12	1208021-02	NS	4500-S2
8/8/12	MW-20B-3Q12	1208021-02	NS	RSK-175
8/8/12	MW-95A-3Q12	1208021-03	FD	300.0
8/8/12	MW-95A-3Q12	1208021-03	FD	415.3
8/8/12	MW-95A-3Q12	1208021-03	FD	2320B
8/8/12	MW-95A-3Q12	1208021-03	FD	4500-S2
8/8/12	MW-95A-3Q12	1208021-03	FD	RSK-175
8/8/12	MW-5A-3Q12	1208021-05	NS	524.2

**TABLE B2**

**SAMPLE CROSS REFERENCE  
 MODESTO GROUNDWATER SUPERFUND SITE  
 MODESTO, CALIFORNIA**

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Analytical Method
8/8/12	MW-5A-3Q12	1208021-05	NS	300.0
8/8/12	MW-5A-3Q12	1208021-05	NS	415.3
8/8/12	MW-5A-3Q12	1208021-05	NS	2320B
8/8/12	MW-5A-3Q12	1208021-05	NS	4500-S2
8/8/12	MW-5A-3Q12	1208021-05	NS	RSK-175
8/8/12	MW-20C-3Q12	1208021-07	NS	524.2
8/8/12	SVE Pre GAC-0802	1208025-01	NS	TO-15
8/8/12	SVE Stack-0802	1208025-02	NS	TO-15
8/8/12	MW-10B-3Q12	1208036-10	NS	524.2
8/8/12	MW-10C-3Q12	1208036-11	NS	524.2
8/8/12	MW-90B-3Q12	1208036-12	FD	524.2
8/8/12	MW-29B-3Q12	1208036-14	NS	524.2
8/8/12	MW-18A-3Q12	1208036-15	NS	524.2
8/8/12	DP-1A-3Q12	1208039-01	NS	TO-15
8/8/12	DP-1B-3Q12	1208039-02	NS	TO-15
8/8/12	DP-5A-3Q12	1208039-03	NS	TO-15
8/8/12	DP-5B-3Q12	1208039-04	NS	TO-15
8/8/12	DP-6B-3Q12	1208039-06	NS	TO-15
8/8/12	DP-94A-3Q12	1208039-07	FD	TO-15
8/8/12	OSVE-10-3Q12	1208039-08	NS	TO-15
8/8/12	OSVE-11-3Q12	1208039-09	NS	TO-15
8/8/12	SVE-1-3Q12	1208039-10	NS	TO-15
8/8/12	SVE-2-3Q12	1208039-11	NS	TO-15
8/8/12	SVE-3-3Q12	1208039-12	NS	TO-15
8/8/12	SVE-4-3Q12	1208039-13	NS	TO-15
8/8/12	SVE-97-3Q12	1208039-14	FD	TO-15
8/8/12	MW-20B-3Q12MS	B2H0034-MS1	MS	300.0
8/8/12	MW-20B-3Q12MSD	B2H0034-MSD1	MSD	300.0
8/8/12	MW-20A-3Q12MS	B2H0042-MS1	MS	RSK-175
8/8/12	MW-20A-3Q12MSD	B2H0042-MSD1	MSD	RSK-175
8/8/12	MW-95A-3Q12MS	B2H0062-MS1	MS	RSK-175
8/8/12	MW-95A-3Q12MSD	B2H0062-MSD1	MSD	RSK-175
8/8/12	SVE Pre GAC-0802DUP	B2H0074-DUP1	DUP	TO-15
8/8/12	SVE-97-3Q12DUP	B2H0089-DUP1	DUP	TO-15
8/8/12	MW-5A-3Q12DUP	B2H0100-DUP1	DUP	2320B
8/8/12	MW-20B-3Q12MS	B2H0136-MS1	MS	415.3
8/8/12	MW-20B-3Q12MSD	B2H0136-MSD1	MSD	415.3
8/8/12	SVE-2-3Q12DUP	B2H0154-DUP2	DUP	TO-15
8/8/12	MW-20A-3Q12	H064-03	NS	M300
8/8/12	MW-20A-3Q12	H064-03	NS	RSK-175
8/8/12	MW-20A-3Q12DUP	H064-03D	DUP	M300
8/8/12	MW-20B-3Q12	H064-04	NS	M300
8/8/12	MW-20B-3Q12	H064-04	NS	RSK-175
8/8/12	MW-5A-3Q12	H064-10	NS	M300
8/8/12	MW-5A-3Q12	H064-10	NS	RSK-175
8/8/12	MW-302-3Q12	H064-13	TB	RSK-175
8/8/12	MW-20A-3Q12	MW-20A-3Q12	NS	EPA 8260B
8/8/12	MW-20B-3Q12	MW-20B-3Q12	NS	EPA 8260B

**TABLE B2**

**SAMPLE CROSS REFERENCE  
 MODESTO GROUNDWATER SUPERFUND SITE  
 MODESTO, CALIFORNIA**

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Analytical Method
8/8/12	MW-302-3Q12	MW-302-3Q12	TB	EPA 8260B
8/8/12	MW-5A-3Q12	MW-5A-3Q12	NS	EPA 8260B
8/8/12	MW-80B-3Q12	MW-80B-3Q12	FD	EPA 8260B
8/8/12	MW-5A-3Q12	440-19934-10	NS	552.2
8/8/12	MW-20A-3Q12	440-19934-3	NS	552.2
8/8/12	MW-20B-3Q12	440-19934-4	NS	552.2
8/9/12	MW-23A-3Q12	1208036-03	NS	524.2
8/9/12	MW-16A-3Q12	1208036-04	NS	524.2
8/9/12	MW-16B-3Q12	1208036-05	NS	524.2
8/9/12	MW-16C-3Q12	1208036-06	NS	524.2
8/9/12	MW-77A-3Q12	1208036-09	FD	524.2
8/9/12	MW-27B-3Q12	1208036-13	NS	524.2
8/10/12	MW-21A-3Q12	1208036-01	NS	524.2
8/10/12	MW-22A-3Q12	1208036-02	NS	524.2
8/10/12	MW-97A-3Q12	1208036-07	FD	524.2
8/10/12	MW-3A-3Q12	1208036-08	NS	524.2
8/10/12	MW-21A-3Q12MS	B2H0060-MS1	MS	524.2
8/10/12	MW-21A-3Q12MSD	B2H0060-MSD1	MSD	524.2
8/30/12	DP-6A-3Q12	1208086-01	NS	TO-15
8/30/12	DP-6A-3Q12DUP	B2I0017-DUP1	DUP	TO-15
9/6/12	SVE Pre GAC-0901	1209012-01	NS	TO-15
9/6/12	SVE Stack-0901	1209012-02	NS	TO-15
9/6/12	SVE PreGAC-0901DUP	B2I0053-DUP2	DUP	TO-15
9/13/12	MW-305-3Q12	1209024-03	TB	524.2
9/13/12	MW-305-3Q12MS	B2I0056-MS1	MS	524.2
9/13/12	MW-305-3Q12MSD	B2I0056-MSD1	MSD	524.2

3Q12 = third quarter, 2012  
 DUP = laboratory duplicate  
 EFF = effluent  
 EW = extraction well  
 FB = field blank  
 FD = field duplicate  
 GWT = groundwater treatment  
 MS = matrix spike  
 MSD = matrix spike duplicate  
 MW = monitoring well  
 NS = normal sample  
 SVE = soil vapor extraction  
 TB = trip blank

**TABLE B3. RESULTS SUMMARY FOR LONG-TERM MONITORING AND SOIL VAPOR EXTRACTION  
THIRD QUARTER 2012, MODESTO GROUNDWATER SUPERFUND SITE**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
0000BLANK	MW-302-3Q12	WQ	E524.2	TB	8/7/2012	Acetone	2.20	4	µg/L	J
	MW-302-3Q12	WQ	RSK-175	TB	8/7/2012	Methane	1.20	1.20	µg/L	
	MW-302-3Q12	WQ	EPA 8260B	TB	8/8/2012	No Analytes Detected				
	MW-302-3Q12	WQ	RSK-175	TB	8/8/2012	No Analytes Detected				
	MW-305-3Q12	WQ	E524.2	TB	9/13/2012	No Analytes Detected				
	MW-402-3Q12	WQ	E524.2	FB	8/7/2012	No Analytes Detected				
DP-1A	DP-1A-3Q12	GS	TO15	NS	8/8/2012	Tetrachloroethene	43	2.70	ppbv	
DP-1B	DP-1B-3Q12	GS	TO15	NS	8/8/2012	Chloroform	1.80	2.60	ppbv	J
						Tetrachloroethene	140	26	ppbv	
DP-5A	DP-5A-3Q12	GS	TO15	NS	8/8/2012	Tetrachloroethene	1.60	2.50	ppbv	J
						Toluene	1.60	2.50	ppbv	
DP-5B	DP-5B-3Q12	GS	TO15	NS	8/8/2012	Chloroform	8.80	2.50	ppbv	J
						Tetrachloroethene	2.30	2.50	ppbv	
DP-6A	DP-6A-3Q12	GS	TO15	NS	8/30/2012	Tetrachloroethene	100	27	ppbv	
	DP-94A-3Q12	GS	TO15	FD	8/8/2012	Tetrachloroethene	52	26	ppbv	
DP-6B	DP-6B-3Q12	GS	TO15	NS	8/8/2012	No Analytes Detected				
MW-01A	MW-1A-3Q12	WG	E524.2	NS	8/6/2012	Tetrachloroethene	1.30	0.500	µg/L	
MW-02A	MW-2A-3Q12	WG	E524.2	NS	8/6/2012	Chloroform	2.60	0.500	µg/L	
						Tetrachloroethene	4.10	0.500	µg/L	
						Chloroform	1.70	0.500	µg/L	
MW-03A	MW-3A-3Q12	WG	E524.2	NS	8/10/2012	Tetrachloroethene	42	2.50	µg/L	
						Chloroform	1.60	0.500	µg/L	
						Tetrachloroethene	44	2.50	µg/L	
MW-04A	MW-4A-3Q12	WG	2320B	NS	8/7/2012	Bicarbonate Alkalinity	420	10	mg/L	
						Total Alkalinity	420	10	mg/L	
	MW-4A-3Q12	WG	300.0	NS	8/7/2012	Chloride (As Cl)	99	5	mg/L	
						Nitrite, Nitrate - Nonspecific	22	0.100	mg/L	
						Sulfate (As So4)	63	2.50	mg/L	
MW-4A-3Q12	WG	415.3	NS	8/7/2012	Total Organic Carbon	0.940	0.500	mg/L		

**TABLE B3 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
<i>MW-04A continued . . .</i>										
	MW-4A-3Q12	WG	4500-S2	NS	8/7/2012	Sulfide	0.670	1	mg/L	J
	MW-4A-3Q12	WG	552.2	NS	8/7/2012	No Analytes Detected				
	MW-4A-3Q12	WG	CENSUS	NS	8/7/2012	Dehalobacter Spp.	137	2.10	cells/mL	J
						Dehalococcoides Spp.	13.9	0.400	cells/mL	
						Desulfitobacterium Spp.	1760000	0.700	cells/mL	J
						Desulfuromonas Spp.	120	0.700	cells/mL	J
						Methane Oxidizing Bacteria	1880000	0.700	cells/mL	J
	MW-4A-3Q12	WG	E524.2	NS	8/7/2012	1,1,1,2-Tetrachloroethane	0.700	0.500	µg/L	
						Chloroform	2.30	0.500	µg/L	
						Cis-1,2-Dichloroethene	1.10	0.500	µg/L	
						Tetrachloroethene	1200	50	µg/L	
						Trichloroethylene	1.20	0.500	µg/L	
	MW-4A-3Q12	WG	EPA 8260B	NS	8/7/2012	Chloroform	1.90	1	µg/L	
						Tetrachloroethene	1300	10	µg/L	
						Trichloroethylene	1	1	µg/L	
	MW-4A-3Q12	WG	M300	NS	8/7/2012	No Analytes Detected				
	MW-4A-3Q12	WG	RSK-175	NS	8/7/2012	Carbon Dioxide	44000	3000	µg/L	
						No Analytes Detected				
	MW-96A-3Q12	WG	CENSUS	FD	8/7/2012	Dehalobacter Spp.	69.3	2.50	cells/mL	J
						Dehalococcoides Spp.	15	0.400	cells/mL	
						Desulfitobacterium Spp.	605000	0.800	cells/mL	J
						Desulfuromonas Spp.	20.8	0.800	cells/mL	J
						Methane Oxidizing Bacteria	3580000	0.800	cells/mL	J
	MW-96A-3Q12	WG	EPA 8260B	FD	8/7/2012	Chloroform	2	1	µg/L	
						Tetrachloroethene	1100	20	µg/L	
						Trichloroethylene	1.10	1	µg/L	
MW-04B	MW-4B-3Q12	WG	2320B	NS	8/7/2012	Bicarbonate Alkalinity	150	10	mg/L	
						Total Alkalinity	150	10	mg/L	
	MW-4B-3Q12	WG	300.0	NS	8/7/2012	Chloride (As Cl)	18	1	mg/L	

**TABLE B3 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
<i>MW-04B continued . . .</i>						Nitrite, Nitrate - Nonspecific Sulfate (As So4)	4.50 7.80	0.100 0.500	mg/L mg/L	
	MW-4B-3Q12	WG	415.3	NS	8/7/2012	No Analytes Detected				
	MW-4B-3Q12	WG	4500-S2	NS	8/7/2012	Sulfide	0.900	1	mg/L	J
	MW-4B-3Q12	WG	552.2	NS	8/7/2012	No Analytes Detected				
	MW-4B-3Q12	WG	E524.2	NS	8/7/2012	Tetrachloroethene	22	0.500	µg/L	
	MW-4B-3Q12	WG	M300	NS	8/7/2012	No Analytes Detected				
	MW-4B-3Q12	WG	RSK-175	NS	8/7/2012	Carbon Dioxide	6500	3000	µg/L	
						No Analytes Detected				
MW-04C	MW-4C-3Q12	WG	E524.2	NS	8/7/2012	Tetrachloroethene	1	0.500	µg/L	
MW-05A	MW-5A-3Q12	WG	2320B	NS	8/8/2012	Bicarbonate Alkalinity	460	10	mg/L	
						Total Alkalinity	460	10	mg/L	
	MW-5A-3Q12	WG	300.0	NS	8/8/2012	Chloride (As Cl)	80	2	mg/L	
						Nitrite, Nitrate - Nonspecific Sulfate (As So4)	8.10 53	0.100 1	mg/L mg/L	
	MW-5A-3Q12	WG	415.3	NS	8/8/2012	Total Organic Carbon	0.600	0.500	mg/L	
	MW-5A-3Q12	WG	4500-S2	NS	8/8/2012	No Analytes Detected				
	MW-5A-3Q12	WG	552.2	NS	8/8/2012	No Analytes Detected				
	MW-5A-3Q12	WG	E524.2	NS	8/8/2012	Chloroform	3	0.500	µg/L	
						Tetrachloroethene	51	2.50	µg/L	
	MW-5A-3Q12	WG	EPA 8260B	NS	8/8/2012	Chloroform	2.80	1	µg/L	
						Tetrachloroethene	51	1	µg/L	
	MW-5A-3Q12	WG	M300	NS	8/8/2012	No Analytes Detected				
	MW-5A-3Q12	WG	RSK-175	NS	8/8/2012	Carbon Dioxide	88000	9700	µg/L	
						Methane	2	1.20	µg/L	
						No Analytes Detected				
	MW-95A-3Q12	WG	2320B	FD	8/8/2012	Bicarbonate Alkalinity	450	10	mg/L	
						Total Alkalinity	450	10	mg/L	
	MW-95A-3Q12	WG	300.0	FD	8/8/2012	Chloride (As Cl)	79	2	mg/L	

**TABLE B3 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
<i>MW-05A continued . . .</i>										
						Nitrite, Nitrate - Nonspecific Sulfate (As So4)	8.20 52	0.100 1	mg/L mg/L	
	MW-95A-3Q12	WG	415.3	FD	8/8/2012	Total Organic Carbon	0.620	0.500	mg/L	
	MW-95A-3Q12	WG	4500-S2	FD	8/8/2012	No Analytes Detected				
	MW-95A-3Q12	WG	RSK-175	FD	8/8/2012	Carbon Dioxide	71000	9700	µg/L	
						Methane	1.70	1.20	µg/L	
MW-06A	MW-6A-3Q12	WG	E524.2	NS	8/7/2012	Bromodichloromethane	0.300	0.500	µg/L	J
						Chloroform	6.70	0.500	µg/L	
						Tetrachloroethene	5.20	0.500	µg/L	
MW-07A	MW-7A-3Q12	WG	E524.2	NS	8/6/2012	Chloroform	1.60	0.500	µg/L	
MW-08A	MW-8A-3Q12	WG	2320B	NS	8/7/2012	Bicarbonate Alkalinity	440	10	mg/L	
						Total Alkalinity	440	10	mg/L	
	MW-8A-3Q12	WG	300.0	NS	8/7/2012	Chloride (As Cl)	38	1	mg/L	
						Nitrite, Nitrate - Nonspecific Sulfate (As So4)	1.30 31	0.100 0.500	mg/L mg/L	
	MW-8A-3Q12	WG	415.3	NS	8/7/2012	Total Organic Carbon	0.470	0.500	mg/L	J
	MW-8A-3Q12	WG	4500-S2	NS	8/7/2012	Sulfide	0.920	1	mg/L	J
	MW-8A-3Q12	WG	552.2	NS	8/7/2012	No Analytes Detected				
	MW-8A-3Q12	WG	E524.2	NS	8/7/2012	Bromodichloromethane	0.600	0.500	µg/L	
						Chloroform	12	0.500	µg/L	
						Tetrachloroethene	9.20	0.500	µg/L	
	MW-8A-3Q12	WG	EPA 8260B	NS	8/7/2012	Chloroform	12	1	µg/L	
						Tetrachloroethene	7.50	1	µg/L	
	MW-8A-3Q12	WG	M300	NS	8/7/2012	No Analytes Detected				
	MW-8A-3Q12	WG	RSK-175	NS	8/7/2012	Carbon Dioxide	50000	3000	µg/L	
						No Analytes Detected				
	MW-92A-3Q12	WG	552.2	FD	8/7/2012	No Analytes Detected				
	MW-92A-3Q12	WG	M300	FD	8/7/2012	No Analytes Detected				
	MW-92A-3Q12	WG	RSK-175	FD	8/7/2012	No Analytes Detected				

**TABLE B3 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
MW-09B	MW-9B-3Q12	WG	E524.2	NS	8/6/2012	Tetrachloroethene	14	0.500	µg/L	
MW-10A	MW-10A-3Q12	WG	E524.2	NS	8/7/2012	Chloroform	5.20	0.500	µg/L	
						Tetrachloroethene	46	2.50	µg/L	
MW-10B	MW-10B-3Q12	WG	E524.2	NS	8/8/2012	Tetrachloroethene	15	0.500	µg/L	
	MW-90B-3Q12	WG	E524.2	FD	8/8/2012	Tetrachloroethene	16	0.500	µg/L	
MW-10C	MW-10C-3Q12	WG	E524.2	NS	8/8/2012	No Analytes Detected				
MW-11A	MW-11A-3Q12	WG	E524.2	NS	8/6/2012	Chloroform	5.90	0.500	µg/L	
						Tetrachloroethene	1	0.500	µg/L	
MW-12A	MW-12A-3Q12	WG	E524.2	NS	8/7/2012	Bromodichloromethane	0.400	0.500	µg/L	J
						Chloroform	9.10	0.500	µg/L	
						Tetrachloroethene	20	0.500	µg/L	
						Trichlorofluoromethane	0.500	0.500	µg/L	
MW-13A	MW-13A-3Q12	WG	E524.2	NS	8/6/2012	Bromodichloromethane	0.300	0.500	µg/L	J
						Chloroform	7.90	0.500	µg/L	
						Tetrachloroethene	2.10	0.500	µg/L	
MW-14A	MW-14A-3Q12	WG	E524.2	NS	8/6/2012	Chloroform	2.90	0.500	µg/L	
						Tetrachloroethene	2.50	0.500	µg/L	
	MW-86A-3Q12	WG	E524.2	FD	8/6/2012	Chloroform	2.90	0.500	µg/L	
						Tetrachloroethene	2.40	0.500	µg/L	
MW-15A	MW-15A-3Q12	WG	2320B	NS	8/7/2012	Bicarbonate Alkalinity	430	10	mg/L	
						Total Alkalinity	430	10	mg/L	
	MW-15A-3Q12	WG	300.0	NS	8/7/2012	Chloride (As Cl)	64	5	mg/L	
						Nitrite, Nitrate - Nonspecific	18	0.100	mg/L	
						Sulfate (As So4)	52	2.50	mg/L	
	MW-15A-3Q12	WG	415.3	NS	8/7/2012	Total Organic Carbon	0.570	0.500	mg/L	
	MW-15A-3Q12	WG	4500-S2	NS	8/7/2012	No Analytes Detected				
	MW-15A-3Q12	WG	552.2	NS	8/7/2012	No Analytes Detected				
	MW-15A-3Q12	WG	E524.2	NS	8/7/2012	1,2-Dichloroethane	0.700	0.500	µg/L	
						Chloroform	1.40	0.500	µg/L	

**TABLE B3 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
<i>MW-15A continued . . .</i>										
	MW-15A-3Q12	WG	M300	NS	8/7/2012	No Analytes Detected				
	MW-15A-3Q12	WG	RSK-175	NS	8/7/2012	Carbon Dioxide	53000	3000	µg/L	
						No Analytes Detected				
MW-16A	MW-16A-3Q12	WG	E524.2	NS	8/9/2012	Chloroform	0.800	0.500	µg/L	
MW-16B	MW-16B-3Q12	WG	E524.2	NS	8/9/2012	Chloroform	0.600	0.500	µg/L	
						Tetrachloroethene	24	0.500	µg/L	
MW-16C	MW-16C-3Q12	WG	E524.2	NS	8/9/2012	Chloroform	0.600	0.500	µg/L	
						Tetrachloroethene	4.90	0.500	µg/L	
MW-17A	MW-17A-3Q12	WG	E524.2	NS	8/7/2012	Bromodichloromethane	0.300	0.500	µg/L	J
						Chloroform	5.90	0.500	µg/L	
						Tetrachloroethene	0.500	0.500	µg/L	
MW-17B	MW-17B-3Q12	WG	2320B	NS	8/7/2012	Bicarbonate Alkalinity	290	10	mg/L	
						Total Alkalinity	290	10	mg/L	
	MW-17B-3Q12	WG	300.0	NS	8/7/2012	Chloride (As Cl)	73	5	mg/L	
						Nitrite, Nitrate - Nonspecific	6.50	0.100	mg/L	
						Sulfate (As So4)	27	0.500	mg/L	
	MW-17B-3Q12	WG	415.3	NS	8/7/2012	Total Organic Carbon	0.540	0.500	mg/L	
	MW-17B-3Q12	WG	4500-S2	NS	8/7/2012	Sulfide	1.10	1	mg/L	
	MW-17B-3Q12	WG	552.2	NS	8/7/2012	No Analytes Detected				
	MW-17B-3Q12	WG	CENSUS	NS	8/7/2012	Dehalobacter Spp.	170	2.50	cells/mL	
						Dehalococcoides Spp.	5.30	0.400	cells/mL	
						Desulfitobacterium Spp.	667000	0.800	cells/mL	
						Methane Oxidizing Bacteria	16300000	0.800	cells/mL	
	MW-17B-3Q12	WG	E524.2	NS	8/7/2012	Chloroform	0.300	0.500	µg/L	J
						Tetrachloroethene	45	2.50	µg/L	
	MW-17B-3Q12	WG	EPA 8260B	NS	8/7/2012	Tetrachloroethene	44	1	µg/L	
	MW-17B-3Q12	WG	M300	NS	8/7/2012	No Analytes Detected				
	MW-17B-3Q12	WG	RSK-175	NS	8/7/2012	Carbon Dioxide	20000	3000	µg/L	
						No Analytes Detected				

**TABLE B3 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
MW-17C	MW-17C-3Q12	WG	E524.2	NS	8/7/2012	No Analytes Detected				
MW-18A	MW-18A-3Q12	WG	E524.2	NS	8/8/2012	Chloroform	2.90	0.500	µg/L	
						Tetrachloroethene	2.20	0.500	µg/L	
MW-19A	MW-19A-3Q12	WG	E524.2	NS	8/6/2012	Chloroform	1.30	0.500	µg/L	
MW-19B1	MW-19B-3Q12	WG	E524.2	NS	8/6/2012	No Analytes Detected				
MW-20A	MW-20A-3Q12	WG	2320B	NS	8/8/2012	Bicarbonate Alkalinity	440	10	mg/L	
						Total Alkalinity	440	10	mg/L	
	MW-20A-3Q12	WG	300.0	NS	8/8/2012	Chloride (As Cl)	68	2	mg/L	
						Nitrite, Nitrate - Nonspecific	11	0.100	mg/L	
						Sulfate (As So4)	57	1	mg/L	
	MW-20A-3Q12	WG	415.3	NS	8/8/2012	Total Organic Carbon	0.750	0.500	mg/L	
	MW-20A-3Q12	WG	4500-S2	NS	8/8/2012	Sulfide	0.670	1	mg/L	J
	MW-20A-3Q12	WG	552.2	NS	8/8/2012	No Analytes Detected				
	MW-20A-3Q12	WG	E524.2	NS	8/8/2012	Bromodichloromethane	0.300	0.500	µg/L	J
						Chloroform	7.30	0.500	µg/L	
						Dichlorodifluoromethane	4.50	0.500	µg/L	J
						Tetrachloroethene	190	10	µg/L	
	MW-20A-3Q12	WG	EPA 8260B	NS	8/8/2012	Chloroform	7.90	1	µg/L	
						Dichlorodifluoromethane	4	1	µg/L	
						Tetrachloroethene	180	1	µg/L	
	MW-20A-3Q12	WG	M300	NS	8/8/2012	No Analytes Detected				
	MW-20A-3Q12	WG	RSK-175	NS	8/8/2012	Carbon Dioxide	38000	3000	µg/L	
						No Analytes Detected				
MW-20B	MW-20B-3Q12	WG	2320B	NS	8/8/2012	Bicarbonate Alkalinity	180	10	mg/L	
						Total Alkalinity	180	10	mg/L	
	MW-20B-3Q12	WG	300.0	NS	8/8/2012	Chloride (As Cl)	22	1	mg/L	
						Nitrite, Nitrate - Nonspecific	5.10	0.100	mg/L	
						Sulfate (As So4)	12	0.500	mg/L	
	MW-20B-3Q12	WG	415.3	NS	8/8/2012	Total Organic Carbon	0.450	0.500	mg/L	J

**TABLE B3 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
<i>MW-20B continued . . .</i>										
	MW-20B-3Q12	WG	4500-S2	NS	8/8/2012	No Analytes Detected				
	MW-20B-3Q12	WG	552.2	NS	8/8/2012	No Analytes Detected				
	MW-20B-3Q12	WG	CENSUS	NS	8/8/2012	Dehalobacter Spp.	0.700	2.10	cells/mL	J
						Desulfitobacterium Spp.	12900	0.700	cells/mL	J
						Methane Oxidizing Bacteria	1150000	0.700	cells/mL	J
	MW-20B-3Q12	WG	E524.2	NS	8/8/2012	Tetrachloroethene	65	5	µg/L	
	MW-20B-3Q12	WG	EPA 8260B	NS	8/8/2012	Tetrachloroethene	50	0	µg/L	
	MW-20B-3Q12	WG	M300	NS	8/8/2012	No Analytes Detected				
	MW-20B-3Q12	WG	RSK-175	NS	8/8/2012	Carbon Dioxide	6700	3000	µg/L	
						No Analytes Detected				
	MW-80B-3Q12	WG	CENSUS	FD	8/8/2012	Dehalobacter Spp.	3.30	2.20	cells/mL	J
						Desulfitobacterium Spp.	51300	0.700	cells/mL	J
						Methane Oxidizing Bacteria	2710000	0.700	cells/mL	J
	MW-80B-3Q12	WG	EPA 8260B	FD	8/8/2012	Tetrachloroethene	51	1	µg/L	
MW-20C	MW-20C-3Q12	WG	E524.2	NS	8/8/2012	No Analytes Detected				
MW-21A	MW-21A-3Q12	WG	E524.2	NS	8/10/2012	Chloroform	5.50	0.500	µg/L	
						Tetrachloroethene	0.700	0.500	µg/L	
MW-22A	MW-22A-3Q12	WG	E524.2	NS	8/10/2012	Chloroform	3.90	0.500	µg/L	
MW-23A	MW-23A-3Q12	WG	E524.2	NS	8/9/2012	Chloroform	3.70	0.500	µg/L	
						Tetrachloroethene	41	2.50	µg/L	
	MW-77A-3Q12	WG	E524.2	FD	8/9/2012	Chloroform	3.80	0.500	µg/L	
						Tetrachloroethene	39	2.50	µg/L	
MW-24B	MW-24B-3Q12	WG	2320B	NS	8/7/2012	Bicarbonate Alkalinity	190	10	mg/L	
						Total Alkalinity	190	10	mg/L	
	MW-24B-3Q12	WG	300.0	NS	8/7/2012	Chloride (As Cl)	27	1	mg/L	
						Nitrite, Nitrate - Nonspecific	5.20	0.100	mg/L	
						Sulfate (As So4)	12	0.500	mg/L	
	MW-24B-3Q12	WG	415.3	NS	8/7/2012	Total Organic Carbon	0.620	0.500	mg/L	
	MW-24B-3Q12	WG	4500-S2	NS	8/7/2012	Sulfide	0.590	1	mg/L	J

**TABLE B3 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
<i>MW-24B continued . . .</i>										
	MW-24B-3Q12	WG	552.2	NS	8/7/2012	No Analytes Detected				
	MW-24B-3Q12	WG	E524.2	NS	8/7/2012	Tetrachloroethene	64	2.50	µg/L	
	MW-24B-3Q12	WG	EPA 8260B	NS	8/7/2012	Tetrachloroethene	47	1	µg/L	
	MW-24B-3Q12	WG	M300	NS	8/7/2012	No Analytes Detected				
	MW-24B-3Q12	WG	RSK-175	NS	8/7/2012	Carbon Dioxide	7800	3000	µg/L	
						Methane	16	1.20	µg/L	
						No Analytes Detected				
MW-25B	MW-25B-3Q12	WG	2320B	NS	8/6/2012	Bicarbonate Alkalinity	180	10	mg/L	
						Total Alkalinity	180	10	mg/L	
	MW-25B-3Q12	WG	300.0	NS	8/6/2012	Chloride (As Cl)	25	1	mg/L	
						Nitrite, Nitrate - Nonspecific	4.20	0.100	mg/L	
						Sulfate (As So4)	12	0.500	mg/L	
	MW-25B-3Q12	WG	415.3	NS	8/6/2012	Total Organic Carbon	0.260	0.500	mg/L	J
	MW-25B-3Q12	WG	4500-S2	NS	8/6/2012	No Analytes Detected				
	MW-25B-3Q12	WG	552.2	NS	8/6/2012	No Analytes Detected				
	MW-25B-3Q12	WG	CENSUS	NS	8/6/2012	Dehalobacter Spp.	47.7	2.40	cells/mL	
						Dehalococcoides Spp.	12.4	0.400	cells/mL	
						Desulfitobacterium Spp.	40100	0.800	cells/mL	
						Desulfuromonas Spp.	23	0.800	cells/mL	
						Methane Oxidizing Bacteria	2500000	0.800	cells/mL	
	MW-25B-3Q12	WG	E524.2	NS	8/6/2012	Tetrachloroethene	79	5	µg/L	
	MW-25B-3Q12	WG	EPA 8260B	NS	8/6/2012	Tetrachloroethene	54	1	µg/L	
	MW-25B-3Q12	WG	M300	NS	8/6/2012	No Analytes Detected				
	MW-25B-3Q12	WG	RSK-175	NS	8/6/2012	Carbon Dioxide	6700	3000	µg/L	
						No Analytes Detected				
MW-26B	MW-26B-3Q12	WG	E524.2	NS	8/7/2012	Tetrachloroethene	0.300	0.500	µg/L	J
MW-27B	MW-27B-3Q12	WG	E524.2	NS	8/9/2012	No Analytes Detected				
MW-28B	MW-28B-3Q12	WG	2320B	NS	8/6/2012	Bicarbonate Alkalinity	220	10	mg/L	
						Total Alkalinity	220	10	mg/L	

**TABLE B3 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
<i>MW-28B continued . . .</i>										
	MW-28B-3Q12	WG	300.0	NS	8/6/2012	Chloride (As Cl)	38	1	mg/L	
						Nitrite, Nitrate - Nonspecific	4.90	0.100	mg/L	
						Sulfate (As So4)	15	0.500	mg/L	
	MW-28B-3Q12	WG	415.3	NS	8/6/2012	Total Organic Carbon	1	0.500	mg/L	
	MW-28B-3Q12	WG	4500-S2	NS	8/6/2012	Sulfide	2.20	1	mg/L	
	MW-28B-3Q12	WG	552.2	NS	8/6/2012	No Analytes Detected				
	MW-28B-3Q12	WG	CENSUS	NS	8/6/2012	Dehalobacter Spp.	80.3	2.30	cells/mL	
						Dehalococcoides Spp.	0.600	0.400	cells/mL	J
						Desulfitobacterium Spp.	110000	0.800	cells/mL	
						Desulfuromonas Spp.	3.50	0.800	cells/mL	
						Methane Oxidizing Bacteria	3690000	0.800	cells/mL	
	MW-28B-3Q12	WG	E524.2	NS	8/6/2012	Tetrachloroethene	38	2.50	µg/L	
	MW-28B-3Q12	WG	EPA 8260B	NS	8/6/2012	Tetrachloroethene	35	1	µg/L	
	MW-28B-3Q12	WG	M300	NS	8/6/2012	No Analytes Detected				
	MW-28B-3Q12	WG	RSK-175	NS	8/6/2012	Carbon Dioxide	11000	3000	µg/L	
						No Analytes Detected				
MW-29B	MW-29B-3Q12	WG	E524.2	NS	8/8/2012	Tetrachloroethene	70	2.50	µg/L	
OSVE-10	OSVE-10-3Q12	GS	TO15	NS	8/8/2012	Tetrachloroethene	370	54	ppbv	
OSVE-11	OSVE-11-3Q12	GS	TO15	NS	8/8/2012	Tetrachloroethene	21	2.40	ppbv	
						Trichloroethylene	1.20	2.40	ppbv	J
SP-11	SVE Pre GAC-0703	GS	TO15	NS	7/18/2012	Chloroform	9.60	2.70	ppbv	J-
						Cis-1,2-Dichloroethene	2.70	2.70	ppbv	
						Tetrachloroethene	190	27	ppbv	
						Trichloroethylene	2.10	2.70	ppbv	J
	SVE Pre GAC-0802				8/8/2012	Chloroform	12	2.60	ppbv	
						Cis-1,2-Dichloroethene	3	2.60	ppbv	
						Tetrachloroethene	500	26	ppbv	
						Trichloroethylene	2.90	2.60	ppbv	
	SVE Pre GAC-0901				9/6/2012	1,2,4-Trimethylbenzene	10	2.60	ppbv	

**TABLE B3 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
<i>SP-11 continued . . .</i>										
						1,2-Dichlorobenzene	7	2.60	ppbv	
						1,3,5-Trimethylbenzene	7.40	2.60	ppbv	
						1,4-Dichlorobenzene	1.80	2.60	ppbv	J
						Chloroform	15	2.60	ppbv	
						Cis-1,2-Dichloroethene	4.30	2.60	ppbv	
						M,P-Xylenes	2.90	5.20	ppbv	J
						O-Xylene	2.70	2.60	ppbv	
						Tetrachloroethene	650	77	ppbv	
						Trichloroethylene	28	2.60	ppbv	
SP-12	SVE Stack-0703	GS	TO15	NS	7/18/2012	Chloroform	4.50	2.10	ppbv	J-
						Tetrachloroethene	2.60	2.10	ppbv	
	SVE Stack-0802				8/8/2012	Chloroform	6.50	2.40	ppbv	
						Tetrachloroethene	1.60	2.40	ppbv	J
	SVE Stack-0901				9/6/2012	1,2-Dichlorobenzene	1.30	2.60	ppbv	J
						Chloroform	8.90	2.60	ppbv	
SVE-01	SVE-1-3Q12	GS	TO15	NS	8/8/2012	Tetrachloroethene	38	2.60	ppbv	
SVE-02	SVE-2-3Q12	GS	TO15	NS	8/8/2012	Cis-1,2-Dichloroethene	4	2.60	ppbv	
						Tetrachloroethene	380	34	ppbv	
						Trichloroethylene	3.30	2.60	ppbv	
SVE-03	SVE-3-3Q12	GS	TO15	NS	8/8/2012	Tetrachloroethene	210	30	ppbv	
	SVE-97-3Q12	GS	TO15	FD	8/8/2012	Tetrachloroethene	220	20	ppbv	
SVE-04	SVE-4-3Q12	GS	TO15	NS	8/8/2012	Chloroform	25	16	ppbv	
						Tetrachloroethene	35	16	ppbv	

Matrix

GS = soil gas  
 WG = groundwater  
 WQ = water quality

**TABLE B3 (Continued)**

<b>Location</b>	<b>Field Sample Identification</b>	<b>Matrix</b>	<b>Method</b>	<b>Sample Type</b>	<b>Date Sampled</b>	<b>Analyte</b>	<b>Result</b>	<b>Reporting Limit</b>	<b>Units</b>	<b>Qualified Result</b>
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Sample Type

FD = Field Duplicate  
 FB = Field Blank  
 NS = Normal Sample  
 TB = Trip Blank

Units

cells/mL = cells per milliliter  
 mg/L = milligrams/Liter  
 ppbv = parts per billion volume  
 µg/L = micrograms/Liter

Qualified Results

J = Analyte concentration considered an estimated value because one or more quality control specifications were not met.  
 J- = Analyte concentration considered an estimated value because one or more quality control specifications were not met, potential low bias.

**TABLE B4. RESULTS SUMMARY FOR THE GROUNDWATER TREATMENT SYSTEM  
THIRD QUARTER 2012, MODESTO GROUNDWATER SUPERFUND SITE**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result	
0000BLANK	MW-301-3Q12	WQ	E524.2	TB1	7/18/2012	Chloroform	0.0400	0.500	µg/L		
	MW-303-3Q12				8/8/2012	Tetrachloroethene	0.130	0.500	µg/L	J	
						Toluene	0.100	0.500	µg/L	J	
SP-01	MW-304-3Q12	WG	E524.2	NS1	9/6/2012	No Analytes Detected					
	GWTS-INF-0703				7/18/2012	Uranium	49.7	1	pCi/L		
	GWTS-INF-0703				7/18/2012	1,1,1,2-Tetrachloroethane	0.270	0.500	µg/L	J	
						Bromodichloromethane	0.0600	0.500	µg/L	J	
						Chloroform	1.90	0.500	µg/L		
						Cis-1,2-Dichloroethene	0.300	0.500	µg/L	J	
						Dichlorodifluoromethane	0.0500	0.500	µg/L	J	
						Tetrachloroethene	740	25	µg/L		
						Toluene	0.150	0.500	µg/L	J	
						Trichloroethylene	0.590	0.500	µg/L		
					GWTS-INF-0802	8/8/2012	Bromodichloromethane	0.160	0.500	µg/L	U
							Chloroform	3.80	0.500	µg/L	
							Chloromethane	0.0400	0.500	µg/L	U
							Tetrachloroethene	97	5	µg/L	
							Trichloroethylene	0.0700	0.500	µg/L	J
	GWTS-INF-0901	9/6/2012	Bromodichloromethane	0.130	0.500	µg/L	J				
			Chloroform	3.60	0.500	µg/L					
			Tetrachloroethene	110	5	µg/L					
			Trichloroethylene	0.0800	0.500	µg/L	J				
	MW-101-0802	WG	E524.2	FD1	8/8/2012	Bromodichloromethane	0.140	0.500	µg/L	J	
						Chloroform	3.80	0.500	µg/L		
						Chloromethane	0.0400	0.500	µg/L	U	
						Tetrachloroethene	98	5	µg/L		
						Trichloroethylene	0.0800	0.500	µg/L	J	
SP-03	CRB INF-0703	WG	E524.2	NS1	7/18/2012	Chloroform	0.0800	0.500	µg/L	U	
						Chloromethane	0.0700	0.500	µg/L	J	

**TABLE B4 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
<i>SP-03 continued . . .</i>										
						Hexachlorobutadiene	0.0300	0.500	µg/L	U
						Tetrachloroethene	7.10	0.500	µg/L	J
SP-04	CRB Mid-0703	WG	E524.2	NS1	7/18/2012	Chloroform	0.0800	0.500	µg/L	U
						Chloromethane	0.0600	0.500	µg/L	J
						Tetrachloroethene	0.250	0.500	µg/L	J
SP-05	CRB EFF-0703	WG	E524.2	NS1	7/18/2012	Chloroform	0.0600	0.500	µg/L	U
						Chloromethane	0.0900	0.500	µg/L	J
	Pre IEX-0703	WG	D5174	NS1	7/18/2012	Uranium	53.3	1	pCi/L	
	Pre IEX-0802				8/8/2012	Uranium	56.6	1	pCi/L	
	Pre IEX-0901				9/6/2012	Uranium	50.5	1	pCi/L	
SP-06	IEX Mid-0703	WG	D5174	NS1	7/18/2012	Uranium	0.665	1	pCi/L	
	IEX Mid-0802				8/8/2012	Uranium	10.1	1	pCi/L	
	IEX Mid-0901				9/6/2012	Uranium	11.6	1	pCi/L	
	MW-106-0703	WG	D5174	FD1	7/18/2012	Uranium	0.585	1	pCi/L	
SP-07	EFF-0703	WG	D5174	NS1	7/18/2012	Uranium	7.44	1	pCi/L	
	EFF-0703	WG	E524.2	NS1	7/18/2012	Bromomethane	0.100	0.500	µg/L	J
						Chloroform	0.140	0.500	µg/L	U
						Chloromethane	0.300	0.500	µg/L	J
	EFF-0703	WG	SM2540C	NS1	7/18/2012	Total Dissolved Solids	581	10	mg/L	
	EFF-0703	WG	SM2540D	NS1	7/18/2012	No Analytes Detected				
	EFF-0703	WG	SM5210B	NS1	7/18/2012	No Analytes Detected				
	EFF-0802	WG	E524.2	NS1	8/8/2012	Chloroform	0.210	0.500	µg/L	U
						Chloromethane	0.0400	0.500	µg/L	U
						Toluene	0.930	0.500	µg/L	
	EFF-0802	WG	SM2540C	NS1	8/8/2012	Total Dissolved Solids	603	10	mg/L	
	EFF-0802	WG	SM2540D	NS1	8/8/2012	No Analytes Detected				
	EFF-0802	WG	SM5210B	NS1	8/8/2012	No Analytes Detected				
	EFF-0901	WG	E524.2	NS1	9/6/2012	Chloroform	0.220	0.500	µg/L	J
						Tetrachloroethene	0.110	0.500	µg/L	J

**TABLE B4 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
<i>SP-07 continued . . .</i>										
	EFF-0901	WG	SM2540C	NS1	9/6/2012	Total Dissolved Solids	614	10	mg/L	
	EFF-0901	WG	SM2540D	NS1	9/6/2012	No Analytes Detected				
	EFF-0901	WG	SM5210B	NS1	9/6/2012	No Analytes Detected				
SP-08	GWTS Pr GAC-0703	GS	TO15	NS1	7/18/2012	Bromomethane	1.30	44	PPBV	U
						Chloroform	6.10	4.40	PPBV	
						Tetrachloroethene	1400	4.40	PPBV	
						Toluene	0.720	4.40	PPBV	J
						Trichloroethylene	1.10	4.40	PPBV	J
	GWTS Pr GAC-0802				8/8/2012	Benzene	0.300	0.780	PPBV	U
						Chloroform	7	0.780	PPBV	
						Chloromethane	1.10	7.80	PPBV	J
						Dichlorodifluoromethane	0.440	0.780	PPBV	J
						Tetrachloroethene	200	0.780	PPBV	
						Toluene	0.420	0.780	PPBV	J
						Trichloroethylene	0.250	0.780	PPBV	J
	GWTS Pr GAC-0901				9/6/2012	1,2,4-Trimethylbenzene	0.250	1.20	PPBV	J
						1,2-Dichlorobenzene	1.90	1.20	PPBV	
						1,4-Dichlorobenzene	0.290	1.20	PPBV	J
						Chloroform	8.20	1.20	PPBV	
						Dichlorodifluoromethane	0.480	1.20	PPBV	J
						M,P-Xylenes	0.500	1.20	PPBV	J
						Tetrachloroethene	200	1.20	PPBV	
						Toluene	0.590	1.20	PPBV	J
						Trichloroethylene	0.740	1.20	PPBV	J
						Trichlorofluoromethane	0.320	1.20	PPBV	J
SP-09	GWTS Stack-0703	GS	TO15	NS1	7/18/2012	1,2-Dibromoethane	0.120	0.790	PPBV	U
						1,2-Dichloroethane	0.200	0.790	PPBV	J
						Benzene	1.60	0.790	PPBV	
						Carbon Tetrachloride	0.150	0.790	PPBV	J

**TABLE B4 (Continued)**

Location	Field Sample Identification	Matrix	Method	Sample Type	Date Sampled	Analyte	Result	Reporting Limit	Units	Qualified Result
<i>SP-09 continued . . .</i>										
	GWTS Stack-0802				8/8/2012	Chloroform	11	0.790	PPBV	
						Chloromethane	1.60	7.90	PPBV	U
						Dichlorodifluoromethane	0.580	0.790	PPBV	J
						Tetrachloroethene	260	0.790	PPBV	
						Toluene	0.130	0.790	PPBV	J
						Trichloroethylene	0.430	0.790	PPBV	J
						Trichlorofluoromethane	0.560	0.790	PPBV	J
						Benzene	1.40	0.780	PPBV	
						Chloroform	7.80	0.780	PPBV	
						Dichlorodifluoromethane	0.440	0.780	PPBV	J
						Tetrachloroethene	120	0.780	PPBV	
						Trichloroethylene	0.270	0.780	PPBV	J
						Trichlorofluoromethane	0.260	0.780	PPBV	J
		GWTS Stack-0901					9/6/2012	1,2,4-Trimethylbenzene	0.230	1.10
					1,2-Dichlorobenzene	8.20		1.10	PPBV	
					1,3-Dichlorobenzene	0.610		1.10	PPBV	J
					1,4-Dichlorobenzene	1.50		1.10	PPBV	
					Benzene	1.40		1.10	PPBV	
					Chloroform	7.50		1.10	PPBV	
					Dichlorodifluoromethane	0.530		1.10	PPBV	J
					M,P-Xylenes	0.190		1.10	PPBV	J
					Tetrachloroethene	150		1.10	PPBV	
					Trichloroethylene	10		1.10	PPBV	
					Trichlorofluoromethane	0.260		1.10	PPBV	J
SP-10	IEXEFF-0802	WG	D5174	NS1	8/8/2012	No Analytes Detected				
	IEXEFF-0901				9/6/2012	No Analytes Detected				

**TABLE B4 (Continued)**

<b>Location</b>	<b>Field Sample Identification</b>	<b>Matrix</b>	<b>Method</b>	<b>Sample Type</b>	<b>Date Sampled</b>	<b>Analyte</b>	<b>Result</b>	<b>Reporting Limit</b>	<b>Units</b>	<b>Qualified Result</b>
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Matrix

GS = soil gas  
 WG = groundwater  
 WQ = water quality

Sample Type

FD = Field Duplicate  
 N = Normal Sample  
 TB = Trip Blank

Units

mg/L = milligrams/Liter  
 ppbv = parts per billion volume  
 pci/L = picoCuries/Liter  
 µg/L = micrograms/Liter

Qualified Results

J = Analyte concentration considered an estimated value because one or more quality control specifications were not met.  
 U = Analyte considered not detected due to external contamination.

**Appendix C**  
**Laboratory Data Validation Reports**

- **Laboratory Data Consultants, Inc.**
- **URS Group, Inc.**

**Laboratory Data Consultants, Inc.**



## Laboratory Data Consultants, Inc.

7750 El Camino Real, Ste. 2L Carlsbad, CA 92009

Phone 760.634.0437

Web [www.lab-data.com](http://www.lab-data.com)

Fax 760.634.0439

URS Corporation  
2870 Gateway Oaks Drive, Suite 300  
Sacramento, CA 95833  
ATTN: Ms. Debbie Casagrande

October 22, 2012

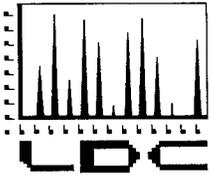
SUBJECT: Modesto Superfund Site Quality Control Summary Report (QCSR) for Quarterly and Monthly Sampling Events, Staged Electronic Data Deliverables (SEDD) and Automated Data Review (ADR) deliverables – 3<sup>rd</sup> Quarter 2012

Dear Ms. Casagrande,

Enclosed are the Quality Control Summary Report (QCSR), validation worksheets, Staged Electronic Data Deliverables (SEDD) and Automated Data Review (ADR) electronic deliverables for the nine EPA Region 9 Laboratory's sample delivery groups (SDG) listed below. The SDGs are associated with the sampling period of July 18 to September 13, 2012. Not all of the analytical methods may have been required in each of the laboratory SDGs.

LDC Project #: 28121, 28292, 28362, 28391, 28490, 28517, and 28564		
SDG #		Analytical Methods
12201D	12220A	EPA Method 524.2 (EPA Region 9 SOP 354, revision 9)
12222A	12222C	EPA Method TO-15 (EPA Region 9 SOP 311, revision 1)
12227B	12227D	Method RSK-175 (EPA Region 9 SOP 325, revision 2)
12244B	12251E	EPA Method 300.0 (EPA Region 9 SOP 530, revision 8)
12258A		EPA Method 415.3 (EPA Region 9 SOP 553, revision 1)
		SM 2320B (EPA Region 9 SOP 560, revision 7)
		SM 2540D (EPA Region 9 SOP 462, revision 6)
		SM 4500-S2 (EPA Region 9 SOP 565, revision 5)

The data validation was performed in accordance with the criteria specified in the EPA Region 9 Standard Operating Procedures (SOP), as well as the National Functional Guidelines for Superfund Organics Methods Data Review (2008) and for Inorganic Methods Data Review (2010). Where specific guidance was not available, the data have been evaluated in a conservative manner consistent with industry standards using professional experience.



The following QCSR deliverables and supporting documents are contained in this report:

- Sample ID Cross Reference and Data Review Level
- Primary and Field QC Samples by Method
- Detected Target Analytes
- Overall Qualified Results Summary
- Completeness Reports
- Reasons for Qualified Results
- Data Qualification Summary Reports
- Manual Data Validation Review Worksheets and ADR reports

If you have any questions, please feel free to contact us at (760) 634-0437.

Sincerely,

A handwritten signature in black ink, appearing to read 'Andrew Kong', written over a horizontal line.

Andrew Kong  
Senior Chemist/Project Manager

**Laboratory Data Consultants, Inc.  
Quality Control Summary Report (QCSR)  
Modesto Superfund Site  
Quarterly and Monthly Sampling Events  
Analytical Data for Samples Collected by URS  
During the Period of  
July 18 to September 13, 2012**

**Prepared for:**

**URS Corporation  
Crown Corporate Center  
2870 Gateway Oaks Drive  
Suite 300  
Sacramento, CA 95833**

**Prepared by:**

**Laboratory Data Consultants, Inc. (LDC)  
7750 El Camino Real, Suite 2L  
Carlsbad, CA 92009**

**Reported: October 22, 2012**



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**Andrew Kong, Senior Chemist/Project Manager  
Laboratory Data Consultants, Inc.**

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### APPENDICES

Appendix A	DATA QUALIFICATION SUMMARY REPORTS
Appendix B	MANUAL VALIDATION LEVEL III & IV WORKSHEETS AND ADR REPORTS

## LIST OF ACRONYMS

<b>ADR</b>	<b>Automated Data Review</b>
<b>CA</b>	<b>California</b>
<b>DU</b>	<b>Sample Duplicate</b>
<b>EPA</b>	<b>US Environmental Protection Agency</b>
<b>GW</b>	<b>Groundwater</b>
<b>GW</b>	<b>Groundwater Monitoring Program</b>
<b>LCS</b>	<b>Laboratory Control Sample</b>
<b>LDC</b>	<b>Laboratory Data Consultants, Inc.</b>
<b>MDL</b>	<b>Method Detection Limit</b>
<b>MS</b>	<b>Matrix Spike</b>
<b>MSD</b>	<b>Matrix Spike Duplicate</b>
<b>NFG</b>	<b>National Functional Guidelines</b>
<b>RL</b>	<b>Reporting Limit</b>
<b>ND</b>	<b>Non-detected</b>
<b>PCE</b>	<b>Tetrachloroethene</b>
<b>QCSR</b>	<b>Quality Control Summary Report</b>
<b>RL</b>	<b>Reporting Limit</b>
<b>RPD</b>	<b>Relative Percent Difference</b>
<b>SAP</b>	<b>Sampling and Analysis Plan</b>
<b>SDG</b>	<b>Sample Delivery Group</b>
<b>SEDD</b>	<b>Staged Electronic Data Deliverables</b>
<b>SM</b>	<b>Standard Methods</b>
<b>SOP</b>	<b>Standard Operating Procedure</b>
<b>SVE</b>	<b>Soil Vapor Extraction</b>
<b>URS</b>	<b>URS Corporation</b>
<b>VOCs</b>	<b>Volatile Organic Compounds</b>

## EXECUTIVE SUMMARY

This Quality Control Summary Report (QCSR) has been prepared by Laboratory Data Consultants, Inc. (LDC) for URS Corporation (URS) for the Modesto Superfund Site in Modesto, California (CA). The purpose of this report is to provide the data user with an independent evaluation of the results generated by the laboratory. The data reviewed in this report were analyzed by U.S. Environmental Protection Agency (EPA) Region 9 Laboratory located in Richmond, CA. The Region 9 laboratory is certified in the State of California by the Department of Health Services. URS Corporation located in Sacramento, CA, collected the samples analyzed for this report.

The data validation was performed in accordance with the EPA Region 9 Laboratory's internal control limits specified in the EPA Region 9 Laboratory's Standard Operating Procedures (SOPs), "Sampling and Analysis Plan, Modesto Groundwater Superfund Site, Modesto, California" (SAP), (June 2010, U.S. Army Corps of Engineers, Sacramento District, and URS), as well as the "National Functional Guidelines (NFG) for Superfund Organic Methods Data Review" (USEPA 2008) and the "National Functional Guidelines for Inorganic Data Review" (USEPA 2010).

Sixty one field samples, seven field duplicates, and three field Quality Control (QC) samples were reported in nine EPA Region 9 Laboratory's sample delivery groups (SDGs) for the R12S70 Modesto Groundwater (GW) Treatment System Summer 2012 Monthly Sampling and the R12S64 July-September 2012 Quarterly Groundwater Monitoring and Soil Vapor Extraction (SVE) sampling efforts.

The laboratory provided electronic data in Staged Electronic Data Deliverables (SEDD) files. The SEDD deliverable was processed through the Automated Data Review (ADR) program in order to produce SEDD and ADR deliverable formats, as requested by URS. Any resulting data validation qualifiers from ADR have been appended to the SEDD and ADR files.

Data review was based primarily on the EPA Region 9 Laboratory's internal control limits specified in the EPA Region 9 Laboratory's SOPs and the "Modesto Groundwater Superfund Site SAP" (June 2010) as well as the NFG for Superfund Organics Methods Data Review and for Inorganic Data Review (USEPA 2008, 2010), using biased qualifiers. In the case where no QC acceptance criteria were specified for this analysis, data were evaluated against the appropriate method references and Standard Methods. Where additional guidance was needed, data were evaluated against QC and data validation criteria provided in the NFG for Superfund Organics Methods Data Review and for Inorganic Data Review (USEPA 2008, 2010), using biased qualifiers. Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

For this review, approximately ten percent of project data were subjected to USEPA Level IV equivalent validation with raw data recalculations, and the remaining 90 percent were subjected to USEPA Level III equivalent validation. All sample results from the sampling period were subjected to automated and manual review through an evaluation of QC results, sample holding

times, cooler temperatures, sample preservation, initial and continuing calibration, surrogate recoveries, matrix spikes/matrix spike duplicates, laboratory duplicates, laboratory control samples, method blanks, and reporting limits. Level IV equivalent validation was designated to the following: SDG 12220A (one sample for Volatile Organic Compounds (VOCs) by EPA Method 524.2, Dissolved Gases and Carbon Dioxide by Method RSK-175, Alkalinity by SM 2320B, Anions by EPA Method 300.0, Sulfide by SM 4500-S2, and Total Organic Carbon by EPA Method 415.3), SDG 12222A (four samples for VOCs by EPA Method 524.2), and SDG 12222C (two samples for VOCs by EPA Method TO-15). There were no significant findings in the Level IV equivalent validation. However, some sample data were qualified based upon the review of the instrument calibration data.

The following items were evaluated by automated review:

- Holding Times
- Cooler Temperatures
- Blanks
- Surrogates - (organics)
- Matrix Spike/Matrix Spike Duplicates (MS/MSD) or Sample Duplicates (DUP)
- Laboratory Control Samples (LCS)
- Reporting Limits (RL)
- Field QC Samples

The evaluation of the associated initial and continuing instrument calibrations, internal standards, sample preservation, and Level IV recalculations and data verifications from the raw data packages were performed by manual review.

The ADR was performed using bias indicators and reason codes for data qualification, where applicable. Appendix A contains a summary of data qualifications and the reasons for qualified results. The results of the ADR are included in Appendix B of this report, along with manual validation worksheets.

## Data Qualifier Definitions

Through the data review process, the data were assigned validation qualifiers. The qualifiers assigned by LDC are based on a technical assessment of the data and represent outliers from each of the data review components (blank contamination, holding time, etc.). The following are definitions of the data qualifiers that may appear in this report:

Data Qualifier	Definition
U	Indicates the compound or analyte was analyzed for, but not detected at or above the reported sample quantitation limit. The result is considered non-detected (ND) at the reported value. This qualifier is added before any additional qualifiers for all ND results.
UJ	Indicates the compound or analyte was analyzed for, but not detected. The sample detection limit is an estimated value due to QC failure or data limitations.
J	Indicates the compound or analyte is positively identified, but the reported concentration is an estimate due to QC failure or data limitations.
J+	Indicates the compound or analyte is positively identified, but the reported concentration is an estimate due to QC failure or data limitations. A high quantitative bias exists in the data.
J-	Indicates the compound or analyte is positively identified, but the reported concentration is an estimate due to QC failure or data limitations. A low quantitative bias exists in the data.
R	Quality control indicates the data is not usable. The presence or absence of the compound or analyte cannot be verified or the reported result is compromised as to be unusable.

Data qualified with the “R” qualifier are considered unusable or rejected. Data qualified with the “J” qualifier are considered as estimated. The data user must determine the appropriate use of estimated data.

The data quality assessment is summarized by reporting analytical completeness. The following equations were used to calculate completeness.

$$\% \text{Analytical Completeness} = (\text{Number of unqualified results} / \text{Number of reported results}) \times 100$$

The analytical completeness, which included all QC parameters, attained for the field samples in the sampling effort is presented in Table 5.

$$\% \text{Contract Compliance Completeness} = (\text{Number of contract compliant results} / \text{Number of reported results}) \times 100$$

The contract compliance completeness, which included all QC parameters, attained for the field samples in the sampling effort is presented in Table 6.

$\% \text{Technical Completeness} = (\text{Number of results not rejected} / \text{Number of reported results}) \times 100$

The technical completeness, which included all QC parameters, attained for the field samples in the sampling effort is presented in Table 7.

Based on review of the analytical data and associated QC results, the sample data were assessed to be valid with minor qualifications. A summary of the overall quality of data is as follows:

## **2.0 Quarterly and Monthly Sampling Events**

Based on review of the analytical data and associated QC results, the overall analytical completeness (number of unqualified results divided by the number of reported results) for the sampling effort was 93.6%.

- VOCs by EPA Method 524.2 had analytical completeness of 93.3%,
- VOCs by EPA Method TO-15 had analytical completeness of 96.4%,
- Dissolved Gases and Carbon Dioxide by Method RSK-175 had analytical completeness of 71.2%,
- Anions by EPA Method 300.0 had analytical completeness of 100.0%,
- Total Organic Carbon by EPA Method 415.3 had analytical completeness of 75.0%,
- Alkalinity by SM 2320B had analytical completeness of 100.0%,
- Total Suspended Solids by SM 2450D had analytical completeness of 100.0%,
- Sulfide by SM 4500-S2 had analytical completeness of 58.3%,

If data qualifiers due to trace values were excluded from this calculation, the analytical completeness would be 93.6% for VOCs by EPA Method 524.2, 97.7% for VOCs by EPA Method TO-15, 75.0% for Dissolved Gases and Carbon Dioxide by Method RSK-175, 100.0% for Total Organic Carbon by EPA Method 415.3, and 100.0% for Sulfide by SM 4500-S2.

The overall contract compliance completeness (number of contract compliant results divided by the number of reported results) for the sampling effort was 93.6%.

- VOCs by EPA Method 524.2 had analytical completeness of 93.3%,
- VOCs by EPA Method TO-15 had analytical completeness of 96.4%,
- Dissolved Gases and Carbon Dioxide by Method RSK-175 had analytical completeness of 71.2%,
- Anions by EPA Method 300.0 had analytical completeness of 100.0%,

- Total Organic Carbon by EPA Method 415.3 had analytical completeness of 75.0%,
- Alkalinity by SM 2320B had analytical completeness of 100.0%,
- Total Suspended Solids by SM 2450D had analytical completeness of 100.0%,
- Sulfide by SM 4500-S2 had analytical completeness of 58.3%,

If data qualifiers due to trace values were excluded from this calculation, the analytical completeness would be 93.6% for VOCs by EPA Method 524.2, 97.7% for VOCs by EPA Method TO-15, 75.0% for Dissolved Gases and Carbon Dioxide by Method RSK-175, 100.0% for Total Organic Carbon by EPA Method 415.3, and 100.0% for Sulfide by SM 4500-S2.

The overall technical completeness (number of non-rejected results divided by the number of reported results) for the sampling effort was 100.0%.

- VOCs by EPA Method 524.2 had analytical completeness of 100.0%,
- VOCs by EPA Method TO-15 had analytical completeness of 100.0%,
- Dissolved Gases and Carbon Dioxide by Method RSK-175 had analytical completeness of 100.0%,
- Anions by EPA Method 300.0 had analytical completeness of 100.0%,
- Total Organic Carbon by EPA Method 415.3 had analytical completeness of 100.0%,
- Alkalinity by SM 2320B had analytical completeness of 100.0%,
- Total Suspended Solids by SM 2450D had analytical completeness of 100.0%,
- Sulfide by SM 4500-S2 had analytical completeness of 100.0%,

The analytical, contract compliance and technical completeness reports are in Tables 5, 6, and 7, respectively.

Appendix A presents a detailed description of the qualified sample results by analytical method.

The overall quality of data by analytical method is summarized below:

**Volatile Organic Compounds by EPA 524.2 (EPA Region 9 SOP 354, revision 9)**

The analytical completeness for VOCs by EPA 524.2 was 93.3%.

Nine of the 3024 sample results were qualified as estimated due to trace values reported between the method detection limit (MDL) and the RL. One hundred and forty-four results were qualified

as estimated due to initial calibration non-conformances, forty six results were qualified as estimated due to initial calibration verification non-conformances, and twenty four results were qualified as estimated due to continuing calibration non-conformances. One acetone result was qualified as non-detected (U) due to contamination in trip blank MW-302-3Q12. Table 8 lists specific samples and reasons for all qualified results with the exception of results that are not assessed by ADR (internal standards, professional judgment, etc.).

MS/MSD analyses were performed on samples MW-25B-3Q12 (SDG 12220A), MW-9B-3Q12 (SDG 12222A), MW-21A-3Q12 (SDG 12227B), and MW-305-3Q12 (SDG 12258A). All acceptance criteria were met.

Two trip blank samples and one field blank sample was collected and analyzed for VOCs. No contaminants were detected in the trip blanks or field blanks with the exceptions noted above.

Sample MW-86A-3Q12 was identified as a field duplicate of sample MW-14A-3Q12 (SDG 12222A), sample MW-77A-3Q12 was identified as a field duplicate of sample MW-23A-3Q12 (SDG 12227B), sample MW-90B-3Q12 was identified as a field duplicate of sample MW-10B-3Q12 (SDG 12227B), and sample MW-97A-3Q12 was identified as a field duplicate of sample MW-3A-3Q12 (SDG 12227B). No data were qualified based upon the field duplicate result. The RPDs between the results were within the criteria in Table 2-10 of the SAP.

#### **Volatile Organic Compounds by EPA TO-15 (EPA Region 9 SOP 311, revision 2)**

The analytical completeness for VOCs by EPA TO-15 was 96.4%.

Ten of the 783 sample results were qualified as estimated due to trace values reported between the MDL and the RL. Four results were qualified as estimated due to initial calibration non-conformances, two results were qualified as estimated due to initial calibration verification non-conformances, and two results were qualified as estimated due to continuing calibration non-conformances. Ten results were qualified as estimated due to laboratory control sample (LCS) recoveries outside the control limit. Table 8 lists specific samples and reasons for all qualified results with the exception of results that are not assessed by ADR (internal standards, professional judgment, etc.).

DUP analyses were performed on samples SVE Pre GAC-0703 (SDG 12201D), SVE Pre GAC-0802 (SDG 12222C), SVE-2-3Q12 (SDG 12227D), SVE-97-3Q12 (SDG 12227D), DP-6A-3Q12 (SDG 12244B), and SVE PreGAC-0901 (SDG 12251E). All acceptance criteria were met.

Sample DP-94A-3Q12 was identified as a field duplicate of sample DP-6A-3Q12 (SDG 12227D) and sample SVE-97-3Q12 was identified as a field duplicate of sample SVE-3-3Q12 (SDG 12227D). No data were qualified based upon the field duplicate result. The RPDs between the results were within the criteria in Table 2-10 of the SAP.

**Dissolved Gases and Carbon Dioxide by Method RSK-175 (EPA Region 9 SOP 325, revision 2)**

The analytical completeness for Dissolved Gases and Carbon Dioxide by Method RSK-175 was 71.2%.

Two of the 52 sample results were qualified as estimated due to trace values reported between the MDL and the RL. Thirteen results were qualified as estimated due to initial calibration verification non-conformances. Table 8 lists specific samples and reasons for all qualified results with the exception of results that are not assessed by ADR (internal standards, professional judgment, etc.).

MS/MSD analyses were performed on samples MW-25B-3Q12 (SDG 12220A), MW-28B-3Q12 (SDG 12220A), MW-20A-3Q12 (SDG 12222A), and MW-95A-3Q12 (SDG 12222A). All acceptance criteria were met.

One trip blank sample was collected and analyzed for dissolved gases and carbon dioxide. No data was qualified due to contaminants detected in the trip blank.

Sample MW-95A-3Q12 was identified as a field duplicate of sample MW-5A-3Q12 (SDG 12222A). No data were qualified based upon the field duplicate result. The RPDs between the results were within the criteria in Table 2-10 of the SAP.

**Anions by EPA Method 300.0 (EPA Region 9 SOP 530, revision 8)**

The analytical completeness for Anions by EPA Method 300.0 was 100.0%.

MS/MSD analyses were performed on samples MW-25B-3Q12 (SDG 12220A) and MW-20B-3Q12 (SDG 12222A). All acceptance criteria were met.

Sample MW-95A-3Q12 was identified as a field duplicate of sample MW-5A-3Q12 (SDG 12222A). No data were qualified based upon the field duplicate result. The RPDs between the results were within the criteria in Table 2-10 of the SAP.

**Total Organic Carbon by EPA Method 415.3 (EPA Region 9 SOP 553, revision 1)**

The analytical completeness for Total Organic Carbon by EPA Method 415.3 was 75.0%.

Three of the 12 sample results were qualified as estimated due to trace values reported between the MDL and the RL. Table 8 lists specific samples and reasons for all qualified results with the exception of results that are not assessed by ADR (internal standards, professional judgment, etc.).

MS/MSD analyses were performed on samples MW-25B-3Q12 (SDG 12220A) and MW-20B-3Q12 (SDG 12222A). All acceptance criteria were met.

Sample MW-95A-3Q12 was identified as a field duplicate of sample MW-5A-3Q12 (SDG 12222A). No data were qualified based upon the field duplicate result. The RPDs between the results were within the criteria in Table 2-10 of the SAP.

**Alkalinity by SM 2320B (EPA Region 9 SOP 560, revision 7)**

The analytical completeness for Alkalinity by SM 2320B was 100.0%.

DUP analyses were performed on samples MW-25B-3Q12 (SDG 12220A) and MW-5A-3Q12 (SDG 12222A). All acceptance criteria were met.

Sample MW-95A-3Q12 was identified as a field duplicate of sample MW-5A-3Q12 (SDG 12222A). No data were qualified based upon the field duplicate result. The RPDs between the results were within the criteria in Table 2-10 of the SAP.

**Total Suspended Solids by SM 2540D (EPA Region 9 SOP 462, revision 7)**

The analytical completeness for Total Suspended Solids by SM 2540D was 100.0%.

DUP analyses were performed on sample EW02-20 (SDG 12258A). All acceptance criteria were met.

Field duplicates were not collected during this sampling event.

**Sulfide by SM 4500-S2 (EPA Region 9 SOP 565, revision 5)**

The analytical completeness for Sulfide by SM 4500-S2 was 58.3%.

Five of the 12 sample results were qualified as estimated due to trace values reported between the MDL and the RL. Table 8 lists specific samples and reasons for all qualified results with the exception of results that are not assessed by ADR (internal standards, professional judgment, etc.).

Sample MW-95A-3Q12 was identified as a field duplicate of sample MW-5A-3Q12 (SDG 12222A). No data were qualified based upon the field duplicate result. The RPDs between the results were within the criteria in Table 2-10 of the SAP.

## **Table 1**

### **Sample ID Cross Reference**

### Table 1: Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
18-Jul-2012	SVE Stack-0703	1207025-02	N	None	TO-15	III
18-Jul-2012	SVE Pre GAC-0703	1207025-01	N	None	TO-15	III
18-Jul-2012	SVE Pre GAC-0703DUP	B2G0043-DUP1	DUP	None	TO-15	III
06-Aug-2012	MW-1A-3Q12	1208017-11	N	5030B	524.2	III
06-Aug-2012	MW-28B-3Q12	1208014-02	N	5030B	524.2	IV
06-Aug-2012	MW-28B-3Q12	1208014-02	N	Gen Prep	300.0	IV
06-Aug-2012	MW-28B-3Q12	1208014-02	N	Gen Prep	415.3	IV
06-Aug-2012	MW-28B-3Q12	1208014-02	N	None	2320B	IV
06-Aug-2012	MW-28B-3Q12	1208014-02	N	None	4500-S2	IV
06-Aug-2012	MW-28B-3Q12	1208014-02	N	None	RSK-175	III
06-Aug-2012	MW-28B-3Q12MS	B2H0058-MS1	MS	None	RSK-175	III
06-Aug-2012	MW-28B-3Q12MSD	B2H0058-MSD1	MSD	None	RSK-175	III
06-Aug-2012	MW-86A-3Q12	1208021-13	FD	5030B	524.2	III
06-Aug-2012	MW-7A-3Q12	1208021-12	N	5030B	524.2	IV
06-Aug-2012	MW-25B-3Q12	1208014-01	N	5030B	524.2	III
06-Aug-2012	MW-25B-3Q12	1208014-01	N	Gen Prep	300.0	III
06-Aug-2012	MW-25B-3Q12	1208014-01	N	Gen Prep	415.3	III
06-Aug-2012	MW-25B-3Q12	1208014-01	N	None	2320B	III
06-Aug-2012	MW-25B-3Q12	1208014-01	N	None	4500-S2	III
06-Aug-2012	MW-25B-3Q12	1208014-01	N	None	RSK-175	III
06-Aug-2012	MW-25B-3Q12MS	B2H0023-MS1	MS	Gen Prep	300.0	III
06-Aug-2012	MW-25B-3Q12MSD	B2H0023-MSD1	MSD	Gen Prep	300.0	III
06-Aug-2012	MW-25B-3Q12MS	B2H0026-MS1	MS	5030B	524.2	III
06-Aug-2012	MW-25B-3Q12MSD	B2H0026-MSD1	MSD	5030B	524.2	III
06-Aug-2012	MW-25B-3Q12MS	B2H0032-MS1	MS	None	RSK-175	III
06-Aug-2012	MW-25B-3Q12MSD	B2H0032-MSD1	MSD	None	RSK-175	III

III = EPA Level 3 Data Review  
IV = EPA Level 4 Data Validation

N = Normal Sample  
FD = Field Duplicate

TB = Trip Blank  
FB = Field Blank

MS = Matrix Spike  
MSD = Matrix Spike Duplicate

**Table 1: Sample Cross Reference**

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
06-Aug-2012	MW-25B-3Q12MS	B2H0090-MS2	MS	Gen Prep	415.3	III
06-Aug-2012	MW-25B-3Q12MSD	B2H0090-MSD2	MSD	Gen Prep	415.3	III
06-Aug-2012	MW-25B-3Q12DUP	B2H0093-DUP1	DUP	None	2320B	III
06-Aug-2012	MW-2A-3Q12	1208017-03	N	5030B	524.2	III
06-Aug-2012	MW-11A-3Q12	1208021-15	N	5030B	524.2	III
06-Aug-2012	MW-13A-3Q12	1208021-17	N	5030B	524.2	III
06-Aug-2012	MW-9B-3Q12	1208021-04	N	5030B	524.2	IV
06-Aug-2012	MW-9B-3Q12MS	B2H0031-MS1	MS	5030B	524.2	III
06-Aug-2012	MW-9B-3Q12MSD	B2H0031-MSD1	MSD	5030B	524.2	III
06-Aug-2012	MW-19A-3Q12	1208017-09	N	5030B	524.2	III
06-Aug-2012	MW-14A-3Q12	1208021-18	N	5030B	524.2	III
06-Aug-2012	MW-19B-3Q12	1208017-10	N	5030B	524.2	III
07-Aug-2012	MW-24B-3Q12	1208017-12	N	5030B	524.2	III
07-Aug-2012	MW-24B-3Q12	1208017-12	N	Gen Prep	300.0	III
07-Aug-2012	MW-24B-3Q12	1208017-12	N	Gen Prep	415.3	III
07-Aug-2012	MW-24B-3Q12	1208017-12	N	None	2320B	III
07-Aug-2012	MW-24B-3Q12	1208017-12	N	None	4500-S2	III
07-Aug-2012	MW-24B-3Q12	1208017-12	N	None	RSK-175	IV
07-Aug-2012	MW-12A-3Q12	1208021-16	N	5030B	524.2	III
07-Aug-2012	MW-302-3Q12	1208017-05	TB	5030B	524.2	III
07-Aug-2012	MW-302-3Q12	1208017-05	TB	None	RSK-175	III
07-Aug-2012	MW-10A-3Q12	1208021-14	N	5030B	524.2	III
07-Aug-2012	MW-4A-3Q12	1208017-04	N	5030B	524.2	III
07-Aug-2012	MW-4A-3Q12	1208017-04	N	Gen Prep	300.0	III
07-Aug-2012	MW-4A-3Q12	1208017-04	N	Gen Prep	415.3	III
07-Aug-2012	MW-4A-3Q12	1208017-04	N	None	2320B	III

**Table 1: Sample Cross Reference**

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
07-Aug-2012	MW-4A-3Q12	1208017-04	N	None	4500-S2	III
07-Aug-2012	MW-4A-3Q12	1208017-04	N	None	RSK-175	III
07-Aug-2012	MW-4B-3Q12	1208017-01	N	5030B	524.2	III
07-Aug-2012	MW-4B-3Q12	1208017-01	N	Gen Prep	300.0	III
07-Aug-2012	MW-4B-3Q12	1208017-01	N	Gen Prep	415.3	III
07-Aug-2012	MW-4B-3Q12	1208017-01	N	None	2320B	III
07-Aug-2012	MW-4B-3Q12	1208017-01	N	None	4500-S2	III
07-Aug-2012	MW-4B-3Q12	1208017-01	N	None	RSK-175	III
07-Aug-2012	MW-4C-3Q12	1208017-02	N	5030B	524.2	III
07-Aug-2012	MW-8A-3Q12	1208017-07	N	5030B	524.2	III
07-Aug-2012	MW-8A-3Q12	1208017-07	N	Gen Prep	300.0	III
07-Aug-2012	MW-8A-3Q12	1208017-07	N	Gen Prep	415.3	III
07-Aug-2012	MW-8A-3Q12	1208017-07	N	None	2320B	III
07-Aug-2012	MW-8A-3Q12	1208017-07	N	None	4500-S2	III
07-Aug-2012	MW-8A-3Q12	1208017-07	N	None	RSK-175	III
07-Aug-2012	MW-17B-3Q12	1208017-08	N	5030B	524.2	III
07-Aug-2012	MW-17B-3Q12	1208017-08	N	Gen Prep	300.0	III
07-Aug-2012	MW-17B-3Q12	1208017-08	N	Gen Prep	415.3	III
07-Aug-2012	MW-17B-3Q12	1208017-08	N	None	2320B	III
07-Aug-2012	MW-17B-3Q12	1208017-08	N	None	4500-S2	III
07-Aug-2012	MW-17B-3Q12	1208017-08	N	None	RSK-175	III
07-Aug-2012	MW-15A-3Q12	1208017-13	N	Gen Prep	300.0	III
07-Aug-2012	MW-15A-3Q12	1208017-13	N	None	2320B	III
07-Aug-2012	MW-15A-3Q12	1208021-09	N	5030B	524.2	III
07-Aug-2012	MW-15A-3Q12	1208021-09	N	Gen Prep	415.3	III
07-Aug-2012	MW-15A-3Q12	1208021-09	N	None	4500-S2	III

**Table 1: Sample Cross Reference**

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
07-Aug-2012	MW-15A-3Q12	1208021-09	N	None	RSK-175	III
07-Aug-2012	MW-402-3Q12	1208017-06	FB	5030B	524.2	III
07-Aug-2012	MW-6A-3Q12	1208021-11	N	5030B	524.2	III
07-Aug-2012	MW-17C-3Q12	1208021-06	N	5030B	524.2	III
07-Aug-2012	MW-17A-3Q12	1208021-10	N	5030B	524.2	III
07-Aug-2012	MW-26B-3Q12	1208021-08	N	5030B	524.2	IV
08-Aug-2012	MW-95A-3Q12	1208021-03	FD	Gen Prep	300.0	III
08-Aug-2012	MW-95A-3Q12	1208021-03	FD	Gen Prep	415.3	III
08-Aug-2012	MW-95A-3Q12	1208021-03	FD	None	2320B	III
08-Aug-2012	MW-95A-3Q12	1208021-03	FD	None	4500-S2	III
08-Aug-2012	MW-95A-3Q12	1208021-03	FD	None	RSK-175	III
08-Aug-2012	MW-5A-3Q12	1208021-05	N	5030B	524.2	III
08-Aug-2012	MW-5A-3Q12	1208021-05	N	Gen Prep	300.0	III
08-Aug-2012	MW-5A-3Q12	1208021-05	N	Gen Prep	415.3	III
08-Aug-2012	MW-5A-3Q12	1208021-05	N	None	2320B	III
08-Aug-2012	MW-5A-3Q12	1208021-05	N	None	4500-S2	III
08-Aug-2012	MW-5A-3Q12	1208021-05	N	None	RSK-175	III
08-Aug-2012	MW-95A-3Q12MS	B2H0062-MS1	MS	None	RSK-175	III
08-Aug-2012	MW-95A-3Q12MSD	B2H0062-MSD1	MSD	None	RSK-175	III
08-Aug-2012	MW-5A-3Q12DUP	B2H0100-DUP1	DUP	None	2320B	III
08-Aug-2012	MW-20C-3Q12	1208021-07	N	5030B	524.2	IV
08-Aug-2012	MW-20A-3Q12	1208021-01	N	5030B	524.2	III
08-Aug-2012	MW-20A-3Q12	1208021-01	N	Gen Prep	300.0	III
08-Aug-2012	MW-20A-3Q12	1208021-01	N	Gen Prep	415.3	III
08-Aug-2012	MW-20A-3Q12	1208021-01	N	None	2320B	III
08-Aug-2012	MW-20A-3Q12	1208021-01	N	None	4500-S2	III

### Table 1: Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
08-Aug-2012	MW-20A-3Q12	1208021-01	N	None	RSK-175	III
08-Aug-2012	MW-20A-3Q12MS	B2H0042-MS1	MS	None	RSK-175	III
08-Aug-2012	MW-20A-3Q12MSD	B2H0042-MSD1	MSD	None	RSK-175	III
08-Aug-2012	MW-20B-3Q12	1208021-02	N	5030B	524.2	III
08-Aug-2012	MW-20B-3Q12	1208021-02	N	Gen Prep	300.0	III
08-Aug-2012	MW-20B-3Q12	1208021-02	N	Gen Prep	415.3	III
08-Aug-2012	MW-20B-3Q12	1208021-02	N	None	2320B	III
08-Aug-2012	MW-20B-3Q12	1208021-02	N	None	4500-S2	III
08-Aug-2012	MW-20B-3Q12	1208021-02	N	None	RSK-175	III
08-Aug-2012	MW-20B-3Q12MS	B2H0034-MS1	MS	Gen Prep	300.0	III
08-Aug-2012	MW-20B-3Q12MSD	B2H0034-MSD1	MSD	Gen Prep	300.0	III
08-Aug-2012	MW-20B-3Q12MS	B2H0136-MS1	MS	Gen Prep	415.3	III
08-Aug-2012	MW-20B-3Q12MSD	B2H0136-MSD1	MSD	Gen Prep	415.3	III
08-Aug-2012	DP-5A-3Q12	1208039-03	N	None	TO-15	III
08-Aug-2012	SVE Stack-0802	1208025-02	N	None	TO-15	IV
08-Aug-2012	DP-5B-3Q12	1208039-04	N	None	TO-15	III
08-Aug-2012	SVE Pre GAC-0802	1208025-01	N	None	TO-15	IV
08-Aug-2012	SVE Pre GAC-0802DUP	B2H0074-DUP1	DUP	None	TO-15	III
08-Aug-2012	SVE-1-3Q12	1208039-10	N	None	TO-15	III
08-Aug-2012	MW-90B-3Q12	1208036-12	FD	5030B	524.2	III
08-Aug-2012	DP-94A-3Q12	1208039-07	FD	None	TO-15	III
08-Aug-2012	SVE-97-3Q12	1208039-14	FD	None	TO-15	III
08-Aug-2012	SVE-97-3Q12DUP	B2H0089-DUP1	DUP	None	TO-15	III
08-Aug-2012	DP-1A-3Q12	1208039-01	N	None	TO-15	III
08-Aug-2012	MW-18A-3Q12	1208036-15	N	5030B	524.2	III
08-Aug-2012	DP-1B-3Q12	1208039-02	N	None	TO-15	III

**Table 1: Sample Cross Reference**

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
08-Aug-2012	SVE-2-3Q12	1208039-11	N	None	TO-15	III
08-Aug-2012	SVE-2-3Q12DUP	B2H0154-DUP2	DUP	None	TO-15	III
08-Aug-2012	SVE-4-3Q12	1208039-13	N	None	TO-15	III
08-Aug-2012	SVE-3-3Q12	1208039-12	N	None	TO-15	III
08-Aug-2012	MW-10C-3Q12	1208036-11	N	5030B	524.2	III
08-Aug-2012	DP-6A-3Q12	1208039-05	N	None	TO-15	III
08-Aug-2012	DP-6B-3Q12	1208039-06	N	None	TO-15	III
08-Aug-2012	MW-10B-3Q12	1208036-10	N	5030B	524.2	III
08-Aug-2012	OSVE-11-3Q12	1208039-09	N	None	TO-15	III
08-Aug-2012	OSVE-10-3Q12	1208039-08	N	None	TO-15	III
08-Aug-2012	MW-29B-3Q12	1208036-14	N	5030B	524.2	III
09-Aug-2012	MW-27B-3Q12	1208036-13	N	5030B	524.2	III
09-Aug-2012	MW-16A-3Q12	1208036-04	N	5030B	524.2	III
09-Aug-2012	MW-16C-3Q12	1208036-06	N	5030B	524.2	III
09-Aug-2012	MW-16B-3Q12	1208036-05	N	5030B	524.2	III
09-Aug-2012	MW-23A-3Q12	1208036-03	N	5030B	524.2	III
09-Aug-2012	MW-77A-3Q12	1208036-09	FD	5030B	524.2	III
10-Aug-2012	MW-21A-3Q12	1208036-01	N	5030B	524.2	III
10-Aug-2012	MW-21A-3Q12MS	B2H0060-MS1	MS	5030B	524.2	III
10-Aug-2012	MW-21A-3Q12MSD	B2H0060-MSD1	MSD	5030B	524.2	III
10-Aug-2012	MW-22A-3Q12	1208036-02	N	5030B	524.2	III
10-Aug-2012	MW-97A-3Q12	1208036-07	FD	5030B	524.2	III
10-Aug-2012	MW-3A-3Q12	1208036-08	N	5030B	524.2	III
30-Aug-2012	DP-6A-3Q12	1208086-01	N	None	TO-15	III
30-Aug-2012	DP-6A-3Q12DUP	B2I0017-DUP1	DUP	None	TO-15	III
06-Sep-2012	SVE Stack-0901	1209012-02	N	None	TO-15	III

**Table 1: Sample Cross Reference**

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
06-Sep-2012	SVE PreGAC-0901	1209012-01	N	None	TO-15	III
06-Sep-2012	SVE PreGAC-0901DUP	B2I0053-DUP2	DUP	None	TO-15	III
13-Sep-2012	MW-305-3Q12	1209024-03	TB	5030B	524.2	III
13-Sep-2012	MW-305-3Q12MS	B2I0056-MS1	MS	5030B	524.2	III
13-Sep-2012	MW-305-3Q12MSD	B2I0056-MSD1	MSD	5030B	524.2	III
13-Sep-2012	EW02-20	1209024-01	N	None	2540D	III
13-Sep-2012	EW02-20DUP	B2I0063-DUP1	DUP	None	2540D	III
13-Sep-2012	EW02-40	1209024-02	N	5030B	524.2	III
13-Sep-2012	EW02-40	1209024-02	N	None	2540D	III

**Table 2**

**Primary and Field QC Samples by Method**

**Table 2: Primary and Field QC Samples by Method**

<b>Analytical Method</b>	<b>Matrix</b>	<b>Primary Samples</b>	<b>Field Duplicates</b>	<b>Trip Blanks</b>	<b>Equipment Blanks</b>	<b>Field Blanks</b>
2320B	Water	11	1	None	None	None
2540D	Water	2	None	None	None	None
300.0	Water	11	1	None	None	None
415.3	Water	11	1	None	None	None
4500-S2	Water	11	1	None	None	None
524.2	Water	41	4	2	None	1
RSK-175	Water	11	1	1	None	None
TO-15	Air	19	2	None	None	None

**Table 3**

**Detected Target Analytes**

**Table 3: Detected Target Analytes**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Units
<b>SDG: 12201D</b>								
TO-15	SVE Pre GAC-0703	Air	N	CHLOROFORM	2.7	9.6J-		ppbv
				CIS-1,2-DICHLOROETHENE	2.7	2.7		ppbv
				TETRACHLOROETHENE	27	190		ppbv
				TRICHLOROETHENE	2.7	2.1J		ppbv
TO-15	SVE Stack-0703	Air	N	CHLOROFORM	2.1	4.5J-		ppbv
				TETRACHLOROETHENE	2.1	2.6		ppbv

\*Note: This report excludes laboratory detects that were qualified as ND due to Blank Contamination

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 3: Detected Target Analytes**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Units
<b>SDG: 12220A</b>								
2320B	MW-15A-3Q12	Water	N	Bicarbonate Alkalinity	10	430		mg/L
				Total Alkalinity	10	430		mg/L
2320B	MW-17B-3Q12	Water	N	Bicarbonate Alkalinity	10	290		mg/L
				Total Alkalinity	10	290		mg/L
2320B	MW-24B-3Q12	Water	N	Bicarbonate Alkalinity	10	190		mg/L
				Total Alkalinity	10	190		mg/L
2320B	MW-25B-3Q12	Water	N	Bicarbonate Alkalinity	10	180		mg/L
				Total Alkalinity	10	180		mg/L
2320B	MW-28B-3Q12	Water	N	Bicarbonate Alkalinity	10	220		mg/L
				Total Alkalinity	10	220		mg/L
2320B	MW-4A-3Q12	Water	N	Bicarbonate Alkalinity	10	420		mg/L
				Total Alkalinity	10	420		mg/L
2320B	MW-4B-3Q12	Water	N	Bicarbonate Alkalinity	10	150		mg/L
				Total Alkalinity	10	150		mg/L
2320B	MW-8A-3Q12	Water	N	Bicarbonate Alkalinity	10	440		mg/L
				Total Alkalinity	10	440		mg/L
300.0	MW-15A-3Q12	Water	N	CHLORIDE	5.0	64		mg/L
				NITRATE AS N	0.10	18		mg/L
				SULFATE AS SO4	2.5	52		mg/L
300.0	MW-17B-3Q12	Water	N	CHLORIDE	5.0	73		mg/L
				NITRATE AS N	0.10	6.5		mg/L
				SULFATE AS SO4	0.50	27		mg/L
300.0	MW-24B-3Q12	Water	N	CHLORIDE	1.0	27		mg/L
				NITRATE AS N	0.10	5.2		mg/L
				SULFATE AS SO4	0.50	12		mg/L
300.0	MW-25B-3Q12	Water	N	CHLORIDE	1.0	25		mg/L
				NITRATE AS N	0.10	4.2		mg/L
				SULFATE AS SO4	0.50	12		mg/L

\*Note: This report excludes laboratory detects that were qualified as ND due to Blank Contamination

N = Normal Sample    TB = Trip Blank  
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**Table 3: Detected Target Analytes**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Units
<b>SDG: 12220A</b>								
300.0	MW-28B-3Q12	Water	N	CHLORIDE	1.0	38		mg/L
				NITRATE AS N	0.10	4.9		mg/L
				SULFATE AS SO4	0.50	15		mg/L
300.0	MW-4A-3Q12	Water	N	CHLORIDE	5.0	99		mg/L
				NITRATE AS N	0.10	22		mg/L
				SULFATE AS SO4	2.5	63		mg/L
300.0	MW-4B-3Q12	Water	N	CHLORIDE	1.0	18		mg/L
				NITRATE AS N	0.10	4.5		mg/L
				SULFATE AS SO4	0.50	7.8		mg/L
300.0	MW-8A-3Q12	Water	N	CHLORIDE	1.0	38		mg/L
				NITRATE AS N	0.10	1.3		mg/L
				SULFATE AS SO4	0.50	31		mg/L
415.3	MW-17B-3Q12	Water	N	Total Organic Carbon	0.50	0.54		mg/L
415.3	MW-24B-3Q12	Water	N	Total Organic Carbon	0.50	0.62		mg/L
415.3	MW-25B-3Q12	Water	N	Total Organic Carbon	0.50	0.26J		mg/L
415.3	MW-28B-3Q12	Water	N	Total Organic Carbon	0.50	1.0		mg/L
415.3	MW-4A-3Q12	Water	N	Total Organic Carbon	0.50	0.94		mg/L
415.3	MW-8A-3Q12	Water	N	Total Organic Carbon	0.50	0.47J		mg/L
4500-S2	MW-17B-3Q12	Water	N	SULFIDE	1.0	1.1		mg/L
4500-S2	MW-24B-3Q12	Water	N	SULFIDE	1.0	0.59J		mg/L
4500-S2	MW-28B-3Q12	Water	N	SULFIDE	1.0	2.2		mg/L
4500-S2	MW-4A-3Q12	Water	N	SULFIDE	1.0	0.67J		mg/L
4500-S2	MW-4B-3Q12	Water	N	SULFIDE	1.0	0.90J		mg/L
4500-S2	MW-8A-3Q12	Water	N	SULFIDE	1.0	0.92J		mg/L

\*Note: This report excludes laboratory detects that were qualified as ND due to Blank Contamination

N = Normal Sample    TB = Trip Blank  
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**Table 3: Detected Target Analytes**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Units
<b>SDG: 12220A</b>								
524.2	MW-17B-3Q12	Water	N	CHLOROFORM	0.5	0.3J		ug/L
				TETRACHLOROETHENE	2.5	45		ug/L
524.2	MW-19A-3Q12	Water	N	CHLOROFORM	0.5	1.3		ug/L
524.2	MW-1A-3Q12	Water	N	TETRACHLOROETHENE	0.5	1.3		ug/L
524.2	MW-24B-3Q12	Water	N	TETRACHLOROETHENE	2.5	64		ug/L
524.2	MW-25B-3Q12	Water	N	TETRACHLOROETHENE	5.0	79		ug/L
524.2	MW-28B-3Q12	Water	N	TETRACHLOROETHENE	2.5	38		ug/L
524.2	MW-2A-3Q12	Water	N	CHLOROFORM	0.5	2.6		ug/L
				TETRACHLOROETHENE	0.5	4.1		ug/L
524.2	MW-302-3Q12	Water	TB	ACETONE	4.0	2.2J		ug/L
524.2	MW-4A-3Q12	Water	N	1,1,1,2-TETRACHLOROETHANE	0.5	0.7		ug/L
				CHLOROFORM	0.5	2.3		ug/L
				CIS-1,2-DICHLOROETHENE	0.5	1.1		ug/L
				TETRACHLOROETHENE	50	1200		ug/L
				TRICHLOROETHENE	0.5	1.2		ug/L
524.2	MW-4B-3Q12	Water	N	TETRACHLOROETHENE	0.5	22		ug/L
524.2	MW-4C-3Q12	Water	N	TETRACHLOROETHENE	0.5	1.0		ug/L
524.2	MW-8A-3Q12	Water	N	BROMODICHLOROMETHANE	0.5	0.6		ug/L
				CHLOROFORM	0.5	12		ug/L
				TETRACHLOROETHENE	0.5	9.2		ug/L
RSK-175	MW-17B-3Q12	Water	N	Carbon Dioxide	3000	20000		ug/L
RSK-175	MW-24B-3Q12	Water	N	Carbon Dioxide	3000	7800		ug/L
				METHANE	1.2	16		ug/L
RSK-175	MW-25B-3Q12	Water	N	Carbon Dioxide	3000	6700		ug/L
				METHANE	1.2	1.1J		ug/L
RSK-175	MW-28B-3Q12	Water	N	Carbon Dioxide	3000	11000		ug/L

\*Note: This report excludes laboratory detects that were qualified as ND due to Blank Contamination

N = Normal Sample      TB = Trip Blank  
 FD = Field Duplicate      FB = Field Blank

**Table 3: Detected Target Analytes**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Units
<b>SDG: 12220A</b>								
RSK-175	MW-302-3Q12	Water	TB	METHANE	1.2	1.2		ug/L
RSK-175	MW-4A-3Q12	Water	N	Carbon Dioxide	3000	44000		ug/L
				METHANE	1.2	0.7J		ug/L
RSK-175	MW-4B-3Q12	Water	N	Carbon Dioxide	3000	6500		ug/L
RSK-175	MW-8A-3Q12	Water	N	Carbon Dioxide	3000	50000		ug/L

\*Note: This report excludes laboratory detects that were qualified as ND due to Blank Contamination

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 3: Detected Target Analytes**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Units
<b>SDG: 12222A</b>								
2320B	MW-20A-3Q12	Water	N	Bicarbonate Alkalinity	10	440		mg/L
				Total Alkalinity	10	440		mg/L
2320B	MW-20B-3Q12	Water	N	Bicarbonate Alkalinity	10	180		mg/L
				Total Alkalinity	10	180		mg/L
2320B	MW-5A-3Q12	Water	N	Bicarbonate Alkalinity	10	460		mg/L
				Total Alkalinity	10	460		mg/L
2320B	MW-95A-3Q12	Water	FD	Bicarbonate Alkalinity	10	450		mg/L
				Total Alkalinity	10	450		mg/L
300.0	MW-20A-3Q12	Water	N	CHLORIDE	2.0	68		mg/L
				NITRATE AS N	0.10	11		mg/L
				SULFATE AS SO4	1.0	57		mg/L
300.0	MW-20B-3Q12	Water	N	CHLORIDE	1.0	22		mg/L
				NITRATE AS N	0.10	5.1		mg/L
				SULFATE AS SO4	0.50	12		mg/L
300.0	MW-5A-3Q12	Water	N	CHLORIDE	2.0	80		mg/L
				NITRATE AS N	0.10	8.1		mg/L
				SULFATE AS SO4	1.0	53		mg/L
300.0	MW-95A-3Q12	Water	FD	CHLORIDE	2.0	79		mg/L
				NITRATE AS N	0.10	8.2		mg/L
				SULFATE AS SO4	1.0	52		mg/L
415.3	MW-15A-3Q12	Water	N	Total Organic Carbon	0.50	0.57		mg/L
415.3	MW-20A-3Q12	Water	N	Total Organic Carbon	0.50	0.75		mg/L
415.3	MW-20B-3Q12	Water	N	Total Organic Carbon	0.50	0.45J		mg/L
415.3	MW-5A-3Q12	Water	N	Total Organic Carbon	0.50	0.60		mg/L
415.3	MW-95A-3Q12	Water	FD	Total Organic Carbon	0.50	0.62		mg/L
4500-S2	MW-20A-3Q12	Water	N	SULFIDE	1.0	0.67J		mg/L

\*Note: This report excludes laboratory detects that were qualified as ND due to Blank Contamination

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 3: Detected Target Analytes**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Units
<b>SDG: 12222A</b>								
524.2	MW-10A-3Q12	Water	N	CHLOROFORM	0.5	5.2		ug/L
				TETRACHLOROETHENE	2.5	46		ug/L
524.2	MW-11A-3Q12	Water	N	CHLOROFORM	0.5	5.9		ug/L
				TETRACHLOROETHENE	0.5	1.0		ug/L
524.2	MW-12A-3Q12	Water	N	BROMODICHLOROMETHANE	0.5	0.4J		ug/L
				CHLOROFORM	0.5	9.1		ug/L
				TETRACHLOROETHENE	0.5	20		ug/L
				TRICHLOROFLUOROMETHANE	0.5	0.5		ug/L
524.2	MW-13A-3Q12	Water	N	BROMODICHLOROMETHANE	0.5	0.3J		ug/L
				CHLOROFORM	0.5	7.9		ug/L
				TETRACHLOROETHENE	0.5	2.1		ug/L
524.2	MW-14A-3Q12	Water	N	CHLOROFORM	0.5	2.9		ug/L
				TETRACHLOROETHENE	0.5	2.5		ug/L
524.2	MW-15A-3Q12	Water	N	1,2-DICHLOROETHANE	0.5	0.7		ug/L
				CHLOROFORM	0.5	1.4		ug/L
524.2	MW-17A-3Q12	Water	N	BROMODICHLOROMETHANE	0.5	0.3J		ug/L
				CHLOROFORM	0.5	5.9		ug/L
				TETRACHLOROETHENE	0.5	0.5		ug/L
524.2	MW-20A-3Q12	Water	N	BROMODICHLOROMETHANE	0.5	0.3J		ug/L
				CHLOROFORM	0.5	7.3		ug/L
				DICHLORODIFLUOROMETHANE	0.5	4.5J		ug/L
				TETRACHLOROETHENE	10	190		ug/L
524.2	MW-20B-3Q12	Water	N	TETRACHLOROETHENE	5.0	65		ug/L
524.2	MW-26B-3Q12	Water	N	TETRACHLOROETHENE	0.5	0.3J		ug/L
524.2	MW-5A-3Q12	Water	N	CHLOROFORM	0.5	3.0		ug/L
				TETRACHLOROETHENE	2.5	51		ug/L
524.2	MW-6A-3Q12	Water	N	BROMODICHLOROMETHANE	0.5	0.3J		ug/L
				CHLOROFORM	0.5	6.7		ug/L
				TETRACHLOROETHENE	0.5	5.2		ug/L
524.2	MW-7A-3Q12	Water	N	CHLOROFORM	0.5	1.6		ug/L

\*Note: This report excludes laboratory detects that were qualified as ND due to Blank Contamination

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 3: Detected Target Analytes**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Units
<b>SDG: 12222A</b>								
524.2	MW-86A-3Q12	Water	FD	CHLOROFORM	0.5	2.9		ug/L
				TETRACHLOROETHENE	0.5	2.4		ug/L
524.2	MW-9B-3Q12	Water	N	TETRACHLOROETHENE	0.5	14		ug/L
RSK-175	MW-15A-3Q12	Water	N	Carbon Dioxide	3000	53000		ug/L
RSK-175	MW-20A-3Q12	Water	N	Carbon Dioxide	3000	38000		ug/L
RSK-175	MW-20B-3Q12	Water	N	Carbon Dioxide	3000	6700		ug/L
RSK-175	MW-5A-3Q12	Water	N	Carbon Dioxide	9700	88000		ug/L
				METHANE	1.2	2.0		ug/L
RSK-175	MW-95A-3Q12	Water	FD	Carbon Dioxide	9700	71000		ug/L
				METHANE	1.2	1.7		ug/L
<b>SDG: 12222C</b>								
TO-15	SVE Pre GAC-0802	Air	N	CHLOROFORM	2.6	12		ppbv
				CIS-1,2-DICHLOROETHENE	2.6	3.0		ppbv
				TETRACHLOROETHENE	26	500		ppbv
				TRICHLOROETHENE	2.6	2.9		ppbv
TO-15	SVE Stack-0802	Air	N	CHLOROFORM	2.4	6.5		ppbv
				TETRACHLOROETHENE	2.4	1.6J		ppbv

\*Note: This report excludes laboratory detects that were qualified as ND due to Blank Contamination

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 3: Detected Target Analytes**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Units
<b>SDG: 12227B</b>								
524.2	MW-10B-3Q12	Water	N	TETRACHLOROETHENE	0.5	15		ug/L
524.2	MW-16A-3Q12	Water	N	CHLOROFORM	0.5	0.8		ug/L
524.2	MW-16B-3Q12	Water	N	CHLOROFORM	0.5	0.6		ug/L
				TETRACHLOROETHENE	0.5	24		ug/L
524.2	MW-16C-3Q12	Water	N	CHLOROFORM	0.5	0.6		ug/L
				TETRACHLOROETHENE	0.5	4.9		ug/L
524.2	MW-18A-3Q12	Water	N	CHLOROFORM	0.5	2.9		ug/L
				TETRACHLOROETHENE	0.5	2.2		ug/L
524.2	MW-21A-3Q12	Water	N	CHLOROFORM	0.5	5.5		ug/L
				TETRACHLOROETHENE	0.5	0.7		ug/L
524.2	MW-22A-3Q12	Water	N	CHLOROFORM	0.5	3.9		ug/L
524.2	MW-23A-3Q12	Water	N	CHLOROFORM	0.5	3.7		ug/L
				TETRACHLOROETHENE	2.5	41		ug/L
524.2	MW-29B-3Q12	Water	N	TETRACHLOROETHENE	2.5	70		ug/L
524.2	MW-3A-3Q12	Water	N	CHLOROFORM	0.5	1.7		ug/L
				TETRACHLOROETHENE	2.5	42		ug/L
524.2	MW-77A-3Q12	Water	FD	CHLOROFORM	0.5	3.8		ug/L
				TETRACHLOROETHENE	2.5	39		ug/L
524.2	MW-90B-3Q12	Water	FD	TETRACHLOROETHENE	0.5	16		ug/L
524.2	MW-97A-3Q12	Water	FD	CHLOROFORM	0.5	1.6		ug/L
				TETRACHLOROETHENE	2.5	44		ug/L

\*Note: This report excludes laboratory detects that were qualified as ND due to Blank Contamination

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 3: Detected Target Analytes**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Units
<b>SDG: 12227D</b>								
TO-15	DP-1A-3Q12	Air	N	TETRACHLOROETHENE	2.7	43		ppbv
TO-15	DP-1B-3Q12	Air	N	CHLOROFORM	2.6	1.8J		ppbv
				TETRACHLOROETHENE	26	140		ppbv
TO-15	DP-5A-3Q12	Air	N	TETRACHLOROETHENE	2.5	1.6J		ppbv
				TOLUENE	2.5	1.6J		ppbv
TO-15	DP-5B-3Q12	Air	N	CHLOROFORM	2.5	8.8		ppbv
				TETRACHLOROETHENE	2.5	2.3J		ppbv
TO-15	DP-6A-3Q12	Air	N	TETRACHLOROETHENE	12	75		ppbv
TO-15	DP-94A-3Q12	Air	FD	TETRACHLOROETHENE	26	52		ppbv
TO-15	OSVE-10-3Q12	Air	N	TETRACHLOROETHENE	54	370		ppbv
TO-15	OSVE-11-3Q12	Air	N	TETRACHLOROETHENE	2.4	21		ppbv
				TRICHLOROETHENE	2.4	1.2J		ppbv
TO-15	SVE-1-3Q12	Air	N	TETRACHLOROETHENE	2.6	38		ppbv
TO-15	SVE-2-3Q12	Air	N	CIS-1,2-DICHLOROETHENE	2.6	4.0		ppbv
				TETRACHLOROETHENE	34	380		ppbv
				TRICHLOROETHENE	2.6	3.3		ppbv
TO-15	SVE-3-3Q12	Air	N	TETRACHLOROETHENE	30	210		ppbv
TO-15	SVE-4-3Q12	Air	N	CHLOROFORM	16	25		ppbv
				TETRACHLOROETHENE	16	35		ppbv
TO-15	SVE-97-3Q12	Air	FD	TETRACHLOROETHENE	20	220		ppbv
<b>SDG: 12244B</b>								
TO-15	DP-6A-3Q12	Air	N	TETRACHLOROETHENE	27	100		ppbv

\*Note: This report excludes laboratory detects that were qualified as ND due to Blank Contamination

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 3: Detected Target Analytes**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Units
<b>SDG: 12251E</b>								
TO-15	SVE PreGAC-0901	Air	N	1,2,4-TRIMETHYLBENZENE	2.6	10		ppbv
				1,2-DICHLOROBENZENE	2.6	7.0		ppbv
				1,3,5-TRIMETHYLBENZENE	2.6	7.4		ppbv
				1,4-DICHLOROBENZENE	2.6	1.8J		ppbv
				CHLOROFORM	2.6	15		ppbv
				CIS-1,2-DICHLOROETHENE	2.6	4.3		ppbv
				m&p-Xylene	5.2	2.9J		ppbv
				O-XYLENE	2.6	2.7		ppbv
				TETRACHLOROETHENE	77	650		ppbv
				TRICHLOROETHENE	2.6	28		ppbv
TO-15	SVE Stack-0901	Air	N	1,2-DICHLOROBENZENE	2.6	1.3J		ppbv
				CHLOROFORM	2.6	8.9		ppbv
<b>SDG: 12258A</b>								
524.2	EW02-40	Water	N	CHLOROFORM	0.5	4.9		ug/L
				CIS-1,2-DICHLOROETHENE	0.5	0.3J		ug/L
				TETRACHLOROETHENE	50	610		ug/L
				TRICHLOROETHENE	0.5	0.5		ug/L

\*Note: This report excludes laboratory detects that were qualified as ND due to Blank Contamination

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

## **Table 4**

### **Overall Qualified Results**

**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12201D</b>										
TO-15	SVE Pre GAC-0703	Air	N	1,1,1-TRICHLOROETHANE	2.7	2.7J,U,Q 2		UJ	ppbv	Lcs
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	2.7	2.7U		UJ	ppbv	Ccv
				1,1-DICHLOROETHENE	2.7	2.7J,U,Q 2		UJ	ppbv	Lcs
				CARBON TETRACHLORIDE	2.7	2.7J,U,Q 2		UJ	ppbv	Lcs
				CHLOROFORM	2.7	9.6J,Q2		J-	ppbv	Lcs
				TRICHLOROETHENE	2.7	2.1J,C1		J	ppbv	RI
				TRICHLOROFLUOROMETHANE	2.7	2.7J,U,Q 2		UJ	ppbv	Lcs
TO-15	SVE Stack-0703	Air	N	1,1,1-TRICHLOROETHANE	2.1	2.1J,U,Q 2		UJ	ppbv	Lcs
				1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	2.1	2.1U		UJ	ppbv	Ccv
				1,1-DICHLOROETHENE	2.1	2.1J,U,Q 2		UJ	ppbv	Lcs
				CARBON TETRACHLORIDE	2.1	2.1J,U,Q 2		UJ	ppbv	Lcs
				CHLOROFORM	2.1	4.5J,Q2		J-	ppbv	Lcs
				TRICHLOROFLUOROMETHANE	2.1	2.1J,U,Q 2		UJ	ppbv	Lcs

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12220A</b>										
415.3	MW-25B-3Q12	Water	N	Total Organic Carbon	0.50	0.26J,C1		J	mg/L	RI
415.3	MW-8A-3Q12	Water	N	Total Organic Carbon	0.50	0.47J,C1		J	mg/L	RI
4500-S2	MW-24B-3Q12	Water	N	SULFIDE	1.0	0.59J,C1		J	mg/L	RI
4500-S2	MW-4A-3Q12	Water	N	SULFIDE	1.0	0.67J,C1		J	mg/L	RI
4500-S2	MW-4B-3Q12	Water	N	SULFIDE	1.0	0.90J,C1		J	mg/L	RI
4500-S2	MW-8A-3Q12	Water	N	SULFIDE	1.0	0.92J,C1		J	mg/L	RI
524.2	MW-17B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				CHLOROFORM	0.5	0.3J,C1		J	ug/L	RI
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-19A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

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**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12220A</b>										
524.2	MW-19B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-1A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-24B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-25B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

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**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12220A</b>										
524.2	MW-28B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-2A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-302-3Q12	Water	TB	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				ACETONE	4.0	2.2J,C1		J	ug/L	RI
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

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**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12220A</b>										
524.2	MW-402-3Q12	Water	FB	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				ACETONE	4.0	3.2J,C1		U	ug/L	Tb
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-4A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-4B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-4C-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

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**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12220A</b>										
524.2	MW-8A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
RSK-175	MW-17B-3Q12	Water	N	ETHANE	1.2	1.2U		UJ	ug/L	Icv
RSK-175	MW-24B-3Q12	Water	N	ETHANE	1.2	1.2U		UJ	ug/L	Icv
RSK-175	MW-25B-3Q12	Water	N	ETHANE	1.2	1.2U		UJ	ug/L	Icv
				METHANE	1.2	1.1J,C1		J	ug/L	RI
RSK-175	MW-28B-3Q12	Water	N	ETHANE	1.2	1.2U		UJ	ug/L	Icv
RSK-175	MW-302-3Q12	Water	TB	ETHANE	1.2	1.2U		UJ	ug/L	Icv
RSK-175	MW-4A-3Q12	Water	N	ETHANE	1.2	1.2U		UJ	ug/L	Icv
				METHANE	1.2	0.7J,C1		J	ug/L	RI
RSK-175	MW-4B-3Q12	Water	N	ETHANE	1.2	1.2U		UJ	ug/L	Icv
RSK-175	MW-8A-3Q12	Water	N	ETHANE	1.2	1.2U		UJ	ug/L	Icv

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**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12222A</b>										
415.3	MW-20B-3Q12	Water	N	Total Organic Carbon	0.50	0.45J,C1		J	mg/L	RI
4500-S2	MW-20A-3Q12	Water	N	SULFIDE	1.0	0.67J,C1		J	mg/L	RI
524.2	MW-10A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-11A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-12A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMODICHLOROMETHANE	0.5	0.4J,C1		J	ug/L	RI
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12222A</b>										
524.2	MW-13A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMODICHLOROMETHANE	0.5	0.3J,C1		J	ug/L	RI
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-14A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-15A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

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**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12222A</b>										
524.2	MW-17A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMODICHLOROMETHANE	0.5	0.3J,C1		J	ug/L	RI
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-17C-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-20A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMODICHLOROMETHANE	0.5	0.3J,C1		J	ug/L	RI
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	4.5J,C3		J	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

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**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12222A</b>										
524.2	MW-20B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-20C-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-26B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TETRACHLOROETHENE	0.5	0.3J,C1		J	ug/L	RI
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-5A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12222A</b>										
524.2	MW-6A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMODICHLOROMETHANE	0.5	0.3J,C1		J	ug/L	RI
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-7A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-8A-3Q12	Water	FD	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-9B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3,		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12222A</b>										
RSK-175	MW-15A-3Q12	Water	N	ETHANE	1.2	1.2U		UJ	ug/L	lcv
RSK-175	MW-20A-3Q12	Water	N	ETHANE	1.2	1.2U		UJ	ug/L	lcv
RSK-175	MW-20B-3Q12	Water	N	ETHANE	1.2	1.2U		UJ	ug/L	lcv
RSK-175	MW-5A-3Q12	Water	N	ETHANE	1.2	1.2U		UJ	ug/L	lcv
RSK-175	MW-95A-3Q12	Water	FD	ETHANE	1.2	1.2U		UJ	ug/L	lcv
<b>SDG: 12222C</b>										
TO-15	SVE Stack-0802	Air	N	TETRACHLOROETHENE	2.4	1.6J,C1		J	ppbv	RI

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12227B</b>										
524.2	MW-10B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3,		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-10C-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3,		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-16A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3,		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-16B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3,		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12227B</b>										
524.2	MW-16C-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3,		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-18A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3,		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-21A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3,		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3,		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3,		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-22A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3,		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12227B</b>										
524.2	MW-23A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv, Ccv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-27B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-29B-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv, Ccv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-3A-3Q12	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv, Ccv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12227B</b>										
524.2	MW-77A-3Q12	Water	FD	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv, Ccv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-90B-3Q12	Water	FD	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv, Ccv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-97A-3Q12	Water	FD	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Icv, Ccv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12227D</b>										
TO-15	DP-1B-3Q12	Air	N	CHLOROFORM	2.6	1.8J,C1		J	ppbv	RI
TO-15	DP-5A-3Q12	Air	N	TETRACHLOROETHENE	2.5	1.6J,C1		J	ppbv	RI
				TOLUENE	2.5	1.6J,C1		J	ppbv	RI
TO-15	DP-5B-3Q12	Air	N	TETRACHLOROETHENE	2.5	2.3J,C1		J	ppbv	RI
TO-15	OSVE-11-3Q12	Air	N	TRICHLOROETHENE	2.4	1.2J,C1		J	ppbv	RI
<b>SDG: 12244B</b>										
TO-15	DP-6A-3Q12	Air	N	1,2-DICHLOROETHANE	2.7	2.7J,U,C 3		UJ	ppbv	lcV
				CIS-1,3-DICHLOROPROPENE	2.7	2.7J,U,C 3		UJ	ppbv	lcV
<b>SDG: 12251E</b>										
TO-15	SVE PreGAC-0901	Air	N	1,2-DICHLOROETHANE	2.6	2.6J,U,C 3		UJ	ppbv	lcRsd
				1,4-DICHLOROBENZENE	2.6	1.8J,C1		J	ppbv	RI
				CIS-1,3-DICHLOROPROPENE	2.6	2.6J,U,C 3		UJ	ppbv	lcRsd
				m&p-Xylene	5.2	2.9J,C1		J	ppbv	RI
TO-15	SVE Stack-0901	Air	N	1,2-DICHLOROBENZENE	2.6	1.3J,C1		J	ppbv	RI
				1,2-DICHLOROETHANE	2.6	2.6J,U,C 3		UJ	ppbv	lcRsd
				CIS-1,3-DICHLOROPROPENE	2.6	2.6J,U,C 3		UJ	ppbv	lcRsd

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

**Table 4: Overall Qualified Results**

Analytical Method	Field Sample ID	Matrix	Sample Type	Analyte	RL	Lab Result	Unc / Error	Overall Qualifier	Units	Reason Code
<b>SDG: 12258A</b>										
524.2	EW02-40	Water	N	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				CIS-1,2-DICHLOROETHENE	0.5	0.3J,C1		J	ug/L	RI
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Ccv
				NAPHTHALENE	0.5	0.5J,U,C 4,		UJ	ug/L	Ccv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
524.2	MW-305-3Q12	Water	TB	2,2-DICHLOROPROPANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd, Ccv
				BROMOMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd
				DICHLORODIFLUOROMETHANE	0.5	0.5J,U,C 3		UJ	ug/L	Ccv
				NAPHTHALENE	0.5	0.5J,U,C 4,		UJ	ug/L	Ccv
				TRANS-1,3-DICHLOROPROPENE	0.5	0.5J,U,C 3		UJ	ug/L	IcRsd

N = Normal Sample    TB = Trip Blank  
 FD = Field Duplicate    FB = Field Blank

## **Table 5**

### **Analytical Completeness**

# Analytical Completeness Report

**Project No. /** R12SA6 / Modesto SVE Summer 2012 Sampling ; R12SB6 / Modesto Groundwater Summer 2012 Qtrly  
**Name :** Monitoring

Analytical Method	Total Number of Analytes	Number of Qualified	Percent Completeness
2320B	48	0	100.0
2540D	2	0	100.0
300.0	36	0	100.0
415.3	12	3	75.0
4500-S2	12	5	58.3
524.2	3024	204	93.3
RSK-175	52	15	71.2
TO-15	783	28	96.4
<b>Total</b>	<b>3969</b>	<b>255</b>	<b>93.6</b>

Note:

$$\text{Percent Completeness} = \frac{\text{Number of Unqualified Results}}{\text{Number of Reported Results}} * 100 \%$$

**Table 6**

**Contract Compliance Completeness**

## Contract Compliance Completeness Report

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**Project No. /** R12SA6 / Modesto SVE Summer 2012 Sampling ; R12SB6 / Modesto Groundwater Summer 2012 Qtrly  
**Name :** Monitoring

<b>Analytical Method</b>	<b>Total Number of Analytes</b>	<b>Number of Qualified</b>	<b>Percent Completeness</b>
2320B	48	0	100.0
2540D	2	0	100.0
300.0	36	0	100.0
415.3	12	3	75.0
4500-S2	12	5	58.3
524.2	3024	204	93.3
RSK-175	52	15	71.2
TO-15	783	28	96.4
<b>Total</b>	<b>3969</b>	<b>255</b>	<b>93.6</b>

**Table 7**

**Technical Completeness**

# Technical Completeness Report

**Project No. / Name :** R12SA6 / Modesto SVE Summer 2012 Sampling ; R12SB6 / Modesto Groundwater Summer 2012 Qtrly Monitoring

Analytical Method	Total Number of Analytes	Number of Rejects	Percent Completeness
2320B	48	0	100.0
2540D	2	0	100.0
300.0	36	0	100.0
415.3	12	0	100.0
4500-S2	12	0	100.0
524.2	3024	0	100.0
RSK-175	52	0	100.0
TO-15	783	0	100.0
<b>Total</b>	<b>3969</b>	<b>0</b>	<b>100.0</b>

Note:

$$\text{Percent Completeness} = \frac{\text{Number of Useable Results}}{\text{Number of Reported Results}} * 100 \%$$

[ Useable results are qualified but not Rejected data ]

## **Table 8**

### **Reasons for Qualified Results**

**Reason for Qualified Results**

SDG Nos. : 12201D, 12220A, 12222A, 12222C, 12227B, 12227D, 12244B, 12251E, 12258A

Sample Del Group (SDG)	Sample ID	Test Method	CAS No.	Detected Qualifier	Non Detected Qualifier	Analyte Name	Reason
12201D	SVE Pre GAC-0703	TO-15	71-55-6		J	1,1,1-TRICHLOROETHANE	LCS spike recovery
12201D	SVE Pre GAC-0703	TO-15	76-13-1		J	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	Continuing calibration percent difference
12201D	SVE Pre GAC-0703	TO-15	75-35-4		J	1,1-DICHLOROETHENE	LCS spike recovery
12201D	SVE Pre GAC-0703	TO-15	56-23-5		J	CARBON TETRACHLORIDE	LCS spike recovery
12201D	SVE Pre GAC-0703	TO-15	67-66-3	J-		CHLOROFORM	LCS spike recovery
12201D	SVE Pre GAC-0703	TO-15	75-69-4		J	TRICHLOROFLUOROMETHANE	LCS spike recovery
12201D	SVE Stack-0703	TO-15	71-55-6		J	1,1,1-TRICHLOROETHANE	LCS spike recovery
12201D	SVE Stack-0703	TO-15	76-13-1		J	1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	Continuing calibration percent difference
12201D	SVE Stack-0703	TO-15	75-35-4		J	1,1-DICHLOROETHENE	LCS spike recovery
12201D	SVE Stack-0703	TO-15	56-23-5		J	CARBON TETRACHLORIDE	LCS spike recovery
12201D	SVE Stack-0703	TO-15	67-66-3	J-		CHLOROFORM	LCS spike recovery
12201D	SVE Stack-0703	TO-15	75-69-4		J	TRICHLOROFLUOROMETHANE	LCS spike recovery
12220A	MW-17B-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-17B-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12220A	MW-17B-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-17B-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-17B-3Q12	RSK-175	74-84-0		J	ETHANE	Initial calibration verification percent difference
12220A	MW-19A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-19A-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12220A	MW-19A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-19A-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-19B-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-19B-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12220A	MW-19B-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-19B-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-1A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-1A-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12220A	MW-1A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference

## Reason for Qualified Results

SDG Nos. : 12201D, 12220A, 12222A, 12222C, 12227B, 12227D, 12244B, 12251E, 12258A

Sample Del Group (SDG)	Sample ID	Test Method	CAS No.	Detected Qualifier	Non Detected Qualifier	Analyte Name	Reason
12220A	MW-1A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-24B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-24B-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12220A	MW-24B-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-24B-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-24B-3Q12	RSK-175	74-84-0	J		ETHANE	Initial calibration verification percent difference
12220A	MW-25B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12220A	MW-25B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-25B-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12220A	MW-25B-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-25B-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-25B-3Q12	RSK-175	74-84-0	J		ETHANE	Initial calibration verification percent difference
12220A	MW-28B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12220A	MW-28B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-28B-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12220A	MW-28B-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-28B-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-28B-3Q12	RSK-175	74-84-0	J		ETHANE	Initial calibration verification percent difference
12220A	MW-2A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-2A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12220A	MW-2A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-2A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-302-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-302-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12220A	MW-302-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-302-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD

## Reason for Qualified Results

SDG Nos. : 12201D, 12220A, 12222A, 12222C, 12227B, 12227D, 12244B, 12251E, 12258A

Sample Del Group (SDG)	Sample ID	Test Method	CAS No.	Detected Qualifier	Non Detected Qualifier	Analyte Name	Reason
12220A	MW-302-3Q12	RSK-175	74-84-0		J	ETHANE	Initial calibration verification percent difference
12220A	MW-402-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-402-3Q12	524.2	67-64-1	U		ACETONE	Present in trip blank
12220A	MW-402-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12220A	MW-402-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-402-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-4A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-4A-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12220A	MW-4A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-4A-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-4A-3Q12	RSK-175	74-84-0		J	ETHANE	Initial calibration verification percent difference
12220A	MW-4B-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-4B-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12220A	MW-4B-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-4B-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-4B-3Q12	RSK-175	74-84-0		J	ETHANE	Initial calibration verification percent difference
12220A	MW-4C-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-4C-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12220A	MW-4C-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-4C-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-8A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12220A	MW-8A-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12220A	MW-8A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12220A	MW-8A-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12220A	MW-8A-3Q12	RSK-175	74-84-0		J	ETHANE	Initial calibration verification percent difference
12222A	MW-10A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD

## Reason for Qualified Results

SDG Nos. : 12201D,12220A,12222A,12222C,12227B,12227D,12244B,12251E,12258A

Sample Del Group (SDG)	Sample ID	Test Method	CAS No.	Detected Qualifier	Non Detected Qualifier	Analyte Name	Reason
12222A	MW-10A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-10A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-10A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-11A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-11A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-11A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-11A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-12A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-12A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-12A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-12A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-13A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-13A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-13A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-13A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-14A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-14A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-14A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-14A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-15A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-15A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-15A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-15A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-15A-3Q12	RSK-175	74-84-0	J		ETHANE	Initial calibration verification percent difference
12222A	MW-17A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-17A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-17A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference

**Reason for Qualified Results**

SDG Nos. : 12201D, 12220A, 12222A, 12222C, 12227B, 12227D, 12244B, 12251E, 12258A

Sample Del Group (SDG)	Sample ID	Test Method	CAS No.	Detected Qualifier	Non Detected Qualifier	Analyte Name	Reason
12222A	MW-17A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-17C-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12222A	MW-17C-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-17C-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-17C-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-17C-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-20A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-20A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-20A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-20A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-20A-3Q12	RSK-175	74-84-0	J		ETHANE	Initial calibration verification percent difference
12222A	MW-20B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-20B-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-20B-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-20B-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-20B-3Q12	RSK-175	74-84-0	J		ETHANE	Initial calibration verification percent difference
12222A	MW-20C-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12222A	MW-20C-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-20C-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-20C-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-20C-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-26B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12222A	MW-26B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-26B-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12222A	MW-26B-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-26B-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-5A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-5A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD

## Reason for Qualified Results

SDG Nos. : 12201D,12220A,12222A,12222C,12227B,12227D,12244B,12251E,12258A

Sample Del Group (SDG)	Sample ID	Test Method	CAS No.	Detected Qualifier	Non Detected Qualifier	Analyte Name	Reason
12222A	MW-5A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-5A-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-5A-3Q12	RSK-175	74-84-0		J	ETHANE	Initial calibration verification percent difference
12222A	MW-6A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-6A-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12222A	MW-6A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-6A-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-7A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-7A-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12222A	MW-7A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-7A-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-86A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-86A-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12222A	MW-86A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-86A-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12222A	MW-95A-3Q12	RSK-175	74-84-0		J	ETHANE	Initial calibration verification percent difference
12222A	MW-9B-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Continuing calibration percent difference
12222A	MW-9B-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12222A	MW-9B-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12222A	MW-9B-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12222A	MW-9B-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-10B-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-10B-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12227B	MW-10B-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-10B-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-10C-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-10C-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD

**Reason for Qualified Results**

SDG Nos. : 12201D, 12220A, 12222A, 12222C, 12227B, 12227D, 12244B, 12251E, 12258A

Sample Del Group ( SDG )	Sample ID	Test Method	CAS No.	Detected Qualifier	Non Detected Qualifier	Analyte Name	Reason
12227B	MW-10C-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-10C-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-16A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-16A-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12227B	MW-16A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-16A-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-16B-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-16B-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12227B	MW-16B-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-16B-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-16C-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-16C-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12227B	MW-16C-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-16C-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-18A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-18A-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12227B	MW-18A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-18A-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-21A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-21A-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12227B	MW-21A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-21A-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-22A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-22A-3Q12	524.2	74-83-9		J	BROMOMETHANE	Initial calibration %RSD
12227B	MW-22A-3Q12	524.2	75-71-8		J	DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-22A-3Q12	524.2	10061-02-6		J	TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-23A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Continuing calibration percent difference
12227B	MW-23A-3Q12	524.2	594-20-7		J	2,2-DICHLOROPROPANE	Initial calibration %RSD

**Reason for Qualified Results**

SDG Nos. : 12201D, 12220A, 12222A, 12222C, 12227B, 12227D, 12244B, 12251E, 12258A

Sample Del Group ( SDG )	Sample ID	Test Method	CAS No.	Detected Qualifier	Non Detected Qualifier	Analyte Name	Reason
12227B	MW-23A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12227B	MW-23A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Continuing calibration percent difference
12227B	MW-23A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-23A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-27B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-27B-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12227B	MW-27B-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-27B-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-29B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12227B	MW-29B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-29B-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12227B	MW-29B-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Continuing calibration percent difference
12227B	MW-29B-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-29B-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-3A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12227B	MW-3A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-3A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12227B	MW-3A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Continuing calibration percent difference
12227B	MW-3A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-3A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-77A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12227B	MW-77A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-77A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12227B	MW-77A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Continuing calibration percent difference
12227B	MW-77A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-77A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-90B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12227B	MW-90B-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-90B-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD

**Reason for Qualified Results**

SDG Nos. : 12201D, 12220A, 12222A, 12222C, 12227B, 12227D, 12244B, 12251E, 12258A

Sample Del Group ( SDG )	Sample ID	Test Method	CAS No.	Detected Qualifier	Non Detected Qualifier	Analyte Name	Reason
12227B	MW-90B-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Continuing calibration percent difference
12227B	MW-90B-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-90B-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12227B	MW-97A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12227B	MW-97A-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12227B	MW-97A-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12227B	MW-97A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Continuing calibration percent difference
12227B	MW-97A-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Initial calibration verification percent difference
12227B	MW-97A-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12244B	DP-6A-3Q12	TO-15	107-06-2	J		1,2-DICHLOROETHANE	Initial calibration verification percent difference
12244B	DP-6A-3Q12	TO-15	10061-01-5	J		CIS-1,3-DICHLOROPROPENE	Initial calibration verification percent difference
12251E	SVE PreGAC-0901	TO-15	107-06-2	J		1,2-DICHLOROETHANE	Initial calibration %RSD
12251E	SVE PreGAC-0901	TO-15	10061-01-5	J		CIS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12251E	SVE Stack-0901	TO-15	107-06-2	J		1,2-DICHLOROETHANE	Initial calibration %RSD
12251E	SVE Stack-0901	TO-15	10061-01-5	J		CIS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12258A	EW02-40	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12258A	EW02-40	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12258A	EW02-40	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12258A	EW02-40	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Continuing calibration percent difference
12258A	EW02-40	524.2	91-20-3	J		NAPHTHALENE	Continuing calibration percent difference
12258A	EW02-40	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD
12258A	MW-305-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Continuing calibration percent difference
12258A	MW-305-3Q12	524.2	594-20-7	J		2,2-DICHLOROPROPANE	Initial calibration %RSD
12258A	MW-305-3Q12	524.2	74-83-9	J		BROMOMETHANE	Initial calibration %RSD
12258A	MW-305-3Q12	524.2	75-71-8	J		DICHLORODIFLUOROMETHANE	Continuing calibration percent difference
12258A	MW-305-3Q12	524.2	91-20-3	J		NAPHTHALENE	Continuing calibration percent difference
12258A	MW-305-3Q12	524.2	10061-02-6	J		TRANS-1,3-DICHLOROPROPENE	Initial calibration %RSD

## **Appendix A**

### **Data Qualification Summary Report**

**SDG 12201D**

# Data Qualifier Summary

Lab Reporting Batch ID: 12201D

Laboratory: R9LAB

EDD Filename: 12201d\_voc\_1207025 FINAL

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA

**Method:** TO-15

**Matrix:** Air

Sample ID: SVE Pre GAC-0703

Collected: 7/18/2012 12:35:00

Analysis Type: Initial

Dilution: 2.71

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1,1-TRICHLOROETHANE	2.7	J,U,Q2	1.4	MDL	2.7	MRL	ppbv	UJ	Lcs
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	2.7	U	1.4	MDL	2.7	MRL	ppbv	UJ	Ccv
1,1-DICHLOROETHENE	2.7	J,U,Q2	1.4	MDL	2.7	MRL	ppbv	UJ	Lcs
CARBON TETRACHLORIDE	2.7	J,U,Q2	1.4	MDL	2.7	MRL	ppbv	UJ	Lcs
CHLOROFORM	9.6	J,Q2	1.4	MDL	2.7	MRL	ppbv	J-	Lcs
TRICHLOROETHENE	2.1	J,C1	1.4	MDL	2.7	MRL	ppbv	J	RI
TRICHLOROFLUOROMETHANE	2.7	J,U,Q2	1.4	MDL	2.7	MRL	ppbv	UJ	Lcs

Sample ID: SVE Stack-0703

Collected: 7/18/2012 12:30:00

Analysis Type: Initial

Dilution: 2.1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1,1-TRICHLOROETHANE	2.1	J,U,Q2	1.0	MDL	2.1	MRL	ppbv	UJ	Lcs
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	2.1	U	1.0	MDL	2.1	MRL	ppbv	UJ	Ccv
1,1-DICHLOROETHENE	2.1	J,U,Q2	1.0	MDL	2.1	MRL	ppbv	UJ	Lcs
CARBON TETRACHLORIDE	2.1	J,U,Q2	1.0	MDL	2.1	MRL	ppbv	UJ	Lcs
CHLOROFORM	4.5	J,Q2	1.0	MDL	2.1	MRL	ppbv	J-	Lcs
TRICHLOROFLUOROMETHANE	2.1	J,U,Q2	1.0	MDL	2.1	MRL	ppbv	UJ	Lcs

\* denotes a non-reportable result

Project Name and Number: R12SA6 - Modesto SVE Summer 2012 Sampling

8/21/2012 12:51:26 PM

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# Data Qualifier Summary

Lab Reporting Batch ID: 12201D

Laboratory: R9LAB

EDD Filename: 12201d\_voc\_1207025 FINAL

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
Ccv	Continuing Calibration Verification Percent Difference Lower Estimation
Lcs	Laboratory Control Spike Lower Estimation
RI	Reporting Limit Trace Value

\* denotes a non-reportable result

Project Name and Number: R12SA6 - Modesto SVE Summer 2012 Sampling

8/21/2012 12:51:26 PM

ADR version 1.6.0.186

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**SDG 12220A**

# Data Qualifier Summary

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_voc\_1of2\_1208014 FINAL

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** 524.2 **Matrix:** Water

Sample ID: MW-25B-3Q12 Collected: 8/6/2012 12:55:00 Analysis Type: Initial Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd, Ccv
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3,Q4	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-28B-3Q12 Collected: 8/6/2012 11:15:00 Analysis Type: Initial Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd, Ccv
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

9/24/2012 12:14:54 PM

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# Data Qualifier Summary

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_voc\_1of2\_1208014 FINAL

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
Ccv	Continuing Calibration Verification Percent Difference Lower Estimation
IcRsd	Initial Calibration Percent Relative Standard Deviation
Icv	Initial Calibration Verification Percent Difference Lower Estimation
Ms	Matrix Spike Upper Estimation

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_voc\_2of2\_1208017 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** 524.2 **Matrix:** Water

Sample ID: MW-17B-3Q12		Collected: 8/7/2012 12:45:00		Analysis Type: Initial1				Dilution: 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
CHLOROFORM	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-19A-3Q12		Collected: 8/6/2012 3:12:00 PM		Analysis Type: Initial				Dilution: 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-19B-3Q12		Collected: 8/6/2012 3:58:00 PM		Analysis Type: Initial				Dilution: 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-1A-3Q12		Collected: 8/6/2012 10:44:00		Analysis Type: Initial				Dilution: 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_voc\_2of2\_1208017 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** 524.2 **Matrix:** Water

Sample ID: MW-24B-3Q12 Collected: 8/7/2012 7:28:00 AM Analysis Type: Initial2 Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-2A-3Q12 Collected: 8/6/2012 12:58:00 Analysis Type: Initial Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-302-3Q12 Collected: 8/7/2012 8:00:00 AM Analysis Type: Initial Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
ACETONE	2.2	J,C1	2.0	MDL	4.0	MRL	ug/L	J	RI
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-402-3Q12 Collected: 8/7/2012 1:30:00 PM Analysis Type: Initial Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
ACETONE	3.2	J,C1	2.0	MDL	4.0	MRL	ug/L	U	Tb
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_voc\_2of2\_1208017 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** 524.2 **Matrix:** Water

**Sample ID:** MW-4A-3Q12 **Collected:** 8/7/2012 8:36:00 AM **Analysis Type:** Initial2 **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-4B-3Q12 **Collected:** 8/7/2012 8:50:00 AM **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-4C-3Q12 **Collected:** 8/7/2012 10:10:00 **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-8A-3Q12 **Collected:** 8/7/2012 11:11:00 **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_voc\_2of2\_1208017 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
IcRsd	Initial Calibration Percent Relative Standard Deviation
Icv	Initial Calibration Verification Percent Difference Lower Estimation
RI	Reporting Limit Trace Value
Tb	Trip Blank Contamination

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_rsk

eQAPP Name: Modesto\_Site\_062812

<b>Method Category:</b>	VOA	
<b>Method:</b>	RSK-175	<b>Matrix:</b> Water

<b>Sample ID:</b> MW-17B-3Q12		<b>Collected:</b> 8/7/2012 12:45:00			<b>Analysis Type:</b> Initial2			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv

<b>Sample ID:</b> MW-24B-3Q12		<b>Collected:</b> 8/7/2012 7:28:00 AM			<b>Analysis Type:</b> Initial2			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv

<b>Sample ID:</b> MW-25B-3Q12		<b>Collected:</b> 8/6/2012 12:55:00			<b>Analysis Type:</b> Initial2			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv
METHANE	1.1	J,C1	0.6	MDL	1.2	MRL	ug/L	U	Tb

<b>Sample ID:</b> MW-28B-3Q12		<b>Collected:</b> 8/6/2012 11:15:00			<b>Analysis Type:</b> Initial2			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv

<b>Sample ID:</b> MW-302-3Q12		<b>Collected:</b> 8/7/2012 8:00:00 AM			<b>Analysis Type:</b> Initial2			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv

<b>Sample ID:</b> MW-4A-3Q12		<b>Collected:</b> 8/7/2012 8:36:00 AM			<b>Analysis Type:</b> Initial2			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv
METHANE	0.7	J,C1	0.6	MDL	1.2	MRL	ug/L	U	Tb

<b>Sample ID:</b> MW-4B-3Q12		<b>Collected:</b> 8/7/2012 8:50:00 AM			<b>Analysis Type:</b> Initial1			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_rsk

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** RSK-175 **Matrix:** Water

Sample ID: MW-8A-3Q12

Collected: 8/7/2012 11:11:00

Analysis Type: Initial2

Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_rsk

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
Icv	Initial Calibration Verification Percent Difference Lower Estimation
Mb	Method Blank Contamination
RI	Reporting Limit Trace Value
Tb	Trip Blank Contamination

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 1208014,1208017 FINAL

eQAPP Name: Modesto\_Site\_062812

<b>Method Category:</b>	GENCHEM	
<b>Method:</b>	415.3	<b>Matrix:</b> Water

Sample ID: MW-25B-3Q12	Collected: 8/6/2012 12:55:00	Analysis Type: Initial	Dilution: 1						
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Total Organic Carbon	0.26	J,C1	0.25	MDL	0.50	MRL	mg/L	J	RI

Sample ID: MW-8A-3Q12	Collected: 8/7/2012 11:11:00	Analysis Type: Initial	Dilution: 1						
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Total Organic Carbon	0.47	J,C1	0.25	MDL	0.50	MRL	mg/L	J	RI

<b>Method Category:</b>	GENCHEM	
<b>Method:</b>	4500-S2	<b>Matrix:</b> Water

Sample ID: MW-24B-3Q12	Collected: 8/7/2012 7:28:00 AM	Analysis Type: Initial	Dilution: 1						
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SULFIDE	0.59	J,C1	0.50	MDL	1.0	MRL	mg/L	J	RI

Sample ID: MW-4A-3Q12	Collected: 8/7/2012 8:36:00 AM	Analysis Type: Initial	Dilution: 1						
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SULFIDE	0.67	J,C1	0.50	MDL	1.0	MRL	mg/L	J	RI

Sample ID: MW-4B-3Q12	Collected: 8/7/2012 8:50:00 AM	Analysis Type: Initial	Dilution: 1						
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SULFIDE	0.90	J,C1	0.50	MDL	1.0	MRL	mg/L	J	RI

Sample ID: MW-8A-3Q12	Collected: 8/7/2012 11:11:00	Analysis Type: Initial	Dilution: 1						
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SULFIDE	0.92	J,C1	0.50	MDL	1.0	MRL	mg/L	J	RI

\* denotes a non-reportable result

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# Data Qualifier Summary

Lab Reporting Batch ID: 12220A  
EDD Filename: 1208014,1208017 FINAL

Laboratory: FALSE  
eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
RI	Reporting Limit Trace Value

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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**SDG 12222A**

# Data Qualifier Summary

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 12222a\_voc\_1208021 FINAL

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** 524.2 **Matrix:** Water

Sample ID: MW-10A-3Q12      Collected: 8/7/2012 8:07:00 AM      Analysis Type: Initial1      Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-11A-3Q12      Collected: 8/6/2012 1:42:00 PM      Analysis Type: Initial      Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-12A-3Q12      Collected: 8/7/2012 7:34:00 AM      Analysis Type: Initial      Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMODICHLOROMETHANE	0.4	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-13A-3Q12      Collected: 8/6/2012 2:17:00 PM      Analysis Type: Initial      Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMODICHLOROMETHANE	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-14A-3Q12      Collected: 8/6/2012 3:32:00 PM      Analysis Type: Initial      Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

\* denotes a non-reportable result

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# Data Qualifier Summary

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 12222a\_voc\_1208021 FINAL

eQAPP Name: Modesto\_Site\_062812

<b>Method Category:</b>	VOA	
<b>Method:</b>	524.2	<b>Matrix:</b> Water

<b>Sample ID:</b> MW-14A-3Q12			<b>Collected:</b> 8/6/2012 3:32:00 PM				<b>Analysis Type:</b> Initial		<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code	
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv	
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	

<b>Sample ID:</b> MW-15A-3Q12			<b>Collected:</b> 8/7/2012 12:54:00				<b>Analysis Type:</b> Initial		<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code	
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv	
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	

<b>Sample ID:</b> MW-17A-3Q12			<b>Collected:</b> 8/7/2012 3:00:00 PM				<b>Analysis Type:</b> Initial		<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code	
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	
BROMODICHLOROMETHANE	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI	
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv	
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	

<b>Sample ID:</b> MW-17C-3Q12			<b>Collected:</b> 8/7/2012 2:15:00 PM				<b>Analysis Type:</b> Initial		<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code	
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Ccv, IcRsd	
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv	
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	

<b>Sample ID:</b> MW-20A-3Q12			<b>Collected:</b> 8/8/2012 8:30:00 AM				<b>Analysis Type:</b> Initial1		<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code	
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	
BROMODICHLOROMETHANE	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI	
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd	

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 12222a\_voc\_1208021 FINAL

eQAPP Name: Modesto\_Site\_062812

<b>Method Category:</b>	VOA	
<b>Method:</b>	524.2	<b>Matrix:</b> Water

<b>Sample ID:</b> MW-20A-3Q12		<b>Collected:</b> 8/8/2012 8:30:00 AM				<b>Analysis Type:</b> Initial1		<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DICHLORODIFLUOROMETHANE	4.5	J,C3	0.2	MDL	0.5	MRL	ug/L	J	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

<b>Sample ID:</b> MW-20B-3Q12		<b>Collected:</b> 8/8/2012 9:35:00 AM				<b>Analysis Type:</b> Initial1		<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

<b>Sample ID:</b> MW-20C-3Q12		<b>Collected:</b> 8/8/2012 8:00:00 AM				<b>Analysis Type:</b> Initial		<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Ccv, IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

<b>Sample ID:</b> MW-26B-3Q12		<b>Collected:</b> 8/7/2012 3:49:00 PM				<b>Analysis Type:</b> Initial		<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Ccv, IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TETRACHLOROETHENE	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

<b>Sample ID:</b> MW-5A-3Q12		<b>Collected:</b> 8/8/2012 7:30:00 AM				<b>Analysis Type:</b> Initial1		<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 12222a\_voc\_1208021 FINAL

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** 524.2 **Matrix:** Water

**Sample ID:** MW-6A-3Q12 **Collected:** 8/7/2012 2:05:00 PM **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMODICHLOROMETHANE	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-7A-3Q12 **Collected:** 8/6/2012 12:24:00 **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-86A-3Q12 **Collected:** 8/6/2012 12:00:00 **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-9B-3Q12 **Collected:** 8/6/2012 3:01:00 PM **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Ccv, IcRsd
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3,Q4	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 12222a\_voc\_1208021 FINAL

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
Ccv	Continuing Calibration Verification Percent Difference Lower Estimation
IcRsd	Initial Calibration Percent Relative Standard Deviation
Icv	Initial Calibration Verification Percent Difference Lower Estimation
Ms	Matrix Spike Upper Estimation
RI	Reporting Limit Trace Value

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 12222a\_rsk

eQAPP Name: Modesto\_Site\_062812

<b>Method Category:</b>	VOA	
<b>Method:</b>	RSK-175	<b>Matrix:</b> Water

<b>Sample ID:</b> MW-15A-3Q12		<b>Collected:</b> 8/7/2012 12:54:00			<b>Analysis Type:</b> Initial1			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv

<b>Sample ID:</b> MW-20A-3Q12		<b>Collected:</b> 8/8/2012 8:30:00 AM			<b>Analysis Type:</b> Initial1			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv

<b>Sample ID:</b> MW-20B-3Q12		<b>Collected:</b> 8/8/2012 9:35:00 AM			<b>Analysis Type:</b> Initial2			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv

<b>Sample ID:</b> MW-5A-3Q12		<b>Collected:</b> 8/8/2012 7:30:00 AM			<b>Analysis Type:</b> Initial1			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv

<b>Sample ID:</b> MW-95A-3Q12		<b>Collected:</b> 8/8/2012 7:30:00 AM			<b>Analysis Type:</b> Initial2			<b>Dilution:</b> 1	
Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ETHANE	1.2	U	0.6	MDL	1.2	MRL	ug/L	UJ	lcv

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 12222a\_rsk

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
Icv	Initial Calibration Verification Percent Difference Lower Estimation
Mb	Method Blank Contamination

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 1208021 FINAL

eQAPP Name: Modesto\_Site\_062812

<b>Method Category:</b>	GENCHEM	
<b>Method:</b>	415.3	<b>Matrix:</b> Water

Sample ID: MW-20B-3Q12      Collected: 8/8/2012 9:35:00 AM      Analysis Type: Initial      Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Total Organic Carbon	0.45	J,C1	0.25	MDL	0.50	MRL	mg/L	J	RI

<b>Method Category:</b>	GENCHEM	
<b>Method:</b>	4500-S2	<b>Matrix:</b> Water

Sample ID: MW-20A-3Q12      Collected: 8/8/2012 8:30:00 AM      Analysis Type: Initial      Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SULFIDE	0.67	J,C1	0.50	MDL	1.0	MRL	mg/L	J	RI

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 1208021 FINAL

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
RI	Reporting Limit Trace Value

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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**SDG 12222C**

# Data Qualifier Summary

Lab Reporting Batch ID: 12222C

Laboratory: FALSE

EDD Filename: 12222c\_voc\_1208025 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

Method Category: VOA  
Method: TO-15 Matrix: Air

Sample ID: SVE Stack-0802

Collected: 8/8/2012 10:20:00

Analysis Type: Initial

Dilution: 2.38

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TETRACHLOROETHENE	1.6	J,C1	1.2	MDL	2.4	MRL	ppbv	J	RI

\* denotes a non-reportable result

Project Name and Number: R12SA6 - Modesto SVE Summer 2012 Sampling

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# Data Qualifier Summary

Lab Reporting Batch ID: 12222C

Laboratory: FALSE

EDD Filename: 12222c\_voc\_1208025 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
RI	Reporting Limit Trace Value

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\* denotes a non-reportable result

Project Name and Number: R12SA6 - Modesto SVE Summer 2012 Sampling

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**SDG 12227B**

# Data Qualifier Summary

Lab Reporting Batch ID: 12227B

Laboratory: FALSE

EDD Filename: 12227b\_voc\_1208036 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** 524.2 **Matrix:** Water

**Sample ID:** MW-10B-3Q12 **Collected:** 8/8/2012 2:50:00 PM **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3,Q3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-10C-3Q12 **Collected:** 8/8/2012 2:02:00 PM **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3,Q3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-16A-3Q12 **Collected:** 8/9/2012 8:25:00 AM **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3,Q3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-16B-3Q12 **Collected:** 8/9/2012 9:44:00 AM **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3,Q3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-16C-3Q12 **Collected:** 8/9/2012 9:05:00 AM **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12227B

Laboratory: FALSE

EDD Filename: 12227b\_voc\_1208036 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** 524.2 **Matrix:** Water

**Sample ID:** MW-16C-3Q12 **Collected:** 8/9/2012 9:05:00 AM **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOMETHANE	0.5	J,U,C3,Q3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-18A-3Q12 **Collected:** 8/8/2012 12:30:00 **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3,Q3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-21A-3Q12 **Collected:** 8/10/2012 8:23:00 **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3,Q4	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3,Q3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3,Q4	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-22A-3Q12 **Collected:** 8/10/2012 8:55:00 **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3,Q3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-23A-3Q12 **Collected:** 8/9/2012 12:27:00 **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd, Ccv
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12227B

Laboratory: FALSE

EDD Filename: 12227b\_voc\_1208036 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** 524.2 **Matrix:** Water

**Sample ID:** MW-23A-3Q12 **Collected:** 8/9/2012 12:27:00 **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcV, Ccv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-27B-3Q12 **Collected:** 8/9/2012 7:37:00 AM **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
BROMOMETHANE	0.5	J,U,C3,Q3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcV
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-29B-3Q12 **Collected:** 8/8/2012 4:10:00 PM **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd, Ccv
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcV, Ccv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-3A-3Q12 **Collected:** 8/10/2012 9:10:00 **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd, Ccv
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcV, Ccv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

**Sample ID:** MW-77A-3Q12 **Collected:** 8/9/2012 12:27:00 **Analysis Type:** Initial **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd, Ccv
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcV, Ccv

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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# Data Qualifier Summary

Lab Reporting Batch ID: 12227B

Laboratory: FALSE

EDD Filename: 12227b\_voc\_1208036 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

Method Category:	VOA								
Method:	524.2	Matrix:	Water						

Sample ID: MW-77A-3Q12      Collected: 8/9/2012 12:27:00      Analysis Type: Initial      Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-90B-3Q12      Collected: 8/8/2012 12:00:00      Analysis Type: Initial      Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd, Ccv
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv, Ccv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-97A-3Q12      Collected: 8/10/2012 9:10:00      Analysis Type: Initial      Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd, Ccv
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Icv, Ccv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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## Data Qualifier Summary

Lab Reporting Batch ID: 12227B

Laboratory: FALSE

EDD Filename: 12227b\_voc\_1208036 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

### Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
Ccv	Continuing Calibration Verification Percent Difference Lower Estimation
IcRsd	Initial Calibration Percent Relative Standard Deviation
Icv	Initial Calibration Verification Percent Difference Lower Estimation
Ms	Matrix Spike Upper Estimation

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

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**SDG 12227D**

# Data Qualifier Summary

Lab Reporting Batch ID: 12227D

Laboratory: FALSE

EDD Filename: 12227d\_voc\_1208039 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

Method Category:	VOA	
Method:	TO-15	Matrix: Air

Sample ID: DP-1B-3Q12      Collected: 8/8/2012 12:33:00      Analysis Type: Initial1      Dilution: 2.57

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CHLOROFORM	1.8	J,C1	1.3	MDL	2.6	MRL	ppbv	J	RI

Sample ID: DP-5A-3Q12      Collected: 8/8/2012 10:14:00      Analysis Type: Initial      Dilution: 2.53

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TETRACHLOROETHENE	1.6	J,C1	1.3	MDL	2.5	MRL	ppbv	J	RI
TOLUENE	1.6	J,C1	1.3	MDL	2.5	MRL	ppbv	J	RI

Sample ID: DP-5B-3Q12      Collected: 8/8/2012 10:29:00      Analysis Type: Initial      Dilution: 2.53

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TETRACHLOROETHENE	2.3	J,C1	1.3	MDL	2.5	MRL	ppbv	J	RI

Sample ID: OSVE-11-3Q12      Collected: 8/8/2012 3:29:00 PM      Analysis Type: Initial      Dilution: 2.42

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	1.2	J,C1	1.2	MDL	2.4	MRL	ppbv	J	RI

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

10/22/2012 8:01:41 AM

ADR version 1.6.0.190

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# Data Qualifier Summary

Lab Reporting Batch ID: 12227D

Laboratory: FALSE

EDD Filename: 12227d\_voc\_1208039 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
Lcs	Laboratory Control Spike Upper Estimation
Mb	Method Blank Contamination
RI	Reporting Limit Trace Value

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

10/22/2012 8:01:41 AM

ADR version 1.6.0.190

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**SDG 12244B**

# Data Qualifier Summary

Lab Reporting Batch ID: 12244B

Laboratory: FALSE

EDD Filename: 12244b\_voc

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** TO-15 **Matrix:** Air

Sample ID: DP-6A-3Q12

Collected: 8/30/2012 8:53:00

Analysis Type: Reinjection-01

Dilution: 2.66

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,2-DICHLOROETHANE	2.7	J,U,C3	1.3	MDL	2.7	MRL	ppbv	UJ	lcv
CIS-1,3-DICHLOROPROPENE	2.7	J,U,C3	1.3	MDL	2.7	MRL	ppbv	UJ	lcv

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

10/16/2012 12:56:44 PM

ADR version 1.6.0.190

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# Data Qualifier Summary

Lab Reporting Batch ID: 12244B

Laboratory: FALSE

EDD Filename: 12244b\_voc

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
lcv	Initial Calibration Verification Percent Difference Lower Estimation

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

10/16/2012 12:56:44 PM

ADR version 1.6.0.190

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**SDG 12251E**

# Data Qualifier Summary

Lab Reporting Batch ID: 12251E

Laboratory: FALSE

EDD Filename: 12251E\_voc

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** TO-15 **Matrix:** Air

**Sample ID:** SVE PreGAC-0901 **Collected:** 9/6/2012 10:49:00 **Analysis Type:** Initial1 **Dilution:** 2.6

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,2-DICHLOROETHANE	2.6	J,U,C3	1.3	MDL	2.6	MRL	ppbv	UJ	IcRsd
1,4-DICHLOROBENZENE	1.8	J,C1	1.3	MDL	2.6	MRL	ppbv	J	RI
CIS-1,3-DICHLOROPROPENE	2.6	J,U,C3	1.3	MDL	2.6	MRL	ppbv	UJ	IcRsd
m&p-Xylene	2.9	J,C1	2.6	MDL	5.2	MRL	ppbv	J	RI

**Sample ID:** SVE Stack-0901 **Collected:** 9/6/2012 10:46:00 **Analysis Type:** Initial- **Dilution:** 2.58

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,2-DICHLOROBENZENE	1.3	J,C1	1.3	MDL	2.6	MRL	ppbv	J	RI
1,2-DICHLOROETHANE	2.6	J,U,C3	1.3	MDL	2.6	MRL	ppbv	UJ	IcRsd
CIS-1,3-DICHLOROPROPENE	2.6	J,U,C3	1.3	MDL	2.6	MRL	ppbv	UJ	IcRsd

\* denotes a non-reportable result

Project Name and Number: R12SA6 - Modesto SVE Summer 2012 Sampling

10/10/2012 12:01:13 PM

ADR version 1.6.0.190

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# Data Qualifier Summary

Lab Reporting Batch ID: 12251E

Laboratory: FALSE

EDD Filename: 12251E\_voc

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
IcRsd	Initial Calibration Percent Relative Standard Deviation
RI	Reporting Limit Trace Value

\* denotes a non-reportable result

Project Name and Number: R12SA6 - Modesto SVE Summer 2012 Sampling

10/10/2012 12:01:13 PM

ADR version 1.6.0.190

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**SDG 12258A**

# Data Qualifier Summary

Lab Reporting Batch ID: 12258A

Laboratory: FALSE

EDD Filename: 12258a\_voc\_1209024 FINAL

eQAPP Name: Modesto\_Site\_062812

**Method Category:** VOA  
**Method:** 524.2 **Matrix:** Water

Sample ID: EW02-40 Collected: 9/13/2012 12:12:00 Analysis Type: Initial Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd, Ccv
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
CIS-1,2-DICHLOROETHENE	0.3	J,C1	0.2	MDL	0.5	MRL	ug/L	J	RI
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Ccv
NAPHTHALENE	0.5	J,U,C4,Q3	0.2	MDL	0.5	MRL	ug/L	UJ	Ccv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

Sample ID: MW-305-3Q12 Collected: 9/13/2012 8:00:00 Analysis Type: Initial Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,2-DICHLOROPROPANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd, Ccv
BROMOMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd
DICHLORODIFLUOROMETHANE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	Ccv
NAPHTHALENE	0.5	J,U,C4,Q3	0.2	MDL	0.5	MRL	ug/L	UJ	Ccv
TRANS-1,3-DICHLOROPROPENE	0.5	J,U,C3	0.2	MDL	0.5	MRL	ug/L	UJ	IcRsd

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

10/10/2012 1:16:13 PM

ADR version 1.6.0.190

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# Data Qualifier Summary

Lab Reporting Batch ID: 12258A

Laboratory: FALSE

EDD Filename: 12258a\_voc\_1209024 FINAL

eQAPP Name: Modesto\_Site\_062812

## Reason Code Legend

<i>Reason Code</i>	<i>Description</i>
Ccv	Continuing Calibration Verification Percent Difference Lower Estimation
lcRsd	Initial Calibration Percent Relative Standard Deviation
RI	Reporting Limit Trace Value

\* denotes a non-reportable result

Project Name and Number: R12SB6 - Modesto Groundwater Summer 2012 Qtrly Monitoring

10/10/2012 1:16:13 PM

ADR version 1.6.0.190

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## *Data Qualifier Summary*

Lab Reporting Batch ID: 12258A

Laboratory: FALSE

EDD Filename: 1209024 FINAL

eQAPP Name: Modesto\_Site\_062812

**No Data Review Qualifiers Applied.**

## **Appendix B**

### **Manual Validation Level III and IV Worksheets and ADR Reports**

**SDG 12201D**

# Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 12201D

Laboratory: R9LAB

EDD Filename: 12201d\_voc\_1207025 FINAL

eQAPP Name: Modesto\_Site\_062812

**Method:** TO-15

**Matrix:** Air

QC Sample ID (Associated Samples)	Compound	LCS %R	LCSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
B2G0043-BS1 (SVE Pre GAC-0703 SVE Stack-0703)	1,1,1-TRICHLOROETHANE	75	-	80.00-131.00	-	1,1,1-TRICHLOROETHANE	J- (all detects) UJ (all non-detects)
	1,1-DICHLOROETHENE	80	-	81.00-127.00	-	1,1-DICHLOROETHENE	
	CARBON TETRACHLORIDE	71	-	77.00-136.00	-	CARBON TETRACHLORIDE	
	CHLOROFORM	80	-	81.00-127.00	-	CHLOROFORM	
	TRICHLOROFLUOROMETHANE	70	-	72.00-141.00	-	TRICHLOROFLUOROMETHAN	

# Reporting Limit Outliers

Lab Reporting Batch ID: 12201D

Laboratory: R9LAB

EDD Filename: 12201d\_voc\_1207025 FINAL

eQAPP Name: Modesto\_Site\_062812

**Method:** TO-15

**Matrix:** Air

<i>SampleID</i>	<i>Analyte</i>	<i>Lab Qual</i>	<i>Result</i>	<i>Reporting Limit</i>	<i>RL Type</i>	<i>Units</i>	<i>Flag</i>
SVE Pre GAC-0703	TRICHLOROETHENE	J,C1	2.1	2.7	MRL	ppbv	J (all detects)

LDC #: 28121A48  
 SDG #: 12201D  
 Laboratory: EPA Region 9 Laboratory

**VALIDATION COMPLETENESS WORKSHEET**  
 ADR

Date: 8/20/12  
 Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

**METHOD:** GC/MS Volatiles (EPA Method TO-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	N	Sampling dates: <u>7/18/12</u>
II.	GC/MS Instrument performance check	SW	
III.	Initial calibration	A	% RSD ≤ 30
IV.	Continuing calibration/ICV	SW	ICV / CCV ≤ 30
V.	Blanks	N	
VI.	Surrogate spikes	N	
VII.	Matrix spike/Matrix spike duplicates / D <sub>ref</sub>	N/D	
VIII.	Laboratory control samples	N	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A <del>N</del>	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A <del>N</del>	
XVI.	Field duplicates	↓	
XVII.	Field blanks	↓	

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet  
 ND = No compounds detected  
 R = Rinsate  
 FB = Field blank  
 D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

Validated Samples:

Air

1	SVE Pre GAC-0703	11		21		31	
2	SVE Stack-0703	12		22		32	
3	SVE Pre GAC-0703DUP	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

## TARGET COMPOUND WORKSHEET

**METHOD:** VOA (EPA Method TO-15)

A. Chloromethane	S. Trichloroethene	KK. Trichlorofluoromethane	CCC. tert-Butylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	MMMM. Benzyl chloride
B. Bromomethane	T. Dibromochloromethane	LL. Methyl-tert-butyl ether	DDD. 1,2,4-Trimethylbenzene	VVV. 4-Ethyltoluene	
C. Vinyl chloride	U. 1,1,2-Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	EEE. sec-Butylbenzene	WWW. Ethanol	
D. Chloroethane	V. Benzene	NN. Diethyl ether	FFF. 1,3-Dichlorobenzene	XXX. Di-isopropyl ether	
E. Methylene chloride	W. trans-1,3-Dichloropropene	OO. 2,2-Dichloropropane	GGG. p-Isopropyltoluene	YYY. tert-Butanol	
F. Acetone	X. Bromoform	PP. Bromochloromethane	HHH. 1,4-Dichlorobenzene	ZZZ. tert-Butyl alcohol	
G. Carbon disulfide	Y. 4-Methyl-2-pentanone	QQ. 1,1-Dichloropropene	III. n-Butylbenzene	AAAA. Ethyl tert-butyl ether	
H. 1,1-Dichloroethene	Z. 2-Hexanone	RR. Dibromomethane	JJJ. 1,2-Dichlorobenzene	BBBB. tert-Amyl methyl ether	
I. 1,1-Dichloroethane	AA. Tetrachloroethene	SS. 1,3-Dichloropropane	KKK. 1,2,4-Trichlorobenzene	CCCC. 1-Chlorohexane	
J. 1,2-Dichloroethene, total	BB. 1,1,2,2-Tetrachloroethane	TT. 1,2-Dibromoethane	LLL. Hexachlorobutadiene	DDDD. Isopropyl alcohol	
K. Chloroform	CC. Toluene	UU. 1,1,1,2-Tetrachloroethane	MMM. Naphthalene	EEEE. Acetonitrile	
L. 1,2-Dichloroethane	DD. Chlorobenzene	VV. Isopropylbenzene	NNN. 1,2,3-Trichlorobenzene	FFFF. Acrolein	
M. 2-Butanone	EE. Ethylbenzene	WW. Bromobenzene	OOO. 1,3,5-Trichlorobenzene	GGGG. Acrylonitrile	
N. 1,1,1-Trichloroethane	FF. Styrene	XX. 1,2,3-Trichloropropane	PPP. trans-1,2-Dichloroethene	HHHH. 1,4-Dioxane	
O. Carbon tetrachloride	GG. Xylenes, total	YY. n-Propylbenzene	QQQ. cis-1,2-Dichloroethene	IIII. Isobutyl alcohol	
P. Bromodichloromethane	HH. Vinyl acetate	ZZ. 2-Chlorotoluene	RRR. m,p-Xylenes	JJJJ. Methacrylonitrile	
Q. 1,2-Dichloropropane	II. 2-Chloroethylvinyl ether	AAA. 1,3,5-Trimethylbenzene	SSS. o-Xylene	KKKK. Propionitrile	
R. cis-1,3-Dichloropropene	JJ. Dichlorodifluoromethane	BBB. 4-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	LLLL. Ethyl ether	





**SDG 12220A**

# Trip Blank Outlier Report

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_voc\_2of2\_1208017 FINAL

eQAPP Name: Modesto\_Site\_062812

**Method:** 524.2  
**Matrix:** Water

Trip Blank Sample ID	Collected Date	Analyte	Result	Associated Samples
MW-302-3Q12(Initial)	8/7/2012 8:00:00 AM	ACETONE	2.2 ug/L	MW-17B-3Q12 MW-19A-3Q12 MW-19B-3Q12 MW-1A-3Q12 MW-24B-3Q12 MW-2A-3Q12 MW-402-3Q12 MW-4A-3Q12 MW-4B-3Q12 MW-4C-3Q12 MW-8A-3Q12

*The following samples and their listed target analytes were qualified due to contamination reported in this blank*

Sample ID	Analyte	Reported Result	Modified Final Result
MW-402-3Q12(Initial)	ACETONE	3.2 ug/L	4.0U ug/L

# Trip Blank Outlier Report

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_rsk

eQAPP Name: Modesto\_Site\_062812

**Method:** RSK-175  
**Matrix:** Water

Trip Blank Sample ID	Collected Date	Analyte	Result	Associated Samples
MW-302-3Q12(Initial2)	8/7/2012 8:00:00 AM	METHANE	1.2 ug/L	MW-17B-3Q12 MW-24B-3Q12 MW-25B-3Q12 MW-28B-3Q12 MW-4A-3Q12 MW-4B-3Q12 MW-8A-3Q12

*The following samples and their listed target analytes were qualified due to contamination reported in this blank*

Sample ID	Analyte	Reported Result	Modified Final Result
MW-25B-3Q12(Initial2)	METHANE	1.1 ug/L	1.2U ug/L
MW-4A-3Q12(Initial2)	METHANE	0.7 ug/L	1.2U ug/L

# Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_voc\_1of2\_1208014 FINAL

eQAPP Name: Modesto\_Site\_062812

Method: 524.2

Matrix: Water

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
MW-25B-3Q12MS (MW-25B-3Q12)	DICHLORODIFLUOROMETHAN	148	137	25.00-135.00	-	DICHLORODIFLUOROMETHA	J+ (all detects)

# Reporting Limit Outliers

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_voc\_2of2\_1208017 FINAL

eQAPP Name: Modesto\_Site\_062812

Method: 524.2

Matrix: Water

<i>SampleID</i>	<i>Analyte</i>	<i>Lab Qual</i>	<i>Result</i>	<i>Reporting Limit</i>	<i>RL Type</i>	<i>Units</i>	<i>Flag</i>
MW-17B-3Q12	CHLOROFORM	J,C1	0.3	0.5	MRL	ug/L	J (all detects)
MW-302-3Q12	ACETONE	J,C1	2.2	4.0	MRL	ug/L	J (all detects)
MW-402-3Q12	ACETONE	J,C1	3.2	4.0	MRL	ug/L	J (all detects)

## Reporting Limit Outliers

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 1208014,1208017 FINAL

eQAPP Name: Modesto\_Site\_062812

**Method:** 415.3

**Matrix:** Water

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
MW-25B-3Q12	Total Organic Carbon	J,C1	0.26	0.50	MRL	mg/L	J (all detects)
MW-8A-3Q12	Total Organic Carbon	J,C1	0.47	0.50	MRL	mg/L	J (all detects)

**Method:** 4500-S2

**Matrix:** Water

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
MW-24B-3Q12	SULFIDE	J,C1	0.59	1.0	MRL	mg/L	J (all detects)
MW-4A-3Q12	SULFIDE	J,C1	0.67	1.0	MRL	mg/L	J (all detects)
MW-4B-3Q12	SULFIDE	J,C1	0.90	1.0	MRL	mg/L	J (all detects)
MW-8A-3Q12	SULFIDE	J,C1	0.92	1.0	MRL	mg/L	J (all detects)

# Reporting Limit Outliers

Lab Reporting Batch ID: 12220A

Laboratory: FALSE

EDD Filename: 12220a\_rsk

eQAPP Name: Modesto\_Site\_062812

Method: RSK-175

Matrix: Water

<i>SampleID</i>	<i>Analyte</i>	<i>Lab Qual</i>	<i>Result</i>	<i>Reporting Limit</i>	<i>RL Type</i>	<i>Units</i>	<i>Flag</i>
MW-25B-3Q12	METHANE	J,C1	1.1	1.2	MRL	ug/L	J (all detects)
MW-4A-3Q12	METHANE	J,C1	0.7	1.2	MRL	ug/L	J (all detects)

LDC #: 28292A1

## VALIDATION COMPLETENESS WORKSHEET

Date: 9/24/12

SDG #: 12220A

ADR

Page: 1 of 1

Laboratory: USEPA Region 9 Laboratory

Reviewer: SVL

2nd Reviewer: [Signature]

METHOD: GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	N	Sampling dates: 8/06-07/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	? RSD $\leq$ 20%
IV.	Continuing calibration/ICV	SW	CV/ICV $\leq$ 30%
V.	Blanks	N	
VI.	Surrogate spikes	N	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	N	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	TB = 7      FB = 8

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

Validated Samples:

Water

1	MW-25B-3Q12	11	MW-1A-3Q12	21	B2H 0026-Blk1	31
2	MW-28B-3Q12	12	MW-24B-3Q12	22	B2H 0029 -	32
3	MW-4B-3Q12	13	MW-19A-3Q12	23	B2H 0031 -	33 (AA)
4	MW-4C-3Q12	14	MW-19B-3Q12	24		34
5	MW-2A-3Q12	15	# 1 MS	25		35
6	MW-4A-3Q12	16	# 1 MSD	26		36
7	MW-302-3Q12	17		27		37
8	MW-402-3Q12	18		28		38
9	MW-8A3Q12	19		29		39
10	MW-17B-3Q12	20		30		40

## TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.





LDC #: 28362A6  
 SDG #: 12220A  
 Laboratory: EPA Region 9 Laboratory

**VALIDATION COMPLETENESS WORKSHEET**

ADR / W

Date: 9-20-12

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

Sm 2320

**METHOD: (Analyte)** Alkalinity (EPA Method 310.4), Chloride, Sulfate, Nitrate-N, (EPA Method 300.0), Sulfide (SM4500), Total Organic Carbon (EPA Method 415.3)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/6-7/12
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VI.	Duplicates	A	DP
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI	Field blanks	N	

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet

ND = No compounds detected  
 R = Rinsate  
 FB = Field blank

D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

Validated Samples:

Water

1	MW-25B-3Q12	11	MW-25B-3Q12DUP	21		31	
2	MW-28B-3Q12 **	12		22		32	
3	MW-4B-3Q12	13		23		33	
4	MW-4A-3Q12	14		24		34	
5	MW-8A3Q12	15		25		35	
6	MW-17B-3Q12	16		26		36	
7	MW-24B-3Q12	17		27		37	
8	MW-15A-3Q12	18		28		38	
9	MW-25B-3Q12MS	19		29		39	
10	MW-25B-3Q12MSD	20		30		40	

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

LDC #: 28362A51a  
 SDG #: 12220A  
 Laboratory: EPA Region 9 Laboratory

**VALIDATION COMPLETENESS WORKSHEET**  
 ADR / IV

Date: 9/20/12  
 Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

**METHOD:** GC Methane, Ethane, & Ethene (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/7/12
II	Initial calibration	A	RSD ≤ 20%
III.	Calibration verification/ICV	SW	COV/COI ≤ 20%
IV.	Blanks	SW	
V	Surrogate recovery	N	
VI.	Matrix spike/Matrix spike duplicates	<del>A</del>	
VII.	Laboratory control samples	<del>A</del>	LCS
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODS	N	
X.	System Performance	N	
XI.	Overall assessment of data	N	
XII.	Field duplicates	N	
XIII.	Field blanks	SW	TB = 5

Note: A = Acceptable      ND = No compounds detected      D = Duplicate  
 N = Not provided/applicable      R = Rinsate      TB = Trip blank  
 SW = See worksheet      FB = Field blank      EB = Equipment blank

Validated Samples: ✓

1	MW-25B-3Q12	11	#240058	21		31	
2	MW-28B-3Q12	12		22		32	
3	MW-4B-3Q12	13		23		33	
4	MW-4A-3Q12	14		24		34	
5	MW-302-3Q12	15		25		35	
6	MW-8A3Q12	16		26		36	
7	MW-17B-3Q12	17		27		37	
8	MW-24B-3Q12 ***	18		28		38	
9	MW-28B-3Q12MS	19		29		39	
10	MW-28B-3Q12MSD	20		30		40	

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



LDC #: 28362A50  
 SDG #: 12220A  
 Laboratory: EPA Region 9 Laboratory

**VALIDATION COMPLETENESS WORKSHEET**  
 ADR/IV

Date: 9/20/12  
 Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

**METHOD:** GC Carbon Dioxide(Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

Validation Area			Comments
I.	Technical holding times	A	Sampling dates: 8/7/12
II.	Initial calibration	A	RSD = 20%
III.	Calibration verification/ICV	X	CCV/ICV = 20%
IV.	Blanks	A	
V.	Surrogate recovery	N	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS
VIII.	Target compound identification	N	
IX.	Compound quantitation/RI/LEQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	N	
XII.	Field duplicates	A	
XIII.	Field blanks	ND	TB = 5

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet

ND = No compounds detected  
 R = Rinsate  
 FB = Field blank

D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

Validated Samples:

1	MW-25B-3Q12	11	B210032	21		31	
2	MW-28B-3Q12	12		22		32	
3	MW-4B-3Q12	13		23		33	
4	MW-4A-3Q12	14		24		34	
5	MW-302-3Q12	15		25		35	
6	MW-8A3Q12	16		26		36	
7	MW-17B-3Q12	17		27		37	
8	MW-24B-3Q12 **	18		28		38	
9	MW-25B-3Q12MS	19		29		39	
10	MW-25B-3Q12MSD	20		30		40	

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** Modesto  
**Collection Date:** August 6 through August 7, 2012  
**LDC Report Date:** September 21, 2012  
**Matrix:** Water  
**Parameters:** Wet Chemistry  
**Validation Level:** EPA Level IV  
**Laboratory:** EPA Region 9 Laboratory  
**Sample Delivery Group (SDG):** 12220A

**Sample Identification**

MW-28B-3Q12

## Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per Standard Method 2320 for Alkalinity, EPA Method 300.0 for Chloride, Sulfate, and Nitrate as Nitrogen, Standard Method 4500 for Sulfide, and EPA Method 415.3 for Total Organic Carbon.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (January 2010).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## **II. Initial Calibration**

All criteria for the initial calibration were met.

## **III. Continuing Calibration**

Continuing calibration frequency and analysis criteria were met.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

No field blanks were identified in this SDG.

## **V. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VI. Duplicates**

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

## **VIII. Sample Result Verification**

All sample result verifications were acceptable.

All analytes reported below the RL and above the MDL were qualified as follows:

<b>Sample</b>	<b>Analyte</b>	<b>Flag</b>	<b>A or P</b>
All samples in SDG 12220A	All analytes reported below the RL and above the MDL.	J (all detects)	A

## **IX. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

## **X. Field Duplicates**

No field duplicates were identified in this SDG.

**Modesto  
Wet Chemistry - Data Qualification Summary - SDG 12220A**

<b>SDG</b>	<b>Sample</b>	<b>Analyte</b>	<b>Flag</b>	<b>A or P</b>	<b>Reason</b>
12220A	MW-28B-3Q12	All analytes reported below the RL and above the MDL.	J (all detects)	A	Sample result verification

**Modesto  
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 12220A**

No Sample Data Qualified in this SDG

**Modesto  
Wet Chemistry - Field Blank Data Qualification Summary - SDG 12220A**

No Sample Data Qualified in this SDG

LDC #: 28362A6

# VALIDATION COMPLETENESS WORKSHEET

SDG #: 12220A

Laboratory: EPA Region 9 Laboratory

ADR (IV)

Date: 9-20-12

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

SM 2320

**METHOD: (Analyte)** Alkalinity (EPA Method 310.4), Chloride, Sulfate, Nitrate-N, (EPA Method 300.0), Sulfide (SM4500), Total Organic Carbon (EPA Method 415.3)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/6 - 7/12
II.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Blanks	A	
V.	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VI.	Duplicates	A	DP
VII.	Laboratory control samples	A	LCS
VIII.	Sample result verification	A	
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI.	Field blanks	N	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

Validated Samples: water

1	MW-25B-3Q12	11	MW-25B-3Q12DUP	21		31	
2	MW-28B-3Q12 **	12		22		32	
3	MW-4B-3Q12	13		23		33	
4	MW-4A-3Q12	14		24		34	
5	MW-8A-3Q12	15		25		35	
6	MW-17B-3Q12	16		26		36	
7	MW-24B-3Q12	17		27		37	
8	MW-15A-3Q12	18		28		38	
9	MW-25B-3Q12MS	19		29		39	
10	MW-25B-3Q12MSD	20		30		40	

Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Method: Inorganics (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. Calibration</b>				
Were all instruments calibrated daily, each set-up time?	/			
Were the proper number of standards used?	/			
Were all initial calibration correlation coefficients > 0.995?	/			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	/			
Were titrant checks performed as required? (Level IV only)	/			
Were balance checks performed as required? (Level IV only)			/	
<b>III. Blanks</b>				
Was a method blank associated with every sample in this SDG?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
<b>IV. Matrix spike/Matrix spike duplicates and Duplicates</b>				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	/			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL (≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were < 5X the CRDL.	/			
<b>V. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	/			
<b>VI. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?		/		
Were the performance evaluation (PE) samples within the acceptance limits?			/	

LDC #: 28362A6

VALIDATION FINDINGS CHECKLIST

Page: 22 of 22  
Reviewer: [Signature]  
2nd Reviewer: [Signature]

Validation Area	Yes	No	NA	Findings/Comments
<b>VII. Sample Result Verification</b>				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
Were detection limits < RL?	/			
<b>VIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>IX. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.		/		
Target analytes were detected in the field duplicates.			/	
<b>X. Field blanks</b>				
Field blanks were identified in this SDG.		/		
Target analytes were detected in the field blanks.			/	



LDC #: 28362A6

**Validation Findings Worksheet**  
**Initial and Continuing Calibration Calculation Verification**

Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

Method: Inorganics, Method see cover

The correlation coefficient (r) for the calibration of Cl was recalculated. Calibration date: 7/19/12

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$$\%R = \frac{\text{Found} \times 100}{\text{True}}$$

Where,

Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (mg/l)	Area	Recalculated	Reported	Acceptable (Y/N)
					r or r <sup>2</sup>	r or r <sup>2</sup>	
Initial Calibration Verification	Cl	s1	0.5	0.069	0.999885	0.999984	Y
		s2	1	0.142			
		s3	5	0.729			
		s4	10	1.527			
		s5	25	4.372			
		s6	50	9.679			
Calibration verification	NO <sub>3</sub> -N	CCV	10	9.814	98	-	N
Calibration verification	SO <sub>4</sub>	↓	25	25.841	103	-	N
Calibration verification	TOC	↓	25	24.20	99	99	Y

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

**VALIDATION FINDINGS WORKSHEET**  
**Level IV Recalculation Worksheet**

**METHOD:** Inorganics, Method See cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{\text{Found}}{\text{True}} \times 100$$
 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).  
 True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$
 Where, S = Original sample concentration  
 D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated	Reported	Acceptable (Y/N)
					%R / RPD	%R / RPD	
LCS	Laboratory control sample	Cl	9.61	10	96	96	Y
9	Matrix spike sample	TOC	(SSR-SR) 2.737	2.86	96	96	↓
11	Duplicate sample	AlK	181	181	0	0	

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.



**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** Modesto  
**Collection Date:** August 7, 2012  
**LDC Report Date:** September 20, 2012  
**Matrix:** Water  
**Parameters:** Methane, Ethane, & Ethene  
**Validation Level:** EPA Level IV  
**Laboratory:** EPA Region 9 Laboratory  
**Sample Delivery Group (SDG):** 12220A

**Sample Identification**

MW-24B-3Q12

## Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per Method RSK-175 for Methane, Ethane, and Ethene.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## II. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0%.

## III. Continuing Calibration

Continuing calibration was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 20.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
5/8/12	Ethane	20.7	All samples in SDG 12220A	J (all detects) UJ (all non-detects)	A

## IV. Blanks

Method blanks were reviewed for each matrix as applicable. No methane, ethane, or ethene was found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound	Concentration	Associated Samples
B2H0058	8/14/12	Methane	0.6 ug/L	All samples in SDG 12220A

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

Sample MW-302-3Q12 was identified as a trip blank. No methane, ethane, or ethene was found with the following exceptions:

Blank ID	Sampling Date	Compound	Concentration	Associated Samples
MW-302-3Q12	8/7/12	Methane	1.2 ug/L	MW-24B-3Q12

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

#### V. Surrogate Recovery

Surrogates were not required by the method.

#### VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

#### VII. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

#### VIII. Target Compound Identification

All target compound identifications were within validation criteria.

#### IX. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria.

All compounds reported below the RL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 12220A	All compounds reported below the RL.	J (all detects)	A

#### X. System Performance

The system performance was acceptable.

#### XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

**XII. Field Duplicates**

No field duplicates were identified in this SDG.

**Modesto  
Methane, Ethane, & Ethene - Data Qualification Summary - SDG 12220A**

SDG	Sample	Compound	Flag	A or P	Reason
12220A	MW-24B-3Q12	Ethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
12220A	MW-24B-3Q12	All compounds reported below the RL.	J (all detects)	A	Compound quantitation and RLs

**Modesto  
Methane, Ethane, & Ethene - Laboratory Blank Data Qualification Summary - SDG 12220A**

No Sample Data Qualified in this SDG

**Modesto  
Methane, Ethane, & Ethene - Field Blank Data Qualification Summary - SDG 12220A**

No Sample Data Qualified in this SDG

LDC #: 28362A51a

**VALIDATION COMPLETENESS WORKSHEET**

Date: 9/20/12

SDG #: 12220A

ADR / IV

Page: 1 of 1

Laboratory: EPA Region 9 Laboratory

Reviewer: u

2nd Reviewer: A

**METHOD:** GC Methane, Ethane, & Ethene (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/7/12
II.	Initial calibration	A	RSD ≤ 20%
III.	Calibration verification/ICV	SW	COV/COI ≤ 20%
IV.	Blanks	SW	
V.	Surrogate recovery	N	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	N	
XII.	Field duplicates	N	
XIII.	Field blanks	SW	TB = S

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet

ND = No compounds detected  
 R = Rinsate  
 FB = Field blank

D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

Validated Samples: ✓

1	MW-25B-3Q12	11	#240058	21		31	
2	MW-28B-3Q12	12		22		32	
3	MW-4B-3Q12	13		23		33	
4	MW-4A-3Q12	14		24		34	
5	MW-302-3Q12	15		25		35	
6	MW-8A3Q12	16		26		36	
7	MW-17B-3Q12	17		27		37	
8	MW-24B-3Q12 **	18		28		38	
9	MW-28B-3Q12MS	19		29		39	
10	MW-28B-3Q12MSD	20		30		40	

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Method: GC HPLC

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. Initial calibration</b>				
Did the laboratory perform a 5 point calibration prior to sample analysis?	/			
Were all percent relative standard deviations (%RSD) < 20%?	/			
Was a curve fit used for evaluation?			/	
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?			/	
Were the RT windows properly established?	/			
<b>III. Continuing calibration</b>				
Was a continuing calibration analyzed daily?	/			
Were all percent differences (%D) < 15.0% or < 20.0% ?	/			
Were all the retention times within the acceptance windows?	/			
<b>IV. Blanks</b>				
Was a method blank associated with every sample in this SDG?	/			
Was a method blank analyzed for each matrix and concentration?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	/			
<b>V. Surrogate spikes</b>				
Were all surrogate %R within the QC limits?	/			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			/	
<b>VI. Matrix spike/Matrix spike duplicates</b>				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	/			
Was a MS/MSD analyzed every 20 samples of each matrix?	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	/			
<b>VII. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	/			
<b>VIII. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

Validation Area	Yes	No	NA	Findings/Comments
<b>X. Target compound identification</b>				
Were the retention times of reported detects within the RT windows?	/			
<b>XI. Compound quantitation/CRQLs</b>				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
<b>XII. System performance</b>				
System performance was found to be acceptable.	/			
<b>XIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>XIV. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.		/		
Target compounds were detected in the field duplicates.			/	
<b>XV. Field blanks</b>				
Field blanks were identified in this SDG.	/			
Target compounds were detected in the field blanks.	/			



## VALIDATION FINDINGS WORKSHEET

### Blanks

**METHOD:**  GC  HPLC (EPA \_\_\_\_\_)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- Y  N  N/A Were all samples associated with a given method blank?
- Y  N  N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
- Y  N  N/A Was a method blank performed with each extraction batch?
- Y  N  N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Blank extraction date: \_\_\_\_\_ Blank analysis date: 8/14/12 Associated samples:           

Conc. units: ug/L

Compound	Blank ID	Sample Identification							
	B2410058	8							
Methane	0.6	16							

Blank extraction date: \_\_\_\_\_ Blank analysis date: \_\_\_\_\_ Associated samples: \_\_\_\_\_

Conc. units: \_\_\_\_\_

Compound	Blank ID	Sample Identification							

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:  
 All contaminants within five times the method blank concentration were qualified as not detected, "U".



LDC #: 28362A51a

### VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

METHOD: GC  HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C  
 average CF = sum of the CF/number of standards  
 %RSD = 100 \* (S/X)

A = Area of compound,  
 C = Concentration of compound,  
 S = Standard deviation of the CF  
 X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated		
				CF (std)	CF (std)	Average CF (initial)	Average CF (initial)	%RSD	%RSD		
1	10AC	5/8/12	Mexflone	44.099 CF (std)	44.099 CF (std)	1.057 <u>EL</u>	1.057 <u>EL</u>	1.033 <u>EL</u>	1.033 <u>EL</u>	6.61	6.62
2											
3											
4											

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculate results.



LDC #: 28362ACT9

# VALIDATION FINDINGS WORKSHEET

## Surrogate Results Verification

Page: 1 of 1

Reviewer: [Signature]  
2nd reviewer: [Signature]

METHOD:  GC  HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery:  $SF/SS * 100$

Where: SF = Surrogate Found  
SS = Surrogate Spiked

Sample ID: 8

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery		Percent Difference
				Reported	Recalculated	
<u>Acetylene</u>		<u>66.33</u>	<u>73.001</u>	<u>10</u>	<u>10</u>	<u>0</u>

Sample ID: \_\_\_\_\_

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery		Percent Difference
				Reported	Recalculated	

Sample ID: \_\_\_\_\_

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery		Percent Difference
				Reported	Recalculated	

## VALIDATION FINDINGS WORKSHEET

### Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

METHOD:    GC    HPLC

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 \* (SSC-SC)/SA

Where: SSC = Spiked sample concentration

SC = Concentration

SA = Spike added

RPD = |SSCLCS - SSCLCSD| \* 2 / (SSCLCS + SSCLCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples:           32H0062-DS1          

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS		LCSD		LCS/LCSD		
	LCS	LCSD	LCS	LCSD	Percent Recovery		Percent Recovery		RPD		
					Reported	Recalc.	Reported	Recalc.	Reported	Recalc.	
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)	44.1		40.9	41.8	95	95					
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

**VALIDATION FINDINGS WORKSHEET**  
**Sample Calculation Verification**

METHOD:  GC  HPLC

Y N N/A  
Y N N/A

Were all reported results recalculated and verified for all level IV samples?

Were all recalculated results for detected target compounds agree within 10% of the reported results?

Concentration=  $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

Example:

Sample ID. 8 Compound Name Mexane

Concentration =  $\frac{16331434}{1.033 \text{ EB}}$   
 = 16 ug/L

- A= Area or height of the compound to be measured
- Fv= Final Volume of extract
- Df= Dilution Factor
- RF= Average response factor of the compound  
In the initial calibration
- Vs= Initial volume of the sample
- Ws= Initial weight of the sample
- %S= Percent Solid

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: \_\_\_\_\_

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** Modesto  
**Collection Date:** August 7, 2012  
**LDC Report Date:** September 20, 2012  
**Matrix:** Water  
**Parameters:** Carbon Dioxide  
**Validation Level:** EPA Level IV  
**Laboratory:** EPA Region 9 Laboratory

**Sample Delivery Group (SDG):** 12220A

**Sample Identification**

MW-24B-3Q12

## Introduction

This data review covers one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per Method RSK-175 for Carbon Dioxide.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## **II. Initial Calibration**

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

## **III. Continuing Calibration**

Continuing calibration was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 20.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 20.0%.

## **IV. Blanks**

Method blanks were reviewed for each matrix as applicable. No carbon dioxide was found in the method blanks.

Sample MW-302-3Q12 was identified as a trip blank. No carbon dioxide was found.

## **V. Surrogate Recovery**

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

## **VI. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

## **VII. Laboratory Control Samples**

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

## **VIII. Target Compound Identification**

All target compound identifications were within validation criteria.

### IX. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria.

All compounds reported below the RL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 12220A	All compounds reported below the RL.	J (all detects)	A

### X. System Performance

The system performance was acceptable.

### XI. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

### XII. Field Duplicates

No field duplicates were identified in this SDG.

**Modesto  
Carbon Dioxide - Data Qualification Summary - SDG 12220A**

<b>SDG</b>	<b>Sample</b>	<b>Compound</b>	<b>Flag</b>	<b>A or P</b>	<b>Reason</b>
12220A	MW-24B-3Q12	All compounds reported below the RL.	J (all detects)	A	Compound quantitation and RLs

**Modesto  
Carbon Dioxide - Laboratory Blank Data Qualification Summary - SDG 12220A**

No Sample Data Qualified in this SDG

**Modesto  
Carbon Dioxide - Field Blank Data Qualification Summary - SDG 12220A**

No Sample Data Qualified in this SDG

LDC #: 28362A50 <sup>516</sup>

SDG #: 12220A

Laboratory: EPA Region 9 Laboratory

**VALIDATION COMPLETENESS WORKSHEET**

ADR 1(N)

Date: 9/20/12

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

**METHOD:** GC Carbon Dioxide(Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: <u>8/7/12</u>
II.	Initial calibration	A	<u>RSD = 20%</u>
III.	Calibration verification/ICV	A	<u>CCV/ICV = 20%</u>
IV.	Blanks	A	
V.	Surrogate recovery	N	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	<u>LOS</u>
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	N	
XII.	Field duplicates	A	
XIII.	Field blanks	ND	<u>TB = 5</u>

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinstate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

Validated Samples:

1	MW-25B-3Q12	11	<u>B2H0032</u>	21		31	
2	MW-28B-3Q12	12		22		32	
3	MW-4B-3Q12	13		23		33	
4	MW-4A-3Q12	14		24		34	
5	MW-302-3Q12	15		25		35	
6	MW-8A3Q12	16		26		36	
7	MW-17B-3Q12	17		27		37	
8	MW-24B-3Q12 **	18		28		38	
9	MW-25B-3Q12MS	19		29		39	
10	MW-25B-3Q12MSD	20		30		40	

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Method: GC HPLC

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. Initial calibration</b>				
Did the laboratory perform a 5 point calibration prior to sample analysis?	/			
Were all percent relative standard deviations (%RSD) < 20%?	/			
Was a curve fit used for evaluation?		/		
Did the initial calibration meet the curve fit acceptance criteria of > 0.990?			/	
Were the RT windows properly established?	/			
<b>III. Continuing calibration</b>				
Was a continuing calibration analyzed daily?	/			
Were all percent differences (%D) < 15.0% or < 20.0% ?	/			
Were all the retention times within the acceptance windows?	/			
<b>IV. Blanks</b>				
Was a method blank associated with every sample in this SDG?	/			
Was a method blank analyzed for each matrix and concentration?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
<b>V. Surrogate spikes</b>				
Were all surrogate %R within the QC limits?	/	/		
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			/	
<b>VI. Matrix spike/Matrix spike duplicates</b>				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	/			
Was a MS/MSD analyzed every 20 samples of each matrix?	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	/			
<b>VII. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per extraction batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	/			
<b>VIII. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	

Validation Area	Yes	No	NA	Findings/Comments
<b>X. Target compound identification</b>				
Were the retention times of reported detects within the RT windows?	/			
<b>XI. Compound quantitation/CRQLs</b>				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
<b>XII. System performance</b>				
System performance was found to be acceptable.	/			
<b>XIII. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>XIV. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.		/		
Target compounds were detected in the field duplicates.			/	
<b>XV. Field blanks</b>				
Field blanks were identified in this SDG.	/			
Target compounds were detected in the field blanks.		/		

LDC #: 28362A50

## VALIDATION FINDINGS WORKSHEET Initial Calibration Calculation Verification

Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

METHOD: GC  HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C  
 average CF = sum of the CF/number of standards  
 %RSD = 100 \* (S/X)

A = Area of compound,  
 C = Concentration of compound,  
 S = Standard deviation of the CF  
 X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				CF (std)	CF (std)	Average CF (initial)	Average CF (initial)	%RSD	%RSD
1	IQAL	2/26/12	CO <sub>2</sub>	1276.1 8.089E3	1276.1 8.089E3	8.242E3	8.242E3	2.53	2.53
2									
3									
4									

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.



VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

METHOD:    GC    HPLC

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 \* (SSC-SC)/SA

Where: SSC = Spiked sample concentration

SC = Concentration

RPD = |SSCLCS - SSCLCSD| \* 2 / (SSCLCS + SSCLCSD)

SA = Spike added

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples:    B210032-BS

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS		LCSD		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Percent Recovery		Percent Recovery		RPD	
					Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
CO <sub>2</sub>	12200		11600		95	95				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

## VALIDATION FINDINGS WORKSHEET

### Sample Calculation Verification

METHOD:  GC  HPLC

- N N/A    Were all reported results recalculated and verified for all level IV samples?  
 N N/A    Were all recalculated results for detected target compounds agree within 10% of the reported results?

Concentration =  $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

Example:

Sample ID 8    Compound Name CO2

- A= Area or height of the compound to be measured
- Fv= Final Volume of extract
- Df= Dilution Factor
- RF= Average response factor of the compound  
In the initial calibration
- Vs= Initial volume of the sample
- Ws= Initial weight of the sample
- %S= Percent Solid

Concentration =  $\frac{64476648}{8.242 \text{ mL}}$   
 = 7800 ug/L

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications

Comments: \_\_\_\_\_

**SDG 12222A**

# Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 12222a\_voc\_1208021 FINAL

eQAPP Name: Modesto\_Site\_062812

Method: 524.2

Matrix: Water

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
MW-9B-3Q12MS (MW-9B-3Q12)	1,1,2-TRICHLORO-1,2,2-TRIFLUORODICHLORODIFLUOROMETHAN	141 155	- 157	38.00-140.00 25.00-135.00	- -	1,1,2-TRICHLORO-1,2,2-TRIFLUORODICHLORODIFLUOROMETHAN	J+ (all detects)

# Reporting Limit Outliers

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 12222a\_voc\_1208021 FINAL

eQAPP Name: Modesto\_Site\_062812

Method: 524.2

Matrix: Water

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
MW-12A-3Q12	BROMODICHLOROMETHANE	J,C1	0.4	0.5	MRL	ug/L	J (all detects)
MW-13A-3Q12	BROMODICHLOROMETHANE	J,C1	0.3	0.5	MRL	ug/L	J (all detects)
MW-17A-3Q12	BROMODICHLOROMETHANE	J,C1	0.3	0.5	MRL	ug/L	J (all detects)
MW-20A-3Q12	BROMODICHLOROMETHANE	J,C1	0.3	0.5	MRL	ug/L	J (all detects)
MW-26B-3Q12	TETRACHLOROETHENE	J,C1	0.3	0.5	MRL	ug/L	J (all detects)
MW-6A-3Q12	BROMODICHLOROMETHANE	J,C1	0.3	0.5	MRL	ug/L	J (all detects)

# Reporting Limit Outliers

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 1208021 FINAL

eQAPP Name: Modesto\_Site\_062812

Method: 415.3

Matrix: Water

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
MW-20B-3Q12	Total Organic Carbon	J,C1	0.45	0.50	MRL	mg/L	J (all detects)

Method: 4500-S2

Matrix: Water

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
MW-20A-3Q12	SULFIDE	J,C1	0.67	1.0	MRL	mg/L	J (all detects)

# Field Duplicate RPD Report

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 12222a\_voc\_1208021 FINAL\_rev

eQAPP Name: Modesto\_Site\_062812

Method: 524.2  
Matrix: Water

Analyte	Concentration (ug/L)		Sample RPD	eQAPP RPD	Flag
	MW-14A-3Q12	MW-86A-3Q12			
CHLOROFORM	2.9	2.9	0	1.00	No Qualifiers Applied
TETRACHLOROETHENE	2.5	2.4	4	1.00	

# Field Duplicate RPD Report

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 1208021 FINAL

eQAPP Name: Modesto\_Site\_062812

**Method: 2320B**  
**Matrix: Water**

Analyte	Concentration (mg/L)		Sample RPD	eQAPP RPD	Flag
	MW-5A-3Q12	MW-95A-3Q12			
Bicarbonate Alkalinity	460	450	2	1.00	No Qualifiers Applied
Total Alkalinity	460	450	2	1.00	

**Method: 300.0**  
**Matrix: Water**

Analyte	Concentration (mg/L)		Sample RPD	eQAPP RPD	Flag
	MW-5A-3Q12	MW-95A-3Q12			
CHLORIDE	80	79	1	1.00	No Qualifiers Applied
NITRATE AS N	8.1	8.2	1	1.00	
SULFATE AS SO4	53	52	2	1.00	

**Method: 415.3**  
**Matrix: Water**

Analyte	Concentration (mg/L)		Sample RPD	eQAPP RPD	Flag
	MW-5A-3Q12	MW-95A-3Q12			
Total Organic Carbon	0.60	0.62	3	1.00	No Qualifiers Applied

# Field Duplicate RPD Report

Lab Reporting Batch ID: 12222A

Laboratory: FALSE

EDD Filename: 12222a\_rsk

eQAPP Name: Modesto\_Site\_062812

Method: RSK-175

Matrix: Water

Analyte	Concentration (ug/L)		Sample RPD	eQAPP RPD	Flag
	MW-5A-3Q12	MW-95A-3Q12			
Carbon Dioxide	88000	71000	21	1.00	No Qualifiers Applied
METHANE	2.0	1.7	16	1.00	

LDC #: 28292B1

**VALIDATION COMPLETENESS WORKSHEET**

Date: 9/12/12

SDG #: 12222A

ADR/IV

Page: 1 of 1

Laboratory: EPA Region 9 Laboratory

Reviewer: [Signature]

524.2

2nd Reviewer: [Signature]

**METHOD:** GC/MS Volatiles (EPA SW-846-Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	N	Sampling dates: 8/06 - 08/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	2 RSD ≤ 20%
IV.	Continuing calibration/ICV	SW	CV/ICV ≤ 30%
V.	Blanks	N	Not reviewed for ADR validation.
VI.	Surrogate spikes		Not reviewed for ADR validation.
VII.	Matrix spike/Matrix spike duplicates		Not reviewed for ADR validation.
VIII.	Laboratory control samples	✓	Not reviewed for ADR validation.
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	Not reviewed for ADR validation.
XI.	Target compound identification	N	Not reviewed for ADR validation.
XII.	Compound quantitation/RL/LOQ/LODs		Not reviewed for ADR validation.
XIII.	Tentatively identified compounds (TICs)		Not reviewed for ADR validation.
XIV.	System performance		Not reviewed for ADR validation.
XV.	Overall assessment of data		Not reviewed for ADR validation.
XVI.	Field duplicates		
XVII.	Field blanks	✓	

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet

ND = No compounds detected  
 R = Rinsate  
 FB = Field blank

D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

Validated Samples: \*\* Indicates sample underwent Level IV validation

WLAAC

1	MW-20A-3Q12	11	MW-7A-3Q12**	21	B2H 0044 - B1k1	31	
2	MW-20B-3Q12	12	MW-86A-3Q12 D	22	B2H 0047 -	32	
3	MW-9B-3Q12**	13	MW-10A-3Q12	23	B2H 0031 -	33	
4	MW-5A-3Q12	14	MW-11A-3Q12	24		34	
5	MW-17C-3Q12	15	MW-12A-3Q12	25		35	
6	MW-20C-3Q12***	16	MW-13A-3Q12	26		36	
7	MW-26B-3Q12**	17	MW-14A-3Q12 D	27		37	
8	MW-15A-3Q12	18	MW-9B-3Q12MS	28		38	
9	MW-17A-3Q12	19	MW-9B-3Q12MSD	29		39	
10	MW-6A-3Q12	20		30		40	

## TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.





LDC #: 28362B6

# VALIDATION COMPLETENESS WORKSHEET

Date: 9-2012

SDG #: 12222A

ADR

Page: 1 of 1

Laboratory: EPA Region 9 Laboratory

Reviewer: [Signature]

2nd Reviewer: [Signature]

SM2320

**METHOD: (Analyte)** Alkalinity (EPA Method 840-1), Chloride, Sulfate, Nitrate-N, (EPA Method 300.0), Sulfide (SM4500), Total Organic Carbon (EPA Method 415.3)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	N	Sampling dates: 8/7-8/12
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	A	
V	Matrix Spike/Matrix Spike Duplicates	N	MS/D
VI.	Duplicates	N	DUP
VII.	Laboratory control samples	N	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	N	
X.	Field duplicates	-	(3,4)
XI	Field blanks	N	

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet

ND = No compounds detected  
 R = Rinsate  
 FB = Field blank

D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

Validated Samples:

Water

1	MW-20A-3Q12	11		21		31	
2	MW-20B-3Q12	12		22		32	
3	MW-95A-3Q12	13		23		33	
4	MW-5A-3Q12	14		24		34	
5	MW-15A-3Q12	15		25		35	
6	MW-20B-3Q12MS	16		26		36	
7	MW-20B-3Q12MSD	17		27		37	
8	MW-5A-3Q12DUP	18		28		38	
9		19		29		39	
10		20		30		40	

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



LDC #: 28362B51a

### VALIDATION COMPLETENESS WORKSHEET

Date: 9/24/12

SDG #: 12222A

ADR

Page: 1 of 2

Laboratory: EPA Region 9 Laboratory

Reviewer: [Signature]

2nd Reviewer: [Signature]

**METHOD:** GC Methane, Ethane, & Ethene (Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	N	Sampling dates: 8/7/12-8/8/12
II.	Initial calibration	A	RSD = 20%
III.	Calibration verification/ICV	SWA	%D ≤ 20   CV/CCV
IV.	Blanks	N	
V.	Surrogate recovery	N	
VI.	Matrix spike/Matrix spike duplicates	N	
VII.	Laboratory control samples	N	
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	N	
XII.	Field duplicates	N	
XIII.	Field blanks	N	

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet

ND = No compounds detected  
 R = Rinsate  
 FB = Field blank

D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

Validated Samples: water

1	MW-20A-3Q12	11		21		31	
2	MW-20B-3Q12	12		22		32	
3	MW-95A-3Q12	13		23		33	
4	MW-5A-3Q12	14		24		34	
5	MW-15A-3Q12	15		25		35	
6	MW-95A-3Q12MS	16		26		36	
7	MW-95A-3Q12MSD	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: \_\_\_\_\_



LDC #: 28362B50515

**VALIDATION COMPLETENESS WORKSHEET**

Date: 8/24/12

SDG #: 12222A

ADR

Page: 1 of 1

Laboratory: EPA Region 9 Laboratory

Reviewer: *ag*

2nd Reviewer: *A*

**METHOD:** GC Carbon Dioxide(Method RSK-175)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	N	Sampling dates: 8/06/12 - 8/07/12
II.	Initial calibration	A	RSD ≤ 20%
III.	Calibration verification/ICV	A	%D ≤ 20
IV.	Blanks	N	
V.	Surrogate recovery	N	
VI.	Matrix spike/Matrix spike duplicates	N	
VII.	Laboratory control samples	N	
VIII.	Target compound identification	N	
IX.	Compound quantitation/RL/LOQ/LODs	N	
X.	System Performance	N	
XI.	Overall assessment of data	N	
XII.	Field duplicates	N	
XIII.	Field blanks	N	

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet

ND = No compounds detected  
 R = Rinsate  
 FB = Field blank

D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

Validated Samples: *water*

1	MW-20A-3Q12	11		21		31	
2	MW-20B-3Q12	12		22		32	
3	MW-95A-3Q12	13		23		33	
4	MW-5A-3Q12	14		24		34	
5	MW-15A-3Q12	15		25		35	
6	MW-20A-3Q12MS	16		26		36	
7	MW-20A-3Q12MSD	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** Modesto  
**Collection Date:** August 6 through August 8, 2012  
**LDC Report Date:** September 25, 2012  
**Matrix:** Water  
**Parameters:** Volatiles  
**Validation Level:** EPA Level IV  
**Laboratory:** EPA Region 9 Laboratory  
**Sample Delivery Group (SDG):** 12222A

**Sample Identification**

MW-9B-3Q12  
MW-26B-3Q12  
MW-7A-3Q12  
MW-20C-3Q12

## Introduction

This data review covers 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 524.2 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

## II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

## III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds with the following exceptions:

Date	Compound	%RSD	Associated Samples	Flag	A or P
7/17/12	Bromomethane 2,2-Dichloropropane trans-1,3-Dichloropropene	25.08 33.37 26.34	All samples in SDG 12222A	J (all detects) UJ (all non-detects)	P

Average relative response factors (RRF) for all compounds were within method and validation criteria.

## IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
8/9/12	2,2-Dichloropropane	30.1	MW-9B-3Q12 MW-26B-3Q12 MW-20C-3Q12 B2H0031-BLK1	J (all detects) UJ (all non-detects)	P

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
7/17/12	Dichlorodifluoromethane	39	All samples in SDG 12222A	J (all detects) UJ (all non-detects)	P

All of the continuing calibration relative response factors (RRF) were within method and validation criteria.

#### V. Blanks

Method blanks were reviewed for each matrix as applicable. No volatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

#### VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

#### VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
MW-9B-3Q12MS/MSD (MW-9B-3Q12)	Dichlorodifluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane	155 (25-135) 141 (38-140)	157 (25-135) -	- -	J+ (all detects) J+ (all detects)	A

#### VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

#### IX. Regional Quality Assurance and Quality Control

Not applicable.

#### X. Internal Standards

All internal standard areas and retention times were within QC limits.

**XI. Target Compound Identifications**

All target compound identifications were within validation criteria.

**XII. Compound Quantitation and RLs**

All compound quantitation and RLs were within validation criteria.

All compounds reported below the RL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 12222A	All compounds reported below the RL.	J (all detects)	A

**XIII. Tentatively Identified Compounds (TICs)**

Tentatively identified compounds were not reported by the laboratory.

**XIV. System Performance**

The system performance was acceptable.

**XV. Overall Assessment of Data**

Data flags are summarized at the end of this report if data has been qualified.

**XVI. Field Duplicates**

No field duplicates were identified in this SDG.

**Modesto  
Volatiles - Data Qualification Summary - SDG 12222A**

SDG	Sample	Compound	Flag	A or P	Reason
12222A	MW-9B-3Q12 MW-26B-3Q12 MW-7A-3Q12 MW-20C-3Q12	Bromomethane 2,2-Dichloropropane trans-1,3-Dichloropropene	J (all detects) UJ (all non-detects)	P	Initial calibration (%RSD)
12222A	MW-9B-3Q12 MW-26B-3Q12 MW-20C-3Q12	2,2-Dichloropropane	J (all detects) UJ (all non-detects)	P	Continuing calibration (%D)
12222A	MW-9B-3Q12 MW-26B-3Q12 MW-7A-3Q12 MW-20C-3Q12	Dichlorodifluoromethane	J (all detects) UJ (all non-detects)	P	Continuing calibration (ICV %D)
12222A	MW-9B-3Q12	Dichlorodifluoromethane 1,1,2-Trichloro-1,2,2-trifluoroethane	J+ (all detects) J+ (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
12222A	MW-9B-3Q12 MW-26B-3Q12 MW-7A-3Q12 MW-20C-3Q12	All compounds reported below the RL.	J (all detects)	A	Compound quantitation and RLs

**Modesto  
Volatiles - Laboratory Blank Data Qualification Summary - SDG 12222A**

No Sample Data Qualified in this SDG

**Modesto  
Volatiles - Field Blank Data Qualification Summary - SDG 12222A**

No Sample Data Qualified in this SDG

LDC #: 28292B1

**VALIDATION COMPLETENESS WORKSHEET**

Date: 9/17/12

SDG #: 12222A

ADR/IV

Page: 1 of 1

Laboratory: EPA Region 9 Laboratory

Reviewer: JYG

2nd Reviewer: [Signature]

524.2

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/06 - 08/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	? RSD ≤ 20%
IV.	Continuing calibration/ICV	SW	CA/ICV ≤ 30%
V.	Blanks	A	Not reviewed for ADR validation.
VI.	Surrogate spikes	A	Not reviewed for ADR validation.
VII.	Matrix spike/Matrix spike duplicates	SW	Not reviewed for ADR validation.
VIII.	Laboratory control samples	A	Not reviewed for ADR validation. LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	Not reviewed for ADR validation.
XI.	Target compound identification	A	Not reviewed for ADR validation.
XII.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for ADR validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for ADR validation.
XIV.	System performance	A	Not reviewed for ADR validation.
XV.	Overall assessment of data	A	Not reviewed for ADR validation.
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable      ND = No compounds detected      D = Duplicate  
 N = Not provided/applicable      R = Rinsate      TB = Trip blank  
 SW = See worksheet      FB = Field blank      EB = Equipment blank

Validated Samples: \*\* Indicates sample underwent Level IV validation

1	MW-20A-3Q12	11	MW-7A-3Q12**	21	B2H0031 - BIK 1	31
2	MW-20B-3Q12	12	MW-8A-3Q12	22	B2H 0044 - J	32
3	MW-9B-3Q12**	13	MW-10A-3Q12	23		33
4	MW-5A-3Q12	14	MW-11A-3Q12	24		34
5	MW-17C-3Q12	15	MW-12A-3Q12	25		35
6	MW-26C-3Q12***	16	MW-13A-3Q12	26		36
7	MW-26B-3Q12**	17	MW-14A-3Q12	27		37
8	MW-15A-3Q12	18	MW-9B-3Q12MS	28		38
9	MW-17A-3Q12	19	MW-9B-3Q12MSD	29		39
10	MW-6A-3Q12	20		30		40

**Method:** Volatiles (EPA Method 524.2)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Cooler temperature criteria was met.	/			
<b>II. GC/MS Instrument performance check</b>				
Were the BFB performance results reviewed and found to be within the specified criteria?	/			
Were all samples analyzed within the 12 hour clock criteria?	/			
<b>III. Initial calibration</b>				
Did the laboratory perform a 5 point calibration prior to sample analysis?	/			
Were all percent relative standard deviations (%RSD) < 20%?		/		
<b>IV. Continuing calibration</b>				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	/			
Were all percent differences (%D) < 30%?		/		
<b>V. Blanks</b>				
Was a method blank associated with every sample in this SDG?	/			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		/		
<b>VI. Surrogate spikes</b>				
Were all surrogate %R within QC limits?	/			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			/	
<b>VII. Matrix spike/Matrix spike duplicates</b>				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?	/			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		/		
<b>VIII. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per analytical batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	/			

**VALIDATION FINDINGS CHECKLIST**

Validation Area	Yes	No	NA	Findings/Comments
<b>IX. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?		<input checked="" type="checkbox"/>		
Were the performance evaluation (PE) samples within the acceptance limits?			<input checked="" type="checkbox"/>	
<b>X. Internal standards</b>				
Were internal standard area counts within +/-40% from the associated calibration standard?	<input checked="" type="checkbox"/>			
Were retention times within - 30% of the last continuing calibration or +/- 50% of the initial calibration?	<input checked="" type="checkbox"/>			
<b>XI. Target compound identification</b>				
Were relative retention times (RRT's) within + 0.06 RRT units of the standard?	<input checked="" type="checkbox"/>			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	<input checked="" type="checkbox"/>			
Were chromatogram peaks verified and accounted for?	<input checked="" type="checkbox"/>			
<b>XII. Compound quantitation/CRQLs</b>				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	<input checked="" type="checkbox"/>			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	<input checked="" type="checkbox"/>			
<b>XIII. Tentatively identified compounds (TICs)</b>				
Were the major ions (> 25 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			<input checked="" type="checkbox"/>	
Were relative intensities of the major ions within ± 20% between the sample and the reference spectra?			<input checked="" type="checkbox"/>	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			<input checked="" type="checkbox"/>	
<b>XIV. System performance</b>				
System performance was found to be acceptable.	<input checked="" type="checkbox"/>			
<b>XV. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	<input checked="" type="checkbox"/>			
<b>XVI. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.		<input checked="" type="checkbox"/>		
Target compounds were detected in the field duplicates.			<input checked="" type="checkbox"/>	
<b>XVII. Field blanks</b>				
Field blanks were identified in this SDG.		<input checked="" type="checkbox"/>		
Target compounds were detected in the field blanks.			<input checked="" type="checkbox"/>	

## TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.







LDC #: 28292 b1

**VALIDATION FINDINGS WORKSHEET**  
**Initial Calibration Calculation Verification**

Page: 1 of 1  
 Reviewer: JVG  
 2nd Reviewer: 1

METHOD: GC/MS VOA (EPA Method 524.2)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$$RRF = (A_x)(C_{is}) / (A_{is})(C_x)$$

average RRF = sum of the RRFs/number of standards

$$\%RSD = 100 * (S/X)$$

$A_x$  = Area of Compound

$C_x$  = Concentration of compound,

S = Standard deviation of the RRFs,

$A_{is}$  = Area of associated internal standard

$C_{is}$  = Concentration of internal standard

X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 5 std)	Recalculated RRF (RRF 5 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL HP5973J	7/17/2012	cis-1,2-DCE (IS1)	4.208	4.208	3.998	3.998	3.59	3.59
			Trichloroethene (IS2)	0.297	0.297	0.293	0.294	1.26	1.30
			Tetrachloroethene (IS3)	0.505	0.505	0.489	0.489	3.15	3.14

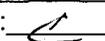
Cis/Cx	Ax	Ais
5/5	392880	93360
5/5	417455	1404797
5/5	468323	926898

Conc	cis-1,2-DCE	Trichloroethene	Tetrachloroethene
0.5	3.781	0.289	0.499
1	3.972	0.292	0.487
2	4.088	0.298	0.502
5	4.208	0.297	0.505
10	3.943	0.296	0.471
25	3.994	0.290	0.471
X =	3.998	0.294	0.489
S =	0.1435	0.0038	0.0153

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC # 28292 B7

**VALIDATION FINDINGS WORKSHEET**  
**Continuing Calibration Results Verification**

Page: 1 of 1  
 Reviewer: JVG  
 2nd Reviewer: 

METHOD: GC/MS VOA (EPA Method 524.2)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference =  $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$   
 $\text{RRF} = (\text{Ax})(\text{Cis}) / (\text{Ais})(\text{Cx})$

Where:

ave. RRF = initial calibration average RRF  
 RRF = continuing calibration RRF  
 Ax = Area of compound,

Cx = Concentration of compound,  
 Ais = Area of associated internal standard  
 Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	080912j02 HP5973J	8/9/2012	cis-1,2-DCE (IS1)	3.998	4.417	4.417	10.5	10.5
			Trichloroethene (IS2)	0.293	0.289	0.289	1.4	1.4
			Tetrachloroethene (IS3)	0.489	0.488	0.488	0.2	0.2
2	081012j02 HP5973J	8/10/2012	cis-1,2-DCE (IS1)	3.998	3.778	3.778	5.5	5.5
			Trichloroethene (IS2)	0.293	0.279	0.279	4.8	4.8
			Tetrachloroethene (IS3)	0.489	0.463	0.463	5.3	5.3

CCV1				CCV12	
Cis/Cx	Compound	Ax	Ais	Ax	Ais
5/5	cis-1,2-DCE (IS1)	316577	71677	285338	75535

LDC #: 28292 B1

**VALIDATION FINDINGS WORKSHEET**  
**Surrogate Results Verification**

Page: 1 of 1  
Reviewer: JVG  
2nd reviewer: [Signature]

**METHOD:** GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS \* 100

Where: SF = Surrogate Found  
SS = Surrogate Spiked

Sample ID: # 3

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8	5.00	4.857	97	97	0
Bromofluorobenzene	↓	4.964	99	99	↓
1,2-Dichlorobenzene-d4		5.417	108	108	
<del>1,2-DCP-d4</del> Dibromofluoromethane		4.990	100	102	

Sample ID: \_\_\_\_\_

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID: \_\_\_\_\_

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

Sample ID: \_\_\_\_\_

	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
			Reported	Recalculated	
Toluene-d8					
Bromofluorobenzene					
1,2-Dichlorobenzene-d4					
Dibromofluoromethane					

LDC #: 78292 B1

## VALIDATION FINDINGS WORKSHEET Laboratory Control Sample Results Verification

Page: 1 of 1  
Reviewer: JVG  
2nd Reviewer: [Signature]

**METHOD:** GC/MS VOA (EPA Method 524.2)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery =  $100 * SSC/SA$

Where: SSC = Spiked sample concentration  
SA = Spike added

RPD =  $|LCS - LCSD| * 2 / (LCS + LCSD)$

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS ID: B24 0031 - BS

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS		LCSD		LCS/LCSD	
	LCS	LCSD	LCS	LCSD	Percent Recovery		Percent Recovery		RPD	
					Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	5.00	NA	5.15	NA	103	103				
Trichloroethene	↓	↓	4.76	↓	99	99				
Benzene	↓	↓	4.84	↓	97	97				
Toluene	↓	↓	4.62	↓	92	92				
Chlorobenzene	↓	↓	9.63	↓	93	93				

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.



**SDG 12222C**

# Reporting Limit Outliers

Lab Reporting Batch ID: 12222C

Laboratory: FALSE

EDD Filename: 12222c\_voc\_1208025 FINAL

eQAPP Name: Modesto\_Site\_062812

Method: TO-15

Matrix: Air

<i>SampleID</i>	<i>Analyte</i>	<i>Lab Qual</i>	<i>Result</i>	<i>Reporting Limit</i>	<i>RL Type</i>	<i>Units</i>	<i>Flag</i>
SVE Stack-0802	TETRACHLOROETHENE	J,C1	1.6	2.4	MRL	ppbv	J (all detects)

LDC #: 28391A48

## VALIDATION COMPLETENESS WORKSHEET

SDG #: 12222C

Level IV

Laboratory: EPA Region 9 Laboratory

Date: 10/2/12

Page: 1 of 1

Reviewer: FB2nd Reviewer: A

METHOD: GC/MS Volatiles (EPA Method TO-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/8/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	Δ	% MD ≤ 30
IV.	Continuing calibration/ICV	Δ	ICV/CCV ≤ 30
V.	Blanks	A	
VI.	Surrogate spikes	N	not required
VII.	Matrix spike/Matrix spike duplicates /DUP	<del>N</del> A	
VIII.	Laboratory control samples	A	LCs
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	Δ	
XI.	Target compound identification	Δ	
XII.	Compound quantitation/RL/LOQ/LODs	Δ	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	Δ	
XV.	Overall assessment of data	Δ	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

Validated Samples:  
AIR

1	SVE Pre GAC-0802	11	B2 H0074	21		31	
2	SVE Stack-0802	12		22		32	
3	SVE Pre GAC-0802DUP	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** Modesto  
**Collection Date:** August 8, 2012  
**LDC Report Date:** October 2, 2012  
**Matrix:** Air  
**Parameters:** Volatiles  
**Validation Level:** EPA Level IV  
**Laboratory:** EPA Region 9 Laboratory  
**Sample Delivery Group (SDG):** 12222C

**Sample Identification**

SVE Pre GAC-0802  
SVE Stack-0802  
SVE Pre GAC-0802DUP

## Introduction

This data review covers 3 air samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method TO-15 for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008).

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- NJ Presumptive evidence of presence of the compound at an estimated quantity.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.
- None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

## **I. Technical Holding Times**

All technical holding time requirements were met.

## **II. GC/MS Instrument Performance Check**

Instrument performance was checked at 24 hour intervals.

All ion abundance requirements were met.

## **III. Initial Calibration**

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

## **IV. Continuing Calibration**

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 30.0% .

The percent differences (%D) of the second source calibration standard were less than or equal to 30.0% for all compounds.

## **V. Blanks**

Method blank analyses were performed at the required frequency. No volatile contaminants were found in the method blanks.

No field blanks were identified in this SDG.

## **VI. Surrogate Spikes**

Surrogates were not required by the method.

## **VII. Matrix Spike/Matrix Spike Duplicates**

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

Duplicate (DUP) sample analyses were analyzed at the required frequency. Results were within QC limits.

### VIII. Laboratory Control Samples (LCS)

Laboratory control samples were analyzed at the required frequency. Percent recoveries (%R) were within QC limits.

### IX. Regional Quality Assurance and Quality Control

Not applicable.

### X. Internal Standards

All internal standard areas and retention times were within QC limits.

### XI. Target Compound Identifications

All target compound identifications were within validation criteria.

### XII. Compound Quantitation and RLs

All compound quantitation and RLs were within validation criteria.

All compounds reported below the RL were qualified as follows:

Sample	Finding	Flag	A or P
All samples in SDG 12222C	All compounds reported below the RL.	J (all detects)	A

### XIII. Tentatively Identified Compounds (TICs)

Tentatively identified compounds were not reported by the laboratory.

### XIV. System Performance

The system performance was acceptable.

### XV. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

### XVI. Field Duplicates

No field duplicates were identified in this SDG.

**Modesto  
Volatiles - Data Qualification Summary - SDG 12222C**

SDG	Sample	Compound	Flag	A or P	Reason
12222C	SVE Pre GAC-0802 SVE Stack-0802	All compounds reported below the RL.	J (all detects)	A	Compound quantitation and RLs

**Modesto  
Volatiles - Laboratory Blank Data Qualification Summary - SDG 12222C**

No Sample Data Qualified in this SDG

**Modesto  
Volatiles - Field Blank Data Qualification Summary - SDG 12222C**

No Sample Data Qualified in this SDG

LDC #: 28391A48

**VALIDATION COMPLETENESS WORKSHEET**

Date: 10/2/12

SDG #: 12222C

Level IV

Page: 1 of 1

Laboratory: EPA Region 9 Laboratory

Reviewer: [Signature]  
2nd Reviewer: [Signature]

**METHOD:** GC/MS Volatiles (EPA Method TO-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 8/8/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	Δ	% RD ≤ 30
IV.	Continuing calibration/ICV	Δ	ICV/CCV ≤ 30
V.	Blanks	A	
VI.	Surrogate spikes	N	not required
VII.	Matrix spike/Matrix spike duplicates /DUP	N/A	
VIII.	Laboratory control samples	A	LCs
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	Δ	
XII.	Compound quantitation/RL/LOQ/LODs	Δ	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	Δ	
XV.	Overall assessment of data	Δ	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable  
 ND = No compounds detected  
 D = Duplicate  
 N = Not provided/applicable  
 R = Rinsate  
 TB = Trip blank  
 SW = See worksheet  
 FB = Field blank  
 EB = Equipment blank

Validated Samples:  
AIR

1	SVE Pre GAC-0802	11	B2 H0074	21		31
2	SVE Stack-0802	12		22		32
3	SVE Pre GAC-0802DUP	13		23		33
4		14		24		34
5		15		25		35
6		16		26		36
7		17		27		37
8		18		28		38
9		19		29		39
10		20		30		40

DC #: 28391A48  
 SDG #: see cover

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

Method: Volatiles (EPA Method TO-15)

Validation Area	Yes	No	NA	Findings/Comments
<b>I. Technical holding times</b>				
All technical holding times were met.	/			
Canister pressure criteria was met.	/			
<b>II. GC/MS Instrument performance check</b>				
Were the BFB performance results reviewed and found to be within the specified criteria?	/			
Were all samples analyzed within the 12 hour clock criteria?	/			
<b>III. Initial calibration</b>				
Did the laboratory perform a 5 point calibration prior to sample analysis?	/			
Were all percent relative standard deviations (%RSD) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	/			
<b>IV. Continuing calibration</b>				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	/			
Were all percent differences (%D) $\leq$ 30% and relative response factors (RRF) $\geq$ 0.05?	/			
<b>V. Blanks</b>				
Was a method blank associated with every sample in this SDG?	/			
Was a method blank analyzed at least once every 12 hours for each matrix and concentration?	/			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.			/	
<b>VI. Surrogate spikes</b>				
Were all surrogate %R within QC limits?			/	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			/	
<b>VII. Matrix spike/Matrix spike duplicates</b>				
Was a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for this SDG?			/	
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			/	
<b>VIII. Laboratory control samples</b>				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per analytical batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	/			

DC #: 28391A48  
 SDG #: pu water

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2  
 Reviewer: 7  
 2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
<b>IX. Regional Quality Assurance and Quality Control</b>				
Were performance evaluation (PE) samples performed?			/	
Were the performance evaluation (PE) samples within the acceptance limits?			/	
<b>X. Internal standards</b>				
Were internal standard area counts within +/-40% from the associated calibration standard?	/			
Were retention times within +/- 20.0 seconds from the associated calibration standard?	/			
<b>XI. Target compound identification</b>				
Were relative retention times (RRT's) within $\pm 0.06$ RRT units of the standard?	/			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	/			
Were chromatogram peaks verified and accounted for?	/			
<b>XII. Compound quantitation/CRQLs</b>				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	/			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	/			
<b>XIII. Tentatively identified compounds (TICs)</b>				
Were the major ions (> 10 percent relative intensity) in the reference spectrum evaluated in sample spectrum?			/	
Were relative intensities of the major ions within $\pm 20\%$ between the sample and the reference spectra?			/	
Did the raw data indicate that the laboratory performed a library search for all required peaks in the chromatograms (samples and blanks)?			/	
<b>XIV. System performance</b>				
System performance was found to be acceptable.	/			
<b>XV. Overall assessment of data</b>				
Overall assessment of data was found to be acceptable.	/			
<b>XVI. Field duplicates</b>				
Field duplicate pairs were identified in this SDG.		/		
Target compounds were detected in the field duplicates.			/	
<b>XVII. Field blanks</b>				
Field blanks were identified in this SDG.		/		
Target compounds were detected in the field blanks.			/	

# TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method TO-15)

A. Chloromethane*	S. Trichloroethene	KK. Trichlorofluoromethane	CCC. tert-Butylbenzene	UUU. Benzyl chloride
B. Bromomethane	T. Dibromochloromethane	LL. Methyl-tert-butyl ether	DDD. 1,2,4-Trimethylbenzene	VVV. 4-Ethyltoluene
C. Vinyl chloride**	U. 1,1,2-Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	EEE. sec-Butylbenzene	WWW. Ethanol
D. Chloroethane	V. Benzene	NN. Diethyl ether	FFF. 1,3-Dichlorobenzene	XXX. Ethyl ether
E. Methylene chloride	W. trans-1,3-Dichloropropene	OO. 2,2-Dichloropropane	GGG. p-Isopropyltoluene	YYY. tert-Butanol
F. Acetone	X. Bromoform*	PP. Bromochloromethane	HHH. 1,4-Dichlorobenzene	ZZZ. tert-Butyl alcohol
G. Carbon disulfide	Y. 4-Methyl-2-pentanone	QQ. 1,1-Dichloropropene	III. n-Butylbenzene	AAAA. Ethyl tert-butyl ether
H. 1,1-Dichloroethene**	Z. 2-Hexanone	RR. Dibromomethane	JJJ. 1,2-Dichlorobenzene	BBBB. tert-Amyl methyl ether
I. 1,1-Dichloroethane*	AA. Tetrachloroethene	SS. 1,3-Dichloropropane	KKK. 1,2,4-Trichlorobenzene	CCCC. 1-Chlorohexane
J. 1,2-Dichloroethane, total	BB. 1,1,2,2-Tetrachloroethane*	TT. 1,2-Dibromoethane	LLL. Hexachlorobutadiene	DDDD. Isopropyl alcohol
K. Chloroform**	CC. Toluene**	UU. 1,1,1,2-Tetrachloroethane	MMM. Naphthalene	EEEE. Acetonitrile
L. 1,2-Dichloroethane	DD. Chlorobenzene*	VV. Isopropylbenzene	NNN. 1,2,3-Trichlorobenzene	FFFF. Acrolein
M. 2-Butanone	EE. Ethylbenzene**	WW. Bromobenzene	OOO. 1,3,5-Trichlorobenzene	GGGG. Acrylonitrile
N. 1,1,1-Trichloroethane	FF. Styrene	XX. 1,2,3-Trichloropropane	PPP. trans-1,2-Dichloroethene	HHHH. 1,4-Dioxane
O. Carbon tetrachloride	GG. Xylenes, total	YY. n-Propylbenzene	QQQ. cis-1,2-Dichloroethene	IIII. Isobutyl alcohol
P. Bromodichloromethane	HH. Vinyl acetate	ZZ. 2-Chlorotoluene	RRR. m,p-Xylenes	JJJJ. Methacrylonitrile
Q. 1,2-Dichloropropane**	II. 2-Chloroethylvinyl ether	AAA. 1,3,5-Trimethylbenzene	SSS. o-Xylene	KKKK. Propionitrile
R. cis-1,3-Dichloropropene	JJ. Dichlorodifluoromethane	BBB. 4-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	LLLL

\* = System performance check compounds (SPCC) for RRF ; \*\* = Calibration check compounds (CCC) for %RSD.

LDC #: 2839/AY8  
 SDG #: pu control

**VALIDATION FINDINGS WORKSHEET**  
**Initial Calibration Calculation Verification**

Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA Method TO-15)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_s)/(A_s)(C_x)$

average RRF = sum of the RRFs/number of standards

$\%RSD = 100 * (S/X)$

$A_x$  = Area of compound,

$C_x$  = Concentration of compound,

S = Standard deviation of the RRFs

X = Mean of the RRFs

$A_s$  = Area of associated internal standard

$C_s$  = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported	Recalculated	Reported	Recalculated	Reported	Recalculated
				RRF (std)	RRF (std)	Average RRF (Initial)	Average RRF (Initial)	%RSD	%RSD
1	1CAL	8/14/12	Methylene chloride (1st internal standard) <sup>(9.80)</sup>	0.976	0.976	1.008	1.008	25.77	25.77
			Trichlorethene (2nd internal standard) <sup>(10.10)</sup>	0.399	0.399	0.374	0.374	15.21	15.21
			Toluene (3rd internal standard) <sup>(10.10)</sup>	1.269	1.269	1.158	1.158	16.28	16.28
2			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
3			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
4			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 2839/A48  
 SDG #: pu cover

**VALIDATION FINDINGS WORKSHEET**  
**Continuing Calibration Results Verification**

Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA TO-15)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference =  $100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$   
 $\text{RRF} = (A_x)(C_s) / (A_s)(C_x)$

Where: ave. RRF = initial calibration average RRF  
 RRF = continuing calibration RRF  
 $A_x$  = Area of compound,  $A_s$  = Area of associated internal standard  
 $C_x$  = Concentration of compound,  $C_s$  = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (Initial)	Reported	Recalculated	Reported	Recalculated
					RRF (CC)	RRF (CC)	%D	%D
1	cen1	8/16/12	Methylene chloride (1st internal standard)	1.008	0.886	0.886	12.1	12.1
			Trichlorethene (2nd internal standard)	0.374	0.346	0.346	7.5	7.5
			Toluene (3rd internal standard)	1.158	1.035	1.035	10.6	10.6
2			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.



**SDG 12227B**

# Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 12227B

Laboratory: FALSE

EDD Filename: 12227b\_voc\_1208036 FINAL

eQAPP Name: Modesto\_Site\_062812

**Method: 524.2**  
**Matrix: Water**

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
MW-21A-3Q12MS (MW-21A-3Q12)	1,1,2-TRICHLORO-1,2,2-TRIFLU 2,2-DICHLOROPROPANE DICHLORODIFLUOROMETHAN	152 - 170	147 155 167	38.00-140.00 25.00-150.00 25.00-135.00	- - -	1,1,2-TRICHLORO-1,2,2-TRIFL 2,2-DICHLOROPROPANE DICHLORODIFLUOROMETHA	J+ (all detects)

# Field Duplicate RPD Report

Lab Reporting Batch ID: 12227B

Laboratory: FALSE

EDD Filename: 12227b\_voc\_1208036 FINAL

eQAPP Name: Modesto\_Site\_062812

Method: 524.2

Matrix: Water

Analyte	Concentration (ug/L)		Sample RPD	eQAPP RPD	Flag
	MW-10B-3Q12	MW-90B-3Q12			
TETRACHLOROETHENE	15	16	6	1.00	No Qualifiers Applied

Analyte	Concentration (ug/L)		Sample RPD	eQAPP RPD	Flag
	MW-3A-3Q12	MW-97A-3Q12			
CHLOROFORM	1.7	1.6	6	1.00	No Qualifiers Applied
TETRACHLOROETHENE	42	44	5	1.00	

Analyte	Concentration (ug/L)		Sample RPD	eQAPP RPD	Flag
	MW-23A-3Q12	MW-77A-3Q12			
CHLOROFORM	3.7	3.8	3	1.00	No Qualifiers Applied
TETRACHLOROETHENE	41	39	5	1.00	

LDC #: 28391B1

**VALIDATION COMPLETENESS WORKSHEET**

SDG #: 12227B

ADR/Level IV

Laboratory: USEPA Region 9 Laboratory

Date: 10/2/12

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

**METHOD:** GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

Validation Area		Comments	
I.	Technical holding times	Δ	Sampling dates: 8/8 - 8/10/12
II.	GC/MS Instrument performance check	Δ	
III.	Initial calibration	SW	% PSD ≤ 20
IV.	Continuing calibration/ICV	SW	ICV/CCV ≤ 30
V.	Blanks	Δ	Not reviewed for ADR validation.
VI.	Surrogate spikes	Δ	Not reviewed for ADR validation.
VII.	Matrix spike/Matrix spike duplicates	SW	Not reviewed for ADR validation.
VIII.	Laboratory control samples	Δ	Not reviewed for ADR validation. LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	Δ	Not reviewed for ADR validation.
XI.	Target compound identification	Δ	Not reviewed for ADR validation.
XII.	Compound quantitation/RL/LOQ/LODs	Δ	Not reviewed for ADR validation.
XIII.	Tentatively identified compounds (TICs)	N	Not reviewed for ADR validation.
XIV.	System performance	Δ	Not reviewed for ADR validation.
XV.	Overall assessment of data	Δ	Not reviewed for ADR validation.
XVI.	Field duplicates	SW	D = 7, 8, 3, 9, 10, 12
XVII.	Field blanks	N	

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet

ND = No compounds detected  
 R = Rinsate  
 FB = Field blank

D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

Validated Samples:\*\* Indicates sample underwent Level IV validation

1	1	MW-21A-3Q12	11	1	MW-10C-3Q12	21	1	B2H0060	31	
2	1	MW-22A-3Q12	12	2	MW-90B-3Q12	22	2	B2H0064	32	
3	2	MW-23A-3Q12	13	1	MW-27B-3Q12	23			33	
4	1	MW-16A-3Q12	14	2	MW-29B-3Q12	24			34	
5	1	MW-16B-3Q12	15	1	MW-18A-3Q12	25			35	
6	1	MW-16C-3Q12	16		MW-21A-3Q12MS	26			36	
7	2	MW-97A-3Q12	17		MW-21A-3Q12MSD	27			37	
8	2	MW-3A-3Q12	18			28			38	
9	2	MW-77A-3Q12	19			29			39	
10	1	MW-10B-3Q12	20			30			40	

## TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA Method 524.2)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.





**SDG 12227D**

# Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 12227D

Laboratory: FALSE

EDD Filename: 12227d\_voc\_1208039 FINAL

eQAPP Name: Modesto\_Site\_062812

Method: TO-15

Matrix: Air

QC Sample ID (Associated Samples)	Compound	LCS %R	LCSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
B2H0089-BS1 (DP-1B-3Q12 DP-6B-3Q12 DP-94A-3Q12 OSVE-10-3Q12 OSVE-11-3Q12 SVE-1-3Q12 SVE-2-3Q12 SVE-3-3Q12)	CHLOROETHANE	137	-	70.00-134.00	-	CHLOROETHANE	J+ (all detects)

# Reporting Limit Outliers

Lab Reporting Batch ID: 12227D

Laboratory: FALSE

EDD Filename: 12227d\_voc\_1208039 FINAL

eQAPP Name: Modesto\_Site\_062812

Method: TO-15

Matrix: Air

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
DP-1B-3Q12	CHLOROFORM	J,C1	1.8	2.6	MRL	ppbv	J (all detects)
DP-5A-3Q12	TETRACHLOROETHENE	J,C1	1.6	2.5	MRL	ppbv	J (all detects)
	TOLUENE	J,C1	1.6	2.5	MRL	ppbv	J (all detects)
DP-5B-3Q12	TETRACHLOROETHENE	J,C1	2.3	2.5	MRL	ppbv	J (all detects)
OSVE-11-3Q12	TRICHLOROETHENE	J,C1	1.2	2.4	MRL	ppbv	J (all detects)

# Field Duplicate RPD Report

Lab Reporting Batch ID: 12227D

Laboratory: FALSE

EDD Filename: 12227d\_voc\_1208039 FINAL

eQAPP Name: Modesto\_Site\_062812

Method: TO-15  
Matrix: Air

Analyte	Concentration (ppbv)		Sample RPD	eQAPP RPD	Flag
	SVE-3-3Q12	SVE-97-3Q12			
TETRACHLOROETHENE	210	220	5	1.00	No Qualifiers Applied

Analyte	Concentration (ppbv)		Sample RPD	eQAPP RPD	Flag
	DP-6A-3Q12	DP-94A-3Q12			
TETRACHLOROETHENE	75	52	36	1.00	No Qualifiers Applied

LDC #: 28391C48

## VALIDATION COMPLETENESS WORKSHEET

SDG #: 12227D

ADR

Laboratory: EPA Region 9 Laboratory

Date: 10/2/12

Page: 6 of 7

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: GC/MS Volatiles (EPA Method TO-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	N	Sampling dates:
II.	GC/MS Instrument performance check	Δ	
III.	Initial calibration	A	% PSD ≤ 30
IV.	Continuing calibration/ICV	A	ICV/CCV ≤ 30
V.	Blanks	N	
VI.	Surrogate spikes	N	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	Δ	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

Validated Samples:

1	DP-1A-3Q12	11	SVE-2-3Q12	21	B2 H0074 ✓	31	
2	DP-1B-3Q12	12	SVE-3-3Q12	22	B2 H0089 ✓	32	
3	DP-5A-3Q12	13	SVE-4-3Q12	23	B2 H0154 ✓	33	
4	DP-5B-3Q12	14	SVE-97-3Q12	24		34	
5	DP-6A-3Q12	15	SVE-2-3Q12DUP	25		35	
6	DP-6B-3Q12	16	SVE-97-3Q12DUP	26		36	
7	DP-94A-3Q12	17		27		37	
8	OSVE-10-3Q12	18		28		38	
9	OSVE-11-3Q12	19		29		39	
10	SVE-1-3Q12	20		30		40	

**SDG 12244B**

LDC #: 28564A48

**VALIDATION COMPLETENESS WORKSHEET**

Date: 10/10/12

SDG #: 12244B

ADR

Page: 1 of 1

Laboratory: EPA Region 9 Laboratory

Reviewer: A  
2nd Reviewer: V

**METHOD:** GC/MS Volatiles (EPA Method TO-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	N	Sampling dates: 8/30/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	%RSD ≤ 30
IV.	Continuing calibration/ICV	ASD	ICV / CCV ≤ 30
V.	Blanks	N	
VI.	Surrogate spikes	N	
VII.	Matrix spike/Matrix spike duplicates /ID#	N/N	
VIII.	Laboratory control samples	N	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	AM	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	AM	
XVI.	Field duplicates	N	
XVII.	Field blanks	J	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

Validated Samples:

Aiv

1	DP-6A-3Q12	11	B2I0017-DLKI	21		31
2	DP-6A-3Q12DUP	12		22		32
3		13		23		33
4		14		24		34
5		15		25		35
6		16		26		36
7		17		27		37
8		18		28		38
9		19		29		39
10		20		30		40

## TARGET COMPOUND WORKSHEET

**METHOD:** VOA (EPA Method TO-15)

A. Chloromethane	S. Trichloroethene	KK. Trichlorofluoromethane	CCC. tert-Butylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	MMMM. Benzyl chloride
B. Bromomethane	T. Dibromochloromethane	LL. Methyl-tert-butyl ether	DDD. 1,2,4-Trimethylbenzene	VVV. 4-Ethyltoluene	
C. Vinyl chloride	U. 1,1,2-Trichloroethane	MM. 1,2-Dibromo-3-chloropropane	EEE. sec-Butylbenzene	WWW. Ethanol	
D. Chloroethane	V. Benzene	NN. Diethyl ether	FFF. 1,3-Dichlorobenzene	XXX. Di-isopropyl ether	
E. Methylene chloride	W. trans-1,3-Dichloropropene	OO. 2,2-Dichloropropane	GGG. p-Isopropyltoluene	YYY. tert-Butanol	
F. Acetone	X. Bromoform	PP. Bromochloromethane	HHH. 1,4-Dichlorobenzene	ZZZ. tert-Butyl alcohol	
G. Carbon disulfide	Y. 4-Methyl-2-pentanone	QQ. 1,1-Dichloropropene	III. n-Butylbenzene	AAAA. Ethyl tert-butyl ether	
H. 1,1-Dichloroethene	Z. 2-Hexanone	RR. Dibromomethane	JJJ. 1,2-Dichlorobenzene	BBBB. tert-Amyl methyl ether	
I. 1,1-Dichloroethane	AA. Tetrachloroethene	SS. 1,3-Dichloropropane	KKK. 1,2,4-Trichlorobenzene	CCCC. 1-Chlorohexane	
J. 1,2-Dichloroethene, total	BB. 1,1,2,2-Tetrachloroethane	TT. 1,2-Dibromoethane	LLL. Hexachlorobutadiene	DDDD. Isopropyl alcohol	
K. Chloroform	CC. Toluene	UU. 1,1,1,2-Tetrachloroethane	MMM. Naphthalene	EEEE. Acetonitrile	
L. 1,2-Dichloroethane	DD. Chlorobenzene	VV. Isopropylbenzene	NNN. 1,2,3-Trichlorobenzene	FFFF. Acrolein	
M. 2-Butanone	EE. Ethylbenzene	WW. Bromobenzene	OOO. 1,3,5-Trichlorobenzene	GGGG. Acrylonitrile	
N. 1,1,1-Trichloroethane	FF. Styrene	XX. 1,2,3-Trichloropropane	PPP. trans-1,2-Dichloroethene	HHHH. 1,4-Dioxane	
O. Carbon tetrachloride	GG. Xylenes, total	YY. n-Propylbenzene	QQQ. cis-1,2-Dichloroethene	IIII. Isobutyl alcohol	
P. Bromodichloromethane	HH. Vinyl acetate	ZZ. 2-Chlorotoluene	RRR. m,p-Xylenes	JJJJ. Methacrylonitrile	
Q. 1,2-Dichloropropane	II. 2-Chloroethylvinyl ether	AAA. 1,3,5-Trimethylbenzene	SSS. o-Xylene	KKKK. Propionitrile	
R. cis-1,3-Dichloropropene	JJ. Dichlorodifluoromethane	BBB. 4-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	LLLL. Ethyl ether	



**SDG 12251E**

# Reporting Limit Outliers

Lab Reporting Batch ID: 12251E

Laboratory: FALSE

EDD Filename: 12251E\_voc

eQAPP Name: Modesto\_Site\_062812

Method: TO-15

Matrix: Air

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
SVE PreGAC-0901	1,4-DICHLOROBENZENE m&p-Xylene	J,C1	1.8	2.6	MRL	ppbv	J (all detects)
		J,C1	2.9	5.2	MRL	ppbv	
SVE Stack-0901	1,2-DICHLOROBENZENE	J,C1	1.3	2.6	MRL	ppbv	J (all detects)

LDC #: 28490A48

## VALIDATION COMPLETENESS WORKSHEET

Date: 10/10/12

SDG #: 12251E

Level ~~1~~ ADR

Page: 1 of 1

Laboratory: EPA Region 9 Laboratory

Reviewer: A2nd Reviewer: W

METHOD: GC/MS Volatiles (EPA Method TO-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	N	Sampling dates: 9/6/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	1. RSD $\leq$ 30
IV.	Continuing calibration/ICV	A	ICV / CCV $\leq$ 30
V.	Blanks	N	
VI.	Surrogate spikes	↓	
VII.	Matrix spike/Matrix spike duplicates / Dup	↓	
VIII.	Laboratory control samples	↓	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	↓	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	↓	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	↓	

Note: A = Acceptable  
N = Not provided/applicable  
SW = See worksheet

ND = No compounds detected  
R = Rinsate  
FB = Field blank

D = Duplicate  
TB = Trip blank  
EB = Equipment blank

Validated Samples:

Air

1	<sup>2-FA</sup> SVE Pre GAC-0901	11		21		31	
2	SVE Stack-0901	12		22		32	
3	SVE Pre GAC-0901DUP	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

## TARGET COMPOUND WORKSHEET

**METHOD:** VOA (EPA Method TO-15)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	VVV. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. 1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. 2-Propanol
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.



**SDG 12258A**

# Reporting Limit Outliers

Lab Reporting Batch ID: 12258A

Laboratory: FALSE

EDD Filename: 12258a\_voc\_1209024 FINAL

eQAPP Name: Modesto\_Site\_062812

Method: 524.2

Matrix: Water

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
EW02-40	CIS-1,2-DICHLOROETHENE	J,C1	0.3	0.5	MRL	ug/L	J (all detects)

LDC #: 28517A1  
 SDG #: 12258A  
 Laboratory: USEPA Region 9 Laboratory

**VALIDATION COMPLETENESS WORKSHEET**

ADR

Date: 10/10/12  
 Page: 1 of 1  
 Reviewer: [Signature]  
 2nd Reviewer: [Signature]

**METHOD:** GC/MS Volatiles (EPA Method 524.2)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	N	Sampling dates: 9/13/12
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	1. RSD = 20
IV.	Continuing calibration/ICV	SW	ICV/CCV = 30
V.	Blanks	N	
VI.	Surrogate spikes	N	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A <del>N</del>	
XI.	Target compound identification	N	
XII.	Compound quantitation/RL/LOQ/LODs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A <del>N</del>	
XVI.	Field duplicates	N	
XVII.	Field blanks	+	TB = 2

Note: A = Acceptable      ND = No compounds detected      D = Duplicate  
 N = Not provided/applicable      R = Rinsate      TB = Trip blank  
 SW = See worksheet      FB = Field blank      EB = Equipment blank

Validated Samples:\*\* Indicates sample underwent Level IV validation

1	2- AA EW02-40	W	11		21		31
2	MW-305-3Q12	↓	12		22		32
3	MW-305-3Q12MS		13		23		33
4	MW-305-3Q12MSD		14		24		34
5			15		25		35
6			16		26		36
7			17		27		37
8			18		28		38
9			19		29		39
10			20		30		40

## TARGET COMPOUND WORKSHEET

**METHOD: VOA**

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC. 1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl chloride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO. 1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.





LDC #: 28517A6

# VALIDATION COMPLETENESS WORKSHEET

Date: 10/10/12

SDG #: 12258A

ADR

Page: 1 of 1

Laboratory: EPA Region 9 Laboratory

Reviewer: A

2nd Reviewer: [Signature]

## METHOD: (Analyte) Total Suspended Solids (SM2540D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	N	Sampling dates: 9/13/12
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Blanks	ND	
V	Matrix Spike/Matrix Spike Duplicates	N	} Dup?
VI.	Duplicates	N	
VII.	Laboratory control samples	N	LCS
VIII.	Sample result verification	N	
IX.	Overall assessment of data	AN	
X.	Field duplicates	N	
XI.	Field blanks	f	

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet

ND = No compounds detected  
 R = Rinsate  
 FB = Field blank

D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

### Validated Samples:

1	EW02-20	(W)	11	21	31
2	EW02-40	↓	12	22	32
3	EW02-20DUP	↓	13	23	33
4			14	24	34
5	PB		15	25	35
6			16	26	36
7			17	27	37
8			18	28	38
9			19	29	39
10			20	30	40

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**URS Group, Inc.**

## ANALYTICAL DATA QUALITY SUMMARY

This section summarizes the quality assurance/quality control (QA/QC) results for sample results generated in support of Modesto Superfund Site during the period of July through September 2012 for the groundwater treatment plant system.

Data were reviewed and qualified, by URS Group, Inc. (URS), using method and laboratory criteria. Precision and accuracy were evaluated from field and laboratory QC samples. 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 were used to evaluate accuracy. External contamination was assessed through the evaluation of method blanks and trip blanks. Comparability of the data was ensured by having project personnel follow standardized field procedures described in the Sampling and Analysis Plan (URS, 2010) and having laboratories follow analytical methods and standard operating procedures. The completeness of the data is the measure of the amount of valid data for each method and matrix (expressed as a percentage). Completeness by method is provided on Table 1. 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 appropriated holding times.

- The completeness objective was met for the third quarter 2012 sampling event: 100 percent of the data produced are usable. There are no rejected results.
- Of 772 results, 63 normal field results were qualified as estimated or not-detected values, because one or more QA objectives were not met.

URS staff collected groundwater samples from three monthly field efforts (07M12, 08M12, and 09M12). Total uranium samples were analyzed by Method ASTM D5174 by GEL Laboratories LLC, in Charleston, South Carolina, samples analyzed by Standard Method (SM) 2540C for total dissolved solids (TDS), SM2540D for total suspended solids (TSS), SM5210B for biochemical oxygen demand (BOD) and E524.2 for volatile organic compounds (VOCs) in groundwater were analyzed by ALS Laboratory in Kelso, Washington, and VOCs in vapor were analyzed by TO-15 by Eurofins Laboratory in Folsom, California. The data were evaluated at a minimum on the following parameters:

- ( ) Sample integrity
- ( ) Blank analysis
- (\*) Laboratory control samples
- ( ) MS recoveries and relative percent differences
- (\*) Surrogate spikes recoveries
- (\*) Reporting Limits
- (\*) Data completeness

\* = All criteria were met for this parameter.

The following samples were collected:

- Total uranium by ASTM D5172: 10 normal samples (NS), 1 field duplicate (FD) and 3 MS/ laboratory duplicates (LD)
- TDS by SM2540C: 3 NS
- TSS by SM2540D: 3 NS
- BOD by SM5210B: 3NS
- VOCs in groundwater by E524.2: 9 NS, 1 FD, 3 trip blanks, and 1 matrix spike/ matrix spike duplicate
- VOCs in vapor by TO-15: 6 NS

Based on the validation performed, all data for this effort are acceptable and can be used for data interpretation. Any limitations on data use are indicated by qualifier flags. Table 2 presents the qualified data. The following items summarize data quality by all methods.

- **Method ASTM D5174:** No results for total uranium were qualified due to specific data quality concerns indicated by QC sample results.
- **Method SM2540C:** No results for TDS were qualified due to specific data quality concerns indicated by QC sample results.
- **Method SM2540D:** One TSS result was reanalyzed outside holding time and is considered an estimated reporting limit (RL).
- **SM5210B:** No results for BOD were qualified due to specific data quality concerns indicated by QC sample results.
- **Method E524.2:** A total of 29 results are qualified. Seventeen results are qualified as estimated concentrations because the result is reported between the detection limit (DL) and RL. Eight results are considered not detected due to external contamination. Two detected results are considered potential low bias and two not detected results are considered estimated RLs due to low MS recoveries.
- **Method TO-15:** A total of 33 results are qualified. Twenty-seven results are qualified as estimated concentrations because the result is reported between the DL and RL. Four results are considered not detected due to external contamination. Two results are considered estimated RLs due to low continuing calibration verification recoveries.

**Table 1. Summary of Completeness by Method**

<b>Method</b>	<b>Number of Samples<sup>a</sup></b>	<b>Number of Analytes</b>	<b>Total Number of Results</b>	<b>Number of Estimated Results</b>	<b>Number of Rejected Results</b>	<b>Percent Completeness</b>
ASTM D5174	10	1	10	0	0	100
SM2540C (water)	3	1	3	0	0	100
SM2540D (water)	3	1	3	1	0	100
SM5210B (water)	3	1	3	0	0	100
E524.2 (water)	9	59	531	29	0	100
TO-15 (soil gas)	6	37	222	33	0	100

<sup>a</sup> This number includes normal field samples only

**Table 2. Qualified Data for the GWTS 3Q12**

Sample Port	Sample ID	Sample Date	Analyte	Result	Detection Limit	Reporting Limit	Units	EPA Flag	Reason Code
<b>Method E524.2</b>									
SP-01	GWTS-INF-0703	7/18/2012	1,1,1,2-Tetrachloroethane	0.27	0.071	0.5	µg/L	J	6G
			Bromodichloromethane	0.06	0.049	0.5	µg/L	J	6G
			Dichlorodifluoromethane	0.05	0.044	0.5	µg/L	J	6G
			Toluene	0.15	0.05	0.5	µg/L	J	6G
			cis-1,2-Dichloroethene	0.3	0.042	0.5	µg/L	J	6G
			n-Butyl Benzene	0	0.016	0.5	µg/L	J	6G
SP-01	GWTS-INF-0802	8/8/2012	Bromodichloromethane	0.16	0.049	0.5	µg/L	U	1A
			Chloromethane	0.04	0.021	0.5	µg/L	U	1A
			Trichloroethene	0.07	0.027	0.5	µg/L	J	6G
SP-01	GWTS-INF-0901	9/6/2012	Bromodichloromethane	0.13	0.049	0.5	µg/L	J	6G
		9/6/2012	Trichloroethene	0.08	0.027	0.5	µg/L	J	6G
SP-03	CRB INF-0703	7/18/2012	1,1-Dichloropropene	0	0.06	0.5	µg/L	UJ	2B-
			Carbon tetrachloride	0	0.039	0.5	µg/L	UJ	2B-
			Chloroform	0.08	0.032	0.5	µg/L	U	1B
			Chloromethane	0.07	0.021	0.5	µg/L	J	6G
			Hexachlorobutadiene	0.03	0.03	0.5	µg/L	U	1A
			Tetrachloroethene	7.1	0.03	0.5	µg/L	J	2B-
SP-04	CRB Mid-0703	7/18/2012	Chloroform	0.08	0.032	0.5	µg/L	U	1B
			Chloromethane	0.06	0.021	0.5	µg/L	J	6G
			Tetrachloroethene	0.25	0.03	0.5	µg/L	J	6G
SP-05	CRB EFF-0703	7/18/2012	Chloroform	0.06	0.032	0.5	µg/L	U	1B
			Chloromethane	0.09	0.021	0.5	µg/L	J	6G
SP-07	EFF-0703	7/18/2012	Bromomethane	0.1	0.087	0.5	µg/L	J	6G
			Chloroform	0.14	0.032	0.5	µg/L	U	1B
			Chloromethane	0.3	0.021	0.5	µg/L	J	6G
SP-07	EFF-0802	8/8/2012	Chloroform	0.21	0.032	0.5	µg/L	U	1A
			Chloromethane	0.04	0.021	0.5	µg/L	U	1A
SP-07	EFF-0901	9/6/2012	Chloroform	0.22	0.032	0.5	µg/L	J	6G
			Tetrachloroethene	0.11	0.03	0.5	µg/L	J	6G
<b>SM2540D</b>									
SP-07	EFF-0901	9/6/2012	Total Suspended Solids	0		5	mg/L	UJ	4A

**Table 2. (Continued)**

Sample Port	Sample ID	Sample Date	Analyte	Result	Detection Limit	Reporting Limit	Units	EPA Flag	Reason Code
<b>TO-15</b>									
SP-08	GWTS Pr GAC-0703	7/18/2012	Bromomethane	1.3	1	44	ppbv	U	1A
			Toluene	0.72	0.59	4.4	ppbv	J	6G
			Trichloroethene	1.1	0.85	4.4	ppbv	J	6G
SP-08	GWTS Pr GAC-0802	8/8/2012	1,2-Dichloroethane	0	0.16	0.78	ppbv	UJ	5B-
			Benzene	0.3	0.085	0.78	ppbv	U	1A
			Chloromethane	1.1	0.67	7.8	ppbv	J	6G
			Dichlorodifluoromethane	0.44	0.17	0.78	ppbv	J	6G
			Toluene	0.42	0.15	0.78	ppbv	J	6G
			Trichloroethene	0.25	0.24	0.78	ppbv	J	6G
SP-08	GWTS Pr GAC-0901	9/6/2012	1,2,4-Trimethylbenzene	0.25	0.16	1.2	ppbv	J	6G
			1,4-Dichlorobenzene	0.29	0.27	1.2	ppbv	J	6G
			Dichlorodifluoromethane	0.48	0.34	1.2	ppbv	J	6G
			Toluene	0.59	0.24	1.2	ppbv	J	6G
			Trichloroethene	0.74	0.43	1.2	ppbv	J	6G
			Trichlorofluoromethane	0.32	0.21	1.2	ppbv	J	6G
			m,p-Xylenes	0.5	0.17	1.2	ppbv	J	6G
SP-09	GWTS Stack-0703	7/18/2012	1,2-Dibromoethane	0.12	0.11	0.79	ppbv	U	1A
			1,2-Dichloroethane	0.2	0.14	0.79	ppbv	J	6G
			Carbon tetrachloride	0.15	0.1	0.79	ppbv	J	6G
			Chloromethane	1.6	0.92	7.9	ppbv	U	1A
			Dichlorodifluoromethane	0.58	0.14	0.79	ppbv	J	6G
			Toluene	0.13	0.1	0.79	ppbv	J	6G
			Trichloroethene	0.43	0.15	0.79	ppbv	J	6G
			Trichlorofluoromethane	0.56	0.22	0.79	ppbv	J	6G
SP-09	GWTS Stack-0802	8/8/2012	1,2-Dichloroethane	0	0.16	0.78	ppbv	UJ	6G
			Dichlorodifluoromethane	0.44	0.17	0.78	ppbv	J	6G
			Trichloroethene	0.27	0.24	0.78	ppbv	J	6G
			Trichlorofluoromethane	0.26	0.21	0.78	ppbv	J	6G
SP-09	GWTS Stack-0901	9/6/2012	1,2,4-Trimethylbenzene	0.23	0.15	1.1	ppbv	J	6G
			1,3-Dichlorobenzene	0.61	0.29	1.1	ppbv	J	6G
			Dichlorodifluoromethane	0.53	0.31	1.1	ppbv	J	6G
			Trichlorofluoromethane	0.26	0.2	1.1	ppbv	J	6G
			m,p-Xylenes	0.19	0.16	1.1	ppbv	J	6G

---

**Table 2. (Continued)**

---

EPA = United States Environmental Protection Agency  
GWTS = groundwater treatment system  
ID = identification  
J = estimated concentration  
mg/L = milligrams per liter  
ppbv = part per billion by volume  
U = not detected  
UJ = estimated reporting limit  
µg/L = micrograms per liter  
3Q12 = third quarter 2012

**Reason Code**

1A = method blank contamination  
1B = trip blank contamination  
2B- = low matrix spike recovery  
6G = result reported between the detection limit and reporting limit

---

## ANALYTICAL DATA QUALITY SUMMARY

This section summarizes the quality assurance/quality control (QA/QC) results for sample results collected and data generated in support of Modesto Superfund Site during the period of July through September 2012. Since, these samples were not analyzed by the United States Environmental Protection Agency Region 9 Laboratory, they were not validated by Laboratory Data Consultants, Inc., but by URS Group, Inc. (URS).

Data were reviewed and qualified by URS using method and laboratory criteria. Precision and accuracy were evaluated from field and laboratory QC samples. 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 were used to evaluate accuracy. External contamination was assessed through the evaluation of method blanks and trip blanks (TBs). Comparability of the data was ensured by having project personnel follow standardized field procedures described in the Sampling and Analysis Plan (URS, 2010) and the Natural Attenuation Work Plan (URS, 2012) and having laboratories follow analytical methods and standard operating procedures. The completeness of the data is the measure of the amount of valid data for each method and matrix (expressed as a percentage). Completeness is provided in Table 1. 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 appropriated holding times.

- The completeness objective was met for the third quarter 2012 (3Q12) event: 99 percent of the data produced are usable. There was only one rejected result.
- Of 490 results, eight normal field results were qualified as estimated or not-detected results and one normal field result was rejected, because of one or more QA objectives were not met.

URS staff collected groundwater samples from Round 2 of the natural attenuation evaluation screening sampling (3Q12). Acetylene (Method RSK-175) and fatty acids (Method 300.0 M) were analyzed by EMAX Laboratories in Torrance, California; haloacetic acids (Method E552.2) were analyzed by Test America Laboratories, Inc. in Irvine, California; targeted anaerobic bacteria (CENSUS) were analyzed by Microbial Insights in Rockford, Tennessee, and compound specific isotope analysis (CSIA) for carbon isotopes (SW8260B) were analyzed by Calscience Environmental Laboratories as a subcontract laboratory to Zymax Forensics in Escondido, California.

The following samples were collected:

- Acetylene by RSK-175: 11 normal samples (NS), 1 field duplicate (FD), 1 TB and 1 MS/MSD
- Fatty acids by 300.0M: 11 NS, 1FD, and 1 MS/1 laboratory duplicate
- Haloacetic acids by E552.2: 11 NS, 1 FD, and 2 MSs
- CENSUS: 5 NS and 2 FD
- CSIA (SW8260B): 9 NS, 2FD, and 1 TB

Based on the validation performed, all data for this effort are acceptable and can be used for data interpretation, except for one result for Method E552.2 which was rejected and should not be used for any purpose. Any limitations on data use are indicated by qualifier flags. The following items summarize data quality by methods. Table 2 presents the qualified data for 3Q12.

- Method RSK-175: No results for acetylene are qualified for data quality concerns indicated by QC sample results.
- Method 300.0M: No results for fatty acids are qualified for data quality concerns indicated by QC sample results.
- Method E552.2: One result for monochloroacetic acid in sample MW-25B-3Q12 is rejected due to a low matrix spike recovery (0 percent).
- Method CENSUS: Eight results are qualified. Seven result are qualified as estimated due to poor field duplicate precision and one of these result is also qualified because the result was reported between the detection limit (DL) and reporting limit (RL). One additional result is qualified as estimated because it was reported between the DL and RL.
- Method CSIA (SW8260B): No results are qualified for data quality concerns indicated by QC sample results.

**Table 1. Summary of Completeness by Method**

<b>Method</b>	<b>Number of Samples<sup>a</sup></b>	<b>Number of Analytes</b>	<b>Total Number of Results</b>	<b>Number of Estimated Results</b>	<b>Number of Rejected Results</b>	<b>Percent Completeness</b>
RSK-175	11	1	11	0	0	100
300.0M	11	5	55	0	0	100
E552.2	11	3	33	0	1	97
CENSUS	5	8	40	8	0	100
CSIA (SW8260B)	9	39	351	0	0	100

<sup>a</sup> This number includes normal field samples only

**Table 2. Qualified Data for 3Q12**

<b>Sample ID</b>	<b>Sample Date</b>	<b>Method</b>	<b>Analyte</b>	<b>Result</b>	<b>Reporting Limit</b>	<b>Detection Limit</b>	<b>Units</b>	<b>EPA Flag</b>
MW-4A-3Q12	8/7/12	CENSUS	Dehalobacter spp.	137	2.1	0.1	cells/mL	J
MW-4A-3Q12	8/7/12	CENSUS	Desulfuromonas spp.	120	0.7	0.1	cells/mL	J
MW-4A-3Q12	8/7/12	CENSUS	Desulfitobacterium spp.	1760000	0.7	0.1	cells/mL	J
MW-4A-3Q12	8/7/12	CENSUS	Methane Oxidizing Bacteria	1880000	0.7	0.1	cells/mL	J
MW-20B-3Q12	8/8/12	CENSUS	Dehalobacter spp.	0.7	2.1	0.1	cells/mL	J
MW-20B-3Q12	8/8/12	CENSUS	Desulfitobacterium spp.	12900	0.7	0.1	cells/mL	J
MW-20B-3Q12	8/8/12	CENSUS	Methane Oxidizing Bacteria	1150000	0.7	0.1	cells/mL	J
MW-25B-3Q12	8/6/12	552.2	Monochloroacetic acid	ND	2.0	0.5	µg/L	R
MW-28B-3Q12	8/6/12	CENSUS	Dehalococcoides spp.	0.6	0.4	0.1	cells/mL	J

J = estimated concentration

mL = milliliter

ND = not detected

R = rejected result

µg/L = micrograms per liter

3Q12 = third quarter 2012

**Appendix D**  
**System Uptime Logs**

**APPENDIX D**  
**SYSTEM UPTIME LOGS**

This section presents quantitative results on operational time for the groundwater treatment (GWT) and soil vapor extraction (SVE) systems. Operation time and percentage of uptime for this reporting period (01 July through 30 September 2012) are as follows:

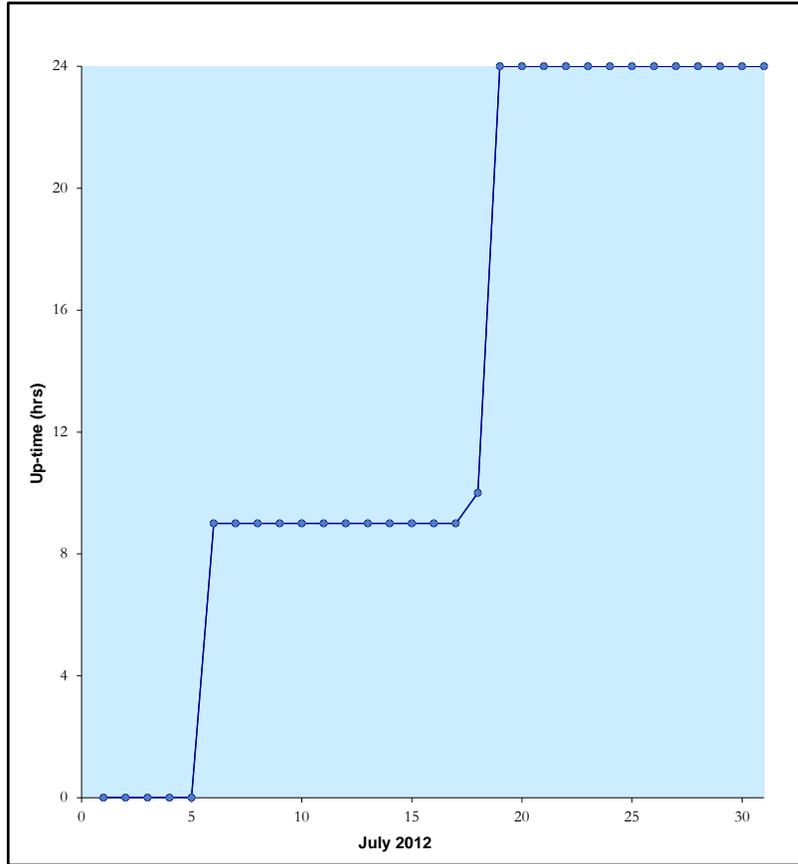
<u>Remedial System</u>	<u>Total Operation Hours</u>	<u>Percentage of Operation</u>
Groundwater Treatment	1,741	79%
Soil Vapor Extraction	2,208	100%

Monthly graphical representations of the GWT system operation time can be found in Figures D-1, D-2, and D-3 for July, August, and September 2012, respectively.

Monthly graphical representations of the SVE system operation time can be found in Figures D-4, D-5, and D-6 for July, August, and September 2012, respectively.

**FIGURE D-1**  
**UPTIME LOG**  
**GROUNDWATER TREATMENT SYSTEM**  
**MODESTO SUPERFUND SITE**

Month	Day	Uptime (hrs)	Description of Activity Performed
July	1	0	Replacement of effluent pump
	2	0	Replacement of effluent pump
	3	0	Replacement of effluent pump
	4	0	Replacement of effluent pump
	5	0	Replacement of effluent pump
	6	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	7	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	8	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	9	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	10	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	11	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	12	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	13	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	14	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	15	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	16	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	17	9	Replacement of effluent pump, System brought back on line to process redevelopment water
	18	10	Replacement of effluent pump, System brought back on line to process redevelopment water
	19	24	
	20	24	
	21	24	
	22	24	
	23	24	
	24	24	
	25	24	
	26	24	
	27	24	
	28	24	
	29	24	
	30	24	
	31	24	

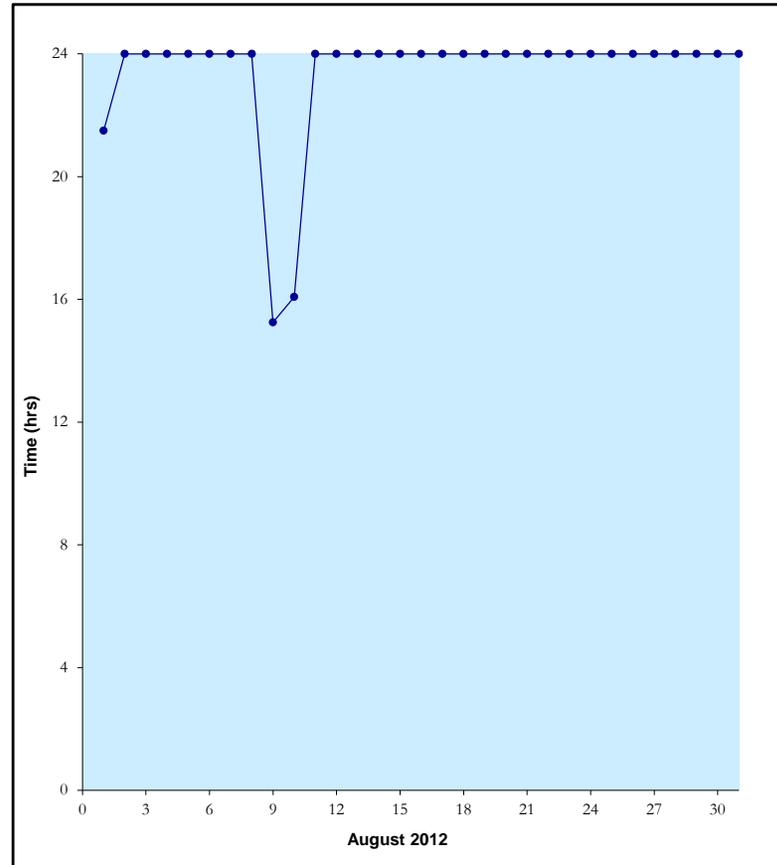


Uptime hours:	<b>430</b>
Uptime %:	<b>57.8%</b>

Notes:

**FIGURE D-2**  
**UPTIME LOG**  
**GROUNDWATER TREATMENT SYSTEM**  
**MODESTO SUPERFUND SITE**

Month	Day	Uptime (hrs)	Description of Activity Performed
May	1	21.5	Shutoff EW-01R to discharge to EW-02 frac tank system
	2	24	
	3	24	
	4	24	
	5	24	
	6	24	
	7	24	
	8	24	
	9	15.25	Repaired leak in LGAC hose.
	10	16.08	Repaired leak in LGAC hose.
	11	24	
	12	24	
	13	24	
	14	24	
	15	24	
	16	24	
	17	24	
	18	24	
	19	24	
	20	24	
	21	24	
	22	24	
	23	24	
	24	24	
	25	24	
	26	24	
	27	24	
	28	24	
	29	24	
	30	24	
	31	24	

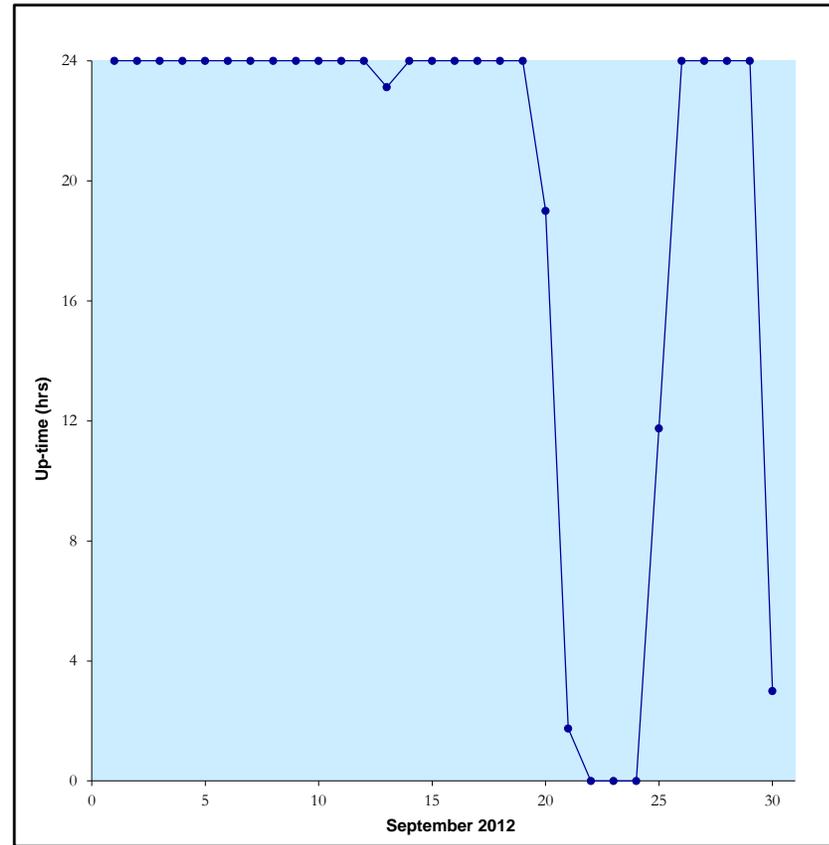


Uptime hours:	724.83
Uptime %:	97.4%

Notes:

**FIGURE D-3**  
**UPTIME LOG**  
**GROUNDWATER TREATMENT SYSTEM**  
**MODESTO SUPERFUND SITE**

Month	Day	Uptime (hrs)	Description of Activity Performed
September	1	24	
	2	24	
	3	24	
	4	24	
	5	24	
	6	24	
	7	24	
	8	24	
	9	24	
	10	24	
	11	24	
	12	24	
	13	23.12	Shutdown system for electrical modification for EW-02
	14	24	
	15	24	
	16	24	
	17	24	
	18	24	
	19	24	
	20	19	System shut off and on for testing and electrical completion
	21	1.75	Float control for effluent pump not responding
	22	0	Float control for effluent pump not responding
	23	0	Float control for effluent pump not responding
	24	0	Float control for effluent pump not responding
	25	11.75	Float control for effluent pump not responding
	26	24	
	27	24	
	28	24	
	29	24	
	30	3	System shutdown due to full bag filters

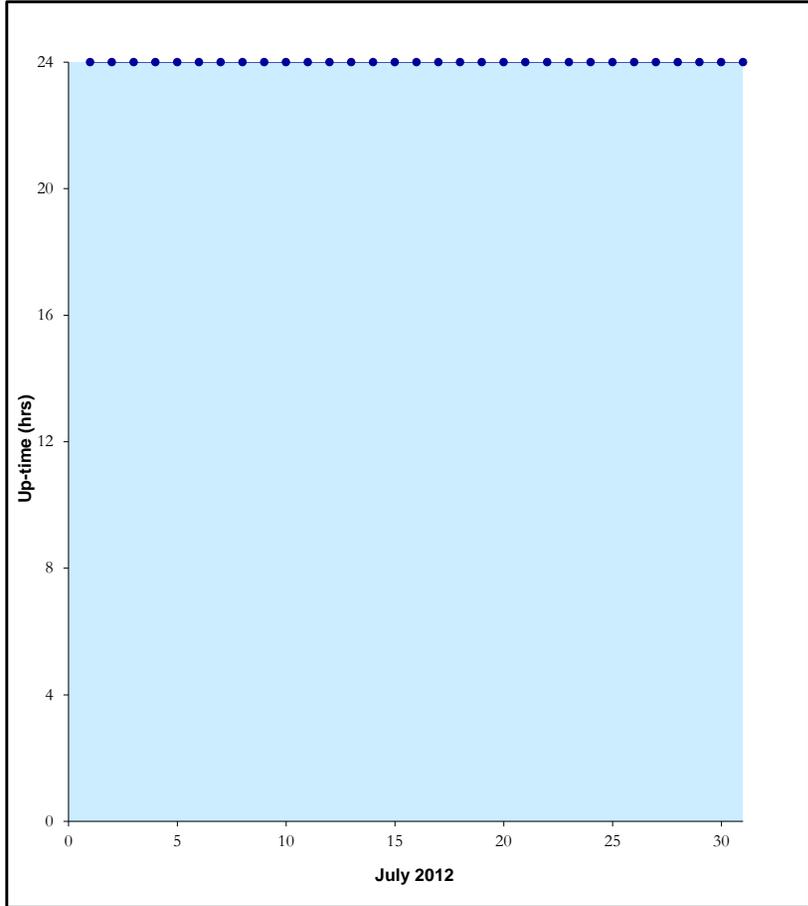


Uptime hours:	<b>586.62</b>
Uptime %:	<b>81.5%</b>

Notes:

**FIGURE D-4**  
**UPTIME LOG**  
**SVE TREATMENT SYSTEM**  
**MODESTO SUPERFUND SITE**

Month	Day	Uptime (hrs)	Description of Activity Performed
July	1	24	
	2	24	
	3	24	
	4	24	
	5	24	
	6	24	
	7	24	
	8	24	
	9	24	
	10	24	
	11	24	
	12	24	
	13	24	
	14	24	
	15	24	
	16	24	
	17	24	
	18	24	
	19	24	
	20	24	
	21	24	
	22	24	
	23	24	
	24	24	
	25	24	
	26	24	
	27	24	
	28	24	
	29	24	
	30	24	
	31	24	

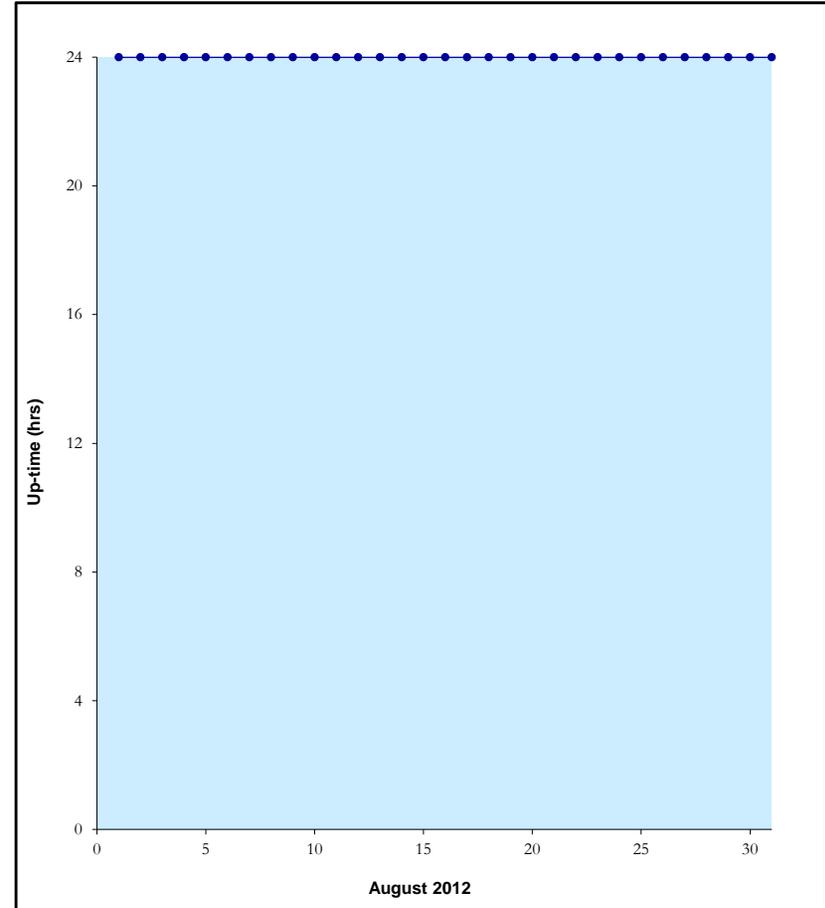


Uptime hours:	<b>744</b>
Uptime %:	<b>100.0%</b>

Notes:

**FIGURE D-5**  
**UPTIME LOG**  
**SVE TREATMENT SYSTEM**  
**MODESTO SUPERFUND SITE**

Month	Day	Uptime (hrs)	Description of Activity Performed
August	1	24	
	2	24	
	3	24	
	4	24	
	5	24	
	6	24	
	7	24	
	8	24	
	9	24	
	10	24	
	11	24	
	12	24	
	13	24	
	14	24	
	15	24	
	16	24	
	17	24	
	18	24	
	19	24	
	20	24	
	21	24	
	22	24	
	23	24	
	24	24	
	25	24	
	26	24	
	27	24	
	28	24	
	29	24	
	30	24	
	31	24	

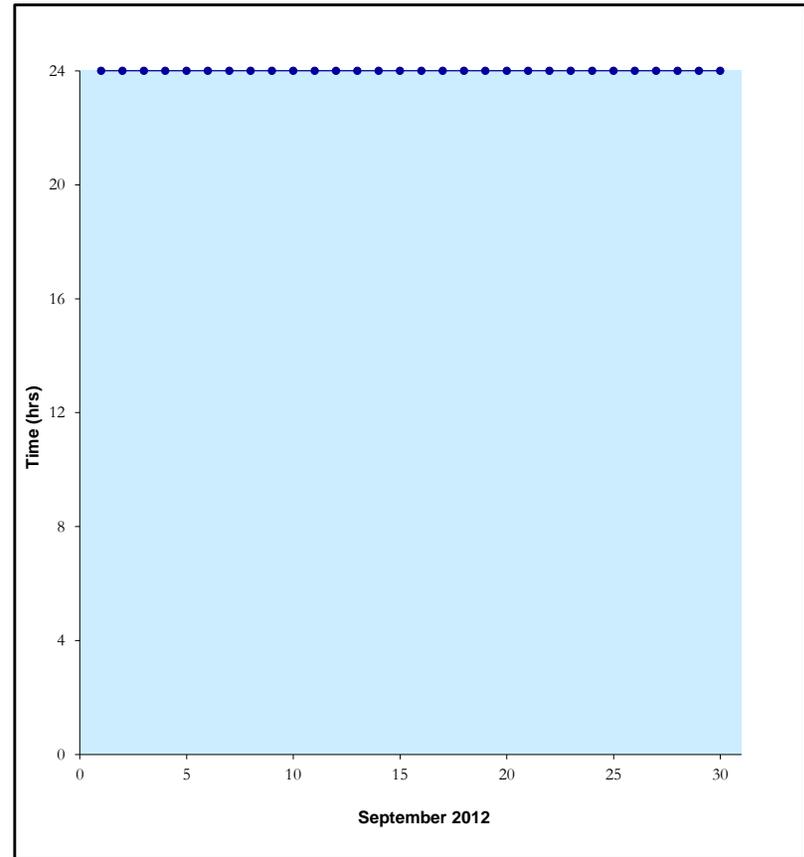


Uptime hours:	<b>744</b>
Uptime %:	<b>100.0%</b>

Notes:

**FIGURE D-6**  
**UPTIME LOG**  
**SVE TREATMENT SYSTEM**  
**MODESTO SUPERFUND SITE**

Month	Day	Uptime (hrs)	Description of Activity Performed
September	1	24	
	2	24	
	3	24	
	4	24	
	5	24	
	6	24	
	7	24	
	8	24	
	9	24	
	10	24	
	11	24	
	12	24	
	13	24	
	14	24	
	15	24	
	16	24	
	17	24	
	18	24	
	19	24	
	20	24	
	21	24	
	22	24	
	23	24	
	24	24	
	25	24	
	26	24	
	27	24	
	28	24	
	29	24	
	30	24	



Uptime hours:	<b>720</b>
Uptime %:	<b>100.0%</b>

Notes:

**Appendix E**  
**Operation and Maintenance Process Logs**

**APPENDIX E**  
**PROCESS AND MONITORING LOGS**

This section presents process and monitoring logs recorded during weekly routine and non-routine visits during this reporting period (01 July through 30 September 2012) for both soil vapor extraction (SVE) and groundwater treatment (GWT) systems. Process readings, (flow rates, pressures, and vapor concentrations) pertaining to individual treatment units (air stripper, liquid granular activated carbon (GAC), and ion exchange) are recorded to document trends in each treatment process and establish typical operating ranges. These process and monitoring logs are working documents that will be updated as necessary to accommodate changes and modifications to the treatment systems.



URS Group  
Preventative and Corrective Maintenance Log  
Modesto Superfund Site

Site Name: \_\_\_\_\_  
Period: \_\_\_\_\_ to \_\_\_\_\_  
(month/day/year) (month/day/year)

Date	Initials	Hour Meter	Maintenance Performed	LOTO Required	LOTO Description (Where?Why?)	LOCK ON (Date/Time)	Zero Energy Check	LOCK OFF (Date/Time)	LOCK ID (Lock No.)
				Y / N			Y / N		
				Y / N			Y / N		
				Y / N			Y / N		
				Y / N			Y / N		
				Y / N			Y / N		
				Y / N			Y / N		

URS Group  
Preventative and Corrective Maintenance Log  
Modesto Superfund Site

Site Name: \_\_\_\_\_

Shutdown Date: <u>7/17/12</u> <i>Cont.</i>	Startup Date: <u>7/18/12</u>
Shutdown Time: <u>1600</u>	Startup Time: <u>0800</u>
Shutdown Purpose or Cause: <i>Shutdown Continued due to replacement of effluent Pump.</i>	
Corrective Actions Taken (if shutdown was unplanned): <i>New Effluent Pump installed. System brought back online to process Redevelopment Water @ EW-2</i>	
Performed By: _____	

Shutdown Date: <u>7/18/12</u> <i>Intermittant</i>	Startup Date: <u>7/18/12</u>
Shutdown Time: <u>0800</u>	Startup Time: <u>1400</u>
Shutdown Purpose or Cause: <i>GWTS operation intermittent on/off to process EW-2 development water</i>	
Corrective Actions Taken (if shutdown was unplanned): <i>EW-1 returned to service 7/18/12 @ 1400</i>	
Performed By: _____	

Shutdown Date: _____	Startup Date: _____
Shutdown Time: _____	Startup Time: _____
Shutdown Purpose or Cause:	
Corrective Actions Taken (if shutdown was unplanned):	
Performed By: _____	

Shutdown Date: _____	Startup Date: _____
Shutdown Time: _____	Startup Time: _____
Shutdown Purpose or Cause:	
Corrective Actions Taken (if shutdown was unplanned):	
Performed By: _____	

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

URS Corporation  
 Modesto Superfund Site  
 Site Inspections

Task Description	7/18/12	7/25/12	1/1	1/1	1/1
WEEKLY	Task Performed (Technician Initials or Value)				
<b>Groundwater Treatment System</b>					
Record Process Logs	GB	TH			
Check Blowers and motors for heat, noise, and vibration	✓	✓			
Check Air Stripper Feed pump/motor (P-2) for heat, noise, and vibration.	✓	✓			
Inspect all process piping for leaks	✓	✓			
Inspect all process hoses/fittings for leaks	✓	✓			
Check Air Stripper Effluent pump/motor (P-3) for heat, noise, and vibration.	✓	✓			
Inspect Sump (Pump as Necessary).	✓	✓			
Check Air Stripper sump level site glass. Clean as necessary	✓	✓			
Inspect IX system influent vacuum break for leaks	✓	✓			
Clean up compound area	✓	✓			
Drain VGAC condensate	✓	✓			
Perform autodialer operational check	✓	✓			
Autodialer battery check	✓	✓			
Perform inspection of EW-1R pipeline	✓	✓			
Inspection of Spill Response Kit	✓	✓			
Inspection of Emergency Response Plan/MSDS Binder	✓	✓			
<b>Soil Vapor Extraction System</b>					
Record Process Logs	✓	✓			
Check Blowers and motors for heat, noise, and vibration	✓	✓			
Inspect all process piping for leaks	✓	✓			
Clean up compound area	✓	✓			
Drain VGAC condensate	✓	✓			
Perform autodialer operational check	✓	✓			
Inspection of Spill Response Kit	✓	✓			
Inspection of Emergency Response Plan/MSDS Binder	✓	✓			

Task Description	Performed		
	Date	Initials	Reading
<b>MONTHLY</b>			
Check fire extinguisher	7/25/12	TH	
Inspect EW-1R vault	7/25/12	TH	
Inspect VI Mitigation operations - "Part House"			
Replace Auto Dialer Batteries (if necessary)	—	—	
<b>Quarterly</b>			
Interlock Checks Groundwater			
Interlock Checks SVE			
Collect Well Flow read at SVE-02			
Collect Well Flow read at SVE-03			
Collect Well Flow read at SVE-04			
<b>ANNUAL</b>			
Collect Amp readings			
<b>Instrument Calibration</b>			
System Effluent Flow Meter (Performed in June and December)			

Notes:

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

Date:  
Weather:  
Sampler:

7/18/12  
Clear  
George Bradshaw / Tamara Hendrick

SAMPLE COLLECTION RECORD  
MODESTO SUPERFUND SITE

Time	Description	Totalizer Reading (gallons)	Flow (gpm)
10:18	GWTS Effluent	9043900	57

Time	Sample Location - Test Method	Sample Description	LOCID	No. of Containers	Container Type	Preservative	pH	Cond.	Temp
1114	EFF-0703 E524.2	Effluent-NS	SP-07	3	40 ml VOA	HCl	8.02	985	25.7
	EFF-0703 SM2540C	Effluent-NS	SP-07	1	250 ml Poly	None	↓	↓	↓
	EFF-0703 SM5210B	Effluent-NS	SP-07	1	500 ml Poly	None	↓	↓	↓
	EFF-0703 SM2540D	Effluent-NS	SP-07	1	500 ml Poly	None	↓	↓	↓
	EFF-0703 D5174	Effluent-NS	SP-07	1	1 Liter Poly	HNO3	↓	↓	↓
1133	IEX Mid-0703 D5174	IEX Mid-0703	SP-06	1	1 Liter Poly	HNO3	7.47	1004	26.4
1138	MW-106-0703 D5174	IEX Mid-0703-FD	SP-06	1	1 Liter Poly	HNO3	"	"	"
1136	Pre IEX-0703 D5174	Pre IEX-0703	SP-05	1	1 Liter Poly	HNO3	7.76	1004	26.4
1141	CRB EFF-0703 E524.2	Carbon Effluent-NS	SP-05	3	40 ml VOA	HCl	7.75	1020	27.2
1144	CRB Mid-0703 E524.2	Carbon Mid-NS	SP-04	3	40 ml VOA	HCl	8.05	1018	27.2
1148	CRB INF-0703 E524.2	Carbon Influent- MS/MSD	SP-03	5	40 ml VOA	HCl	8.21	1030	27.6
1153	GWTS-INF-0703 E524.2	Influent-NS	SP-01	3	40 ml VOA	HCl	7.70	1047	27.9
1153	GWTS-INF-0703 D5174	Influent-NS	SP-01	1	1 Liter Poly	HNO3	"	"	"
0706	MW-106-3Q12 E524.2	TB	TB	3	40 ml VOA	HCl	-	-	-
1100	GWTS Stack-0703 TO-15	GWTP VGAC Effluent-NS	SP-09	1	1 Liter Summa	None			
1153	GWTS Pr GAC-0703 TO-15	GWTP VGAC Influent-NS	SP-08	1	1 Liter Summa	None			
1230	SVE Stack-0703 TO-15	SVE VGAC Effluent-NS	SP-12	1	400ml Summa	None	#860		
1235	SVE Pre GAC-0703 TO-15	SVE VGAC Influent-NS	SP-11	1	400ml Summa	None	#862		

Sampler Signature:  Date: 7/18/12

Notes:

	FD = Field Duplicate
	FB = Field Blank (ambient)
	NS = Normal Sample
	TB = Trip Blank
Scan COCs to:	
URS Attn: Debbie Casagrande (916) 679-2040	

**URS Corporation**  
**Modesto, Superfund Site**  
**Process Data Sheet**

Groundwater Treatment System																	
Initials	Date	Time	Hour Meter Hrs.	Utility Power		System Influent				Anti-Solvent Sequestrant T-3 Gallons	Air Stripper Water						
						Flow GPM	Pressure PSI	Total Flow Gallons	pH		Influent Pressure PSI	Effluent Pressure PSI	Flow GPM	Pressure PSI	Influent Pressure PSI	Effluent Pressure PSI	Flow GPM
TH	8/11/12	0930	52714	15.98	4718	48	15	13831	7.34	26	8.6	6.5	56	44	41.2	42.7	58
GB	8/8/12	0750	52880	15.98	6470	46	33	18354	7.44	22	9.9	6.6	56	44	45.3	42.8	58
TH	8/14/12	0815	53007	15.98	7839	46	31	21852	7.28	18	10.3	7.3	56	44	46.2	43.7	58
TH	8/23/12	0820	53223	15.98	10164	46	32	27750	7.35	30	9.8	6.8	56	45	46.4	44.0	59
TH	8/30/12	0915	53390	15.98	11966	46	32	32248	7.00	26	9.6	6.8	56	45	47.1	44.4	59
Design Range or Target Value				10.0-30	N/A	3.0-85	30-50	n/a	5.0-12.0	3.0-25	30-50	30-50	40-70	30-50	30-50	30-50	40-70

Groundwater Treatment System																	
Air Stripper Vapor						Liquid Carbon			Ion Exchange			System Effluent				Radiation Meter	
Sump Pressure	Effluent Pressure	Influent P.I.D.	Effluent P.I.D.	Temp	Flow	Influent Pressure	Mid-Bed Pressure	Effluent Pressure	Influent Pressure	Mid-Bed Pressure	Flow	Flow	Pressure	pH	Effluent Total Flow	Outside GWTS	Inside GWTS
Air Stripper Trays	in. H2O	ppm	ppm	°F	CFM	PSI	PSI	PSI	PSI	PSI	GPM	Gpm	PSI	pH	Gallons	mR/hr Peak	mR/hr Peak
-	-	0.0	0.0	82.3	455	38	33	28	19.5	11	45	56	0	7.56	99583	0	0
-	-	0.2	0.0	69.9	695	38	33	28	20	11	44	56	0	8.16	04077	0	0
-	-	0.3	0.0	71.0	645	39	33.5	28.5	21	11	46	56	0	7.91	0551	0	0
-	-	0.0	0.0	70.4	630	39.5	34	29	21.5	11.5	45	56	0	7.87	13430	0	0
-	-	0.0	0.0	70.5	655	40	34	29	21.5	11.5	45	56	0	7.78	17929	0	0
5.0-25	5.0-25	0-100	0-10	65-75	550-650	25-70	25-60	25-50	1.0-10	1.0-10	3.0-60	3.0-50	1.0-5	5.0-12	N/A	0-1	0-1

Soil Vapor Extraction System																	
SVE Influent						Blower			Filter		Vapor				Radiation Meter		
Date	Time	Pressure In. H2O	Temp °F	Flow CFM	Dilution Yes/No	Hour Meter Hrs.	Effluent Pressure In. H2O	Temp °F	Flow CFM	Influent Pressure In. H2O	Effluent Pressure In. H2O	Influent P.I.D.	Effluent P.I.D.	Temp °F	Flow CFM	Outside SVE	Inside SVE
												VGAC Vessel	Stack			mR/hr Peak	mR/hr Peak
8/11/12	1015	-61	86.5	157	N	12300	-3.3	201.5	158	-65	-69	0	0	201.5	158	0	0
8/8/12	1605	-61	85.8	153	N	12469	3.0	200.3	155	-65	-68	0	0	200.3	155	0	0
8/14/12	0850	-61	87.7	160	N	12611	3.0	200.1	156	-66	-70	0	0	200.1	156	0	0
8/23/12	0920	-62	85.2	155	N	12828	3.0	196.4	154	-65	-69	0	0	196.4	154	0	0
8/30/12	0945	-60	84.4	168	N	12996	3.25	197.7	154	-65	-68.5	0	0	197.7	154	0	0
		25-70	65-75	100-200	NO	N/A	2.0-10	65-75	100-200	N/A	N/A	0-100	0-10	65-75	100-200	0-1	0-1

Note: For pressures measured relative to atmospheric (barometric) pressure, use (-) for vacuum.  
 Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

	<b>SVE</b>	<b>KW</b>	<b>KWH</b>	<b>SVE</b>	<b>KW</b>	<b>KWH</b>
8/11/12	9.01	7300		8/23/12	9.09	11937
8/8/12	9.09	8786		8/30/12	9.09	13414
8/14/12	9.09	10053				

\* 640 mR/hr water flow

URS Group  
Preventative and Corrective Maintenance Log  
Modesto Superfund Site

Site Name: \_\_\_\_\_  
 Period: 8/1/12 to 8/31/12  
(month/day/year) (month/day/year)

Date	Initials	Hour Meter	Maintenance Performed	LOTO Required	LOTO Description (Where?Why?)	LOCK ON (Date/Time)	Zero Energy Check	LOCK OFF (Date/Time)	LOCK ID (Lock No.)
				Y / N			Y / N		
				Y / N			Y / N		
				Y / N			Y / N		
				Y / N			Y / N		
				Y / N			Y / N		
				Y / N			Y / N		

URS Group  
Preventative and Corrective Maintenance Log  
Modesto Superfund Site

Site Name: \_\_\_\_\_

Shutdown Date: <u>8/1/12</u>	Startup Date: <u>8/1/12</u>
Shutdown Time: <u>0845</u>	Startup Time: <u>1115</u>
Shutdown Purpose or Cause: <u>Shutdown EW-1 to discharge EW-2 frac tank to system</u>	
Corrective Actions Taken (if shutdown was unplanned):	
Performed By: _____	

Shutdown Date: <u>8/9/12</u>	Startup Date: <u>8/10/12</u>
Shutdown Time: <u>1515</u>	Startup Time: <u>0755</u>
Shutdown Purpose or Cause: <u>Shutdown system due to leak in hose between LGAs. Repaired and restarted.</u>	
Corrective Actions Taken (if shutdown was unplanned):	
Performed By: _____	

Shutdown Date: _____	Startup Date: _____
Shutdown Time: _____	Startup Time: _____
Shutdown Purpose or Cause:	
Corrective Actions Taken (if shutdown was unplanned):	
Performed By: _____	

Shutdown Date: _____	Startup Date: _____
Shutdown Time: _____	Startup Time: _____
Shutdown Purpose or Cause:	
Corrective Actions Taken (if shutdown was unplanned):	
Performed By: _____	

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

URS Corporation  
 Modesto Superfund Site  
 Site Inspections

Task Description	8/1/12	8/8/12	8/14/12	8/23/12	11
WEEKLY	Task Performed (Technician Initials or Value)				
<b>Groundwater Treatment System</b>					
Record Process Logs	TH	GB	TH	TH	
Check Blowers and motors for heat, noise, and vibration					
Check Air Stripper Feed pump/motor (P-2) for heat, noise, and vibration.					
Inspect all process piping for leaks					
Inspect all process hoses/fittings for leaks					
Check Air Stripper Effluent pump/motor (P-3) for heat, noise, and vibration.					
Inspect Sump (Pump as Necessary).					
Check Air Stripper sump level site glass. Clean as necessary					
Inspect IX system Influent vacuum break for leaks					
Clean up compound area					
Drain VGAC condensate					
Perform autodialer operational check					
Autodialer battery check					
Perform inspection of EW-1R pipeline					
Inspection of Spill Response Kit					
Inspection of Emergency Response Plan/MSDS Binder					
<b>Soil Vapor Extraction System</b>					
Record Process Logs	TH	GB	TH	TH	
Check Blowers and motors for heat, noise, and vibration					
Inspect all process piping for leaks					
Clean up compound area					
Drain VGAC condensate					
Perform autodialer operational check					
Inspection of Spill Response Kit					
Inspection of Emergency Response Plan/MSDS Binder					

Task Description	Date	Performed Initials	Reading
<b>MONTHLY</b>			
Check fire extinguisher			
Inspect EW-1R vault	8/14/12	GB	
Inspect VI Mitigation operations - "Part House"			
Replace Auto Dialer Batteries (if necessary)			
<b>Quarterly</b>			
Interlock Checks Groundwater			
Interlock Checks SVE			
Collect Well Flow read at SVE-02			
Collect Well Flow read at SVE-03			
Collect Well Flow read at SVE-04			
<b>ANNUAL</b>			
Collect Amp readings			
<b>Instrument Calibration</b>			
System Effluent Flow Meter (Performed in June and December)			

Notes:

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

Date:  
Weather:  
Sampler:

8/8/12  
11:11 AM  
CROSS BRANCHED

SAMPLE COLLECTION RECORD  
MODESTO SUPERFUND SITE

Time	Description	Location Reading (allied)	Flow (gpm)
	QWTS Effluent		

Time	Sample Location - Test Method	Sample Description	LOI/D	No. of Containers	Container Type	Preservative	pH	Cond	Temp
0830	EFF-0802 ES24.2	Effluent-NS	SP-07	3	40 ml VOA	HCl	8.16	1060	21.0
0830	EFF-0802 SM2540C	Effluent-NS	SP-07	1	250 ml Poly	None	8.16	1060	21.0
0840	EFF-0802 SM5210B	Effluent-NS	SP-07	1	500 ml Poly	None	8.32	1020	6.0
0840	EFF-0802 SM2540D	Effluent-NS	SP-07	1	500 ml Poly	None	8.32	1020	6.0
0850	IEX EFF-0802 DS174	IEX Eff-0802	SP-10	1	1 Liter Poly	HNO3	7.85	1020	20.6
0855	IEX Mid-0802 DS174	IEX Mid-0802	SP-06	1	1 Liter Poly	HNO3	7.83	1020	20.8
0900	Pre IEX-0802 DS174	Pre IEX-0802	SP-05	1	1 Liter Poly	HNO3	7.84	1020	21.0
0905	GWTS-INF-0802 ES24.2	Influent-NS	SP-01	3	40 ml VOA	HCl	7.44	1040	20.8
0910	MW-101-NS ES24.2	Influent-FD	SP-01	3	40 ml VOA	HCl	7.44	1040	20.8
0820	MW-303-3Q12 ES24.2	TB	TB	3	40 ml VOA	HCl	-	-	-
0930	GWTS Stack-0802 TD-15	GWTP VGAC Effluent-NS	SP-09	1	1 Liter Summa	None	# 37414		
0945	GWTS Pr GAC-0802 TO-15	GWTP VGAC Influent-NS	SP-08	1	1 Liter Summa	None	# 36510		
1020	SVE Stack-0802 TD-15	SVE VGAC Effluent-NS	SP-12	1	400ml Summa	None	# 646		
1030	SVE Pre GAC-0802 TO-15	SVE VGAC Influent-NS	SP-11	1	400ml Summa	None	# 670		

Sampler Signature:  Date: 8/8/12

Notes:

FD = Field Duplicate
FB = Field Blank (ambient)
NS = Normal Sample
TB = Trip Blank

Scan COCs for:  
URS Attn: Debbie Casagrande (916) 679-2040

URS Corporation  
Modesto, Superfund Site  
Process Data Sheet

Groundwater Treatment System																		
			Hour Meter		Utility Power		System Influent				Anti-Solvent Sequestant	Air Stripper Water						
Initials	Date	Time	Hrs.	KW	KWH	Flow	Pressure	Total Flow	pH		Influent Pressure	Effluent Pressure	Flow	Pressure	Influent Pressure	Effluent Pressure	Flow	
							GPM	PSI	Gallons	pH	T-3	Deg Filter F-1		Pump P-3	Bag Filter F-2			
									M100		Gallons	PSI	PSI	GPM	PSI	PSI	PSI	GPM
TH	9/6/12	0830	53557	15.98	13785	46	32	36767	7.14	22	9.8	6.6	56	45	47.0	44.0	59	
TH	9/13/12	0840	53725	15.98	15613	46	32	41306	7.20	18	9.7	6.9	58	45	47.2	44.4	60	
TH	9/20/12	1050	53894	15.98	17412	46	16	45352	7.03	31	9.8	6.9	58	45	47.0	44.3	60	
TH	9/25/12	1220	53910	15.98	17606	46	16	45721	7.34	30.5	10.1	7.2	58	45	46.5	44.2	60	
Design Range or Target Value				10.0-30	N/A	3.0-85	30-30	n/a	5.0-12.0	3.0-25	30-50	30-50	40-70	30-50	30-50	30-50	40-70	

Groundwater Treatment System																	
Air Stripper Vapor				Liquid Carbon				Ion Exchange				System Effluent				Radiation Meter	
Sump Pressure	Effluent Pressure	Influent P.I.D.	Effluent P.I.D.	Temp	Flow	Influent Pressure	Mid-Bed Pressure	Effluent Pressure	Influent Pressure	Mid-Bed Pressure	Flow	Flow	Pressure	pH	Effluent Total Flow	Outside GWTS	Inside GWTS
Air Stripper Trays		VGAC Vessel		Stack													
In. H2O	In. H2O	ppm	ppm	°F	CFM	PSI	PSI	PSI	PSI	PSI	GPM	Gpm	In H2O	pH	Gallons	mR/hr Peak	mR/hr Peak
—	—	0	0	70.3	655	40	34	29	21.5	11	45	56	0	7.92	22452	0	0
—	—	0	0	70.4	675	40	34	29	21.5	11	45	56	0	7.85	26996	0	0
—	—	0	0	69.3	675	40	34	29	21.5	11	45	56	0	7.80	31479	0	0
—	—	0	0	71.2	655	39	33.5	28	21	11	45	56	0	7.75	31881	0	0
5.0-25	5.0-25	0-100	0-10	65-75	550-650	25-70	25-60	25-50	1.0-10	1.0-10	3.0-60	3.0-50	1.0-5	5.0-12	N/A	0-1	0-1

Soil Vapor Extraction System																	
SVE Influent						Blower				Filter		Vapor				Radiation Meter	
Date	Time	Pressure	Temp	Flow	Dilution	Hour Meter	Effluent Pressure	Temp	Flow	Influent Pressure	Effluent Pressure	Influent P.I.D.	Effluent P.I.D.	Temp	Flow	Outside SVE	Inside SVE
		In. H2O	°F	CFM	Yes/No	Hrs.	In. H2O	°F	CFM	In. H2O	In. H2O	VGAC Vessel		Stack			
							ppm	ppm						°F	CFM	mR/hr Peak	mR/hr Peak
9/6/12	1030	-61	82.3	168	N	13165	3	194.0	156	-65	-69	0	0	194.0	156	0	0
9/13/12	0900	-61	82.2	174	N	13331	3.2	196.6	173	-66	-70	0	0	196.6	173	0	0
9/20/12	0810	-64	78.8	170	N	13499	3	188.6	163	-67	-71	0	0	188.6	163	0	0
9/25/12	1200	-61	81.8	173	N	13622	3	204.1	167	-65	-69	0	0	204.1	167	0	0
		25-70	65-75	100-200	NO	N/A	2.0-10	65-75	100-200	N/A	N/A	0-100	0-10	65-75	100-200	0-1	0-1

Note: For pressures measured relative to atmospheric (barometric) pressure, use (+) for vacuum.

Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

	<u>KW</u>	<u>KWh</u>		<u>KW</u>	<u>KWh</u>
9/6/12	9.09	14880	9/25/12	9.09	18920
9/13/12	9.09	16357			
9/20/12	9.09	17829			

URS Group  
Preventative and Corrective Maintenance Log  
Modesto Superfund Site

Site Name: \_\_\_\_\_  
 Period: 9/1/12 to 9/30/12  
(month/day/year) (month/day/year)

Date	Initials	Hour Meter	Maintenance Performed	LOTO Required	LOTO Description (Where?Why?)	LOCK ON (Date/Time)	Zero Energy Check	LOCK OFF (Date/Time)	LOCK ID (Lock No.)
				Y/N			Y/N		
				Y/N			Y/N		
				Y/N			Y/N		
				Y/N			Y/N		
				Y/N			Y/N		
				Y/N			Y/N		

URS Group  
Preventative and Corrective Maintenance Log  
Modesto Superfund Site

Site Name: \_\_\_\_\_

Shutdown Date: <u>9/13/12</u>	Startup Date: <u>9/13/12</u>
Shutdown Time: <u>0915</u>	Startup Time: <u>1008</u>
Shutdown Purpose or Cause: <u>Shutdown system for electrical modification for new extraction well.</u>	
Corrective Actions Taken (if shutdown was unplanned):	
Performed By: _____	

Shutdown Date: <u>9/2/12</u>	Startup Date: <u>9/25/12</u>
Shutdown Time: <u>0145</u>	Startup Time: <u>1215</u>
Shutdown Purpose or Cause: <u>float control for EFF pump not responding.</u>	
Corrective Actions Taken (if shutdown was unplanned):	
Performed By: _____	

Shutdown Date: <u>9/20/12</u>	Startup Date: <u>9/20/12</u>
Shutdown Time: <u>0800</u>	Startup Time: <u>1300</u>
Shutdown Purpose or Cause: <u>System on and off for testing and electrical completion.</u>	
Corrective Actions Taken (if shutdown was unplanned):	
Performed By: _____	

Shutdown Date: <u>9/30/12</u>	Startup Date: <u>10/1/12</u>
Shutdown Time: <u>0300</u>	Startup Time: <u>0810</u>
Shutdown Purpose or Cause: <u>System shutdown on full bag filters.</u>	
Corrective Actions Taken (if shutdown was unplanned):	
Performed By: _____	

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

URS Corporation  
 Modesto Superfund Site  
 Site Inspections

Task Description	9/6/12 TH	9/13/12 TH	9/20/12 TH	9/27/12 TH	10/4/12 TH	10/11/12 TH
WEEKLY	Task Performed (Technician Initials or Value)					
<b>Groundwater Treatment System</b>						
Record Process Logs	✓	✓	✓	✓	✓	✓
Check Blowers and motors for heat, noise, and vibration	✓	✓	✓	✓	✓	✓
Check Air Stripper Feed pump/motor (P-2) for heat, noise, and vibration.	✓	✓	✓	✓	✓	✓
Inspect all process piping for leaks	✓	✓	✓	✓	✓	✓
Inspect all process hoses/fittings for leaks	✓	✓	✓	✓	✓	✓
Check Air Stripper Effluent pump/motor (P-3) for heat, noise, and vibration.	✓	✓	✓	✓	✓	✓
Inspect Sump (Pump as Necessary).	✓	✓	✓	✓	✓	✓
Check Air Stripper sump level site glass. Clean as necessary	✓	✓	✓	✓	✓	✓
Inspect IX system influent vacuum break for leaks	✓	✓	✓	✓	✓	✓
Clean up compound area	✓	✓	✓	✓	✓	✓
Drain VGAC condensate	✓	✓	✓	✓	✓	✓
Perform autodialer operational check	✓	✓	✓	✓	✓	✓
Autodialer battery check	✓	✓	✓	✓	✓	✓
Perform inspection of EW-1R pipeline	✓	✓	✓	✓	✓	✓
Inspection of Spill Response Kit	✓	✓	✓	✓	✓	✓
Inspection of Emergency Response Plan/MSDS Binder	✓	✓	✓	✓	✓	✓
<b>Soil Vapor Extraction System</b>						
Record Process Logs	✓	✓	✓	✓	✓	✓
Check Blowers and motors for heat, noise, and vibration	✓	✓	✓	✓	✓	✓
Inspect all process piping for leaks	✓	✓	✓	✓	✓	✓
Clean up compound area	✓	✓	✓	✓	✓	✓
Drain VGAC condensate	✓	✓	✓	✓	✓	✓
Perform autodialer operational check	✓	✓	✓	✓	✓	✓
Inspection of Spill Response Kit	✓	✓	✓	✓	✓	✓
Inspection of Emergency Response Plan/MSDS Binder	✓	✓	✓	✓	✓	✓

Task Description	Date	Performed Initials	Reading
<b>MONTHLY</b>			
Check fire extinguisher	9/20/12	TH	
Inspect EW-1R vault	9/20/12	TH	
Inspect VI Mitigation operations - "Part House"			
Replace Auto Dialer Batteries (if necessary)			
<b>Quarterly</b>			
Interlock Checks Groundwater	9/13/12	GB/TH	
Interlock Checks SVE			
Collect Well Flow read at SVE-02	N/A	N/A	—
Collect Well Flow read at SVE-03	N/A	N/A	—
Collect Well Flow read at SVE-04	N/A	N/A	—
<b>ANNUAL</b>			
Collect Amp readings			
<b>Instrument Calibration</b>			
System Effluent Flow Meter (Performed in June and December)			

Notes:

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

Date: 9/6/12  
 Weather: cloudy  
 Sampler: Tamara Macadick

SAMPLE COLLECTION RECORD  
 MODESTO SUPERFUND SITE

Time	Description	Totalizer Reading (gallons)	Flow (gpm)
	GWTS Effluent	2245200	56

Time	Sample Location	Test Method	Sample Description	LOCLD	No. of Containers	Container Type	Preservative	pH	Cond	Temp
0910	EFF-0901	E524.2	Effluent-NS	SP-07	3	40 ml VOA	HCl	7.92	—	20.9
0910	EFF-0901	SM2540C	Effluent-NS	SP-07	1	250 ml Poly	None	"	—	"
0910	EFF-0901	SM5210B	Effluent-NS	SP-07	1	500 ml Poly	None	8.11	—	10.6
"	EFF-0901	SM2540D	Effluent-NS	SP-07	1	500 ml Poly	None	"	—	"
0920	IEXEFF-0901	D5174	IEX Eff-0901	SP-10	1	1 Liter Poly	HNO3	7.91	—	20.8
0926	IEX Mid-0901	D5174	IEX Mid-0901	SP-06	1	1 Liter Poly	HNO3	7.89	—	21.0
0933	Pre IEX-0901	D5174	Pre IEX-0901	SP-05	1	1 Liter Poly	HNO3	7.91	—	21.0
0950	GWTS-INF-0901	E524.2	Influent-NS	SP-01	3	40 ml VOA	HCl	7.14	—	21.1
—	MW-101-NS	E524.2	Influent-FD	SP-01	3	40 ml VOA	HCl	—	—	—
0800	MW3013Q12	E524.2	TB	TB	28	40 ml VOA	HCl	—	—	—
1015	GWTS Stack-0901	TO-15	GWTP VGAC Effluent-NS	SP-09	1	1 Liter Summa	None	—	—	—
1020	GWTS Pr GAC-0901	TO-15	GWTP VGAC Influent-NS	SP-08	1	1 Liter Summa	None	—	—	—
1046	SVE Stack-0901	TO-15	SVE VGAC Effluent-NS	SP-12	1	400ml Summa	None	—	—	—
1049	SVE Pre GAC-0901	TO-15	SVE VGAC Influent-NS	SP-11	1	400ml Summa	None	—	—	—

Sampler Signature: [Signature] Date: 9/6/12

Notes:

FD = Field Duplicate  
 FB = Field Blank (ambient)  
 NS = Normal Sample  
 TB = Trip Blank

Scan COCs to:  
 URS Attn: Debbie Casagrande (916) 679-2040

# Modesto Superfund Site Interlock Check List

Tested By: TA GB

Alarm	Set Point	Actual	Date Tested
<b>GWTP</b>			
EQ Tank High/High Level	450	450	9/20/12
EQ Tank Low/Low Level	125	125	9/20/12
Vapor Phase Carbon High Pressure	20	2	9/20/12
GAC High Pressure	30	17	9/20/12
Extraction Well Low Current	5	0	9/20/12
Extraction Well High Current	20	14	9/20/12
Air Stripper General Fault	—	—	9/20/12
DP Transmitter 1 High/High	17	17	9/20/12
DP Transmitter 2 High/High	30	30	9/20/12
Air Stripper Low Flow	—	—	9/20/12
Air Stripper Blower Off	—	—	9/20/12
Effluent Transfer Pump Off	—	—	9/20/12
Air Stripper Sump High/High	—	—	9/20/12
<b>SVE</b>			
Knockout Drum High/High Level			
Filter High DP			
Blower Motor Power Failure			
Carbon High Influent Pressure			
High VOC Concentration (NOT ACTIVE)			

**Appendix F**  
**Operational History**

**APPENDIX F**  
**OPERATIONAL HISTORY**

This section presents a summary of routine and non-routine operation and maintenance events performed on the remedial treatment systems 01 July 2001 through 30 September 2012. Tables F-1 (a) and F-1(b) lists the event, start and end dates and the type of maintenance (Routine, Nonroutine, Reimbursable, or Optimization) that was performed.

TABLE F-1(a)

**OPERATIONAL HISTORY  
GROUNDWATER TREATMENT AND SOIL VAPOR EXTRACTION SYSTEM  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA**

(Page 1 of 3)

No.	Event	Start Date	End Date	Type of Maintenance
1	Start up of groundwater treatment and soil vapor extraction system	05-Jul-01		Routine
2	Replaced motor starter in 7.5 horsepower transfer pump	07-Jul-01	16-Jul-01	Reimbursable
3	Installed hour meter in SVE system	17-Jul-01	17-Jul-01	Reimbursable
4	Replaced equalization tank float assembly	26-Jul-01	31-Jul-01	Reimbursable
5	Moved vacuum breaker to location after ion exchange vessels	31-Jul-01	31-Jul-01	Reimbursable
6	Repaired faulty pipe joint in SVE system	08-Aug-01	09-Aug-01	Reimbursable
7	Installed duplex bag filters	11-Aug-01	27-Aug-01	Reimbursable
8	Switched 5.0 horsepower and 7.5 horsepower transfer pump	11-Aug-01	27-Aug-01	Reimbursable
9	Replaced ruptured 1/4 inch hose on the liquid GAC vessels	29-Aug-01	30-Aug-01	Reimbursable
10	Programmed duplex bag filters into PLC logic	06-Sep-01	06-Sep-01	Reimbursable
11	Backflushed lead ion exchange vessel	11-Sep-01	11-Sep-01	Routine
12	Carbon change out for SVE vapor GAC	18-Sep-01	27-Sep-01	Routine
13	Bypassed lead ion exchange vessel	20-Sep-01	20-Sep-01	Routine
14	Water chemistry data collected from GWT system	25-Sep-01	25-Sep-01	Reimbursable
15	Repair of PID meter in SVE system	09-Oct-01	26-Oct-01	Reimbursable
16	Carbon change out for GWT vapor GAC	23-Oct-01	23-Oct-01	Routine
17	Replaced anti-scalant with Redux-300	02-Nov-01	02-Nov-01	Routine
18	Installed pulsation damper after filter #2	07-Nov-01	07-Nov-01	Reimbursable
19	Carbon change out for SVE vapor GAC	05-Dec-01	19-Dec-01	Routine
20	Installed polishing ion exchange vessel using virgin resin. Sixty (60) percent of flow through ion exchange and 40 percent bypassed.	13-Dec-01	13-Dec-01	Routine
21	Carbon change out for GWT vapor GAC	19-Dec-01	19-Dec-01	Routine
22	SVE Vapor Carbon Changeout	06-Feb-02	06-Feb-02	Routine
23	Air Stripper Annual Inspection. No abnormal conditions were reported	28-Mar-02	28-Mar-02	Routine
24	Installed air conditioning unit inside SVE treatment system trailer.	04-Jun-02	04-Jun-02	Optimization
25	Optimization of GWT system 1) Switched location of vapor GAC and liquid GAC vessel. 2) Replace filter unit with 10-micron bag filter after air stripper. 3) Insulated vapor GAC vessel. 4) Added two additional phone lines. 5) Addition of floor drains. 6) Installed cooling/air conditioning unit in GWT and SVE control panel.	11-Jun-02	14-Jun-02	Optimization
26	Carbon change out for GWT vapor GAC	14-Jun-02	14-Jun-02	Routine
27	Removed and replaced leaking hoses in GWT system. Bag Filter 2 to GAC-2 manifold and GAC-3 to effluent manifold.	26-Jun-02	26-Jun-02	Reimbursable
29	SVE Vapor Carbon Changeout	17-Jul-02	17-Jul-02	Routine
30	GWT Liquid Carbon Changeouts (Lead and Lag Vessels)	12-Oct-02	12-Oct-02	Routine
31	SVE Vapor Carbon Changeout	13-Dec-02	13-Dec-02	Routine
32	Carbon Changeout for GWT Vapor GAC	23-Apr-03	23-Apr-03	Routine
33	GWT Ion Exchange Changeout	23-Apr-03	23-Apr-03	Routine
34	Replaced P-2 Motor Starter. Fixed EQ Tank Level Indicators	07-May-03	07-May-03	Non Routine
35	Calibrated pH meter and repaired MiniRAE PID	07-Jul-03	07-Jul-03	Non Routine
36	Emptied and cleaned chemical dry tank, and cleaned CMI pump.	17-Jul-03	17-Jul-03	Non Routine

TABLE F-1(a)

**OPERATIONAL HISTORY  
GROUNDWATER TREATMENT AND SOIL VAPOR EXTRACTION SYSTEM  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA**

(Page 2 of 3)

No.	Event	Start Date	End Date	Type of Maintenance
37	SVE Vapor Carbon changeout.	13-Aug-03	13-Aug-03	Routine
38	Exhaust fan not working. Fan was removed and replaced.	04-Sep-03	25-Sep-03	Non Routine
39	Disassembled, inspected and cleaned P-2.	11-Sep-03	11-Sep-03	Non Routine
40	Redeveloped EW-1 and replaced the EW-1 submersible pump	17-Mar-04	06-Apr-04	Non Routine
41	Replaced influent and effluent totalizers.	07-Apr-04	07-Apr-04	Non Routine
42	Replaced broken lead GAC vessel camlock fitting	16-May-04	17-May-04	Non Routine
43	Removed lag GAC vessel from service due to leak in vessel	17-May-04	17-May-04	Non Routine
44	GWT Liquid Carbon Changeouts (Lead Vessel)	03-Jun-04	03-Jun-04	Routine
45	GWT Ion Exchange Changeout (Lead Vessel)	18-Jun-04	18-Jun-04	Routine
46	Installed refurbished lag GAC vessel with fresh carbon	08-Oct-04	08-Oct-04	Non Routine
47	GWT system shutdown because of a high current alarm. The system was left off line and not repaired as requested by USACE	04-Nov-04	04-Nov-04	Non Routine
48	Replaced GWT system effluent flow meter (new baseline - 870 gallons), calibrated digital display meter.	09-Jun-05	09-Jun-05	Non Routine
49	Repaired air conditioning unit in SVE trailer	02-Jun-05	28-Jun-05	Non Routine
50	Repaired vent fan unit in GWTS trailer.	21-Jul-05	28-Jul-05	Non Routine
51	SVE System GAC changeout.	03-Nov-05	03-Nov-05	Routine
52	Drill and developed extraction well EW-1R, located adjacent to MW-3. This well replaces failed extraction well EW-1	21-Jun-06	28-Jun-06	Non Routine
53	Start up of groundwater treatment system with replacement well EW-1R	24-Aug-06	24-Aug-06	Non Routine
54	Installed new digital display for effluent flow totalizer on GWTS.	22-Sep-06	22-Sep-06	Non Routine
55	Replaced effluent sample port on the GWTS.	20-Oct-06	20-Oct-06	Non Routine
56	Replaced Filters F1 and F2 on the GWTS.	24-Oct-06	24-Oct-06	Routine
57	Replaced bag filters on GWTS	13-Jan-07	13-Jan-07	Routine
58	Replaced hoses mid-GAC on GWTS	22-Jan-07	22-Jan-07	Non Routine
59	Replaced piping on SVE (post-stack)	12-Mar-07	16-Apr-07	Non Routine
60	Changed ion exchange resin filters on GWTS	25-Jun-07	02-Jul-07	Non Routine
61	Repaired SVE control system	19-Jul-07	31-Jul-07	Non Routine
62	Replaced hour meter	27-Aug-07	27-Aug-07	Non Routine
63	Replaced detective float switch	05-Sep-07	05-Sep-07	Non Routine
64	Replaced Influent bag filters for GWTS	22-Oct-07	22-Oct-07	Routine
65	Pressure sensors cleaned and replaced on GWTS	23-Oct-07	23-Oct-07	Non Routine
66	GWTS Carbon change out (water and vapor phase)	19-Nov-07	19-Nov-07	Routine
67	Replaced filter socks on 3 filter vessels	14-Mar-08	14-Mar-08	Routine
68	Replaced the broken effluent valve	05-Apr-08	07-Apr-08	Non Routine
69	Replaced gasket on GAC vessel #1	16-Aug-08	16-Aug-08	Routine
70	Replaced gasket on GAC vessel #1	21-Aug-08	21-Aug-08	Routine
71	SVE System Carbon change-out	05-Oct-08	5-Oct-08	Routine
72	Replaced filter bags in 3 canisters on the GWTS.	24-Feb-09	24-Feb-09	Routine
73	Replaced air stripper sump pump flow meter on GWTS.	13-Mar-09	13-Mar-09	Non-routine
74	Replace PVC pipe with iron pipe on SVE effluent/blower.	19-Mar-09	19-Mar-09	Non-routine
75	Changed out carbon in the GAC filter vessels (GWTS).	25-Jun-09	26-Jun-09	Routine
76	Replace 2" ball valve at groundwater treatment system (GWTS).	25-Sep-09	02-Oct-09	Non-routine

TABLE F-1(a)

**OPERATIONAL HISTORY  
GROUNDWATER TREATMENT AND SOIL VAPOR EXTRACTION SYSTEM  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA**

(Page 3 of 3)

No.	Event	Start Date	End Date	Type of Maintenance
77	Replace broken 2" ball valve, re-piped effluent piping system, added piping reinforcement (GWTS).	15-Oct-09	16-Oct-09	Non-routine
78	Replace broken one-way ball check valve (GWTS).	17-Nov-09	19-Nov-09	Non-routine
79	Repaired a loose wire at the GWTS secondary containment alarm system.	20-Jan-10	20-Jan-10	Non-routine

**Notes:**

GAC - Granular Activate Carbon

GWTS - Groundwater Treatment System

PID - Photoionization Detector

PLC - Programmable Logic Controller

SVE - Soil Vapor Extraction

**TABLE F-1(b) OPERATIONAL HISTORY GROUNDWATER TREATMENT AND SOIL VAPOR EXTRACTION SYSTEM MODESTO SUPERFUND SITE MODESTO, CALIFORNIA (Page 1 of 2)**

No.	Event	Start Date	End Date	Type of Maintenance
1	URS Corporation Inc. begins operation and maintenance activities	01-Mar-10		
2	Reprogrammed Emergency call-out system with URS contact information	01-Mar-10	01-Mar-10	Routine
3	Installed a vacuum break anti-syphon valve at effluent of the LGAC vessels.	18-Mar-10	18-Mar-10	Routine
4	Performed a backwash of the primary LGAC vessel	01-Apr-10	01-Apr-10	Routine
5	Performed a backwash of the secondary LGAC vessel	29-Apr-10	29-Apr-10	Routine
6	Replaced a dry disconnect coupling at the effluent of the primary IX vessel.	27-May-10	27-May-10	Routine
7	Calibrated and certified the sewer outfall flow meter	09-Jun-10	09-Jun-10	Reimbursable
8	Installed a automatic composite sampler at GWTS effluent.	20-Jul-10	20-Jul-10	Reimbursable
9	Performed a change-out of the GWTS Air Stripper and SVE system VGAC.	19-Aug-10	19-Aug-10	Routine
10	Performed a backwash of the primary LGAC vessel	21-Oct-10	21-Oct-10	Routine
11	Tested GWTS interlock controls.	03-Nov-10	03-Nov-10	Routine
12	Tested SVE system interlock controls	03-Nov-10	03-Nov-10	Routine
13	Performed a change-out of the resin in the primary IX system vessel.	09-Dec-10	09-Dec-10	Routine
14	Calibrated and certified the sewer outfall flow meter	09-Dec-10	09-Dec-10	Reimbursable
15	Lubricated all pumps and motors	21-Jan-11	21-Jan-11	Routine
16	Performed a change-out of the resin in the primary and secondary IX system vessel.	24-Feb-11	24-Feb-11	Routine
17	Calibrated the pressure sensors on the groundwater treatment system bag filters.	24-Feb-11	24-Feb-11	Routine
18	Performed a backwash of the primary LGAC vessel	26-May-11	26-May-11	Routine
19	Calibrated and certified the sewer outfall flow meter	04-Jun-11	04-Jun-11	Reimbursable
20	Replaced sequestrant relay and cleared chemical blockage in pump and tubing	06-Sep-11	06-Sep-11	Routine
21	Replaced all tubing on sequestrant delivery system. Disassembled chemical dosing pump. Cleaned out pump and tank and reassembled. Filtered existing sequestrant product for reuse.	08-Sep-11	08-Sep-11	Routine
22	Replaced gasket on primay LGAC.	28-Nov-11	28-Nov-11	Routine
23	Performed a change-out of the resin in the primary IX system vessel.	15-Dec-11	15-Dec-11	Routine
24	Calibrated and certified the sewer outfall flow meter	21-Dec-11	21-Dec-11	Routine
25	Inspected IX resin vessels and installed new lid gaskets.	16-Feb-12	16-Feb-12	Routine
26	Changed bag filters.	08-Mar-12	08-Mar-12	Routine
27	Changed bag filters.	15-Mar-12	15-Mar-12	Routine
28	Replaced High Level Float Switch in Influent Equalization Tank	20-Mar-12	20-Mar-12	Routine
29	New stainless steel float switches installed in influent equalization tank.	16-Mar-12	20-Mar-12	Routine
30	Changed bag filters.	02-Apr-12	02-Apr-12	Routine
31	Changed bag filters.	09-Apr-12	09-Apr-12	Routine
32	Changed bag filters.	24-Apr-12	24-Apr-12	Routine
33	Performed a change-out of the resin in the secondary IX system vessel.	17-May-12	17-May-12	Reimbursable
34	Performed interlock alarm testing for proper functionality.	24-May-12	24-May-12	Routine
35	Replaced High Level Float Switch in Influent Equalization Tank	30-May-12	30-May-12	Routine
36	Replaced all IX vessel hose connections.	14-Jun-12	14-Jun-12	Routine
37	Replaced effluent Y-strainer.	18-Jun-12	18-Jun-12	Routine
38	Cleaned out all flow indicators and meters.	19-Jun-12	19-Jun-12	Routine
39	Disassembly and cleaning of air stripper.	20-Jun-12	20-Jun-12	Routine
40	Added air filter element to external air stripper inlet port.	21-Jun-12	21-Jun-12	Routine
41	Utility power meter replaced to separate usage billing for SVE unit.	25-Jun-12	25-Jun-12	Reimbursable
42	Installed new effluent pump in GWTS	03-Jul-12	03-Jul-12	Reimbursable
43	Installed external filtering system to process quarterly monitoring purge water.	25-Jul-12	25-Jul-12	Non-routine

**TABLE F-1(b) OPERATIONAL HISTORY GROUNDWATER TREATMENT AND SOIL VAPOR EXTRACTION SYSTEM MODESTO SUPERFUND SITE MODESTO, CALIFORNIA (Page 2 of 2)**

No.	Event	Start Date	End Date	Type of Maintenance
44	Installation of EW-02 to include new well, electrical, vault and conveyance line. Work will continue in August.	01-Jul-12	31-Jul-12	Non-routine
45	Completed electrical, vault, and conveyance line for EW-02.	01-Aug-12	31-Aug-12	Non-routine
46	Shut off EW-01R to discharge from EW-02 frac tank.	01-Aug-12	01-Aug-12	Non-routine
47	Shut down system due to leak in hose between LGACs. Repaired hose and restarted.	09-Aug-12	09-Aug-12	Routine
48	Changed bag filters.	06-Sep-12	06-Sep-12	Routine
49	Shut down system for electrical modification for EW-02.	13-Sep-12	13-Sep-12	Non-routine
50	Changed bag filters and replaced sight glass tubing for stripper.	13-Sep-12	13-Sep-12	Routine
51	Changed bag filters.	20-Sep-12	20-Sep-12	Routine
52	Changed bag filters.	21-Sep-12	21-Sep-12	Routine
53	Replaced three floats in the stripper sump and changed bag filters.	25-Sep-12	25-Sep-12	Routine

**Notes:**

LGAC - Liquid Phase Granular Activated Carbon

VGAC - Vapor Phase Granular Activated Carbon

SVE - Soil Vapor Extraction

GWTS - Groundwater Treatment System

IX - Ion Exchange

**Appendix G**  
**Historical Well Construction, Analytical, and Mass Removed Data**

**Table G-1. Well Construction Details**

<b>Well No.</b>	<b>Casing Diameter (inches)</b>	<b>Boring Depth (ft bgs)</b>	<b>Screen Interval (ft bgs)</b>	<b>Top of Casing Elevation (ft msl)<sup>a</sup></b>
<b>Groundwater Monitoring Wells</b>				
MW-01A	4	101	91-101	91.61
MW-02A	4	96	86-96	90.88 <sup>b</sup>
MW-03A	4	94	84-94	91.49 <sup>b</sup>
MW-04A	4	89	78-88	91.13
MW-04B	2	154	144-154	91.11
MW-04C	2	237	227-237	91.25
MW-05A	2	90	60-90	90.74
MW-06A	2	90	60-90	89.72 <sup>b</sup>
MW-07A	2	90	60-90	91.24
MW-08A	2	90	60-90	91.44
MW-09A	2	155	144-154	91.20 <sup>b</sup>
MW-09B		155	144-154	91.19
MW-10A	2	91	60-89	90.48
MW-10B	2	160	153-163	90.21
MW-10C	2	230	220-230	90.5
MW-11A	2	92	70-90	89.91
MW-12A	2	99	87-97	91.15 <sup>b</sup>
MW-13A	2	99	77-97	89.27
MW-14A	2	92	70-90	89.79
MW-15A	2	102	80-100	91.76
MW-16A	2	86	76-86	91.89
MW-16B	2	139	129-139	91.82
MW-16C	2	236	226-236	91.64
MW-17A	2	88	77-87	89.64
MW-17B	2	140	129-139	89.69
MW-17C	2	232	222-232	89.76
MW-18A	2	66	56-66	90.14
MW-19A	2	101	91-101	91.22
MW-19B1	2	147	137-147	91.08
MW-20A	2	86	76-86	90.7
MW-20B		162	152-162	90.65
MW-20C		235	225-235	90.79
MW-21A	2	102	90-100	91.75 <sup>c</sup>
MW-22A	2	62	50-60	91.69 <sup>c</sup>
MW-23A	2	102	89-99	90.26 <sup>c</sup>
MW-24B	2	157	145-155	92.93 <sup>c</sup>
MW-25B	2	157	145-155	91.78 <sup>c</sup>
MW-26B	2	157	145-155	89.71 <sup>c</sup>
MW-27B	2	157	145-155	89.34 <sup>c</sup>
MW-28B	2	157	145-155	89.21 <sup>c</sup>
MW-29B	2	157	145-155	89.74 <sup>c</sup>
EW-01	5	115	65-95	89.54
EW-01R	6	120	59-109	90.65 <sup>b</sup>
EW-02	6	116	60.5-110.5	91.64 <sup>d</sup>

**Table G-1. (Continued)**

<b>Well No.</b>	<b>Casing Diameter (inches)</b>	<b>Boring Depth (ft bgs)</b>	<b>Screen Interval (ft bgs)</b>	<b>Top of Casing Elevation (ft msl)<sup>a</sup></b>
<b>Soil Vapor Wells</b>				
SVE-01	2	40	18-38	89.84
SVE-02	2	13	7-12	91.36
SVE-03	2	39	13-23	91.38
SVE-04	2	39	28-38	91.38
<b>DP-1</b>				91.44
DP-1A	1	40	28-29	
DP-1B	1	40	38-39	
<b>DP-2</b>			-	91.27
DP-2A	1	40	15-16	
DP-2B	1	40	34-35	
<b>DP-3</b>			-	91.86
DP-3A	1	40	19-20	
DP-3B	1	40	29-30	
<b>DP-4</b>			-	91.92
DP-4A	1	40	23-24	
DP-4B	1	40	38.5-39.5	
<b>DP-5</b>			-	91.27
DP-5A	2	37	15-16	
DP-5B	2	37	34-35	
<b>DP-6</b>			-	91.69
DP-6A	2	36	15-16	
DP-6B	2	36	34-35	

<sup>a</sup> Wells resurveyed in February 2003.

<sup>b</sup> Wells resurveyed in September 2006.

<sup>c</sup> Wells installed and surveyed in September 2011.

<sup>d</sup> Well installed June 2012 and surveyed August 2012

bgs = below ground surface

ft = feet

msl = mean sea level

TABLE G-2(a)

**GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA**

(Page 1 of 13)

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
MW-1A	101	91 - 101	89.14	Apr-00 <sup>a</sup>	NA	50.62
			89.14	Aug-00 <sup>a</sup>	NA	50.34
			89.14	Nov-00 <sup>a</sup>	NA	48.92
			89.14	Feb-01 <sup>a</sup>	NA	50.28
			89.14	Aug-01	42.71	46.43
			89.14	Oct-01	44.55	44.59
			89.14	Nov-01	44.41	44.73
			89.14	Feb-02	43.17	45.97
			89.14	May-02	42.44	46.70
			89.14	Aug-02	45.60	43.54
			89.14	Nov-02	46.00	43.14
			89.14	Feb-03	44.95	44.19
			91.611	May-03	44.15	47.46
			91.61	Aug-03	45.55	46.06
			91.61	Nov-03	46.15	45.46
			91.61	Feb-04	44.70	46.91
			91.61	May-04	43.95	47.66
			91.61	Aug-04	46.20	45.41
			91.61	Nov-04	45.70	45.91
			91.61	Feb-05	44.30	47.31
			91.61	May-05	42.60	49.01
			91.61	Aug-05	43.40	48.21
			91.61	Nov-05	44.40	47.21
			91.61	Feb-06	43.04	48.57
			91.61	May-06	41.65	49.96
			91.61	Aug-06	42.53	49.08
			91.61	Aug-06 <sup>b</sup>	43.07	48.54
91.61	Nov-06	43.66	47.95			
91.61	Feb-07	42.34	49.27			
91.61	May-07	40.94	50.67			
91.61	Aug-07	43.25	48.36			
91.61	Nov-07	43.85	47.76			
91.61	Feb-08	42.73	48.88			
91.61	May-08	42.10	49.51			
91.61	Aug-08	43.45	48.16			
91.61	Dec-08	44.28	47.33			
91.61	Feb-09	43.71	47.90			
91.61	Jun-09	43.88	47.73			
91.61	Aug-09	49.45	42.16			
91.61	Nov-09	46.45	45.16			
MW-2A	96	86 - 96	88.63	Apr-00 <sup>a</sup>	NA	50.48
			88.63	Aug-00 <sup>a</sup>	NA	50.19
			88.63	Nov-00 <sup>a</sup>	NA	48.80
			88.63	Feb-01 <sup>a</sup>	NA	50.32
			88.63	Aug-01	42.00	46.63
			88.63	Oct-01	44.30	44.33
			88.63	Nov-01	44.20	44.43
			88.63	Feb-02	42.77	45.86
			88.63	May-02	42.10	46.53
			88.63	Aug-02	45.50	43.13
			88.63	Nov-02	45.70	42.93
			88.63	Feb-03	44.60	44.03
			90.911	May-03	43.75	47.16
			90.91	Aug-03	45.10	45.81
90.91	Nov-03	45.65	45.26			
90.91	Feb-04	44.13	46.78			

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

(Page 2 of 13)

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			90.91	May-04	43.10	47.81
			90.91	Aug-04	45.81	45.10
			90.91	Nov-04	45.14	45.77
			90.91	Feb-05	43.43	47.48
			90.91	May-05	41.93	48.98
			90.91	Aug-05	42.90	48.01
			90.91	Nov-05	43.75	47.16
			90.91	Feb-06	42.25	48.66
			90.91	May-06	40.97	49.94
			90.882	Aug-06	41.52	49.36
			90.88	Aug-06 <sup>b</sup>	44.20	46.68
			90.88	Nov-06	42.90	47.98
			90.88	Feb-07	41.61	49.27
			90.88	May-07	40.20	50.68
			90.88	Aug-07	42.52	48.36
			90.88	Nov-07	43.10	47.78
			90.88	Feb-08	42.01	48.87
			90.88	May-08	41.35	49.53
			90.88	Aug-08	42.65	48.23
			90.88	Dec-08	43.48	47.40
			90.88	Feb-09	42.94	47.94
			90.88	Jun-09	43.25	47.63
			90.88	Aug-09	44.63	46.25
			90.88	Nov-09	45.57	45.31
MW-3A	94	84 - 94	89.42	Apr-00 <sup>a</sup>	NA	50.75
			88.42	Aug-00 <sup>a</sup>	NA	50.12
			89.42	Nov-00 <sup>a</sup>	NA	48.62
			88.42	Feb-01 <sup>a</sup>	NA	50.22
			89.42	Aug-01	43.00	46.42
			88.42	Oct-01	45.35	44.07
			89.42	Nov-01	44.09	45.33
			88.42	Feb-02	43.98	45.44
			89.42	May-02	43.14	46.28
			88.42	Aug-02	46.55	42.87
			89.42	Nov-02	46.70	42.72
			88.42	Feb-03	45.80	43.62
			91.591	May-03	44.10	47.49
			91.59	Aug-03	46.25	45.34
			91.59	Nov-03	47.95	43.64
			91.59	Feb-04	45.25	46.34
			91.59	May-04	44.35	47.24
			91.59	Aug-04	47.05	44.54
			91.59	Nov-04	46.52	45.07
			91.59	Feb-05	44.85	46.74
			91.59	May-05	43.20	48.39
			91.59	Aug-05	44.27	47.32
			91.59	Nov-05	46.25	45.34
			91.59	Feb-06	44.65	46.94
			91.59	May-06	43.25	48.34
			91.492	Aug-06	43.82	47.67
			91.49	Aug-06 <sup>b</sup>	45.64	45.85
			91.49	Nov-06	46.61	44.88
			91.49	Feb-07	45.91	45.58
			91.49	May-07	41.19	50.30
			91.49	Aug-07	46.53	44.96
			91.49	Nov-07	47.2	44.29
			91.49	Feb-08	46.1	45.39
			91.49	May-08	45.25	46.24
			91.49	Aug-08	46.6	44.89

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

(Page 3 of 13)

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			91.49	Dec-08	46.36	45.13
			91.49	Feb-09	46.18	45.31
			91.49	Jun-09	46.28	45.21
			91.49	Aug-09	47.73	43.76
			91.49	Nov-09	48.5	42.99
MW-4A	89	78 - 88	88.66	Apr-00 <sup>a</sup>	NA	50.15
			88.66	Aug-00 <sup>a</sup>	NA	50.01
			88.66	Nov-00 <sup>a</sup>	NA	48.11
			88.66	Feb-01 <sup>a</sup>	NA	49.74
			88.66	Aug-01	43.50	45.16
			88.66	Oct-01	44.11	44.55
			88.66	Nov-01	44.46	44.20
			88.66	Feb-02	43.21	45.45
			88.66	May-02	42.13	46.53
			88.66	Aug-02	44.80	43.86
			88.66	Nov-02	45.50	43.16
			88.66	Feb-03	44.35	44.31
			91.131	May-03	44.05	47.08
			91.13	Aug-03	45.10	46.03
			91.13	Nov-03	46.25	44.88
			91.13	Feb-04	44.85	46.28
			91.13	May-04	44.25	46.88
			91.13	Aug-04	45.90	45.23
			91.13	Nov-04	46.32	44.81
			91.13	Feb-05	44.68	46.45
			91.13	May-05	42.90	48.23
			91.13	Aug-05	43.75	47.38
			91.13	Nov-05	44.80	46.33
			91.13	Feb-06	43.36	47.77
			91.13	May-06	41.80	49.33
			91.13	Aug-06	42.34	48.79
			91.13	Aug-06 <sup>b</sup>	43.17	47.96
			91.13	Nov-06	44.05	47.08
			91.13	Feb-07	43.03	48.10
			91.13	May-07	40.83	50.30
			91.13	Aug-07	43.53	47.60
			91.13	Nov-07	44.39	46.74
			91.13	Feb-08	43.30	47.83
			91.13	May-08	42.36	48.77
			91.13	Aug-08	43.64	47.49
			91.13	Dec-08	44.79	46.34
			91.13	Feb-09	44.21	46.92
			91.13	Jun-09	44.18	46.95
			91.13	Aug-09	45.62	45.51
			91.13	Nov-09	46.89	44.24
MW-4B	154	144-154	91.11	Dec-08	44.73	46.38
			91.11	Feb-09	43.78	47.33
			91.11	Jun-09	44.80	46.31
			91.11	Aug-09	46.72	44.39
			91.11	Nov-09	46.73	44.38
MW-4C	237	227-237	91.25	Dec-08	44.35	46.90
			91.25	Feb-09	42.76	48.49
			91.25	Jun-09	49.75	41.50
			91.25	Aug-09	53.94	37.31
			91.25	Nov-09	46.00	45.25

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

(Page 4 of 13)

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
MW-5A	90	60 - 90	90.61	Apr-00 <sup>a</sup>	NA	50.39
			90.61	Aug-00 <sup>a</sup>	NA	50.45
			90.61	Nov-00 <sup>a</sup>	NA	48.41
			90.61	Feb-01 <sup>a</sup>	NA	50.11
			90.61	Aug-01	42.44	48.17
			90.61	Oct-01	43.75	46.86
			90.61	Nov-01	43.86	46.75
			90.61	Feb-02	42.65	47.96
			90.61	May-02	41.62	48.99
			90.61	Aug-02	44.60	46.01
			90.61	Nov-02	45.60	45.01
			90.61	Feb-03	44.35	46.26
			90.741	May-03	43.30	47.44
			90.74	Aug-03	44.45	46.29
			90.74	Nov-03	45.55	45.19
			90.74	Feb-04	44.13	46.61
			90.74	May-04	43.10	47.64
			90.74	Aug-04	45.12	45.62
			90.74	Nov-04	45.25	45.49
			90.74	Feb-05	43.55	47.19
			90.74	May-05	41.93	48.81
			90.74	Aug-05	42.70	48.04
			90.74	Nov-05	43.75	46.99
			90.74	Feb-06	42.36	48.38
			90.74	May-06	40.90	49.84
			90.74	Aug-06	41.47	49.27
			90.74	Aug-06 <sup>b</sup>	42.07	48.67
			90.74	Nov-06	43.15	47.59
			90.74	Feb-07	41.95	48.79
			90.74	May-07	40.21	50.53
			90.74	Aug-07	42.55	48.19
			90.74	Nov-07	43.35	47.39
			90.74	Feb-08	42.34	48.40
90.74	May-08	41.50	49.24			
90.74	Aug-08	42.68	48.06			
90.74	Dec-08	43.81	46.93			
90.74	Feb-09	43.33	47.41			
90.74	Jun-09	43.19	47.55			
90.74	Aug-09	44.68	46.06			
90.74	Nov-09	45.97	44.77			
MW-6A	90	60 - 90	89.98	Apr-00 <sup>a</sup>	NA	50.23
			89.98	Aug-00 <sup>a</sup>	NA	50.21
			89.98	Nov-00 <sup>a</sup>	NA	47.96
			89.98	Feb-01 <sup>a</sup>	NA	49.78
			89.98	Aug-01	41.30	48.68
			89.98	Oct-01	42.90	47.08
			89.98	Nov-01	43.48	46.50
			89.98	Feb-02	41.98	48.00
			89.98	May-02	40.87	49.11
			89.98	Aug-02	44.20	45.78
			89.98	Nov-02	44.50	45.48
			89.98	Feb-03	43.65	46.33
			89.481	May-03	42.60	46.88
			89.48	Aug-03	44.10	45.38
			89.48	Nov-03	45.22	44.26

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

(Page 5 of 13)

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			89.48	Feb-04	43.45	46.03
			89.48	May-04	42.85	46.63
			89.48	Aug-04	44.62	44.86
			89.48	Nov-04	45.25	44.23
			89.48	Feb-05	43.60	45.88
			89.48	May-05	41.81	47.67
			89.48	Aug-05	42.65	46.83
			89.48	Nov-05	43.78	45.70
			89.48	Feb-06	42.35	47.13
			89.48	May-06	40.71	48.77
			89.722	Aug-06	40.86	48.86
			89.72	Aug-06 <sup>b</sup>	41.16	48.56
			89.72	Nov-06	42.20	47.52
			89.72	Feb-07	40.94	48.78
			89.72	May-07	39.52	50.20
			89.72	Aug-07	41.61	48.11
			89.72	Nov-07	42.56	47.16
			89.72	Feb-08	41.42	48.30
			89.72	May-08	40.44	49.28
			89.72	Aug-08	41.75	47.97
			89.72	Dec-08	42.98	46.74
			89.72	Feb-09	42.32	47.40
			89.72	Jun-09	42.23	47.49
			89.72	Aug-09	43.61	46.11
			89.72	Nov-09	44.89	44.83
MW-7A	90	60 - 90	91.23	Apr-00 <sup>a</sup>	NA	50.86
			91.23	Aug-00 <sup>a</sup>	NA	51.06
			91.23	Nov-00 <sup>a</sup>	NA	49.24
			91.23	Feb-01 <sup>a</sup>	NA	50.73
			91.23	Aug-01	41.33	49.90
			91.23	Oct-01	42.72	48.51
			91.23	Nov-01	43.07	48.16
			91.23	Feb-02	41.96	49.27
			91.23	May-02	40.67	50.56
			91.23	Aug-02	43.70	47.53
			91.23	Nov-02	44.60	46.63
			91.23	Feb-03	43.60	47.63
			91.241	May-03	42.65	48.59
			91.24	Aug-03	43.85	47.39
			91.24	Nov-03	45.05	46.19
			91.24	Feb-04	43.70	47.54
			91.24	May-04	42.80	48.44
			91.24	Aug-04	44.30	46.94
			91.24	Nov-04	44.98	46.26
			91.24	Feb-05	43.38	47.86
			91.24	May-05	41.82	49.42
			91.24	Aug-05	42.35	48.89
			91.24	Nov-05	43.40	47.84
			91.24	Feb-06	42.17	49.07
			91.24	May-06	40.82	50.42
			91.24	Aug-06	41.31	49.93
			91.24	Aug-06 <sup>b</sup>	41.50	49.74
			91.24	Nov-06	42.53	48.71
			91.24	Feb-07	41.46	49.78
			91.24	May-07	40.21	51.03
			91.24	Aug-07	41.77	49.47

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

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Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			91.24	Nov-07	42.63	48.61
			91.24	Feb-08	41.82	49.42
			91.24	May-08	40.96	50.28
			91.24	Aug-08	41.98	49.26
			91.24	Dec-08	43.15	48.09
			91.24	Feb-09	NA	NA
			91.24	Jun-09	42.65	48.59
			91.24	Aug-09	43.92	47.32
			91.24	Nov-09	45.29	45.95
MW-8A	90	60 - 90	91.53	Apr-00	NA	50.52
			91.53	Aug-00	NA	50.42
			91.53	Nov-00	NA	48.54
			91.53	Feb-01	NA	50.25
			91.53	Aug-01	42.41	49.12
			91.53	Oct-01	45.60	45.93
			91.53	Nov-01	45.68	45.85
			91.53	Feb-02	44.36	47.17
			91.53	May-02	43.31	48.22
			91.53	Aug-02	46.20	45.33
			91.53	Nov-02	47.50	44.03
			91.53	Feb-03	45.65	45.88
			91.441	May-03	44.40	47.04
			91.44	Aug-03	45.40	46.04
			91.44	Nov-03	46.57	44.87
			91.44	Feb-04	45.22	46.22
			91.44	May-04	43.85	47.59
			91.44	Aug-04	46.15	45.29
			91.44	Nov-04	45.97	45.47
			91.44	Feb-05	44.35	47.09
			91.44	May-05	42.75	48.69
			91.44	Aug-05	43.39	48.05
			91.44	Nov-05	44.47	46.97
			91.44	Feb-06	43.14	48.30
			91.44	May-06	41.61	49.83
			91.44	Aug-06	42.21	49.23
			91.44	Aug-06	42.94	48.50
			91.44	Nov-06	44.03	47.41
			91.44	Feb-07	42.88	48.56
			91.44	May-07	40.96	50.48
			91.44	Aug-07	43.43	48.01
			91.44	Nov-07	44.28	47.16
			91.44	Feb-08	43.32	48.12
			91.44	May-08	42.41	49.03
			91.44	Aug-08	43.53	47.91
			91.44	Dec-08	44.73	46.71
			91.44	Feb-09	44.28	47.16
			91.44	Jun-09	44.08	47.36
			91.44	Aug-09	45.55	45.89
			91.44	Nov-09	46.91	44.53
MW-9B	155	144 - 154	91.19	Apr-00 <sup>a</sup>	NA	50.24
			91.19	Aug-00 <sup>a</sup>	NA	48.38
			91.19	Nov-00 <sup>a</sup>	NA	47.72
			91.19	Feb-01 <sup>a</sup>	NA	50.05
			91.19	Aug-01	44.04	47.15
			91.19	Oct-01	45.17	46.02

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

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Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			91.19	Nov-01	44.76	46.43
			91.19	Feb-02	42.64	48.55
			91.19	May-02	42.72	48.47
			91.19	Aug-02	47.05	44.14
			91.19	Nov-02	45.90	45.29
			91.19	Feb-03	44.45	46.74
			91.181	May-03	44.20	46.98
			91.18	Aug-03	47.00	44.18
			91.18	Nov-03	46.55	44.63
			91.18	Feb-04	44.37	46.81
			91.18	May-04	44.55	46.63
			91.18	Aug-04	47.25	43.93
			91.18	Nov-04	46.42	44.76
			91.18	Feb-05	44.45	46.73
			91.18	May-05	43.15	48.03
			91.18	Aug-05	45.25	45.93
			91.18	Nov-05	45.40	45.78
			91.18	Feb-06	43.31	47.87
			91.18	May-06	42.30	48.88
			91.202	Aug-06	43.51	47.69
			91.2	Aug-06 <sup>b</sup>	43.98	47.22
			91.20	Nov-06	43.80	47.40
			91.20	Feb-07	42.14	49.06
			91.20	May-07	40.52	50.68
			91.20	Aug-07	44.37	46.83
			91.20	Nov-07	44.05	47.15
			91.20	Feb-08	42.45	48.75
			91.20	May-08	42.54	48.66
			91.20	Aug-08	44.50	46.70
			91.20	Dec-08	44.47	46.73
			91.20	Feb-09	43.62	47.58
			91.20	Jun-09	44.52	46.68
			91.20	Aug-09	46.54	44.66
			91.20	Nov-09	46.52	44.68
MW-10A	91	60 - 89	90.47	Apr-00 <sup>a</sup>	NA	49.66
			90.47	Aug-00 <sup>a</sup>	NA	50.67
			90.47	Nov-00 <sup>a</sup>	NA	46.94
			90.47	Feb-01 <sup>a</sup>	NA	49.03
			90.47	Aug-01	42.54	47.93
			90.47	Oct-01	44.19	46.28
			90.47	Nov-01	44.51	45.96
			90.47	Feb-02	42.93	47.54
			90.47	May-02	41.86	48.61
			90.47	Aug-02	45.20	45.27
			90.47	Nov-02	46.00	44.47
			90.47	Feb-03	44.70	45.77
			90.481	May-03	43.55	46.93
			90.48	Aug-03	45.20	45.28
			90.48	Nov-03	46.35	44.13
			90.48	Feb-04	44.70	45.78
			90.48	May-04	43.85	46.63
			90.48	Aug-04	45.81	44.67
			90.48	Nov-04	46.48	44.00
			90.48	Feb-05	44.74	45.74
			90.48	May-05	42.87	47.61
			90.48	Aug-05	43.90	46.58

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

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Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			90.48	Nov-05	45.07	45.41
			90.48	Feb-06	43.45	47.03
			90.48	May-06	41.70	48.78
			90.48	Aug-06	42.33	48.15
			90.48	Aug-06 <sup>b</sup>	42.59	47.89
			90.48	Nov-06	43.51	46.97
			90.48	Feb-07	42.21	48.27
			90.48	May-07	40.81	49.67
			90.48	Aug-07	43.03	47.45
			90.48	Nov-07	43.96	46.52
			90.48	Feb-08	42.70	47.78
			90.48	May-08	41.77	48.71
			90.48	Aug-08	43.24	47.24
			90.48	Dec-08	44.40	46.08
			90.48	Feb-09	43.69	46.79
			90.48	Jun-09	43.55	46.93
			90.48	Aug-09	45.02	45.46
			90.48	Nov-09	46.34	44.14
MW-10B	163	153-163	90.21	Dec-08	44.12	46.09
			90.21	Feb-09	43.18	47.03
			90.21	Jun-09	43.90	46.31
			90.21	Aug-09	45.81	44.40
			90.21	Nov-09	46.07	44.14
			90.21	Mar-10	44.01	46.20
MW-10C	230	220-230	90.5	Dec-08	44.13	46.37
			90.5	Feb-09	42.50	48.00
			90.5	Jun-09	48.50	42.00
			90.5	Aug-09	53.44	37.06
			90.5	Nov-09	45.75	44.75
MW-11A	92	70 - 90	89.91	Apr-00 <sup>a</sup>	NA	50.83
			89.91	Aug-00 <sup>a</sup>	NA	50.64
			89.91	Nov-00 <sup>a</sup>	NA	49.38
			89.91	Feb-01 <sup>a</sup>	NA	50.93
			89.91	Aug-01	40.32	49.59
			89.91	Oct-01	41.50	48.41
			89.91	Nov-01	43.12	46.79
			89.91	Feb-02	40.15	49.76
			89.91	May-02	39.56	50.35
			89.91	Aug-02	42.60	47.31
			89.91	Nov-02	43.90	46.01
			89.91	Feb-03	41.90	48.01
			89.911	May-03	41.15	48.76
			89.91	Aug-03	42.65	47.26
			89.91	Nov-03	43.52	46.39
			89.91	Feb-04	42.00	47.91
			89.91	May-04	41.35	48.56
			89.91	Aug-04	42.86	47.05
			89.91	Nov-04	43.35	46.56
			89.91	Feb-05	41.75	48.16
			89.91	May-05	40.22	49.69
			89.91	Aug-05	40.85	49.06
			89.91	Nov-05	41.80	48.11
			89.91	Feb-06	40.53	49.38
			89.91	May-06	39.27	50.64

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

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Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			89.91	Aug-06	39.86	50.05
			89.91	Aug-06 <sup>b</sup>	40.05	49.86
			89.91	Nov-06	40.90	49.01
			89.91	Feb-07	39.79	50.12
			89.91	May-07	38.74	51.17
			89.91	Aug-07	40.34	49.57
			89.91	Nov-07	41.07	48.84
			89.91	Feb-08	40.11	49.80
			89.91	May-08	39.38	50.53
			89.91	Aug-08	40.47	49.44
			89.91	Dec-08	41.47	48.44
			89.91	Feb-09	41.01	48.90
			89.91	Jun-09	41.12	48.79
			89.91	Aug-09	42.44	47.47
			89.91	Nov-09	43.52	46.39
MW-12A	99	87 - 97	91.17	Apr-00 <sup>a</sup>	NA	50.01
			91.17	Aug-00 <sup>a</sup>	NA	49.45
			91.17	Nov-00 <sup>a</sup>	NA	47.28
			91.17	Feb-01 <sup>a</sup>	NA	49.51
			91.17	Aug-01	43.18	47.99
			91.17	Oct-01	44.63	46.54
			91.17	Nov-01	44.86	46.31
			91.17	Feb-02	43.21	47.96
			91.17	May-02	42.04	49.13
			91.17	Aug-02	46.10	45.07
			91.17	Nov-02	46.30	44.87
			91.17	Feb-03	45.05	46.12
			91.151	May-03	44.50	46.65
			91.15	Aug-03	46.20	44.95
			91.15	Nov-03	46.88	44.27
			91.15	Feb-04	44.95	46.20
			91.15	May-04	44.50	46.65
			91.15	Aug-04	46.75	44.40
			91.15	Nov-04	47.02	44.13
			91.15	Feb-05	45.10	46.05
			91.15	May-05	43.52	47.63
			91.15	Aug-05	44.95	46.20
			91.15	Nov-05	45.80	45.35
			91.15	Feb-06	44.01	47.14
			91.15	May-06	42.41	48.74
			91.152	Aug-06	43.22	47.93
			91.15	Aug-06 <sup>b</sup>	43.51	47.64
			91.15	Nov-06	44.05	47.10
			91.15	Feb-07	42.61	48.54
			91.15	May-07	41.44	49.71
			91.15	Aug-07	43.91	47.24
			91.15	Nov-07	44.43	46.72
			91.15	Feb-08	43.02	48.13
			91.15	May-08	42.45	48.70
			91.15	Aug-08	44.15	47.00
			91.15	Dec-08	44.90	46.25
			91.15	Feb-09	44.14	47.01
			91.15	Jun-09	44.27	46.88
			91.15	Aug-09	46.04	45.11
			91.15	Nov-09	47.02	44.13

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

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Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
MW-13A	99	77 - 97	89.33	Apr-00 <sup>a</sup>	NA	49.21
			89.33	Aug-00 <sup>a</sup>	NA	49.30
			89.33	Nov-00 <sup>a</sup>	NA	46.88
			89.33	Feb-01 <sup>a</sup>	NA	48.67
			89.33	Aug-01	41.68	47.65
			89.33	Oct-01	43.23	46.10
			89.33	Nov-01	43.64	45.69
			89.33	Feb-02	41.99	47.34
			89.33	May-02	40.82	48.51
			89.33	Aug-02	44.10	45.23
			89.33	Nov-02	44.70	44.63
			89.33	Feb-03	43.60	45.73
			89.271	May-03	42.35	46.92
			89.27	Aug-03	43.80	45.47
			89.27	Nov-03	45.25	44.02
			89.27	Feb-04	43.72	45.55
			89.27	May-04	42.65	46.62
			89.27	Aug-04	42.65	46.62
			89.27	Nov-04	45.30	43.97
			89.27	Feb-05	43.63	45.64
			89.27	May-05	41.75	47.52
			89.27	Aug-05	42.45	46.82
			89.27	Nov-05	43.70	45.57
			89.27	Feb-06	42.31	46.96
			89.27	May-06	40.52	48.75
			89.27	Aug-06	40.92	48.35
			89.27	Aug-06 <sup>b</sup>	41.08	48.19
			89.27	Nov-06	42.15	47.12
			89.27	Feb-07	40.99	48.28
			89.27	May-07	39.68	49.59
			89.27	Aug-07	41.80	47.47
			89.27	Nov-07	42.64	46.63
89.27	Feb-08	41.48	47.79			
89.27	May-08	40.38	48.89			
89.27	Aug-08	41.66	47.61			
89.27	Dec-08	43.01	46.26			
89.27	Feb-09	42.40	46.87			
89.27	Jun-09	42.25	47.02			
89.27	Aug-09	43.40	45.87			
89.27	Nov-09	44.84	44.43			
MW-14A	92	70 - 90	89.81	Apr-00 <sup>a</sup>	NA	50.19
			89.81	Aug-00 <sup>a</sup>	NA	49.93
			89.81	Nov-00 <sup>a</sup>	NA	48.39
			89.81	Feb-01 <sup>a</sup>	NA	49.95
			89.81	Aug-01	41.21	48.60
			89.81	Oct-01	42.57	47.24
			89.81	Nov-01	42.89	46.92
			89.81	Feb-02	41.35	48.46
			89.81	May-02	40.60	49.21
			89.81	Aug-02	43.80	46.01
			89.81	Nov-02	44.00	45.81
			89.81	Feb-03	43.10	46.71
			89.791	May-03	42.15	47.64
			89.79	Aug-03	43.30	46.49
			89.79	Nov-03	44.60	45.19
			89.79	Feb-04	43.03	46.76

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

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Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			89.79	May-04	42.33	47.46
			89.79	Aug-04	43.85	45.94
			89.79	Nov-04	44.40	45.39
			89.79	Feb-05	42.87	46.92
			89.79	May-05	41.20	48.59
			89.79	Aug-05	41.85	47.94
			89.79	Nov-05	42.90	46.89
			89.79	Feb-06	41.60	48.19
			89.79	May-06	40.15	49.64
			89.79	Aug-06	40.49	49.30
			89.79	Aug-06 <sup>b</sup>	40.72	49.07
			89.79	Nov-06	41.72	48.07
			89.79	Feb-07	40.60	49.19
			89.79	May-07	39.31	50.48
			89.79	Aug-07	41.18	48.61
			89.79	Nov-07	42.03	47.76
			89.79	Feb-08	41.05	48.74
			89.79	May-08	40.15	49.64
			89.79	Aug-08	41.35	48.44
			89.79	Dec-08	42.45	47.34
			89.79	Feb-09	41.92	47.87
			89.79	Jun-09	41.95	47.84
			89.79	Aug-09	43.18	46.61
			89.79	Nov-09	44.40	45.39
MW-15A	102	80 - 100	91.75	Apr-00 <sup>a</sup>	NA	50.80
			91.75	Aug-00 <sup>a</sup>	NA	50.40
			91.75	Nov-00 <sup>a</sup>	NA	48.76
			91.75	Feb-01 <sup>a</sup>	NA	50.55
			91.75	Aug-01	42.48	49.27
			91.75	Oct-01	43.88	47.87
			91.75	Nov-01	44.05	47.70
			91.75	Feb-02	42.73	49.02
			91.75	May-02	41.92	49.83
			91.75	Aug-02	45.10	46.65
			91.75	Nov-02	45.60	46.15
			91.75	Feb-03	44.45	47.30
			91.761	May-03	44.05	47.71
			91.76	Aug-03	45.25	46.51
			91.76	Nov-03	46.05	45.71
			91.76	Feb-04	44.46	47.30
			91.76	May-04	43.85	47.91
			91.76	Aug-04	45.82	45.94
			91.76	Nov-04	46.05	45.71
			91.76	Feb-05	44.30	47.46
			91.76	May-05	42.85	48.91
			91.76	Aug-05	43.95	47.81
			91.76	Nov-05	44.80	46.96
			91.76	Feb-06	43.26	48.50
			91.76	May-06	41.92	49.84
			91.76	Aug-06	42.66	49.10
			91.76	Aug-06 <sup>b</sup>	42.90	48.86
			91.76	Nov-06	43.55	48.21
			91.76	Feb-07	42.30	49.46
			91.76	May-07	41.09	50.67
			91.76	Aug-07	43.20	48.56
			91.76	Nov-07	43.80	47.96
			91.76	Feb-08	42.65	49.11

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

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Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
			91.76	May-08	42.05	49.71
			91.76	Aug-08	43.40	48.36
			91.76	Dec-08	44.25	47.51
			91.76	Feb-09	43.68	48.08
			91.76	Jun-09	43.86	47.90
			91.76	Aug-09	45.47	46.29
			91.76	Nov-09	46.46	45.30
MW-16A	86	76-86	91.89	Dec-08	47.01	44.88
			91.89	Feb-09	45.81	46.08
			91.89	Jun-09	46.43	45.46
			91.89	Aug-09	48.65	43.24
			91.89	Nov-09	48.95	42.94
MW-16B	139	129-139	91.82	Dec-08	46.98	44.84
			91.82	Feb-09	45.75	46.07
			91.82	Jun-09	46.40	45.42
			91.82	Aug-09	48.67	43.15
			91.82	Nov-09	48.90	42.92
MW-16C	236	226-236	91.64	Dec-08	46.70	44.94
			91.64	Feb-09	45.01	46.63
			91.64	Jun-09	50.05	41.59
			91.64	Aug-09	54.46	37.18
			91.64	Nov-09	48.52	43.12
MW-17A	88	77-87	89.64	Dec-08	44.20	45.44
			89.64	Feb-09	43.45	46.19
			89.64	Jun-09	43.25	46.39
			89.64	Aug-09	44.43	45.21
			89.64	Nov-09	46.03	43.61
MW-17B	140	129-139	89.69	Dec-08	44.39	45.30
			89.69	Feb-09	43.41	46.28
			89.69	Jun-09	43.60	46.09
			89.69	Aug-09	45.29	44.40
			89.69	Nov-09	46.20	43.49
MW-17C	232	222-232	89.76	Dec-08	44.33	45.43
			89.76	Feb-09	42.55	47.21
			89.76	Jun-09	48.68	41.08
			89.76	Aug-09	52.98	36.78
			89.76	Nov-09	45.91	43.85
MW-18A	66	56-66	90.14	Dec-08	44.47	45.67
			90.14	Feb-09	43.70	46.44
			90.14	Jun-09	43.57	46.57
			90.14	Aug-09	45.03	45.11
			90.14	Nov-09	46.35	43.79
MW-19A	101	91-101	91.22	Dec-08	45.51	45.71
			91.22	Feb-09	44.55	46.67
			91.22	Jun-09	45.45	45.77
			91.22	Aug-09	47.14	44.08
			91.22	Nov-09	47.50	43.72
MW-19B	147	137-147	91.08	Dec-08	45.89	45.19
			91.08	Feb-09	44.76	46.32
			91.08	Jun-09	46.07	45.01
			91.08	Aug-09	48.26	42.82
			91.08	Nov-09	47.92	43.16

TABLE G-2(a)

GROUNDWATER MONITORING WELL WATER TABLE ELEVATION  
 MODESTO SUPERFUND SITE  
 MODESTO, CALIFORNIA

(Page 13 of 13)

Monitoring Well Number	Well Depth (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSL)
MW-20A	86	76-86	90.70	Dec-08	45.27	45.43
			90.70	Feb-09	44.31	46.39
			90.70	Jun-09	44.56	46.14
			90.70	Aug-09	47.12	43.58
			90.70	Nov-09	47.26	43.44
MW-20B	162	152-162	90.65	Dec-08	45.45	45.20
			90.65	Feb-09	44.36	46.29
			90.65	Jun-09	45.08	45.57
			90.65	Aug-09	48.22	42.43
			90.65	Nov-09	47.40	43.25
MW-20C	235	225-235	90.79	Dec-08	45.01	45.78
			90.79	Feb-09	43.53	47.26
			90.79	Jun-09	48.60	42.19
			90.79	Aug-09	53.44	37.35
			90.79	Nov-09	46.73	44.06
EW-1			89.54	Nov-06	43.40	46.14
			89.54	Feb-07	42.21	47.33
			89.54	May-07	40.28	49.26
			89.54	Aug-07	42.90	46.64
			89.54	Feb-08	42.48	47.06
			89.54	May-08	41.75	47.79
			89.54	Aug-08	42.99	47.66
			89.54	Feb-09	43.55	45.99
			89.54	Jun-09	43.34	46.20
			89.54	Aug-09	44.99	44.55
89.54	Nov-09	46.16	43.38			
EW-1R <sup>3</sup>	114	59-109	90.65	Aug-06	41.80	48.85
			90.65	Aug-06 <sup>b</sup>	48.70	41.95
			90.65	Nov-06	49.40	41.25
			90.65	Feb-07	48.24	42.41
			90.65	May-07	40.33	50.32
			90.65	Aug-07	48.60	42.05
			90.65	Nov-07	49.50	41.15
			90.65	Feb-08	49.98	40.67
			90.65	May-08	49.50	41.15
			90.65	Aug-08	51.51	39.14
			90.65	Dec-08	52.16	38.49
			90.65	Feb-09	53.88	36.77
			90.65	Jun-09	52.04	38.61
90.65	Aug-09	54.86	35.79			
90.65	Nov-09	55.82	34.83			

**Notes:**

<sup>1</sup>Wells re-surveyed in May 2003.

<sup>2</sup>Wells re-surveyed in September 2006

<sup>3</sup>EW-1R is the replacement extraction well. It was installed in August 2006 and started on August 24,

<sup>a</sup>Historical data from Ecology and Environment

<sup>b</sup>Second round of Aug. 2006 water levels recorded after the start of EW-1R

ft bgs - feet below ground surface

MSL - Mean Sea Level

MW - Monitoring Well

NA - Not Applicable

TOC - Top of Casing

Table G-2(b) MODESTO SUPERFUND SITE  
HISTORICAL GROUNDWATER ELEVATIONS 1Q10 THROUGH CURRENT

Well Identification	Well Dept (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSI)
EW-01R (SP-01)	120	59 - 109	92.03	Mar-10	54.23	37.80
EW-01R (SP-01)	120	59 - 109	92.03	Nov-10	55.82	36.21
EW-01R (SP-01)	120	59 - 109	92.03	Mar-11	54.27	37.76
EW-01R (SP-01)	120	59 - 109	92.03	Jun-11	53.82	38.21
EW-01R (SP-01)	120	59 - 109	92.03	Sep-11	54.52	37.51
EW-01R (SP-01)	120	59 - 109	92.03	Nov-11	56.14	35.89
EW-01R (SP-01)		59 - 109	92.03	Jan-12	55.58	36.45
EW-01R (SP-01)	120	59 - 109	92.03	Apr-12	41.18	50.85
EW-01R (SP-01)	120	59 - 109	92.03	Aug-12	54.89	37.14
MW-01A	101	91 - 101	91.61	Mar-10	44.81	46.80
MW-01A	101	91 - 101	91.61	May-10	43.78	47.83
MW-01A	101	91 - 101	91.610846	Aug-10	44.41	47.20
MW-01A	101	91 - 101	91.610846	Nov-10	44.98	46.63
MW-01A	101	91 - 101	91.610846	Mar-11	43.11	48.50
MW-01A	101	91 - 101	91.610846	Jun-11	42.20	49.41
MW-01A	101	91 - 101	91.610846	Sep-11	42.73	48.88
MW-01A	101	91 - 101	91.610846	Nov-11	42.97	48.64
MW-01A	101	91 - 101	91.610846	Jan-12	42.19	49.42
MW-01A	101	91 - 101	91.610846	Apr-12	41.51	50.10
MW-01A	101	91 - 101	91.610846	Aug-12	42.00	49.61
MW-02A	96	86 - 96	90.88	Mar-10	44.02	46.86
MW-02A	96	86 - 96	90.88	May-10	43.03	47.85
MW-02A	96	86 - 96	90.88	Aug-10	43.52	47.36
MW-02A	96	86 - 96	90.88	Nov-10	44.21	46.67
MW-02A	96	86 - 96	90.88	Mar-11	42.38	48.50
MW-02A	96	86 - 96	90.88	Jun-11	41.44	49.44
MW-02A	96	86 - 96	90.88	Sep-11	41.90	48.98
MW-02A	96	86 - 96	90.88	Nov-11	42.12	48.76
MW-02A	96	86 - 96	90.88	Jan-12	41.52	49.36
MW-02A	96	86 - 96	90.88	Apr-12	40.80	50.08
MW-02A	96	86 - 96	90.88	Aug-12	41.15	49.73
MW-03A	94	84 - 94	91.49	Mar-10	46.77	44.72
MW-03A	94	84 - 94	91.49	May-10	45.76	45.73
MW-03A	94	84 - 94	91.49	Aug-10	46.38	45.11
MW-03A	94	84 - 94	91.49	Nov-10	46.89	44.60
MW-03A	94	84 - 94	91.49	Mar-11	44.95	46.54
MW-03A	94	84 - 94	91.49	Jun-11	44.00	47.49
MW-03A	94	84 - 94	91.49	Sep-11	44.56	46.93
MW-03A	94	84 - 94	91.49	Nov-11	44.89	46.60
MW-03A	94	84 - 94	91.49	Jan-12	44.19	47.30
MW-03A	94	84 - 94	91.49	Apr-12	41.84	49.65
MW-03A	94	84 - 94	91.49	Aug-12	43.82	47.67
MW-04A	89	78 - 88	91.13	Mar-10	45.39	45.74
MW-04A	89	78 - 88	91.13	May-10	44.23	46.90
MW-04A	89	78 - 88	91.130153	Aug-10	44.58	46.55
MW-04A	89	78 - 88	91.130153	Nov-10	45.47	45.66
MW-04A	89	78 - 88	91.130153	Mar-11	43.51	47.62
MW-04A	89	78 - 88	91.130153	Jun-11	42.47	48.66
MW-04A	89	78 - 88	91.130153	Sep-11	42.94	48.19
MW-04A	89	78 - 88	91.130153	Nov-11	43.33	47.80
MW-04A	89	78 - 88	91.130153	Jan-12	42.74	48.39
MW-04A	89	78 - 88	91.130153	Apr-12	41.90	49.23
MW-04A	89	78 - 88	91.130153	Aug-12	42.10	49.03
MW-04B	154	144 - 154	91.11	Mar-10	44.70	46.41
MW-04B	154	144 - 154	91.11	May-10	43.82	47.29
MW-04B	154	144 - 154	91.11	Aug-10	45.31	45.80

Table G-2(b) MODESTO SUPERFUND SITE  
HISTORICAL GROUNDWATER ELEVATIONS 1Q10 THROUGH CURRENT

Well Identification	Well Dept (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSI)
MW-04B	154	144 - 154	91.11	Nov-10	45.24	45.87
MW-04B	154	144 - 154	91.11	Mar-11	43.08	48.03
MW-04B	154	144 - 154	91.11	Jun-11	42.18	48.93
MW-04B	154	144 - 154	91.11	Sep-11	43.48	47.63
MW-04B	154	144 - 154	91.11	Nov-11	43.38	47.73
MW-04B	154	144 - 154	91.11	Jan-12	42.44	48.67
MW-04B	154	144 - 154	91.11	Apr-12	41.83	49.28
MW-04B	154	144 - 154	91.11	Aug-12	42.80	48.31
MW-04C	237	227 - 237	91.25	Mar-10	43.15	48.10
MW-04C	237	227 - 237	91.25	May-10	44.64	46.61
MW-04C	237	227 - 237	91.25	Aug-10	50.22	41.03
MW-04C	237	227 - 237	91.25	Nov-10	45.22	46.03
MW-04C	237	227 - 237	91.25	Mar-11	42.86	48.39
MW-04C	237	227 - 237	91.25	Jun-11	42.75	48.50
MW-04C	237	227 - 237	91.25	Sep-11	47.15	44.10
MW-04C	237	227 - 237	91.25	Nov-11	43.69	47.56
MW-04C	237	227 - 237	91.25	Jan-12	41.94	49.31
MW-04C	237	227 - 237	91.25	Apr-12	41.49	49.76
MW-04C	237	227 - 237	91.25	Aug-12	47.47	43.78
MW-05A	90	60 - 90	90.74	Mar-10	44.43	46.31
MW-05A	90	60 - 90	90.74	May-10	43.39	47.35
MW-05A	90	60 - 90	90.74	Aug-10	43.72	47.02
MW-05A	90	60 - 90	90.74	Nov-10	44.60	46.14
MW-05A	90	60 - 90	90.74	Mar-11	42.71	48.03
MW-05A	90	60 - 90	90.74	Jun-11	41.75	48.99
MW-05A	90	60 - 90	90.74	Sep-11	42.08	48.66
MW-05A	90	60 - 90	90.74	Nov-11	42.48	48.26
MW-05A	90	60 - 90	90.74	Jan-12	41.87	48.87
MW-05A	90	60 - 90	90.74	Apr-12	41.09	49.65
MW-05A	90	60 - 90	90.74	Aug-12	41.34	49.40
MW-06A	90	60 - 90	89.72	Mar-10	43.49	46.23
MW-06A	90	60 - 90	89.72	May-10	42.24	47.48
MW-06A	90	60 - 90	89.72	Aug-10	42.53	47.19
MW-06A	90	60 - 90	89.72	Nov-10	43.54	46.18
MW-06A	90	60 - 90	89.72	Mar-11	41.66	48.06
MW-06A	90	60 - 90	89.72	Jun-11	40.50	49.22
MW-06A	90	60 - 90	89.72	Sep-11	40.96	48.76
MW-06A	90	60 - 90	89.72	Nov-11	41.40	48.32
MW-06A	90	60 - 90	89.72	Jan-12	40.81	48.91
MW-06A	90	60 - 90	89.72	Apr-12	40.24	49.48
MW-06A	90	60 - 90	89.72	Aug-12	40.27	49.45
MW-07A	90	60 - 90	91.24	Mar-10	43.89	47.35
MW-07A	90	60 - 90	91.24	May-10	42.89	48.35
MW-07A	90	60 - 90	91.23817	Aug-10	43.00	48.24
MW-07A	90	60 - 90	91.23817	Nov-10	43.97	47.27
MW-07A	90	60 - 90	91.23817	Mar-11	42.30	48.94
MW-07A	90	60 - 90	91.23817	Jun-11	41.36	49.88
MW-07A	90	60 - 90	91.23817	Sep-11	41.55	49.69
MW-07A	90	60 - 90	91.23817	Nov-11	41.85	49.39
MW-07A	90	60 - 90	91.23817	Jan-12	41.40	49.84
MW-07A	90	60 - 90	91.23817	Apr-12	40.92	50.32
MW-07A	90	60 - 90	91.23817	Aug-12	40.82	50.42
MW-08A	90	60 - 90	91.44	Mar-10	45.39	46.05
MW-08A	90	60 - 90	91.44	May-10	44.33	47.11
MW-08A	90	60 - 90	91.439673	Aug-10	44.64	46.80
MW-08A	90	60 - 90	91.439673	Nov-10	45.53	45.91

Table G-2(b) MODESTO SUPERFUND SITE  
HISTORICAL GROUNDWATER ELEVATIONS 1Q10 THROUGH CURRENT

Well Identification	Well Dept (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSI)
MW-08A	90	60 - 90	91.439673	Mar-11	43.69	47.75
MW-08A	90	60 - 90	91.439673	Jun-11	42.66	48.78
MW-08A	90	60 - 90	91.439673	Sep-11	42.98	48.46
MW-08A	90	60 - 90	91.439673	Nov-11	43.38	48.06
MW-08A	90	60 - 90	91.439673	Jan-12	42.80	48.64
MW-08A	90	60 - 90	91.439673	Apr-12	41.91	49.53
MW-08A	90	60 - 90	91.439673	Aug-12	42.28	49.16
MW-09B	155	144 - 154	91.2	Mar-10	44.47	46.73
MW-09B	155	144 - 154	91.2	May-10	43.68	47.52
MW-09B	155	144 - 154	91.2	Aug-10	45.13	46.07
MW-09B	155	144 - 154	91.2	Nov-10	45.16	46.04
MW-09B	155	144 - 154	91.2	Mar-11	42.91	48.29
MW-09B	155	144 - 154	91.2	Jun-11	42.07	49.13
MW-09B	155	144 - 154	91.2	Sep-11	43.33	47.87
MW-09B	155	144 - 154	91.2	Nov-11	43.18	48.02
MW-09B	155	144 - 154	91.2	Jan-12	42.31	48.89
MW-09B	155	144 - 154	91.2	Apr-12	41.60	49.60
MW-09B	155	144 - 154	91.2	Aug-12	42.61	48.59
MW-10A	91	60 - 89	90.48	Mar-10	44.68	45.80
MW-10A	91	60 - 89	90.48	May-10	43.52	46.96
MW-10A	91	60 - 89	90.476695	Aug-10	43.94	46.54
MW-10A	91	60 - 89	90.476695	Nov-10	44.93	45.55
MW-10A	91	60 - 89	90.476695	Mar-11	42.85	47.63
MW-10A	91	60 - 89	90.476695	Jun-11	41.77	48.71
MW-10A	91	60 - 89	90.476695	Sep-11	42.31	48.17
MW-10A	91	60 - 89	90.476695	Nov-11	42.82	47.66
MW-10A	91	60 - 89	90.476695	Jan-12	42.15	48.33
MW-10A	91	60 - 89	90.476695	Apr-12	41.55	48.93
MW-10A	91	60 - 89	90.476695	Aug-12	41.62	48.86
MW-10B	160	153 - 163	90.21	Mar-10	44.01	46.20
MW-10B	160	153 - 163	90.21	May-10	43.08	47.13
MW-10B	160	153 - 163	90.21	Aug-10	44.44	45.77
MW-10B	160	153 - 163	90.21	Nov-10	44.55	45.66
MW-10B	160	153 - 163	90.21	Mar-11	42.37	47.84
MW-10B	160	153 - 163	90.21	Jun-11	41.37	48.84
MW-10B	160	153 - 163	90.21	Sep-11	42.66	47.55
MW-10B	160	153 - 163	90.21	Nov-11	42.66	47.55
MW-10B	160	153 - 163	90.21	Jan-12	41.72	48.49
MW-10B	160	153 - 163	90.21	Apr-12	41.11	49.10
MW-10B	160	153 - 163	90.21	Aug-12	41.90	48.31
MW-10C	230	220 - 230	90.5	Mar-10	42.87	47.63
MW-10C	230	220 - 230	90.5	May-10	44.22	46.28
MW-10C	230	220 - 230	90.5	Aug-10	49.92	40.58
MW-10C	230	220 - 230	90.5	Nov-10	44.88	45.62
MW-10C	230	220 - 230	90.5	Mar-11	42.47	48.03
MW-10C	230	220 - 230	90.5	Jun-11	42.20	48.30
MW-10C	230	220 - 230	90.5	Sep-11	46.99	43.51
MW-10C	230	220 - 230	90.5	Nov-11	43.51	46.99
MW-10C	230	220 - 230	90.5	Jan-12	41.65	48.85
MW-10C	230	220 - 230	90.5	Apr-12	41.30	49.20
MW-10C	230	220 - 230	90.5	Aug-12	47.14	43.36
MW-11A	92	70 - 90	89.91	Mar-10	42.15	47.76
MW-11A	92	70 - 90	89.91	May-10	41.12	48.79
MW-11A	92	70 - 90	89.913277	Aug-10	41.42	48.49
MW-11A	92	70 - 90	89.913277	Nov-10	42.19	47.72
MW-11A	92	70 - 90	89.913277	Mar-11	40.57	49.34

Table G-2(b) MODESTO SUPERFUND SITE  
HISTORICAL GROUNDWATER ELEVATIONS 1Q10 THROUGH CURRENT

Well Identification	Well Dept (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSI)
MW-11A	92	70 - 90	89.913277	Jun-11	39.65	50.26
MW-11A	92	70 - 90	89.913277	Sep-11	39.93	49.98
MW-11A	92	70 - 90	89.913277	Nov-11	40.08	49.83
MW-11A	92	70 - 90	89.913277	Jan-12	39.63	50.28
MW-11A	92	70 - 90	89.913277	Apr-12	39.18	50.73
MW-11A	92	70 - 90	89.913277	Aug-12	39.18	50.73
MW-12A	99	87 - 97	91.15	Mar-10	45.17	45.98
MW-12A	99	87 - 97	91.15	May-10	44.07	47.08
MW-12A	99	87 - 97	91.15	Aug-10	44.86	46.29
MW-12A	99	87 - 97	91.15	Nov-10	45.56	45.59
MW-12A	99	87 - 97	91.15	Mar-11	43.31	47.84
MW-12A	99	87 - 97	91.15	Jun-11	42.40	48.75
MW-12A	99	87 - 97	91.15	Sep-11	43.22	47.93
MW-12A	99	87 - 97	91.15	Nov-11	43.54	47.61
MW-12A	99	87 - 97	91.15	Jan-12	42.79	48.36
MW-12A	99	87 - 97	91.15	Apr-12	42.12	49.03
MW-12A	99	87 - 97	91.15	Aug-12	46.93	44.22
MW-13A	99	77 - 97	89.27	Mar-10	43.44	45.83
MW-13A	99	77 - 97	89.27	May-10	42.17	47.10
MW-13A	99	77 - 97	89.271675	Aug-10	42.35	46.92
MW-13A	99	77 - 97	89.271675	Nov-10	43.44	45.83
MW-13A	99	77 - 97	89.271675	Mar-11	41.67	47.60
MW-13A	99	77 - 97	89.271675	Jun-11	40.46	48.81
MW-13A	99	77 - 97	89.271675	Sep-11	40.76	48.51
MW-13A	99	77 - 97	89.271675	Nov-11	41.32	47.95
MW-13A	99	77 - 97	89.271675	Jan-12	40.77	48.50
MW-13A	99	77 - 97	89.271675	Apr-12	40.19	49.08
MW-13A	99	77 - 97	89.271675	Aug-12	40.17	49.10
MW-14A	92	70 - 90	89.79	Mar-10	43.04	46.75
MW-14A	92	70 - 90	89.79	May-10	41.93	47.86
MW-14A	92	70 - 90	89.785398	Aug-10	42.17	47.62
MW-14A	92	70 - 90	89.785398	Nov-10	43.00	46.79
MW-14A	92	70 - 90	89.785398	Mar-11	41.35	48.44
MW-14A	92	70 - 90	89.785398	Jun-11	40.34	49.45
MW-14A	92	70 - 90	89.785398	Sep-11	40.58	49.21
MW-14A	92	70 - 90	89.785398	Nov-11	40.91	48.88
MW-14A	92	70 - 90	89.785398	Jan-12	40.42	49.37
MW-14A	92	70 - 90	89.785398	Apr-12	39.89	49.90
MW-14A	92	70 - 90	89.785398	Aug-12	39.89	49.90
MW-15A	102	80 - 100	91.76	Mar-10	44.82	46.94
MW-15A	102	80 - 100	91.76	May-10	43.80	47.96
MW-15A	102	80 - 100	91.764875	Aug-10	44.40	47.36
MW-15A	102	80 - 100	91.764875	Nov-10	45.03	46.73
MW-15A	102	80 - 100	91.764875	Mar-11	43.11	48.65
MW-15A	102	80 - 100	91.764875	Jun-11	42.23	49.53
MW-15A	102	80 - 100	91.764875	Sep-11	42.77	48.99
MW-15A	102	80 - 100	91.764875	Nov-11	43.02	48.74
MW-15A	102	80 - 100	91.764875	Jan-12	42.41	49.35
MW-15A	102	80 - 100	91.764875	Apr-12	41.80	49.96
MW-15A	102	80 - 100	91.764875	Aug-12	42.10	49.66
MW-16A	86	76 - 86	91.89	Mar-10	46.55	45.34
MW-16A	86	76 - 86	91.89	May-10	45.41	46.48
MW-16A	86	76 - 86	91.89	Aug-10	47.34	44.55
MW-16A	86	76 - 86	91.89	Nov-10	47.40	44.49
MW-16A	86	76 - 86	91.89	Mar-11	44.62	47.27
MW-16A	86	76 - 86	91.89	Jun-11	43.58	48.31

Table G-2(b) MODESTO SUPERFUND SITE  
HISTORICAL GROUNDWATER ELEVATIONS 1Q10 THROUGH CURRENT

Well Identification	Well Dept (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSI)
MW-16A	86	76 - 86	91.89	Sep-11	45.51	46.38
MW-16A	86	76 - 86	91.89	Nov-11	45.53	46.36
MW-16A	86	76 - 86	91.89	Jan-12	44.29	47.60
MW-16A	86	76 - 86	91.89	Apr-12	43.54	48.35
MW-16A	86	76 - 86	91.89	Aug-12	44.46	47.43
MW-16B	139	129 - 139	91.82	Mar-10	46.48	45.34
MW-16B	139	129 - 139	91.82	May-10	45.33	46.49
MW-16B	139	129 - 139	91.82	Aug-10	47.32	44.50
MW-16B	139	129 - 139	91.82	Nov-10	47.34	44.48
MW-16B	139	129 - 139	91.82	Mar-11	44.60	47.22
MW-16B	139	129 - 139	91.82	Jun-11	43.53	48.29
MW-16B	139	129 - 139	91.82	Sep-11	45.43	46.39
MW-16B	139	129 - 139	91.82	Nov-11	45.46	46.36
MW-16B	139	129 - 139	91.82	Jan-12	44.24	47.58
MW-16B	139	129 - 139	91.82	Apr-12	43.51	48.31
MW-16B	139	129 - 139	91.82	Aug-12	44.43	47.39
MW-16C	236	226 - 236	91.64	Mar-10	45.51	46.13
MW-16C	236	226 - 236	91.64	May-10	46.22	45.42
MW-16C	236	226 - 236	91.64	Aug-10	52.77	38.87
MW-16C	236	226 - 236	91.64	Nov-10	47.40	44.24
MW-16C	236	226 - 236	91.64	Mar-11	44.73	46.91
MW-16C	236	226 - 236	91.64	Jun-11	44.07	47.57
MW-16C	236	226 - 236	91.64	Sep-11	49.02	42.62
MW-16C	236	226 - 236	91.64	Nov-11	45.99	45.65
MW-16C	236	226 - 236	91.64	Jan-12	44.12	47.52
MW-16C	236	226 - 236	91.64	Apr-12	43.39	48.25
MW-16C	236	226 - 236	91.64	Aug-12	48.55	43.09
MW-17A	88	77 - 87	89.64	Mar-10	44.36	45.28
MW-17A	88	77 - 87	89.64	May-10	43.01	46.63
MW-17A	88	77 - 87	89.64	Aug-10	43.42	46.22
MW-17A	88	77 - 87	89.64	Nov-10	44.48	45.16
MW-17A	88	77 - 87	89.64	Mar-11	42.51	47.13
MW-17A	88	77 - 87	89.64	Jun-11	41.15	48.49
MW-17A	88	77 - 87	89.64	Sep-11	41.81	47.83
MW-17A	88	77 - 87	89.64	Nov-11	42.48	47.16
MW-17A	88	77 - 87	89.64	Jan-12	41.75	47.89
MW-17A	88	77 - 87	89.64	Apr-12	41.04	48.60
MW-17A	88	77 - 87	89.64	Aug-12	41.10	48.54
MW-17B	140	129 - 139	89.69	Mar-10	44.21	45.48
MW-17B	140	129 - 139	89.69	May-10	43.02	46.67
MW-17B	140	129 - 139	89.69	Aug-10	43.98	45.71
MW-17B	140	129 - 139	89.69	Nov-10	44.60	45.09
MW-17B	140	129 - 139	89.69	Mar-11	42.42	47.27
MW-17B	140	129 - 139	89.69	Jun-11	41.17	48.52
MW-17B	140	129 - 139	89.69	Sep-11	42.31	47.38
MW-17B	140	129 - 139	89.69	Nov-11	42.68	47.01
MW-17B	140	129 - 139	89.69	Jan-12	41.70	47.99
MW-17B	140	129 - 139	89.69	Apr-12	41.06	48.63
MW-17B	140	129 - 139	89.69	Aug-12	41.54	48.15
MW-17C	232	222 - 232	89.76	Mar-10	43.06	46.70
MW-17C	232	222 - 232	89.76	May-10	44.10	45.66
MW-17C	232	222 - 232	89.76	Aug-10	51.62	38.14
MW-17C	232	222 - 232	89.76	Nov-10	45.08	44.68
MW-17C	232	222 - 232	89.76	Mar-11	42.36	47.40
MW-17C	232	222 - 232	89.76	Jun-11	41.85	47.91
MW-17C	232	222 - 232	89.76	Sep-11	43.30	46.46

Table G-2(b) MODESTO SUPERFUND SITE  
HISTORICAL GROUNDWATER ELEVATIONS 1Q10 THROUGH CURRENT

Well Identification	Well Dept (ft bgs)	Screened Interval (ft bgs)	Top of Casing Elevation (ft bgs)	Date	Depth to Water (feet from TOC)	Water Table Elevation (feet above MSI)
MW-17C	232	222 - 232	89.76	Nov-11	44.07	45.69
MW-17C	232	222 - 232	89.76	Jan-12	41.60	48.16
MW-17C	232	222 - 232	89.76	Apr-12	40.97	48.79
MW-17C	232	222 - 232	89.76	Aug-12	47.40	42.36
MW-18A	66	56 - 66	90.14	Mar-10	44.58	45.56
MW-18A	66	56 - 66	90.14	May-10	43.39	46.75
MW-18A	66	56 - 66	90.14	Aug-10	43.89	46.25
MW-18A	66	56 - 66	90.14	Nov-10	44.00	46.14
MW-18A	66	56 - 66	90.14	Mar-11	42.77	47.37
MW-18A	66	56 - 66	90.14	Jun-11	41.56	48.58
MW-18A	66	56 - 66	90.14	Sep-11	42.28	47.86
MW-18A	66	56 - 66	90.14	Nov-11	42.83	47.31
MW-18A	66	56 - 66	90.14	Jan-12	42.11	48.03
MW-18A	66	56 - 66	90.14	Apr-12	41.48	48.66
MW-18A	66	56 - 66	90.14	Aug-12	41.57	48.57
MW-19A	101	91 - 101	91.22	Mar-10	45.43	45.79
MW-19A	101	91 - 101	91.22	May-10	44.37	46.85
MW-19A	101	91 - 101	91.22	Aug-10	45.83	45.39
MW-19A	101	91 - 101	91.22	Nov-10	46.02	45.20
MW-19A	101	91 - 101	91.22	Mar-11	43.65	47.57
MW-19A	101	91 - 101	91.22	Jun-11	42.63	48.59
MW-19A	101	91 - 101	91.22	Sep-11	44.07	47.15
MW-19A	101	91 - 101	91.22	Nov-11	44.14	47.08
MW-19A	101	91 - 101	91.22	Jan-12	43.18	48.04
MW-19A	101	91 - 101	91.22	Apr-12	42.58	48.64
MW-19A	101	91 - 101	91.22	Aug-12	44.18	47.04
MW-19B1	147	137 - 147	91.08	Mar-10	45.55	45.53
MW-19B1	147	137 - 147	91.08	May-10	44.68	46.40
MW-19B1	147	137 - 147	91.08	Aug-10	46.78	44.30
MW-19B1	147	137 - 147	91.08	Nov-10	46.42	44.66
MW-19B1	147	137 - 147	91.08	Mar-11	43.84	47.24
MW-19B1	147	137 - 147	91.08	Jun-11	42.93	48.15
MW-19B1	147	137 - 147	91.08	Sep-11	44.85	46.23
MW-19B1	147	137 - 147	91.08	Nov-11	44.59	46.49
MW-19B1	147	137 - 147	91.08	Jan-12	43.45	47.63
MW-19B1	147	137 - 147	91.08	Apr-12	42.81	48.27
MW-19B1	147	137 - 147	91.08	Aug-12	44.03	47.05
MW-20A	86	76 - 86	90.7	Mar-10	45.28	45.42
MW-20A	86	76 - 86	90.7	May-10	44.08	46.62
MW-20A	86	76 - 86	90.7	Aug-10	44.97	45.73
MW-20A	86	76 - 86	90.7	Nov-10	45.79	44.91
MW-20A	86	76 - 86	90.7	Mar-11	43.40	47.30
MW-20A	86	76 - 86	90.7	Jun-11	42.28	48.42
MW-20A	86	76 - 86	90.7	Sep-11	43.35	47.35
MW-20A	86	76 - 86	90.7	Nov-11	43.74	46.96
MW-20A	86	76 - 86	90.7	Jan-12	42.84	47.86
MW-20A	86	76 - 86	90.7	Apr-12	42.15	48.55
MW-20A	86	76 - 86	90.7	Aug-12	41.12	49.58
MW-20B	162	152 - 162	90.65	Mar-10	45.19	45.46
MW-20B	162	152 - 162	90.65	May-10	44.11	46.54
MW-20B	162	152 - 162	90.65	Aug-10	45.74	44.91
MW-20B	162	152 - 162	90.65	Nov-10	45.96	44.69
MW-20B	162	152 - 162	90.65	Mar-11	43.38	47.27
MW-20B	162	152 - 162	90.65	Jun-11	42.34	48.31
MW-20B	162	152 - 162	90.65	Sep-11	43.94	46.71
MW-20B	162	152 - 162	90.65	Nov-11	44.00	46.65

**Table G-2(b) MODESTO SUPERFUND SITE  
HISTORICAL GROUNDWATER ELEVATIONS 1Q10 THROUGH CURRENT**

<b>Well Identification</b>	<b>Well Dept (ft bgs)</b>	<b>Screened Interval (ft bgs)</b>	<b>Top of Casing Elevation (ft bgs)</b>	<b>Date</b>	<b>Depth to Water (feet from TOC)</b>	<b>Water Table Elevation (feet above MSL)</b>
MW-20B	162	152 - 162	90.65	Jan-12	42.69	47.96
MW-20B	162	152 - 162	90.65	Apr-12	42.21	48.44
MW-20B	162	152 - 162	90.65	Aug-12	43.06	47.59
MW-20C	235	225 - 235	90.79	Mar-10	43.84	46.95
MW-20C	235	225 - 235	90.79	May-10	44.42	46.37
MW-20C	235	225 - 235	90.79	Aug-10	50.67	40.12
MW-20C	235	225 - 235	90.79	Nov-10	45.78	45.01
MW-20C	235	225 - 235	90.79	Mar-11	43.14	47.65
MW-20C	235	225 - 235	90.79	Jun-11	42.65	48.14
MW-20C	235	225 - 235	90.79	Sep-11	47.52	43.27
MW-20C	235	225 - 235	90.79	Nov-11	44.74	46.05
MW-20C	235	225 - 235	90.79	Jan-12	42.48	48.31
MW-20C	235	225 - 235	90.79	Apr-12	41.89	48.90
MW-20C	235	225 - 235	90.79	Aug-12	47.39	43.40
MW-21A	102	90 - 100	91.75	Nov-11	45.34	46.41
MW-21A	102	90 - 100	91.75	Jan-12	44.62	47.13
MW-21A	102	90 - 100	91.75	Apr-12	43.42	48.33
MW-21A	102	90 - 100	91.75	Aug-12	44.83	46.92
MW-22A	62	50 - 60	91.69	Nov-11	45.36	46.33
MW-22A	62	50 - 60	91.69	Jan-12	44.20	47.49
MW-22A	62	50 - 60	91.69	Apr-12	43.45	48.24
MW-22A	62	50 - 60	91.69	Aug-12	44.02	47.67
MW-23A	102	89 - 99	90.26	Nov-11	40.85	49.41
MW-23A	102	89 - 99	90.26	Jan-12	40.71	49.55
MW-23A	102	89 - 99	90.26	Apr-12	40.19	50.07
MW-23A	102	89 - 99	90.26	Aug-12	40.26	50.00
MW-24B	157	145 - 155	92.93	Nov-11	45.94	46.99
MW-24B	157	145 - 155	92.93	Jan-12	44.89	48.04
MW-24B	157	145 - 155	92.93	Apr-12	44.21	48.72
MW-24B	157	145 - 155	92.93	Aug-12	44.91	48.02
MW-25B	157	145 - 155	91.78	Nov-11	45.40	46.38
MW-25B	157	145 - 155	91.78	Jan-12	44.27	47.51
MW-25B	157	145 - 155	91.78	Apr-12	43.44	48.34
MW-25B	157	145 - 155	91.78	Aug-12	44.12	47.66
MW-26B	157	145 - 155	89.71	Nov-11	43.03	46.68
MW-26B	157	145 - 155	89.71	Jan-12	41.95	47.76
MW-26B	157	145 - 155	89.71	Apr-12	41.23	48.48
MW-26B	157	145 - 155	89.71	Aug-12	41.78	47.93
MW-27B	157	145 - 155	89.34	Nov-11	42.36	46.98
MW-27B	157	145 - 155	89.34	Jan-12	41.40	47.94
MW-27B	157	145 - 155	89.34	Apr-12	40.70	48.64
MW-27B	157	145 - 155	89.34	Aug-12	41.19	48.15
MW-28B	157	145 - 155	89.21	Nov-11	41.40	47.81
MW-28B	157	145 - 155	89.21	Jan-12	40.62	48.59
MW-28B	157	145 - 155	89.21	Apr-12	40.06	49.15
MW-28B	157	145 - 155	89.21	Aug-12	40.52	48.69
MW-29B	157	145 - 155	89.74	Nov-11	41.45	48.29
MW-29B	157	145 - 155	89.74	Jan-12	40.72	49.02
MW-29B	157	145 - 155	89.74	Apr-12	40.15	49.59
MW-29B	157	145 - 155	89.74	Aug-12	40.63	49.11

ft bgs = feet below ground surface

MSL = mean sea level

TOC = top of casing

Table G-3. Historical through Current Analytical Data

Included as excel file on this CD.



FIGURE G-4(b)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

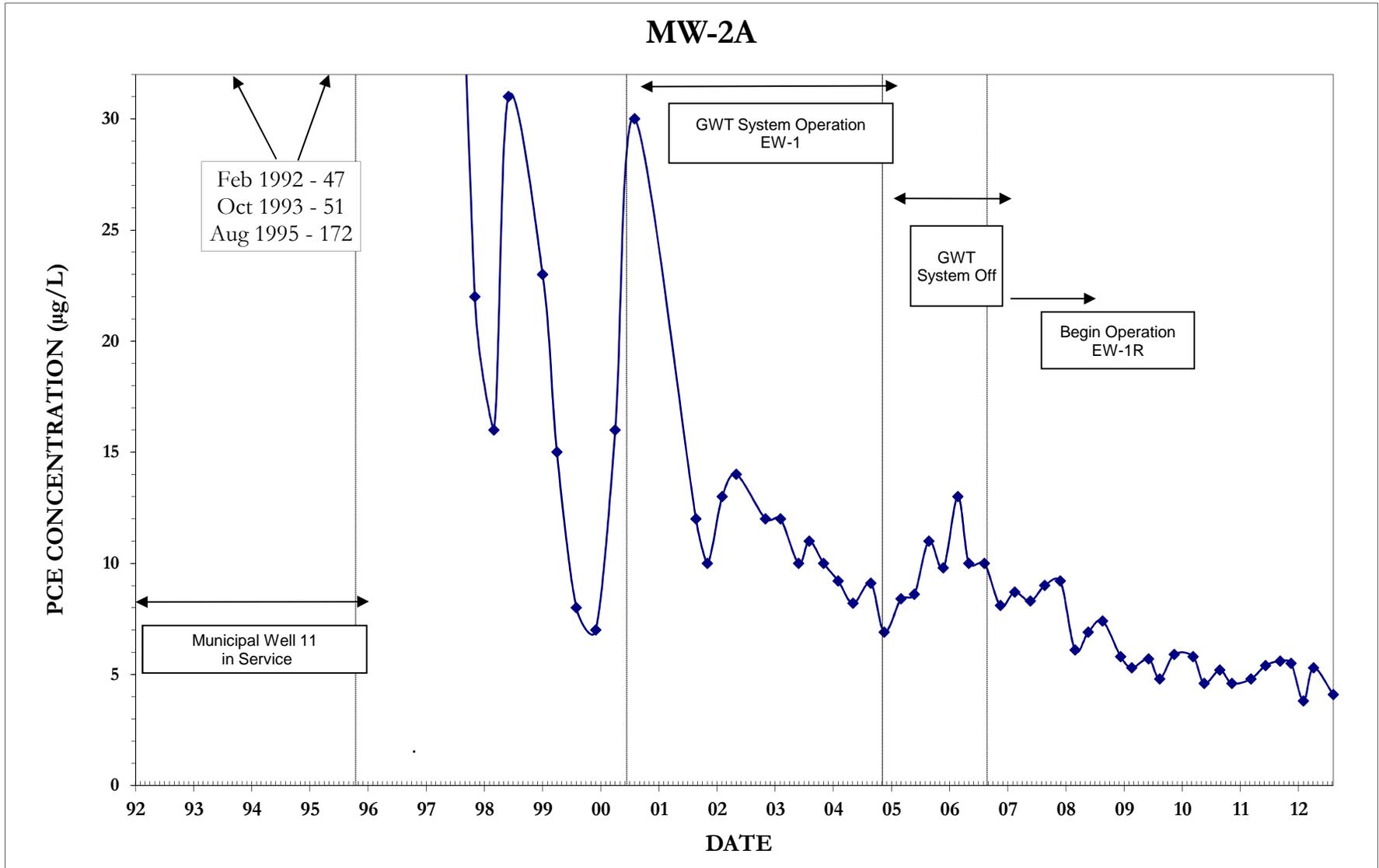


FIGURE G-4(c)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

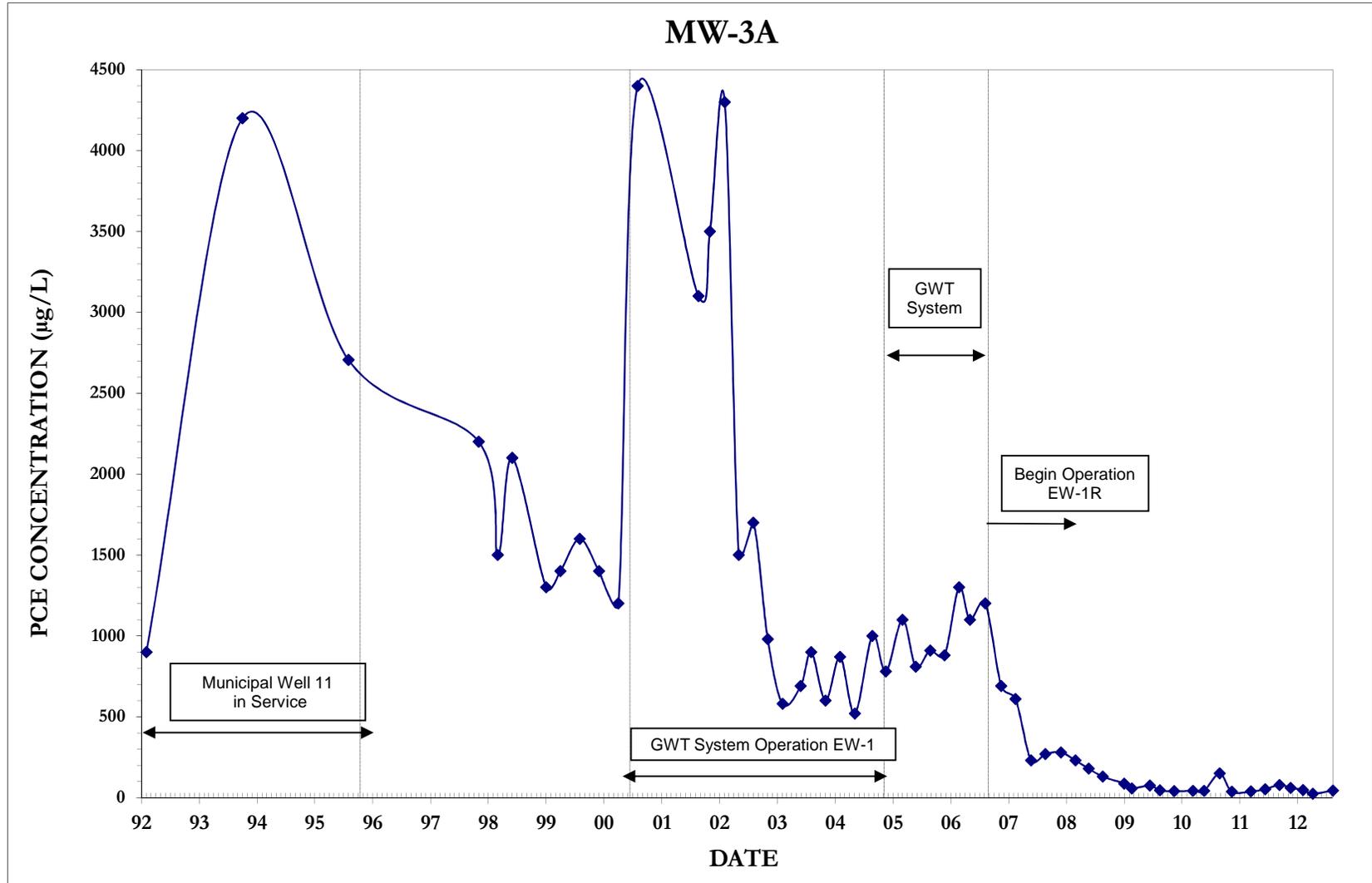


FIGURE G-4(d)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

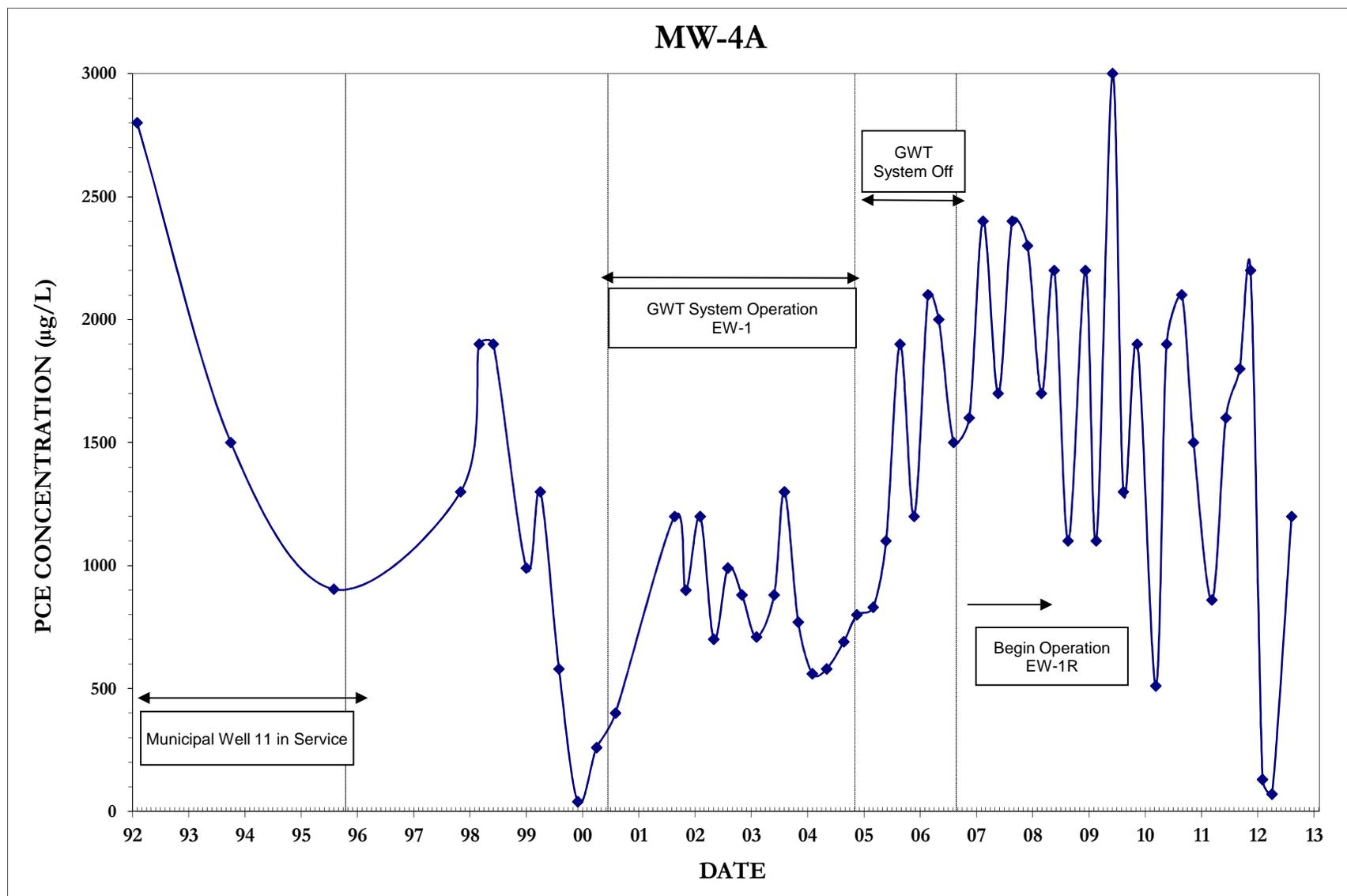


FIGURE G-4(e)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

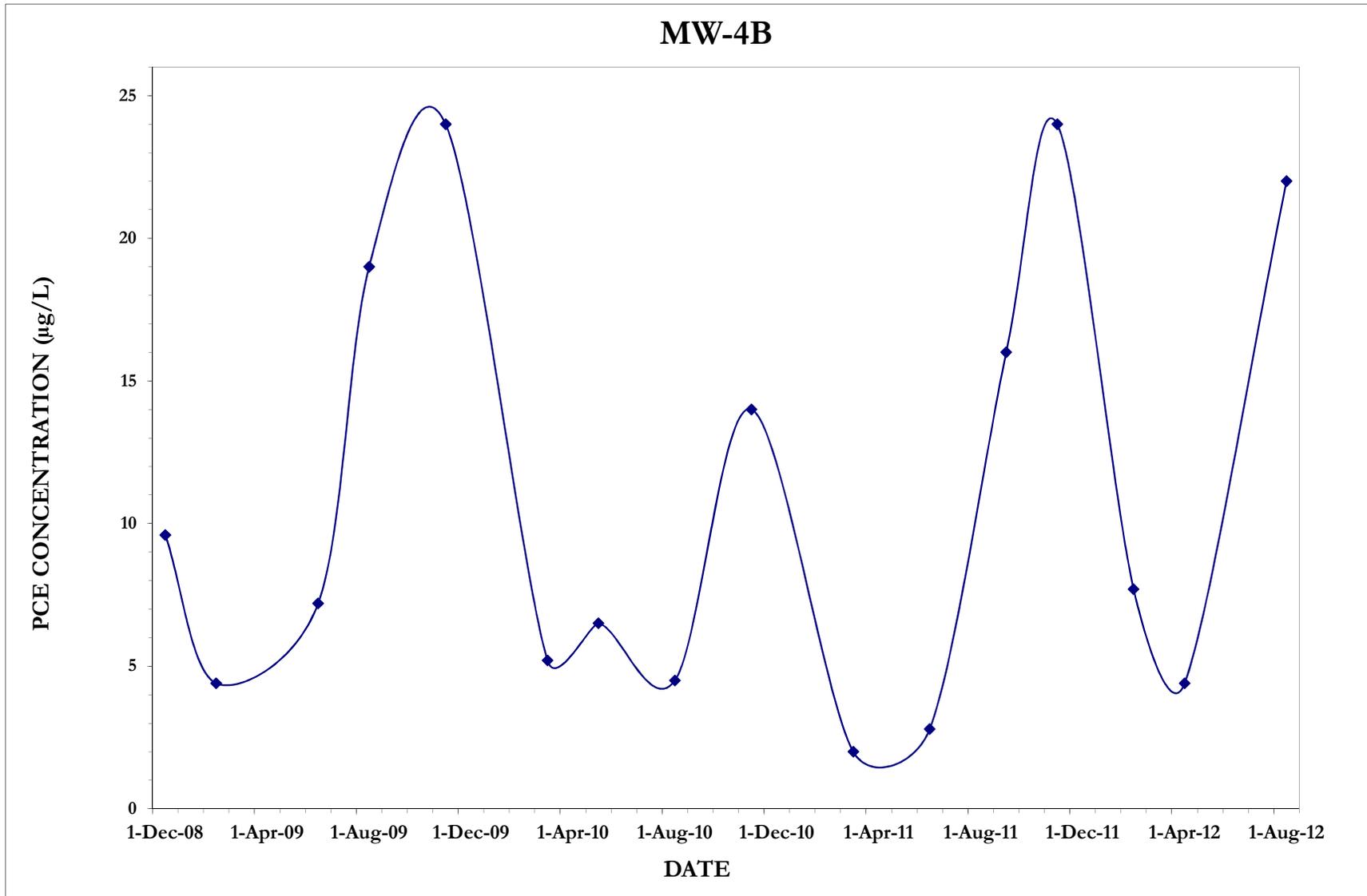


FIGURE G-4(f)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

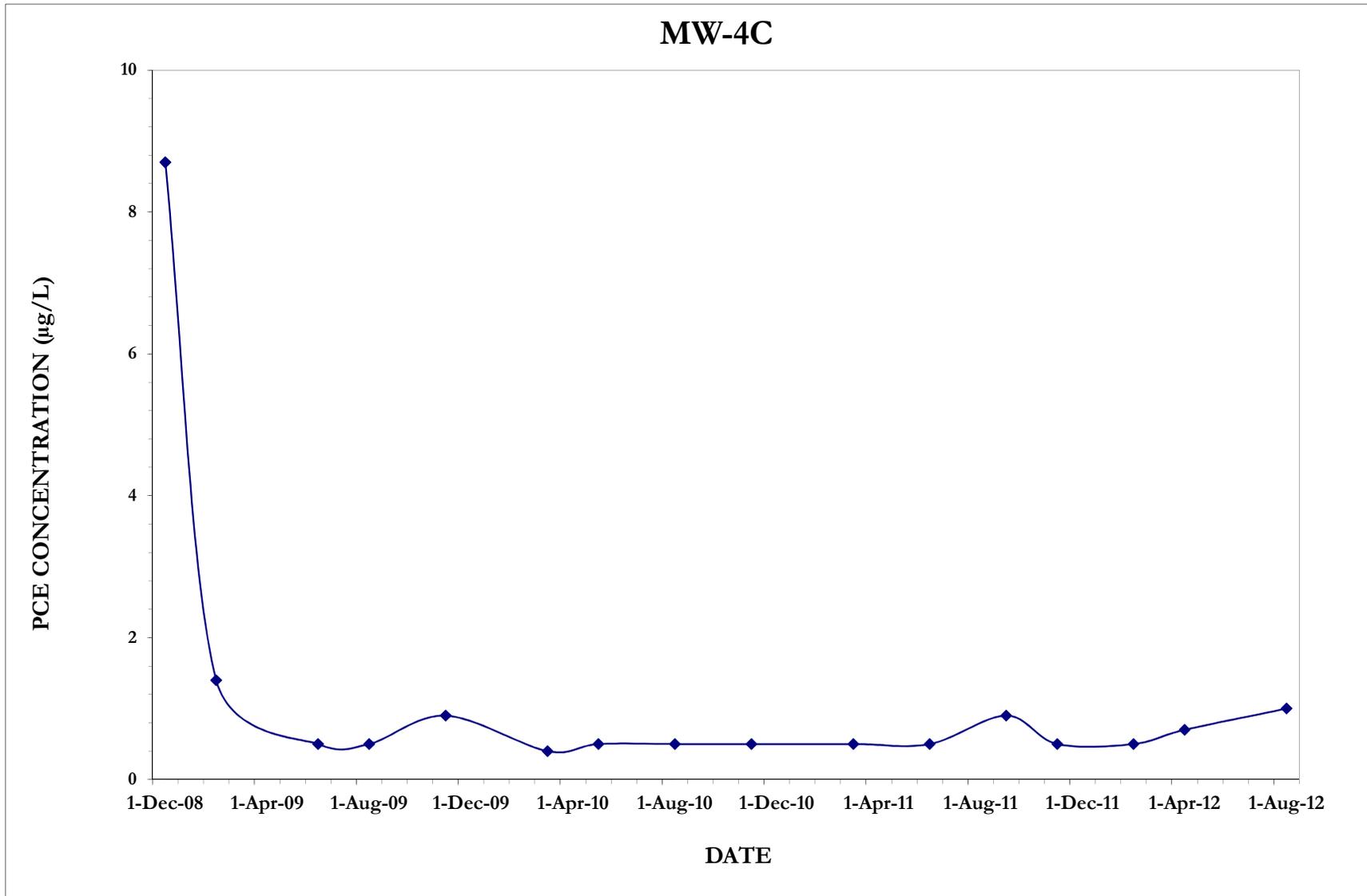


FIGURE G-4(g)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

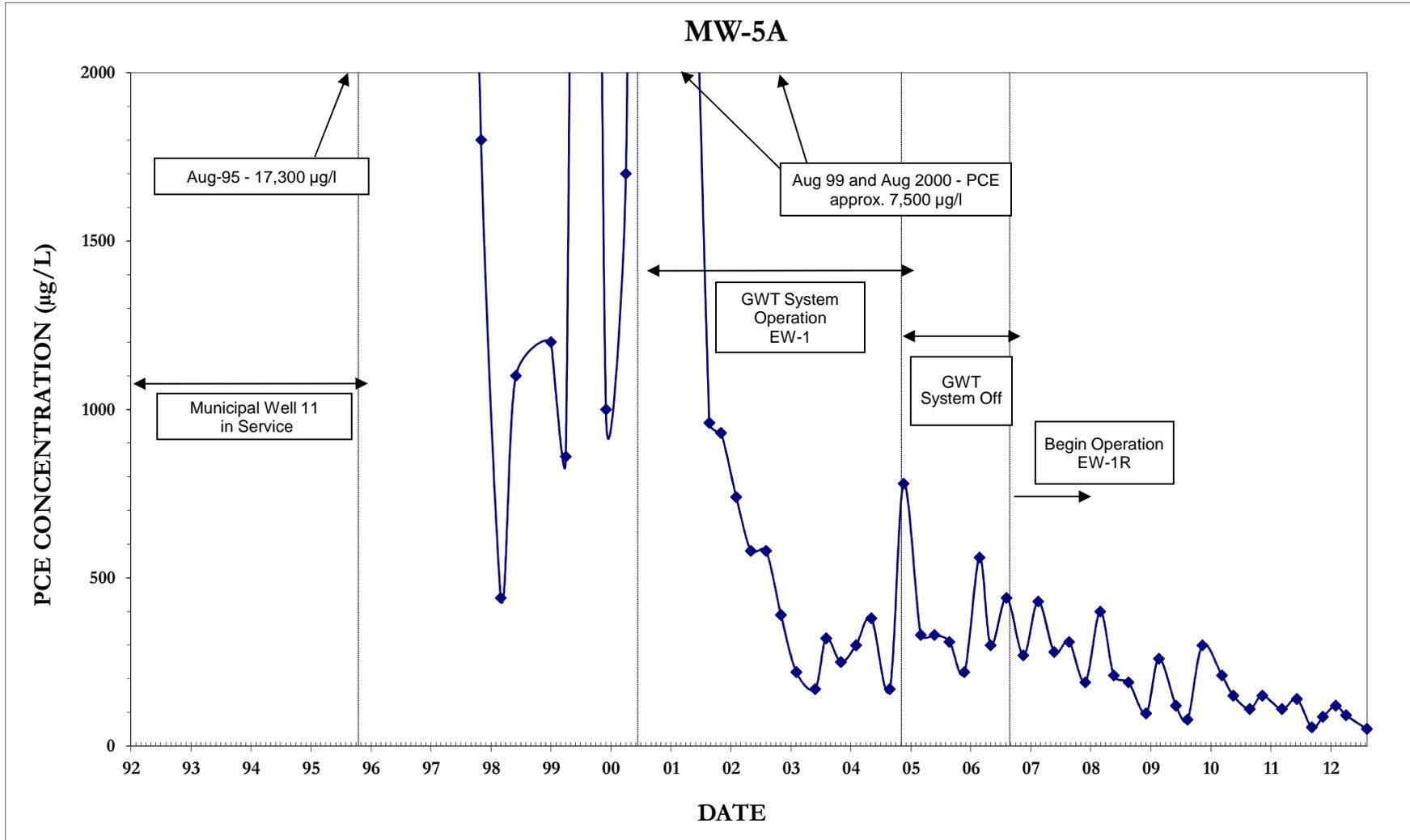


FIGURE G-4(h)

HISTORICAL PCE CONCENTRATION IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

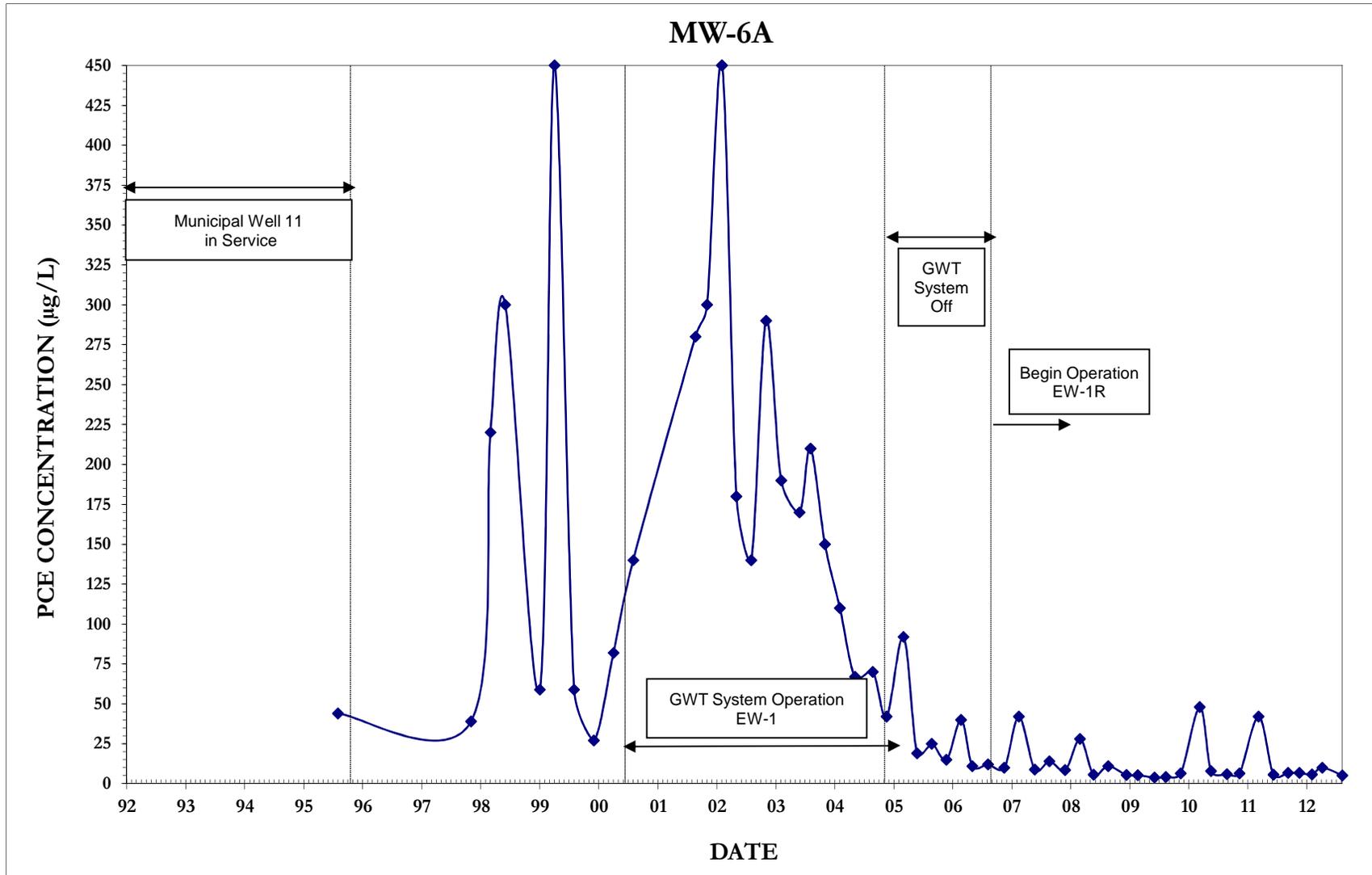


FIGURE G-4(i)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

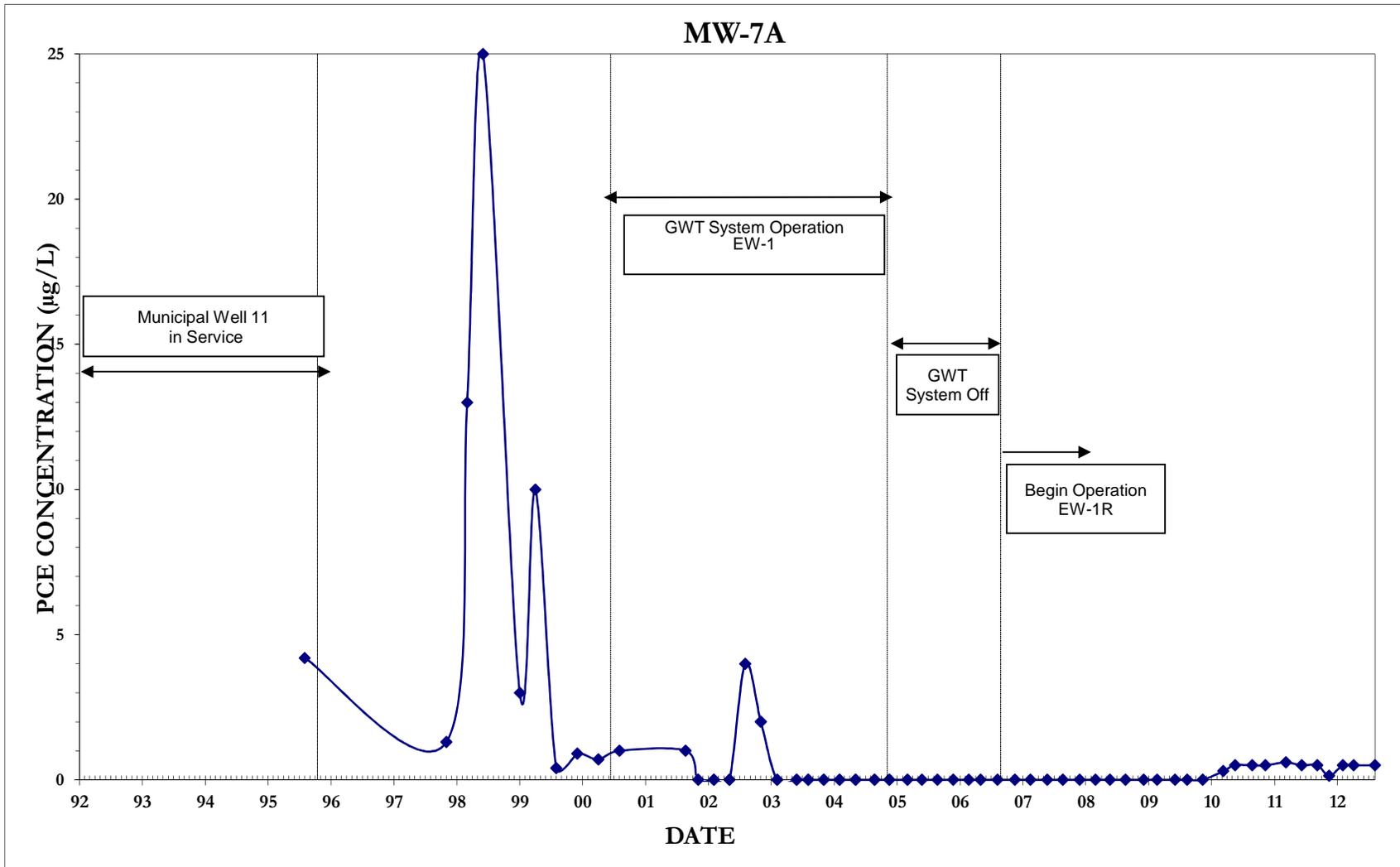


FIGURE G-4(j)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

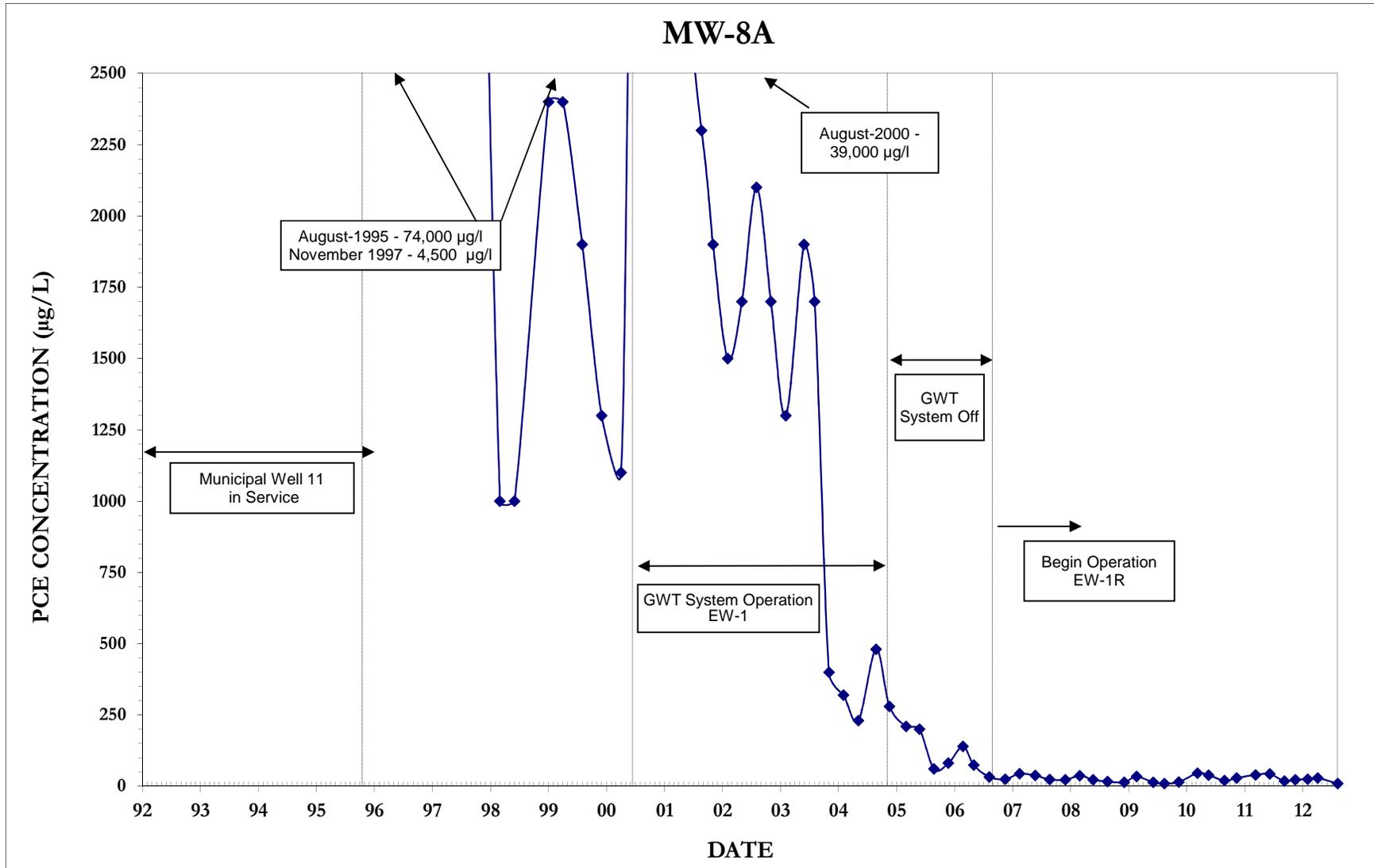


FIGURE G-4(k)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

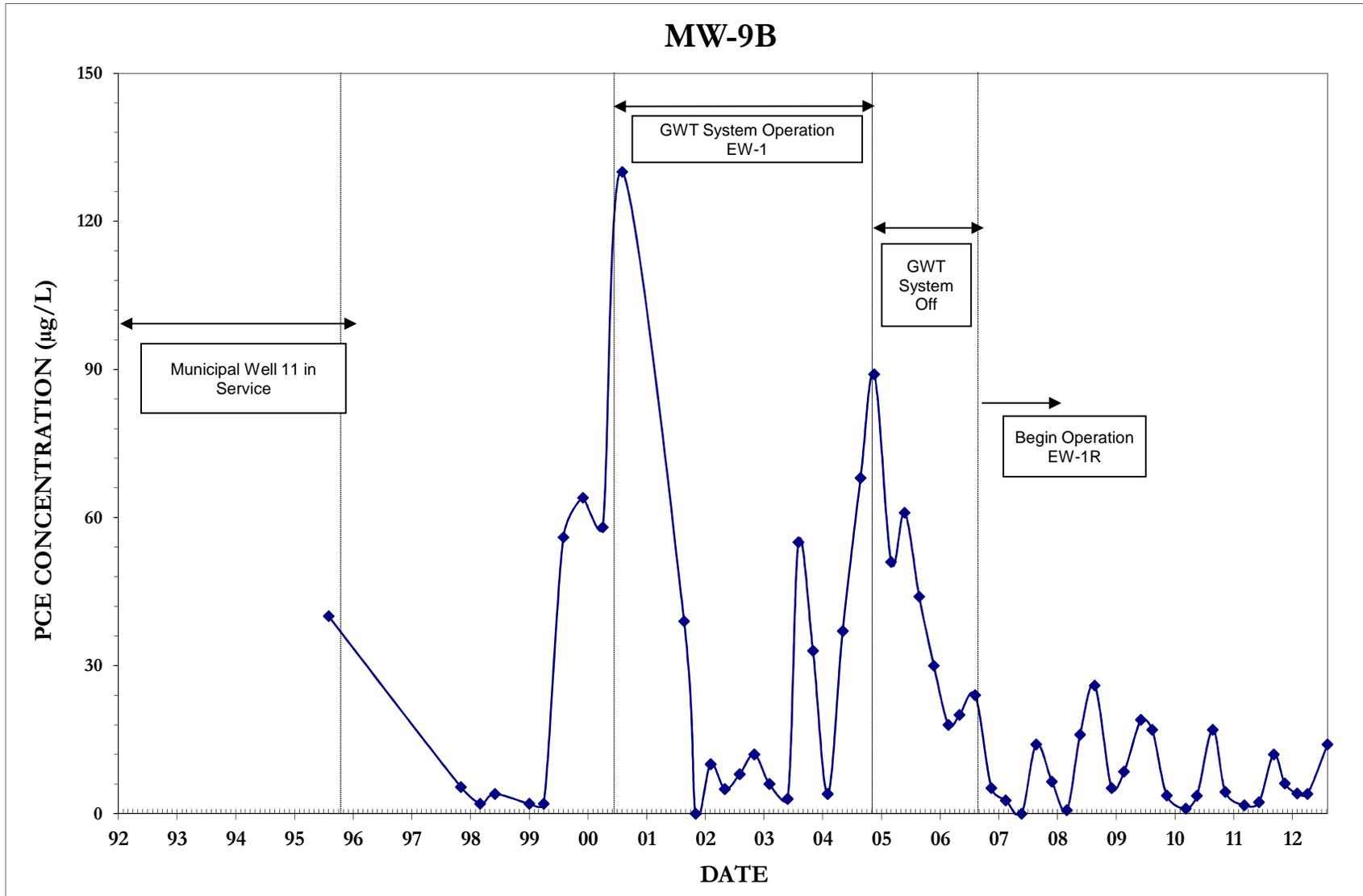


FIGURE G-4(I)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

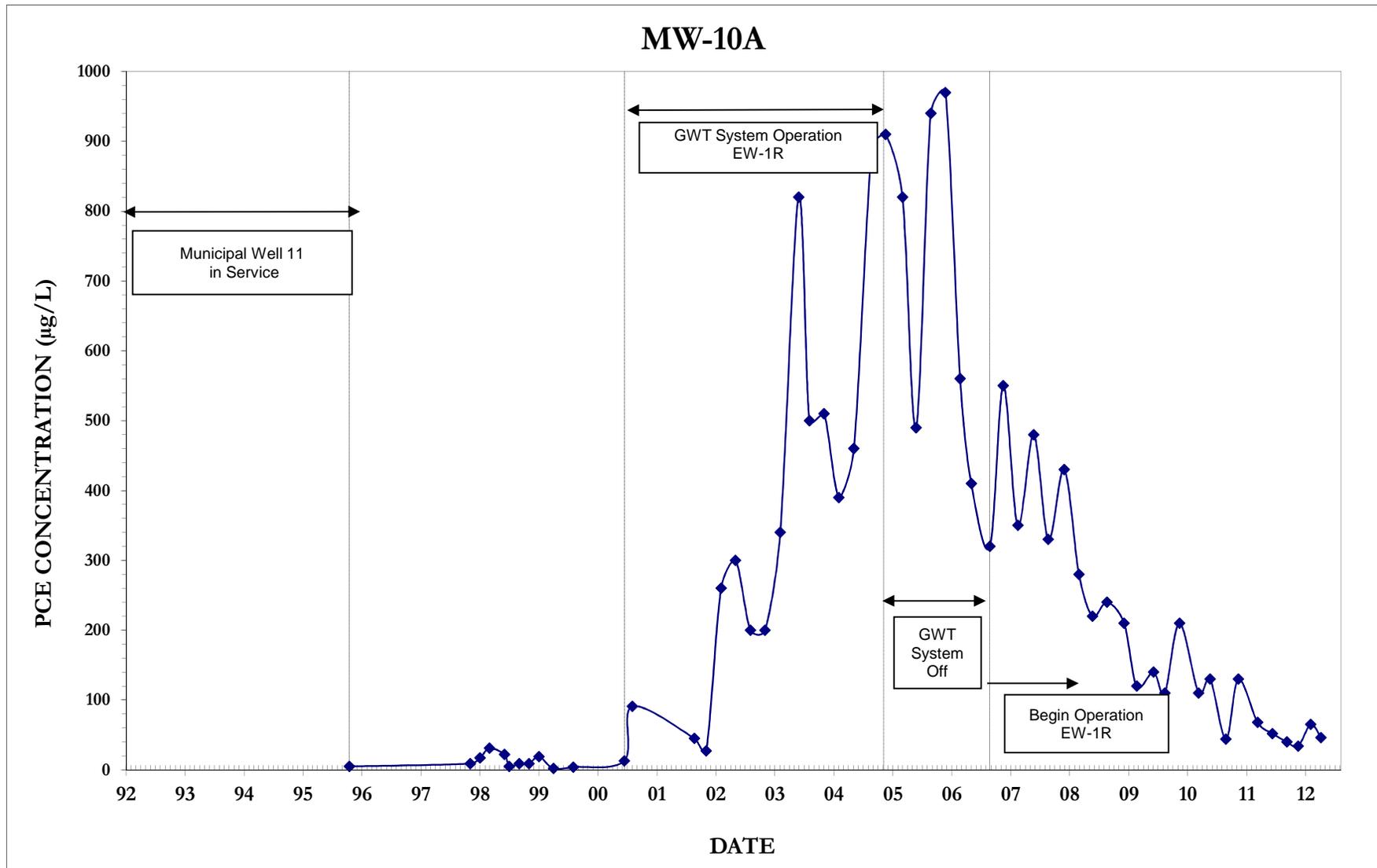


FIGURE G-4(m)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

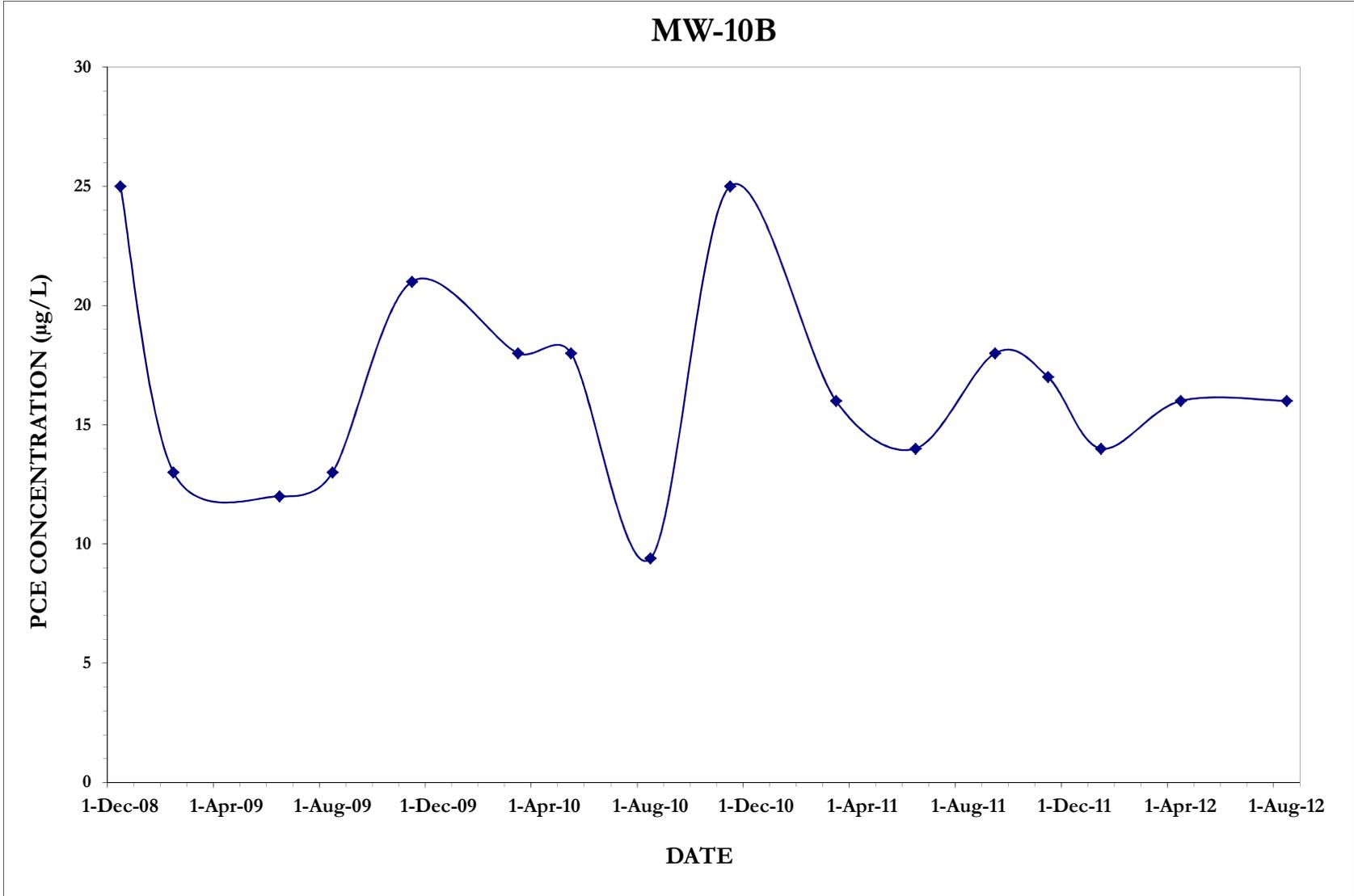


FIGURE G-4(n)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

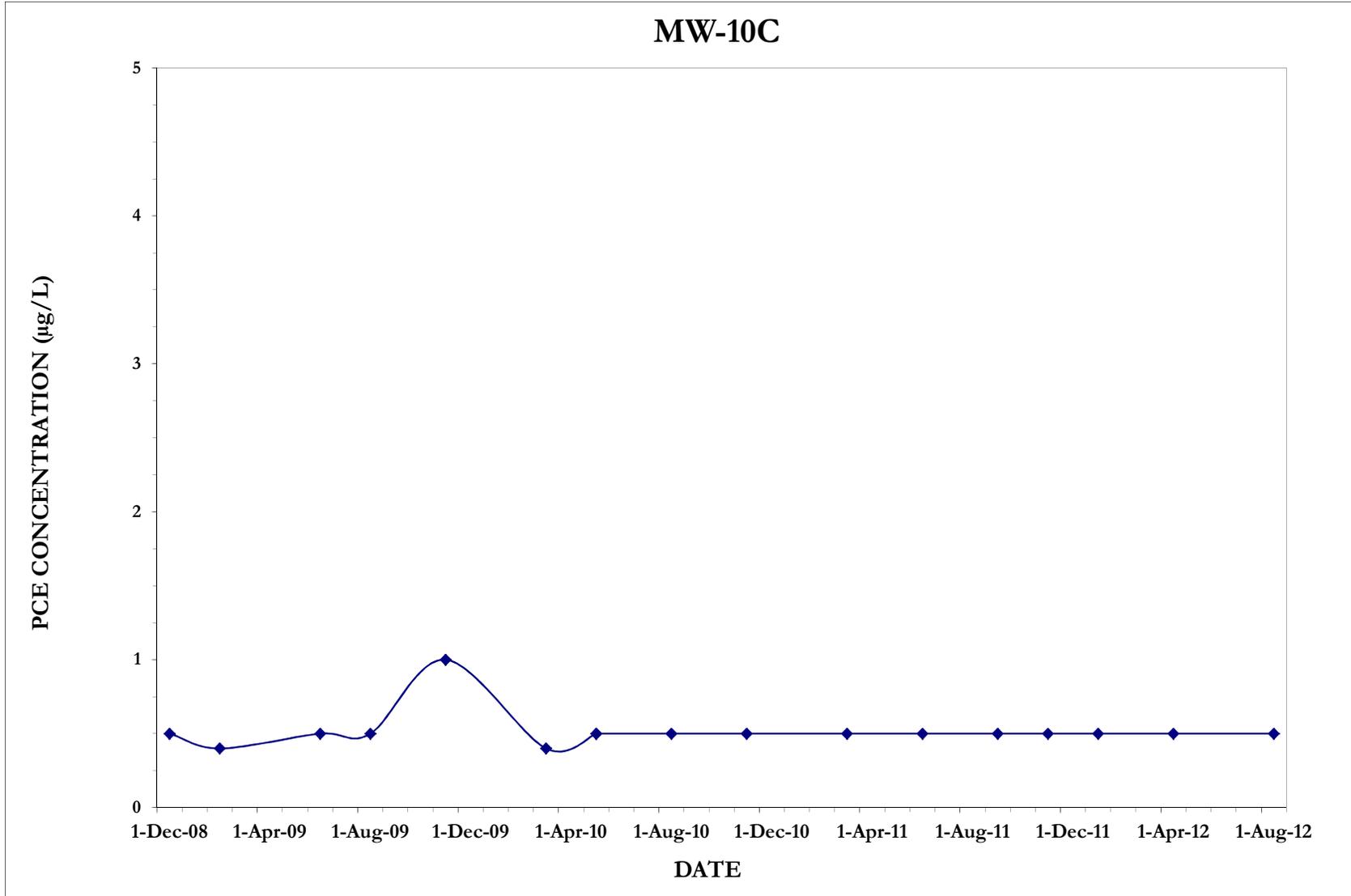




FIGURE G-4(p)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

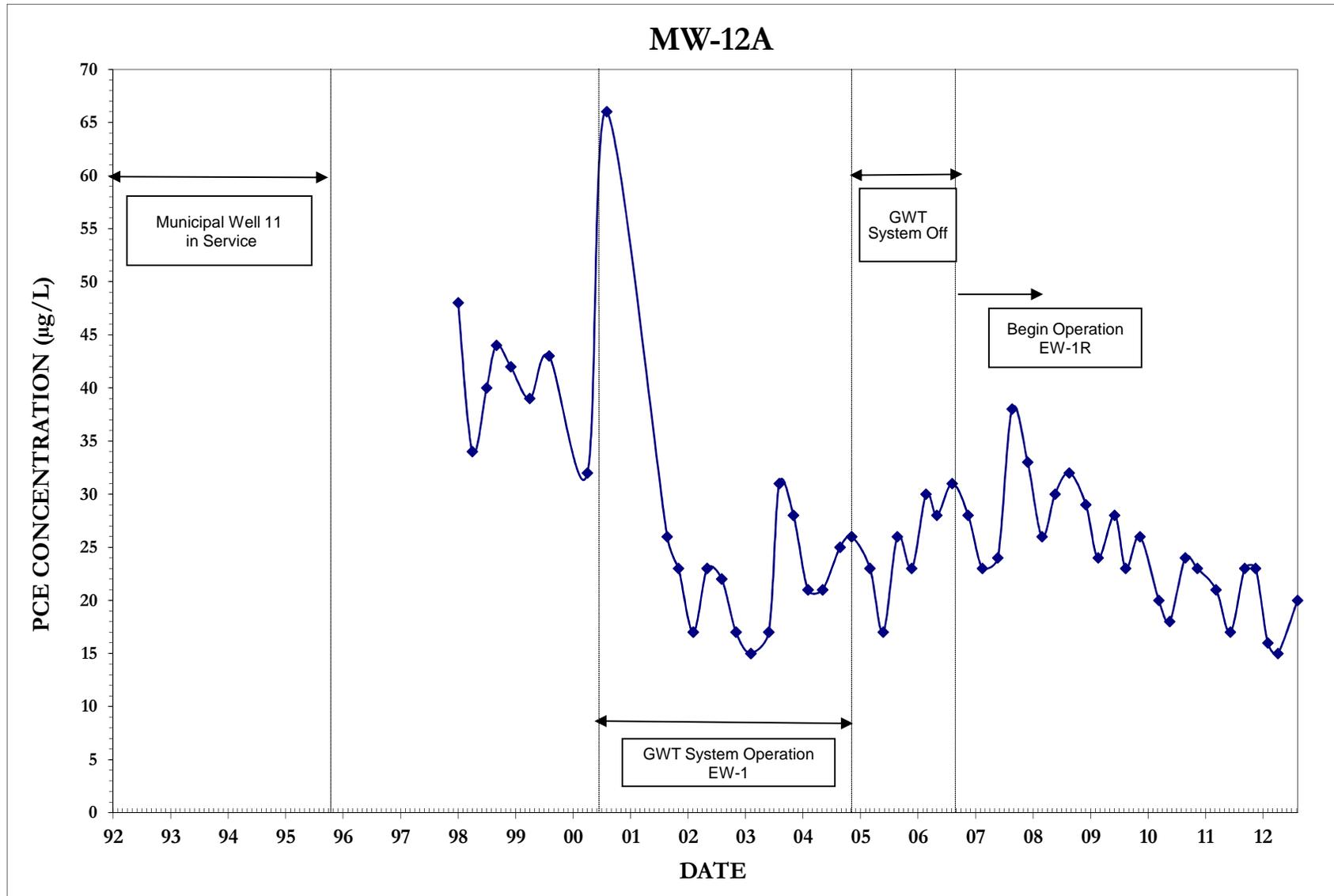


FIGURE G-4(q)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

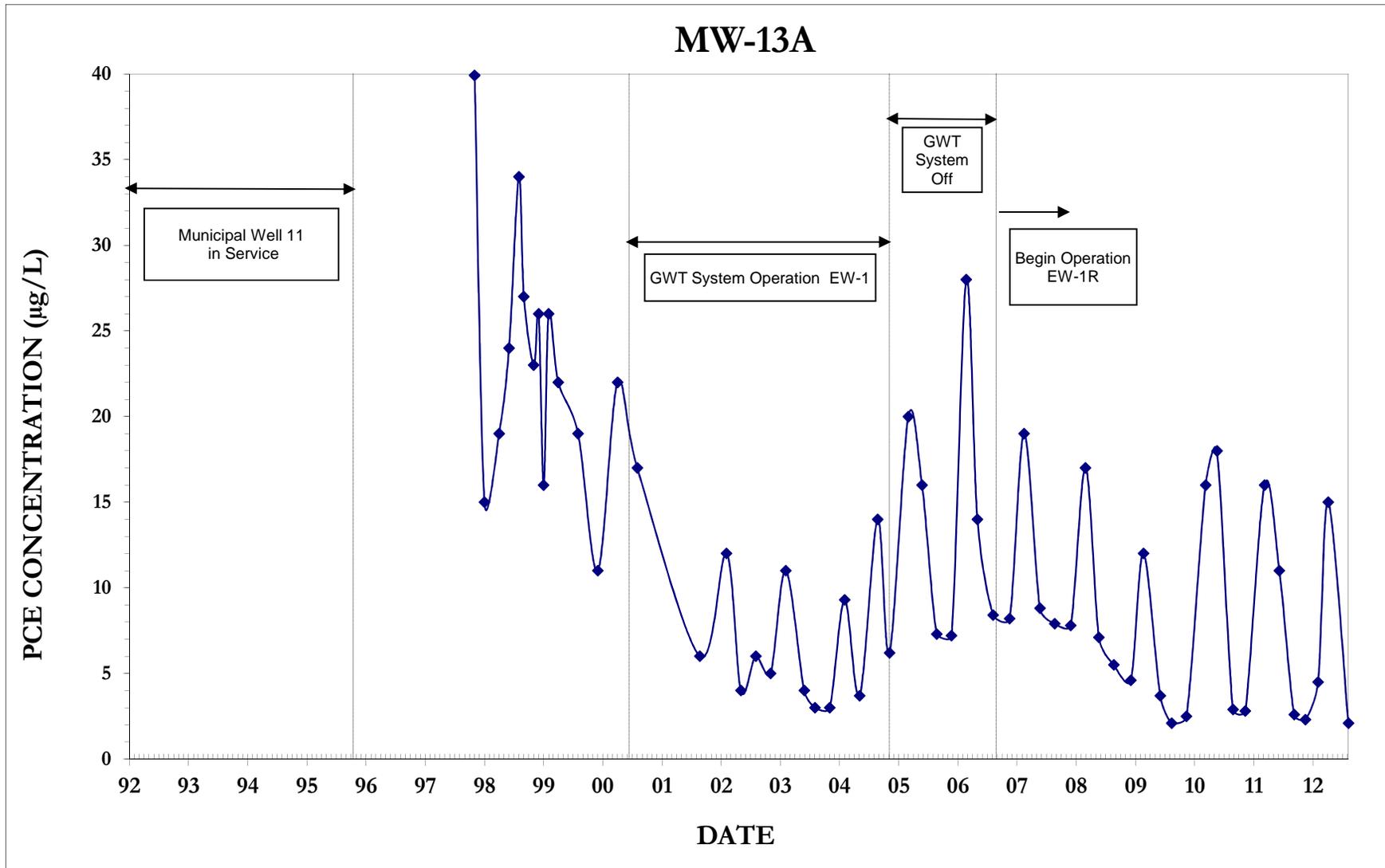


FIGURE G-4(r)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

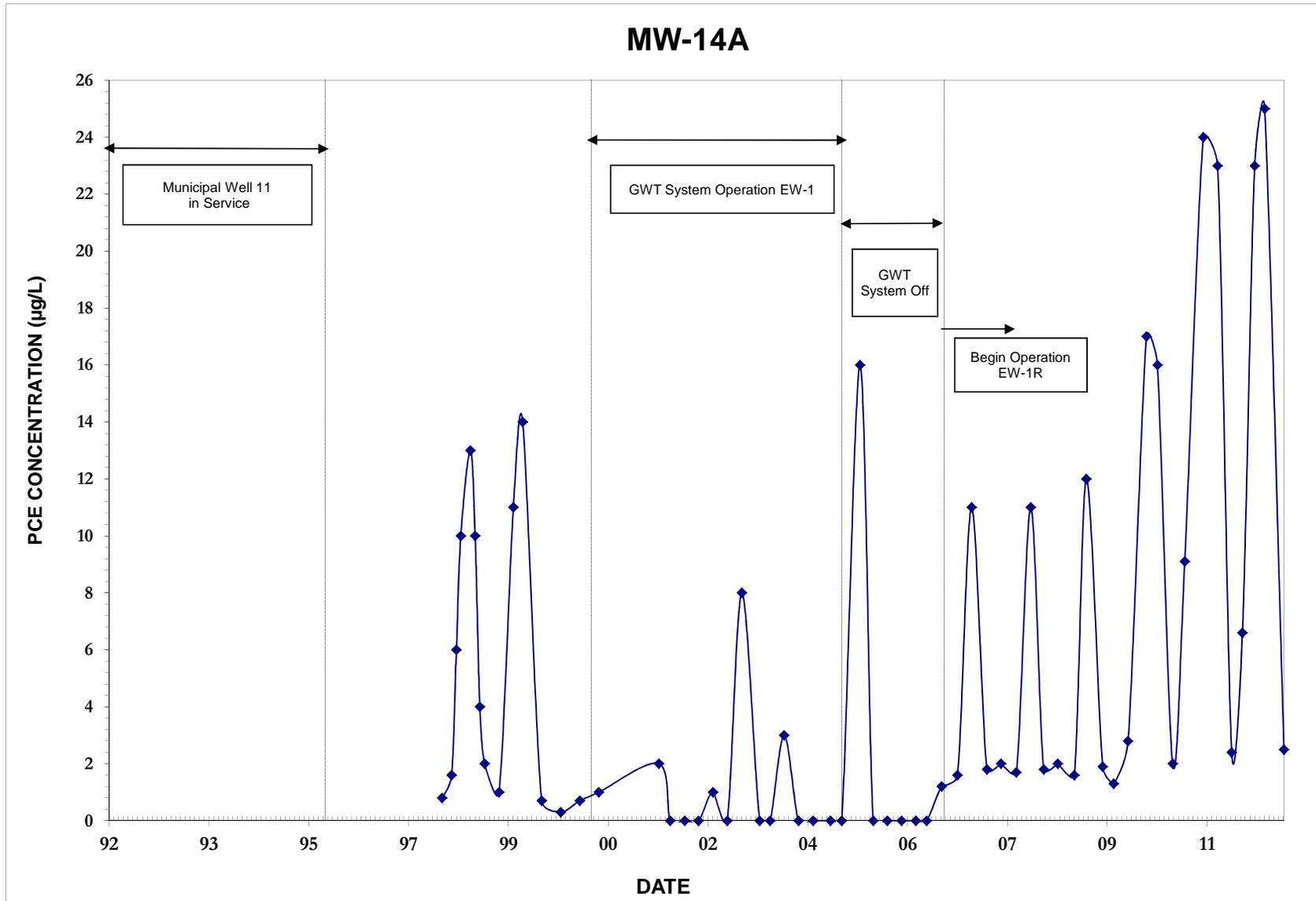


FIGURE G-4(s)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

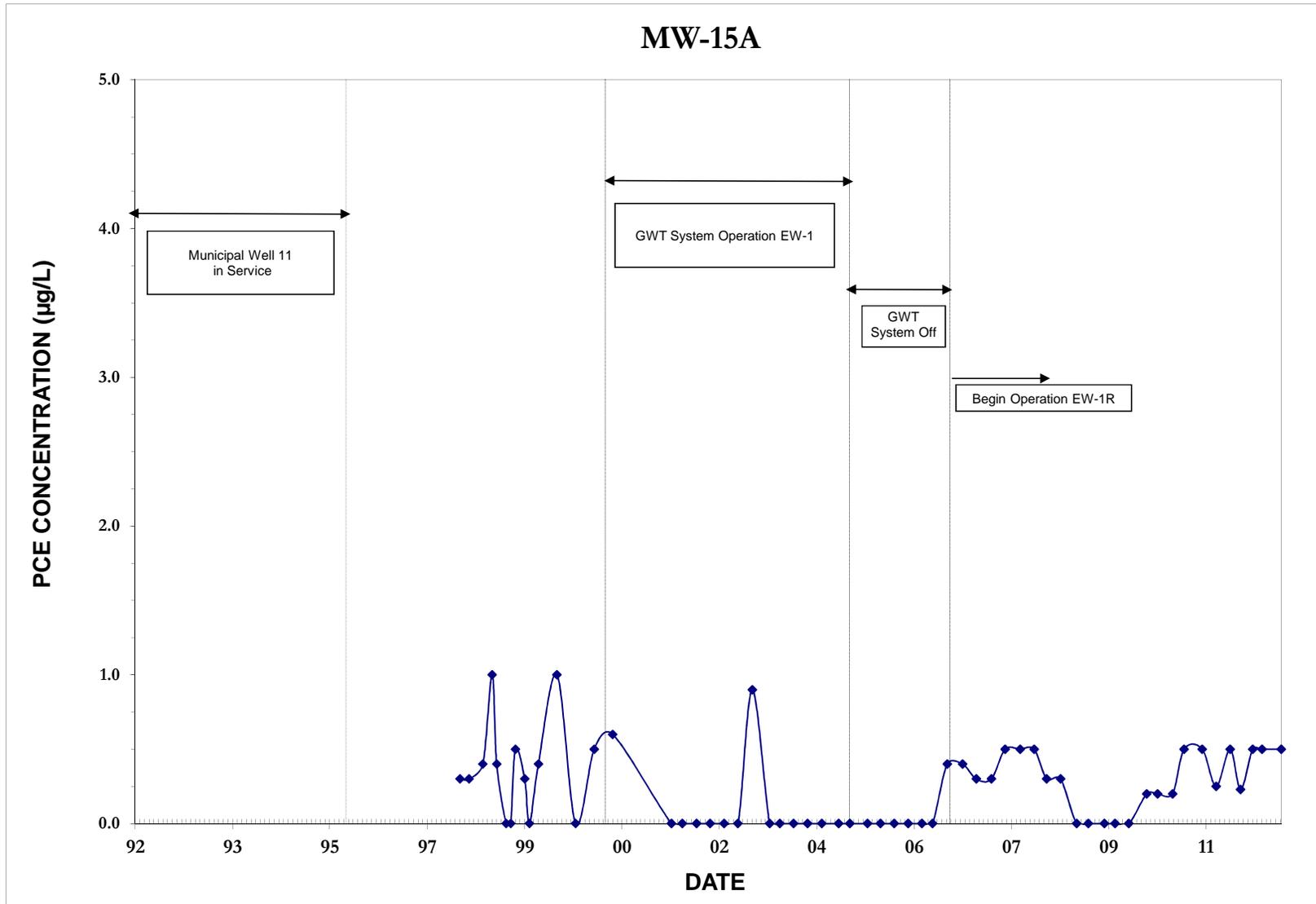


FIGURE G-4(t)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

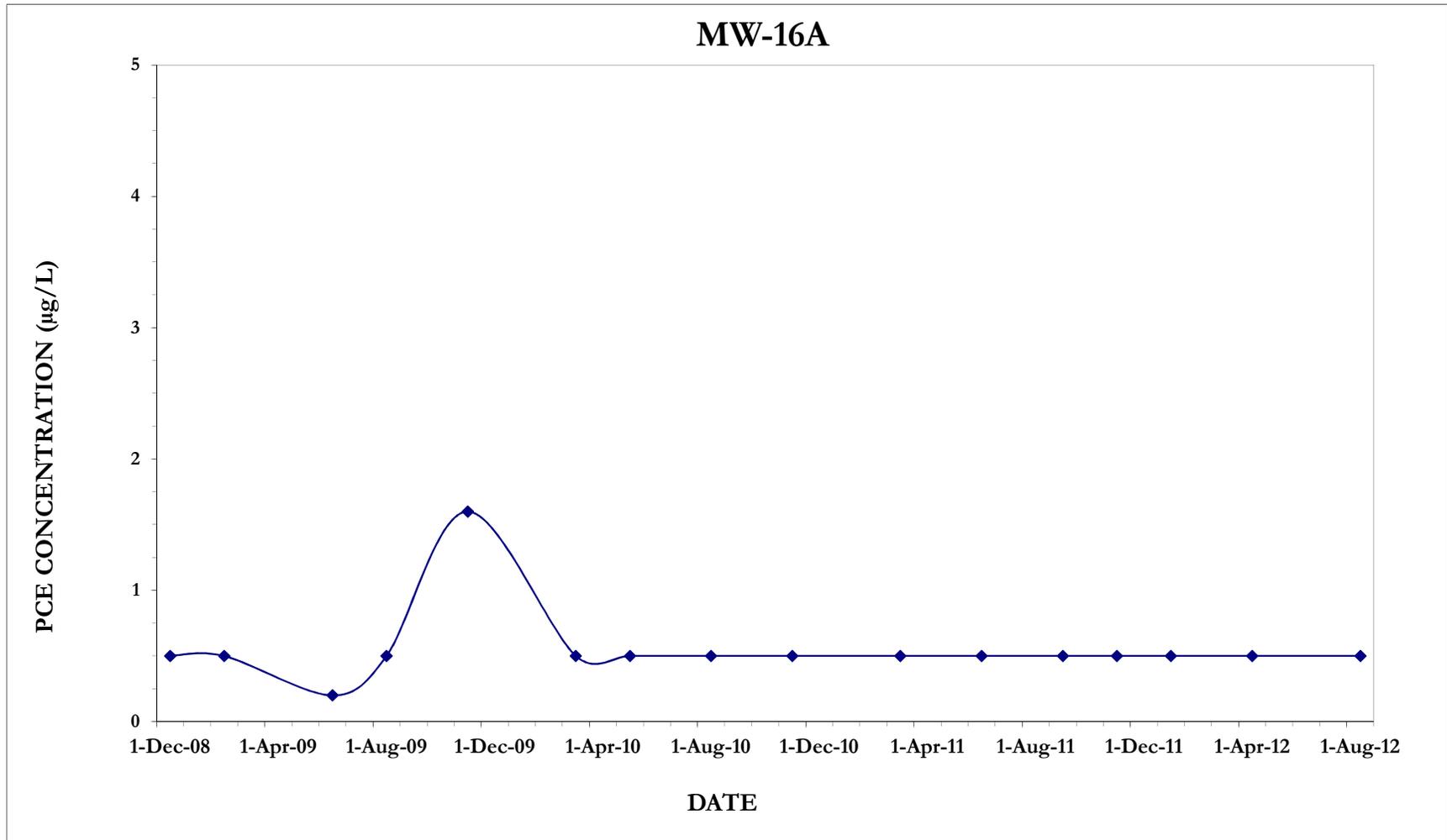


FIGURE G-4(u)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

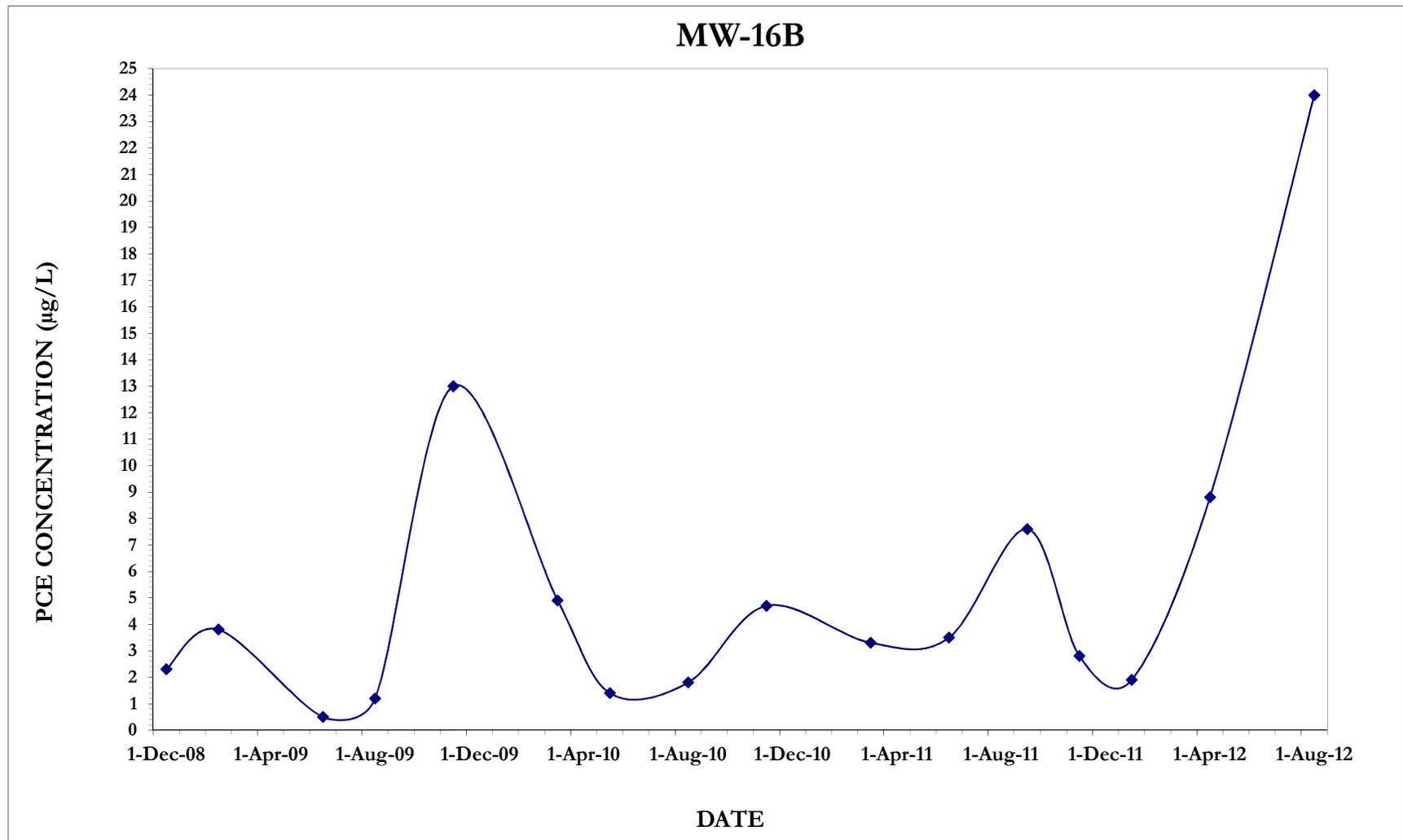


FIGURE G-4(v)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

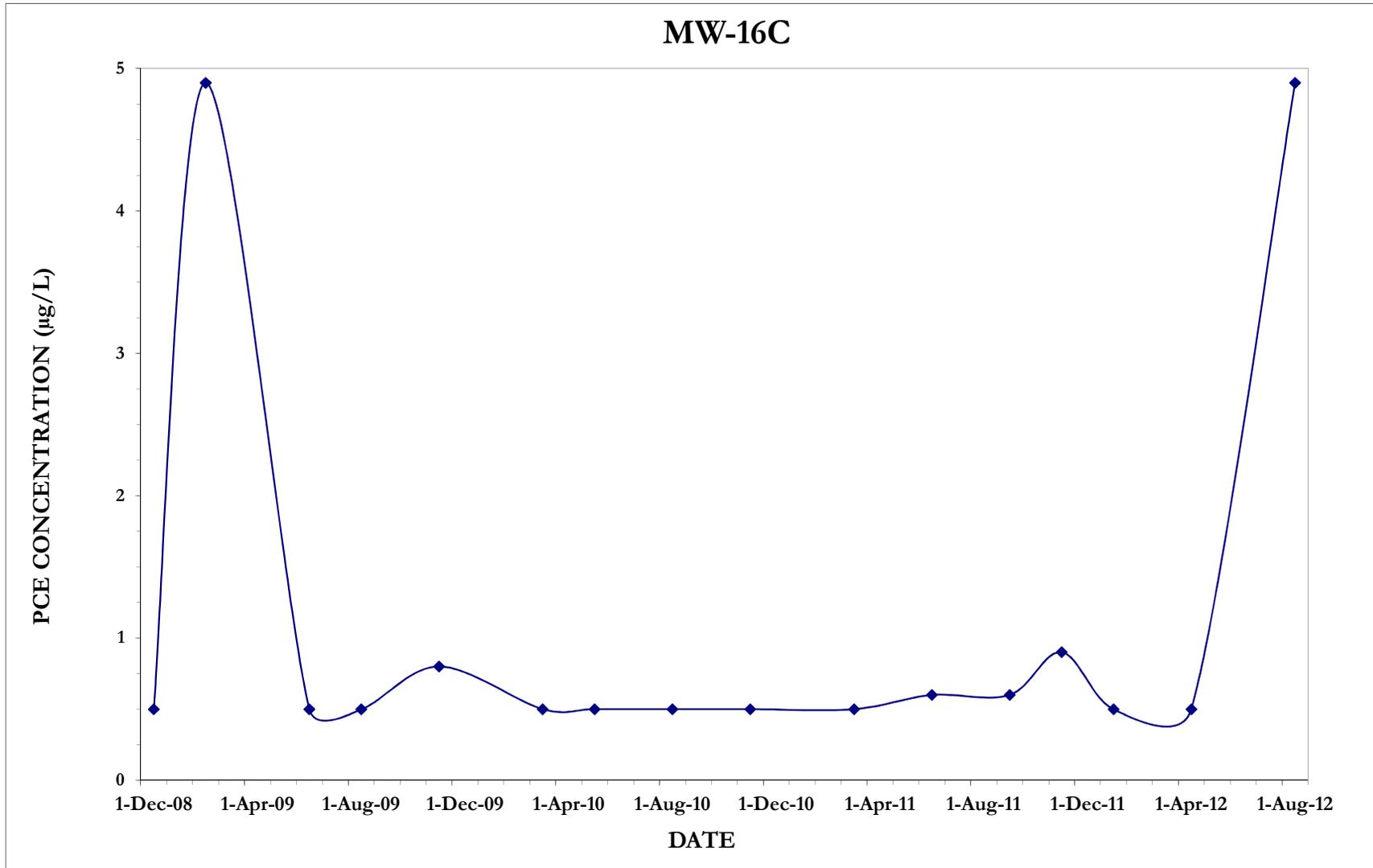


FIGURE G-4(w)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

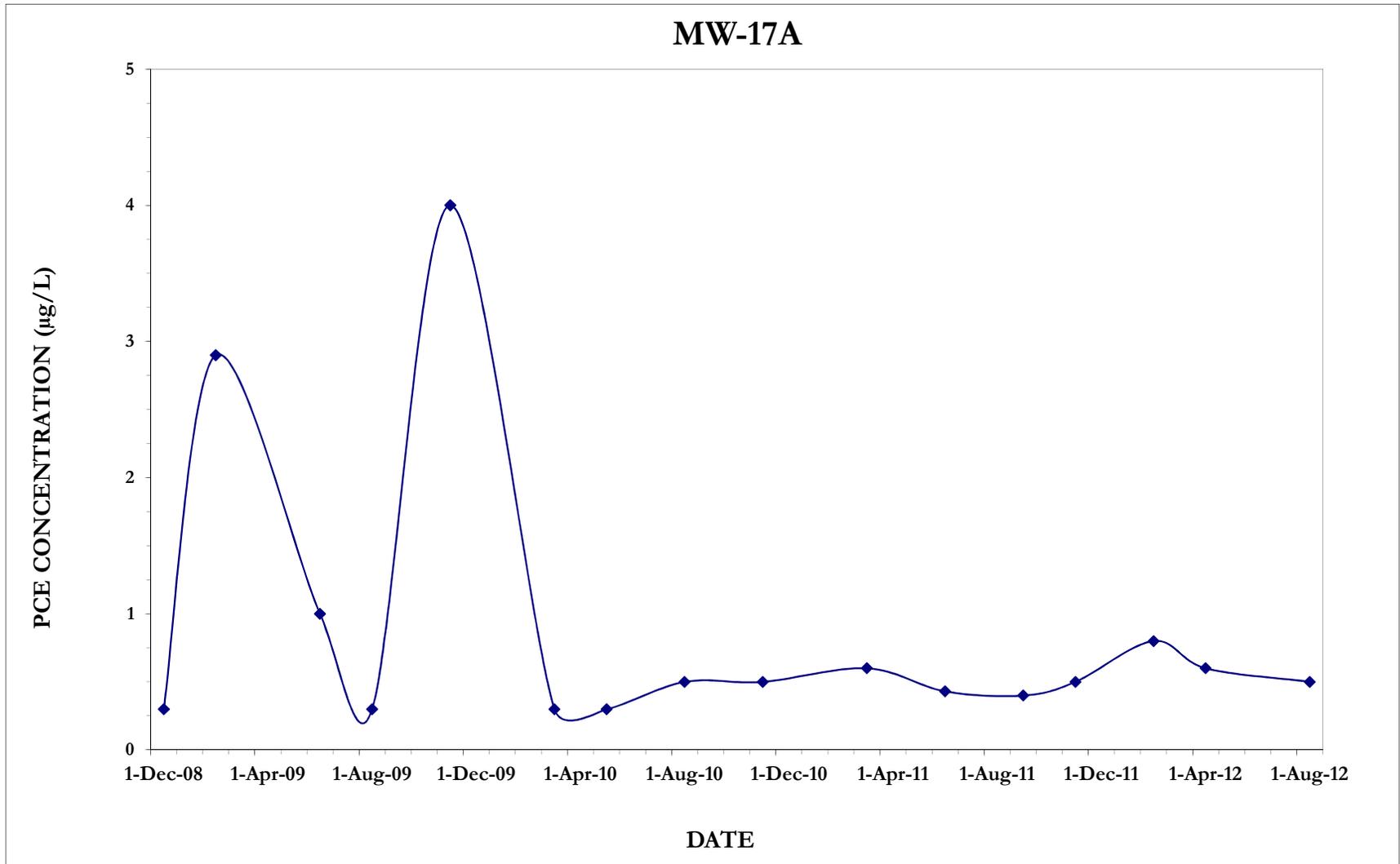


FIGURE G-4(x)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

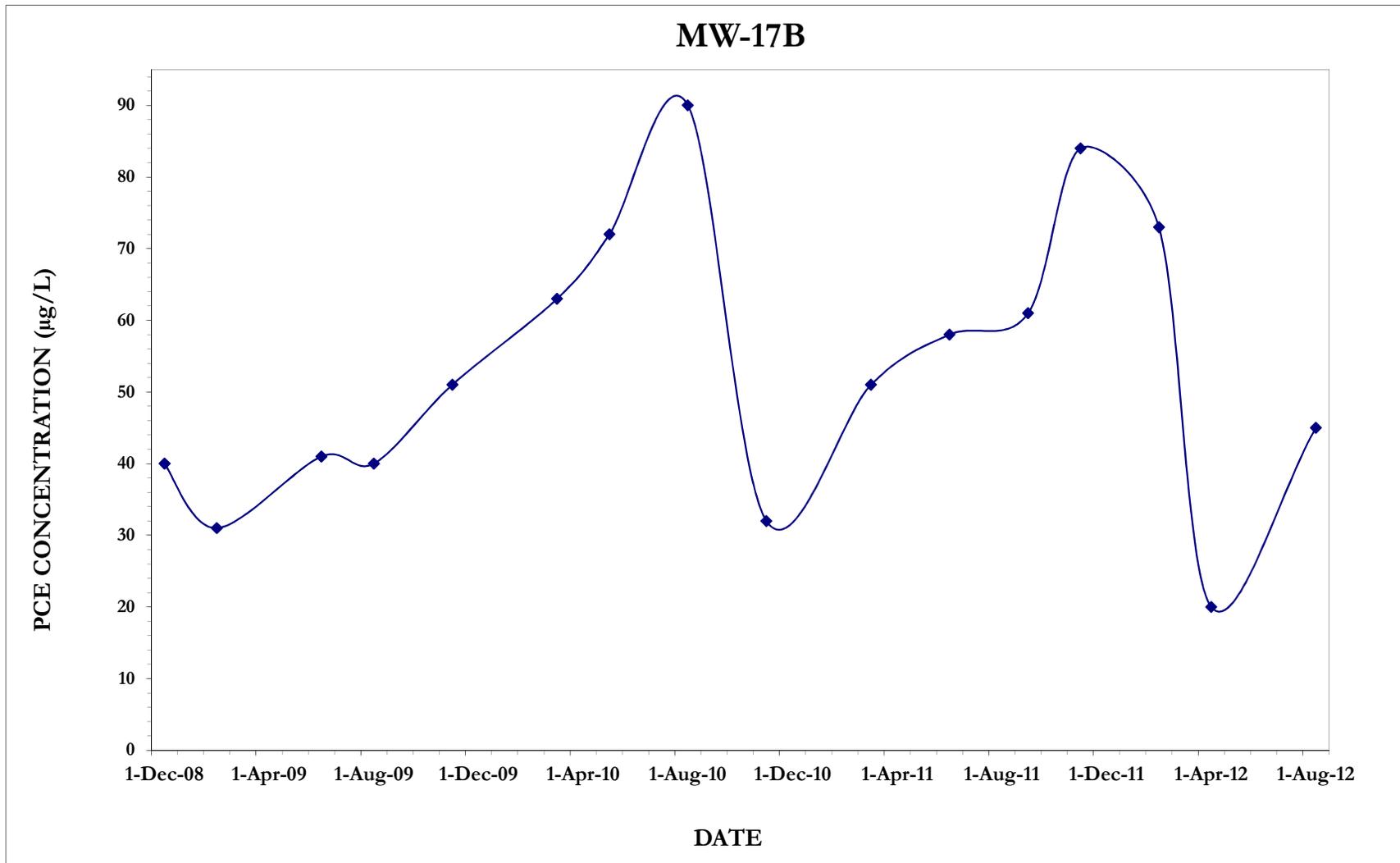


FIGURE G-4(y)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

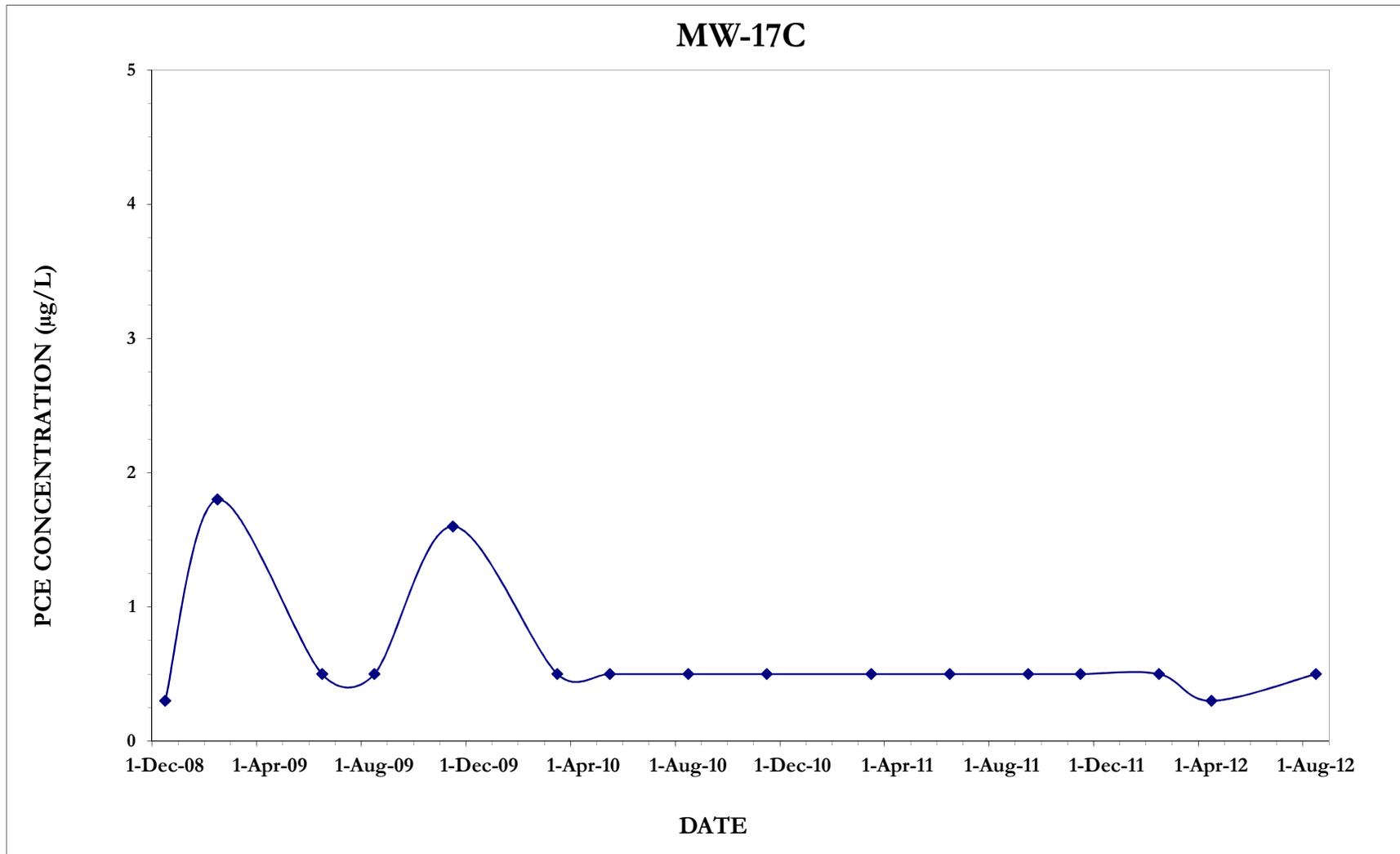


FIGURE G-4(z)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

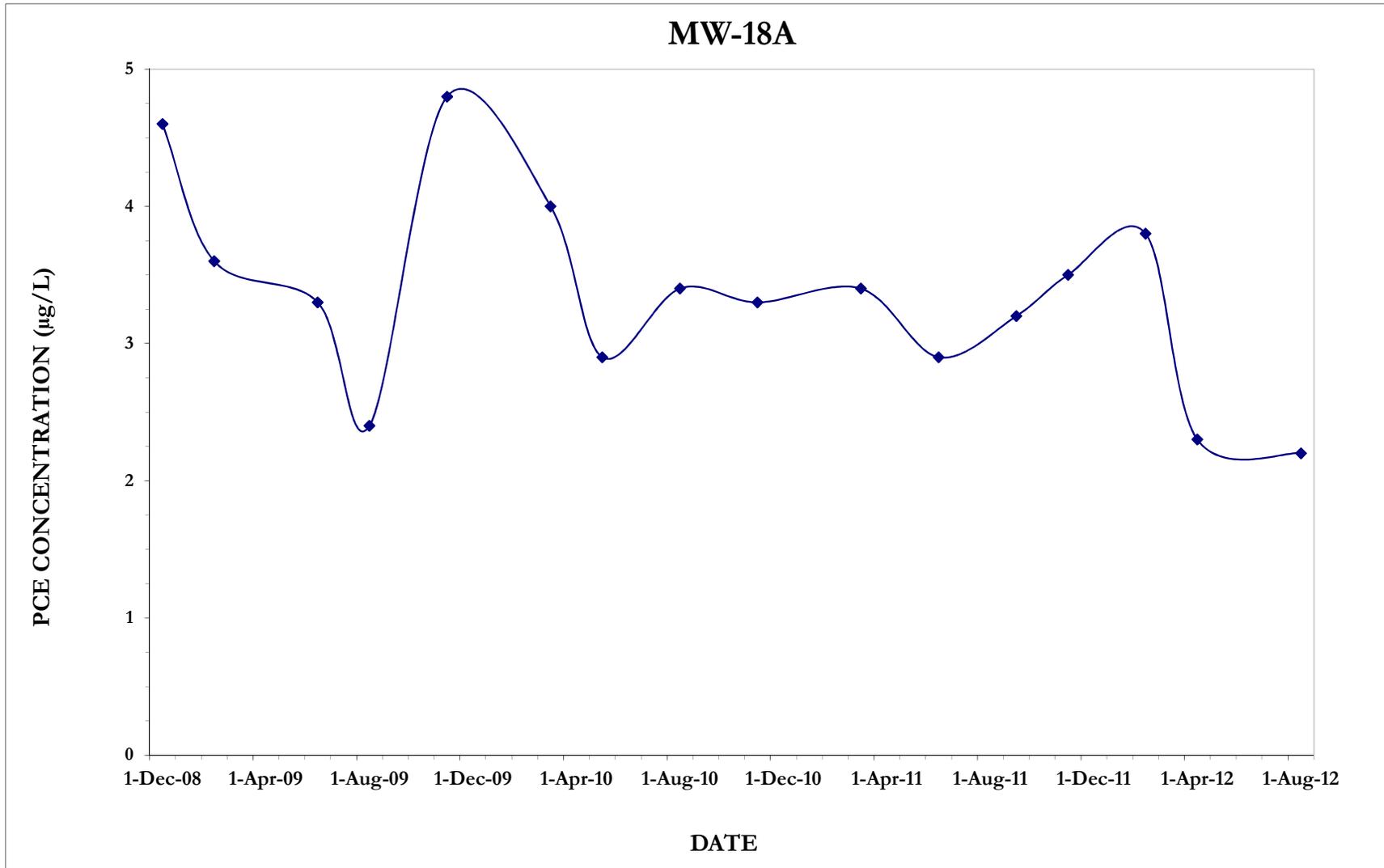


FIGURE G-4(aa)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

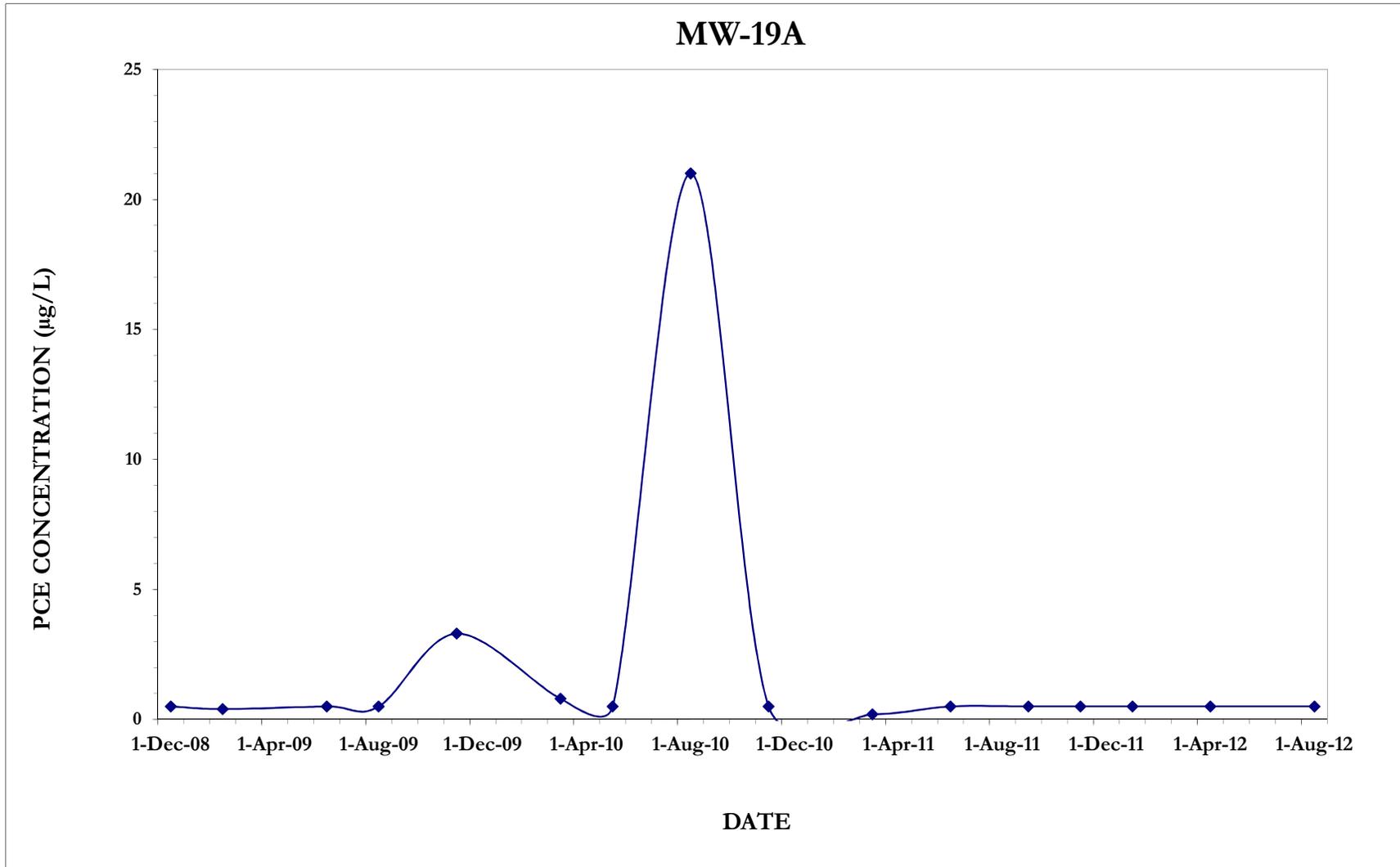


FIGURE G-4(ab)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

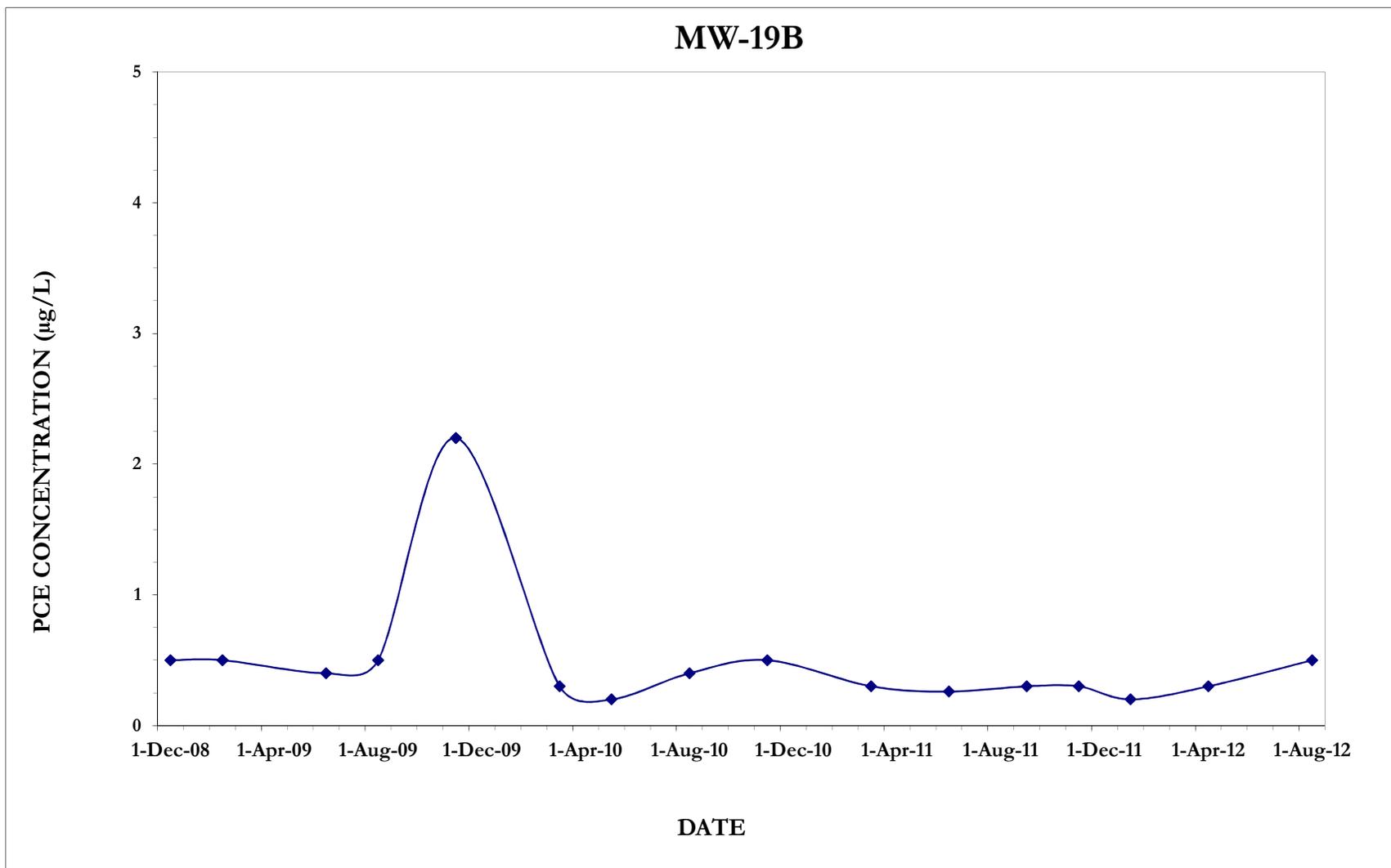


FIGURE G-4(ac)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

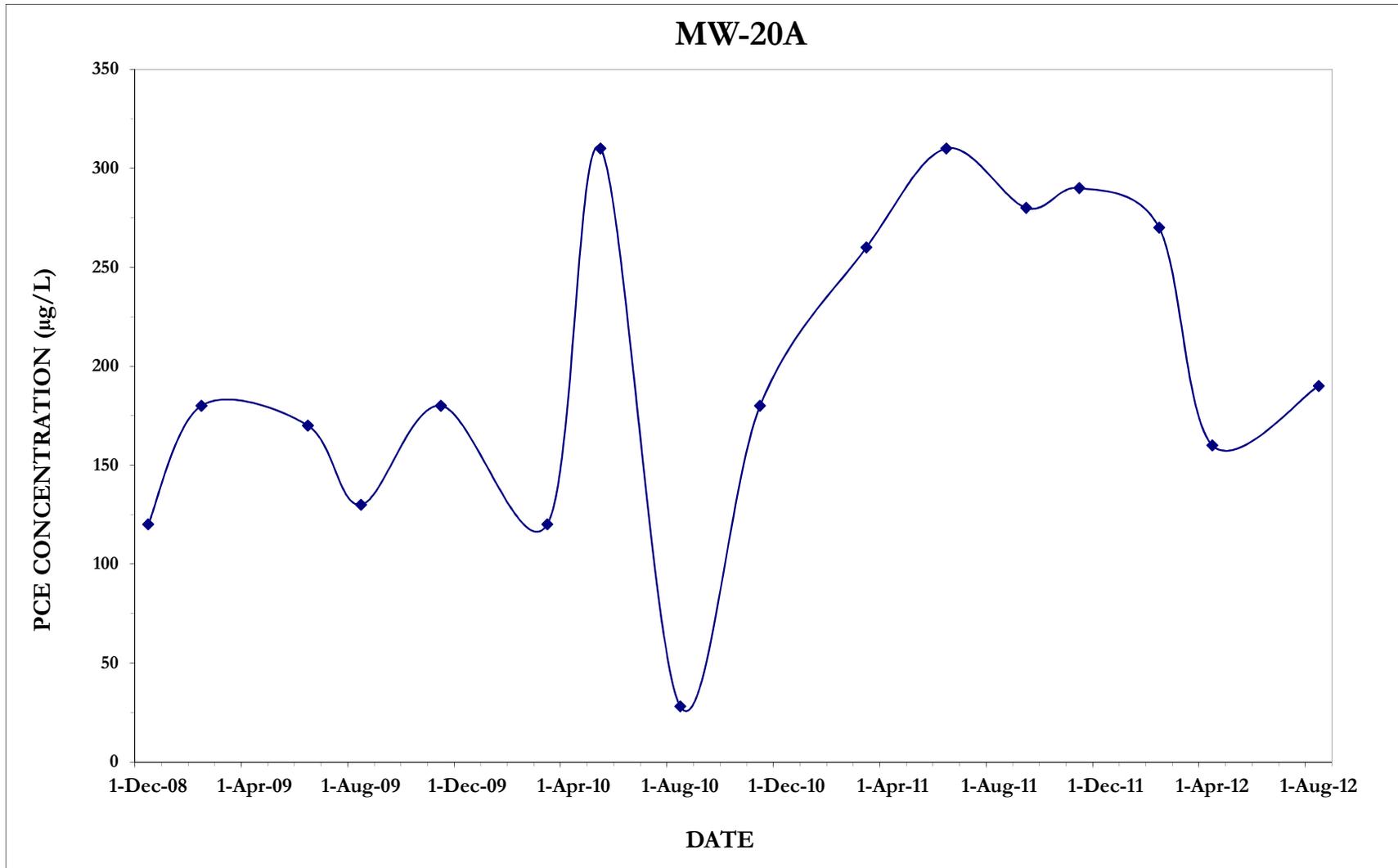


FIGURE G-4(ad)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

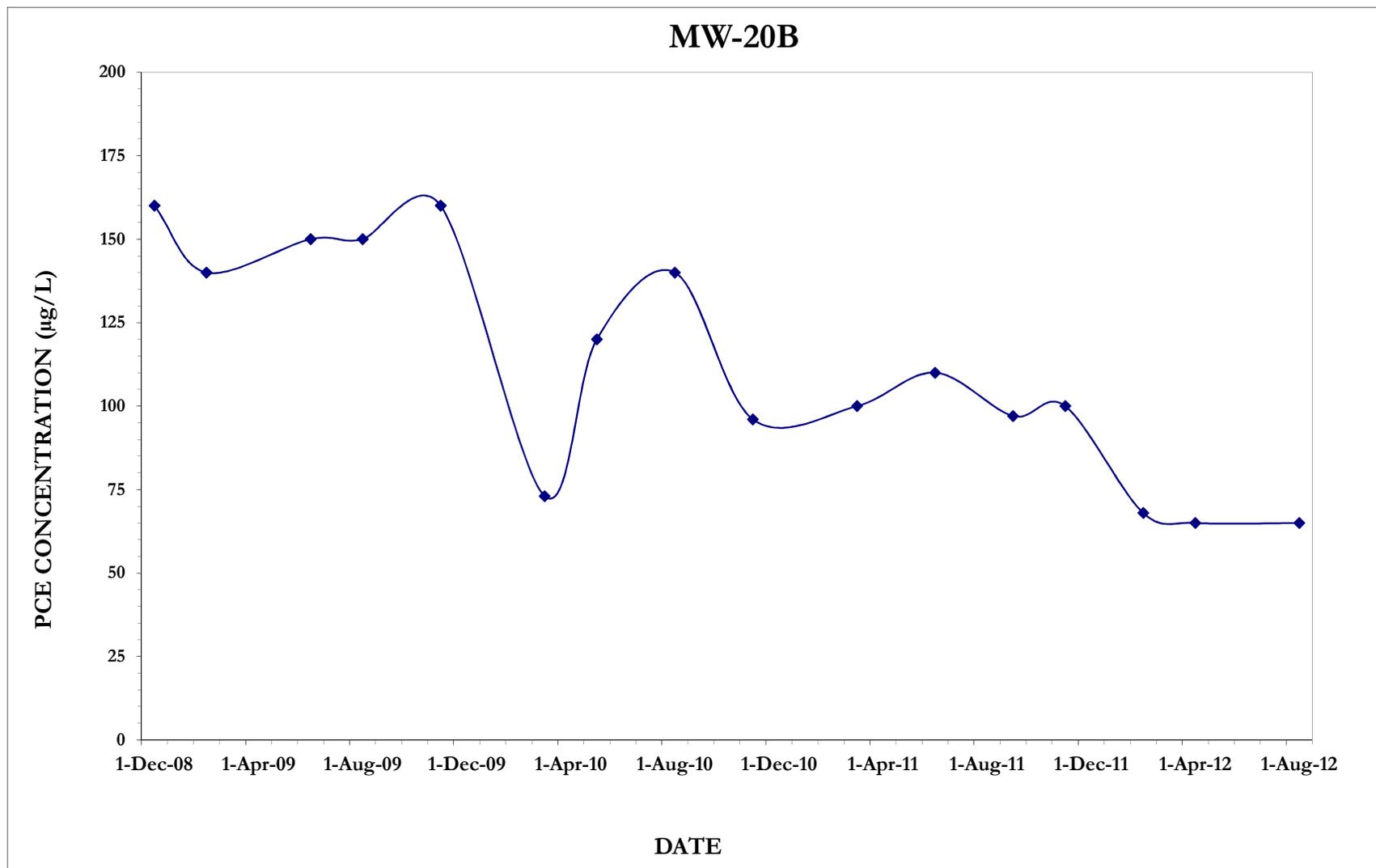


FIGURE G-4(ae)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

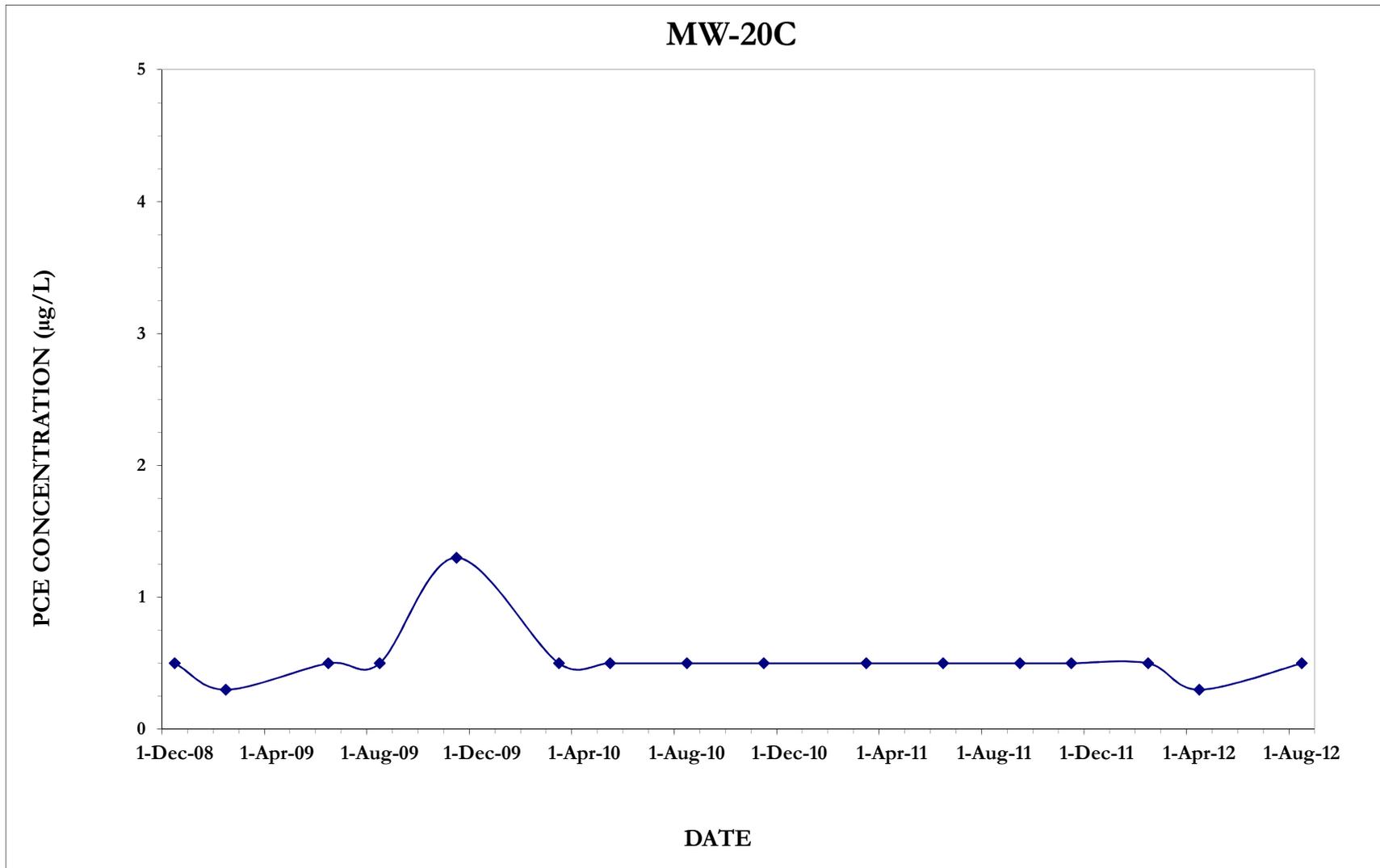


FIGURE G-4(af)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

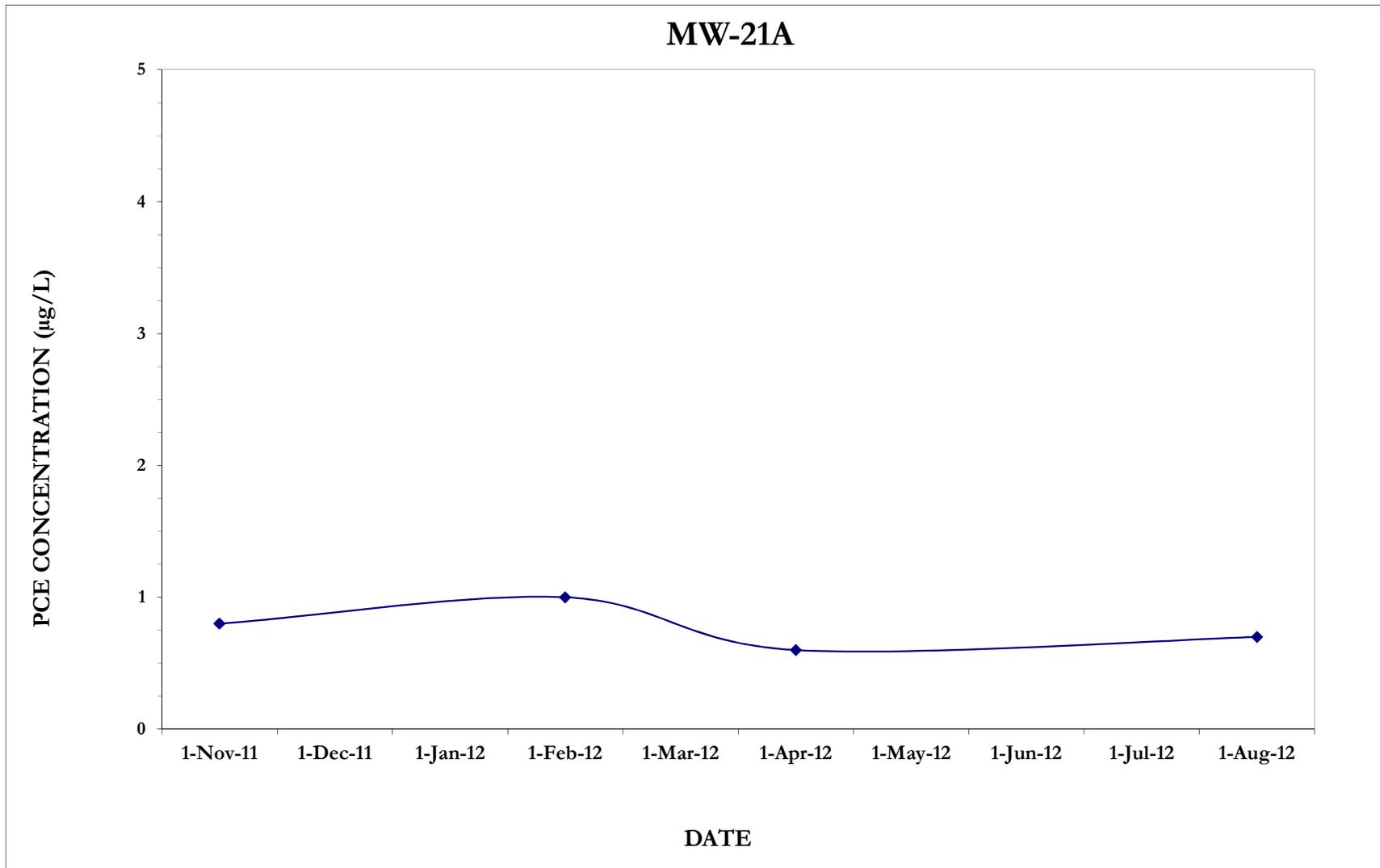


FIGURE G-4(ag)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

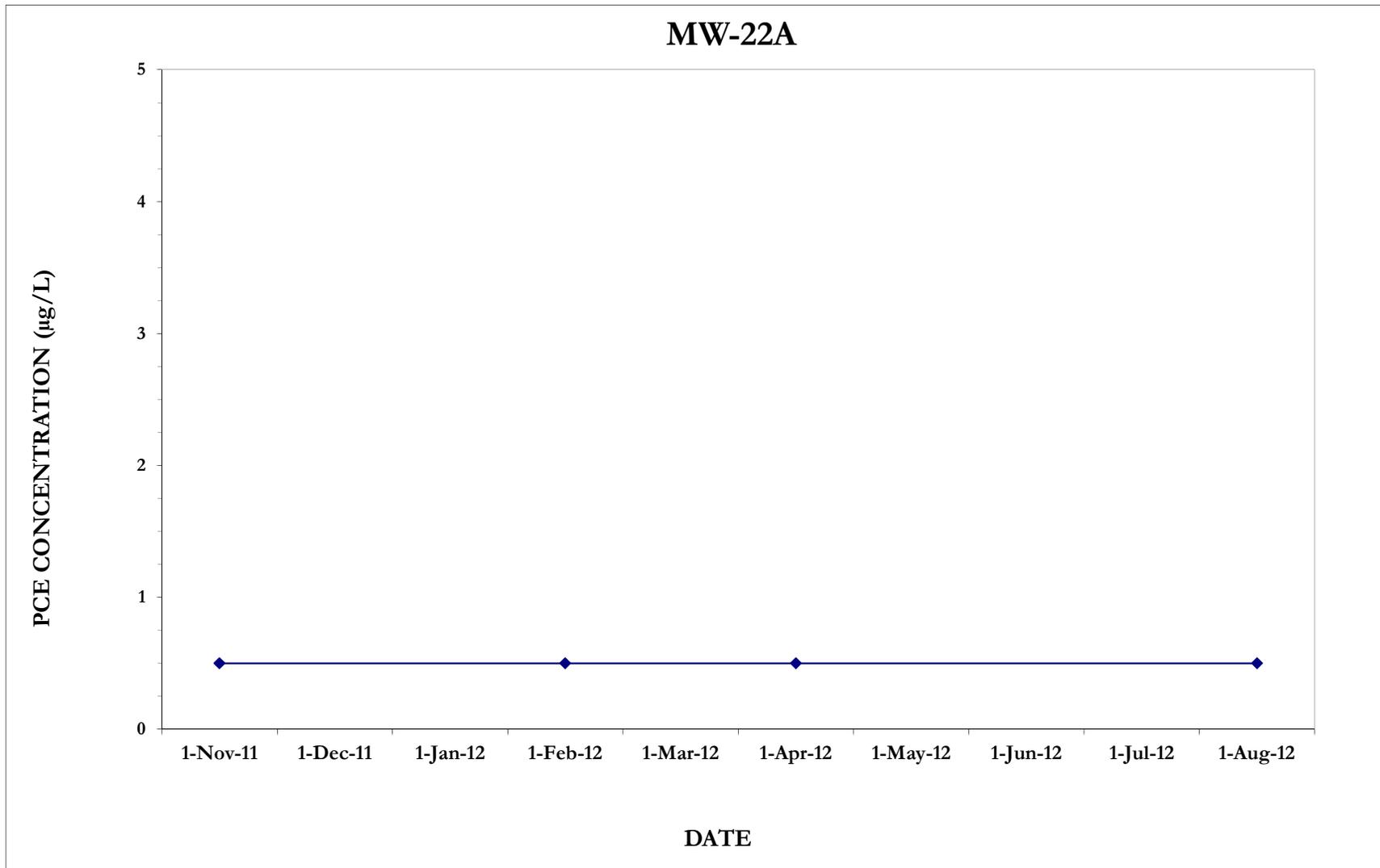


FIGURE G-4(ah)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

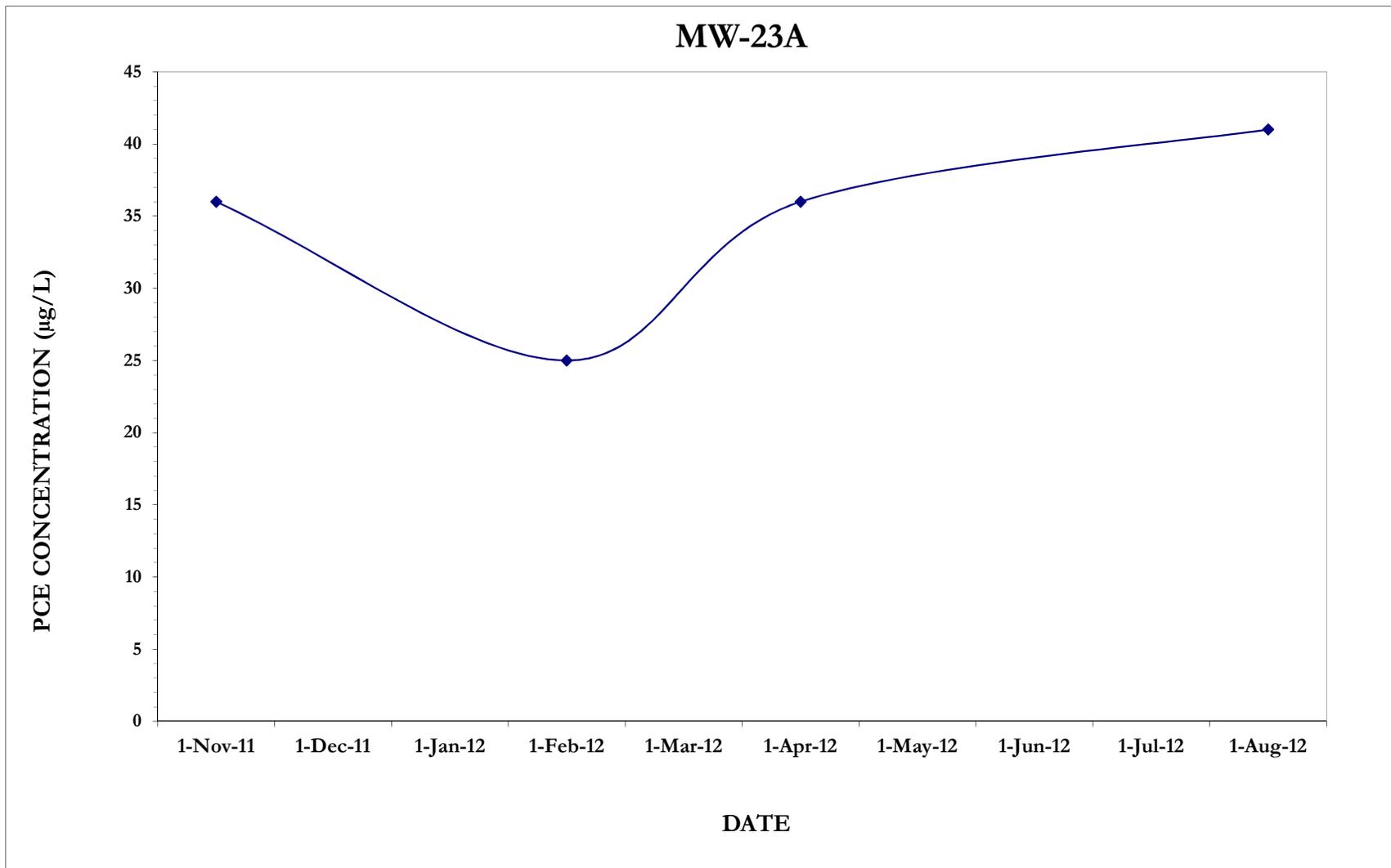


FIGURE G-4(ai)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

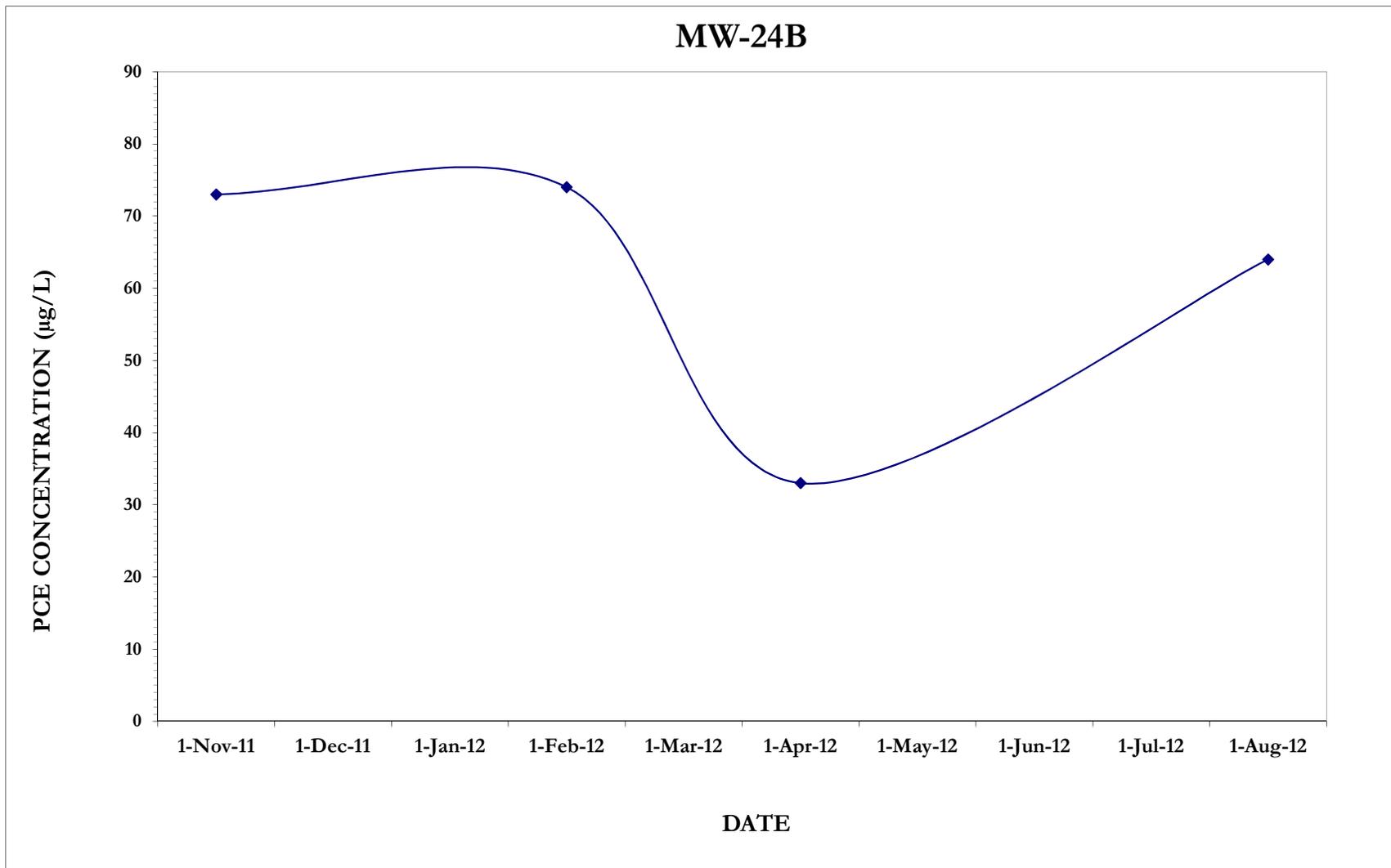


FIGURE G-4(a)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

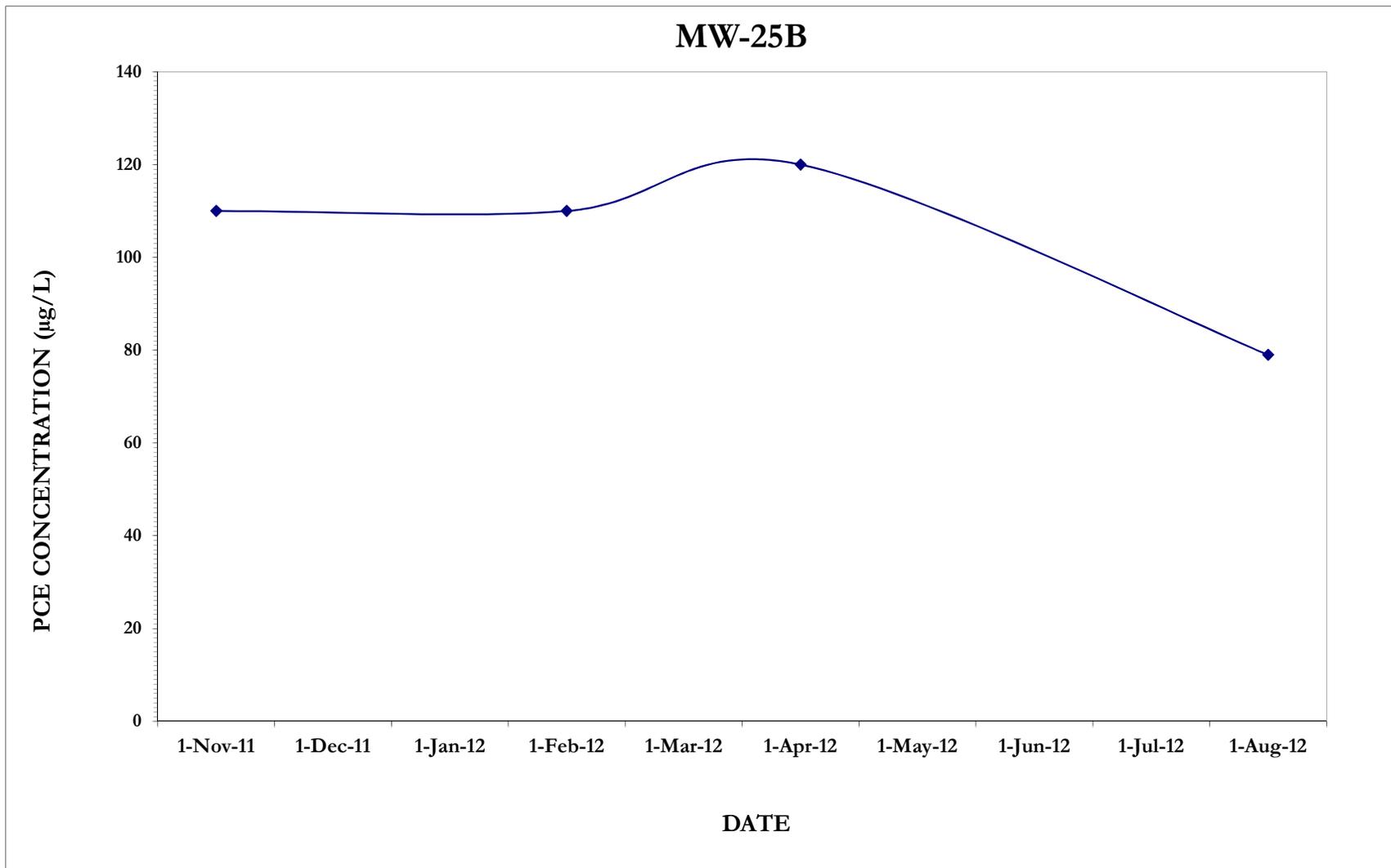


FIGURE G-4(ak)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

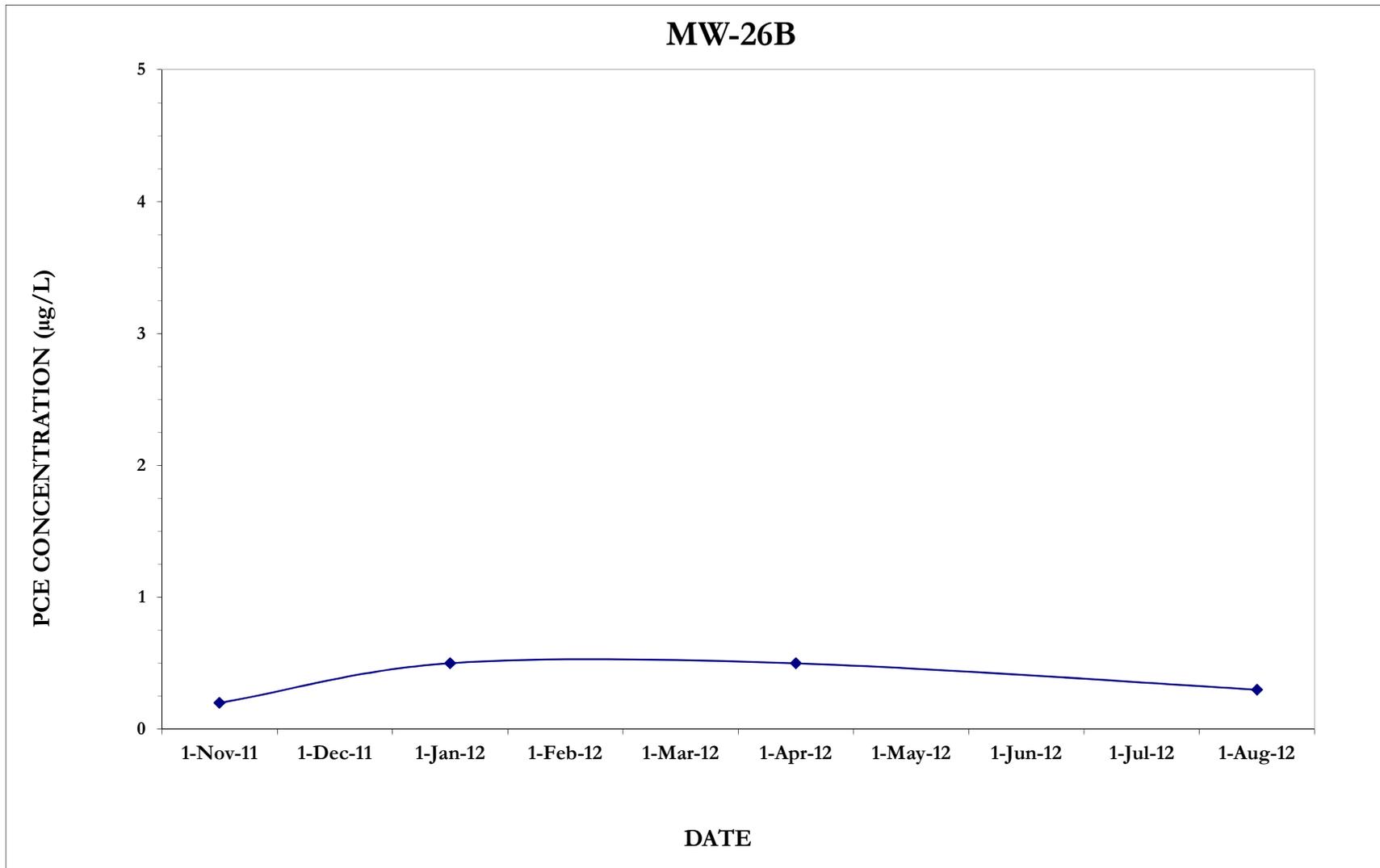


FIGURE G-4(a)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

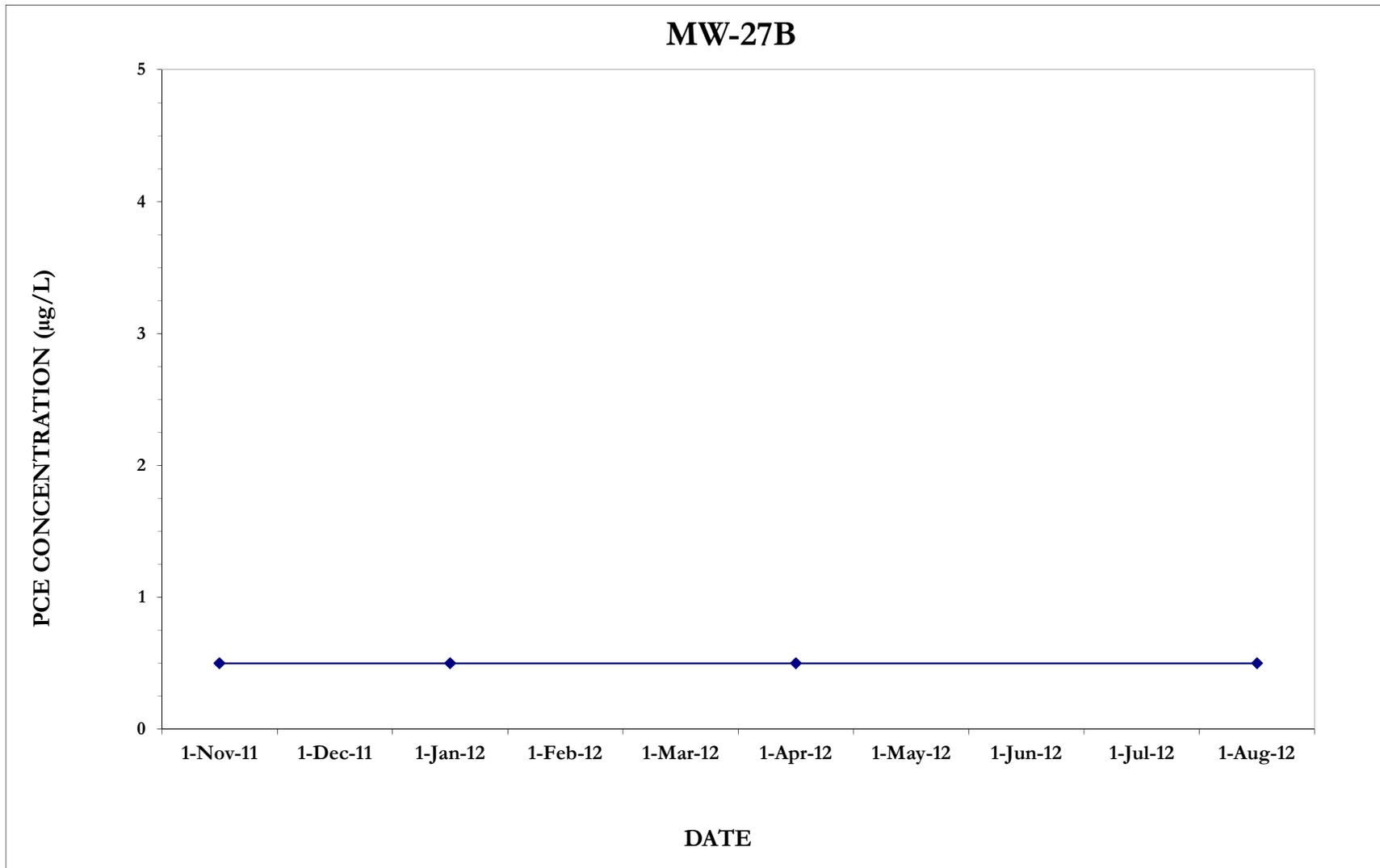


FIGURE G-4(am)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA

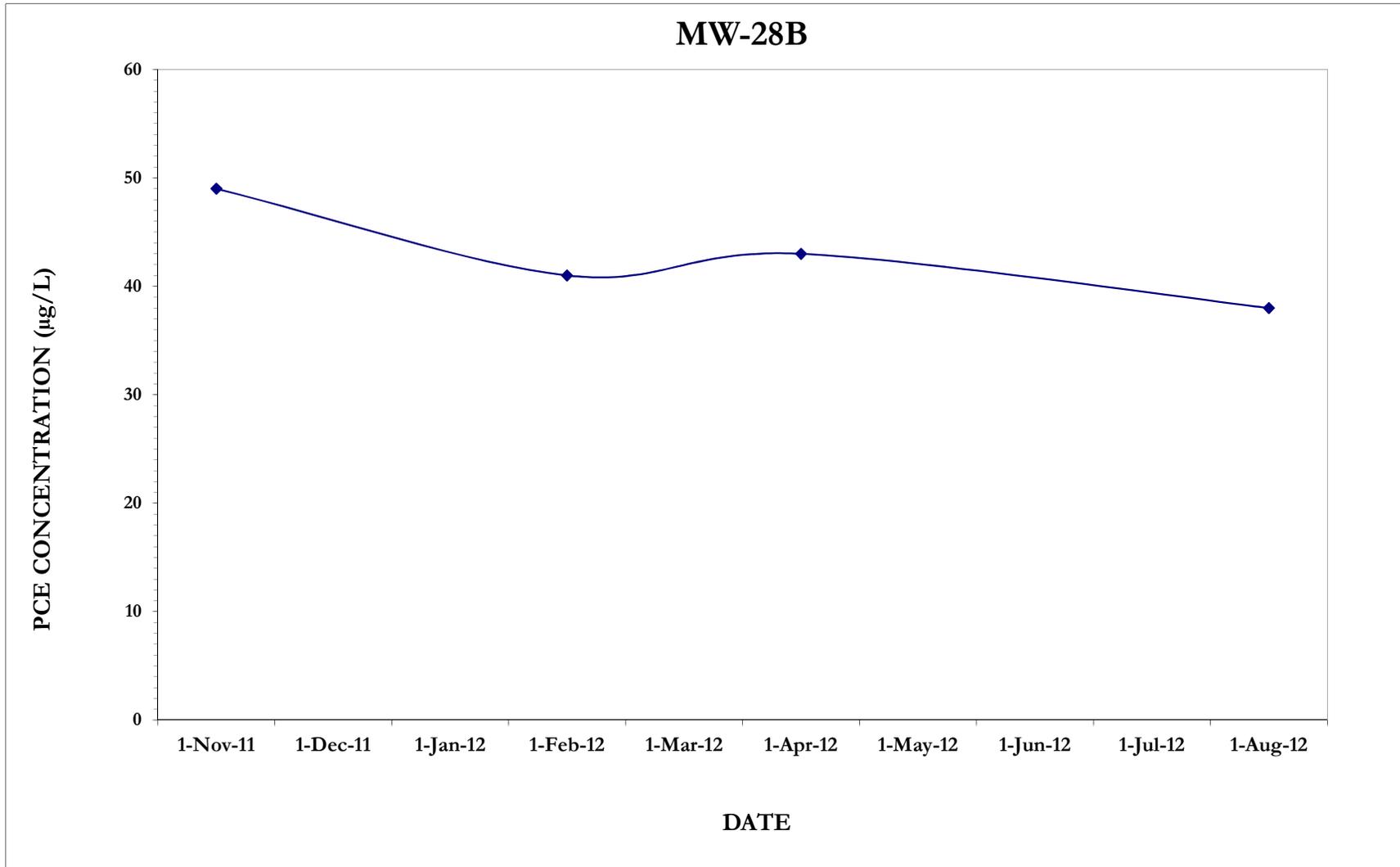
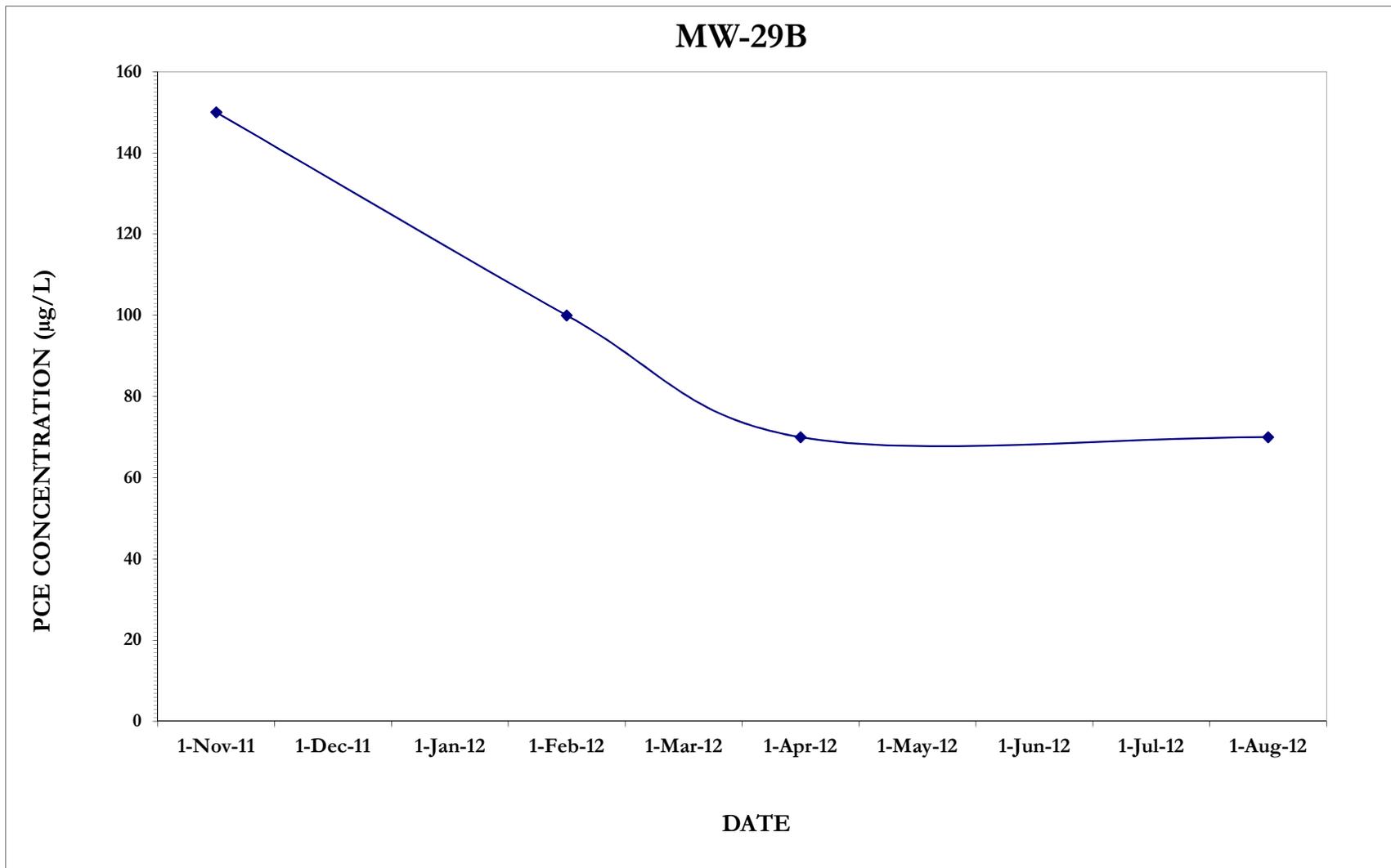


FIGURE G-4(an)

HISTORICAL PCE CONCENTRATIONS IN  
GROUNDWATER MONITORING WELLS  
MODESTO SUPERFUND SITE  
MODESTO, CALIFORNIA



**TABLE G-5 PCE MASS REMOVED BY GROUNDWATER TREATMENT SYSTEMMODESTO SUPERFUND SITEMODESTO, CALIFORNIA(Page 1 of 3)**

Sampe Date	Volume of Water Treated Since Previuos sample (gallons)	Total Volume of Water Treated (gallons)	Influent PCE concentration (µg/L)	Mass of PCE Removed Since Previuos sample (lbs)	Cumulative Mass of PCE Removed (lbs)
28-Aug-01	701,200	701,200	330	1.93	1.93
21-Sep-01	673,100	1,374,300	770	4.33	6.26
17-Oct-01	1,842,900	3,217,200	890	13.69	19.95
13-Nov-01	1,208,800	4,426,000	780	7.87	27.81
13-Dec-01	2,126,600	6,552,600	710	12.60	40.42
16-Jan-02	1,992,550	8,545,150	750	12.47	52.89
19-Feb-02	2,435,550	10,980,700	820	16.67	69.56
21-Mar-02	2,144,100	13,124,800	321	5.74	75.30
17-Apr-02	1,908,400	15,033,200	690	10.99	86.29
23-May-02	2,543,200	17,576,400	900	19.10	105.39
20-Jun-02	1,699,600	19,276,000	730	10.35	115.75
18-Jul-02	1,989,500	21,265,500	620	10.29	126.04
19-Aug-02	2,289,500	23,555,000	610	11.66	137.70
26-Sep-02	2,659,200	26,214,200	620	13.76	151.46
24-Oct-02	1,769,600	27,983,800	580	8.57	160.02
18-Nov-02	1,764,700	29,748,500	550	8.10	168.12
18-Dec-02	2,086,100	31,834,600	310	5.40	173.52
16-Jan-03	1,503,500	33,338,100	380	4.77	178.29
20-Feb-03	2,377,800	35,715,900	490	9.72	188.01
20-Mar-03	1,877,700	37,593,600	490	7.68	195.69
30-Apr-03	2,701,900	40,295,500	410	9.25	204.94
29-May-03	1,794,800	42,090,300	270	4.04	208.98
26-Jun-03	1,679,200	43,769,500	490	6.87	215.85
24-Jul-03	1,470,800	45,240,300	510	6.26	222.11
28-Aug-03	1,402,800	46,643,100	540	6.32	228.43
18-Sep-03	902,600	47,545,700	550	4.14	232.58
23-Oct-03	1,420,900	48,966,600	450	5.34	237.91
19-Nov-03	962,500	49,929,100	390	3.13	241.05
18-Dec-03	870,100	50,799,200	420	3.05	244.10
22-Jan-04	1,210,000	52,009,200	350	3.53	247.63
26-Feb-04	1,191,800	53,201,000	290	2.88	250.51
8-Apr-04	431,700	53,632,700	230	0.83	251.34
22-Apr-04	1,369,164	55,001,864	310	3.54	254.89
20-May-04	1,844,450	56,846,313	350	5.39	260.27
23-Jun-04	1,502,110	58,348,423	250	3.13	263.41
29-Jul-04	2,355,600	60,704,023	350	6.88	270.29
26-Aug-04	1,767,150	62,471,173	350	5.16	275.45
4-Oct-04	1,931,540	64,402,713	330	5.32	280.77
21-Oct-04	1,168,970	65,571,683	290	2.83	283.60
24-Aug-06	0	0	620.00	0.00	285.42
28-Sep-06	1,460,060	67,784,613	530.00	6.46	291.88
24-Oct-06	2,861,570	70,646,183	580	13.85	305.73
15-Nov-06	2,370,250	73,016,433	500	9.89	315.62
27-Dec-06	2,139,250	75,155,683	450	8.03	323.66
29-Jan-07	2,365,450	77,521,133	420.0	8.29	331.95
28-Feb-07	1,240,000	78,761,133	360.0	3.73	335.67
26-Mar-07	1,847,900	80,609,033	320.0	4.94	340.61

TABLE G-5 PCE MASS REMOVED BY GROUNDWATER TREATMENT SYSTEMMODESTO SUPERFUND SITEMODESTO, CALIFORNIA(Page 2 of 3)

Sampe Date	Volume of Water Treated Since Previuos sample (gallons)	Total Volume of Water Treated (gallons)	Influent PCE concentration (µg/L)	Mass of PCE Removed Since Previuos sample (lbs)	Cumulative Mass of PCE Removed (lbs)
16-Apr-07	1,521,900	82,130,933	320.0	4.06	344.67
2-Jul-07	0	82,130,933	76.0	0.00	344.67
23-Jul-07	1,281,000	83,411,933	290.0	3.10	347.77
23-Aug-07	2,451,700	85,863,633	290.0	5.93	353.71
18-Sep-07	1,554,100	87,417,733	360.0	4.67	358.38
29-Oct-07	2,562,300	89,980,033	280.0	5.99	364.36
28-Nov-07	1,285,700	91,265,733	310.0	3.33	367.69
20-Dec-07	1,538,400	92,804,133	260.0	3.34	371.03
17-Jan-08	2,473,700	95,277,833	240.0	4.95	375.98
25-Feb-08	2,249,000	97,526,833	250.0	4.69	375.72
31-Mar-08	2,318,700	99,845,533	280.0	5.42	381.14
25-Apr-08	1,569,600	101,415,133	210.0	2.75	383.89
22-May-08	1,761,600	103,176,733	280.0	4.12	388.01
24-Jun-08	2,024,600	105,201,333	240.0	4.06	392.06
23-Jul-08	2,905,200	108,106,533	240.0	5.82	397.88
28-Aug-08	1,045,500	109,152,033	220.0	1.92	399.80
25-Sep-08	1,148,600	110,300,633	150.0	1.44	401.24
30-Oct-08	2,067,400	112,368,033	250.0	4.31	405.55
25-Nov-08	1,437,600	113,805,633	210.0	2.52	408.07
30-Dec-08	2,350,906	116,156,539	190.0	3.73	411.80
30-Jan-09	2,004,294	118,160,833	190.0	3.18	414.98
24-Feb-09	1,677,300	119,838,133	180.0	2.52	417.50
30-Mar-09	2,266,700	122,104,833	170.0	3.22	420.72
23-Apr-09	1,565,200	123,670,033	160.0	2.09	422.81
26-May-09	2,045,500	125,715,533	180.0	3.07	425.88
29-Jun-09	1,844,200	127,559,733	150.0	2.31	428.19
29-Jul-09	1,952,600	129,512,333	190.0	3.10	431.28
10-Aug-09	793,600	130,305,933	250.0	1.66	432.94
22-Sep-09	2,874,700	133,180,633	170.0	4.08	437.02
26-Oct-09	1,407,400	134,588,033	250.0	2.94	439.95
23-Nov-09	1,712,600	136,300,633	160.0	2.29	442.24
16-Dec-09	1,351,400	137,652,033	180.0	2.03	444.27
27-Jan-10	2,585,600	140,237,633	160.0	3.45	447.72
25-Feb-10	1,771,800	142,009,433	160.0	2.37	450.09
11-Mar-10	882,600	142,892,033	180.0	1.33	451.42
7-Apr-10	1,743,300	144,635,333	180.0	2.62	454.03
12-May-10	2,337,600	146,972,933	160.0	3.12	457.16
17-Jun-10	1,527,400	148,500,333	130.0	1.66	458.81
15-Jul-10	1,846,600	150,346,933	140.0	2.16	460.97
12-Aug-10	1,846,600	152,193,533	150.0	2.31	463.28
9-Sep-10	1,832,100	154,025,633	210.0	3.21	466.49
14-Oct-10	2,295,600	156,321,233	140.0	2.68	469.18
18-Nov-10	2,268,500	158,589,733	130.0	2.46	471.64
9-Dec-10	1,365,000	159,954,733	88.0	1.00	472.64
13-Jan-11	2,271,000	162,225,733	110.0	2.08	474.72
10-Feb-11	1,850,600	164,076,333	120.0	1.85	476.58
9-Mar-11	1,747,400	165,823,733	120.0	1.75	478.33
14-Apr-11	2,373,000	168,196,733	120.0	2.38	480.70
10-May-11	1,730,400	169,927,133	140.0	2.02	482.73
2-Jun-11	1,516,100	171,443,233	120.0	1.52	484.25
14-Jul-11	2,753,400	174,196,633	140.0	3.22	487.46
11-Aug-11	1,833,700	176,030,333	160.0	2.45	489.91
13-Sep-11	1,966,400	177,996,733	130.0	2.13	492.04
13-Oct-11	1,960,000	179,956,733	140.0	2.29	494.33

TABLE G-5 PCE MASS REMOVED BY GROUNDWATER TREATMENT SYSTEMMODESTO SUPERFUND SITEMODESTO, CALIFORNIA(Page 3 of 3)

Sampe Date	Volume of Water Treated Since Previuos sample (gallons)	Total Volume of Water Treated (gallons)	Influent PCE concentration (µg/L)	Mass of PCE Removed Since Previuos sample (lbs)	Cumulative Mass of PCE Removed (lbs)
9-Nov-11	1,761,100	181,717,833	130.0	1.91	496.25
8-Dec-11	1,745,200	183,463,033	150.0	2.18	498.43
12-Jan-12	2,269,900	185,732,933	140.0	2.65	501.08
9-Feb-12	1,811,900	187,544,833	150.0	2.27	503.35
8-Mar-12	1,794,700	189,339,533	120.0	1.80	505.15
5-Apr-12	1,448,800	190,788,333	130.0	1.57	506.72
8-May-12	2,039,800	192,828,133	130.0	2.21	508.93
7-Jun-12	1,932,900	194,761,033	150.0	2.42	511.35
18-Jul-12	592,700	195,353,733	740.0	3.66	515.01
8-Aug-12	1,363,800	196,717,533	97.0	1.10	516.12
6-Sep-12	1,837,500	198,555,033	110.0	1.69	517.80

**Notes:**

µg/L - micrograms per liter

lbs - pounds

PCE - Tetrachloroethene

**TABLE G-6 PCE MASS REMOVED BY SOIL VAPOR EXTRACTION SYSTEMMODESTO SUPERFUND  
SITEMODESTO, CALIFORNIA(Page 1 of 5)**

Date Sampled	Cumulative Hours of Operation	Cumulative Days of Operation	Mass Extraction Rate (lbs/day)	Cumulative Mass Extracted (a) (lbs)
6/11/2001	5.8	0.2	53.0	12.70
8/9/2001	590.8	24.6	7.0	744.00
8/20/2001	854.8	35.6	6.4	817.63
8/30/2001	1,094.8	45.6	6.2	880.30
9/7/2001	1,286.8	53.6	3.9	920.57
9/12/2001	1,406.8	58.6	4.9	942.62
10/29/2001	1,920.0	80.0	7.9	1,079.84
11/13/2001	2,272.0	94.7	8.1	1,197.56
12/13/2001	2,787.8	116.2	6.0	1,348.99
1/16/2002	3,469.3	144.6	4.6	1,498.66
2/19/2002	4,283.8	178.5	6.1	1,679.54
3/21/2002	5,003.8	208.5	4.6	1,839.44
4/17/2002	5,603.8	233.5	4.0	1,946.39
5/23/2002	6,467.8	269.5	2.7	2,066.49
6/20/2002	7,039.0	293.3	3.7	2,142.61
7/18/2002	7,526.0	313.6	4.3	2,223.90
8/19/2002	8,294.0	345.6	4.7	2,367.84
9/19/2002	9,037.0	376.5	2.0	2,471.06
10/24/2002	9,839.6	410.0	2.3	2,542.57
11/18/2002	10,441.0	435.0	2.0	2,596.51
12/18/2002	11,167.0	465.3	1.6	2,650.80
1/16/2003	11,519.0	480.0	1.8	2,675.27
3/27/2003	12,578.0	524.1	1.6	2,748.88
4/30/2003	13,390.1	557.9	1.8	2,806.77
5/29/2003	14,037.2	584.9	1.7	2,854.55
6/26/2003	14,067.7	586.2	1.7	2,856.70
7/24/2003	14,737.8	614.1	1.5	2,901.48
8/28/2003	15,502.0	645.9	2.0	2,958.25
9/18/2003	15,980.8	665.9	1.9	2,997.31
10/23/2003	16,797.6	699.9	1.3	3,050.65
11/19/2003	17,448.4	727.0	1.3	3,085.25

**TABLE G-6 PCE MASS REMOVED BY SOIL VAPOR EXTRACTION SYSTEMMODESTO SUPERFUND  
SITEMODESTO, CALIFORNIA(Page 2 of 5)**

Date Sampled	Cumulative Hours of Operation	Cumulative Days of Operation	Mass Extraction Rate (lbs/day)	Cumulative Mass Extracted (a) (lbs)
12/18/2003	18,092.9	753.9	1.4	3,121.56
1/22/2004	18,688.3	778.7	1.1	3,153.22
2/26/2004	19,529.0	813.7	0.7	3,185.64
3/29/2004	20,245.3	843.6	1.4	3,217.84
4/22/2004	20,872.0	869.7	0.5	3,242.93
5/20/2004	21,408.8	892.0	0.5	3,253.44
6/23/2004	22,174.7	923.9	0.6	3,269.99
7/29/2004	22,976.8	957.4	0.6	3,289.24
8/26/2004	23,644.1	985.2	0.5	3,303.77
9/30/2004	24,481.0	1020.0	0.4	3,319.59
10/21/2004	24,988.4	1041.2	0.5	3,329.59
11/18/2004	25,653.5	1068.9	0.3	3,341.19
12/16/2004	26,349.7	1097.9	0.3	3,350.62
1/19/2005	27,140.5	1130.9	0.2	3,359.30
2/24/2005	28,011.5	1167.1	0.2	3,366.49
3/22/2005	28,628.3	1192.8	0.2	3,371.23
4/26/2005	29,759.6	1240.0	0.2	3,379.36
5/25/2005	30,455.6	1269.0	0.07	3,382.64
6/22/2005	31,175.6	1299.0	0.13	3,385.63
7/20/2005	31,847.6	1327.0	0.13	3,389.39
8/24/2005	32,663.6	1361.0	0.07	3,392.81
9/21/2005	33,335.6	1389.0	0.09	3,394.98
10/18/2005	33,672.0	1403.0	0.13	3,396.49
11/16/2005	33,985.0	1416.0	0.08	3,397.84
1/6/2006	34,992.1	1458.0	0.06	3,399.62
1/31/2006	35,760.1	1490.0	0.06	3,401.52
2/22/2006	36,288.1	1512.0	0.04	3,402.03

**TABLE G-6 PCE MASS REMOVED BY SOIL VAPOR EXTRACTION SYSTEMMODESTO SUPERFUND  
SITEMODESTO, CALIFORNIA(Page 3 of 5)**

Date Sampled	Cumulative Hours of Operation	Cumulative Days of Operation	Mass Extraction Rate (lbs/day)	Cumulative Mass Extracted (a) (lbs)
3/29/2006	37,128.1	1547.0	0.01	3,402.92
4/20/2006	37,703.0	1571.0	0.04	3,403.50
5/25/2006	38,543.6	1606.0	0.02	3,404.62
6/29/2006	39,260.2	1635.8	0.05	3,405.63
7/28/2006	39,954.0	1664.8	0.03	3,406.78
8/31/2006	40,099.3	1670.8	0.06	3,407.06
9/28/2006	40,602.1	1691.8	0.03	3,407.94
10/30/2006	41,216.9	1717.4	0.02	3,408.57
11/27/2006	41,986.1	1749.4	0.04	3,409.58
12/1/2006	41,986.1	1749.4	0.00	3,409.58
1/1/2007	41,986.1	1749.4	0.00	3,409.58
2/1/2007	41,986.1	1749.4	0.00	3,409.58
3/1/2007	41,986.1	1749.4	0.00	3,409.58
4/25/2007	41,998.1	1749.9	0.05	3,409.60
6/8/2007	43,030.1	1792.9	0.003	3,410.65
6/26/2007	43,460.5	1810.9	0.00	3,410.68
7/18/2007	43,988.5	1832.9	0.00	3,410.68
8/24/2007	44,540.5	1855.9	0.00	3,410.68
9/24/2007	45,308.5	1887.9	0.00	3,410.69
10/29/2007	46,148.5	1922.9	0.001	3,410.71
11/28/2007	46,868.5	1952.9	0.000	3,410.73
12/20/2007	47,396.5	1974.9	0.001	3,410.75
1/17/2008	48,068.5	2002.9	0.000	3,410.76
2/25/2008	49,004.5	2041.9	0.000	3,410.76
3/31/2008	49,844.5	2076.9	0.001	3,410.77
4/25/2008	50,444.5	2101.9	0.001	3,410.80
5/22/2008	51,092.5	2128.9	0.001	3,410.82
6/24/2008	51,884.5	2161.9	0.012	3,411.03
7/16/2008	52,412.5	2183.9	0.047	3,411.67

**TABLE G-6 PCE MASS REMOVED BY SOIL VAPOR EXTRACTION SYSTEMMODESTO SUPERFUND  
SITEMODESTO, CALIFORNIA(Page 4 of 5)**

Date Sampled	Cumulative Hours of Operation	Cumulative Days of Operation	Mass Extraction Rate (lbs/day)	Cumulative Mass Extracted (a) (lbs)
8/20/2008	53,252.5	2218.9	0.032	3,413.06
9/25/2008	54,116.5	2254.9	0.019	3,413.98
11/18/2008	55,412.5	2308.9	0.038	3,415.50
12/10/2008	55,940.5	2330.9	0.012	3,416.04
12/30/2008	56,420.5	2350.9	0.001	3,416.16
1/30/2009	57,164.5	2381.9	0.000	3,416.18
2/27/2009	57,836.5	2409.9	0.050	3,416.89
3/10/2009	58,100.5	2420.9	0.057	3,417.48
4/23/2009	59,156.5	2464.9	0.088	3,420.68
5/28/2009	59,996.5	2499.9	0.067	3,423.39
6/29/2009	60,764.5	2531.9	0.122	3,426.40
7/29/2009	61,484.5	2561.9	0.122	3,430.06
8/10/2009	61,772.5	2573.9	0.184	3,431.90
9/22/2009	62,804.5	2616.9	0.097	3,437.94
10/26/2009	63,620.5	2650.9	0.071	3,440.79
11/23/2009	64,292.5	2678.9	0.063	3,442.66
12/16/2009	64,844.5	2701.9	0.051	3,443.97
1/27/2010	65,852.5	2743.9	0.077	3,446.66
2/25/2010	66,548.5	2772.9	0.060	3,448.65
3/11/2010	66,884.5	2786.9	0.001	3,449.08
4/7/2010	67,532.5	2813.9	0.012	3,449.27
5/12/2010	68,372.5	2848.9	0.012	3,449.70
6/17/2010	69,236.5	2884.9	0.024	3,450.35
7/15/2010	69,908.5	2912.9	0.076	3,451.76
8/12/2010	70,580.5	2940.9	0.059	3,453.65
9/9/2010	71,252.5	2968.9	0.063	3,455.36
10/19/2010	72,212.5	3008.9	0.024	3,457.11
11/18/2010	72,932.5	3038.9	0.004	3,457.54
12/9/2010	73,436.5	3059.9	0.007	3,457.66

**TABLE G-6 PCE MASS REMOVED BY SOIL VAPOR EXTRACTION SYSTEMMODESTO SUPERFUND  
SITEMODESTO, CALIFORNIA(Page 5 of 5)**

Date Sampled	Cumulative Hours of Operation	Cumulative Days of Operation	Mass Extraction Rate (lbs/day)	Cumulative Mass Extracted (a) (lbs)
1/13/2011	74,276.5	3094.9	0.008	3,457.93
2/10/2011	74,948.5	3122.9	0.010	3,458.17
3/9/2011	75,596.5	3149.9	0.016	3,458.51
4/14/2011	76,460.5	3185.9	0.0003	3,458.79
5/10/2011	77,084.5	3211.9	0.0002	3,458.80
6/2/2011	77,636.5	3234.9	0.009	3,458.90
7/14/2011	78,644.5	3276.9	0.017	3,459.44
8/11/2011	79,316.5	3304.9	0.016	3,459.90
9/13/2011	80,108.5	3337.9	0.015	3,460.41
10/13/2011	80,828.5	3367.9	0.014	3,460.84
11/9/2011	81,476.5	3394.9	0.0003	3,461.04
12/8/2011	82,128.7	3422.0	0.003	3,461.07
1/12/2012	82,968.7	3457.0	0.001	3,461.14
2/9/2012	83,640.7	3485.0	0.003	3,461.20
3/8/2012	84,312.7	3513.0	0.004	3,461.29
4/5/2012	84,984.7	3541.0	0.004	3,461.40
5/8/2012	85,776.7	3574.0	0.005	3,461.55
6/7/2012	86,496.7	3604.0	0.001	3,461.63
7/18/2012	87,480.7	3645.0	0.021	3,462.07
8/8/2012	87,984.7	3666.0	0.053	3,462.84
9/6/2012	88,680.7	3695.0	0.073	3,464.67
<b>TOTAL</b>	<b>82,128.7</b>	<b>3,422.0</b>		<b>3,464.67</b>

**Notes:**

(a) Cumulative mass extracted was determined by multiplying the average mass extraction rate times the days of operation.

lbs - pounds

lbs/day - pounds per day