



**Chevron U.S.A. Inc.**

2410 Camino Ramon, San Ramon, California • Phone (415) 842-9500  
Mail Address: P.O. Box 5004, San Ramon, CA 94583-0804

Marketing Operations

D. Moller  
Manager, Operations  
S. L. Patterson  
Area Manager, Operations  
C. G. Trimbach  
Manager, Engineering

November 8, 1990

Dennis Byrne  
Alameda County  
Environmental Health  
80 Swan Way, Room 200  
Oakland, California 94621

Re: Former Chevron Bulk Plant #1001067  
1520 Powell Street  
Emeryville, California

Dear Mr. Byrne:

Enclosed are the results of the quarterly ground water sampling for the second and third quarters of 1990 conducted by Western Geologic Resources at the above referenced site. As indicated in the report, all water samples were analyzed for total purgeable petroleum hydrocarbons (TPH) and aromatic hydrocarbons (BTEX). Chevron will continue to monitor the site on a quarterly basis.

Chevron proposes to discontinue sampling wells MW-14, MW-15 and MW-2 on a quarterly basis and sample them annually. All other wells will be sampled on a quarterly basis. This program will be initiated the fourth quarter of 1990 if no answer is received by December 1, 1990.

I declare under penalty of perjury that the information contained in the attached report is true and correct, and that any recommended actions are appropriate under the circumstances, to the best of my knowledge. If you have any questions or require additional information, please contact Lisa Backlund at (415) 842-9527.

Sincerely,  
J. Hartwig

By Lisa Backlund  
Lisa Backlund, Engineer

cc: Tom Callaghan  
California Regional Water  
Quality Control Board  
1800 Harrison Street  
Oakland, California 94607



**WESTERN GEOLOGIC RESOURCES INC.**

2169 E. FRANCISCO BLVD., SUITE B / SAN RAFAEL  
CALIFORNIA 94901 / FAX 415.457.8521  
TELE 415.457.7595

30 October 1990

Ms. Lisa Backlund  
Chevron USA  
2410 Camino Ramon  
San Ramon, California 94583-0804

Re: Quarterly Groundwater Monitoring  
Sampled 20 and 21 September 1990  
Abandoned Chevron Asphalt Plant and Terminal  
1520 Powell Street  
Emeryville, California  
WGR Project #1-045.48

Dear Ms. Backlund:

This letter report presents the results of the quarterly groundwater monitoring performed on 20 and 21 September 1990 by Western Geologic Resources, Inc. (WGR) at the subject site (Figures 1 and 2).

#### **GROUNDWATER SAMPLING**

On 20 and 21 September 1990, WGR staff measured depth to water and purged groundwater from monitor wells MW-1 through MW-3, MW-7, MW-8 and MW-10 through MW-19. Wells MW-1 through MW-3, MW-7, MW-12 through MW-15 and MW-19 were purged dry before three well-casing volumes could be evacuated, and the wells were sampled after recovering to a minimum of 30% of their static water levels. Monitor well MW-9 has not been located since 7 July 1985 and wells MW-4 through MW-6 were abandoned during soil excavation in 1989. All groundwater samples were collected according to the WGR standard operating procedure for groundwater sampling included as Attachment A; field forms are included as Attachment B.

All purged water was temporarily stored on-site in 55-gallon drums pending analytic results. The groundwater samples and a laboratory-supplied travel blank consisting of deionized water were shipped under chain-of-custody to GTEL Environmental Laboratories, Inc. of Concord, California.

#### **GROUNDWATER FLOW**

Figure 2 shows the potentiometric surface of shallow groundwater based on depth-to-water measurements taken on 20 September 1990. Average groundwater flow direction for 20 September 1990 was to the south at a gradient of about 0.8%. Groundwater-elevation data are presented in Table 1.

COLORADO SPRINGS  
SALT LAKE CITY  
SAN DIEGO  
VENTURA



## ANALYTIC RESULTS

Groundwater from all monitor wells sampled was analyzed for total purgeable petroleum hydrocarbons (TPPH), for benzene, toluene, ethylbenzene and total xylenes (BTEX) and for purgeable halocarbons by EPA Methods 8015, 8020 and 601. Samples from MW-1 were analyzed for total dissolved solids by Standard Method 209B. Analytic results for past sampling events and this round of sampling are presented in Table 2. The chain-of-custody forms and laboratory reports with quality assurance/quality control documentation are included as Attachments C and D, respectively.

## COMMENTS

Groundwater flow direction remains to the south. Analytic results are similar to previous results from the 19 June 1990 sampling round. The samples taken from monitor well MW-8 showed a significant increase in benzene concentrations over the previous sampling event. Samples from monitor well MW-1 had concentrations of chloromethane over the detection limits for the first time. Samples from MW-1 had levels of total dissolved solids below the detection limits.

Western Geologic Resources, Inc. is pleased to provide geologic and environmental consulting services for Chevron and trusts that this report meets your needs. Please call us at (415) 457-7595 if you have any questions.

Sincerely,  
Western Geologic Resources, Inc.

Randall D. Smith  
Staff Geologist

Christopher S. Alger  
Project Geologist

RDS/CSA:vw

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L. Backlund/30 October 1990

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## **FIGURES**

1. Site Location Map
2. Potentiometric Surface of Shallow Groundwater, 20 September 1990

## **TABLES**

1. Groundwater-Elevation Data
2. Analytic Results: Groundwater Samples

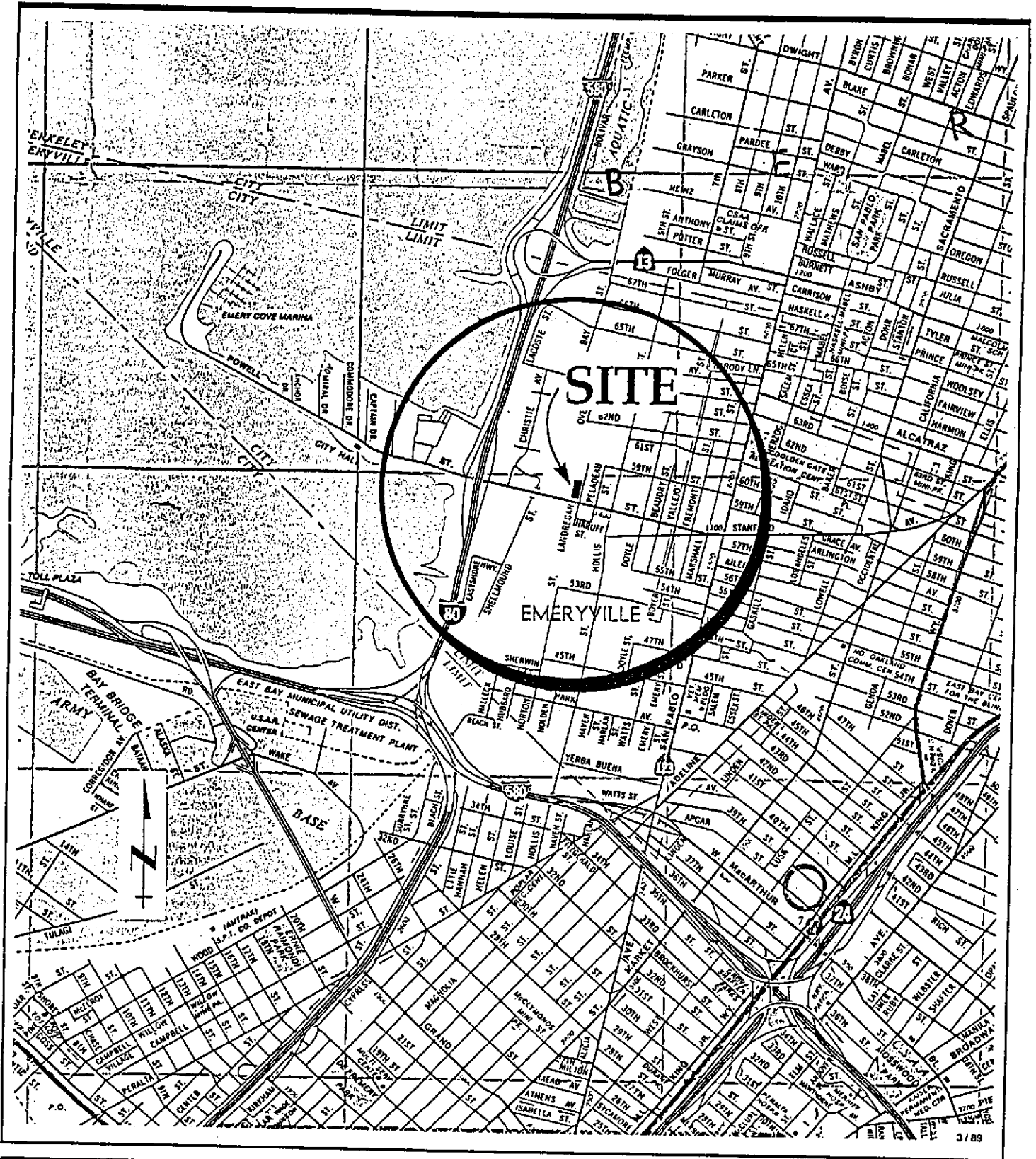
## **ATTACHMENTS**

- A. SOP-4: Groundwater Purging and Sampling
- B. Field Sampling and Monitoring Forms
- C. Chain-of-Custody Forms
- D. Laboratory Reports with Quality Assurance/Quality Control Documents

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**FIGURES**



NOT TO SCALE

Road Map Reference: CSAA map of Oakland

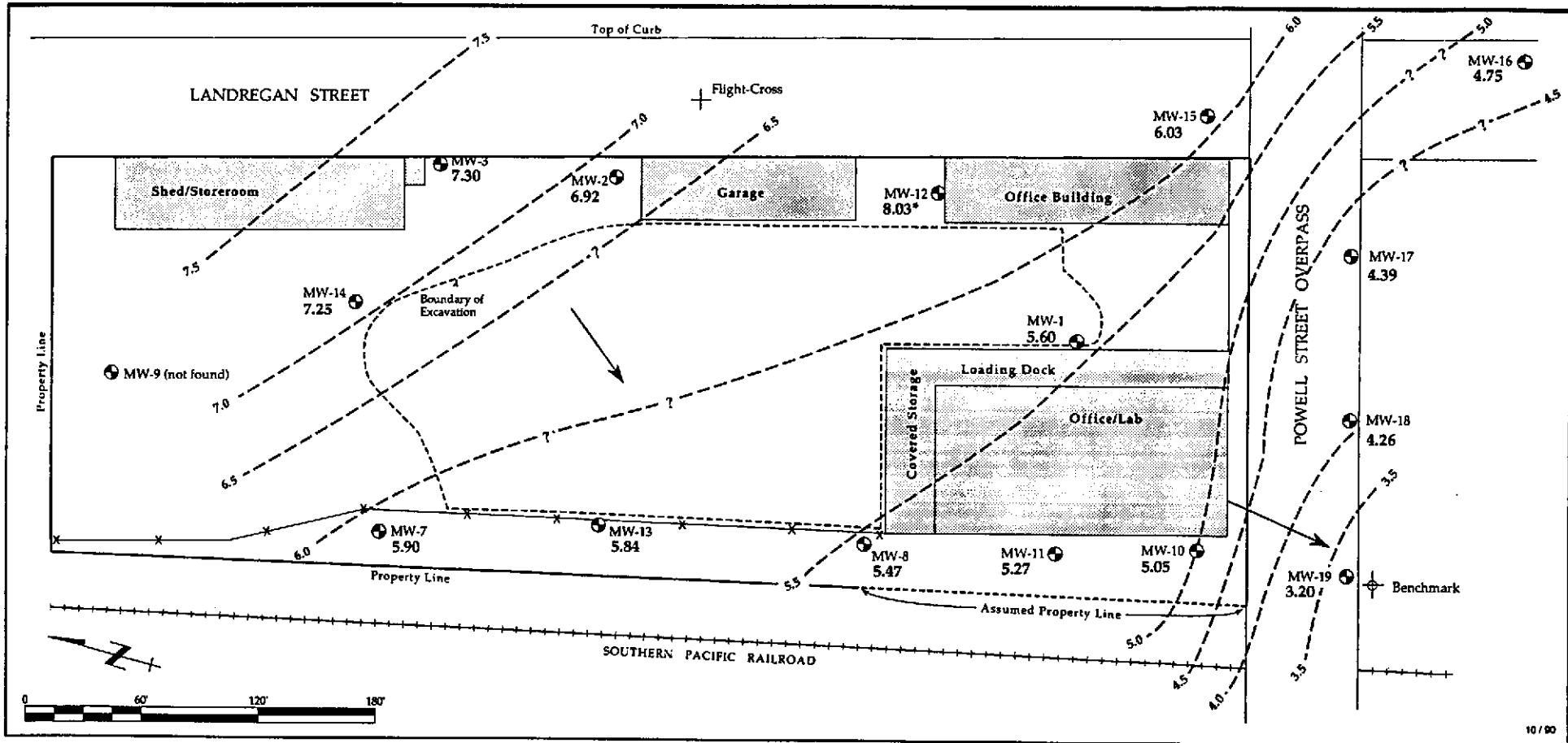
Site Location Map  
Former Chevron Asphalt Plant and Terminal  
Emeryville, California

FIGURE

1

WESTERN GEOLOGIC RESOURCES, INC.

1-045.44



10 / 90

EXPLANATION	
<p>● MW-8 5.47</p> <p>● 8.03*</p> <p>→</p>	<p>Monitor Well location and groundwater elevation, feet above mean sea level</p> <p>Anomalous water elevation, not used for contouring</p> <p>Estimated direction of ground water flow</p>

<p>Potentiometric Surface of Shallow Groundwater 20 September 1990 Former Chevron Asphalt Plant and Terminal Emeryville, California</p>	<p>FIGURE <b>2</b></p>
<p>WESTERN GEOLOGIC RESOURCES, INC. 1-045.48</p>	



## TABLES





TABLE 1. Groundwater-Elevation Data  
Abandoned Chevron Asphalt Plant and Terminal  
Emeryville, California

Well ID #	Date	Rel.-TOC ←-----	TOC	DTW -----ft-----	Rel.-Elev.-W	Elev.-W
MW-1	13 Apr 89	98.56	10.67	3.72	94.84	6.95
MW-1	31 Jul 89	98.56	10.67	5.72	92.84	4.95
MW-1	8 Dec 89	98.56	10.67	4.80	93.76	5.87
MW-1	21 Mar 90	---	10.67	4.74	---	5.93
MW-1	19 Jun 90	---	10.67	4.75	---	5.92
MW-1	20 Sep 90	---	10.67	5.07	---	5.60
MW-2	13 Apr 89	99.20	13.78	2.62	96.58	11.16
MW-2	31 Jul 89	99.20	13.78	4.63	94.57	9.15
MW-2	8 Dec 89	99.20	13.78	5.98	93.22	7.80
MW-2	21 Mar 90	---	13.78	5.85	---	7.93
MW-2	19 Jun 90	---	13.78	5.95	---	7.83
MW-2	20 Sep 90	---	13.78	6.86	---	6.92
MW-3	13 Apr 89	99.50	11.73	2.34	97.16	9.39
MW-3	31 Jul 89	99.50	11.73	4.79	94.71	6.94
MW-3	8 Dec 89	99.50	11.73	3.03	96.47	8.70
MW-3	21 Mar 90	---	11.73	2.55	---	9.18
MW-3	19 Jun 90	---	11.73	2.76	---	8.97
MW-3	20 Sep 90	---	11.73	4.43	---	7.30
MW-4*	13 Apr 89	99.86	---	2.12	96.74	---
MW-5*	13 Apr 89	98.53	---	2.79	95.74	---
MW-6*	13 Apr 89	99.03	---	1.90	97.13	---
MW-7	13 Apr 89	98.40	10.47	1.90	96.50	8.57
MW-7	31 Jul 89	98.40	10.47	4.24	94.16	6.23
MW-7	8 Dec 89	98.40	10.47	2.65	95.75	7.82
MW-7	21 Mar 90	---	10.47	2.76	---	7.71
MW-7	19 Jun 90	---	10.47	3.24	---	7.23
MW-7	20 Sep 90	---	10.47	4.57	---	5.90
MW-8	13 Apr 89	98.31	10.46	2.80	95.51	7.66
MW-8	31 Jul 89	98.31	10.46	5.70	92.61	4.76
MW-8	8 Dec 89	98.31	10.46	4.13	94.18	6.33
MW-8	21 Mar 90	---	10.46	4.07	---	6.39
MW-8	19 Jun 90	---	10.46	4.25	---	6.21
MW-8	20 Sep 90	---	10.46	4.99	---	5.47

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TABLE 1. Groundwater-Elevation Data (continued)  
 Abandoned Chevron Asphalt Plant and Terminal  
 Emeryville, California

Well ID #	Date	Rel.-TOC	TOC	DTW	Rel.-Elev.-W	Elev.-W
				-----ft-----		
MW-10	21 Mar 90	---	10.82	4.60	---	6.22
MW-10	19 Jun 90	---	10.82	4.89	---	5.93
MW-10	20 Sep 90	---	10.82	5.77	---	5.05
MW-11	21 Mar 90	---	11.38	4.82	---	6.56
MW-11	19 Jun 90	---	11.38	5.14	---	6.24
MW-11	20 Sep 90	---	11.38	6.11	---	5.27
MW-12	21 Mar 90	---	13.03	6.76	---	6.27
MW-12	19 Jun 90	---	13.03	6.62	---	6.41
MW-12	20 Sep 90	---	13.03	5.00	---	8.03
MW-13	21 Mar 90	---	11.15	4.08	---	7.07
MW-13	19 Jun 90	---	11.15	4.34	---	6.81
MW-13	20 Sep 90	---	11.15	5.31	---	5.84
MW-14	21 Mar 90	---	9.78	0.91	---	8.87
MW-14	19 Jun 90	---	9.78	1.03	---	8.75
MW-14	20 Sep 90	---	9.78	2.53	---	7.25
MW-15	21 Mar 90	---	11.01	4.72	---	6.29
MW-15	19 Jun 90	---	11.01	4.78	---	6.23
MW-15	20 Sep 90	---	11.01	4.98	---	6.03
MW-16	26 Mar 90	---	11.11	5.84	---	5.27
MW-16	19 Jun 90	---	11.11	5.90	---	5.21
MW-16	20 Sep 90	---	11.11	6.36	---	4.75
MW-17	26 Mar 90	---	10.41	5.61	---	4.80
MW-17	19 Jun 90	---	10.41	---	---	---
MW-17	20 Sep 90	---	10.41	6.02	---	4.39
MW-18	26 Mar 90	---	9.80	5.15	---	4.65
MW-18	19 Jun 90	---	9.80	5.19	---	4.61
MW-18	20 Sep 90	---	9.80	5.54	---	4.26
MW-19	26 Mar 90	---	8.45	5.00	---	3.45
MW-19	19 Jun 90	---	8.45	5.06	---	3.39
MW-19	20 Sep 90	---	8.45	5.25	---	3.20

1-045.44/G1SP0.WK1



TABLE 1. Groundwater-Elevation Data (continued)  
Abandoned Chevron Asphalt Pland and Terminal  
Emeryville, California

NOTES:

- Rel.-TOC = Relative Top-of-Casing elevation surveyed to temporary benchmark established at southwest corner of former totalizer, arbitrarily set at 100.00 ft above mean sea level. This TOC was used for reports prior to 21 March 1990
- TOC = Top-of-Casing elevation as surveyed in April 1990, in feet above mean sea level. Back-calculated using  $TOC - DTW = Elev.-W$  to figure previous TOC's
- DTW = Depth-to-Water
- Rel.-Elev.-W = Relative Elevation of groundwater calculated by formula:  
 $Rel. Elev.-W = (Rel. - TOC) - DTW$
- Elev.-W = Elevation of groundwater
- ft = feet
- \* = Monitor wells destroyed during soil excavation
- = Not analyzed
- Datum = feet above mean sea level

1-045.44/G1SP0.WK1



TABLE 2. Analytic Results: Groundwater Samples  
Former Chevron Asphalt Plant  
Emeryville, California

Well ID #	Date	FC	O&G <-ppm->	TPH/TPPH <-ppm->	B	T	E	X	1,1-DCE	1,2-DCE	1,1-DCA	TCA	TCE	PCE	CF	VC	Other
-----ppb----->																	
MW-1	14 Apr 89	---	---	<5,000	34	<5	<5	<10	<5	19	<5	<5	11	<5	<20	340	I
MW-1	31 Jul 89	---	---	7,000	57	1.2	<0.2	1.6	6.8	54	2.7	7.2	57	<0.2	<1	760	II
MW-1	8 Dec 89	---	---	---	26	0.4	0.9	2	4.3	2,700	1.7	1.4	59	<0.5	<0.5	520	---
MW-1	21 Mar 90	---	---	3,500	120	9	3	3	7.1	7,000	2.1	1.1	130	<0.5	<0.5	1,100	---
MW-1	19 Jun 90	---	---	2,700	100	<0.3	<0.3	7	12	6,100	3.1	<0.5	81	<0.5	<0.5	1,200	---
MW-1	21 Sep 90	---	---	2,200	120	2	2	0.79	1.8	2,400	2.2	1.7	60	<0.5	<0.5	1,100	III
MW-2	14 Apr 89	---	<3.0	<100	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.2	---
MW-2	31 Jul 89	---	---	<100	<0.2	<1.0	<0.2	<0.4	<0.2	<0.2	<0.4	0.5	<0.2	<0.2	<1	<0.2	---
MW-2	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-2	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-2	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-2	21 Sep 90	---	---	<50	<1.5	<1.5	<1.5	4.5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-3	14 Apr 89	---	<3.0	<100	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.2	---
MW-3	31 Jul 89	---	---	<100	<0.2	<1.0	<0.2	<0.4	<0.2	<0.2	<0.2	0.5	<0.2	<0.2	<1	<0.2	---
MW-3	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-3	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-3	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-3	21 Sep 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-4	14 Apr 89	DSL 2	<3.0	380	<0.5	<1	<1	<1	<1	<1	2	<1	<1	<1	<2	<1	---
MW-4+	8 Dec 89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-5	14 Apr 89	DSL 2	<3.0	4,300	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	---
MW-5+	8 Dec 89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	14 Apr 89	DSL 2	<3.0	3,300	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	---
MW-6+	8 Dec 89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---



TABLE 2. Analytic Results: Groundwater Samples (continued)  
Former Chevron Asphalt Plant  
Emeryville, California

Well ID #	Date	FC	O&G <-ppm->	TPH/TPPH <-ppm->	B	T	E	X	1,1-DCE	1,2-DCE	1,1-DCA	TCA	TCE	PCE	CF	VC	Other
-----ppb----->																	
MW-7	14 Apr 89	---	<3.0	<50	<0.5	<1	<1	<1	<1	<1	1	1	<1	<1	<2	<1	---
MW-7	31 Jul 89	DSL 2	---	160	<0.1	<0.5	<0.1	<0.2	<0.1	0.3	0.3	4.5	<0.1	<0.1	<0.5	<0.1	IV
MW-7D	31 Jul 89	DSL 2	---	100	<0.1	<0.5	<0.1	<0.2	<0.1	0.4	0.2	2.6	<0.1	<0.1	<0.5	<0.1	IV
MW-7	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	0.67	<0.5	<0.5	<0.5	<1.0	---
MW-7	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	0.6	<0.2	<0.5	<0.5	1.4	<0.5	<0.5	<0.5	<1	---
MW-7	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	0.67	<0.5	<0.5	<0.5	<1	---
MW-7	20 Sep 90	---	---	<50	1.5	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-8	14 Apr 89	---	<3.0	<50	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	---
MW-8	31 Jul 89	---	---	<50	<0.1	<0.5	<0.1	<0.2	<0.1	0.6	1.7	1.7	0.4	<0.1	<0.5	1.2	V
MW-8	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	0.53	<0.5	0.84	<0.5	<0.5	<0.5	<1.0	---
MW-8	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	0.96	<0.5	0.72	<0.5	<0.5	<0.5	<1	---
MW-8	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	0.59	<0.5	0.67	<0.5	<0.5	<0.5	<1	---
MW-8	20 Sep 90	---	---	<50	6	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-10	14 Apr 89	---	<3.0	<50	<0.5	<1	<1	<1	<1	15*	2	<1	5	<1	<2	<1	---
MW-10	31 Jul 89	---	---	<50	<0.1	<0.5	<0.1	<0.2	0.7	6.3	2.9	<0.1	5.3	<0.1	<0.5	<0.1	VI
MW-10	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	24	3.1	<0.5	4.9	<0.5	0.6	<1.0	---
MW-10	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	0.7	30	2.5	<0.5	3.5	<0.5	<0.5	<1	---
MW-10	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	0.3	33	2.6	<0.5	6.3	<0.5	<0.5	<1	---
MW-10	20 Sep 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	32	5.0	<0.5	5.9	<0.5	<0.5	<1	---
MW-11	14 Apr 89	---	<3.0	<50	<0.5	<1	<1	<1	1	120*	<1	<1	4	<1	<2	10	---
MW-11	31 Jul 89	---	---	<100	<0.2	<0.2	<0.2	<0.2	0.9	40	2.2	1.4	2.9	<0.2	<0.2	<0.2	VII
MW-11	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	0.5	120	2.1	1.2	4.1	<0.5	<0.5	2.4	---
MW-11	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	1.3	150	1.2	1.7	3.5	<0.5	<0.5	4.3	VIII
MW-11	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	0.68	140	1.3	<0.5	5.0	<0.5	<0.5	1	---
MW-11	20 Sep 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	100	1.1	<0.5	3.8	<0.5	<0.5	<1	---
MW-12	14 Apr 89	---	<3.0	<50	<0.5	<1	<1	<1	<1	1*	<1	<1	<1	<1	<2	<1	---
MW-12	31 Jul 89	---	---	<100	<0.1	<0.5	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	0.8	<0.1	<0.5	<0.1	IX
MW-12	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-12	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-12	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-12	20 Sep 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---

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TABLE 2. Analytic Results: Groundwater Samples (continued)  
Former Chevron Asphalt Plant  
Emeryville, California

Well ID #	Date	FC	O&G <-ppm->	TPH/TPPH	B	T	E	X	1,1-DCE	1,2-DCE	1,1-DCA	TCA	TCE	PCE	CF	VC	Other
MW-13	21 Mar 90	---	---	480	<0.3	<0.3	1.0	5.0	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-13	19 Jun 90	---	---	180	<0.3	<0.3	0.8	3.0	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-13	20 Sep 90	---	---	150	<0.3	<0.3	<0.3	0.54	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-14	21 Mar 90	---	---	170	<0.3	<0.3	0.4	2.0	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-14	19 Jun 90	---	---	77	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-14	20 Sep 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-15	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-15	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-15	21 Sep 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
MW-16	26 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	0.8	<0.5	<0.5	27	8	2	<1	---
MW-16	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	35	7	2	<1	---
MW-16	21 Sep 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	0.9	<0.5	<0.5	49	15	4.1	<1	---
MW-17	26 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	5.2	0.7	1.3	32	11	1.1	<1	---
MW-17	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	3.1	<0.5	1.0	38	13	1.2	<1	---
MW-17	20 Sep 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	2.4	<0.5	1.4	44	16	2.8	<1	---
MW-18	26 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	1.7	<0.5	2.4	33	20	0.9	<1	---
MW-18	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	2.7	<0.5	0.9	63	20	0.73	<1	---
MW-18	20 Sep 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	3.3	<0.5	1.6	76	25	1.7	<1	---
MW-19	26 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	10	<0.5	2.5	41	53	3.2	<1	---
MW-19	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	13	<0.5	1.5	46	47	2.8	<1	---
MW-19	20 Sep 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	5.8	<0.5	2.5	39	32	3.1	<1	---
TB	14 Apr 89	---	---	<50	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	---
TB	31 Jul 89	---	---	<50	<0.1	<0.5	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	---
TB	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
TB	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
TB	26 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<1	---
TB	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
TB	20 Sep 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---

045C2SP0.VW



TABLE 2. Analytic Results: Groundwater Samples (continued)  
Former Chevron Asphalt Plant  
Emeryville, California

NOTES:

FC	= Fuel Characterization	+	= Destroyed monitor wells - 1989
O&G	= Oil and Grease	TB	= Travel Blenk
TPH/TPPH	= Total Petroleum Hydrocarbons/Total Purgeable Petroleum Hydrocarbons	---	= Not analyzed/not detected
B	= Benzene	<	= Less than
T	= Toluene	I	= 6 ppb 1,2-dichloropropane; 720 ppb cis-1,2-dichloroethene
E	= Ethylbenzene	II	= 0.6 ppb 1,2-dichloroethane; 2,600 ppb cis-1,2-dichloroethene
X	= Total Xylenes	III	= 63 ppb chloromethane; 0.6 ppb methylene chloride
1,1-DCE	= 1,1-Dichloroethene	IV	= 0.1 ppb 1,2-dichlorobenzene
1,2-DCE	= trans-1,2-dichloroethene	V	= 1.9 ppb cis-1,2-dichloroethene
1,1-DCA	= 1,1-Dichloroethane	VI	= 27 ppb cis-1,2-dichloroethene
TCA	= 1,1,1-Trichloroethane	VII	= 110 ppb cis-1,2-dichloroethene
TCE	= Trichloroethene	VIII	= 1.8 ppb 1,2-dichloroethane
PCE	= Tetrachloroethene	IX	= 1.7 ppb 1,2-dichloroethene
CF	= Chloroform	Gas	= Gasoline
VC	= Vinyl Chloride	DSL 2	= Diesel #2
ppm	= parts-per-million	*	= Not specified if cis- or trans-1,2-dichloroethene
ppb	= parts-per-billion		

ANALYTICAL LABORATORIES: Central Coast April 1989 and July 1989 sampling  
GTEL Analytical Laboratories all sampling since December 1989



## **ATTACHMENT A**

### **SOP-4: GROUNDWATER PURGING AND SAMPLING**





**STANDARD OPERATING PROCEDURES  
RE: GROUNDWATER PURGING AND SAMPLING  
SOP-4**

Prior to water sampling, each well is purged by evacuating a minimum of three well-casing volumes of groundwater or until the discharge water temperature, conductivity, and pH stabilize. The groundwater sample should be taken when the water level in the well recovers to 80% of its static level.

The sampling equipment used consists of either a teflon bailer or a stainless steel bladder pump with a teflon bladder. If the sampling system is dedicated to the well, then the bailer is made of teflon, but the bladder pump is PVC with a polypropylene bladder. Forty milliliter (ml) glass volatile-organic-analysis (VOA) vials, with teflon septa, are used as sample containers.

The groundwater sample is decanted into each VOA vial in such a manner that there is a meniscus at the top of the vial. The cap is quickly placed over the top of the vial and securely tightened. The VOA vial is then inverted and tapped to see if air bubbles are present. If none are present, the sample is labeled and refrigerated for delivery under chain-of-custody to the laboratory. Label information should include a sample identification number, job identification number, date, time, type of analysis requested, and the sampler's name.

For quality control purposes, a duplicate water sample is collected from each well. This sample is put on hold at the laboratory. A trip blank is prepared at the laboratory and placed in the transport cooler. It remains with the cooler and is analyzed by the laboratory along with the groundwater samples. A field blank is prepared in the field when sampling equipment is not dedicated. The field blank is prepared after a pump or bailer has been steam-cleaned, prior to use in a second well, and is analyzed along with the other samples. The field blank demonstrates the quality of in-field cleaning procedures to prevent cross-contamination.

To minimize the potential for cross-contamination between wells, all the well-development and water-sampling equipment that is not dedicated to a well is steam-cleaned between each well. As a second precautionary measure, wells will be sampled in order of least to highest concentrations as established by previous analyses.



## **ATTACHMENT B**

### **FIELD SAMPLING AND MONITORING FORMS**

# LIQUID-LEVEL DATA SHEET

Project No. 1-045-48	Project Name Emeryville	Date 9/20/90	Initials Q.D. B.B.
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Well No.	HISTORIC DATA/DATE:				CURRENT DATA:				Method WLP/PB/IP*	Time	Comments
	DTLH	DTW	LHT	Sounded Depth	DTLH	DTW	LHT	Sounded Depth			
MW1						5.07					
2						6.86					
3						4.43					
7						4.57					
8						4.99					
10						5.77					
11						6.11					
12						5.00 <del>5.00</del>					
13						5.31					
14						2.53					
15						4.98					
16						6.36					
18						5.54					

\* WLP = Water-Level Probe  
 PB = Product Bailer  
 IP = Interface Probe

# LIQUID-LEVEL DATA SHEET

Project No. **1-045-48** Project Name **Emeryville** Date **9/20/90** Initials **GD BB**

Well No.	HISTORIC DATA/DATE				CURRENT DATA:				Method WLP/PB/IP*	Time	Comments
	DTLH	DTW	LHT	Sounded Depth	DTLH	DTW	LHT	Sounded Depth			
19						5.25					
17						6.02					

\* WLP = Water-Level Probe  
PB = Product Bailer  
IP = Interface Probe

# WATER SAMPLING DATA

Project No. 1-045.48	Project Name Emeryville	Well Name MW1	Date 9/20/90	Time	Initials QD BB
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<b>WELL DATA</b>		
Well Depth (ft.) 11.4	Sounded Depth (ft.)	Well Type <input checked="" type="checkbox"/> Monitor Well <input type="checkbox"/> Sampling Port <input type="checkbox"/> Other (describe)
DTW (ft.) 5.07	Date/Time	
Well Diam. (in.) 3	LHC Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	LHC Thickness

<b>CHEMICAL DATA</b>			
Time	Ph Probe No.	Temp Probe No.	Cond Probe No.

<b>EVACUATION</b>		
Initial Height of Water in Casing (ft.) 6.33	Formulas and Conversions r = well radius in ft. h = ht. of water column in ft. vol. of column = $\pi r^2 h$ 7.48 gal / ft <sup>3</sup>  $V_c$ casing = 0.163 gal / ft. $V_{cs}$ casing = 0.367 gal / ft. $V_{cs}$ casing = 0.653 gal / ft. $V_{cs}$ casing = 0.826 gal / ft. $V_{cs}$ casing = 1.470 gal / ft. $V_{cs}$ casing = 2.610 gal / ft. $V_{cs}$ casing = 4.080 gal / ft.	Sampling Equipment Dedicated System <input checked="" type="checkbox"/> Bladder Pump <input type="checkbox"/> Bailor PVC Bailor <input type="checkbox"/> 1/2 in. <input type="checkbox"/> 1 1/4 in. <input type="checkbox"/> 3 in.
Volume (gal) 2.32		Sampling Port No.
Volume to be Evacuated <input checked="" type="checkbox"/> x3 <input type="checkbox"/> x4 6.96 (7gal.)	Volume (gal)	Rate (gpm)

<b>SAMPLING</b>	
Point of Collection <input checked="" type="checkbox"/> PE Hose <input type="checkbox"/> End of Bailor <input type="checkbox"/> Other:	Time Samples Taken 11:30 Date 9/21/90
Sample Color clear	Depth to Water (ft.) 6.75 Refrigerated? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sediment / Foreign Matter no sediment	Odor none
Sampling Sequence	

Evacuation	Evacuated	Evacuated	Evacuated	Evacuated
Stop Time	8:50	8:56		
Start Time	8:40	8:55		
Minutes	10	1 min		
Amt Evac'd	6 gal	0.25 gal		
Total Evac'd				
Total Minutes				
Evac Rate				

Sample ID No.	Volume (ml)	Container	Preservative	Analysis	Lab
09210.01 A	40	VOA	HCL	EPA 602/8015	G-Tel
B					
C			none	EPA 601	
D					
E	1 liter	B	none	Total Dissolve Solids	

Pumped Dry? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	After (gal)	Recovery	
Depth to Water During Pumping (ft.) 10.1	Time 8:57	Time	DTW
Depth to Water for 80% Recovery 6.34	Recovery Rate (gpm) .059	1 8:57	10.1
Sampled After: <input checked="" type="checkbox"/> 80% Rec. <input type="checkbox"/> 2 hours	% Recovery at Time of Sampling 93%	2 9:02	9.3
		3 11:25	5.50
		4	
		5	

Container Codes: P = Plastic Bottle V = VOA B = Brown Glass C = Clear Glass Other: Describe
<b>COMMENTS</b> Well started to go dry at 8:50, 5 mins. later well was pumping strongly for 1 min. DTW at 8:57 = 10.1 DTW at 9:02 = 9.3

# WATER SAMPLING DATA

Project No. <b>1-045.48</b>	Project Name <b>Emeryville</b>	Well Name <b>MW2</b>	Date <b>9/21/90</b>	Time	Initials <b>AD</b>
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<b>WELL DATA</b>		
Well Depth (ft.) <b>14.07</b>	Sounded Depth (ft.)	Well Type <input checked="" type="checkbox"/> Monitor Well <input type="checkbox"/> Sampling Port <input type="checkbox"/> Other (describe)
DTW (ft.) <b>6.86</b>	Date/Time	
Well Diam. (in.) <b>3</b>	LHC Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	LHC Thickness

<b>CHEMICAL DATA</b>			
Time	Ph Probe No.	Temp Probe No.	Cond Probe No.

<b>EVACUATION</b>		
Initial Height of Water in Casing (ft.) <b>7.21</b>	Formulas and Conversions <small>r = well radius in ft. h = ht. of water column in ft. vol. of column = <math>\pi r^2 h</math> 7.48 gal/ft<sup>3</sup></small> $V_c$ casing = 0.163 gal/ft. $V_{c1}$ casing = 0.367 gal/ft. $V_{c2}$ casing = 0.653 gal/ft. $V_{c3}$ casing = 0.826 gal/ft. $V_{c4}$ casing = 1.470 gal/ft. $V_{c5}$ casing = 2.610 gal/ft. $V_{c6}$ casing = 4.080 gal/ft.	Sampling Equipment Dedicated System <input checked="" type="checkbox"/> Bladder Pump <input type="checkbox"/> Bailor. PVC Bailor <input type="checkbox"/> 1/2 in. <input type="checkbox"/> 1 1/4 in. <input type="checkbox"/> 3 in.
Volume (gal) <b>2.64</b>		Sampling Port No.
Volume to be Evacuated <input checked="" type="checkbox"/> x3 <input type="checkbox"/> x4 <b>7.93</b>		Volume (gal)      Rate (gpm)

<b>SAMPLING</b>	
Point of Collection <input checked="" type="checkbox"/> PE Hose <input type="checkbox"/> End of Bailor <input type="checkbox"/> Other:	Time Samples Taken <b>12:22</b> Date <b>9/21/90</b>
	Depth to Water (ft.) <b>9.10</b> Refrigerated? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Color <b>partly cloudy</b>	Odor <b>slight odor</b>
Sediment / Foreign Matter <b>slight sediment</b>	
Sampling Sequence	

	Evacuated		Evacuated	
	Evacuated	Evacuated	Evacuated	Evacuated
Stop Time	<b>9:45</b>			
Start Time	<b>9:28</b>			
Minutes	<b>17</b>			
Amt Evac'd	<b>4</b> gal			
Total Evac'd				
Total Minutes				
Evac Rate				

Sample ID No.	Volume (ml)	Container	Preservative	Analysis	Lab
<b>09210.02A</b>	<b>40</b>	<b>VOA</b>	<b>HCL</b>	<b>EPA 602/8015</b>	<b>G-Tel</b>
↓	↓	↓	↓	↓	↓
B	↓	↓	↓	↓	↓
C	↓	↓	habe	EPA 601	↓
D	↓	↓	↓	↓	↓

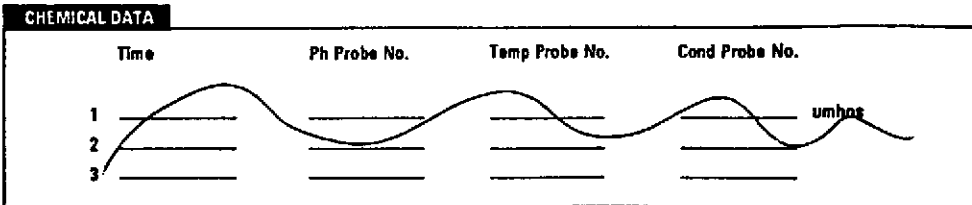
Pumped Dry? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	After (gal)	Recovery	
Depth to Water During Pumping (ft.) <b>9.1</b>	Time <b>9:50</b>	1 <b>9:50</b>	DTW <b>9.1</b>
Depth to Water for 80% Recovery <b>8.30</b>	Recovery Rate (gpm) <b>.009</b>	2 <b>9:55</b>	<b>9.22</b>
Sampled After: <input type="checkbox"/> 80% Rec. <input checked="" type="checkbox"/> 2 hours	% Recovery at Time of Sampling <b>74.7</b>	3 <b>12:17</b>	<b>8.68</b>
		4	
		5	

Container Codes: P = Plastic Bottle, V = VOA, B = Brown Glass, C = Clear Glass, Other: Describe
<b>COMMENTS</b> 9:45 well goes dry DTW at 9:50 = 9.1' DTW at 9:55 = 9.22'

# WATER SAMPLING DATA

Project No. 1-045.48	Project Name Emergency	Well Name mw3	Date 9/21/90	Time	Initials AD
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<b>WELL DATA</b>	Sounded Depth (ft.)	Well Type
Well Depth (ft.) 12	Date/Time	<input checked="" type="checkbox"/> Monitor Well <input type="checkbox"/> Sampling Port <input type="checkbox"/> Other (describe)
DTW (ft.) 4.43	LHC Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	LHC Thickness
Well Diam. (in.) 3		



<b>EVACUATION</b>	Formulas and Conversions	Sampling Equipment
Initial Height of Water in Casing (ft.) 7.57	$r = \text{well radius in ft.}$ $h = \text{ht. of water column in ft.}$ $\text{vol. of column} = \pi r^2 h$ 7.48 gal / ft <sup>3</sup>	<input checked="" type="checkbox"/> Bladder Pump <input type="checkbox"/> Bailor PVC Bailor <input type="checkbox"/> 1/2 in. <input type="checkbox"/> 1 1/4 in. <input type="checkbox"/> 3 in.
Volume (gal) 2.8	$V_c \cdot \text{casing} = 0.163 \text{ gal / ft.}$ $V_c \cdot \text{casing} = 0.367 \text{ gal / ft.}$ $V_c \cdot \text{casing} = 0.653 \text{ gal / ft.}$ $V_c \cdot \text{casing} = 0.826 \text{ gal / ft.}$ $V_c \cdot \text{casing} = 1.470 \text{ gal / ft.}$ $V_c \cdot \text{casing} = 2.610 \text{ gal / ft.}$ $V_c \cdot \text{casing} = 4.080 \text{ gal / ft.}$	Sampling Port No.
Volume to be Evacuated <input checked="" type="checkbox"/> x3 <input type="checkbox"/> x4 8.3		Volume (gal)      Rate (gpm)

<b>SAMPLING</b>	Point of Collection	Time Samples Taken	Date
<input checked="" type="checkbox"/> PE Hose <input type="checkbox"/> End of Bailor <input type="checkbox"/> Other:	Time Samples Taken 12:10	Date 9/21/90	
Sample Color cloudy	Depth to Water (ft.) 6.39	Refrigerated? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sediment / Foreign Matter little sediment	Odor slight odor		
Sampling Sequence			

Evacuation	Evacuated	Evacuated	Evacuated	Evacuated
Stop Time	10:15			
Start Time	10:05			
Minutes	10			
Amt Evac'd	5.25 gal			
Total Evac'd				
Total Minutes				
Evac Rate				

Sample ID No.	Volume (ml)	Container	Preservative	Analysis	Lab
09210.03A	40	VDA	HCL	EPA 602/8015	G-Tel
B	↓	↓	↓	↓	↓
C	↓	↓	none	EPA 601	↓
D	↓	↓	↓	↓	↓

Pumped Dry? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	After (gal)	Recovery
Depth to Water During Pumping (ft.) 10.75	Time 10:28	Time      DTW
Depth to Water for 80% Recovery 5.94	Recovery Rate (gpm) .062	1 10:28      10.75 2 10:33      9.9 3 11:50      6.38 4 12:10      5.94 5 _____
Sampled After: <input checked="" type="checkbox"/> 80% Rec. <input type="checkbox"/> 2 hours	% Recovery at Time of Sampling 80%	

**COMMENTS**

10:28 am well pumped dry DTW = 10.75  
at 10:33 am = 9.9' DTW  
6.38

WATER SAMPLING DATA Well Name MW# 7 Date 9-20-90 Time 1200  
 Job Name Emeryville Job Number 1-045-48 Initials BB  
 WELL DATA: Well type M (M=monitoring well; Describe \_\_\_\_\_)  
 Depth to Water 4.57 ft.  
 Well Depth 13.59 ft. (spec.) Sounded Depth \_\_\_\_\_ ft.  
 Well Diameter 3 in. Date \_\_\_\_\_ Time \_\_\_\_\_

EVACUATION: Sampling Equipment:  
 PVC Bailer: \_\_\_\_\_ in. Dedicated: Bladder Pump  ; Bailer   
 Sampling Port: Number \_\_\_\_\_ Rate \_\_\_\_\_ gpm. Volume \_\_\_\_\_ gal.  
 Other \_\_\_\_\_  
 Initial Height of Water in Casing 9.02 ft.; Volume 3.31 gal.  
 Volume To Be Evacuated = 9.93 gal. (initial volume x3 2, x4 \_\_\_\_\_)

	Evacuated	Evacuated	Evacuated
Time: Stop	<u>1222</u>	_____	_____
Start	<u>1208</u>	_____	_____
Total minutes	<u>14</u>	_____	_____
Amount Evacuated	<u>7.0</u>	_____	_____
Total Evacuated	<u>7</u> gal.	_____	_____
Evacuation Rate	<u>0.5</u> gpm.	_____	_____

Formulas / Conversions  
 r = well radius in ft  
 h = ht of water col in ft  
 vol. of col. =  $\pi r^2 h$   
 7.48 gal/ft<sup>3</sup>  
 V<sub>c</sub> casing = 0.163 gal/ft  
 V<sub>c</sub> casing = 0.367 gal/ft  
 V<sub>c</sub> casing = 0.653 gal/ft  
 V<sub>c</sub> casing = 0.826 gal/ft  
 V<sub>c</sub> casing = 1.47 gal/ft  
 V<sub>c</sub> casing = 2.6 gal/ft

Depth to water during pumping \_\_\_\_\_ ft. time \_\_\_\_\_  
 Pumped dry? yes After 7 gal. Recovery rate 0.05  
 Depth to water for 80% recovery 6.37 ft.

CHEMICAL DATA: Temp. Probe # \_\_\_\_\_ Ph. Probe # \_\_\_\_\_ Cond. Probe # \_\_\_\_\_

Time	1	2	3	4	°C	umhos
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

SAMPLING: Point of collection: PE hose 1; End of bailer \_\_\_\_\_; Other \_\_\_\_\_  
 Samples taken 1506 time Depth to water 17.50 ft. Refrigerated:   
 Sample description: Water color cloudy Odor none  
 Sediment/Foreign matter none

Sample ID no.	Container	Preservative	Analysis	Lab
<u>04210-07A 40</u> ml	<u>QA / other</u>	<u>HCl</u>	<u>EPA 602/8015</u>	<u>6-TEL</u>
<u>3</u> ml	↓	↓	↓	↓
<u>0</u> ml	↓	<u>none</u>	<u>EPA 601</u>	↓
<u>0</u> ml	↓	↓	↓	↓
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe \_\_\_\_\_

COMMENTS: 104 @ 1223 = 12.25'  
1228 = 11.5'  
1500 = 5.23'



# WATER SAMPLING DATA

Project No. <b>1-045.48</b>	Project Name <b>Emer-jv. 11c</b>	Well Name <b>MW 8</b>	Date <b>9/20/90</b>	Time	Initials <b>GD</b>
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WELL DATA		
Well Depth (ft.) <b>15.69</b>	Sounded Depth (ft.)	Well Type <input checked="" type="checkbox"/> Monitor Well <input type="checkbox"/> Sampling Port <input type="checkbox"/> Other (describe)
DTW (ft.) <b>4.99</b>	Date/Time	
Well Diam. (in.) <b>3</b>	LHC Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	LHC Thickness

CHEMICAL DATA			
Time	Ph Probe No.	Temp Probe No.	Cond Probe No.

EVACUATION		
Initial Height of Water in Casing (ft.) <b>10.2</b>	Formulas and Conversions $r = \text{well radius in ft.}$ $h = \text{ht. of water column in ft.}$ $\text{vol. of column} = \pi r^2 h$ $7.48 \text{ gal / ft}^3$  $V_{cs} = \text{casing} = 0.163 \text{ gal / ft.}$ $V_{cs} = \text{casing} = 0.367 \text{ gal / ft.}$ $V_{cs} = \text{casing} = 0.653 \text{ gal / ft.}$ $V_{cs} = \text{casing} = 0.826 \text{ gal / ft.}$ $V_{cs} = \text{casing} = 1.470 \text{ gal / ft.}$ $V_{cs} = \text{casing} = 2.610 \text{ gal / ft.}$ $V_{cs} = \text{casing} = 4.080 \text{ gal / ft.}$	Sampling Equipment Dedicated System <input checked="" type="checkbox"/> Bladder Pump <input type="checkbox"/> Bailor PVC Bailor <input type="checkbox"/> 1/2 in. <input type="checkbox"/> 1 1/4 in. <input type="checkbox"/> 3 in.
Volume (gal) <b>3.7</b>		Sampling Port No.
Volume to be Evacuated <input checked="" type="checkbox"/> x3 <input type="checkbox"/> x4  <b>11.2</b>		Volume (gal)      Rate (gpm)

SAMPLING		
Point of Collection <input checked="" type="checkbox"/> PE Hose <input type="checkbox"/> End of Bailor <input type="checkbox"/> Other:	Time Samples Taken <b>14:35</b>	Date <b>9/20/90</b>
	Depth to Water (ft.) <b>13.2</b>	Refrigerated? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Color <b>clear</b>	Odor <b>none</b>	
Sediment / Foreign Matter <b>no sediment</b>		
Sampling Sequence		

Evacuation	Evacuated	Evacuated	Evacuated	Evacuated
Stop Time	<b>14:30</b>			
Start Time	<b>14:15</b>			
Minutes	<b>15</b>			
Amt Evac'd	<b>11.2 gal</b>			
Total Evac'd	<b>11.2 gal</b>			
Total Minutes	<b>15 min</b>			
Evac Rate				

Sample ID No.	Volume (ml)	Container	Preservative	Analysis	Lab
<b>0921-09A</b>	<b>40</b>	<b>VOA</b>	<b>HCL</b>	<b>EPA 602/18015G-Tel</b>	
↓ <b>B</b>	↓	↓	↓	↓	↓
↓ <b>C</b>	↓	↓	<b>none</b>	<b>EPA 601</b>	↓
↓ <b>D</b>	↓	↓	↓	↓	↓

Pumped Dry? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	After (gal)	Recovery	
		Time	DTW
Depth to Water During Pumping (ft.)		1 _____	_____
		2 _____	_____
Depth to Water for 80% Recovery		3 _____	_____
	Recovery Rate (gpm)	4 _____	_____
Sampled After: <input type="checkbox"/> 80% Rec. <input type="checkbox"/> 2 hours		5 _____	_____
	% Recovery at Time of Sampling		

Container Codes:	P = Plastic Bottle V = VOA	B = Brown Glass C = Clear Glass	Other: Describe
COMMENTS			

# WATER SAMPLING DATA

Project No. <b>i-045-48</b>	Project Name <b>Emeryville</b>	Well Name <b>MW 10</b>	Date <b>9/20/90</b>	Time	Initials <b>QD</b>
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<b>WELL DATA</b>	Sounded Depth (ft.) <b>20.36</b>	Well Type <input checked="" type="checkbox"/> Monitor Well <input type="checkbox"/> Sampling Port <input type="checkbox"/> Other (describe)
DTW (ft.) <b>5.77</b>	Date/Time	
Well Diam. (in.) <b>4</b>	LHC Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	LHC Thickness

<b>CHEMICAL DATA</b>				
Time	Ph Probe No.	Temp Probe No.	Cond Probe No.	
1				umhos
2				
3				

<b>EVACUATION</b>	Initial Height of Water in Casing (ft) <b>14.59</b>	Formulas and Conversions <small>r = well radius in ft. h = ht. of water column in ft. vol. of column = π r<sup>2</sup> h 7.48 gal / ft<sup>3</sup></small> V <sub>1</sub> casing = 0.163 gal / ft. V <sub>2</sub> casing = 0.367 gal / ft. V <sub>3</sub> casing = 0.653 gal / ft. V <sub>4</sub> casing = 0.826 gal / ft. V <sub>5</sub> casing = 1.470 gal / ft. V <sub>6</sub> casing = 2.610 gal / ft. V <sub>10</sub> casing = 4.080 gal / ft.	Sampling Equipment Dedicated System <input checked="" type="checkbox"/> Bladder Pump <input type="checkbox"/> Boiler PVC Bailor <input type="checkbox"/> 1/2 in. <input type="checkbox"/> 1 1/4 in. <input type="checkbox"/> 3 in.
Volume (gal) <b>9.5</b>			Sampling Port No.
Volume to be Evacuated <input checked="" type="checkbox"/> x3 <input type="checkbox"/> x4 <b>28.6</b>			Volume (gal)      Rate (gpm)

<b>SAMPLING</b>	
Point of Collection <input checked="" type="checkbox"/> PE Hose <input type="checkbox"/> End of Bailor <input type="checkbox"/> Other:	Time Samples Taken <b>13:40</b> Date <b>9/19/20</b> Depth to Water (ft) <b>7.50</b> Refrigerated? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Color <b>clear</b>	Odor <b>none</b>
Sediment / Foreign Matter <b>no sediment</b>	
Sampling Sequence	

Evacuation	Evacuated	Evacuated	Evacuated	Evacuated
Stop Time	<b>13:35</b>			
Start Time	<b>13:15</b>			
Minutes	<b>20</b>			
Amt Evac'd	<b>28.6</b> gal	gal	gal	gal
Total Evac'd	<b>28.6</b> gal	gal	gal	gal
Total Minutes	<b>20</b> min	min	min	min
Evac Rate	gpm	gpm	gpm	gpm

Sample ID No.	Volume (ml)	Container	Preservative	Analysis	Lab
<b>09210.10A</b>	<b>40</b>	<b>VOA</b>	<b>HCL</b>	<b>EPA 602/18015</b>	<b>G-Tel</b>
<b>B</b>			↓	↓	↓
<b>C</b>			<b>none</b>	<b>EPA 601</b>	↓
<b>D</b>			↓	↓	↓

Pumped Dry? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	After (gal)	<b>Recovery</b>	
Depth to Water During Pumping (ft)	Time	Time	DTW
Depth to Water for 80% Recovery	Recovery Rate (gpm)	1	
Sampled After: <input type="checkbox"/> 80% Rec. <input type="checkbox"/> 2 hours	% Recovery at Time of Sampling	2	
		3	
		4	
		5	

Container Codes:	P = Plastic Bottle V = VOA	B = Brown Glass C = Clear Glass	Other: Describe
<b>COMMENTS</b>			

# WATER SAMPLING DATA

Project No. <b>1-045-48</b>	Project Name <b>Emeryville</b>	Well Name <b>Mw 11</b>	Date <b>9/20/90</b>	Time	Initials <b>GD</b>
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<b>WELL DATA</b>	Sounded Depth (ft.)	Well Type
Well Depth (ft.) <b>19.43</b>	Date/Time	<input checked="" type="checkbox"/> Monitor Well <input type="checkbox"/> Sampling Port <input type="checkbox"/> Other (describe)
DTW (ft.) <b>6.11</b>	LHC Present? <input type="checkbox"/> Yes <input type="checkbox"/> No	LHC Thickness
Well Diam. (in.) <b>4</b>		

<b>CHEMICAL DATA</b>				
Time	Ph Probe No.	Temp Probe No.	Cond Probe No.	

<b>EVACUATION</b>	Formulas and Conversions	Sampling Equipment
Initial Height of Water in Casing (ft.) <b>13.32</b>	$r = \text{well radius in ft.}$ $h = \text{ht. of water column in ft.}$ $\text{vol. of column} = \pi r^2 h$ $7.48 \text{ gal/ft}^3$	Dedicated System <input checked="" type="checkbox"/> Bladder Pump <input type="checkbox"/> Bailor PVC Bailor <input type="checkbox"/> 1/2 in. <input type="checkbox"/> 1 1/4 in. <input type="checkbox"/> 3 in.
Volume (gal.) <b>8.5</b>	$V_{10} \text{ casing} = 0.163 \text{ gal/ft.}$ $V_{12} \text{ casing} = 0.367 \text{ gal/ft.}$ $V_{14} \text{ casing} = 0.653 \text{ gal/ft.}$ $V_{16} \text{ casing} = 0.826 \text{ gal/ft.}$ $V_{18} \text{ casing} = 1.470 \text{ gal/ft.}$ $V_{20} \text{ casing} = 2.610 \text{ gal/ft.}$ $V_{22} \text{ casing} = 4.080 \text{ gal/ft.}$	Sampling Port No.
Volume to be Evacuated <input checked="" type="checkbox"/> x3 <input type="checkbox"/> x4 <b>26.1</b>		Volume (gal)   Rate (gpm)

<b>SAMPLING</b>		Time Samples Taken <b>12:40</b>	Date <b>9/20/90</b>
Point of Collection <input checked="" type="checkbox"/> PE Hose <input type="checkbox"/> End of Bailor <input type="checkbox"/> Other:	Depth to Water (ft.) <b>2.50</b>	Refrigerated? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Color <b>clear</b>	Odor <b>none</b>		
Sediment / Foreign Matter <b>no sediment</b>			
Sampling Sequence			

Evacuation	Evacuated	Evacuated	Evacuated	Evacuated
Stop Time	<b>12:30</b>			
Start Time	<b>11:50</b>			
Minutes	<b>40 min</b>			
Amt Evac'd	<b>26.1 gal</b>	gal	gal	gal
Total Evac'd	<b>26.1 gal</b>	gal	gal	gal
Total Minutes	<b>40 min</b>	min	min	min
Evac Rate	gpm	gpm	gpm	gpm

Sample ID No.	Volume (ml)	Container	Preservative	Analysis	Lab
<b>09210.11 A</b>	<b>40</b>	<b>VOA</b>	<b>HCL</b>	<b>EPA 602/8015</b>	<b>G-Tel</b>
<b>B</b>					
<b>C</b>			<b>none</b>	<b>EPA 601</b>	
<b>D</b>					

Pumped Dry? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	After (gal)	Recovery
Depth to Water During Pumping (ft.)	Time	Time   DTW
Depth to Water for 80% Recovery	Recovery Rate (gpm)	1 _____
Sampled After: <input type="checkbox"/> 80% Rec. <input type="checkbox"/> 2 hours	% Recovery at Time of Sampling	2 _____
		3 _____
		4 _____
		5 _____

Container Codes:	P = Plastic Bottle V = VOA	B = Brown Glass C = Clear Glass	Other: Describe
<b>COMMENTS</b>			

WATER SAMPLING DATA Well Name MW#12 Date 9.20.90 Time 800  
 Job Name EMERYVILLE Job Number 1-095.48 Initials RB  
 WELL DATA: Well type M (M=monitoring well; Describe \_\_\_\_\_)  
 Depth to Water 5.00 ft.  
 Well Depth 19.21 ft. (spec.) Sounded Depth \_\_\_\_\_ ft.  
 Well Diameter 4 in. Date \_\_\_\_\_ Time \_\_\_\_\_

EVACUATION: Sampling Equipment:  
 PVC Bailer: \_\_\_\_\_ in. Dedicated: Bladder Pump X; Bailer \_\_\_\_\_  
 Sampling Port: Number \_\_\_\_\_ Rate \_\_\_\_\_ gpm. Volume \_\_\_\_\_ gal.  
 Other \_\_\_\_\_  
 Initial Height of Water in Casing 14.21 ft; Volume 9.28 gal.  
 Volume To Be Evacuated = 27.8 gal. (initial volume x3 X, x4 \_\_\_\_\_)

	Evacuated	Evacuated	Evacuated
Time: Stop	<u>824</u>	_____	_____
Start	<u>814</u>	_____	_____
Total minutes	<u>10</u>	_____	_____
Amount Evacuated	<u>10.5</u>	_____	_____
Total Evacuated	<u>10.5</u> gal.	_____	_____
Evacuation Rate	<u>0.95</u> gpm.	_____	_____

Formulas / Conversions  
 r = well radius in ft  
 h = ht of water col in ft  
 vol. of col. =  $\pi r^2 h$   
 7.48 gal/ft<sup>3</sup>  
 V<sub>c</sub> casing = 0.163 gal/ft  
 V<sub>c</sub> casing = 0.267 gal/ft  
 V<sub>c</sub> casing = 0.653 gal/ft  
 V<sub>c</sub> casing = 0.826 gal/ft  
 V<sub>c</sub> casing = 1.47 gal/ft  
 V<sub>c</sub> casing = 2.61 gal/ft

Depth to water during pumping \_\_\_\_\_ ft. \_\_\_\_\_ time  
 Pumped dry? YES After 10.5 gal. Recovery rate 0.27  
 Depth to water for 80% recovery 7.85 ft.

CHEMICAL DATA: Temp. Probe # \_\_\_\_\_ Flu Probe # \_\_\_\_\_ Cond. Probe # \_\_\_\_\_

Time	1	2	3	4	_____	_____	_____	_____
	_____ °C	_____	_____	_____	_____	_____	_____	_____ umhos

SAMPLING: Point of collection: PE Hose X; End of bailer \_\_\_\_\_; Other \_\_\_\_\_  
 Samples taken 115 time Depth to water 9.97 ft. Refrigerated: X  
 Sample description: Water color CLEAR Odor None  
 Sediment/Foreign matter None

Sample ID no.	Container	Preservative	Analysis	Lab
<u>09210-12A 40</u> ml	<u>YDA / other</u>	<u>HCl</u>	<u>EPA 602/8015</u>	<u>G.TEL</u>
<u>3</u> ml	<u>J</u>	<u>↓</u>	<u>J</u>	<u>J</u>
<u>C</u> ml	<u>J</u>	<u>None</u>	<u>EPA 601</u>	<u>J</u>
<u>D</u> ml	<u>J</u>	<u>↓</u>	<u>↓</u>	<u>J</u>
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe \_\_\_\_\_

COMMENTS: Dry 825 @ 18.35  
830 16.28  
1008 7.92  
1056 7.33

WATER SAMPLING DATA Well Name MW-13 Date 9-20-90 Time 1230  
Job Name Emergency Job Number 1-045-48 Initials BJS  
WELL DATA: Well type M (M=monitoring well; Describe \_\_\_\_\_)  
Depth to Water 5.31 ft.  
Well Depth 12.5 ft. (spec.) Sounded Depth \_\_\_\_\_ ft.  
Well Diameter 4 in. Date \_\_\_\_\_ Time \_\_\_\_\_

EVACUATION: Sampling Equipment:  
PVC Bailer: 3 in. Dedicated: Bladder Pump \_\_\_\_\_; Bailer \_\_\_\_\_  
Sampling Port: Number \_\_\_\_\_ Rate \_\_\_\_\_ gpm. Volume \_\_\_\_\_ gal.  
Other \_\_\_\_\_  
Initial Height of Water in Casing 4.19 ft; Volume 4.70 gal.  
Volume To Be Evacuated = 14.1 gal. (initial volume x3 ^, x4 \_\_\_\_\_)

	Evacuated	Evacuated	Evacuated
Time: Stop	<u>1243</u>	_____	_____
Start	<u>1237</u>	_____	_____
Total minutes	<u>6</u>	_____	_____
Amount Evacuated	<u>10.0</u>	_____	_____
Total Evacuated	<u>10</u> gal.	_____	_____
Evacuation Rate	<u>0.6</u> gpm.	_____	_____

Formulas / Conversions  
r = well radius in ft  
h = ht of water col in ft  
vol. of col. =  $\pi r^2 h$   
7.48 gal/ft<sup>3</sup>  
V<sub>c</sub> casing = 0.163 gal/ft  
V<sub>c</sub> casing = 0.267 gal/ft  
V<sub>c</sub> casing = 0.653 gal/ft  
V<sub>c</sub> casing = 0.826 gal/ft  
V<sub>c</sub> casing = 1.47 gal/ft  
V<sub>c</sub> casing = 2.61 gal/ft

Depth to water during pumping \_\_\_\_\_ ft. Time \_\_\_\_\_  
Pumped dry? yes After 10.0 gal. Recovery rate 0.081  
Depth to water for 80% recovery 6.75 ft.

CHEMICAL DATA: Temp. Probe # \_\_\_\_\_ Flu Probe # \_\_\_\_\_ Cond. Probe # \_\_\_\_\_

Time	1	2	3	4	°C	umhos
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

SAMPLING: Point of collection: PE hose \_\_\_\_\_; End of bailer X; Other \_\_\_\_\_  
Samples taken 1522 time Depth to water 7.97 ft. Refrigerated: \_\_\_\_\_  
Sample description: Water color clear Odor moderate X  
Sediment/Foreign matter \_\_\_\_\_

Sample ID no.	Container	Preservative	Analysis	Lab
<u>09210-137-40</u> ml	<u>VOA / other</u>	<u>HCl</u>	<u>EPA 602/8015</u>	<u>G-73 L</u>
<u>B</u> ml	<u>J</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>C</u> ml	<u>J</u>	<u>None</u>	<u>EPA 601</u>	<u>↓</u>
<u>a</u> ml	<u>J</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>*</u> ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: Dry @ 1244 - 14.31'  
1249 13.69'  
15:16 6.19'

WATER SAMPLING DATA Well Name RW #14 Date 9.20.90 Time 1120  
 Job Name EMERYVILLE Job Number 1-045-98 Initials BJS  
 WELL DATA: Well type M (M=monitoring well; Describe \_\_\_\_\_)  
 Depth to Water 2.53 ft.  
 Well Depth 10 ft. (spec.) Sounded Depth \_\_\_\_\_ ft.  
 Well Diameter 4 in. Date \_\_\_\_\_ Time \_\_\_\_\_

EVACUATION: Sampling Equipment:  
 PVC Bailer: 3 in. Dedicated: Bladder Pump \_\_\_\_\_; Bailer \_\_\_\_\_  
 Sampling Port: Number \_\_\_\_\_ Rate \_\_\_\_\_ gpm. Volume \_\_\_\_\_ gal.  
 Other \_\_\_\_\_  
 Initial Height of Water in Casing 7.47 ft; Volume 4.88 gal.  
 Volume To Be Evacuated = 14.63 gal. (initial volume x3 ^, x4 \_\_\_\_\_)

	Evacuated	Evacuated	Evacuated
Time: Stop	<u>1159</u>	_____	_____
Start	<u>1157</u>	_____	_____
Total minutes	<u>2</u>	_____	_____
Amount Evacuated	<u>6.0</u>	_____	_____
Total Evacuated	_____ gal.	_____	_____
Evacuation Rate	<u>30</u> gpm.	_____	_____

Formulas / Conversions  
 r = well radius in ft  
 h = ht of water col in ft  
 vol. of col. =  $\pi r^2 h$   
 7.48 gal/ft<sup>3</sup>  
 V<sub>c</sub> casing = 0.163 gal/ft  
 V<sub>c</sub> casing = 0.367 gal/ft  
 V<sub>c</sub> casing = 0.653 gal/ft  
 V<sub>c</sub> casing = 0.826 gal/ft  
 V<sub>c</sub> casing = 1.47 gal/ft  
 V<sub>c</sub> casing = 2.61 gal/ft

Depth to water during pumping \_\_\_\_\_ ft. \_\_\_\_\_ time  
 Pumped dry? (x) After 6.0 gal. Recovery rate 0.633  
 Depth to water for 80% recovery 4.02 ft.

CHEMICAL DATA: Temp. Probe # \_\_\_\_\_ Flu Probe # \_\_\_\_\_ Cond. Probe # \_\_\_\_\_

Time	1	2	3	4	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____	_____	_____	_____

SAMPLING: Point of collection: PE hose \_\_\_\_\_; End of bailer X; Other \_\_\_\_\_  
 Samples taken 1543 time Depth to water 2.52 ft. Refrigerated: X  
 Sample description: Water color CCFA Odor None  
 Sediment/Foreign matter None

Sample ID no.	Container	Preservative	Analysis	Lab
<u>09210-14A 40ml</u>	<u>VOA / other</u>	<u>HCl</u>	<u>EPA 602/8015</u>	<u>GTCL</u>
<u>B ml</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>C ml</u>	<u>↓</u>	<u>None</u>	<u>EPA 601</u>	<u>↓</u>
<u>b ml</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe \_\_\_\_\_

COMMENTS: 114 @ 1200 939  
1205 9.14  
1538 4.53

**WATER SAMPLING DATA** Well Name MW#15 Date 9-21-90 Time 830  
 Job Name EMERGENCY Job Number 1-045-48 Initials BB  
**WELL DATA:** Well type M (M=monitoring well; Describe \_\_\_\_\_)  
 Depth to Water 4.98 ft.  
 Well Depth 10.5 ft. (spec.) Sounded Depth \_\_\_\_\_ ft.  
 Well Diameter 4 in. Date \_\_\_\_\_ Time \_\_\_\_\_

**EVACUATION:** Sampling Equipment:  
 PVC Bailer: 3 in. Dedicated: Bladder Pump \_\_\_\_\_; Bailer \_\_\_\_\_  
 Sampling Port: Number \_\_\_\_\_ Rate \_\_\_\_\_ gpm. Volume \_\_\_\_\_ gal.  
 Other \_\_\_\_\_  
 Initial Height of Water in Casing 5.52 ft; Volume 3.6 gal.  
 Volume To Be Evacuated = 10.8 gal. (initial volume x3 2, x4 \_\_\_\_\_)

	Evacuated	Evacuated	Evacuated
Time: Stop	<u>942</u>	_____	_____
Start	<u>938</u>	_____	_____
Total minutes	<u>4</u>	_____	_____
Amount Evacuated	<u>5.0</u>	_____	_____
Total Evacuated	<u>5.0</u> gal.	_____	_____
Evacuation Rate	<u>1.25</u> gpm.	_____	_____

**Formulas / Conversions**  
 r = well radius in ft  
 h = ht of water col in ft  
 vol. of col. =  $\pi r^2 h$   
 7.48 gal/ft<sup>3</sup>  
~~V<sub>c</sub> casing = 0.163 gal/ft~~  
~~V<sub>c</sub> casing = 0.267 gal/ft~~  
~~V<sub>c</sub> casing = 0.653 gal/ft~~  
~~V<sub>c</sub> casing = 0.826 gal/ft~~  
~~V<sub>c</sub> casing = 1.47 gal/ft~~  
~~V<sub>c</sub> casing = 2.61 gal/ft~~

Depth to water during pumping \_\_\_\_\_ ft. \_\_\_\_\_ time  
 Pumped dry? yes After 5.0 gal. Recovery rate 0.065  
 Depth to water for 80% recovery 6.08 ft.

**CHEMICAL DATA:** Temp. Probe # \_\_\_\_\_ Ph Probe # \_\_\_\_\_ Cond. Probe # \_\_\_\_\_  
 Time \_\_\_\_\_ 1 \_\_\_\_\_ °C \_\_\_\_\_ umhos  
 \_\_\_\_\_ 2 \_\_\_\_\_  
 \_\_\_\_\_ 3 \_\_\_\_\_  
 \_\_\_\_\_ 4 \_\_\_\_\_

**SAMPLING:** Point of collection: PE hose \_\_\_\_\_; End of bailer 1; Other \_\_\_\_\_  
 Samples taken 11/1 time Depth to water 7.05 ft. Refrigerated: x  
 Sample description: Water color CLEAR Odor NONE  
 Sediment/Foreign matter NONE

Sample ID no.	Container	Preservative	Analysis	Lab
<u>09210-15A 40</u> ml	<u>100 / other</u>	<u>HE1</u>	<u>EPA 602/8015</u>	<u>G-TEC</u>
<u>B</u> ml	<u>J</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>C</u> ml	<u>J</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>D</u> ml	<u>J</u>	<u>NONE</u>	<u>EPA 601</u>	<u>↓</u>
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

**MENTS:** Dry @ 843 = 9.70'  
848 = 9.20'  
1104 = 5.95'

WATER SAMPLING DATA Well Name MW#16 Date 9-21-90 Time 8:55  
 Job Name Sourville Job Number 1-045-48 Initials BB  
 WELL DATA: Well type M (M=monitoring well; Describe         )  
 Depth to Water 6.36 ft.  
 Well Depth 13.34 ft. (spec.) Sounded Depth          ft.  
 Well Diameter 2 in. Date          Time         

EVACUATION: Sampling Equipment:  
 PVC Bailer: 1 1/4 in. Dedicated: Bladder Pump -; Bailer -  
 Sampling Port: Number          Rate          gpm. Volume          gal.  
 Other           
 Initial Height of Water in Casing 6.98 ft.; Volume 1.14 gal.  
 Volume To Be Evacuated = 3.4 gal. (initial volume x3 x, x4         )

	Evacuated	Evacuated	Evacuated
Time: Stop	<u>9.26</u>	_____	_____
Start	<u>9.19</u>	_____	_____
Total minutes	<u>7</u>	_____	_____
Amount Evacuated	<u>        </u>	_____	_____
Total Evacuated	<u>3.5</u> gal.	_____	_____
Evacuation Rate	<u>0.5</u> gpm.	_____	_____

Formulas / Conversions  
 r = well radius in ft  
 h = ht of water col in ft  
 vol. of col. =  $\pi r^2 h$   
 7.48 gal/ft<sup>3</sup>  
 V<sub>1</sub> casing = 0.163 gal/ft  
 V<sub>2</sub> casing = 0.267 gal/ft  
 V<sub>3</sub> casing = 0.653 gal/ft  
 V<sub>4</sub> casing = 0.826 gal/ft  
 V<sub>5</sub> casing = 1.47 gal/ft  
 V<sub>6</sub> casing = 3.61 gal/ft

Depth to water during pumping 6.38 ft. 9:23 time  
 Pumped dry? NO After          gal. Recovery rate           
 Depth to water for 80% recovery          ft.

CHEMICAL DATA: Temp. Probe #          Ph Probe #          Cond. Probe #         

Time	1	2	3	4	°C	umhos
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

SAMPLING: Point of collection: PE Hose         ; End of bailer X; Other           
 Samples taken 9:28 time Depth to water 6.36 ft. Refrigerated: X  
 Sample description: Water color Brown Odor None  
 Sediment/Foreign matter Brown silt

Sample ID no.	Container	Preservative	Analysis	Lab
<u>09210-11A</u>	<u>40 ml</u>	<u>None</u>	<u>EPA 602/8015</u>	<u>C-TEC</u>
<u>B</u>	<u>ml</u>	<u>        </u>	<u>        </u>	<u>        </u>
<u>C</u>	<u>ml</u>	<u>None</u>	<u>EPA 601</u>	<u>        </u>
<u>D</u>	<u>ml</u>	<u>        </u>	<u>        </u>	<u>        </u>
_____	ml	_____	_____	_____
_____	ml	_____	_____	_____
_____	ml	_____	_____	_____
_____	ml	_____	_____	_____

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



WATER SAMPLING DATA Well Name MW#17 Date 9.20.90 Time 1410  
 Job Name Emergency Job Number 1-045.48 Initials BB  
 WELL DATA: Well type M (M=monitoring well; Describe \_\_\_\_\_)  
 Depth to Water 6.02 ft.  
 Well Depth 12 ft. (spec.) Sounded Depth \_\_\_\_\_ ft.  
 Well Diameter 2 in. Date \_\_\_\_\_ Time \_\_\_\_\_

EVACUATION: Sampling Equipment:  
 PVC Bailer: 1 1/4 in. Dedicated: Bladder Pump \_\_\_\_\_; Bailer \_\_\_\_\_ gal.  
 Sampling Port: Number \_\_\_\_\_ Rate \_\_\_\_\_ gpm. Volume \_\_\_\_\_ gal.  
 Other \_\_\_\_\_  
 Initial Height of Water in Casing 5.98 ft; Volume 0.97 gal.  
 Volume To Be Evacuated = 2.72 gal. (initial volume x3 3)

	Evacuated	Evacuated	Evacuated
Time: Stop	<u>1419</u>	_____	_____
Start	<u>1416</u>	_____	_____
Total minutes	<u>3</u>	_____	_____
Amount Evacuated	_____	_____	_____
Total Evacuated	<u>3.0</u> gal.	_____	_____
Evacuation Rate	<u>1.0</u> gpm.	_____	_____

Formulas / Conversions  
 r = well radius in ft  
 h = ht of water col in ft  
 vol. of col. =  $\pi r^2 h$   
 7.48 gal/ft<sup>3</sup>  
 V<sub>c</sub> casing = 0.163 gal/ft  
 V<sub>w</sub> casing = 0.307 gal/ft  
 V<sub>h</sub> casing = 0.653 gal/ft  
 V<sub>l</sub> casing = 0.826 gal/ft  
 V<sub>u</sub> casing = 1.47 gal/ft  
 V<sub>t</sub> casing = 2.61 gal/ft

Depth to water during pumping 6.07 ft. 1408 time  
 Pumped dry? NO After \_\_\_\_\_ gal. Recovery rate \_\_\_\_\_  
 Depth to water for 80% recovery \_\_\_\_\_ ft.

CHEMICAL DATA: Temp. Probe # \_\_\_\_\_ Ph Probe # \_\_\_\_\_ Cond. Probe # \_\_\_\_\_

Time	1	2	3	4	_____	_____	_____	_____
	_____ °C	_____	_____	_____	_____	_____	_____	_____ umhos

SAMPLING: Point of collection: PE Hose \_\_\_\_\_; End of bailer ✓; Other \_\_\_\_\_  
 Samples taken 1422 time Depth to water 6.02 ft. Refrigerated: ✓  
 Sample description: Water color BROWN Odor NONE  
 Sediment/Foreign matter CLAY

De	Container	Preservative	Analysis	Lab
<u>16.17A 40 ml</u>	<u>VOL / other</u>	<u>HCL</u>	<u>SPAL602015</u>	<u>G TEL</u>
<u>B ↓ ml</u>	_____	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>C ↓ ml</u>	_____	<u>NONE</u>	<u>SPAL601</u>	<u>↓</u>
<u>D ↓ ml</u>	_____	<u>↓</u>	<u>↓</u>	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____

Des: P = plastic bottle; C or B = clear/brown glass; Describe \_\_\_\_\_

WGR

WATER SAMPLING DATA Well Name rw-18 Date 9-20-90 Time 1335  
 Job Name Smyrna Job Number 1-04548 Initials BB  
 WELL DATA: Well type M (M=monitoring well; Describe \_\_\_\_\_)  
 Depth to Water 55 ft.  
 Well Depth 11 ft. (spec.) Sounded Depth \_\_\_\_\_ ft.  
 Well Diameter 2 in. Date \_\_\_\_\_ Time \_\_\_\_\_

EVACUATION: Sampling Equipment:  
 PVC Bailer: 1 1/4 in. Dedicated: Bladder Pump \_\_\_\_\_; Bailer \_\_\_\_\_  
 Sampling Port: Number \_\_\_\_\_ Rate \_\_\_\_\_ gpm. Volume \_\_\_\_\_ gal.  
 Other \_\_\_\_\_  
 Initial Height of Water in Casing 55 ft.; Volume 0.90 gal.  
 Volume To Be Evacuated = 2.69 gal. (initial volume x3, x4)

	Evacuated	Evacuated	Evacuated
Time: Stop	<u>1356</u>		
Start	<u>1347</u>		
Total minutes	<u>9</u>		
Amount Evacuated			
Total Evacuated	<u>3.0</u> gal.		
Evacuation Rate	<u>0.33</u> gpm.		

Formulas / Conversions  
 $r$  = well radius in ft  
 $h$  = ht of water col in ft  
 vol. of col. =  $\pi r^2 h$   
 $2.48 \text{ gal/ft}^3$   
 $V_c \text{ casing} = 0.163 \text{ gal/ft}$   
 $V_c \text{ casing} = 0.267 \text{ gal/ft}$   
 $V_c \text{ casing} = 0.653 \text{ gal/ft}$   
 $V_c \text{ casing} = 0.826 \text{ gal/ft}$   
 $V_c \text{ casing} = 1.67 \text{ gal/ft}$   
 $V_c \text{ casing} = 2.61 \text{ gal/ft}$

Depth to water during pumping 550 ft. 1353 time  
 Pumped dry? NO After \_\_\_\_\_ gal. Recovery rate \_\_\_\_\_  
 Depth to water for 80% recovery \_\_\_\_\_ ft.

CHEMICAL DATA: Temp. Probe # \_\_\_\_\_ Flt Probe # \_\_\_\_\_ Cond. Probe # \_\_\_\_\_  
 Time \_\_\_\_\_ 1 \_\_\_\_\_ °C \_\_\_\_\_ umhos  
 \_\_\_\_\_ 2 \_\_\_\_\_  
 \_\_\_\_\_ 3 \_\_\_\_\_  
 \_\_\_\_\_ 4 \_\_\_\_\_

SAMPLING: Point of collection: PE hose \_\_\_\_\_; End of bailer X; Other \_\_\_\_\_  
 Samples taken 1400 time Depth to water 550 ft. Refrigerated: X  
 Sample description: Water color Brown Odor None  
 Sediment/Foreign matter Brown silt

Sample ID no.	Container	Preservative	Analysis	Lab
<u>09210-18A</u>	<u>40 ml</u>	<u>None / other</u>	<u>EP8015/602</u>	<u>G-TEL</u>
<u>B</u>	<u>ml</u>	<u>Hel</u>	<u>↓</u>	
<u>C</u>	<u>ml</u>	<u>None</u>	<u>EP1601</u>	<u>↓</u>
<u>a</u>	<u>ml</u>	<u>↓</u>		
	<u>ml</u>			
	<u>ml</u>			
	<u>ml</u>			
	<u>ml</u>			

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe \_\_\_\_\_

COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**WATER SAMPLING DATA** Well Name NW-19 Date 9.20.90 Time 1250  
 Job Name Summitville Job Number 1-04598 Initials BA  
**WELL DATA:** Well type M (M=monitoring well; Describe \_\_\_\_\_)  
 Depth to Water 5.25 ft.  
 Well Depth 9 ft. (spec.) Sounded Depth \_\_\_\_\_ ft.  
 Well Diameter 2 in. Date \_\_\_\_\_ Time \_\_\_\_\_

**EVACUATION:** Sampling Equipment:  
 PVC Bailer: 1 1/4 in. Dedicated: Bladder Pump \_\_\_\_\_; Bailer \_\_\_\_\_  
 Sampling Port: Number \_\_\_\_\_ Rate \_\_\_\_\_ gpm. Volume \_\_\_\_\_ gal.  
 Other \_\_\_\_\_  
 Initial Height of Water in Casing 3.75 ft.; Volume 0.61 gal.  
 Volume To Be Evacuated = 1.83 gal. (initial volume x3 2, x4 \_\_\_\_\_)

	Evacuated	Evacuated	Evacuated
Time: Stop	<u>1311</u>	<u>1317</u>	<u>1322</u>
Start	<u>1308</u>	<u>1314</u>	<u>1321</u>
Total minutes	<u>3</u>	<u>1</u>	<u>1</u>
Amount Evacuated	<u>1.25</u>	<u>0.5</u>	<u>0.25</u>
Total Evacuated	<u>2.0</u> gal.		
Evacuation Rate	<u>0.4</u> gpm.		

**Formulas / Conversions**  
 r = well radius in ft  
 h = ht of water col in ft  
 vol. of col. =  $\pi r^2 h$   
 7.48 gal/ft<sup>3</sup>  
 V<sub>1</sub> casing = 0.163 gal/ft  
 V<sub>2</sub> casing = 0.267 gal/ft  
 V<sub>3</sub> casing = 0.653 gal/ft  
 V<sub>4</sub> casing = 0.826 gal/ft  
 V<sub>5</sub> casing = 1.47 gal/ft  
 V<sub>6</sub> casing = 2.61 gal/ft

Depth to water during pumping \_\_\_\_\_ ft. \_\_\_\_\_ time  
 Pumped dry? YES After 1.25 gal. Recovery rate 0.075  
 Depth to water for 80% recovery 6.00 ft.

**CHEMICAL DATA:** Temp. Probe # \_\_\_\_\_ Flu Probe # \_\_\_\_\_ Cond. Probe # \_\_\_\_\_

Time	1	2	3	4	°C	umhos
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

**SAMPLING:** Point of collection: PE hose \_\_\_\_\_; End of bailer 2; Other \_\_\_\_\_  
 Samples taken 1326 time Depth to water 5.48 ft. Refrigerated: X  
 Sample description: Water color Tan Odor None  
 Sediment/Foreign matter fine brown silt

Sample ID no.	Container	Preservative	Analysis	Lab
<u>09210.19A</u>	<u>40 ml</u>	<u>HCl</u>	<u>EPA 602/80/15</u>	<u>6.73 C</u>
<u>B</u>	<u>ml</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>C</u>	<u>ml</u>	<u>None</u>	<u>EPA 601</u>	<u>↓</u>
<u>P</u>	<u>ml</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe \_\_\_\_\_

**COMMENTS:** \_\_\_\_\_ 1311 7.65  
 \_\_\_\_\_ 1316 5.36  
 \_\_\_\_\_  
 \_\_\_\_\_

WATER SAMPLING DATA Well Name Travel Blanks Date 9-20-90 Time \_\_\_\_\_  
 Job Name Rayville Job Number 1-045-48 Initials \_\_\_\_\_  
 WELL DATA: Well type \_\_\_\_\_ (M=monitoring well; Describe \_\_\_\_\_)  
 Depth to Water \_\_\_\_\_ ft.  
 Well Depth \_\_\_\_\_ ft. (spec.) Sounded Depth \_\_\_\_\_ ft.  
 Well Diameter \_\_\_\_\_ in. Date \_\_\_\_\_ Time \_\_\_\_\_

EVACUATION: Sampling Equipment:  
 PVC Bailer: \_\_\_\_\_ in. Dedicated: Bladder Pump \_\_\_\_\_ ; Bailer \_\_\_\_\_ gal.  
 Sampling Port: Number \_\_\_\_\_ Rate \_\_\_\_\_ gpm. Volume \_\_\_\_\_ gal.  
 Other \_\_\_\_\_  
 Initial Height of Water in Casing \_\_\_\_\_ ft; Volume \_\_\_\_\_ gal.  
 Volume To Be Evacuated = \_\_\_\_\_ gal. (initial volume x3 \_\_\_\_\_, x4 \_\_\_\_\_)

	Evacuated	Evacuated	Evacuated
Time: Stop	_____	_____	_____
Start	_____	_____	_____
Total minutes	_____	_____	_____
Amount Evacuated	_____	_____	_____
Total Evacuated	_____ gal.	_____	_____
Evacuation Rate	_____ gpm.	_____	_____

Formulas / Conversions  
 r = well radius in ft  
 h = ht of water col in ft  
 vol. of col. =  $\pi r^2 h$   
 7.48 gal/ft<sup>3</sup>  
 V<sub>1</sub>" casing = 0.163 gal/ft  
 V<sub>2</sub>" casing = 0.267 gal/ft  
 V<sub>3</sub>" casing = 0.653 gal/ft  
 V<sub>4</sub>" casing = 0.826 gal/ft  
 V<sub>5</sub>" casing = 1.47 gal/ft  
 V<sub>6</sub>" casing = 2.61 gal/ft

Depth to water during pumping \_\_\_\_\_ ft. \_\_\_\_\_ time  
 Pumped dry? \_\_\_\_\_ After \_\_\_\_\_ gal. Recovery rate \_\_\_\_\_  
 Depth to water for 80% recovery \_\_\_\_\_ ft.

CHEMICAL DATA: Temp. Probe # \_\_\_\_\_ Ph Probe # \_\_\_\_\_ Cond. Probe # \_\_\_\_\_

Time	1	2	3	4	°C	umhos
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

SAMPLING: Point of collection: PE hose \_\_\_\_\_; End of bailer \_\_\_\_\_; Other \_\_\_\_\_  
 Samples taken \_\_\_\_\_ time Depth to water \_\_\_\_\_ ft. Refrigerated: \_\_\_\_\_  
 Sample description: Water color \_\_\_\_\_ Odor \_\_\_\_\_  
 Sediment/Foreign matter \_\_\_\_\_

Sample ID no.	Container	Preservative	Analysis	Lab
09260-20A 40 ml	POA / other	NaClO <sub>2</sub> /Azide/other	SIA 602 (P015)	G-TEL
60 ↓ ml	↓	None	PT 601	↓
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____
_____ ml	_____	_____	_____	_____

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: G-TEL TBS - NO label

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**ATTACHMENT C**  
**CHAIN-OF-CUSTODY FORM**

# Chain-of-Custody Record

**Chevron U.S.A. Inc.**  
 P.O. Box 5004  
 San Ramon, CA 94583  
 FAX (415) 842-9591

Chevron Facility Number EMERYVILLE PLANT  
 Consultant Release Number \_\_\_\_\_ Consultant Project Number 1-645.48  
 Consultant Name WESTERN GEOLOGIC RESOURCES  
 Address 2167 E. FRANCISCO SAN RAFAEL  
 Fax Number 415 457 8521  
 Project Contact (Name) CHRIS ALLEN  
 (Phone) 415 457 7595

Chevron Contact (Name) LOSA BACKLUND  
 (Phone) 842-9527  
 Laboratory Name 6-TCL  
 Contract Number 4014960  
 Samples Collected by (Name) A Douglas, B Baldwin  
 Collection Date 9-20-1990  
 Signature BBA

Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Analyses To Be Performed										DATE COLLECTED Remarks
								Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr: 624	Total Lead DHS-Luft	EDB DHS-AB 1803	EPA 601	TOTAL DISSOLVED SOLIDS		
09Z10-01	ABCD	5	W		11:36	Ag: HCl	✓	✓										9/21/90
02	ABCD	4			12:22	AD = W.O.V												9/21/90
03	ABCD				12:22	EE = W.O.V												9/21/90
07	ABCD				15:06													9/20/90
08	ABCD				14:35													9/20/90
10	ABCD				13:40													9/20/90
11	ABCD				12:40													9/20/90
12	ABCD				11:57													9/20/90
13	ABCD				15:22													9/20/90
14	ABCD				15:43													9/20/90
15	ABCD				11:11													9/21/90
16	ABCD				9:28													9/21/90
17	ABCD				14:22													9/20/90

Relinquished By (Signature) <u>BBA</u>	Organization <u>WGA</u>	Date/Time <u>9/21/90 1400</u>	Received By (Signature) <u>Jamie Davis</u>	Organization	Date/Time	Turn Around Time (Circle Choice) 24 Hrs 48 Hrs 5 Days <u>10 Days</u>
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time <u>9/21 5:05</u>	

# Chain-of-Custody Record

**Chevron U.S.A. Inc.**  
 P.O. Box 5004  
 San Ramon, CA 94583  
 FAX (415) 842-9591

Chevron Facility Number EMERYVILLE PLANT  
 Consultant \_\_\_\_\_ Consultant \_\_\_\_\_  
 Release Number \_\_\_\_\_ Project Number 1-048.45  
 Consultant Name W612  
 Address PAN RAFAEL  
 Fax Number \_\_\_\_\_  
 Project Contact (Name) C. ALGER  
 (Phone) \_\_\_\_\_

Chevron Contact (Name) C. BACKLAND  
 (Phone) \_\_\_\_\_  
 Laboratory Name GTEL  
 Contract Number 4014960  
 Samples Collected by (Name) ADouglas, B Baldwin  
 Collection Date 9-20 + 9/21/90  
 Signature BB

Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Analyses To Be Performed										Date Collected	Remarks	
								Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTX Soil: 8020/Wtr.: 602	Arom. Volatiles - BTX Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803	CPA 601					
09210-18	ABCD	4	W		1400	AB=LCL	X	X				X							9.20.90	
↓	19	4	↓		1326	CD=NONE	↓	↓				↓							↓	
↓	70-33	2	↓		-	NONE	↓	↓				↓							↓	

Relinquished By (Signature) <u>BB</u>	Organization <u>W6A</u>	Date/Time <u>9/21/90 1400</u>	Received By (Signature) <u>Jamie Daw</u>	Organization	Date/Time	Turn Around Time (Circle Choice) 24 Hrs 48 Hrs 5 Days 10 Days
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)	Organization	Date/Time <u>9-21 5:05</u>	



## **ATTACHMENT D**

**LABORATORY REPORTS WITH QUALITY ASSURANCE/  
QUALITY CONTROL DOCUMENTS**



Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009535  
 Report Issue Date: October 2, 1990

Table 1

**ANALYTICAL RESULTS**  
 Purgeable Aromatics and Total Petroleum Hydrocarbons  
 as Gasoline in Water  
 EPA Method 8020/8015<sup>1</sup>

GTEL Sample Number		01	02*	03	04
Client Identification		09210-01 ABCDE	09210-02 ABCD	09210-03 ABCD	09210-07 ABCD
Date Sampled		9/20-21/90	9/20-21/90	9/20-21/90	9/20-21/90
Date Analyzed		09/25/90	09/25/90	09/25/90	09/25/90
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	120	<1.5	<0.3	1.5
Toluene	0.3	2	<1.5	<0.3	<0.3
Ethylbenzene	0.3	2	<1.5	<0.3	<0.3
Xylene (total)	0.6	0.79	4.5	<0.6	<0.6
TPH as Gasoline	50	2200	<50	<50	<50

GTEL Sample Number		05	06	07	08
Client Identification		09210-08 ABCD	09210-10 ABCD	09210-11 ABCD	09210-12 ABCD
Date Sampled		9/20-21/90	9/20-21/90	9/20-21/90	9/20-21/90
Date Analyzed		09/25/90	09/25/90	09/25/90	09/25/90
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	6	<0.3	<0.3	<0.3
Toluene	0.3	<0.3	<0.3	<0.3	<0.3
Ethylbenzene	0.3	<0.3	<0.3	<0.3	<0.3
Xylene (total)	0.6	<0.6	<0.6	<0.6	<0.6
TPH as Gasoline	50	<50	<50	<50	<50

1 = Extraction by EPA Method 5030

\*Detection Limits raised due to surfactants in sample.

Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009535  
 Report Issue Date: October 2, 1990

Table 1

ANALYTICAL RESULTS  
 Purgeable Aromatics and Total Petroleum Hydrocarbons  
 as Gasoline in Water  
 EPA Method 8020/8015<sup>1</sup>

GTEL Sample Number		09	10	11	12
Client Identification		09210-13 ABCD	09210-14 ABCD	09210-15 ABCD	09210-16 ABCD
Date Sampled		9/20-21/90	9/20-21/90	9/20-21/90	9/20-21/90
Date Analyzed		09/25/90	09/25/90	09/25/90	09/25/90
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	<0.3	<0.3	<0.3	<0.3
Toluene	0.3	<0.3	<0.3	<0.3	<0.3
Ethylbenzene	0.3	<0.3	<0.3	<0.3	<0.3
Xylene (total)	0.6	0.54	<0.6	<0.6	<0.6
TPH as Gasoline	50	150	<50	<50	<50

GTEL Sample Number		13	14	15	16
Client Identification		09210-17 ABCD	09210-18 ABCD	09210-19 ABCD	09210-20 AB
Date Sampled		9/20-21/90	9/20-21/90	9/20-21/90	9/20-21/90
Date Analyzed		09/25/90	09/25/90	09/25/90	09/25/90
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	<0.3	<0.3	<0.3	<0.3
Toluene	0.3	<0.3	<0.3	<0.3	<0.3
Ethylbenzene	0.3	<0.3	<0.3	<0.3	<0.3
Xylene (total)	0.6	<0.6	<0.6	<0.6	<0.6
TPH as Gasoline	50	<50	<50	<50	<50

1 = Extraction by EPA Method 5030

Project Number: SFB-175-0204.72  
Consultant Project Number: 1-045.48  
Contract Number: N46CWC0244-9-X  
Facility Number: Emeryville Plant  
Work Order Number: C009535  
Report Issue Date: October 1, 1990

## QA Conformance Summary

### Purgeable Aromatics and Total Petroleum Hydrocarbons as Gasoline in Water EPA Method 8020/8015

#### 1.0 Blanks

Five of 5 target compounds were below detection limits in the reagent blank as shown in Table 2.

#### 2.0 Independent QC Check Sample

The control limits were met for 4 out of 4 QC check compounds as shown in Table 3.

#### 3.0 Surrogate Compound Recoveries

Percent recovery limits were met for the surrogate compound (naphthalene) for all samples as shown in Table 4.

#### 4.0 Matrix Spike (MS) Accuracy

Percent recovery limits were met for 4 of 4 compounds in the MS as shown in Table 5.

#### 5.0 Reagent Water Spike (WS) and Reagent Water Spike (WSD) Duplicate Precision

Relative percent difference (RPD) criteria was met for 4 of 4 analytes in the WS and WSD as shown in Table 6.

#### 6.0 Sample Handling

6.1 Sample handling and holding time criteria were met for all samples.

6.2 There were no exceptional conditions requiring dilution of samples.

Project Number: SFB-175-0204.72  
Consultant Project Number: 1-045.48  
Contract Number: N46CWC0244-9-X  
Facility Number: Emeryville Plant  
Work Order Number: C009535  
Report Issue Date: October 1, 1990

Table 2

REAGENT BLANK DATA

Purgeable Aromatics and Total Petroleum Hydrocarbons  
as Gasoline in Water  
EPA Method 8020/8015

Date of Analysis: 09/25/90

Analyte	Concentration, ug/L
Benzene	<0.3
Toluene	<0.3
Ethylbenzene	<0.3
Xylene (total)	<0.6
Gasoline	<50

<# = Not detected at the indicated detection limit.

Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009535  
 Report Issue Date: October 1, 1990

Table 3

INDEPENDENT QC CHECK SAMPLE RESULTS

Purgeable Aromatics and Total Petroleum Hydrocarbons  
 as Gasoline in Water  
 EPA Method 8020/8015

Date of Analysis: 09/25/90

Analyte	Expected Result, ug/L	Observed Result, ug/L	Recovery, %	Acceptability Limits, %
Benzene	50	55	110	85 - 115
Toluene	50	56	112	85 - 115
Ethylbenzene	50	57	114	85 - 115
Xylene (total)	150	173	115	85 - 115

Table 3a

INDEPENDENT QC CHECK SAMPLE SOURCE

Purgeable Aromatics and Total Petroleum Hydrocarbons  
 as Gasoline in Water  
 EPA Method 8020/8015

Analyte	Lot Number	Source
Benzene	LA18042	Supelco
Toluene	LA18042	Supelco
Ethylbenzene	LA18042	Supelco
Xylene (total)	LA18042	Supelco

Table 4  
 SURROGATE COMPOUND RECOVERY  
 Naphthalene

Purgeable Aromatics and Total Petroleum Hydrocarbons  
 as Gasoline in Water  
 EPA Method 8020/8015

Acceptability Limits<sup>1</sup>: 70 - 130 %

GTEL No.	Expected Result, ug/L	Surrogate Result, ug/L	Surrogate Recovery, %
Blank	200	232	116
01	200	250	125
02	200	172	86
03	200	234	117
04	200	260	130
05	200	235	118
06	200	252	126
07	200	232	116
08	200	238	119
09	200	251	126
10	200	231	116
11	200	228	114
12	200	260	130
13	200	244	122
14	200	241	120
MS	200	189	95
WS	200	186	93
WSD	200	172	86

MS = Matrix Spike  
 WS = Reagent Water Spike  
 WSD = Reagent Water Spike Duplicate  
 1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Project Number: SFB-175-0204.72  
Consultant Project Number: 1-045.48  
Contract Number: N46CWC0244-9-X  
Facility Number: Emeryville Plant  
Work Order Number: C009535  
Report Issue Date: October 1, 1990

Table 4  
SURROGATE COMPOUND RECOVERY  
Naphthalene

Purgeable Aromatics and Total Petroleum Hydrocarbons  
as Gasoline in Water  
EPA Method 8020/8015

Acceptability Limits<sup>1</sup>: 70 - 130 %

GTEL No.	Expected Result, ug/L	Surrogate Result, ug/L	Surrogate Recovery, %
15	200	229	115
16	200	236	118

MS = Matrix Spike  
WS = Reagent Water Spike  
WSD = Reagent Water Spike Duplicate  
1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Project Number: SFB-175-0204.72  
Consultant Project Number: 1-045.48  
Contract Number: N46CWC0244-9-X  
Facility Number: Emeryville Plant  
Work Order Number: C009535  
Report Issue Date: October 1, 1990

Table 5

MATRIX SPIKE (MS) RECOVERY REPORT

Purgeable Aromatics and Total Petroleum Hydrocarbons  
as Gasoline in Water  
EPA Method 8020/8015

Date of Analysis: 09/25/90  
Sample Spiked: C009518-5

Client ID: MW-4  
Units: ug/L

Analyte	Sample Result	Concentration Added	Concentration Recovered	MS Result	MS, % Recovery	Acceptability Limits <sup>1</sup> , %
Benzene	<0.3	25	23.7	23.7	95	71 - 123
Toluene	<0.3	25	22.1	22.1	88	69 - 120
Ethylbenzene	<0.3	25	22.4	22.4	90	72 - 121
Xylene (total)	<0.6	75	73.4	73.4	98	75 - 123

<# = Not detected at the indicated detection limit.

1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.



Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009535  
 Report Issue Date: October 1, 1990

Table 6

REAGENT WATER SPIKE (WS) AND REAGENT WATER SPIKE DUPLICATE (WSD)  
 RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD) REPORT

Purgeable Aromatics and Total Petroleum Hydrocarbons  
 as Gasoline in Water  
 EPA Method 8020/8015

Date of Analysis: 09/25/90

Units: ug/L

Analyte	Concentration Added	WS Result	WS, % Recovery	WSD Result	WSD, % Recovery
Benzene	25	22.8	91	22.6	90
Toluene	25	21.4	86	21.2	85
Ethylbenzene	25	21.5	86	21.3	85
Xylene (total)	75	70.2	94	69.6	93

Analyte	RPD, %	Maximum RPD, %	Acceptability Limits <sup>1</sup> % Recovery
Benzene	1	30	76 - 120
Toluene	1	30	72 - 117
Ethylbenzene	1	30	73 - 123
Xylene (total)	1	30	81 - 125

1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N48CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009536  
 Report Issue Date: October 9, 1990

Table 1

ANALYTICAL RESULTS

Purgeable Halocarbons in Water  
 EPA Method 601

Date Sampled		9/20-21/90	9/20-21/90	9/20-21/90	9/20-21/90
Date Analyzed		10/03/90	10/03/90	10/03/90	10/03/90
Client Identification		09210-1 ABCDE	09210-2 ABCD	09210-3 ABCD	09210-7 ABCD
GTEL Sample Number		01	02	03	04
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	63	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	1100	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	0.6	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.2	1.8	<0.2	<0.2	<0.2
1,1-Dichloroethane	0.5	2.2	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	0.5	2400	<0.5	<0.5	<0.5
Chloroform	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	1.7	<0.5	<0.5	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	60	<0.5	<0.5	<0.5
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5

1 = Extraction by EPA Method 5030

Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009536  
 Report Issue Date: October 9, 1990

Table 1  
 ANALYTICAL RESULTS  
 Purgeable Halocarbons in Water  
 EPA Method 601

Date Sampled		9/20-21/90	9/20-21/90	9/20-21/90	9/20-21/90
Date Analyzed		10/03/90	10/03/90	10/03/90	10/03/90
Client Identification		09210-8 ABCD	09210-10 ABCD	09210-11 ABCD	09210-12 ABCD
GTEL Sample Number		05	06	07	08
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	<1	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	3.1	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	0.5	<0.5	5.0	1.1	<0.5
trans-1,2-Dichloroethene	0.5	<0.5	32	100	<0.5
Chloroform	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	<0.5	5.9	3.8	<0.5
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5

1 = Extraction by EPA Method 5030

Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009536  
 Report Issue Date: October 9, 1990

Table 1  
 ANALYTICAL RESULTS  
 Purgeable Halocarbons in Water  
 EPA Method 601

Date Sampled		9/20-21/90	9/20-21/90	9/20-21/90	9/20-21/90
Date Analyzed		10/04/90	10/04/90	10/04/90	10/04/90
Client Identification		09210-13 ABCD	09210-14 ABCD	09210-15 ABCD	09210-16 ABCD
GTEL Sample Number		09	10	11	12
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	<1	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	0.5	<0.5	<0.5	<0.5	0.9
Chloroform	0.5	<0.5	<0.5	<0.5	4.1
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	0.7
1,1,1-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	<0.5	<0.5	<0.5	49
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	15
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5

1 = Extraction by EPA Method 5030

Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009536  
 Report Issue Date: October 9, 1990

Table 1

ANALYTICAL RESULTS

Purgeable Halocarbons in Water  
 EPA Method 601

Date Sampled		9/20-21/90	9/20-21/90	9/20-21/90	9/20-21/90
Date Analyzed		10/04/90	10/04/90	10/04/90	10/04/90
Client Identification		09210-17 ABCD	09210-18 ABCD	09210-19 ABCD	09210-20 AB
GTEL Sample Number		13	14	15	16
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	<1	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	0.5	2.4	3.3	5.8	<0.5
Chloroform	0.5	2.8	1.7	3.1	<0.5
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	1.4	1.6	2.5	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	44	76	39	<0.5
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	16	25	32	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5

1 = Extraction by EPA Method 5030

QA Conformance Summary  
Purgeable Halocarbons in Water  
EPA Method 601

1.0 Blanks

Zero of 29 target compounds found in Reagent blank as shown in Table 2.

2.0 Independent QC Check Sample

The control limits were met for 8 out of 8 QC check compounds as shown in Table 3.

3.0 Surrogate Compound Recoveries

Percent recovery limits were met for the surrogate compound (Bromofluorobenzene) for all samples as shown in Table 4.

4.0 Matrix Spike (MS) Accuracy

Percent recovery limits were met for 3 of 3 compounds in the MS as shown in Table 5.

5.0 Reagent Water Spike (WS) and Reagent Water Spike Duplicate (WSD) Precision

Relative percent difference (RPD) criteria was met for 3 of 3 compounds in the WS and WSD as shown in Table 6.

6.0 Sample Handling

6.1 Sample handling and holding time criteria were met for all samples.

6.2 There were no exceptional conditions requiring dilution of samples.

Table 2  
 REAGENT BLANK DATA  
 Purgeable Halocarbons in Water  
 EPA Method 601

Date of Analysis: 10/04/90

Analyte	Observed Result, ug/L
Chloromethane	<0.5
Bromomethane	<0.5
Dichlorodifluoromethane	<0.5
Vinyl chloride	<1
Chloroethane	<0.5
Methylene chloride	<0.5
Trichlorofluoromethane	<0.5
1,1-Dichloroethene	<0.2
1,1-Dichloroethane	<0.5
trans-1,2-Dichloroethene	<0.5
Chloroform	<0.5
1,2-Dichloroethane	<0.5
1,1,1-Trichloroethane	<0.5
Carbon tetrachloride	<0.5
Bromodichloromethane	<0.5
1,2-Dichloropropane	<0.5
trans-1,3-Dichloropropene	<0.5
Trichloroethene	<0.5
Dibromochloromethane	<0.5
1,1,2-Trichloroethane	<0.5
cis-1,3-Dichloropropene	<0.5
2-Chloroethylvinyl ether	<1
Bromoform	<0.5
1,1,2,2-Tetrachloroethane	<0.5
Tetrachloroethene	<0.5
Chlorobenzene	<0.5
1,3-Dichlorobenzene	<0.5
1,2-Dichlorobenzene	<0.5
1,4-Dichlorobenzene	<0.5

<# = Not Detected at the indicated detection limit.

Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009536  
 Report Issue Date: October 9, 1990

Table 3  
 INDEPENDENT QC CHECK SAMPLE RESULTS

Purgeable Halocarbons in Water  
 EPA Method 601

Date of Analysis: 09/07/90

Analyte	Expected Result, ug/L	Observed Result, ug/L	Recovery, %	Acceptability Limits, %
Vinyl Chloride	50	49.9	100	85 - 115
Bromomethane	50	47.6	95	85 - 115
trans-1,2-Dichloroethene	50	49.6	99	85 - 115
1,1-Dichloroethane	50	49	98	85 - 115
1,1,1-Trichloroethane	50	51.1	102	85 - 115
Trichloroethene	50	48.1	96	85 - 115
Tetrachloroethene	50	47.2	95	85 - 115
1,1,2,2-Tetrachloroethane	50	50	100	85 - 115

Table 3a  
 INDEPENDENT QC CHECK SAMPLE SOURCE

Purgeable Halocarbons in Water  
 EPA Method 601

Analyte	Lot Number	Source
Vinyl Chloride	LA21062	SUPELCO PURGEABLE MIX C
Bromomethane	LA21062	SUPELCO PURGEABLE MIX C
trans-1,2-Dichloroethene	LA20674	SUPELCO PURGEABLE MIX B
1,1-Dichloroethane	LA21173	SUPELCO PURGEABLE MIX A
1,1,1-Trichloroethane	LA20674	SUPELCO PURGEABLE MIX B
Trichloroethene	LA21173	SUPELCO PURGEABLE MIX A
Tetrachloroethene	LA21173	SUPELCO PURGEABLE MIX A
1,1,2,2-Tetrachloroethane	LA20674	SUPELCO PURGEABLE MIX B



Project Number: SFB-175-0204.72  
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 Facility Number: Emeryville Plant  
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Table 4  
 SURROGATE COMPOUND RECOVERY  
 Bromofluorobenzene  
 Purgeable Halocarbons in Water  
 EPA Method 601

Acceptability Limits<sup>1</sup>: 63 - 131 %

GTEL No.	Expected Result, ug/L	Surrogate Result, ug/L	Surrogate Recovery, %
Blank	50	61	122
01	50	61	122
02	50	55	110
03	50	41	82
04	50	56	112
05	50	53	106
06	50	52	104
07	50	63	126
08	50	57	114
09	50	60	120
10	50	58	116
11	50	50	100
12	50	61	122
13	50	61	122
14	50	62	124
15	50	65	130
16	50	56	112
MS	50	63	126
WS	50	57	114
WSD	50	58	116

MS = Matrix Spike  
 WS = Reagent Water Spike  
 WSD = Reagent Water Spike Duplicate  
 1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009536  
 Report Issue Date: October 9, 1990

Table 5  
 MATRIX SPIKE (MS) RECOVERY REPORT  
 Purgeable Halocarbons in Water  
 EPA Method 601

Date of Analysis: 10/04/90  
 Sample Spiked: C009536-09

Client ID: 09210-13  
 Units: ug/L

Analyte	Sample Result	MS Result	Concentration Added	MS, % Recovery	Acceptability Limits, % <sup>1</sup>
1,1-Dichloroethene	<0.2	49.3	50	99	64 - 114
Chlorobenzene	<0.5	61.3	50	123	58 - 123
Trichloroethene	<0.5	52.7	50	105	66 - 120

<# = Not detected at the indicated detection limit.

1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009536  
 Report Issue Date: October 10, 1990

Table 6  
 REAGENT WATER SPIKE (WS) AND REAGENT WATER SPIKE DUPLICATE (WSD) RESULTS  
 AND RELATIVE PERCENT DIFFERENCE (RPD) REPORT

Purgeable Halocarbons in Water  
 EPA Method 601

Date of Analysis: 10/04/90

Units: ug/L

Analyte	Concentration Added	WS Result	WSD Result	WS, % Recovery	WSD, % Recovery
1,1 Dichloroethene	50	44.7	47.2	89	94
Chlorobenzene	50	44.6	43.9	89	88
Trichloroethene	50	49.3	49.9	99	100

Analyte	RPD, %	Maximum RPD, %	Acceptability Limits % Recovery <sup>1</sup>
1,1 Dichloroethene	6	30	72-116
Chlorobenzene	1	30	58-126
Trichloroethene	1	30	79-119

1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Project Number: SFB-175-0204.72  
Consultant Project Number: 1-045.48  
Contract Number: N46CWC0244-9-X  
Facility Number: Emeryville Plant  
Work Order Number: C009537  
Report Issue Date: October 3, 1990

Table 1

ANALYTICAL RESULTS

Total Dissolved Solids in Water  
Standard Methods 209B<sup>1</sup>

Sample Identification		Date Analyzed	Concentration, mg/L <sup>2</sup>
GTEL No.	Client ID		
C009537-1A	09210-01 ABCDE	09/27/90	1250

1. Standard Methods 16<sup>th</sup> edition, 1985.
2. Method detection limit = 10 mg/L; analyte below this level would not be detected.

Project Number: SFB-175-0204.72  
Consultant Project Number: 1-045.48  
Contract Number: N46CWC0244-9-x  
Facility Number: Emeryville Plant  
Work Order Number: C009537  
Report Issue Date: October 3, 1990

QA Conformance Summary

Total Dissolved Solids in Water  
Standard Methods 209B

1.0 Blanks

The method blank was below the detection limit as shown in Table 2.

2.0 Laboratory Control Sample

The control limits were met for the laboratory control compound (sodium chloride) as shown in Table 3.

3.0 Balance Calibration Check

The balance calibration check criteria were met as shown in Table 4.

4.0 Sample Duplicate Precision

The relative percent difference (RPD) criterion was met in the sample duplicate as shown in Table 5.

5.0 Sample Handling

Sample handling and holding time criteria were met for all samples.

Project Number: SFB-175-0204.72  
Consultant Project Number: 1-045.48  
Contract Number: N46CWC0244-9-X  
Facility Number: Emeryville Plant  
Work Order Number: C009537  
Report Issue Date: October 3, 1990

Table 2

METHOD BLANK DATA

Total Dissolved Solids in Water  
Standard Methods 209B

Date of Analysis: 09/27/90

Analyte	Concentration, mg/L
Total Dissolved Solids	<10

<# = Not detected at the indicated detection limit.

Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009537  
 Report Issue Date: October 3, 1990

Table 3

LABORATORY CONTROL SAMPLE (LCS) RESULTS

Total Dissolved Solids in Water  
 Standard Methods 209B

Date of Analysis: 09/27/90 Units: mg/L

Analyte	Expected Result	Observed Result	Recovery, %	Acceptability Limits <sup>1</sup> , %
Sodium Chloride	1000	992	99	75-125

1. 95 % confidence interval for past quarter.

Table 3a

LABORATORY CONTROL SAMPLE (LCS) SOURCE

Total Dissolved Solids in Water  
 Standard Methods 209B

Analyte	Lot Number	Source
Sodium Chloride	7532 KDLS	MALLINOFRODT/GAS 7646.14.5 09/20/90 Dup

Project Number: SFB-175-0204.72  
 Consultant Project Number: 1-045.48  
 Contract Number: N46CWC0244-9-X  
 Facility Number: Emeryville Plant  
 Work Order Number: C009537  
 Report Issue Date: October 3, 1990

Table 4

LABORATORY BALANCE CALIBRATION CHECK

Total Dissolved Solids in Water  
Standard Methods 209B

True Mass	Observed Mass	Acceptability Limits
10.0 mg	10.0	± 0.1 mg
100.0108 g	100.0100	± 0.0010g

Table 5

LABORATORY DUPLICATE SAMPLE RESULTS  
AND RELATIVE PERCENT DIFFERENCE (RPD) REPORT

Total Dissolved Solids in Water  
Standard Methods 209B

Date of Analysis: 09/27/90  
 Sample Used: C009537-1

Client ID: 09210-01  
 Units: mg/L

Sample Result	Duplicate Result	RPD, %	Acceptability Limits, %
1160	1337	6.6%	20