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Groundwater Monitoring Results
Second Semi-Annual 2012 Monitoring Period
Cargill Salt – Alameda Facility
Alameda, California



CRAWFORD
CONSULTING
INC.



November 13, 2012

Alameda County Environmental Health Services
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577
Attn: Jerry Wickham

**RE: Groundwater Monitoring Results, Second Semi-Annual 2012 Monitoring Period,
Cargill Salt – Alameda Facility, Alameda, California,
SLIC Case No. RO0002480**

Dear Mr. Wickham,

The attached report presents the groundwater monitoring results for the second semi-annual 2012 monitoring period for the Cargill Salt Alameda facility. The report presents the results of groundwater monitoring data collected during the third quarter of 2012. Groundwater levels in the site monitoring wells were measured, groundwater samples were collected and analyzed, and the groundwater flow direction and gradient were determined.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report are true and correct to the best of my knowledge.

Should you have any questions concerning the report, please don't hesitate to call me at (510) 790-8182.

Sincerely,

Sean Riley
Environmental Manager

**Groundwater Monitoring Results
Second Semi-Annual 2012 Monitoring Period
Cargill Salt – Alameda Facility
Alameda, California**

**Prepared for:
Cargill Salt
7220 Central Avenue
Newark, California 94560**

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**Project No. CS1605
November 13, 2012**

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(presented in electronic format only)

- Appendix A. Field Data Sheets
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- Appendix C. Certified Analytical Reports and Chain-of-Custody Documentation

Electronic File

Entire report presented in electronic file format (pdf) on CD-ROM inside back cover.

1 Introduction

Crawford Consulting, Inc. (Crawford) has prepared this report on behalf of Cargill Salt for the Cargill Salt Dispensing Systems Division facility (hereafter, the Site) in Alameda, California.

Results of groundwater transect sampling and the initial sampling of three groundwater monitoring wells installed in November 1999 were presented in the January 31, 2000 report, *Groundwater Characterization and Monitoring Well Installation, Cargill Salt – Alameda Facility, Alameda, California* (Crawford Consulting, Inc. and Conor Pacific/EFW). The purpose of the groundwater transect sampling and the monitoring well installation and sampling was to help characterize and monitor the occurrence of volatile organic compounds (VOCs), primarily tetrachloroethene (PCE) and its breakdown product, trichloroethene (TCE), previously detected in groundwater at the Site.

One of the recommendations in the report was to confirm the groundwater analytical results of the newly installed monitoring wells (wells MW-1, MW-2, and MW-3) and the groundwater flow direction and gradient via quarterly monitoring. Cargill Salt began groundwater monitoring on a quarterly basis after the initial groundwater monitoring well sampling event in November 1999. For 2000 through 2005, reporting was performed on an annual basis. Cargill began reporting on a semi-annual basis in 2006.

Cargill Salt conducted additional characterization activities in November and December 2001 to evaluate the off-site extent of VOCs in the soil and groundwater. Soil and groundwater samples were collected and analyzed from a neighboring residential property and along Clement Avenue, slug tests were performed in the three existing monitoring wells, and a groundwater monitoring well (MW-4) was installed in Clement Avenue.

A phytoremediation project was implemented at the Site in June 2005. Based on reductions in PCE concentrations in groundwater since 2006, Alameda County Environmental Health suggested in a September 30, 2009 letter that Cargill Salt reduce the groundwater monitoring frequency from quarterly to semi-annually. The second half of 2009 was the first semi-annual monitoring period under the reduced monitoring frequency. Groundwater sampling and analysis is now performed during the first and third quarters.

1.1 Reporting Period Activities

This report presents the results of groundwater monitoring data collected during the third quarter of 2012. Groundwater levels in the Site monitoring wells were measured, groundwater samples were collected and analyzed, and the groundwater flow direction and gradient were determined.

The monitoring event for the second semi-annual 2012 monitoring period was conducted on September 17, 2012. Supervision of the monitoring event was conducted for Cargill Salt by Crawford. Groundwater level measurements and collection of groundwater samples were conducted by Field Solutions, Inc. The groundwater samples were analyzed by TestAmerica Laboratories, Inc., a state-certified laboratory in Pleasanton, California.

1.2 Background Information

A description of the Site and a summary of the development of characterization and monitoring programs for the Site are presented in this section.

1.2.1 Site Description

Alameda is an island on the east side of San Francisco Bay, separated from Oakland by a tidal canal (Figure 1). The Cargill Salt Dispensing Systems Division facility is located on a rectangular lot in an industrial and residential neighborhood. The facility building occupies approximately one-third of the Site and is separated from the vacant, unpaved side of the lot by an asphalt driveway (Figure 2). The Site is bordered by a sheet-metal shop and a residential lot to the northwest, an apartment complex to the southwest, and a residential lot to the southeast.

From 1951 to 1978, the Alameda facility produced salt-dispensing units, which required casting and milling aluminum parts.

Constituents of concern associated with site operations have included casting sands with elevated concentrations of metals, and solvents, machine oils, and grease used in casting and milling operations. As discussed below, previous investigations and remedial activities have investigated and remediated metals and solvents (VOCs) in vadose-zone soil.

1.2.2 Summary of Investigative and Remedial Activities

Cargill Salt initiated site investigative activities in 1993 to determine if facility operations had impacted site soils. Cargill Salt submitted the results of the soil sampling investigation to the Alameda County Environmental Health Services (ACEHS) in October 1993 along with a workplan for excavation and disposal of impacted soils and assessment of potential impact to groundwater (Groundworks Environmental, Inc. [Groundworks], 1993).

After approval of the workplan by ACEHS, Cargill Salt conducted several phases of soil remediation and groundwater characterization. Surficial soils impacted by metals were excavated for disposal off site. Vadose-zone soils with the highest degree of impact by VOCs were also excavated for off-site disposal (see “Soil excavation area” on Figure 2).

The results of these activities were submitted to the ACEHS in a report, *Soil and Groundwater Investigations and Remedial Activities, July 1993 – September 1994, Cargill Salt – Alameda Facility, Alameda, California* (Groundworks, 1995). Recommendations for additional work to further delineate the lateral and vertical extent of VOCs in groundwater beneath the Site were presented in the report.

A workplan for the additional delineation of VOCs in groundwater, *Workplan for Groundwater Characterization and Monitoring Well Installation, 2016 Clement Avenue, Alameda, California* (CCI), was submitted to the ACEHS in July 1999.

After approval of the workplan by the ACEHS, Cargill Salt conducted groundwater sampling and well installation activities during August and November of 1999. The results of these activities were submitted to the ACEHS in a report, *Groundwater Characterization and Monitoring Well Installation, Cargill Salt – Alameda Facility, Alameda, California* (Crawford Consulting, Inc. and Conor Pacific/EFW, dated January 31, 2000). After the initial groundwater monitoring well sampling event in November 1999, Cargill Salt began groundwater monitoring on a quarterly basis.

A work plan for remedial investigation activities, *Workplan for Off-Site Characterization, Cargill Salt – Alameda Facility, Alameda, California* (Conor Pacific/EFW), was submitted to the ACEHS in June 2001. After approval of the workplan by the ACEHS, Cargill Salt conducted characterization activities in November and December 2001 to evaluate off-site extent of VOCs in the soil and groundwater. Soil and groundwater samples were collected and analyzed from a neighboring residential property and along Clement Avenue, slug tests were performed in the three existing monitoring wells, and a groundwater monitoring well (MW-4) was installed in Clement Avenue. The results of these activities were submitted to the ACEHS in the August 21, 2002 submittal *Off-Site Groundwater Characterization, Cargill Salt – Alameda Facility, Alameda, California*, prepared by Conor Pacific/EFW.

A phytoremediation project was implemented at the Site in June 2005. The project involved planting 96 bare-root hybrid poplar trees in a grid of 24 rows. The rows are generally 6 feet apart with trees on 7-foot centers on each row. Selection of the phytoremediation approach and implementation of the project were described in the October 20, 2006 report, *Groundwater Monitoring Results, First through Fourth Quarter 2005, Cargill Salt – Alameda Facility, Alameda, California* prepared by Crawford Consulting, Inc. In April 2008, seven additional saplings were planted in the rear of the property near monitoring well MW-2.

The Site groundwater monitoring wells were re-surveyed in September 2006 by CSS Environmental Services in order to provide Geotracker-compliant survey data. Results of the casing elevation survey indicate that each well is approximately 6.4 feet higher than the previous survey conducted in 1999. This difference is due to the use of different datum for the 2006 and 1999 surveys. The casing elevations from the September 2006 survey are shown on Table 1.

1.2.3 Source of VOC Impact

As discussed in the 1995 report, the occurrence of VOCs in soils and groundwater at the Site appears to be the result of a discharge or spill to surficial soils at a location near the rear property line at the southwestern corner of the property. The area with the highest degree of chemical impact was delineated prior to excavation and was then excavated using a backhoe and transported off-site for appropriate disposal. It is possible that the VOCs detected in soils and groundwater at this location were associated with waste products from facility operations. The VOCs may be associated with solvents previously used for degreasing operations at the facility, although there are no records indicating use of PCE. Site records indicate that the solvents used for degreasing operations were not PCE-based solvents.

It is also possible that the VOCs and oil and grease are associated with waste products discarded from neighboring properties. There is an apartment complex next to the rear property line of the facility, and the laundry room for this complex is in the utility shed immediately adjacent to the rear property line. This laundry room is only 4 feet away from the area of highest impact to soil. If PCE associated with laundry cleaning products were spilled in this laundry room, it is possible that it could have drained onto the Cargill Salt property.

2 Groundwater Flow Analysis

Groundwater levels were measured and a groundwater contour map was prepared for the second semi-annual 2012 monitoring event.

2.1 Water-Level Measurement

Water levels in groundwater monitoring wells (MW-1, MW-2, MW-3, and MW-4) were measured on September 17, 2012, before any of the groundwater monitoring wells were purged for sampling for the semi-annual monitoring event. The groundwater monitoring well locations are shown on Figure 2. The water levels were measured with an electric sounder. The depth to water at each well was recorded on a *Water Level Field Data* sheet (see Appendix A).

The water-level data through the third quarter of 2012 are shown on Table 1. The data in Table 1 include the date and time of measurement, the well casing elevation, the measured depth to groundwater, the groundwater elevation, and the change in elevation from the previous measurement. A plot of historical groundwater elevations is shown in Figure 3.

As reviewed in the last semi-annual monitoring report, groundwater levels in the on-site monitoring wells (MW-1, MW-2, and MW-3) and off-site well (MW-4) showed a different pattern in the first and third quarters of 2011 than the general seasonal pattern for the previous nine years (see Figure 3). Groundwater levels in all four wells generally exhibit similar seasonal fluctuations, and the first quarter groundwater elevations have typically exhibited effects of winter-season recharge. However, the groundwater elevations recorded in March 2011 for the three most downgradient wells showed a decline rather than the typical seasonal rise. The levels measured for those three wells in March 2011 were the lowest recorded to date. The September 2011 groundwater elevations recorded for all four wells were the lowest recorded to date for each of the wells. As noted in the last report, there was a rebound in the levels as indicated by the March 2012 groundwater elevations, which were 0.8 to 1.96 feet higher than recorded in September 2011.

However, the downward trend noted for 2011 continued in 2012 as groundwater levels fell after 2011/2012 winter-season recharge. The September 2012 groundwater elevations recorded for all four wells were the lowest recorded to date for each of the wells. Additionally, there was a reversal in gradient between wells MW-3 and MW-4, as discussed further in Section 2.2 below.

The reason for this atypical behavior in the groundwater elevations is unknown and it is suspected that artificial dewatering operations or new drainage structures downgradient of the site are resulting in lower than typical groundwater elevations.

2.2 Groundwater Flow Direction and Gradient

A groundwater contour map based on the September 2012 water-level data is shown on Figure 4.

The groundwater flow direction determined for the third quarter of 2012 for the facility area was to the northeast, consistent with the flow direction previously determined for the Site. However, there was a reversal in the previously measured gradient between wells MW-3 and MW-4. This resulted in a change in the groundwater flow direction northeast of the site, as shown on Figure 3. The groundwater flow direction determined for the area northeast of the site is to the northwest.

The horizontal hydraulic gradient measured for the third quarter of 2012 in the on-site area was 0.024.

2.3 Groundwater Velocity

Average linear groundwater flow velocities (V) were calculated using a form of Darcy's Law,

$$V = Ki/n,$$

where “ K ” is the hydraulic conductivity, “ i ” is the horizontal hydraulic gradient, and “ n ” is the effective porosity. The groundwater velocity calculations for the second quarter of 2012 groundwater data are presented in Appendix B.

Using hydraulic conductivity and porosity values determined for saturated native materials at the Site [based on slug tests and laboratory soil testing, respectively (Conor Pacific/EFW, 2002)], and the horizontal hydraulic gradients determined from the third quarter 2012 groundwater contour map, the groundwater flow velocity beneath the Site is calculated to be approximately 2 feet per year (ft/yr) for the third quarter 2012 measurements. The groundwater velocities measured for the Site have historically been in the range of 0.1 to 2 ft/yr.

3 Groundwater Sampling and Analysis

This section summarizes the sample collection and analytical methods, presents an evaluation of quality control data, and summarizes the results of the sampling events.

3.1 Sample Collection and Analysis

Groundwater samples were collected September 17, 2012 from groundwater monitoring wells MW-1, MW-2, MW-3, and MW-4. Dedicated tubing was installed in wells MW-1, MW-2, and MW-3 prior to the first quarter 2000 sampling event and on December 17, 2001 in well MW-4 to facilitate sampling with a peristaltic pump. Dedicated fluorinated ethylene propylene resin (FEP)-lined polyethylene tubing was installed in each monitoring well. The tubing intake was placed about one foot above the well bottom in each of the wells. Viton[®] dedicated check valves were installed on the tubing intakes to prevent back-flow of water into the well. A short length of dedicated Viton[®] tubing was installed at the well head for use in a peristaltic pump head. Prior to sample collection for each quarterly monitoring event, the wells were purged using a peristaltic pump. Field parameters (pH, electrical conductivity, temperature, and turbidity) were measured in purged groundwater from each well prior to sampling; these data are recorded on the Sample Collection Field Data sheets presented in Appendix A. After purging, groundwater samples were collected using the peristaltic pump and the dedicated Viton[®] pump head discharge tubing.

The groundwater samples were analyzed for VOCs using U.S. Environmental Protection Agency (USEPA) Method 8260. Results for all Method 8010 analytes were reported. The groundwater samples for the second semi-annual 2012 event were delivered with appropriate chain-of-custody documentation to TestAmerica Laboratories, Inc., a state-certified laboratory in Pleasanton, California, for chemical analysis.

3.2 Analytical Results

The results of field and laboratory quality control measures and the results of the groundwater monitoring well samples are reviewed in this section. The certified analytical reports and chain-of-custody documentation are presented in Appendix C.

3.2.1 Quality Control

Quality control (QC) samples were analyzed as part of the sampling and analysis program to evaluate the precision and accuracy of the reported groundwater chemistry data. QC samples included both field and laboratory samples. Descriptions of the purpose of specific field and laboratory QC samples used during the sampling and analysis program and an evaluation of field and laboratory QC results are presented below.

Field Quality Control Samples

A field duplicate was used during the second semi-annual 2012 sampling event for the Site. A field duplicate is used to assess sampling and analytical precision. The duplicate is collected at a selected well (MW-2) and then submitted "blind" to the laboratory for analysis with the same batch as the regular sample for the selected well. An estimate of precision is obtained by calculating the relative percent difference (RPD) between the regular sample and the duplicate sample using the following formula:

$$\text{RPD} = \frac{[x - y] 100}{0.5 (x + y)}$$

where: $[x - y]$ = the absolute value of the difference in concentration between the regular sample (x) and the duplicate sample (y).

Laboratory Quality Control Samples

The following types of laboratory QC samples were used during the second semi-annual 2012 analytical program for the Site:

- surrogate spikes
- matrix spikes/duplicate matrix spikes

A surrogate spike is a check standard added to a sample in a known amount prior to analysis. Surrogate spikes consist of analytes not normally found in environmental samples and not targeted by the analytical procedure. Surrogate spikes provide information on recovery efficiency by comparing the percent recovery of specific surrogate analyses to statistically derived acceptance limits developed by the USEPA or the laboratory (provided such laboratory-specific limits are stricter than those developed by the USEPA). If the recoveries fall within the acceptance limits for the analytes, the analysis exhibits acceptable recovery efficiency. Recoveries that fall outside the acceptance limits indicate a potential problem with the recovery efficiency of analytes, which in turn indicates a potential bias with respect to the reported concentration of the environmental samples analyzed in the same batch.

Matrix spikes and duplicate matrix spikes are analyzed by the laboratory for the purpose of providing a quantitative measure of accuracy and precision, and to document the effect that the sample matrix has on the analysis. A selected sample is spiked in duplicate with known concentrations of analytes. The recoveries of the spiked analytes are compared to statistically derived acceptance limits developed by the USEPA or the laboratory (provided such laboratory-specific limits are stricter than those developed by the USEPA). If the recoveries fall within the acceptance limits for the analytes, the analysis has no statistically significant bias (i.e., the analysis is accurate). Recoveries that fall outside of the acceptance limits have a positive or negative bias, depending on whether the recovery is greater or less than the upper or lower acceptance limit, respectively. Analyses where analyte recoveries fall outside the acceptance limits should be regarded as estimates only.

Precision for matrix spikes is measured by calculating the relative percent differences (RPDs) between the measured concentration of analytes in the matrix and the duplicate matrix spike. The following equation is used for matrix spikes:

$$\text{RPD} = \frac{[\text{MS} - \text{MSD}] 100}{0.5 (\text{MS} + \text{MSD})}$$

where: [MS - MSD] = the absolute value of the difference in concentration between the matrix spike (MS) and the matrix spike duplicate (MSD)

Third Quarter 2012 Field QC Results

One field duplicate (DUP-1) was analyzed as part of the third quarter 2012 sampling event at the Site. The duplicate sample was collected at groundwater monitoring well MW-2 and was analyzed for halogenated VOCs using USEPA Method 8260B (8010 list). Table 2 summarizes the calculated RPDs for MW-2 and MW-2 duplicate (DUP-1). The one parameter (PCE) for which the RPD could be calculated (see Table 2), exhibited a high RPD value (i.e., more than 15%) indicative of poor precision.

Second Semi-Annual 2012 Laboratory QC Results

A review of the second semi-annual 2012 field data sheets and laboratory reports (presented in Appendices A and C, respectively) indicates that all analyses were performed within USEPA or California Department of Health Services (DHS) recommended maximum sample holding times.

QC data on surrogate spike recoveries and matrix spike recoveries are presented in the laboratory reports. These data indicate: (1) no surrogate spike recoveries were outside of the laboratory's acceptance limits; (2) RPD values for the matrix spikes and duplicate matrix spikes indicate a high overall degree of analytical precision.

No matrix spike or duplicate matrix spike recoveries were outside of the laboratory's control limits.

The laboratory QC data indicate that the results reported herein are of adequate quality for evaluation of site groundwater conditions.

3.2.2 Groundwater Results

The results for the second semi-annual 2012 monitoring event are shown on Table 3a and Figure 5. The results of historical VOC analyses for each quarter for 2000 through third quarter 2012 are summarized in Table 3b, which also shows the VOC results for the initial sampling event for monitoring wells MW-1, MW-2, and MW-3 in November 1999. Historical VOC results for all the wells are plotted on Figure 6.

Consistent with previous monitoring events, PCE and its breakdown product TCE were detected in Site groundwater samples from the third quarter 2012 monitoring event.

For the second semi-annual 2012 event, the concentrations of PCE detected were:

- 380 micrograms per liter ($\mu\text{g/L}$) in monitoring well MW-1
- 18 $\mu\text{g/L}$ in MW-2
- not detected in MW-3 and MW-4

TCE was detected at 37 $\mu\text{g/L}$ in monitoring well MW-1, but was not detected in MW-2, MW-3 or MW-4.

Cis-1,2-Dichloroethene (Cis-1,2-DCE) was not detected in monitoring wells MW-1, MW-2, MW-3, or MW-4.

1,1-Dichloroethene (DCE) was detected at 53 $\mu\text{g/L}$ in monitoring well MW-3, but was not detected in monitoring wells MW-1, MW-2, or MW-4.

1,1-Dichloroethane (DCA) was detected at 1.7 $\mu\text{g/L}$ in monitoring well MW-3, but was not detected in monitoring wells MW-1, MW-2, or MW-4.

1,1,1-Trichloroethane (TCA) was detected at 1.5 $\mu\text{g/L}$ in monitoring well MW-3, but was not detected in monitoring wells MW-1, MW-2, or MW-4.

3.3 Discussion

Variations in VOC concentrations at monitoring well MW-2, the well with historically the highest reported PCE concentrations at the site, generally correlate with variations in groundwater elevations at the Site. An increase in VOC concentrations generally follows a rise in groundwater elevations, and a decrease in VOC concentration generally follows a fall in groundwater levels (see Figure 7). The variations in VOC concentrations sometimes lag one quarter behind the variations in groundwater elevation.

The average seasonal concentration of PCE reported for groundwater monitoring well MW-2 has been lower since the second quarter of 2006 (June 2006 event) compared to results reported since monitoring began in 1999 (see Figure 6). The PCE concentrations reported for MW-2 since June 2006 are an indication that the phytoremediation project implemented in June 2005 has reduced the average seasonal concentration of PCE at the site.

The results for VOC concentrations reported for the second semi-annual 2012 quarterly monitoring event are generally similar to the results reported since the second quarter of 2006 (see Figure 6), with the following notable exceptions:

- The concentrations of PCE reported for well MW-2 during the last seven events are the seven lowest consecutive values ever reported for MW-2.
- The concentration of PCE reported for well MW-2 for the September 2012 event (18 $\mu\text{g/L}$) is the lowest concentration reported to date for MW-2.
- The concentrations of DCE reported for well MW-3 have shown increases for the last four semi-annual events, rising from a concentration of 0.64 $\mu\text{g/L}$ in September 2010 to 53 $\mu\text{g/L}$ in September 2012.

The rising trend in DCE concentrations noted for well MW-3 may be related to the downward trend in groundwater elevations noted for the site. As discussed in Section 2.1, the reason for the downward groundwater elevation trend measured for 2011 and 2012 is unknown and it is suspected that artificial dewatering operations or new drainage structures downgradient of the site are resulting in lower than typical groundwater elevations.

4 Phytoremediation Project Status

A phytoremediation project was implemented at the Site in June 2005. The project involved planting 96 bare-root hybrid poplar trees in a grid on the unpaved portion of the site. Selection of the phytoremediation approach and implementation of the project were described in the report, *Groundwater Monitoring Results, First through Fourth Quarter 2005, Cargill Salt – Alameda Facility, Alameda, California* (Crawford Consulting, Inc., October 20, 2006).

The trees were 4-ft-tall, bare-root poles with no foliage when planted in June 2005. During the first two years of growth, the trees developed foliage and most grew 3 to 10 additional feet in height. Photos comparing the appearance of the trees just after planting in 2005 with photos taken in June 2007, September 2009, November 2010, and May 2011 are show below and on the following pages. After three years, most of the trees had grown to heights of 10 to 25 feet. After five years, most of the trees have grown to heights of 25 to 35 feet. In April 2008, seven additional saplings were planted in the rear of the property near monitoring well MW-2.

As discussed in Section 3.3, the PCE concentrations reported for monitoring well MW-2 since June 2006 are an indication that the phytoremediation project has been effective at reducing the average seasonal VOC concentration in groundwater at the site.



Bare-root trees planted in June 2005 - View towards rear of property



June 2007 - View from driveway towards rear of property



September 2009 - View from street towards driveway and rear of property



November 2010 – View from street towards driveway and rear of property
(compare tree height to photo on previous page)



May 2011 – Same view as above



June 2007 - View of front planting strip at Clement Avenue



September 2009 - View of front planting strip at Clement Avenue.
(Note relative height of gate vs. trees in the pictures above and on next page)



November 2010 – Trees dropping foliage. Also, branches on bottom 6 feet of trunks have been cleared for site visibility.



May 11, 2011 – Same view as above



November 8, 2012 – Same view as previous picture.



November 8, 2012 – View from street.

Professional Certification

**Groundwater Monitoring Results
Second Semi-Annual 2012 Monitoring Period
Cargill Salt – Alameda Facility
Alameda, California**

This report has been prepared by CRAWFORD CONSULTING, INC. with the professional certification of the California professional geologist whose signature appears below.



Dana C. Johnston
Project Manager



Mark C. Wheeler
Principal Geologist
P.G. 4563

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Limitations

This report and the evaluations presented herein have been prepared in accordance with generally accepted professional standards and is based solely on the scope of work and services described herein. This report has been prepared solely for the use of Cargill Salt for the purposes noted herein. Any use of this report, in whole or in part, by a third party for other than the purposes noted herein is at such party's sole risk.

Table 1. Groundwater Level Data

Well/ Piezometer	Date	Time	Casing Elevation (feet, MSL)	Depth to Water (feet)	Water Elevation (feet, MSL)	Elev. Change from Last Measurement (feet)
MW-1	11/16/1999	09:56	13.16	3.75	9.41	NA
MW-1	3/30/2000	10:09	13.16	2.81	10.35	0.94
MW-1	5/16/2000	09:43	13.16	3.32	9.84	-0.51
MW-1	7/28/2000	09:11	13.16	3.58	9.58	-0.26
MW-1	11/30/2000	08:36	13.16	3.52	9.64	0.06
MW-1	3/26/2001	08:47	13.16	3.15	10.01	0.37
MW-1	6/25/2001	10:19	13.16	3.53	9.63	-0.38
MW-1	9/28/2001	09:32	13.16	3.96	9.20	-0.43
MW-1	12/17/2001	10:47	13.16	3.23	9.93	0.73
MW-1	3/21/2002	07:28	13.16	2.89	10.27	0.34
MW-1	6/6/2002	08:03	13.16	3.50	9.66	-0.61
MW-1	9/20/2002	08:30	13.16	3.86	9.30	-0.36
MW-1	12/19/2002	08:38	13.16	3.13	10.03	0.73
MW-1	3/4/2003	10:31	13.16	3.08	10.08	0.05
MW-1	6/9/2003	08:32	13.16	3.29	9.87	-0.21
MW-1	9/8/2003	10:02	13.16	3.79	9.37	-0.50
MW-1	12/1/2003	10:16	13.16	3.78	9.38	0.01
MW-1	3/4/2004	09:31	13.16	2.88	10.28	0.90
MW-1	6/2/2004	08:42	13.16	3.45	9.71	-0.57
MW-1	9/14/2004	08:01	13.16	3.87	9.29	-0.42
MW-1	12/8/2004	07:44	13.16	3.23	9.93	0.64
MW-1	3/3/2005	08:07	13.16	2.01	11.15	1.22
MW-1	6/10/2005	07:05	13.16	2.90	10.26	-0.89
MW-1	9/16/2005	08:00	13.16	3.62	9.54	-0.72
MW-1	12/6/2005	08:00	13.16	3.28	9.88	0.34
MW-1	3/10/2006	07:40	13.16	2.28	10.88	1.00
MW-1	6/9/2006	09:45	13.16	3.09	10.07	-0.81
MW-1	9/11/2006	10:24	13.16	3.70	9.46	-0.61
MW-1	12/15/2006	07:34	13.16	2.94	10.22	0.76
MW-1	3/6/2007	09:18	13.16	2.87	10.29	0.07
MW-1	6/15/2007	07:29	13.16	3.30	9.86	-0.43
MW-1	9/11/2007	08:05	13.16	3.85	9.31	-0.55
MW-1	12/4/2007	08:53	13.16	3.58	9.58	0.27
MW-1	3/20/2008	08:13	13.16	3.00	10.16	0.58
MW-1	6/18/2008	08:22	13.16	3.73	9.43	-0.73
MW-1	9/3/2008	08:06	13.16	3.93	9.23	-0.20
MW-1	12/4/2008	08:12	13.16	3.71	9.45	0.22
MW-1	3/5/2009	09:18	13.16	1.83	11.33	1.88
MW-1	6/11/2009	08:40	13.16	3.52	9.64	-1.69
MW-1	9/3/2009	07:57	13.16	3.98	9.18	-0.46
MW-1	3/2/2010	08:10	13.16	2.37	10.79	1.61
MW-1	9/3/2010	07:01	13.16	3.80	9.36	-1.43
MW-1	3/17/2011	08:04	13.16	4.44	8.72	-0.64
MW-1	9/23/2011	07:25	13.16	6.43	6.73	-1.99
MW-1	3/22/2012	07:47	13.16	4.47	8.69	1.96
MW-1	9/17/2012	08:14	13.16	6.66	6.50	-2.19
MW-2	11/16/1999	11:15	16.22	5.22	11.00	NA
MW-2	3/30/2000	10:05	16.22	2.80	13.42	2.42
MW-2	5/16/2000	09:35	16.22	4.13	12.09	-1.33
MW-2	7/28/2000	09:17	16.22	4.85	11.37	-0.72

Table 1. Groundwater Level Data

Well/ Piezometer	Date	Time	Casing Elevation (feet, MSL)	Depth to Water (feet)	Water Elevation (feet, MSL)	Elev. Change from Last Measurement (feet)
MW-2	11/30/2000	08:32	16.22	4.75	11.47	0.10
MW-2	3/26/2001	08:40	16.22	3.28	12.94	1.47
MW-2	6/25/2001	12:12	16.22	4.75	11.47	-1.47
MW-2	9/28/2001	12:20	16.22	5.41	10.81	-0.66
MW-2	12/17/2001	10:44	16.22	4.07	12.15	1.34
MW-2	3/28/2002	09:37	16.22	3.40	12.82	0.67
MW-2	6/6/2002	08:11	16.22	4.70	11.52	-1.30
MW-2	9/20/2002	08:34	16.22	5.28	10.94	-0.58
MW-2	12/19/2002	08:45	16.22	3.37	12.85	1.91
MW-2	3/4/2003	10:26	16.22	3.11	13.11	0.26
MW-2	6/9/2003	08:31	16.22	4.16	12.06	-1.05
MW-2	9/8/2003	10:08	16.22	5.26	10.96	-1.10
MW-2	12/1/2003	10:20	16.22	5.05	11.17	0.21
MW-2	3/4/2004	09:34	16.22	2.86	13.36	2.19
MW-2	6/2/2004	08:53	16.22	4.47	11.75	-1.61
MW-2	9/14/2004	07:59	16.22	5.26	10.96	-0.79
MW-2	12/8/2004	08:00	16.22	4.20	12.02	1.06
MW-2	3/3/2005	08:04	16.22	1.90	14.32	2.30
MW-2	6/10/2005	07:09	16.22	3.74	12.48	-1.84
MW-2	9/16/2005	08:08	16.22	4.92	11.30	-1.18
MW-2	12/6/2005	10:58	16.22	4.39	11.83	0.53
MW-2	3/10/2006	07:47	16.22	2.13	14.09	2.26
MW-2	6/9/2006	10:03	16.22	3.75	12.47	-1.62
MW-2	9/11/2006	10:22	16.22	4.94	11.28	-1.19
MW-2	12/15/2006	07:32	16.22	4.08	12.14	0.86
MW-2	3/6/2007	09:13	16.22	3.27	12.95	0.81
MW-2	6/15/2007	07:31	16.22	4.57	11.65	-1.30
MW-2	9/11/2007	08:07	16.22	5.60	10.62	-1.03
MW-2	12/4/2007	08:47	16.22	4.99	11.23	0.61
MW-2	3/20/2008	08:17	16.22	3.48	12.74	1.51
MW-2	6/18/2008	08:27	16.22	4.93	11.29	-1.45
MW-2	9/3/2008	08:08	16.22	5.58	10.64	-0.65
MW-2	12/4/2008	08:14	16.22	5.07	11.15	0.51
MW-2	3/5/2009	11:10	16.22	2.30	13.92	2.77
MW-2	6/11/2009	08:41	16.22	4.44	11.78	-2.14
MW-2	9/3/2009	08:01	16.22	5.55	10.67	-1.11
MW-2	3/2/2010	08:12	16.22	2.88	13.34	2.67
MW-2	9/3/2010	07:04	16.22	5.18	11.04	-2.30
MW-2	3/17/2011	08:08	16.22	3.14	13.08	2.04
MW-2	9/23/2011	07:27	16.22	6.13	10.09	-2.99
MW-2	3/22/2012	07:42	16.22	4.24	11.98	1.89
MW-2	9/17/2012	08:18	16.22	6.77	9.45	-2.53
MW-3	11/16/1999	15:43	13.34	4.34	9.00	NA
MW-3	3/30/2000	10:01	13.34	2.77	10.57	1.57
MW-3	5/16/2000	09:46	13.34	3.44	9.90	-0.67
MW-3	7/28/2000	09:05	13.34	3.72	9.62	-0.28
MW-3	11/30/2000	08:34	13.34	3.73	9.61	-0.01
MW-3	3/26/2001	08:54	13.34	3.51	9.83	0.22
MW-3	6/25/2001	10:21	13.34	3.65	9.69	-0.14
MW-3	9/28/2001	09:30	13.34	3.96	9.38	-0.31

Table 1. Groundwater Level Data

Well/ Piezometer	Date	Time	Casing Elevation (feet, MSL)	Depth to Water (feet)	Water Elevation (feet, MSL)	Elev. Change from Last Measurement (feet)
MW-3	12/17/2001	10:38	13.34	3.28	10.06	0.68
MW-3	3/21/2002	07:28	13.34	3.10	10.24	0.18
MW-3	6/6/2002	08:07	13.34	3.63	9.71	-0.53
MW-3	9/20/2002	08:25	13.34	3.82	9.52	-0.19
MW-3	12/19/2002	08:42	13.34	3.10	10.24	0.72
MW-3	3/4/2003	10:36	13.34	3.29	10.05	-0.19
MW-3	6/9/2003	08:28	13.34	3.41	9.93	-0.12
MW-3	9/8/2003	10:00	13.34	3.85	9.49	-0.44
MW-3	12/1/2003	10:30	13.34	3.90	9.44	-0.05
MW-3	3/4/2004	09:22	13.34	3.11	10.23	0.79
MW-3	6/2/2004	08:46	13.34	3.53	9.81	-0.42
MW-3	9/14/2004	08:05	13.34	4.07	9.27	-0.54
MW-3	12/8/2004	07:40	13.34	3.73	9.61	0.34
MW-3	3/3/2005	07:53	13.34	2.36	10.98	1.37
MW-3	6/10/2005	07:14	13.34	3.15	10.19	-0.79
MW-3	9/16/2005	08:04	13.34	3.90	9.44	-0.75
MW-3	12/6/2005	08:04	13.34	3.35	9.99	0.55
MW-3	3/10/2006	07:43	13.34	2.89	10.45	0.46
MW-3	6/9/2006	09:33	13.34	3.26	10.08	-0.37
MW-3	9/11/2006	10:19	13.34	3.70	9.64	-0.44
MW-3	12/15/2006	07:37	13.34	3.10	10.24	0.60
MW-3	3/6/2007	09:16	13.34	3.04	10.30	0.06
MW-3	6/15/2007	07:27	13.34	3.60	9.74	-0.56
MW-3	9/11/2007	08:03	13.34	3.87	9.47	-0.27
MW-3	12/4/2007	08:50	13.34	3.62	9.72	0.25
MW-3	3/20/2008	08:15	13.34	3.13	10.21	0.49
MW-3	6/18/2008	08:24	13.34	3.90	9.44	-0.77
MW-3	9/3/2008	08:02	13.34	3.92	9.42	-0.02
MW-3	12/4/2008	08:10	13.34	3.59	9.75	0.33
MW-3	3/5/2009	09:23	13.34	2.79	10.55	0.80
MW-3	6/11/2009	08:38	13.34	3.14	10.20	-0.35
MW-3	9/3/2009	07:55	13.34	4.31	9.03	-1.17
MW-3	3/2/2010	08:09	13.34	2.94	10.40	1.37
MW-3	9/3/2010	07:07	13.34	3.75	9.59	-0.81
MW-3	3/17/2011	07:59	13.34	4.88	8.46	-1.13
MW-3	9/23/2011	07:23	13.34	6.33	7.01	-1.45
MW-3	3/22/2012	07:45	13.34	5.05	8.29	1.28
MW-3	9/17/2012	08:10	13.34	6.54	6.80	-1.49
MW-4	12/17/2001	10:40	12.43	2.55	9.88	NA
MW-4	3/28/2002	08:05	12.43	3.06	9.37	-0.51
MW-4	6/6/2002	07:57	12.43	2.85	9.58	0.21
MW-4	9/20/2002	08:28	12.43	3.21	9.22	-0.36
MW-4	12/19/2002	08:53	12.43	3.70	8.73	-0.49
MW-4	3/4/2003	10:34	12.43	3.14	9.29	0.56
MW-4	6/9/2003	08:29	12.43	2.82	9.61	0.32
MW-4	9/8/2003	10:04	12.43	3.43	9.00	-0.61
MW-4	12/1/2003	10:14	12.43	3.12	9.31	0.31
MW-4	3/4/2004	09:27	12.43	2.81	9.62	0.31
MW-4	6/2/2004	08:44	12.43	3.34	9.09	-0.53
MW-4	9/14/2004	08:03	12.43	3.51	8.92	-0.17

Table 1. Groundwater Level Data

Well/ Piezometer	Date	Time	Casing Elevation (feet, MSL)	Depth to Water (feet)	Water Elevation (feet, MSL)	Elev. Change from Last Measurement (feet)
MW-4	12/8/2004	07:36	12.43	3.10	9.33	0.41
MW-4	3/3/2005	07:44	12.43	2.48	9.95	0.62
MW-4	6/10/2005	07:02	12.43	2.47	9.96	0.01
MW-4	9/16/2005	08:12	12.43	3.23	9.20	-0.76
MW-4	12/6/2005	07:50	12.43	3.17	9.26	0.06
MW-4	3/10/2006	07:37	12.43	3.77	8.66	-0.60
MW-4	6/9/2006	07:30	12.43	2.49	9.94	1.28
MW-4	9/11/2006	10:17	12.43	3.19	9.24	-0.70
MW-4	12/21/2006	NR	12.43	2.90	9.53	0.29
MW-4	3/6/2007	09:20	12.43	2.54	9.89	0.36
MW-4	6/15/2007	07:33	12.43	3.03	9.40	-0.49
MW-4	9/11/2007	08:11	12.43	3.27	9.16	-0.24
MW-4	12/4/2007	08:55	12.43	3.25	9.18	0.02
MW-4	3/20/2008	08:20	12.43	2.65	9.78	0.60
MW-4	6/18/2008	08:31	12.43	3.35	9.08	-0.70
MW-4	9/3/2008	07:58	12.43	3.28	9.15	0.07
MW-4	12/4/2008	08:17	12.43	3.12	9.31	0.16
MW-4	3/5/2009	09:27	12.43	2.16	10.27	0.96
MW-4	6/11/2009	08:43	12.43	2.84	9.59	-0.68
MW-4	9/3/2009	08:04	12.43	3.49	8.94	-0.65
MW-4	3/2/2010	08:14	12.43	2.32	10.11	1.17
MW-4	9/3/2010	07:10	12.43	3.10	9.33	-0.78
MW-4	3/17/2011	07:55	12.43	4.52	7.91	-1.42
MW-4	9/23/2011	07:21	12.43	5.38	7.05	-0.86
MW-4	3/22/2012	07:50	12.43	4.58	7.85	0.80
MW-4	9/17/2012	08:21	12.43	5.45	6.98	-0.87

Key:

NA = Not available

feet, MSL = feet, relative to Mean Sea Level

Casing elevations for all wells were resurveyed on September 6, 2006 by CSS Environmental Services for Geotracker compliance.

Table 2.
Relative Percent Difference Based on Duplicate Samples

Third Quarter 2012

Analysis	Well MW-2 Results	Duplicate (DUP-1) Results	RPD ¹ (%)
Volatile Organic Compounds ($\mu\text{g/L}$)			
Tetrachloroethene (PCE)	18	12	40
¹ RPD = relative percent difference All other 8010 list analytes not detected (by 8260).			

Table 3a. Summary of Groundwater Monitoring Well Data - Third Quarter 2012

Well No. Field Date	MW-1 9/17/2012	MW-2 9/17/2012	MW-3 9/17/2012	MW-4 9/17/2012	MCL ¹
DCE ²	<5.0	<0.5	53	<0.5	6
DCA ³	<5.0	<0.5	1.7	<0.5	5
cis-1,2-DCE ⁴	<5.0	<0.5	<0.5	<0.5	6
TCA ⁵	<5.0	<0.5	1.5	<0.5	200
TCE ⁶	37	<0.5	<0.5	<0.5	5
PCE ⁷	380	18	<0.5	<0.5	5
Other analytes ⁸	nd ⁹	nd	nd	nd	nd

Notes:

Results measured in micrograms per liter ($\mu\text{g/L}$)

¹ MCL = California Primary Drinking Water Standard - Maximum Contaminant Level

² DCE = 1,1-Dichloroethene

³ DCA = 1,1-Dichloroethane

⁴ cis-1,2-DCE = cis-1,2-Dichloroethene

⁵ TCA = 1,1,1-Trichloroethane

⁶ TCE = Trichloroethene

⁷ PCE = Tetrachloroethene

⁸ All other 8010 list analytes

⁹ nd = not detected above laboratory reporting limit

Table 3b. Historical Summary of Groundwater Monitoring Well Data

Results measured in micrograms per liter ($\mu\text{g/L}$)

Well No.	MW-1																							MCL ¹	
	Field Date	11/16/99	3/30/00	5/16/00	7/28/00	11/30/00	3/26/01	6/25/01	9/28/01	12/17/01	3/21/02	6/6/02	9/20/02	12/19/02	3/4/03	6/9/03	9/8/03	12/1/03	3/4/04	6/2/04	9/14/04	12/8/04	3/3/05		6/10/05
DCE ²	< 50.0	13	< 10	15	14	< 13	14	15	< 13	< 13	< 13	< 13	< 13	< 10	12	5.2	8.4	< 5.0	5.8	6.6	< 5.0	< 5.0	< 2.0	< 5.0	6
CFC 113 ³	na ⁴	1.4	< 10	< 10	< 8.3	< 50	< 50	< 50	< 50	< 13	< 13	< 13	< 13	< 10	< 10	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 5.0	ne ⁵
DCA ⁶	< 50.0	0.8	< 10	< 10	< 4.2	< 13	< 13	< 13	< 13	< 13	< 13	< 13	< 13	< 10	< 10	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 5.0	5
Chloroform	< 50.0	0.6*	< 10	< 10	< 8.3	< 13	< 13	< 13	< 13	< 13	< 13	< 13	< 13	< 10	< 10	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 10	ne
cis-1,2-DCE ⁷	< 10	< 10	< 10	< 10	< 4.2	< 13	< 13	< 13	< 13	< 13	< 13	< 13	< 13	< 10	< 10	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 5.0	6
TCA ⁸	< 50.0	1.6	< 10	< 10	< 4.2	< 13	< 13	< 13	< 13	< 13	< 13	< 13	< 13	< 10	< 10	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 2.0	< 5.0	200
TCE ⁹	178	150	190	170	130	180	250	210	190	160	140	190	68	97	90	110	130	53	72	81	39	15	23	34	5
PCE ¹⁰	906	1,400	1,900	1,200	880	1,000	1,400	1,000	1,400	1,100	980	1,100	600	730	770	780	850	370	490	620	380	160	180	240	5
Other analytes ¹¹	nd ¹²	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Well No.	MW-2																							MCL ¹	
	Field Date	11/16/99	3/30/00	5/16/00	7/28/00	11/30/00	3/26/01	6/25/01	9/28/01	12/17/01	3/28/02	6/6/02	9/20/02	12/30/02	3/4/03	6/9/03	9/8/03	12/1/03	3/4/04	6/2/04	9/14/04	12/8/04	3/3/05		6/10/05
DCE ²	< 50.0	< 0.5	< 25	< 25	< 8.3	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 20	< 20	< 20	< 20	< 20	< 25	< 25	< 20	< 50	< 25	< 20	6
CFC 113 ³	na	< 0.5	< 25	< 25	< 17	< 100	< 100	< 100	< 100	< 25	< 25	< 25	< 25	< 20	< 20	< 20	< 20	< 20	< 25	< 25	< 20	< 50	< 25	< 20	ne ⁵
DCA ⁶	< 50.0	< 0.5	< 25	< 25	< 8.3	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 20	< 20	< 20	< 20	< 20	< 25	< 25	< 20	< 50	< 25	< 20	5
Chloroform	< 50.0	< 0.5	< 25	< 25	< 17	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 20	< 20	< 20	< 20	< 20	< 25	< 25	< 20	< 50	< 25	< 40	ne
cis-1,2-DCE ⁷	< 50.0	< 0.5	< 25	< 25	< 8.3	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 20	< 20	< 20	< 20	< 20	< 25	< 25	< 20	< 50	< 25	< 20	6
TCA ⁸	< 50.0	5.0	< 25	< 25	< 8.3	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 25	< 20	< 20	< 20	< 20	< 20	< 25	< 25	< 20	< 50	< 25	< 20	200
TCE ⁹	< 50	29	53	< 25	20	40	78	< 25	< 25	49	52	32	< 25	58	41	28	25	39	49	37	30	78	43	29	5
PCE ¹⁰	840	3,600	3,200	3,300	1,700	2,200	4,400	1,700	1,700	3,500	3,800	2,100	1,800	3,900	3,800	2,500	2,500	3,000	4,100	3,800	2,800	7,300	3,600	2,500	5
Other analytes ¹¹	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Notes:

¹ MCL = California Primary Drinking Water Standard - Maximum Contaminant Level (in micrograms per liter [$\mu\text{g/L}$])

² DCE = 1,1-Dichloroethene

³ CFC 113 = Trichlorotrifluoroethane (1,1,2-Trichloro-1,2,2-trifluoroethane)

⁴ na = not analyzed

⁵ ne = not established or none applicable

⁶ DCA = 1,1-Dichloroethane

⁷ cis-1,2-DCE = cis-1,2-Dichloroethene

⁸ TCA = 1,1,1-Trichloroethane

⁹ TCE = Trichloroethene

¹⁰ PCE = Tetrachloroethene

¹¹ All other 8010 list analytes

¹² nd = not detected above laboratory reporting limit

* Chloroform detected in equipment blank at 1.6 $\mu\text{g/L}$ for 3/30/00 event.

Table 3b. Historical Summary of Groundwater Monitoring Well Data

Well No.	MW-1																					MCL ¹	
	Field Date	12/6/05	3/10/06	6/9/06	9/11/06	12/15/06	3/6/07	6/15/07	9/11/07	12/4/07	3/20/08	6/18/08	9/3/08	12/4/08	3/5/09	6/11/09	9/3/09	3/2/10	9/3/10	3/17/11	9/23/11		3/22/12
DCE ²	<2.0	<0.5	<2.0	3.3	<2.0	<2.0	3.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<0.5	<2.5	<10	<5.0	<5.0	<5.0	6.1	<5.0	<5.0	6
CFC 113 ³	<2.0	<0.5	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<0.5	<2.5	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	ne ⁵
DCA ⁶	<2.0	<0.5	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<0.5	<2.5	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5
Chloroform	<4.0	1.4	<4.0	<4.0	<4.0	<4.0	<4.0	<10	<10	<4.0	<10	<10	<10	1.9	<5.0	<20	<10	<10	<10	<10	<10	<10	ne
cis-1,2-DCE ⁷	<2.0	<0.5	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	0.62	<2.5	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	6
TCA ⁸	<2.0	<0.5	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0	<5.0	<2.0	<5.0	<5.0	<5.0	<0.5	<2.5	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	200
TCE ⁹	16	3.4	22	47	20	17	38	51	29	18	42	65	42	6.5	40	68	27	57	36	89	40	37	5
PCE ¹⁰	140	39	140	400	210	170	310	430	330	170	390	620	320	68	300	640	170	420	330	850	350	380	5
Other analytes ¹¹	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd ⁹	--

Well No.	MW-2																					MCL ¹	
	Field Date	12/6/05	3/10/06	6/9/06	9/11/06	12/15/06	3/6/07	6/15/07	9/11/07	12/4/07	3/20/08	6/18/08	9/3/08	12/4/08	3/5/09	6/11/09	9/3/09	3/2/10	9/3/10	3/17/11	9/23/11		3/22/12
DCE ²	<25	<25	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<25	<5.0	<5.0	<5.0	<5.0	<0.5	<0.5	<0.5	6
CFC 113 ³	<25	<25	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<25	<5.0	<5.0	<5.0	<5.0	<0.5	<0.5	<0.5	ne ⁵
DCA ⁶	<25	<25	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<25	<5.0	<5.0	<5.0	<5.0	<0.5	<0.5	<0.5	5
Chloroform	<50	<50	<40	<20	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<50	<10	<10	<10	<10	<1.0	<1.0	<1.0	ne
cis-1,2-DCE ⁷	<25	<25	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<25	<5.0	8.0	6.2	13	1.3	3.8	<0.5	6
TCA ⁸	<25	<25	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<25	<5.0	<5.0	<5.0	<5.0	<0.5	<0.5	<0.5	200
TCE ⁹	45	59	<20	<20	<20	<20	22	31	<20	<20	21	<20	<20	<20	<25	<5.0	9.5	<5.0	6.3	0.93	2.3	<0.5	5
PCE ¹⁰	3,300	5,200	1,600	990	1,000	1,600	2,400	1,700	1,100	2,900	1,700	1,600	2,000	2,300	1,500	410	860	180	530	40	120	18	5
Other analytes ¹¹	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Notes:

¹ MCL = California Primary Drinking Water Standard - Maximum Contaminant Level

² DCE = 1,1-Dichloroethene

³ CFC 113 = Trichlorotrifluoroethane (1,1,2-Trichloro-1,2,2-trifluoroethane)

⁴ na = not analyzed

⁵ ne = not established or none applicable

⁶ DCA = 1,1-Dichloroethane

⁷ cis-1,2-DCE = cis-1,2-Dichloroethene

⁸ TCA = 1,1,1-Trichloroethane

⁹ TCE = Trichloroethene

¹⁰ PCE = Tetrachloroethene

¹¹ All other 8010 list analytes

¹² nd = not detected above laboratory reporting limit

Table 3b. Historical Summary of Groundwater Monitoring Well Data

Results measured in micrograms per liter (µg/L)

Well No.	MW-3																										MCL ¹	
Field Date	11/16/99	3/30/00	5/16/00	7/28/00	11/30/00	3/26/01	6/25/01	9/28/01	12/17/01	3/21/02	6/6/02	9/20/02	12/19/02	3/4/03	6/9/03	9/8/03	12/1/03	3/4/04	6/2/04	9/14/04	12/8/04	3/3/05	6/10/05	9/16/05	12/6/05	3/10/06	6/9/06	MCL ¹
DCE ²	<0.500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.51	<0.5	0.81	<0.5	<0.5	0.68	2.4	1.5	1.1	0.86	4.3	6
CFC 113 ³	na	<0.5	<0.5	<0.5	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ne ⁵
DCA ⁶	<0.500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.50	5
Chloroform	<0.500	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	ne
cis-1,2-DCE ⁷	<0.500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
TCA ⁸	<0.500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	200
TCE ⁹	<0.500	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
PCE ¹⁰	<0.500	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	0.81	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.90	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
Other analytes ¹¹	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Well No.	MW-4																										MCL ¹	
Field Date	12/17/01	3/28/02	6/6/02	9/20/02	12/19/02	3/4/03	6/9/03	9/8/03	12/1/03	3/4/04	6/2/04	9/14/04	12/8/04	3/3/05	6/10/05	9/16/05	12/6/05	3/10/06	6/9/06	9/11/06	12/21/06	3/6/07	6/15/07	9/11/07	12/4/07	3/20/08	6/18/08	MCL ¹
DCE ²	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
CFC 113 ³	<2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ne ⁵
DCA ⁶	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
Chloroform	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ne
cis-1,2-DCE ⁷	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
TCA ⁸	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	200
TCE ⁹	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
PCE ¹⁰	2.6	2.8	2.0	2.5	1.1	2.1	2.1	1.6	1.6	1.7	1.4	1.3	1.2	0.93	0.98	0.8	1.1	0.79	0.64	0.70	0.63	0.70	0.75	0.86	0.92	0.91	0.86	5
Other analytes ¹¹	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Notes:

¹ MCL = California Primary Drinking Water Standard - Maximum Contaminant Level (in micrograms per liter [µg/L])

² DCE = 1,1-Dichloroethene

³ CFC 113 = Trichlorotrifluoroethane (1,1,2-Trichloro-1,2,2-trifluoroethane)

⁴ na = not analyzed

⁵ ne = not established or none applicable

⁶ DCA = 1,1-Dichloroethane

⁷ cis-1,2-DCE = cis-1,2-Dichloroethene

⁸ TCA = 1,1,1-Trichloroethane

⁹ TCE = Trichloroethene

¹⁰ PCE = Tetrachloroethene

¹¹ All other 8010 list analytes

¹² nd = not detected above laboratory reporting limit

Table 3b. Historical Summary of Groundwater Monitoring Well Data

Well No.	MW-3																			MCL ¹
Field Date	9/11/06	12/15/06	3/6/07	6/15/07	9/11/07	12/4/07	3/20/08	6/18/08	9/3/08	12/4/08	3/5/09	6/11/09	9/3/09	3/2/10	9/3/10	3/17/11	9/23/11	3/22/12	9/17/12	
DCE ²	2.8	1.6	1.5	2.4	1.4	1.1	1.0	1.4	0.79	0.59	<0.5	0.95	0.51	<0.5	0.64	13	34	45	53	6
CFC 113 ³	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ne ⁵
DCA ⁶	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.90	1.4	1.4	1.7	5
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ne
cis-1,2-DCE ⁷	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
TCA ⁸	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	1.5	1.5	200
TCE ⁹	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
PCE ¹⁰	<0.5	0.56	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.79	<0.5	<0.5	5
Other analytes ¹¹	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Well No.	MW-4											MCL ¹
Field Date	9/3/08	12/4/08	3/5/09	6/11/09	9/3/09	3/2/10	9/3/10	3/17/11	9/23/11	3/22/12	9/17/12	
DCE ²	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
CFC 113 ³	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ne ⁵
DCA ⁶	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	ne
cis-1,2-DCE ⁷	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6
TCA ⁸	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	200
TCE ⁹	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
PCE ¹⁰	0.84	0.65	0.62	0.70	0.79	0.78	0.64	<0.5	<0.5	<0.5	<0.5	5
Other analytes ¹¹	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--

Notes:

¹ MCL = California Primary Drinking Water Standard - Maximum Contaminant Level

² DCE = 1,1-Dichloroethene

³ CFC 113 = Trichlorotrifluoroethane (1,1,2-Trichloro-1,2,2-trifluoroethane)

⁴ na = not analyzed

⁵ ne = not established or none applicable

⁶ DCA = 1,1-Dichloroethane

⁷ cis-1,2-DCE = cis-1,2-Dichloroethene

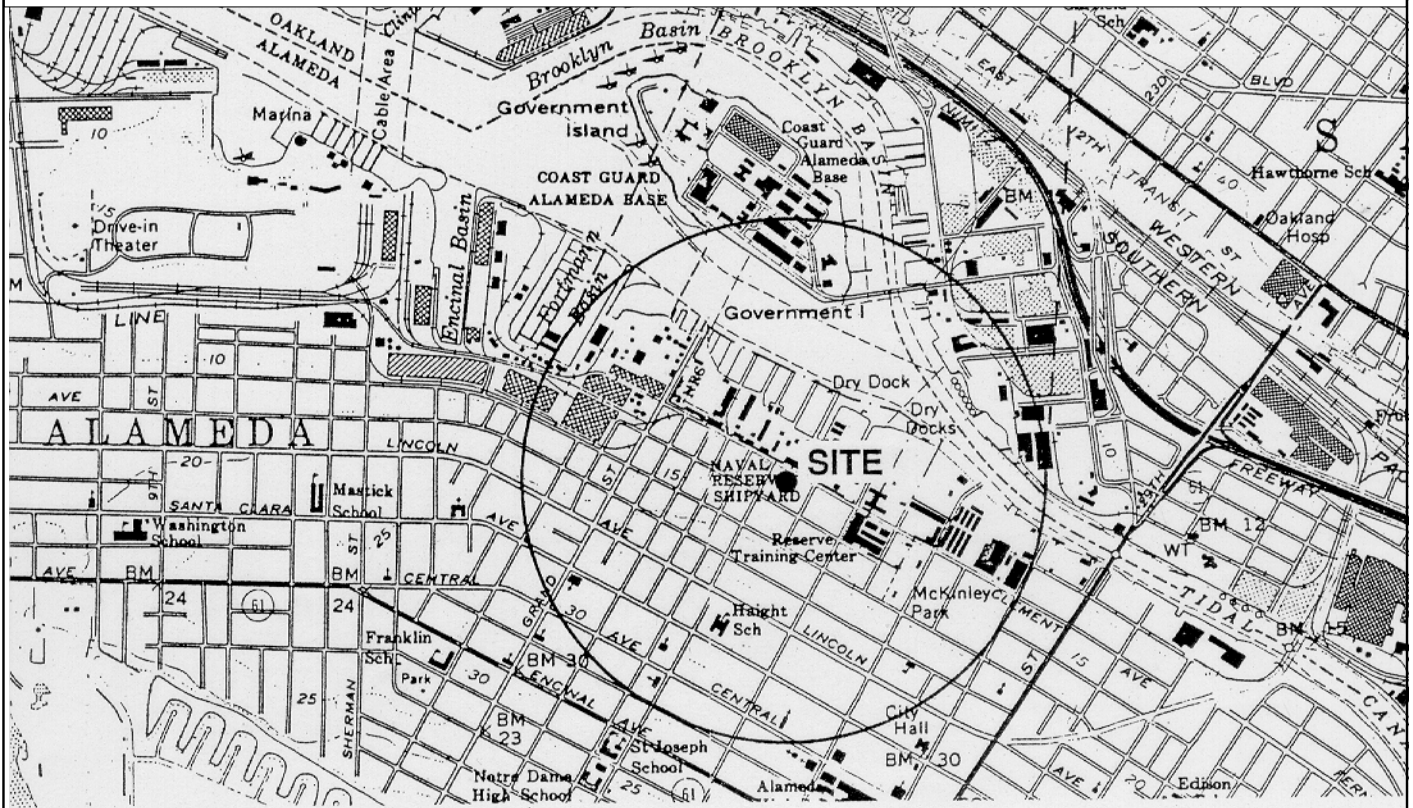
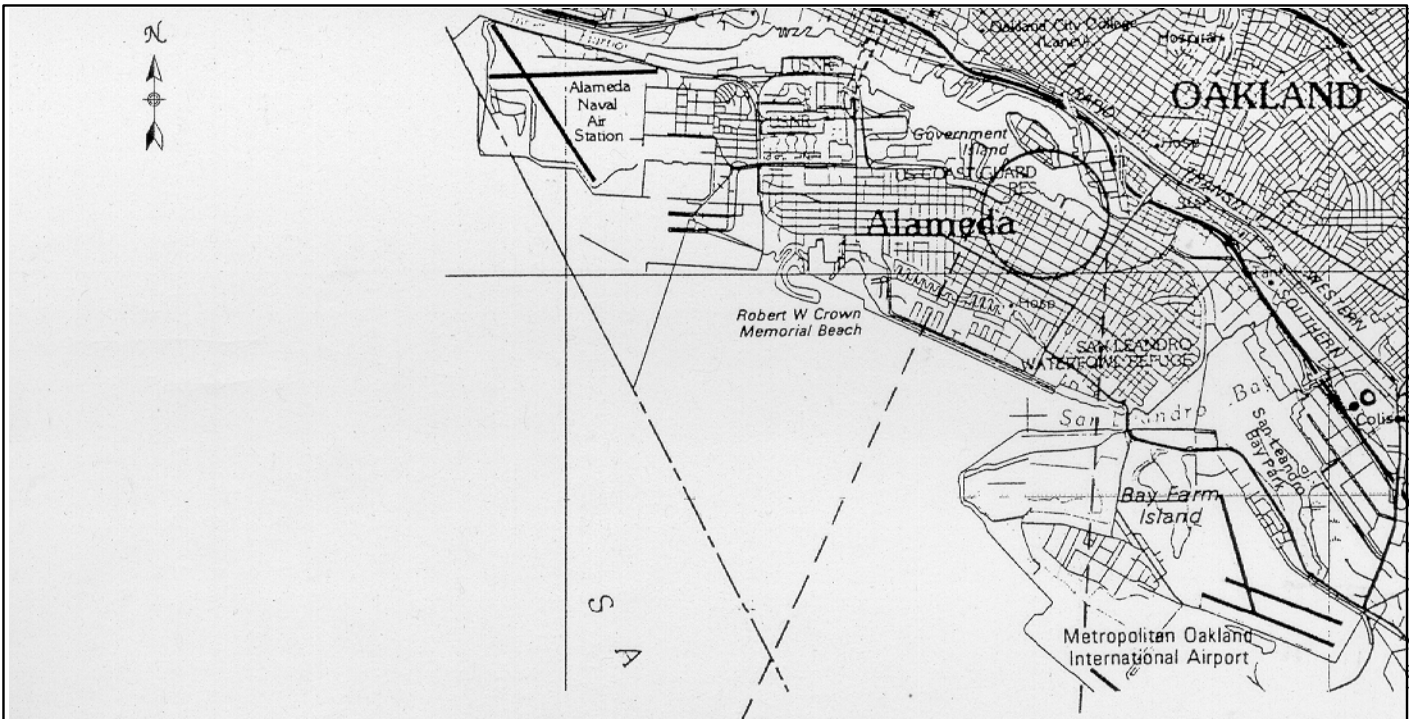
⁸ TCA = 1,1,1-Trichloroethane

⁹ TCE = Trichloroethene

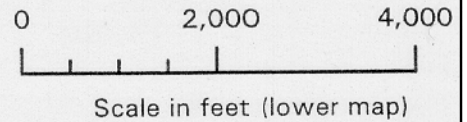
¹⁰ PCE = Tetrachloroethene

¹¹ All other 8010 list analytes

¹² nd = not detected above laboratory reporting limit



Base map (upper): U.S.G.S. 1:1,000,000-scale series (Topographic)
 San Francisco Quadrangle, California, 1978.
 Base map (lower): U.S.G.S. 7.5 minute series (Topographic)
 Oakland East and Oakland West Quadrangles, California,
 1959, Photorevised 1980.



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 INC.**

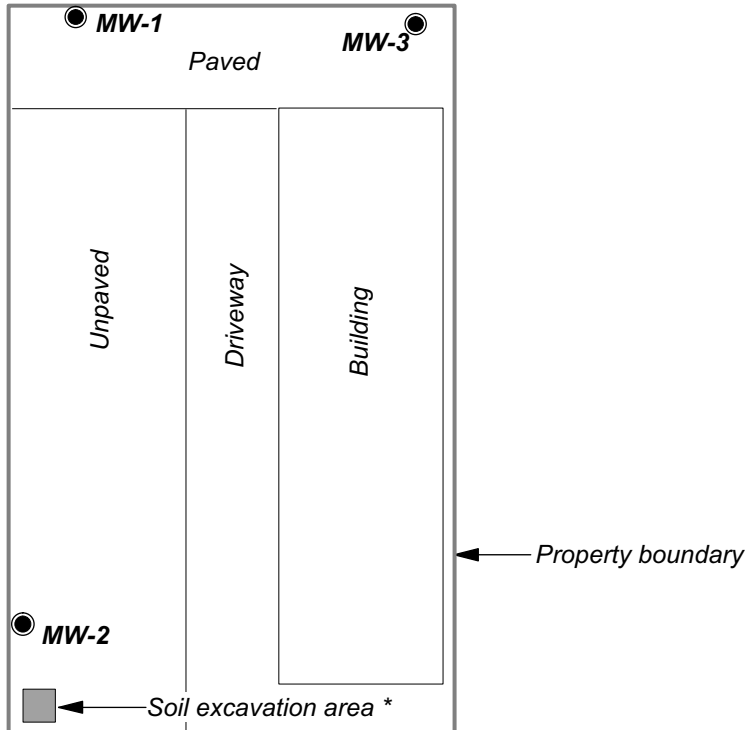
Project No. CS1605
 Cargill Salt Dispensing Systems Division
 2016 Clement Avenue, Alameda, California
Figure 1. Site Location



MW-4

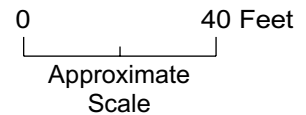
Curb line (Typ.)

Clement Avenue



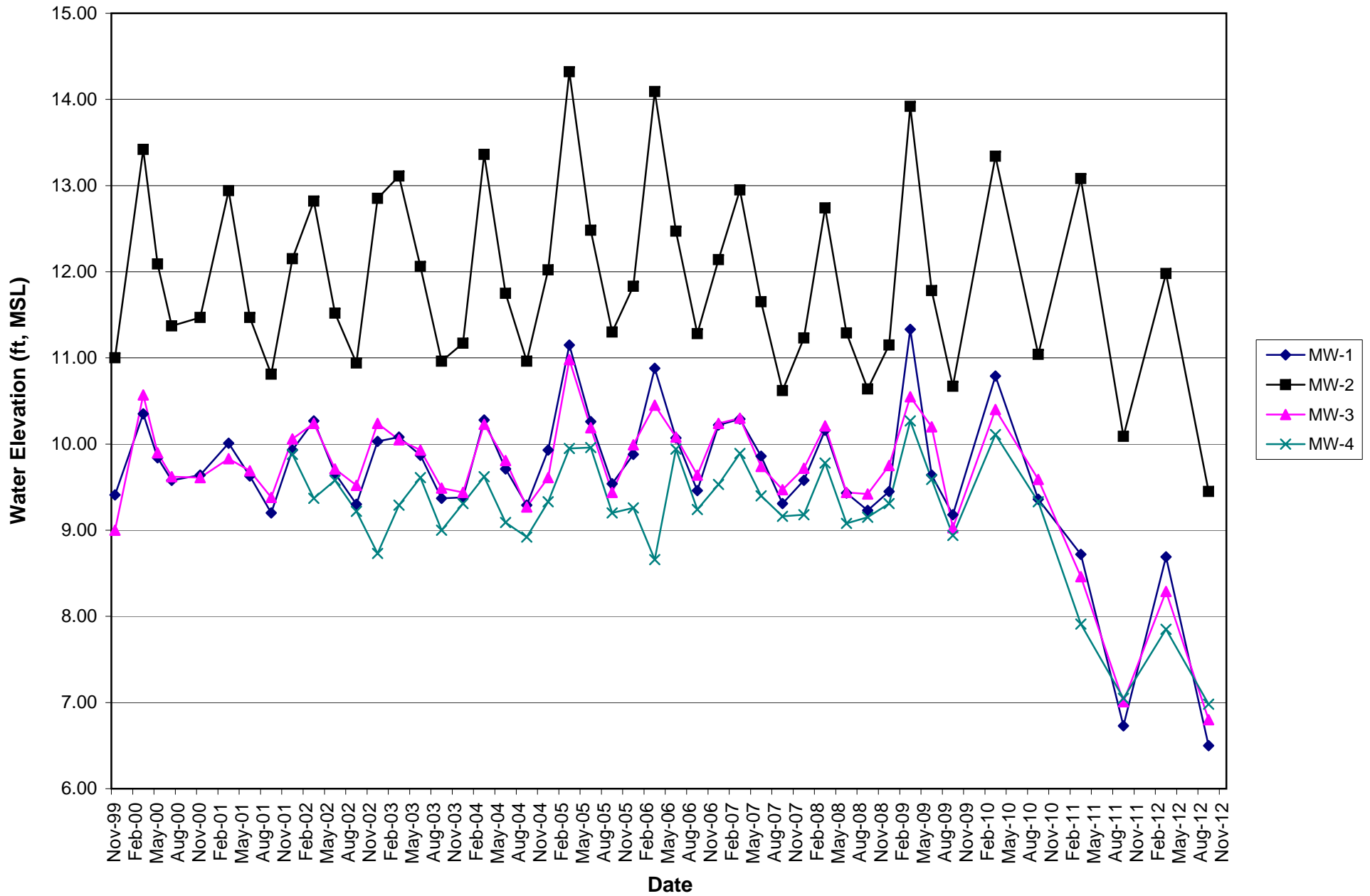
EXPLANATION

- Groundwater monitoring well
- * Excavated in February 1994



Project No. CS1605
 Cargill Salt Dispensing Systems Division
 2016 Clement Avenue, Alameda, California
Figure 2. Groundwater Monitoring Well Locations

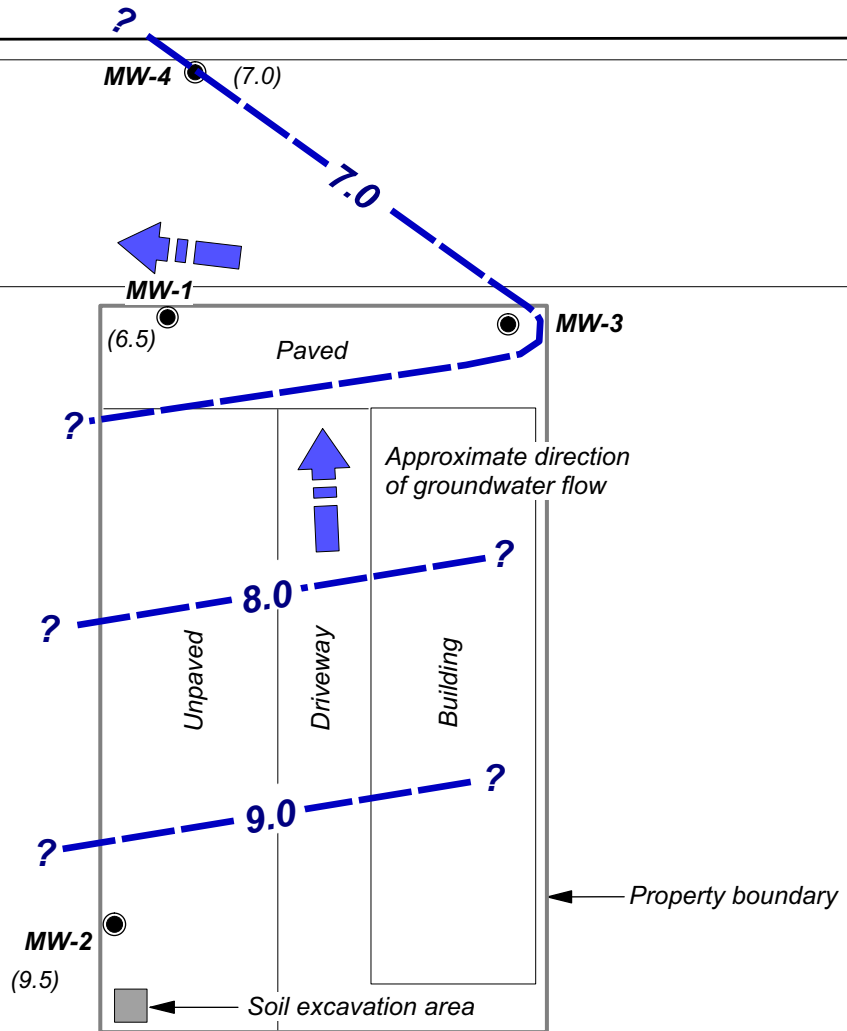
Figure 3. Graphical Summary of Groundwater Elevations





Curb line (Typ.)

Clement Avenue



EXPLANATION

● Monitoring well

(7.0) Groundwater elevation (Ft.-MSL);
measured 9/17/12

?-7.0- Groundwater elevation contour
(Ft.-MSL)

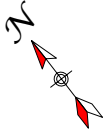
0 40 Feet
Approximate
Scale

1605fig412Q3.dsf 11/7/12

Base map from Conor Pacific/EFW, Off-Site
Groundwater Characterization, August 21, 2002.



Project No. CS1605
Cargill Salt Dispensing Systems Division
2016 Clement Avenue, Alameda, California
Figure 4. Groundwater Elevation Contours - September 2012



Curb line (Typ.)

Clement Avenue

MW-4

DCE	<0.5
DCA	<0.5
cis-1,2-DCE	<0.5
TCA	<0.5
TCE	<0.5
PCE	<0.5

DCE	<5.0
DCA	<5.0
cis-1,2-DCE	<5.0
TCA	<5.0
TCE	37
PCE	380

MW-1 Paved MW-3

DCE	53
DCA	1.7
cis-1,2-DCE	<0.5
TCA	1.5
TCE	<0.5
PCE	<0.5

DCE	<0.5
DCA	<0.5
cis-1,2-DCE	<0.5
TCA	<0.5
TCE	<0.5
PCE	18

MW-2

Soil excavation area

Unpaved

Driveway

Building

Property boundary

EXPLANATION

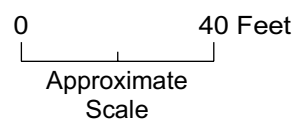
● Groundwater monitoring well location All concentrations reported in micrograms per liter (µg/L), in groundwater. All other 8010 list analytes were below detection limits.

— Analyte concentration

DCE	53
DCA	1.7
cis-1,2-DCE	<0.5
TCA	1.5
TCE	<0.5
PCE	<0.5

— Analytical parameter

DCE = 1,1-Dichloroethene
 DCA = 1,1-Dichloroethane
 PCE = Tetrachloroethene
 TCA = 1,1,1-Trichloroethane
 TCE = Trichloroethene
 VOCs = Volatile organic compounds
 cis-1,2-DCE = cis-1,2-Dichloroethene



1605fig512Q3.dsf 11/5/12

Base map from Conor Pacific/EFW, Off-Site Groundwater Characterization, August 21, 2002.



Project No. CS1605
 Cargill Salt Dispensing Systems Division
 2016 Clement Avenue, Alameda, California
Figure 5. VOC Concentrations in Groundwater – September 2012

Figure 6. Graphical Summary of PCE Concentrations

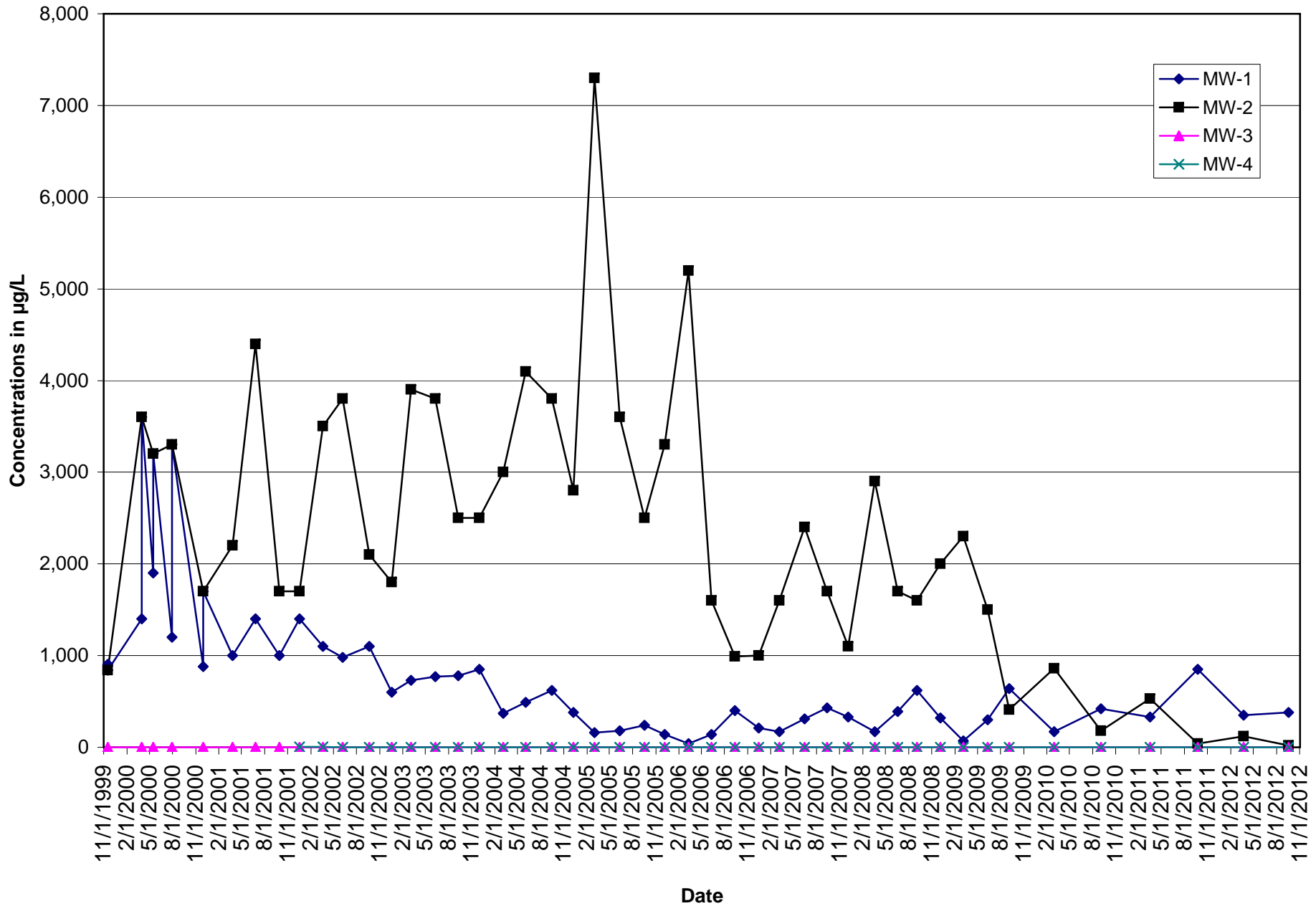
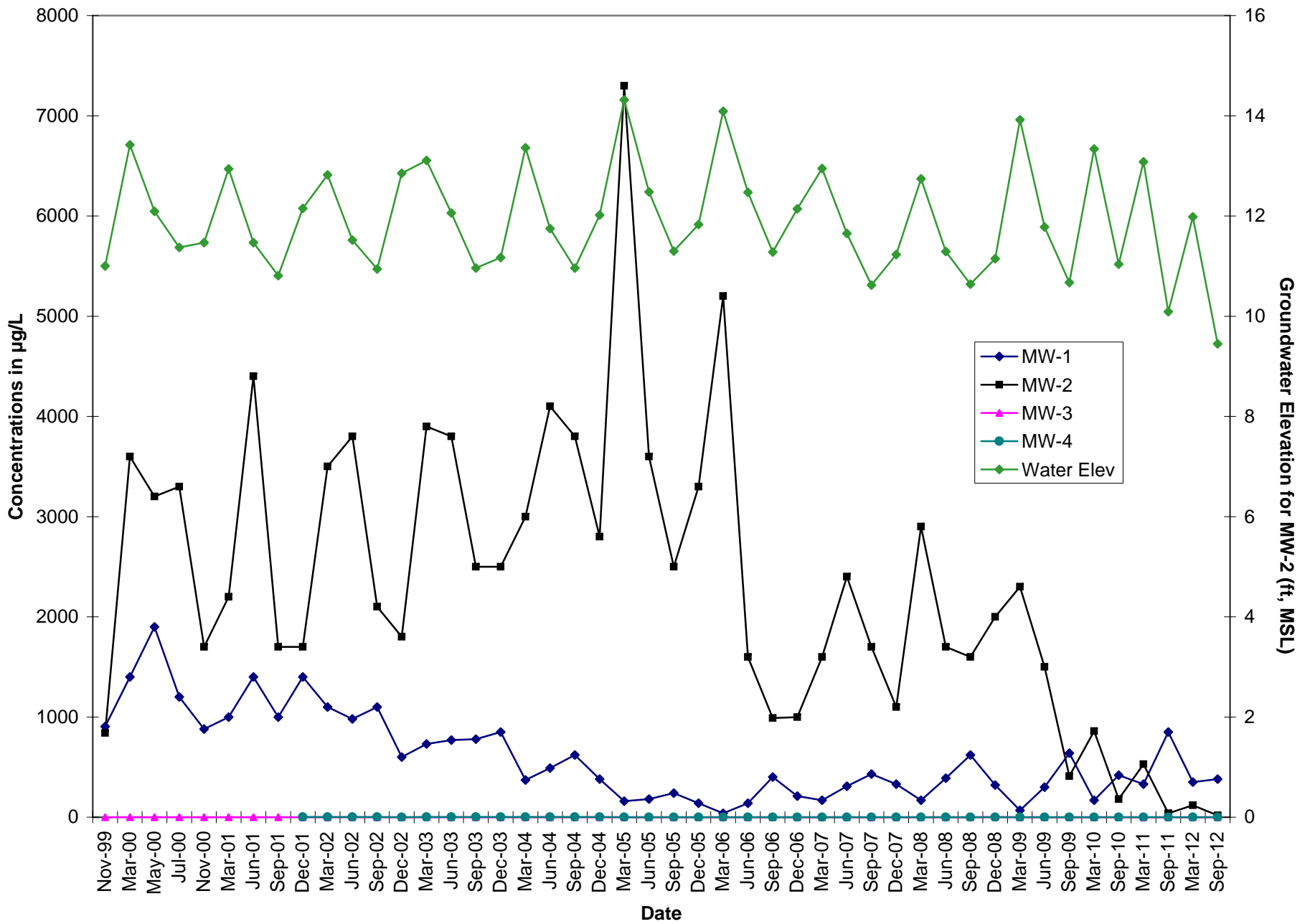


Figure 7. PCE Concentrations vs. Groundwater Elevation



Appendix A
Field Data Sheets

WATER LEVEL FIELD DATA

Cargill Salt
 Alameda Facility
 Alameda, California
 Project No. CS1605

Well ID	Date	Time	Depth to Water (1st Msmt.) (feet)	Depth to Water (2nd Msmt.) (feet)	Comments
MW-1	9/17/12	0814	6.66	6.66	well ok
MW-2	9/17/12	0818	6.77	6.77	leaks on well
MW-3	9/17/12	0810 0811	6.54	6.54	well ok
MW-4	9/17/12	0821	5.45	5.45	well lid does not secure, needs new box

Data Collection

Field measurements by: Print: <u>Ruben Guerra</u> Signature: <u>[Signature]</u> Date: <u>9/17/12</u>	Reviewed by: Print: <u>J Butkus</u> Signature: <u>[Signature]</u> Date: <u>9/18/12</u>
---	---

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-2
 Sample ID: MW-2
 Start Date: 9/17/12
 Finish Date: 9/17/12

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 6.92 Well depth (ft): 17.5
 One casing volume (gal.): 0.43 Calculated purge volume (gal.) (3 x casing volume): 1.30
 $One\ casing\ volume = \pi \times [casing\ radius\ (in.) \times 1\ ft/12\ in.]^2 \times [well\ depth\ (ft) - depth\ to\ water\ (ft)] \times 7.48\ gal/ft^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): ND Method for checking: Interface probe Clear bailer

WELL PURGING

Date purged: 9/17/12 Start time: 1126 End time: 1147
 Purging equipment: Submersible pump Bladder pump Peristaltic pump
 PVC bailer Teflon bailer Other
 Purge rate: 0.2 gal/min Well yield (H/L): High
 Purge water disposal: Drum on site

Time (2400 hr)	Cumulative Vol. Purged (gal)	pH (units)	EC (μS/cm)	T (°C)	Color (Visual)	Turbidity (Visual or NTU)
<u>1133</u>	<u>1.6</u>	<u>6.82</u>	<u>503</u>	<u>17.4</u>	<u>Tan</u>	<u>89.1</u>
<u>1140</u>	<u>3.2</u>	<u>6.88</u>	<u>483</u>	<u>17.6</u>	<u>clear</u>	<u>19.3</u>
<u>1147</u>	<u>4.9</u>	<u>6.91</u>	<u>481</u>	<u>17.7</u>	<u>clear</u>	<u>7.7</u>

Total Purged (gal): (4) 1.3

WELL SAMPLING

Date sampled: 9/17/12 Start time: 1150 End time: 1156
 Sampling equipment: Peristaltic pump Bladder pump Teflon bailer
 PVC bailer Other

Depth to water (ft) before sampling: 7.51

Weather conditions: Slightly cloudy Ambient temperature (° F): 65
 Well condition/Remarks: Dup-1 collector All samples collected

Meter calibration: EC pH
 Temperature SEEMW-4 Turbidity

Purged and sampled by (print): A. Szwedarg
 Signature: [Signature] Reviewed by: [Signature]

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-3
 Sample ID: MW-3
 Start Date: 9/17/12
 Finish Date: 9/17/12

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 6.41 Well depth (ft): 17.6
 One casing volume (gal.): 0.45 Calculated purge volume (gal.) (3 x casing volume): 1.37
 One casing volume = $\pi \times [\text{casing radius (in.)} \times 1 \text{ ft}/12 \text{ in.}]^2 \times [\text{well depth (ft)} - \text{depth to water (ft)}] \times 7.48 \text{ gal/ft}^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): ND Method for checking: Interface probe Clear bailer

WELL PURGING

Date purged: 9/17/12 Start time: 0936 End time: 1018
 Purging equipment: Submersible pump Bladder pump Peristaltic pump
 PVC bailer Teflon bailer Other
 Purge rate: ~~0.25~~ 0.12 gpm Well yield (H/L): Low
 Purge water disposal: Drum on site

Time (2400 hr)	Cumulative Vol. Purged (gal.)	pH (units)	EC ($\mu\text{S/cm}$)	T ($^{\circ}\text{C}$)	Color (Visual)	Turbidity (Visual or NTU)
<u>0950</u>	<u>1.7</u>	<u>7.49</u>	<u>584</u>	<u>18.1</u>	<u>clear</u>	<u>6.2</u>
<u>1003</u>	<u>3.4</u>	<u>7.51</u>	<u>579</u>	<u>18.4</u>	<u>clear</u>	<u>14.2</u>
<u>1018</u>	<u>5.2</u>	<u>7.54</u>	<u>578</u>	<u>18.3</u>	<u>tan</u>	<u>9.5</u>

Total Purged (gal.): (L) 1.4

WELL SAMPLING

Date sampled: 9/17/12 Start time: 1020 End time: 1023
 Depth to water (ft) before sampling: 16.50
 Sampling equipment: Peristaltic pump Bladder pump Teflon bailer
 PVC bailer Other

Weather conditions: cloudy overcast Ambient temperature ($^{\circ}\text{F}$): 60
 Well condition/Remarks: All samples collected

Meter calibration: EC SEEMW-4 pH
 Temperature Turbidity
 Purged and sampled by (print): Aguevans
 Signature: [Signature] Reviewed by: [Signature]

SAMPLE COLLECTION FIELD DATA

Project No.: CS1605
 Project Name: Alameda Facility
 Location: Alameda, CA
 Client: Cargill Salt

Well ID: MW-4
 Sample ID: MW-4
 Start Date: 9/17/12
 Finish Date: 9/17/12

WELL INFORMATION

Casing diameter (in.): 1.0 Depth to water (ft): 5.45 Well depth (ft): 19.0
 One casing volume (gal.): 0.56 Calculated purge volume (gal.) (3 x casing volume): 1.67
 $One\ casing\ volume = \pi \times [casing\ radius\ (in.) \times 1\ ft/12\ in.]^2 \times [well\ depth\ (ft) - depth\ to\ water\ (ft)] \times 7.48\ gal/ft^3$
 Gallons per linear ft for casing diameter of: 1" = 0.041 2" = 0.16 4" = 0.65 5" = 1.0 6" = 1.5 8" = 2.6
 Floating product thickness (ft): ND Method for checking: Interface probe Clear bailer

WELL PURGING

Date purged: 9/17/12 Start time: 0832 End time: 0919
 Purging equipment: Submersible pump Bladder pump Peristaltic pump
 PVC bailer Teflon bailer Other
 Purge rate: 0.13 Lpm Well yield (GAL): 175H
 Purge water disposal: DRUMONSITE

Time (2400 hr)	Cumulative Vol. Purged (gals)	pH (units)	EC (µS/cm)	T (°C)	Color (Visual)	Turbidity (Visual or NTU)
<u>0850</u>	<u>2.1</u>	<u>7.28</u>	<u>740</u>	<u>19.3</u>	<u>clear</u>	<u>9.1</u>
<u>0901</u>	<u>4.2</u>	<u>7.40</u>	<u>643</u>	<u>19.8</u>	<u>clear</u>	<u>6.6</u>
<u>0919</u>	<u>6.3</u>	<u>7.53</u>	<u>642</u>	<u>19.7</u>	<u>clear</u>	<u>2.7</u>

Total Purged (gals): 1.7

WELL SAMPLING

Date sampled: 9/17/12 Start time: 0922 End time: 0925
 Depth to water (ft) before sampling: 12.41
 Sampling equipment: Peristaltic pump Bladder pump Teflon bailer
 PVC bailer Other

Weather conditions: cloudy overcast Ambient temperature (° F): 60
 Well condition/Remarks: well has head replacement
 All samples collected

Meter calibration: EC 16,550, 16,630 pH 97.7 cu 11.01, 10.01, 11.01, 4.01
 Temperature 16.7 Turbidity scay, 20.0.2
 Purged and sampled by (print): R. Suarez
 Signature: [Signature] Reviewed by: [Signature]

Appendix B

Groundwater Velocity Calculations

APPENDIX B
GROUNDWATER VELOCITY CALCULATIONS

FOR CARGILL ALAMEDA SITE

GROUNDWATER VELOCITY FORMULA

$V = Ki/n$ where:

V = average linear groundwater velocity i = hydraulic gradient
 K = hydraulic conductivity n = effective porosity

PARAMETERS

Range of hydraulic conductivity values (K) from slug tests:

Material	Well	K (cm/sec)
Silty sand (SM) and Clayey sand (SC)	MW-1	0.00002
Silty sand (SM) and Clayey sand (SC)	MW-2	0.00002
Silty sand (SM) and Clayey sand (SC)	MW-3	0.000003

Highest measured K = 0.00002

Porosity (n) = 33% (from laboratory analysis of boring B21 soil sample)

Hydraulic gradient (i) calculated from groundwater contours:

September 2012 0.024

UNIT CONVERSIONS

1 day = 86,400 sec 1 cm/sec = 2,834.65 ft/day
 1 foot = 30.48 cm 1 cm/sec = 1,034,645.67 ft/yr

CALCULATED VELOCITIES

Measurement Event	Flow Direction	K (cm/sec)	i (ft/ft)	n	V (ft/yr)
September 2012	NE	0.00002	0.024	0.33	2

Calculations and assumptions prepared by:

Mark C. Wheeler

Date: 11/7/12

Appendix C

Certified Analytical Reports and Chain-of-Custody Documentation

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pleasanton
1220 Quarry Lane
Pleasanton, CA 94566
Tel: (925)484-1919

TestAmerica Job ID: 720-44572-1
Client Project/Site: Alameda Facility CS 1605

For:
Crawford Consulting Inc
4 North First Street Suite 650
San Jose, California 95113-1326

Attn: Mr. Mark Wheeler



Authorized for release by:
9/24/2012 9:59:35 AM

Onieka Howard
Project Manager I
onieka.howard@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



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Definitions/Glossary

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CNF	Contains no Free Liquid
DL, RA, RE, IN	Indicates a Dilution, Reanalysis, Re-extraction, or additional Initial metals/anion analysis of the sample
EDL	Estimated Detection Limit
EPA	United States Environmental Protection Agency
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RL	Reporting Limit
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Job ID: 720-44572-1

Laboratory: TestAmerica Pleasanton

Narrative

Job Narrative
720-44572-1

Comments

No additional comments.

Receipt

The samples were received on 9/17/2012 12:45 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.8° C.

GC/MS VOA

No analytical or quality issues were noted.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Detection Summary

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Client Sample ID: MW-1

Lab Sample ID: 720-44572-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	37		5.0		ug/L	10		8260B	Total/NA
Tetrachloroethene	380		5.0		ug/L	10		8260B	Total/NA

Client Sample ID: MW-2

Lab Sample ID: 720-44572-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Tetrachloroethene	18		0.50		ug/L	1		8260B	Total/NA

Client Sample ID: MW-3

Lab Sample ID: 720-44572-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,1-Dichloroethene	53		0.50		ug/L	1		8260B	Total/NA
1,1-Dichloroethane	1.7		0.50		ug/L	1		8260B	Total/NA
1,1,1-Trichloroethane	1.5		0.50		ug/L	1		8260B	Total/NA

Client Sample ID: MW-4

Lab Sample ID: 720-44572-4

No Detections

Client Sample ID: DUP-1

Lab Sample ID: 720-44572-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Tetrachloroethene	12		0.50		ug/L	1		8260B	Total/NA

Client Sample ID: TB-1

Lab Sample ID: 720-44572-6

No Detections

Client Sample Results

Client: Crawford Consulting Inc
 Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Client Sample ID: MW-1
Date Collected: 09/17/12 11:06
Date Received: 09/17/12 12:45

Lab Sample ID: 720-44572-1
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		5.0		ug/L			09/18/12 17:47	10
1,1-Dichloroethane	ND		5.0		ug/L			09/18/12 17:47	10
Dichlorodifluoromethane	ND		5.0		ug/L			09/18/12 17:47	10
Vinyl chloride	ND		5.0		ug/L			09/18/12 17:47	10
Chloroethane	ND		10		ug/L			09/18/12 17:47	10
Trichlorofluoromethane	ND		10		ug/L			09/18/12 17:47	10
Methylene Chloride	ND		50		ug/L			09/18/12 17:47	10
trans-1,2-Dichloroethene	ND		5.0		ug/L			09/18/12 17:47	10
cis-1,2-Dichloroethene	ND		5.0		ug/L			09/18/12 17:47	10
Chloroform	ND		10		ug/L			09/18/12 17:47	10
1,1,1-Trichloroethane	ND		5.0		ug/L			09/18/12 17:47	10
Carbon tetrachloride	ND		5.0		ug/L			09/18/12 17:47	10
1,2-Dichloroethane	ND		5.0		ug/L			09/18/12 17:47	10
Trichloroethene	37		5.0		ug/L			09/18/12 17:47	10
1,2-Dichloropropane	ND		5.0		ug/L			09/18/12 17:47	10
Dichlorobromomethane	ND		5.0		ug/L			09/18/12 17:47	10
trans-1,3-Dichloropropene	ND		5.0		ug/L			09/18/12 17:47	10
cis-1,3-Dichloropropene	ND		5.0		ug/L			09/18/12 17:47	10
1,1,2-Trichloroethane	ND		5.0		ug/L			09/18/12 17:47	10
Tetrachloroethene	380		5.0		ug/L			09/18/12 17:47	10
Chlorodibromomethane	ND		5.0		ug/L			09/18/12 17:47	10
Chlorobenzene	ND		5.0		ug/L			09/18/12 17:47	10
Bromoform	ND		10		ug/L			09/18/12 17:47	10
1,1,2,2-Tetrachloroethane	ND		5.0		ug/L			09/18/12 17:47	10
1,3-Dichlorobenzene	ND		5.0		ug/L			09/18/12 17:47	10
1,4-Dichlorobenzene	ND		5.0		ug/L			09/18/12 17:47	10
1,2-Dichlorobenzene	ND		5.0		ug/L			09/18/12 17:47	10
Chloromethane	ND		10		ug/L			09/18/12 17:47	10
Bromomethane	ND		10		ug/L			09/18/12 17:47	10
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.0		ug/L			09/18/12 17:47	10
EDB	ND		5.0		ug/L			09/18/12 17:47	10
1,2,4-Trichlorobenzene	ND		10		ug/L			09/18/12 17:47	10
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	91		70 - 130					09/18/12 17:47	10
<i>4-Bromofluorobenzene</i>	86		67 - 130					09/18/12 17:47	10
<i>1,2-Dichloroethane-d4 (Surr)</i>	102		75 - 138					09/18/12 17:47	10

Client Sample Results

Client: Crawford Consulting Inc
 Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Client Sample ID: MW-2

Lab Sample ID: 720-44572-2

Date Collected: 09/17/12 11:50

Matrix: Water

Date Received: 09/17/12 12:45

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			09/18/12 14:12	1
1,1-Dichloroethane	ND		0.50		ug/L			09/18/12 14:12	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/18/12 14:12	1
Vinyl chloride	ND		0.50		ug/L			09/18/12 14:12	1
Chloroethane	ND		1.0		ug/L			09/18/12 14:12	1
Trichlorofluoromethane	ND		1.0		ug/L			09/18/12 14:12	1
Methylene Chloride	ND		5.0		ug/L			09/18/12 14:12	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/18/12 14:12	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/18/12 14:12	1
Chloroform	ND		1.0		ug/L			09/18/12 14:12	1
1,1,1-Trichloroethane	ND		0.50		ug/L			09/18/12 14:12	1
Carbon tetrachloride	ND		0.50		ug/L			09/18/12 14:12	1
1,2-Dichloroethane	ND		0.50		ug/L			09/18/12 14:12	1
Trichloroethene	ND		0.50		ug/L			09/18/12 14:12	1
1,2-Dichloropropane	ND		0.50		ug/L			09/18/12 14:12	1
Dichlorobromomethane	ND		0.50		ug/L			09/18/12 14:12	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/18/12 14:12	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/18/12 14:12	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/18/12 14:12	1
Tetrachloroethene	18		0.50		ug/L			09/18/12 14:12	1
Chlorodibromomethane	ND		0.50		ug/L			09/18/12 14:12	1
Chlorobenzene	ND		0.50		ug/L			09/18/12 14:12	1
Bromoform	ND		1.0		ug/L			09/18/12 14:12	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/18/12 14:12	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/18/12 14:12	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/18/12 14:12	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/18/12 14:12	1
Chloromethane	ND		1.0		ug/L			09/18/12 14:12	1
Bromomethane	ND		1.0		ug/L			09/18/12 14:12	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/18/12 14:12	1
EDB	ND		0.50		ug/L			09/18/12 14:12	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/18/12 14:12	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		70 - 130		09/18/12 14:12	1
4-Bromofluorobenzene	95		67 - 130		09/18/12 14:12	1
1,2-Dichloroethane-d4 (Surr)	104		75 - 138		09/18/12 14:12	1

Client Sample Results

Client: Crawford Consulting Inc
 Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Client Sample ID: MW-3
Date Collected: 09/17/12 10:20
Date Received: 09/17/12 12:45

Lab Sample ID: 720-44572-3
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	53		0.50		ug/L			09/19/12 05:21	1
1,1-Dichloroethane	1.7		0.50		ug/L			09/19/12 05:21	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/19/12 05:21	1
Vinyl chloride	ND		0.50		ug/L			09/19/12 05:21	1
Chloroethane	ND		1.0		ug/L			09/19/12 05:21	1
Trichlorofluoromethane	ND		1.0		ug/L			09/19/12 05:21	1
Methylene Chloride	ND		5.0		ug/L			09/19/12 05:21	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/19/12 05:21	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/19/12 05:21	1
Chloroform	ND		1.0		ug/L			09/19/12 05:21	1
1,1,1-Trichloroethane	1.5		0.50		ug/L			09/19/12 05:21	1
Carbon tetrachloride	ND		0.50		ug/L			09/19/12 05:21	1
1,2-Dichloroethane	ND		0.50		ug/L			09/19/12 05:21	1
Trichloroethene	ND		0.50		ug/L			09/19/12 05:21	1
1,2-Dichloropropane	ND		0.50		ug/L			09/19/12 05:21	1
Dichlorobromomethane	ND		0.50		ug/L			09/19/12 05:21	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/19/12 05:21	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/19/12 05:21	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/19/12 05:21	1
Tetrachloroethene	ND		0.50		ug/L			09/19/12 05:21	1
Chlorodibromomethane	ND		0.50		ug/L			09/19/12 05:21	1
Chlorobenzene	ND		0.50		ug/L			09/19/12 05:21	1
Bromoform	ND		1.0		ug/L			09/19/12 05:21	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/19/12 05:21	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/19/12 05:21	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/19/12 05:21	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/19/12 05:21	1
Chloromethane	ND		1.0		ug/L			09/19/12 05:21	1
Bromomethane	ND		1.0		ug/L			09/19/12 05:21	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/19/12 05:21	1
EDB	ND		0.50		ug/L			09/19/12 05:21	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/19/12 05:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	100		70 - 130					09/19/12 05:21	1
<i>4-Bromofluorobenzene</i>	98		67 - 130					09/19/12 05:21	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	107		75 - 138					09/19/12 05:21	1

Client Sample Results

Client: Crawford Consulting Inc
 Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Client Sample ID: MW-4
Date Collected: 09/17/12 09:22
Date Received: 09/17/12 12:45

Lab Sample ID: 720-44572-4
Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			09/19/12 05:53	1
1,1-Dichloroethane	ND		0.50		ug/L			09/19/12 05:53	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/19/12 05:53	1
Vinyl chloride	ND		0.50		ug/L			09/19/12 05:53	1
Chloroethane	ND		1.0		ug/L			09/19/12 05:53	1
Trichlorofluoromethane	ND		1.0		ug/L			09/19/12 05:53	1
Methylene Chloride	ND		5.0		ug/L			09/19/12 05:53	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/19/12 05:53	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/19/12 05:53	1
Chloroform	ND		1.0		ug/L			09/19/12 05:53	1
1,1,1-Trichloroethane	ND		0.50		ug/L			09/19/12 05:53	1
Carbon tetrachloride	ND		0.50		ug/L			09/19/12 05:53	1
1,2-Dichloroethane	ND		0.50		ug/L			09/19/12 05:53	1
Trichloroethene	ND		0.50		ug/L			09/19/12 05:53	1
1,2-Dichloropropane	ND		0.50		ug/L			09/19/12 05:53	1
Dichlorobromomethane	ND		0.50		ug/L			09/19/12 05:53	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/19/12 05:53	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/19/12 05:53	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/19/12 05:53	1
Tetrachloroethene	ND		0.50		ug/L			09/19/12 05:53	1
Chlorodibromomethane	ND		0.50		ug/L			09/19/12 05:53	1
Chlorobenzene	ND		0.50		ug/L			09/19/12 05:53	1
Bromoform	ND		1.0		ug/L			09/19/12 05:53	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/19/12 05:53	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/19/12 05:53	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/19/12 05:53	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/19/12 05:53	1
Chloromethane	ND		1.0		ug/L			09/19/12 05:53	1
Bromomethane	ND		1.0		ug/L			09/19/12 05:53	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/19/12 05:53	1
EDB	ND		0.50		ug/L			09/19/12 05:53	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/19/12 05:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	99		70 - 130					09/19/12 05:53	1
4-Bromofluorobenzene	98		67 - 130					09/19/12 05:53	1
1,2-Dichloroethane-d4 (Surr)	105		75 - 138					09/19/12 05:53	1

Client Sample Results

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Client Sample ID: DUP-1

Lab Sample ID: 720-44572-5

Date Collected: 09/17/12 00:00

Matrix: Water

Date Received: 09/17/12 12:45

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			09/19/12 06:25	1
1,1-Dichloroethane	ND		0.50		ug/L			09/19/12 06:25	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/19/12 06:25	1
Vinyl chloride	ND		0.50		ug/L			09/19/12 06:25	1
Chloroethane	ND		1.0		ug/L			09/19/12 06:25	1
Trichlorofluoromethane	ND		1.0		ug/L			09/19/12 06:25	1
Methylene Chloride	ND		5.0		ug/L			09/19/12 06:25	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/19/12 06:25	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/19/12 06:25	1
Chloroform	ND		1.0		ug/L			09/19/12 06:25	1
1,1,1-Trichloroethane	ND		0.50		ug/L			09/19/12 06:25	1
Carbon tetrachloride	ND		0.50		ug/L			09/19/12 06:25	1
1,2-Dichloroethane	ND		0.50		ug/L			09/19/12 06:25	1
Trichloroethene	ND		0.50		ug/L			09/19/12 06:25	1
1,2-Dichloropropane	ND		0.50		ug/L			09/19/12 06:25	1
Dichlorobromomethane	ND		0.50		ug/L			09/19/12 06:25	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/19/12 06:25	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/19/12 06:25	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/19/12 06:25	1
Tetrachloroethene	12		0.50		ug/L			09/19/12 06:25	1
Chlorodibromomethane	ND		0.50		ug/L			09/19/12 06:25	1
Chlorobenzene	ND		0.50		ug/L			09/19/12 06:25	1
Bromoform	ND		1.0		ug/L			09/19/12 06:25	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/19/12 06:25	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/19/12 06:25	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/19/12 06:25	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/19/12 06:25	1
Chloromethane	ND		1.0		ug/L			09/19/12 06:25	1
Bromomethane	ND		1.0		ug/L			09/19/12 06:25	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/19/12 06:25	1
EDB	ND		0.50		ug/L			09/19/12 06:25	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/19/12 06:25	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	99		70 - 130					09/19/12 06:25	1
<i>4-Bromofluorobenzene</i>	100		67 - 130					09/19/12 06:25	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	109		75 - 138					09/19/12 06:25	1

Client Sample Results

Client: Crawford Consulting Inc
 Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Client Sample ID: TB-1

Lab Sample ID: 720-44572-6

Date Collected: 09/17/12 00:00

Matrix: Water

Date Received: 09/17/12 12:45

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			09/18/12 14:43	1
1,1-Dichloroethane	ND		0.50		ug/L			09/18/12 14:43	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/18/12 14:43	1
Vinyl chloride	ND		0.50		ug/L			09/18/12 14:43	1
Chloroethane	ND		1.0		ug/L			09/18/12 14:43	1
Trichlorofluoromethane	ND		1.0		ug/L			09/18/12 14:43	1
Methylene Chloride	ND		5.0		ug/L			09/18/12 14:43	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/18/12 14:43	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/18/12 14:43	1
Chloroform	ND		1.0		ug/L			09/18/12 14:43	1
1,1,1-Trichloroethane	ND		0.50		ug/L			09/18/12 14:43	1
Carbon tetrachloride	ND		0.50		ug/L			09/18/12 14:43	1
1,2-Dichloroethane	ND		0.50		ug/L			09/18/12 14:43	1
Trichloroethene	ND		0.50		ug/L			09/18/12 14:43	1
1,2-Dichloropropane	ND		0.50		ug/L			09/18/12 14:43	1
Dichlorobromomethane	ND		0.50		ug/L			09/18/12 14:43	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/18/12 14:43	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/18/12 14:43	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/18/12 14:43	1
Tetrachloroethene	ND		0.50		ug/L			09/18/12 14:43	1
Chlorodibromomethane	ND		0.50		ug/L			09/18/12 14:43	1
Chlorobenzene	ND		0.50		ug/L			09/18/12 14:43	1
Bromoform	ND		1.0		ug/L			09/18/12 14:43	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/18/12 14:43	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/18/12 14:43	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/18/12 14:43	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/18/12 14:43	1
Chloromethane	ND		1.0		ug/L			09/18/12 14:43	1
Bromomethane	ND		1.0		ug/L			09/18/12 14:43	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/18/12 14:43	1
EDB	ND		0.50		ug/L			09/18/12 14:43	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/18/12 14:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>Toluene-d8 (Surr)</i>	96		70 - 130					09/18/12 14:43	1
<i>4-Bromofluorobenzene</i>	94		67 - 130					09/18/12 14:43	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	104		75 - 138					09/18/12 14:43	1

QC Sample Results

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 720-121106/4

Matrix: Water

Analysis Batch: 121106

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	ND		0.50		ug/L			09/18/12 09:37	1
1,1-Dichloroethane	ND		0.50		ug/L			09/18/12 09:37	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/18/12 09:37	1
Vinyl chloride	ND		0.50		ug/L			09/18/12 09:37	1
Chloroethane	ND		1.0		ug/L			09/18/12 09:37	1
Trichlorofluoromethane	ND		1.0		ug/L			09/18/12 09:37	1
Methylene Chloride	ND		5.0		ug/L			09/18/12 09:37	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/18/12 09:37	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/18/12 09:37	1
Chloroform	ND		1.0		ug/L			09/18/12 09:37	1
1,1,1-Trichloroethane	ND		0.50		ug/L			09/18/12 09:37	1
Carbon tetrachloride	ND		0.50		ug/L			09/18/12 09:37	1
1,2-Dichloroethane	ND		0.50		ug/L			09/18/12 09:37	1
Trichloroethene	ND		0.50		ug/L			09/18/12 09:37	1
1,2-Dichloropropane	ND		0.50		ug/L			09/18/12 09:37	1
Dichlorobromomethane	ND		0.50		ug/L			09/18/12 09:37	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/18/12 09:37	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/18/12 09:37	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/18/12 09:37	1
Tetrachloroethene	ND		0.50		ug/L			09/18/12 09:37	1
Chlorodibromomethane	ND		0.50		ug/L			09/18/12 09:37	1
Chlorobenzene	ND		0.50		ug/L			09/18/12 09:37	1
Bromoform	ND		1.0		ug/L			09/18/12 09:37	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/18/12 09:37	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/18/12 09:37	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/18/12 09:37	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/18/12 09:37	1
Chloromethane	ND		1.0		ug/L			09/18/12 09:37	1
Bromomethane	ND		1.0		ug/L			09/18/12 09:37	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/18/12 09:37	1
EDB	ND		0.50		ug/L			09/18/12 09:37	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/18/12 09:37	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	96		70 - 130		09/18/12 09:37	1
4-Bromofluorobenzene	96		67 - 130		09/18/12 09:37	1
1,2-Dichloroethane-d4 (Surr)	103		75 - 138		09/18/12 09:37	1

Lab Sample ID: LCS 720-121106/5

Matrix: Water

Analysis Batch: 121106

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	25.4		ug/L		102	64 - 128
1,1-Dichloroethane	25.0	25.4		ug/L		102	70 - 130
Dichlorodifluoromethane	25.0	20.2		ug/L		81	34 - 132
Vinyl chloride	25.0	24.5		ug/L		98	54 - 135
Chloroethane	25.0	25.1		ug/L		100	62 - 138
Trichlorofluoromethane	25.0	23.0		ug/L		92	66 - 132

QC Sample Results

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-121106/5

Matrix: Water

Analysis Batch: 121106

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methylene Chloride	25.0	25.4		ug/L		102	70 - 147
trans-1,2-Dichloroethene	25.0	25.0		ug/L		100	68 - 130
cis-1,2-Dichloroethene	25.0	26.8		ug/L		107	70 - 130
Chloroform	25.0	25.4		ug/L		102	70 - 130
1,1,1-Trichloroethane	25.0	26.9		ug/L		108	70 - 130
Carbon tetrachloride	25.0	27.5		ug/L		110	70 - 146
1,2-Dichloroethane	25.0	25.1		ug/L		100	61 - 132
Trichloroethene	25.0	25.2		ug/L		101	70 - 130
1,2-Dichloropropane	25.0	25.8		ug/L		103	70 - 130
Dichlorobromomethane	25.0	27.6		ug/L		110	70 - 130
trans-1,3-Dichloropropene	25.0	28.8		ug/L		115	70 - 140
cis-1,3-Dichloropropene	25.0	29.8		ug/L		119	70 - 130
1,1,2-Trichloroethane	25.0	26.4		ug/L		105	70 - 130
Tetrachloroethene	25.0	25.3		ug/L		101	70 - 130
Chlorodibromomethane	25.0	29.2		ug/L		117	70 - 145
Chlorobenzene	25.0	24.1		ug/L		96	70 - 130
Bromoform	25.0	24.8		ug/L		99	68 - 136
1,1,2,2-Tetrachloroethane	25.0	25.8		ug/L		103	70 - 130
1,3-Dichlorobenzene	25.0	24.4		ug/L		98	70 - 130
1,4-Dichlorobenzene	25.0	24.6		ug/L		98	70 - 130
1,2-Dichlorobenzene	25.0	23.8		ug/L		95	70 - 130
Chloromethane	25.0	26.0		ug/L		104	52 - 175
Bromomethane	25.0	24.5		ug/L		98	43 - 151
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	23.7		ug/L		95	42 - 162
EDB	25.0	26.7		ug/L		107	70 - 130
1,2,4-Trichlorobenzene	25.0	22.8		ug/L		91	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	103		70 - 130
4-Bromofluorobenzene	104		67 - 130
1,2-Dichloroethane-d4 (Surr)	100		75 - 138

Lab Sample ID: LCSD 720-121106/6

Matrix: Water

Analysis Batch: 121106

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
1,1-Dichloroethene	25.0	25.5		ug/L		102	64 - 128	0	20
1,1-Dichloroethane	25.0	25.5		ug/L		102	70 - 130	0	20
Dichlorodifluoromethane	25.0	20.1		ug/L		80	34 - 132	0	20
Vinyl chloride	25.0	24.4		ug/L		98	54 - 135	0	20
Chloroethane	25.0	25.1		ug/L		100	62 - 138	0	20
Trichlorofluoromethane	25.0	22.5		ug/L		90	66 - 132	2	20
Methylene Chloride	25.0	25.8		ug/L		103	70 - 147	2	20
trans-1,2-Dichloroethene	25.0	24.9		ug/L		99	68 - 130	1	20
cis-1,2-Dichloroethene	25.0	26.9		ug/L		108	70 - 130	0	20
Chloroform	25.0	25.2		ug/L		101	70 - 130	1	20
1,1,1-Trichloroethane	25.0	27.1		ug/L		108	70 - 130	1	20
Carbon tetrachloride	25.0	27.2		ug/L		109	70 - 146	1	20

QC Sample Results

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 720-121106/6

Matrix: Water

Analysis Batch: 121106

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dichloroethane	25.0	25.1		ug/L		100	61 - 132	0	20
Trichloroethene	25.0	25.3		ug/L		101	70 - 130	0	20
1,2-Dichloropropane	25.0	26.0		ug/L		104	70 - 130	1	20
Dichlorobromomethane	25.0	27.0		ug/L		108	70 - 130	2	20
trans-1,3-Dichloropropene	25.0	28.2		ug/L		113	70 - 140	2	20
cis-1,3-Dichloropropene	25.0	29.5		ug/L		118	70 - 130	1	20
1,1,2-Trichloroethane	25.0	26.3		ug/L		105	70 - 130	0	20
Tetrachloroethene	25.0	25.4		ug/L		102	70 - 130	0	20
Chlorodibromomethane	25.0	29.1		ug/L		117	70 - 145	0	20
Chlorobenzene	25.0	24.7		ug/L		99	70 - 130	2	20
Bromoform	25.0	25.0		ug/L		100	68 - 136	1	20
1,1,1,2-Tetrachloroethane	25.0	25.8		ug/L		103	70 - 130	0	20
1,3-Dichlorobenzene	25.0	24.8		ug/L		99	70 - 130	2	20
1,4-Dichlorobenzene	25.0	24.7		ug/L		99	70 - 130	0	20
1,2-Dichlorobenzene	25.0	24.4		ug/L		98	70 - 130	2	20
Chloromethane	25.0	25.9		ug/L		104	52 - 175	1	20
Bromomethane	25.0	25.3		ug/L		101	43 - 151	3	20
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	24.2		ug/L		97	42 - 162	2	20
EDB	25.0	26.1		ug/L		105	70 - 130	2	20
1,2,4-Trichlorobenzene	25.0	23.3		ug/L		93	70 - 130	2	20

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
Toluene-d8 (Surr)	102		70 - 130
4-Bromofluorobenzene	105		67 - 130
1,2-Dichloroethane-d4 (Surr)	97		75 - 138

Lab Sample ID: 720-44572-2 MS

Matrix: Water

Analysis Batch: 121106

Client Sample ID: MW-2

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	ND		25.0	22.3		ug/L		89	60 - 140
1,1-Dichloroethane	ND		25.0	24.4		ug/L		98	60 - 140
Dichlorodifluoromethane	ND		25.0	18.7		ug/L		75	38 - 140
Vinyl chloride	ND		25.0	24.4		ug/L		98	58 - 140
Chloroethane	ND		25.0	24.4		ug/L		98	51 - 140
Trichlorofluoromethane	ND		25.0	21.9		ug/L		88	60 - 140
Methylene Chloride	ND		25.0	24.8		ug/L		99	40 - 140
trans-1,2-Dichloroethene	ND		25.0	23.5		ug/L		94	60 - 140
cis-1,2-Dichloroethene	ND		25.0	26.3		ug/L		104	60 - 140
Chloroform	ND		25.0	24.4		ug/L		98	60 - 140
1,1,1-Trichloroethane	ND		25.0	25.3		ug/L		101	60 - 140
Carbon tetrachloride	ND		25.0	25.1		ug/L		100	60 - 140
1,2-Dichloroethane	ND		25.0	24.8		ug/L		99	60 - 140
Trichloroethene	ND		25.0	24.1		ug/L		95	60 - 140
1,2-Dichloropropane	ND		25.0	25.6		ug/L		102	60 - 140
Dichlorobromomethane	ND		25.0	26.9		ug/L		108	60 - 140
trans-1,3-Dichloropropene	ND		25.0	28.5		ug/L		114	60 - 140
cis-1,3-Dichloropropene	ND		25.0	29.0		ug/L		116	60 - 140

QC Sample Results

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 720-44572-2 MS

Matrix: Water

Analysis Batch: 121106

Client Sample ID: MW-2

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec. Limits			
	Result	Qualifier	Added	Result	Qualifier							
1,1,2-Trichloroethane	ND		25.0	26.2		ug/L		105	60 - 140			
Tetrachloroethene	18		25.0	41.2		ug/L		92	60 - 140			
Chlorodibromomethane	ND		25.0	28.6		ug/L		115	60 - 140			
Chlorobenzene	ND		25.0	23.8		ug/L		95	60 - 140			
Bromoform	ND		25.0	23.8		ug/L		95	56 - 140			
1,1,1,2-Tetrachloroethane	ND		25.0	24.5		ug/L		98	60 - 140			
1,3-Dichlorobenzene	ND		25.0	23.9		ug/L		96	60 - 140			
1,4-Dichlorobenzene	ND		25.0	24.5		ug/L		98	60 - 140			
1,2-Dichlorobenzene	ND		25.0	23.5		ug/L		94	60 - 140			
Chloromethane	ND		25.0	24.3		ug/L		97	52 - 140			
Bromomethane	ND		25.0	24.5		ug/L		98	23 - 140			
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		25.0	21.6		ug/L		87	60 - 140			
EDB	ND		25.0	25.3		ug/L		101	60 - 140			
1,2,4-Trichlorobenzene	ND		25.0	22.4		ug/L		89	60 - 140			
Surrogate	MS MS		Limits									
	%Recovery	Qualifier										
Toluene-d8 (Surr)	100		70 - 130									
4-Bromofluorobenzene	108		67 - 130									
1,2-Dichloroethane-d4 (Surr)	99		75 - 138									

Lab Sample ID: 720-44572-2 MSD

Matrix: Water

Analysis Batch: 121106

Client Sample ID: MW-2

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
	Result	Qualifier	Added	Result	Qualifier						
1,1-Dichloroethene	ND		25.0	21.8		ug/L		87	60 - 140	2	20
1,1-Dichloroethane	ND		25.0	23.7		ug/L		95	60 - 140	3	20
Dichlorodifluoromethane	ND		25.0	19.9		ug/L		80	38 - 140	6	20
Vinyl chloride	ND		25.0	25.7		ug/L		103	58 - 140	5	20
Chloroethane	ND		25.0	25.5		ug/L		102	51 - 140	4	20
Trichlorofluoromethane	ND		25.0	24.4		ug/L		98	60 - 140	11	20
Methylene Chloride	ND		25.0	23.8		ug/L		95	40 - 140	4	20
trans-1,2-Dichloroethene	ND		25.0	22.8		ug/L		91	60 - 140	3	20
cis-1,2-Dichloroethene	ND		25.0	25.4		ug/L		101	60 - 140	3	20
Chloroform	ND		25.0	23.5		ug/L		94	60 - 140	4	20
1,1,1-Trichloroethane	ND		25.0	25.1		ug/L		101	60 - 140	1	20
Carbon tetrachloride	ND		25.0	24.7		ug/L		99	60 - 140	2	20
1,2-Dichloroethane	ND		25.0	23.9		ug/L		96	60 - 140	4	20
Trichloroethene	ND		25.0	23.4		ug/L		92	60 - 140	3	20
1,2-Dichloropropane	ND		25.0	24.6		ug/L		98	60 - 140	4	20
Dichlorobromomethane	ND		25.0	25.5		ug/L		102	60 - 140	5	20
trans-1,3-Dichloropropene	ND		25.0	27.0		ug/L		108	60 - 140	5	20
cis-1,3-Dichloropropene	ND		25.0	27.7		ug/L		111	60 - 140	4	20
1,1,2-Trichloroethane	ND		25.0	24.4		ug/L		98	60 - 140	7	20
Tetrachloroethene	18		25.0	40.1		ug/L		88	60 - 140	3	20
Chlorodibromomethane	ND		25.0	27.4		ug/L		110	60 - 140	4	20
Chlorobenzene	ND		25.0	23.0		ug/L		92	60 - 140	4	20
Bromoform	ND		25.0	22.7		ug/L		91	56 - 140	5	20
1,1,2,2-Tetrachloroethane	ND		25.0	23.8		ug/L		95	60 - 140	3	20

QC Sample Results

Client: Crawford Consulting Inc
 Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 720-44572-2 MSD

Client Sample ID: MW-2

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 121106

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier				Limits		
1,3-Dichlorobenzene	ND		25.0	23.3		ug/L		93	60 - 140	3	20
1,4-Dichlorobenzene	ND		25.0	23.0		ug/L		92	60 - 140	6	20
1,2-Dichlorobenzene	ND		25.0	22.4		ug/L		90	60 - 140	5	20
Chloromethane	ND		25.0	25.4		ug/L		102	52 - 140	5	20
Bromomethane	ND		25.0	25.7		ug/L		103	23 - 140	5	20
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		25.0	21.3		ug/L		85	60 - 140	1	20
EDB	ND		25.0	24.4		ug/L		98	60 - 140	4	20
1,2,4-Trichlorobenzene	ND		25.0	20.6		ug/L		83	60 - 140	8	20

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Toluene-d8 (Surr)	101		70 - 130
4-Bromofluorobenzene	108		67 - 130
1,2-Dichloroethane-d4 (Surr)	100		75 - 138

Lab Sample ID: MB 720-121168/4

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 121168

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1-Dichloroethene	ND		0.50		ug/L			09/18/12 20:18	1
1,1-Dichloroethane	ND		0.50		ug/L			09/18/12 20:18	1
Dichlorodifluoromethane	ND		0.50		ug/L			09/18/12 20:18	1
Vinyl chloride	ND		0.50		ug/L			09/18/12 20:18	1
Chloroethane	ND		1.0		ug/L			09/18/12 20:18	1
Trichlorofluoromethane	ND		1.0		ug/L			09/18/12 20:18	1
Methylene Chloride	ND		5.0		ug/L			09/18/12 20:18	1
trans-1,2-Dichloroethene	ND		0.50		ug/L			09/18/12 20:18	1
cis-1,2-Dichloroethene	ND		0.50		ug/L			09/18/12 20:18	1
Chloroform	ND		1.0		ug/L			09/18/12 20:18	1
1,1,1-Trichloroethane	ND		0.50		ug/L			09/18/12 20:18	1
Carbon tetrachloride	ND		0.50		ug/L			09/18/12 20:18	1
1,2-Dichloroethane	ND		0.50		ug/L			09/18/12 20:18	1
Trichloroethene	ND		0.50		ug/L			09/18/12 20:18	1
1,2-Dichloropropane	ND		0.50		ug/L			09/18/12 20:18	1
Dichlorobromomethane	ND		0.50		ug/L			09/18/12 20:18	1
trans-1,3-Dichloropropene	ND		0.50		ug/L			09/18/12 20:18	1
cis-1,3-Dichloropropene	ND		0.50		ug/L			09/18/12 20:18	1
1,1,2-Trichloroethane	ND		0.50		ug/L			09/18/12 20:18	1
Tetrachloroethene	ND		0.50		ug/L			09/18/12 20:18	1
Chlorodibromomethane	ND		0.50		ug/L			09/18/12 20:18	1
Chlorobenzene	ND		0.50		ug/L			09/18/12 20:18	1
Bromoform	ND		1.0		ug/L			09/18/12 20:18	1
1,1,2,2-Tetrachloroethane	ND		0.50		ug/L			09/18/12 20:18	1
1,3-Dichlorobenzene	ND		0.50		ug/L			09/18/12 20:18	1
1,4-Dichlorobenzene	ND		0.50		ug/L			09/18/12 20:18	1
1,2-Dichlorobenzene	ND		0.50		ug/L			09/18/12 20:18	1
Chloromethane	ND		1.0		ug/L			09/18/12 20:18	1
Bromomethane	ND		1.0		ug/L			09/18/12 20:18	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		0.50		ug/L			09/18/12 20:18	1

QC Sample Results

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 720-121168/4

Matrix: Water

Analysis Batch: 121168

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
EDB	ND		0.50		ug/L			09/18/12 20:18	1
1,2,4-Trichlorobenzene	ND		1.0		ug/L			09/18/12 20:18	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	100		70 - 130					09/18/12 20:18	1
4-Bromofluorobenzene	101		67 - 130					09/18/12 20:18	1
1,2-Dichloroethane-d4 (Surr)	101		75 - 138					09/18/12 20:18	1

Lab Sample ID: LCS 720-121168/5

Matrix: Water

Analysis Batch: 121168

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	25.0	21.9		ug/L		87	64 - 128
1,1-Dichloroethane	25.0	21.7		ug/L		87	70 - 130
Dichlorodifluoromethane	25.0	19.5		ug/L		78	34 - 132
Vinyl chloride	25.0	24.4		ug/L		97	54 - 135
Chloroethane	25.0	27.9		ug/L		111	62 - 138
Trichlorofluoromethane	25.0	27.6		ug/L		110	66 - 132
Methylene Chloride	25.0	22.9		ug/L		91	70 - 147
trans-1,2-Dichloroethene	25.0	21.0		ug/L		84	68 - 130
cis-1,2-Dichloroethene	25.0	22.2		ug/L		89	70 - 130
Chloroform	25.0	21.1		ug/L		84	70 - 130
1,1,1-Trichloroethane	25.0	22.3		ug/L		89	70 - 130
Carbon tetrachloride	25.0	23.4		ug/L		94	70 - 146
1,2-Dichloroethane	25.0	21.7		ug/L		87	61 - 132
Trichloroethene	25.0	22.3		ug/L		89	70 - 130
1,2-Dichloropropane	25.0	21.7		ug/L		87	70 - 130
Dichlorobromomethane	25.0	22.9		ug/L		92	70 - 130
trans-1,3-Dichloropropene	25.0	23.5		ug/L		94	70 - 140
cis-1,3-Dichloropropene	25.0	24.1		ug/L		96	70 - 130
1,1,2-Trichloroethane	25.0	23.2		ug/L		93	70 - 130
Tetrachloroethene	25.0	22.2		ug/L		89	70 - 130
Chlorodibromomethane	25.0	23.8		ug/L		95	70 - 145
Chlorobenzene	25.0	21.7		ug/L		87	70 - 130
Bromoform	25.0	23.5		ug/L		94	68 - 136
1,1,2,2-Tetrachloroethane	25.0	21.8		ug/L		87	70 - 130
1,3-Dichlorobenzene	25.0	21.8		ug/L		87	70 - 130
1,4-Dichlorobenzene	25.0	21.6		ug/L		86	70 - 130
1,2-Dichlorobenzene	25.0	21.5		ug/L		86	70 - 130
Chloromethane	25.0	23.3		ug/L		93	52 - 175
Bromomethane	25.0	29.4		ug/L		118	43 - 151
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	25.7		ug/L		103	42 - 162
EDB	25.0	23.6		ug/L		94	70 - 130
1,2,4-Trichlorobenzene	25.0	20.7		ug/L		83	70 - 130
Surrogate	%Recovery	LCS Qualifier	Limits				
Toluene-d8 (Surr)	102		70 - 130				

QC Sample Results

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 720-121168/5

Matrix: Water

Analysis Batch: 121168

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Surrogate	LCS		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	102		67 - 130
1,2-Dichloroethane-d4 (Surr)	99		75 - 138

Lab Sample ID: LCSD 720-121168/6

Matrix: Water

Analysis Batch: 121168

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec.		RPD	Limit
							Limits	RPD		
1,1-Dichloroethene	25.0	22.0		ug/L		88	64 - 128	1	20	
1,1-Dichloroethane	25.0	22.5		ug/L		90	70 - 130	3	20	
Dichlorodifluoromethane	25.0	19.5		ug/L		78	34 - 132	0	20	
Vinyl chloride	25.0	24.2		ug/L		97	54 - 135	1	20	
Chloroethane	25.0	27.4		ug/L		110	62 - 138	2	20	
Trichlorofluoromethane	25.0	27.7		ug/L		111	66 - 132	0	20	
Methylene Chloride	25.0	23.2		ug/L		93	70 - 147	2	20	
trans-1,2-Dichloroethene	25.0	21.8		ug/L		87	68 - 130	4	20	
cis-1,2-Dichloroethene	25.0	23.0		ug/L		92	70 - 130	4	20	
Chloroform	25.0	21.9		ug/L		88	70 - 130	4	20	
1,1,1-Trichloroethane	25.0	23.2		ug/L		93	70 - 130	4	20	
Carbon tetrachloride	25.0	24.4		ug/L		98	70 - 146	4	20	
1,2-Dichloroethane	25.0	22.3		ug/L		89	61 - 132	3	20	
Trichloroethene	25.0	23.6		ug/L		94	70 - 130	6	20	
1,2-Dichloropropane	25.0	22.6		ug/L		90	70 - 130	4	20	
Dichlorobromomethane	25.0	23.6		ug/L		94	70 - 130	3	20	
trans-1,3-Dichloropropene	25.0	24.5		ug/L		98	70 - 140	4	20	
cis-1,3-Dichloropropene	25.0	24.8		ug/L		99	70 - 130	3	20	
1,1,2-Trichloroethane	25.0	24.0		ug/L		96	70 - 130	4	20	
Tetrachloroethene	25.0	23.0		ug/L		92	70 - 130	4	20	
Chlorodibromomethane	25.0	24.6		ug/L		98	70 - 145	3	20	
Chlorobenzene	25.0	22.8		ug/L		91	70 - 130	5	20	
Bromoform	25.0	25.0		ug/L		100	68 - 136	6	20	
1,1,2,2-Tetrachloroethane	25.0	23.4		ug/L		94	70 - 130	7	20	
1,3-Dichlorobenzene	25.0	23.2		ug/L		93	70 - 130	6	20	
1,4-Dichlorobenzene	25.0	22.9		ug/L		92	70 - 130	6	20	
1,2-Dichlorobenzene	25.0	23.0		ug/L		92	70 - 130	6	20	
Chloromethane	25.0	23.3		ug/L		93	52 - 175	0	20	
Bromomethane	25.0	29.2		ug/L		117	43 - 151	1	20	
1,1,2-Trichloro-1,2,2-trifluoroethane	25.0	25.8		ug/L		103	42 - 162	1	20	
EDB	25.0	24.2		ug/L		97	70 - 130	3	20	
1,2,4-Trichlorobenzene	25.0	21.5		ug/L		86	70 - 130	4	20	

Surrogate	LCSD		Limits
	%Recovery	Qualifier	
Toluene-d8 (Surr)	101		70 - 130
4-Bromofluorobenzene	99		67 - 130
1,2-Dichloroethane-d4 (Surr)	97		75 - 138

QC Association Summary

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

GC/MS VOA

Analysis Batch: 121106

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-44572-1	MW-1	Total/NA	Water	8260B	
720-44572-2	MW-2	Total/NA	Water	8260B	
720-44572-2 MS	MW-2	Total/NA	Water	8260B	
720-44572-2 MSD	MW-2	Total/NA	Water	8260B	
720-44572-6	TB-1	Total/NA	Water	8260B	
LCS 720-121106/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 720-121106/6	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 720-121106/4	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 121168

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
720-44572-3	MW-3	Total/NA	Water	8260B	
720-44572-4	MW-4	Total/NA	Water	8260B	
720-44572-5	DUP-1	Total/NA	Water	8260B	
LCS 720-121168/5	Lab Control Sample	Total/NA	Water	8260B	
LCSD 720-121168/6	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 720-121168/4	Method Blank	Total/NA	Water	8260B	

Lab Chronicle

Client: Crawford Consulting Inc
 Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Client Sample ID: MW-1

Date Collected: 09/17/12 11:06

Date Received: 09/17/12 12:45

Lab Sample ID: 720-44572-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		10	121106	09/18/12 17:47	AC	TAL SF

Client Sample ID: MW-2

Date Collected: 09/17/12 11:50

Date Received: 09/17/12 12:45

Lab Sample ID: 720-44572-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	121106	09/18/12 14:12	AC	TAL SF

Client Sample ID: MW-3

Date Collected: 09/17/12 10:20

Date Received: 09/17/12 12:45

Lab Sample ID: 720-44572-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	121168	09/19/12 05:21	AC	TAL SF

Client Sample ID: MW-4

Date Collected: 09/17/12 09:22

Date Received: 09/17/12 12:45

Lab Sample ID: 720-44572-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	121168	09/19/12 05:53	AC	TAL SF

Client Sample ID: DUP-1

Date Collected: 09/17/12 00:00

Date Received: 09/17/12 12:45

Lab Sample ID: 720-44572-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	121168	09/19/12 06:25	AC	TAL SF

Client Sample ID: TB-1

Date Collected: 09/17/12 00:00

Date Received: 09/17/12 12:45

Lab Sample ID: 720-44572-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	121106	09/18/12 14:43	AC	TAL SF

Laboratory References:

TAL SF = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919

Certification Summary

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Laboratory: TestAmerica Pleasanton

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2496	01-31-14

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
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- 10
- 11
- 12
- 13
- 14

Method Summary

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL SF

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SF = TestAmerica Pleasanton, 1220 Quarry Lane, Pleasanton, CA 94566, TEL (925)484-1919



Sample Summary

Client: Crawford Consulting Inc
Project/Site: Alameda Facility CS 1605

TestAmerica Job ID: 720-44572-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
720-44572-1	MW-1	Water	09/17/12 11:06	09/17/12 12:45
720-44572-2	MW-2	Water	09/17/12 11:50	09/17/12 12:45
720-44572-3	MW-3	Water	09/17/12 10:20	09/17/12 12:45
720-44572-4	MW-4	Water	09/17/12 09:22	09/17/12 12:45
720-44572-5	DUP-1	Water	09/17/12 00:00	09/17/12 12:45
720-44572-6	TB-1	Water	09/17/12 00:00	09/17/12 12:45

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Test America

1220 Quarry Lane, Pleasanton, CA 94566
 (925) 484-1919 FAX (925) 484-1096

720.44572

CHAIN OF CUSTODY / LABORATORY ANALYSIS REQUEST FORM


Service Request:

140792

Date: 9/17/12


9/24/2012


Project Name: Alameda Facility
Project Number: CS1605
Project Manager: Dana Johnston
Company/Address: Crawford Consulting, Inc.
 4 North Second St, Suite 650
 San Jose, CA 95113
Phone: (408) 287-9934

Sampler's Signature:


Sample I.D.	Date	Time	LAB I.D.	Sample Matrix
1 MW-1	9/17/12	1106		Water
2 MW-2	9/17/12	1150		Water
3 MW-3	9/17/12	1020		Water
4 MW-4	9/17/12	0922		Water
5 DUP-1	9/17/12	—		Water
6 TB-1	9/17/12	—		Water

Number of Containers	Analysis Requested										REMARKS			
	Volatile Organics (VOCs) (EPA 8021B)	Pb (7421); As (7060)	Same as Metals	COD, TKN	500 ml plastic H ₂ SO ₄	Chloride, Nitrate	500 ml plastic NP	pH, Conductivity	500 ml plastic NP	Total Phenols		2 x 500 ml glass H ₂ SO ₄	Volatile Organics (3010) 3 x 40 ml vial	TPH/ETEX
3											X			
3											X			
3											X			
3											X			
3											X			
2											X			

Relinquished By
 Signature: 
 Printed Name: Dana Johnston
 Firm: TASP
 Date/Time: 9/17/12 1245

Received By
 Signature: 
 Printed Name: Dana Johnston
 Firm: TASP
 Date/Time: 9/17/12 1245

TURNAROUND REQUIREMENTS
 24 hr _____ 48 hr _____ 5 day _____
 Standard (5 working days)
 Provide Verbal Preliminary Results _____
 Provide pdf Results _____
 Due Date _____

REPORT REQUIREMENTS
 I. Routine Report
 II. Report (includes DUP, MS MSD, as required, may be charged as samples)
 III. Data Validation Report (includes All Raw Data)
 RWQCB _____
 (MDLs/PQLs/TRAC#)

INVOICE INFORMATION
 P.O. # _____
 Bill to: _____

SAMPLE RECEIPT
 Shipping VIA: _____
 Shipping #: _____
 Condition: _____

Relinquished By
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

Received By
 Signature: _____
 Printed Name: _____
 Firm: _____
 Date/Time: _____

Special Instructions/Comments:
 Please report MRLs only
 Please pdf results to: Dana Johnston at dana@crawfordconsulting.com
 Please provide EDF for Geotracker. Global ID is SL0600177511
 7.80 < 4hrs

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Login Sample Receipt Checklist

Client: Crawford Consulting Inc

Job Number: 720-44572-1

Login Number: 44572

List Number: 1

Creator: Apostol, Anita

List Source: TestAmerica Pleasanton

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	