



November 25, 1996

Mr. Steve Chrissanthos
Alameda Cellars
1709 Otis Drive
Alameda, California 94501

RE: Quarterly Groundwater Monitoring Report
2425 Encinal Avenue, Alameda, California
ACC Project No. 6039-2.5

Dear Mr. Chrissanthos:

The enclosed report describes the materials and procedures used during the quarterly groundwater investigation performed at 2425 Encinal Avenue, Alameda, California. This work was performed to evaluate the aerial extent of groundwater impact and evaluate petroleum hydrocarbon plume stability in accordance with requests from Alameda County Health Care Services Agency (ACHCSA).

The groundwater from each well located at 2425 Encinal was sampled for petroleum hydrocarbons as gasoline. In addition, the groundwater was evaluated for indications of natural bioremediation.

Based on the sample analysis and in-field testing conducted in July 1996, natural bioremediation is occurring at this site. However, natural bioremediation is occurring slowly. Therefore, ACHCSA requested installation of a "bio-barrier" in the groundwater. A Work Plan dated November 4, 1996, for this work was submitted to ACHCSA. In addition, ACHCSA requested continued quarterly monitoring to document degrading trends of groundwater constituents and possibly present the "no further action" alternative to ACHCSA for consideration to obtain site closure.

If you have any comments regarding this report, please call me at (510) 638-8400.

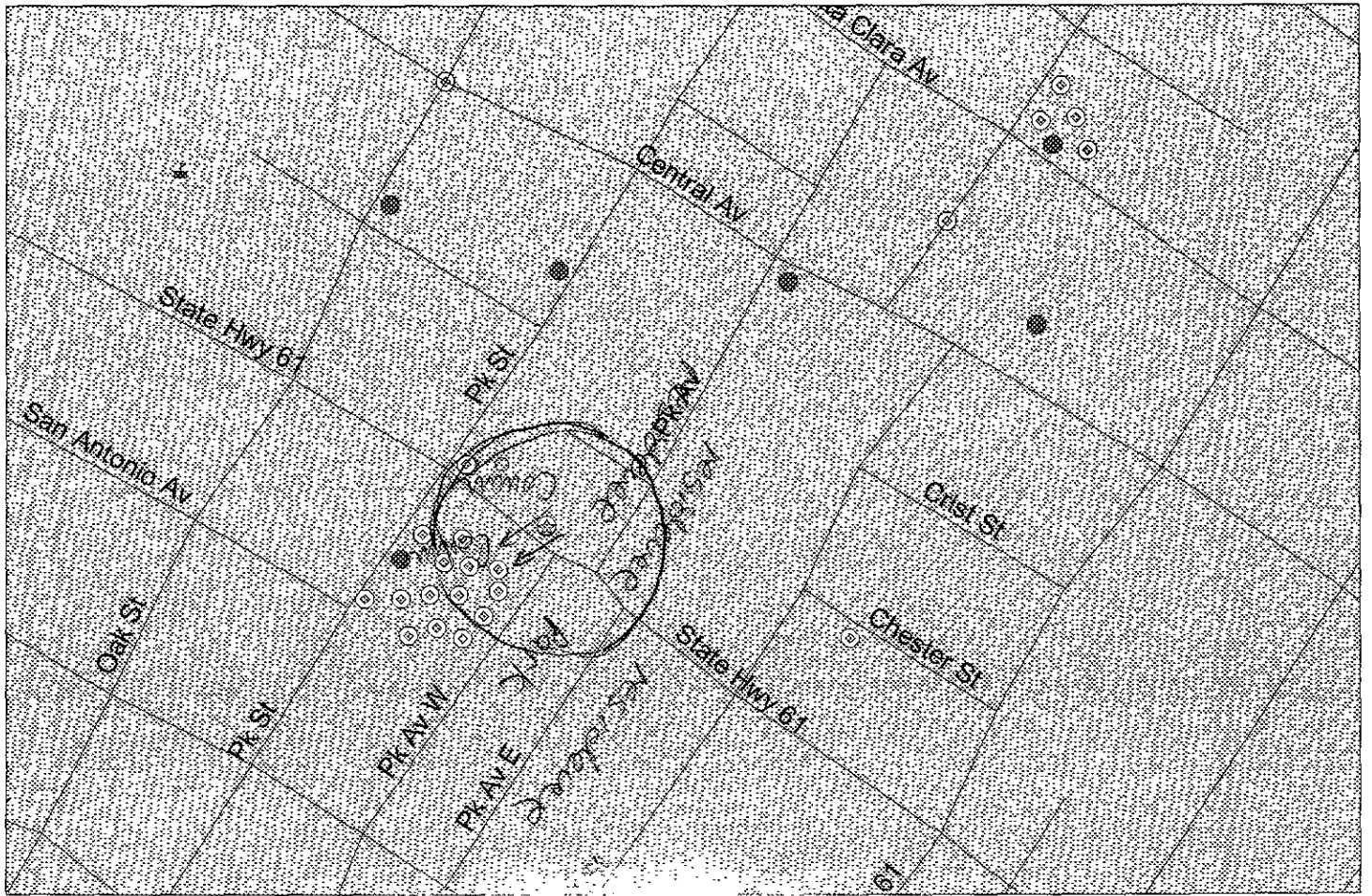
Sincerely,

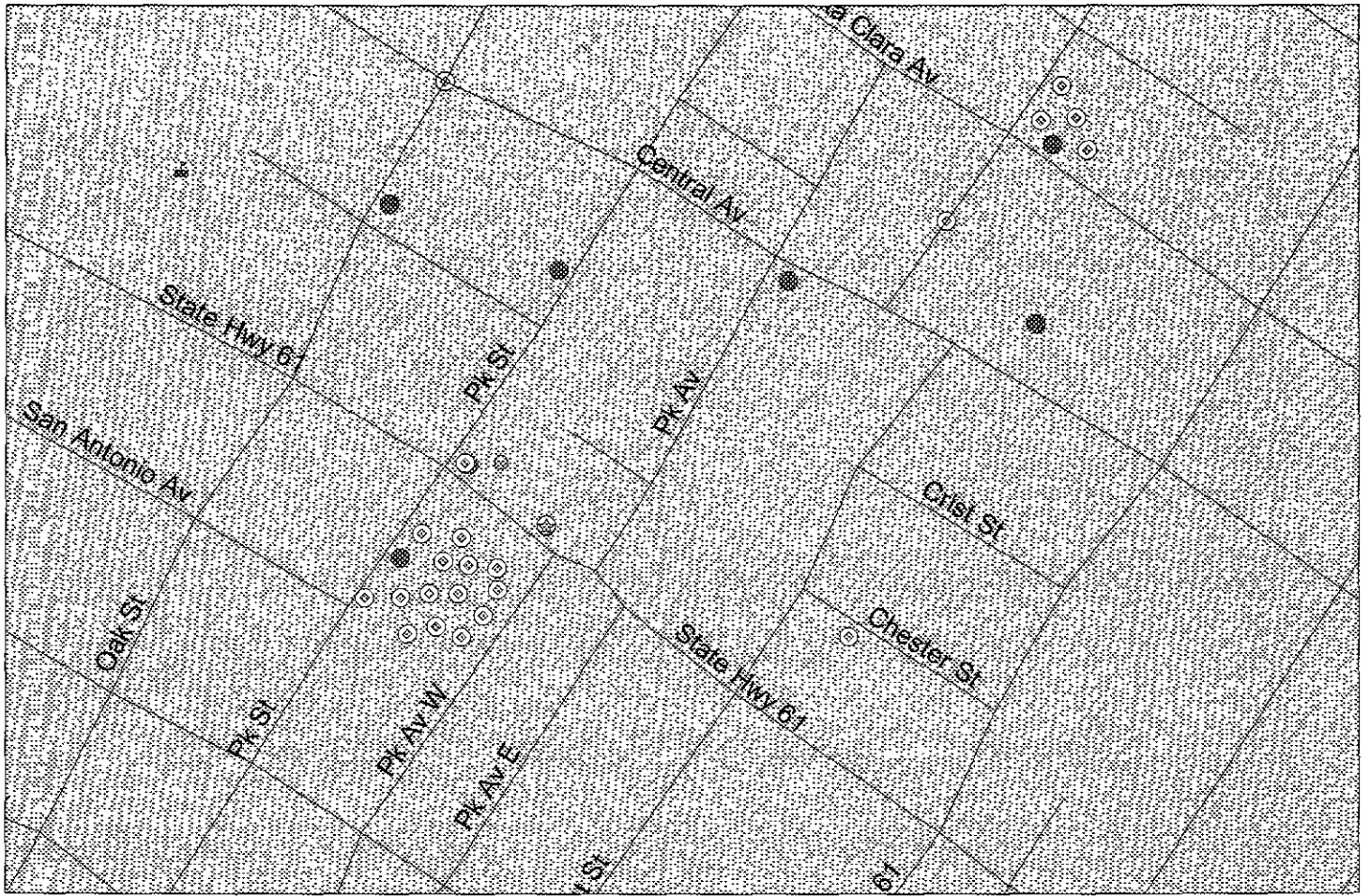
A handwritten signature in black ink, appearing to read 'Misty C. Kaltreider'. The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Misty C. Kaltreider
Project Geologist

/mck:mcr

cc: Ms. Juliet Shin, ACHCSA







ENVIRONMENTAL
PROTECTION

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QUARTERLY
GROUNDWATER
MONITORING REPORT

November 25, 1996

2425 Encinal Avenue
Alameda, California

Prepared For:
Mr. Steve Chrissanthos
Alameda Cellars

OAKLAND ■ SACRAMENTO
SEATTLE ■ LOS ANGELES

ACC Project No. 95-6039-2.5

GROUNDWATER MONITORING REPORT

2425 Encinal Avenue
Alameda, California

ACC Project No. 6039-2.5


Prepared for:
Mr. Steve Chrissanthos
Alameda Cellars
1709 Otis Drive
Alameda, California

November 25, 1996

Prepared by:


Misty Kaltreider
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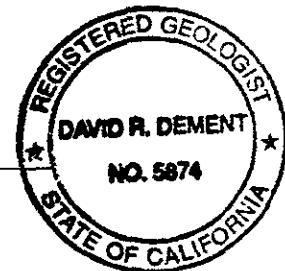


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GROUNDWATER MONITORING REPORT

2425 Encinal Avenue
Alameda, California

1.0 INTRODUCTION

On behalf of Mr. Steve Chrissanthos of Alameda Cellars, ACC Environmental Consultants, Inc., (ACC) has prepared this report on groundwater monitoring performed at 2425 Encinal Avenue, Alameda, California. The site is located at the northern corner of Encinal and Park Avenues in Alameda, California (Figure 1). The property is occupied by Alameda Cellars, a commercial liquor store.

The purpose of the work was to evaluate changes in the groundwater flow direction and gradient and monitor for the presence of petroleum hydrocarbons in groundwater in the vicinity of two former 10,000-gallon gasoline underground storage tanks (USTs). The project objectives were to: 1) measure the water levels and calculate the elevation of the groundwater in each monitoring well; 2) obtain groundwater samples from the six existing monitoring wells and analyze the water samples for total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylenes (BTEX); 3) obtain water quality measurements; and 4) report the findings.

2.0 BACKGROUND

In March 1990, two 10,000-gallon gasoline USTs were removed from the subject site. Analysis of the soil samples collected from beneath the USTs indicated concentrations up to 710 parts per million (ppm) TPHg.

In December 1992, ACC performed a subsurface investigation, including drilling five borings on site. Three of the borings were converted into monitoring wells MW-1, MW-2a, and MW-3. Analytical results of the soil collected during drilling and sampling indicated concentrations up to 1,365 ppm TPHg and up to 18.9 ppm benzene. Initial groundwater samples collected in January 1993 from the monitoring wells indicated concentrations up to 5,680 parts per billion (ppb) in well MW-2a and up to 1,560 ppb benzene in well MW-1.

An additional soil investigation was conducted in May 1993 to evaluate the extent of impact in the soil and groundwater. Findings of the additional investigation indicated the lateral extent of petroleum hydrocarbon impacted soil did not appear to extend beyond the property boundaries along the northern, western, and eastern sides. However, along the southern side, the impacted soil appeared to extend into Park and Encinal Avenues. Field observations made during the additional investigation and soil sample analysis indicated impacted soil existed primarily around the former tank excavation and the former dispenser island. The vertical extent of petroleum hydrocarbons in the soil occurs at the soil/groundwater interface.

Analysis of grab groundwater samples collected from borings drilled during the additional investigation indicate that residual petroleum hydrocarbons from the former tank excavation and dispenser island are migrating off site via the groundwater.

In December 1993, three additional monitoring wells (MW-4, MW-5, and MW-6) were installed at the property to further evaluate the extent of petroleum hydrocarbon impact to groundwater. Locations of the monitoring wells are illustrated on Figure 2. Laboratory analysis of the soil samples collected from each boring indicated no detectable concentrations of constituents, which verifies the lateral extent of soil impact.

Laboratory analytical results of the groundwater samples collected from monitoring wells MW-5 and MW-6 have consistently indicated no detectable concentrations above reporting limits of constituents evaluated, indicating a lateral extent of groundwater impact. Laboratory analytical results of groundwater collected from monitoring well MW-4 indicated detectable concentrations of constituents. The location of the southern edge of the groundwater impact is just off site to the south. This crossgradient movement is attributed to the relatively flat gradient and possible recharge into the excavated area.

In a letter dated April 30, 1996, the Alameda County Health Care Services Agency (ACHCSA) requested that in-field testing and additional analytical analyses be performed on the groundwater at the site to evaluate whether natural bioremediation is occurring. This report documents the findings from the groundwater monitoring evaluation.

3.0 GROUNDWATER MONITORING AND SAMPLING

ACC conducted groundwater monitoring on October 14, 1996. Work at the site included measuring depth to water, subjectively evaluating groundwater in the wells, and purging and sampling the wells for laboratory analysis.

3.1 Groundwater Monitoring

Before groundwater sampling, the depth to the surface of the water table was measured from the top of the polyvinyl chloride well casing using a Solinst water level meter. The water level measurements were recorded to the nearest 0.01 foot with respect to mean sea level (MSL). No data was collected from well MW-2, because the well could not be opened. Groundwater monitoring data obtained at the site is included in Appendix 1. Information regarding well elevations and groundwater levels is summarized in Table 1.

TABLE 1 - GROUNDWATER DEPTH INFORMATION

Well ID Well Elevation	Date Monitored	Depth to Groundwater (feet)	Groundwater Elevation (feet above MSL)
MW-1 27.61	01/09/93	6.75	20.86
	02/09/93	6.41	21.20
	03/10/93	6.34	21.27
	04/12/93	6.52	21.09
	05/17/93	7.38	20.23
	06/28/93	8.42	19.19
	07/13/93	8.68	18.93
	08/10/93	8.25	19.36
	09/10/93	8.73	18.88
	10/12/93	9.04	18.57
	12/20/93	7.87	19.74
	03/18/94	6.96	20.65
	04/08/94	7.69	19.92
	06/22/94	8.55	19.06
	12/07/94	6.92	20.69
	03/16/95	5.54	22.07
	06/23/95	7.17	20.44
	09/14/95	8.17	19.44
	12/18/95	6.77	20.84
	3/19/96	5.34	22.27
06/27/96	7.45	20.16	
10/14/96	8.66	18.95	

Well ID Well Elevation	Date Monitored	Depth to Groundwater (feet)	Groundwater Elevation (feet above MSL)
MW-2a 27.98	01/09/93	7.06	20.92
	02/09/93	6.63	21.35
	03/10/93	6.57	21.41
	04/12/93	6.77	21.21
	05/17/93	7.61	20.37
	06/28/93	8.68	19.30
	07/13/93	8.94	19.04
	08/10/93	8.66	19.32
	09/10/93	8.95	19.03
	10/12/93	9.36	18.62
	12/20/93	8.24	19.74
	03/18/94	7.80	20.18
	04/08/94	7.67	20.31
	06/22/94	7.82	20.16
	12/07/94	7.23	20.75
	03/16/95	5.62	22.36
	06/23/95	7.35	20.63
	09/14/95	8.41	19.57
	12/18/95	7.05	20.93
	3/19/96	5.49	22.49
06/27/96	7.67	20.31	
10/14/96	---	---	

Well ID Well Elevation	Date Monitored	Depth to Groundwater (feet)	Groundwater Elevation (feet above MSL)
MW-3 27.89	01/09/93	6.68	21.21
	02/09/93	6.25	21.64
	03/10/93	6.18	21.71
	04/12/93	6.41	21.48
	05/17/93	7.37	20.52
	06/28/93	8.47	19.42
	07/13/93	8.74	19.15
	08/10/93	8.45	19.44
	09/10/93	8.52	19.37
	10/12/93	9.20	18.69
	12/20/93	7.95	19.94
	03/18/94	6.60	21.29
	04/08/94	7.70	20.19
	06/22/94	8.62	19.27
	12/07/94	6.92	20.97
	03/16/95	5.25	22.64
	06/23/95	6.99	20.90
	09/14/95	8.11	19.78
	12/18/95	6.58	21.31
	3/19/96	5.14	22.75
06/27/96	7.37	20.52	
10/14/96	8.62	19.27	
MW-4 26.97	12/20/93	7.25	19.72
	03/18/94	6.64	20.33
	04/08/94	7.12	19.85
	06/22/94	7.96	19.01
	12/07/94	6.32	20.65
	03/16/95	5.08	21.89
	06/23/95	6.65	20.32
	09/14/95	7.61	19.36
	12/18/95	6.20	20.77
	03/19/96	4.87	22.10
	06/27/96	6.93	20.04
	10/14/96	8.12	18.85

Well ID Well Elevation	Date Monitored	Depth to Groundwater (feet)	Groundwater Elevation (feet above MSL)
MW-5 27.34	12/20/93	8.01	19.33
	03/18/94	7.80	19.54
	04/08/94	7.82	19.52
	06/22/94	8.51	18.83
	12/07/94	7.08	20.26
	03/16/95	5.72	21.62
	06/23/95	7.38	19.96
	09/14/95	8.27	19.07
	12/18/95	7.17	20.17
	3/19/96	5.49	21.85
	06/27/96	7.55	19.79
	10/14/96	8.72	18.62
MW-6 28.03	12/20/93	8.00	20.03
	03/18/94	---	---
	04/08/94	7.72	20.31
	06/22/94	8.68	19.35
	12/07/94	---	---
	12/13/94	6.73	21.30
	03/16/95	5.04	22.99
	06/23/95	6.90	21.13
	09/14/95	8.07	19.96
	12/18/95	---	---
	3/19/96	5.05	22.98
	06/27/96	7.55	19.79
	10/14/96	8.63	19.40

Note: Depth to groundwater measured from the top of well casing
 --- = Depth to groundwater not measured

In addition, groundwater monitoring was performed before, during, and after purging to evaluate the groundwater for intrinsic parameters of biodegradation. Monitoring included measuring dissolved oxygen (DO), salinity, turbidity, pH, and temperature with the use of a Horiba® U-10 meter and continuous flow-cell. The parameter results from October 14, 1996, are summarized in Table 2.

TABLE 2 - MONITORING PARAMETERS

Well No.- Gallons Removed	pH	Temp (°C)	Conductivity (µn/cm)	DO (mg/L)	Salinity	Turbidity (units)
MW-1 - 1.5	6.55	23.1	0.738	4.68	0.03	10
3.0	6.61	22.8	0.706	4.80	0.03	-10
4.5	6.72	22.1	0.595	4.82	0.02	94
6.0	6.70	22.2	0.593	4.89	0.02	92
MW-2a	---	---	---	---	---	---
MW-3-1.0	6.59	22.8	0.543	5.11	0.02	-10
2.0	6.65	22.4	0.537	5.58	0.02	849
3.0	6.70	22.6	0.522	5.07	0.02	872
4.0	6.68	22.5	0.525	5.25	0.02	877
MW-4 - 1.6	6.64	22.4	0.648	5.42	0.02	10
3.2	6.67	22.9	0.641	5.28	0.02	137
MW-4 - 4.8	6.66	22.9	0.613	5.42	0.02	143
6.4	6.67	23.0	0.611	5.38	0.02	146
MW-5-1.5	6.79	24.6	0.516	5.71	0.02	10
3.0	6.82	24.2	0.515	6.22	0.02	999
4.5	6.82	24.1	0.503	6.46	0.02	583
6.0	6.79	23.9	0.494	6.08	0.02	999
MW-6-1.5	6.72	20.7	0.276	6.65	0.01	48
3.0	6.66	20.4	0.266	6.64	0.01	238
4.5	6.69	20.3	0.292	6.32	0.01	999
6.0	6.68	20.2	0.290	6.84	0.01	855

Notes: mg/L = milligrams per liter, equivalent to parts per million

Monitoring well MW-2 was not accessible and therefore not sampled

3.2 Groundwater Gradient

The groundwater flow direction, as calculated from monitoring well data obtained on October 14, 1996, is illustrated on Figure 3. Based on groundwater elevation calculations, groundwater flow is toward the southwest at an average gradient of 0.007 foot/foot. The groundwater flow direction, as determined from monitoring well data, is similar to previous sampling events. Table 3 summarizes historical gradient and approximate flow directions calculated from water elevations.

TABLE 3 - HISTORICAL GRADIENT AND FLOW DIRECTION

Date Monitored	Gradient (foot/foot)	Direction
01/09/93	0.01	west
02/09/93	0.01	southwest
03/10/93	0.01	west/southwest
04/12/93	0.01	west/southwest
05/17/93	0.01	south/southwest
06/28/93	0.01	southwest
07/13/93	0.01	southwest
08/10/93	0.004	west
09/10/93	0.02	southwest
10/12/93	0.004	southwest
12/20/93	0.01	west
03/18/94	0.02	west
04/08/94	0.01	west
06/22/94	0.03	south/southwest
12/07/94	0.01 (average)	west/southwest
03/16/95	0.01	southwest
06/23/95	0.01-0.013 (varies)	southwest
09/14/95	0.008	southwest
12/18/95	0.011	southwest
03/19/96	0.011	southwest
06/27/96	0.013	southwest
10/14/96	0.007	southwest

3.3 Groundwater Sampling

Before groundwater sampling, each well was purged using a new polyethylene disposable bailer and new string. Groundwater samples were collected when temperature, pH, and conductivity of the water stabilized and a minimum of four well-casing volumes of water had been removed. Following purging, each well was allowed to recharge prior to sampling. When recovery to 80 percent of the static water level was observed, a sample was collected for analysis. Groundwater conditions were monitored during purging and sampling. Well monitoring worksheets are included as Appendix 1.

Wells were sampled using a disposable polyethylene bailer attached to new string. From each monitoring well, sample vials were filled to overflowing and sealed so that no air was trapped in the vial. Once filled, sample vials were inverted and tapped to test for air bubbles. Samples were collected in approved, laboratory-supplied vials. Sample containers were labeled with self-adhesive, preprinted tags and were stored in a pre-chilled, insulated container pending delivery to a state-certified laboratory for analysis.

Water purged during the development and sampling of the monitoring wells was stored temporarily on site in Department of Transportation approved 55-gallon drums pending laboratory analysis and proper disposal.

4.0 RESULTS OF GROUNDWATER SAMPLING

Groundwater samples collected from each well were submitted to Chromalab, Inc., following chain of custody protocol. Groundwater samples collected from wells MW-1 and MW-3 through MW-6 were analyzed for TPHg and BTEX by EPA Method 8015M/8020. Copies of the chain of custody record and laboratory analytical reports are included in Appendix 2. Dissolved gasoline constituents were detected in groundwater samples collected from wells MW-1, MW-3, and MW-4. Laboratory analysis of water samples collected from wells MW-5 and MW-6 indicated no detectable concentrations of constituents. A historic summary of groundwater sample results is presented in Table 4.

TABLE 4 - GROUNDWATER SAMPLE ANALYTICAL RESULTS

Well ID	Date Sampled	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW-1	01/09/93	5,360	1,560.0	1,026.6	641.0	2,706.2
	04/12/93	12,000	750.0	100.0	500.0	1,400.0
	07/13/93	720	119.6	32.7	70.8	262.0
	10/12/93	8,400	420.0	39.0	280.0	880.0
	12/20/93	5,200	270.0	58.0	170.0	590.0
	03/18/94	18,000	570.0	180.0	270.0	1,500.0
	04/08/94	NT	NT	NT	NT	NT
	06/22/94	4,800	160.0	56.0	130.0	310.0
	12/07/94	9,100	530.0	200.0	350.0	1,300.0
	03/16/95	230	15.0	4.5	9.4	38.0
	06/23/95	2,700	170.0	19.0	40.0	180.0
	09/14/95	1,700	160.0	12.0	69.0	100.0
	12/18/95	2,900	190.0	57.0	130.0	380.0
	03/19/96	14,000	910	280	400	2,100
	06/27/96	5,300	320	81	280	710
10/14/96	1,000	58	4.2	40	25	

Well ID	Date Sampled	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW-2a	01/09/93	5,680	801.6	598.6	840.2	2,196.1
	04/12/93	12,000	460.0	110.0	240.0	1,600.0
	07/13/93	550	145.2	47.5	126.8	127.4
	10/12/93	2,000	280.0	17.0	100.0	120.0
	12/20/93	3,300	450.0	40.0	200.0	350.0
	03/18/94	7,900	370.0	53.0	190.0	530.0
	04/08/94	NT	NT	NT	NT	NT
	06/22/94	3,800	420.0	37.0	140.0	290.0
	12/07/94	6,800	640.0	100.0	370.0	950.0
	03/16/95	6,500	590.0	96.0	360.0	1,000.0
	06/23/95	4,300	170.0	58.0	33.0	810.0
	09/14/95	1,700	270.0	17.0	76.0	160.0
	12/18/95	3,900	410.0	52.0	290.0	610.0
	03/19/96	9,000	470	70	540	1,400
	06/27/96	9,900	350	33	230	580
10/14/96	---	---	---	---	---	
MW-3	01/09/93	< 50	< 0.5	< 0.5	< 0.5	< 0.5
	04/12/93	1,500	95.0	30.0	46.0	85.0
	07/13/93	540	18.3	106.2	75.7	128.0
	10/12/93	3,500	290.0	230.0	210.0	460.0
	12/20/93	690	31.0	10.0	31.0	25.0
	03/18/94	450	9.6	11.0	5.5	23.0
	04/08/94	NT	NT	NT	NT	NT
	06/22/94	2,500	150.0	130.0	81.0	280.0
	12/07/94	420	16.0	8.3	26.0	37.0
	03/16/95	490	19.0	2.7	24.0	46.0
	06/23/95	860	41.0	5.4	32.0	110.0
	09/14/95	720	43.0	3.7	50.0	86.0
	12/18/95	860	27.0	10.0	38.0	53.0
	03/19/96	570	28	2.2	21	30
	06/27/96	910	54	4.9	53	79
10/14/96	610	48	3.6	31	37	

Well ID	Date Sampled	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW-4	12/20/93	580	2.3	<0.5	1.4	1.1
	03/18/94	2,100	11.0	1.5	2.3	6.0
	04/08/94	NT	NT	NT	NT	NT
	06/22/94	1,600	39.0	7.5	13.0	16.0
	12/07/94	2,100	82.0	9.6	4.7	14.0
	03/16/95	3,400	140.0	12.0	45.0	29.0
	06/23/95	1,800	140.0	13.0	13.0	28.0
	09/14/95	3,900	250.0	6.1	3.8	11.0
	12/18/95	2,400	94.0	14.0	11.0	29.0
	03/19/96	1,300	68.0	8.2	25.0	21.0
	06/27/96	2,100	96.0	11.0	18.0	20.0
	10/14/96	2,300	130	8.4	3.4	5.6
MW-5	12/20/93	<50	<0.5	<0.5	<0.5	<0.5
	03/18/94	<50	<0.5	<0.5	<0.5	<0.5
	04/08/94	NT	NT	NT	NT	NT
	06/22/94	<50	<0.5	<0.5	<0.5	<0.5
	12/07/94	<50	<0.5	<0.5	<0.5	<0.5
	03/16/95	<50	<0.5	<0.5	<0.5	<0.5
	06/12/95	<50	<0.5	<0.5	<0.5	<0.5
	09/14/95	<50	<0.5	<0.5	<0.5	<0.5
	12/18/95	<50	<0.5	<0.5	<0.5	<0.5
	03/19/96	<50	<0.5	<0.5	<0.5	<0.5
	06/27/96	<50	<0.5	<0.5	<0.5	<0.5
	10/14/96	<50	<0.5	<0.5	<0.5	<0.5
MW-6	12/20/93	<50	<0.5	<0.5	<0.5	<0.5
	03/13/94	NT	NT	NT	NT	NT
	04/08/94	<50	<0.5	<0.5	<0.5	<0.5
	06/22/94	<50	<0.5	<0.5	<0.5	<0.5
	12/13/94	<50	<0.5	<0.5	<0.5	<0.5
	03/16/95	<50	<0.5	<0.5	<0.5	<0.5
	06/23/95	<50	<0.5	<0.5	<0.5	<0.5
	09/14/95	<50	<0.5	<0.5	<0.5	<0.5
	03/19/96	<50	<0.5	<0.5	<0.5	<0.5
	06/27/96	<50	<0.5	<0.5	<0.5	<0.5
	10/14/96	<50	<0.5	<0.5	<0.5	<0.5

Notes: µg/L = micrograms per liter (approximately equivalent to ppb); NT = Not tested

5.0 DISCUSSION

This report documents the quarterly monitoring conducted for five of the six groundwater wells at Alameda Cellars, 2425 Encinal Avenue, Alameda, California. Monitoring well MW-2a was not accessible and therefore, not monitored or sampled. Groundwater sample results indicate detectable concentrations of gasoline constituents in the groundwater samples collected from wells MW-1, MW-3, and MW-4. No detectable concentrations of TPHg and BTEX were reported in samples collected from wells MW-5 and MW-6, which is consistent with previous sampling events.

The samples collected from wells MW-1 and MW-3 indicated a decrease in gasoline constituents compared with the previous sampling event conducted in June 1996. Concentrations of petroleum hydrocarbons reported in well MW-4 have increased since the previous sampling event; however, the concentrations of gasoline are lower compared with sampling data collected in September 1995 and December 1995 from well MW-4. Groundwater flow direction and gradient are consistent with the previous sampling events.

Groundwater elevations decreased in all wells. The concentrations of constituents decreased with respect to water levels in wells MW-1 and MW-3.

In addition to petroleum hydrocarbons, the groundwater was evaluated for indicator parameters of bioremediation. The water in each well was monitored before, during, and after purging to evaluate indications of biodegradation. Results of each parameter monitored are discussed below.

5.1 Dissolved Oxygen

Dissolved oxygen was measured by using a flow-cell type configuration compared with a down-hole meter. The flow-cell unit has continuous groundwater flowing past the probe with no agitation, whereas the down-hole unit has virtually no water flow around the probe. Research on the down-hole probe versus the flow cell indicates that the down-hole probe used oxygen to generate a reading; therefore, a properly constructed flow-cell unit would be more accurate in the actual amount of DO in the natural groundwater. Previous DO readings were taken using a down-hole meter and were registered to be relatively low. Additional DO readings collected during this quarter were obtained with the use of a flow-cell unit. The unit consisted of a down-hole pump lowered into the groundwater, which was pumped into a small bucket in a double-contained holding system. The water was pumped into the small, inner bucket to overflowing to prevent introduction of oxygen. The probe was lowered into the small bucket and direct readings were recorded. Overflowing water was pumped from the containment bucket into a drum.

DO concentrations can be used to evaluate the mass of constituents that can be biodegraded by aerobic processes. During aerobic biodegradation, DO levels are reduced and aerobic biodegradation can degrade BTEX components if sufficient DO (>1 to 2 mg/L) is present (Buscheck and O'Reilly, March 1995). Levels of DO varied throughout the site from 4.68 mg/L in well MW-1 to 6.65 mg/L in well MW-6. Water from wells MW-1, MW-3, and MW-4 (with elevated concentrations of petroleum hydrocarbons) indicated the lowest levels of DO. Water from

wells MW-5 and MW-6 (with no detectable concentrations of petroleum hydrocarbons) indicated the highest levels of DO. This indicates that sufficient DO is present in the non-impacted groundwater, and aerobic degradation of the petroleum hydrocarbons is occurring. The measured reduction in DO from non-impacted groundwater indicates that the natural microbes are using the DO to degrade the petroleum hydrocarbons.

6.0 CONCLUSIONS

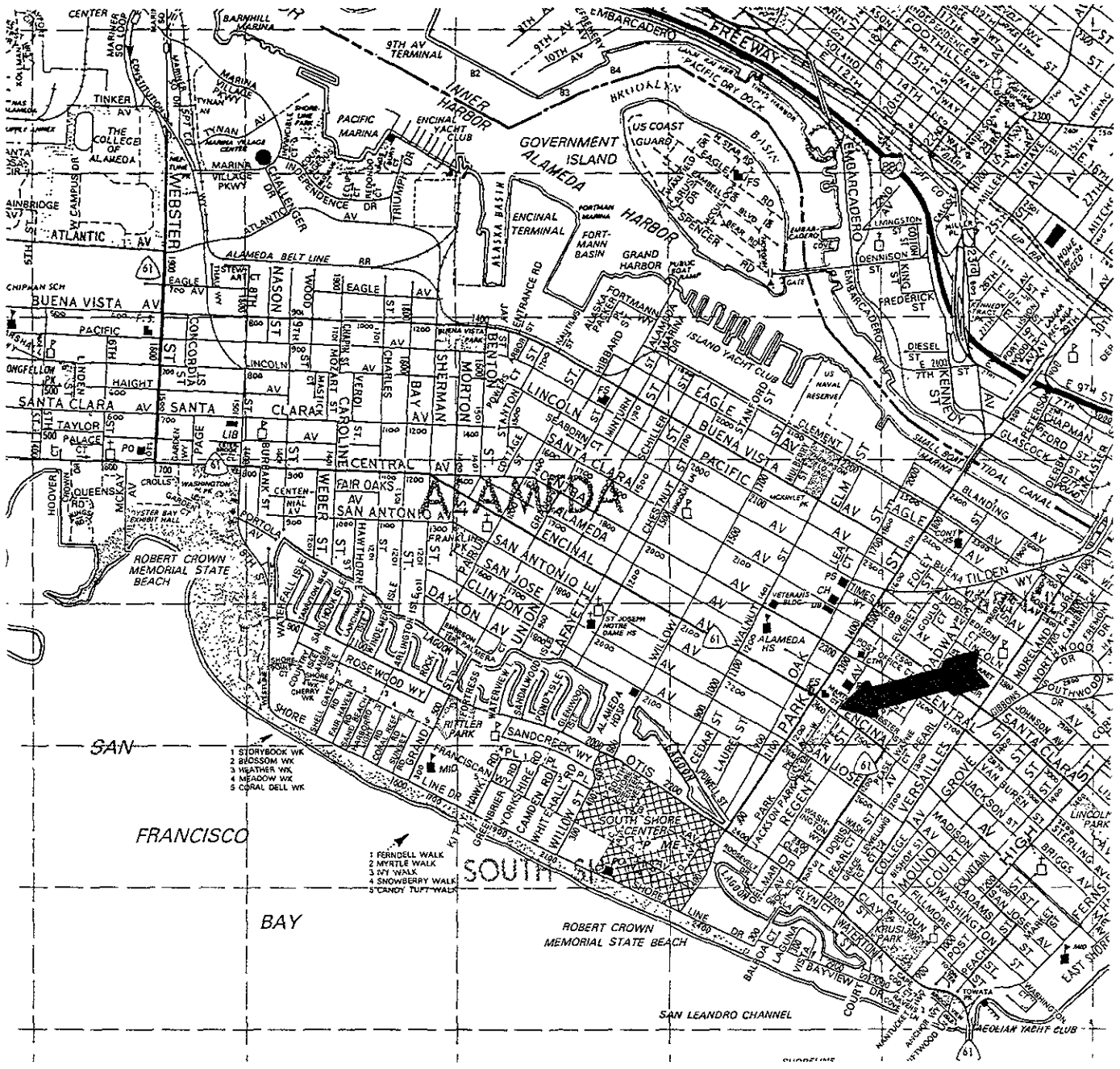
The extent of the groundwater impact has been identified and groundwater monitoring conducted since January 1993 has documented fluctuating concentrations of TPHg and BTEX. However, the overall concentrations within the groundwater are decreasing. Based on the work completed to date and the analysis results from groundwater monitoring, the following conclusions can be made:

- The findings from the groundwater monitoring and analysis indicate that natural biodegradation is occurring within the impacted groundwater plume. Due to the relatively low naturally occurring concentrations of DO in the groundwater, natural biodegradation is occurring both aerobically and anaerobically within the groundwater at the site.
- Because of the relatively slow rate of anaerobic biodegradation, petroleum hydrocarbon concentrations in the groundwater will continue to illustrate fluctuations as a result of fluctuating water levels, but the overall concentrations will decrease with time. This slow decrease has been illustrated in the groundwater sampling and analysis performed at the site since 1993.
- The most recent groundwater sampling indicates detectable concentrations of petroleum hydrocarbons in monitoring wells MW-1 through MW-4. TPHg concentrations decreased in wells MW-1 and MW-3 during the current event. TPHg concentrations have increased in monitoring well MW-4.
- Since January 1993, varying concentrations of petroleum hydrocarbons in wells MW-1 through MW-4 appear to be a result of residual hydrocarbons from the former excavation that continue to impact the groundwater through fluctuating groundwater levels.
- The bulk of the source was removed with the tank removal; therefore, ACC believes that the detectable concentrations observed in the groundwater are the result of remnant impacted soil affecting the groundwater.
- The area of impact is limited based on laboratory results from samples collected from well MW-5, which has continually indicated no detectable concentrations of constituents.
- Due to the relatively flat gradient, the potential for plume migration is limited. Impacted groundwater will likely degrade before any substantial downgradient migration occurs.

7.0 RECOMMENDATIONS

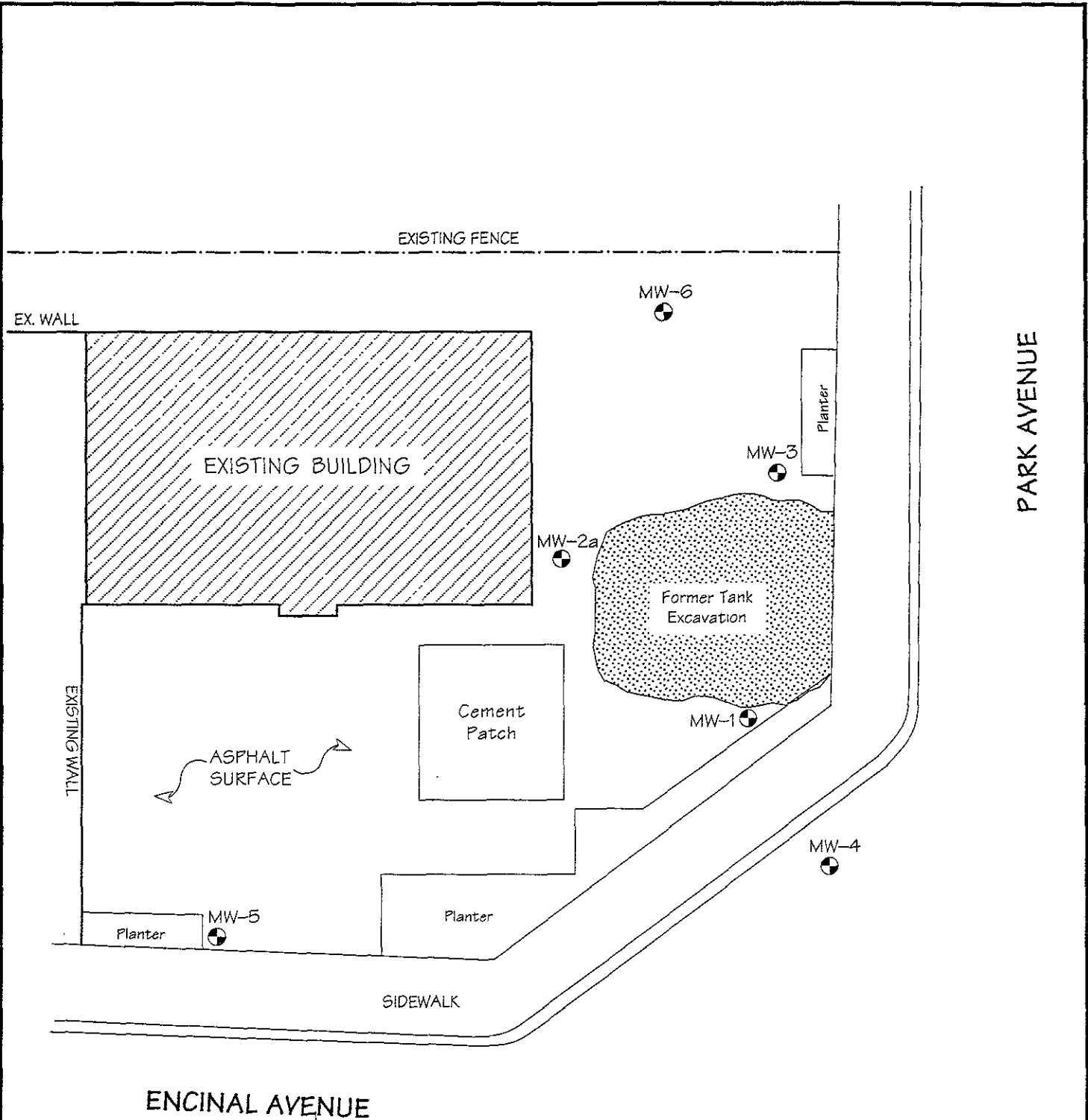
Based on the work completed to date and the laboratory results from the groundwater samples collected, ACC anticipates that the concentrations observed within the monitoring wells will fluctuate with seasonal precipitation then will decline with time.

ACC recommends that the groundwater monitoring of all six wells be reduced to semiannually in order to document decreasing trends.




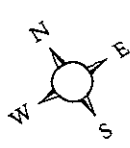
SOURCE: THOMAS BROTHERS GUIDE, 1990 ed.

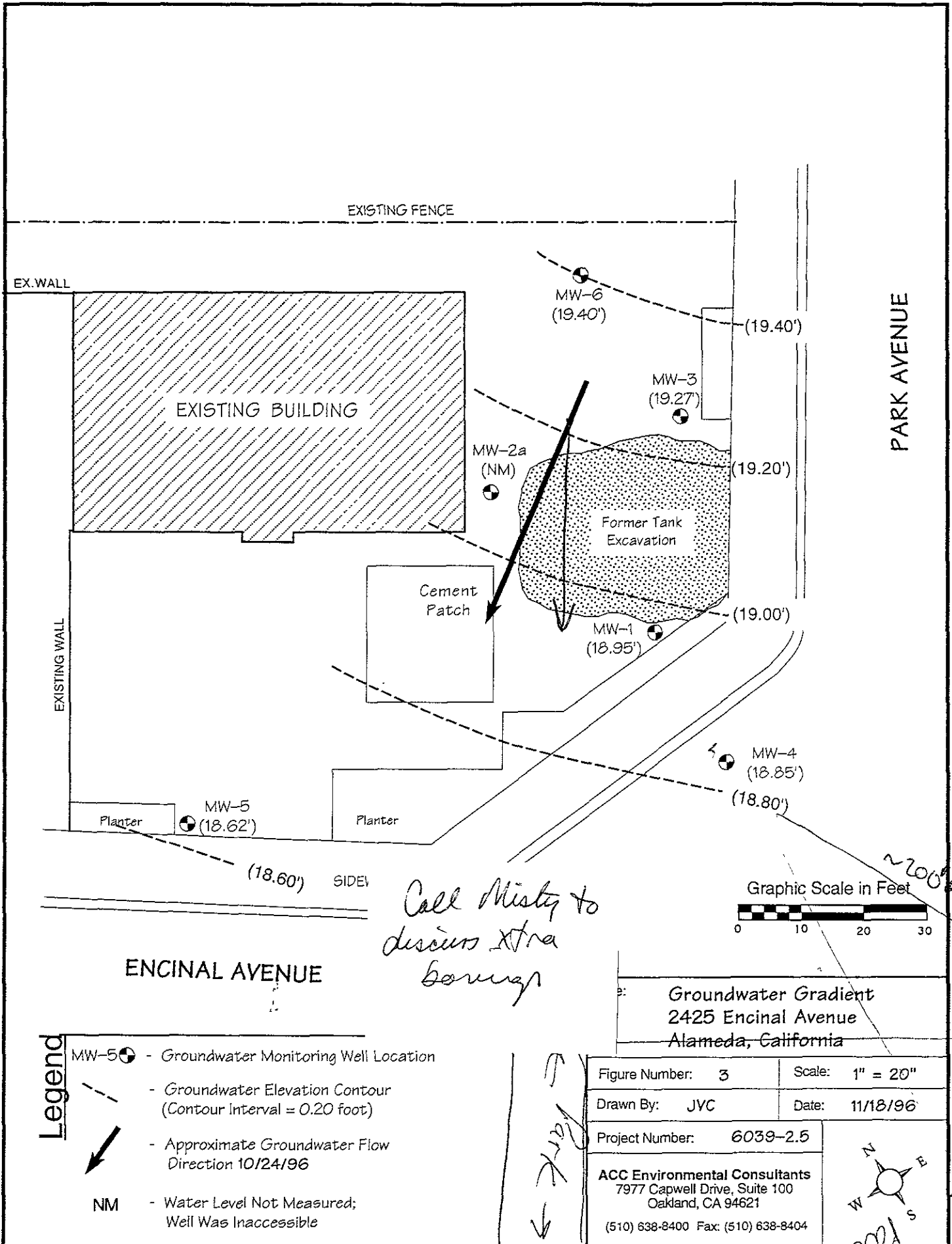
Title: Location Map 2425 Encinal Avenue Alameda, California	
Figure Number: 1.0	Scale: 1" = 1/4 mi
Drawn By: JVC	Date: 3/19/96
Project Number: 6039-5	
ACC Environmental Consultants 7977 Capwell Drive, Suite 100 Oakland, California 94621 (510) 638-8400 Fax: (510) 638-8404	



Legend

MW-5  - Groundwater Monitoring Well Location

Title: Site Plan 2425 Encinal Ave Alameda, California	
Figure Number: 2	Scale: 1" = 20'
Drawn By: JVC	Date: 11/18/96
Project Number: 6039-5	
ACC Environmental Consultants 7977 Capwell Drive, Suite 100 Oakland, CA 94621 (510) 638-8400 Fax: (510) 638-8404	
	



WELL MONITORING WORKSHEET

JOB NAME: <u>Alameda Cellars</u>	PURGE METHOD: <u>Manual Bailing</u>
SITE ADDRESS: <u>2425 Encinal Ave</u>	SAMPLED BY: <u>E. Cisneros</u>
JOB #: <u>6039-5.0</u>	LABORATORY: <u>Chromalab</u>
DATE: <u>10/14/96</u>	ANALYSIS: <u>TPHg, BTEX</u>
Onsite Drum Inventory SOIL:	MONITORING <input checked="" type="checkbox"/> DEVELOPING <input type="checkbox"/>
EMPTY: <u>1</u> WATER: <u>1/2 85% full</u>	SAMPLING <input checked="" type="checkbox"/>

	PURGE VOLUME		HYDAG READINGS			OBSERVATIONS
	(Gal)	pH	Temp. (°C)	Cond. un/cm		
WELL: <u>MW-1</u>					<input type="checkbox"/>	Froth
DEPTH OF BORING: <u>17.28'</u>	<u>1.5</u>	<u>6.55</u>	<u>23.1</u>	<u>.738</u>	<input type="checkbox"/>	Sheen
DEPTH TO WATER: <u>8.66'</u>	<u>3.0</u>	<u>6.61</u>	<u>22.8</u>	<u>.706</u>	<input checked="" type="checkbox"/>	Odor Type <u>gas</u>
WATER COLUMN: <u>8.62'</u>	<u>4.5</u>	<u>6.72</u>	<u>22.1</u>	<u>.595</u>	<input type="checkbox"/>	Free Product
WELL DIAMETER: <u>2"</u>						Amount _____ Type _____
WELL VOLUME: <u>≈ 1.5 gal</u>					<input type="checkbox"/>	Other
COMMENTS:						Sal: .03 Turb: 10 D.O.: 4.68
						.03 -10 4.80
						.02 14 4.82
						.02 92 4.89
	<u>6.0</u>	<u>6.70</u>	<u>22.2</u>	<u>.593</u>		
WELL: <u>MW-2</u>	(Gal)	pH	Temp. (°C)	Cond. un/cm	<input type="checkbox"/>	Froth
DEPTH OF BORING:					<input type="checkbox"/>	Sheen
DEPTH TO WATER:					<input type="checkbox"/>	Odor Type _____
WATER COLUMN:					<input type="checkbox"/>	Free Product
WELL DIAMETER:						Amount _____ Type _____
WELL VOLUME:					<input type="checkbox"/>	Other
COMMENTS: <u>Could not open.</u>						
WELL: <u>MW-3</u>	(Gal)	pH	Temp. (°C)	Cond. un/cm	<input type="checkbox"/>	Froth
DEPTH OF BORING: <u>14.29'</u>	<u>1.0</u>	<u>6.59</u>	<u>22.8</u>	<u>.543</u>	<input type="checkbox"/>	Sheen
DEPTH TO WATER: <u>8.62'</u>	<u>2.0</u>	<u>6.65</u>	<u>22.4</u>	<u>.537</u>	<input type="checkbox"/>	Odor Type _____
WATER COLUMN: <u>5.67'</u>	<u>3.0</u>	<u>6.70</u>	<u>22.6</u>	<u>.522</u>	<input type="checkbox"/>	Free Product
WELL DIAMETER: <u>2"</u>						Amount _____ Type _____
WELL VOLUME: <u>≈ 1.0 gal</u>					<input type="checkbox"/>	Other
COMMENTS:						Sal: .02 Turb: 10 D.O.: 5.11
						.02 849 5.58
						.02 872 5.07
						.02 877 5.25
	<u>4.0</u>	<u>6.68</u>	<u>22.5</u>	<u>.525</u>		

JOB NAME: <u>Alameda Cellars</u>	PURGE METHOD: <u>Manual Bailing</u>
SITE ADDRESS: <u>2425 Encinal Ave</u>	SAMPLED BY: <u>E. Cisneros</u>
JOB #: <u>6039-5.0</u>	LABORATORY: <u>Chromalab</u>
DATE: <u>10/14/96</u>	ANALYSIS: <u>TPH_g, BTEX</u>
Onsite Drum Inventory SOIL:	MONITORING <input checked="" type="checkbox"/> DEVELOPING <input type="checkbox"/>
EMPTY: WATER: <u>≈85% full</u>	SAMPLING <input checked="" type="checkbox"/>

	PURGE VOLUME				HYDRA-READINGS				OBSERVATIONS	
	(Gal)	pH	Temp. (E)	Cond. un/cm	Froth	Sheen	Odor	Type		
WELL: <u>MW-4</u>										
DEPTH OF BORING: <u>17.51'</u>	<u>1.6</u>	<u>6.64</u>	<u>22.4</u>	<u>.648</u>	<input type="checkbox"/>	<input type="checkbox"/>				
DEPTH TO WATER: <u>8.12'</u>	<u>3.2</u>	<u>6.67</u>	<u>22.9</u>	<u>.641</u>	<input type="checkbox"/>	<input type="checkbox"/>				
WATER COLUMN: <u>9.39'</u>	<u>4.8</u>	<u>6.66</u>	<u>22.9</u>	<u>.613</u>	<input type="checkbox"/>	<input type="checkbox"/>				
WELL DIAMETER: <u>2"</u>									Amount	Type
WELL VOLUME: <u>≈1.6 gal</u>									<input type="checkbox"/>	Other
COMMENTS:									<u>Sal: .02</u>	<u>Turb: -10 D.O.: 5.42</u>
									<u>.02</u>	<u>137</u>
									<u>.02</u>	<u>143</u>
									<u>.02</u>	<u>146</u>
	<u>6.4</u>	<u>6.67</u>	<u>23.0</u>	<u>.611</u>						<u>5.38</u>
WELL: <u>MW-5</u>										
DEPTH OF BORING: <u>17.54'</u>	<u>1.5</u>	<u>6.79</u>	<u>24.6</u>	<u>.516</u>	<input type="checkbox"/>	<input type="checkbox"/>				
DEPTH TO WATER: <u>8.72'</u>	<u>3.0</u>	<u>6.82</u>	<u>24.2</u>	<u>.515</u>	<input type="checkbox"/>	<input type="checkbox"/>				
WATER COLUMN: <u>8.82'</u>	<u>4.5</u>	<u>6.82</u>	<u>24.1</u>	<u>.503</u>	<input type="checkbox"/>	<input type="checkbox"/>				
WELL DIAMETER: <u>2"</u>									Amount	Type
WELL VOLUME: <u>≈1.5 gal</u>									<input type="checkbox"/>	Other
COMMENTS:									<u>Sal: .02</u>	<u>Turb. 10 D.O.: 5.71</u>
									<u>.02</u>	<u>999</u>
									<u>.02</u>	<u>583</u>
									<u>.02</u>	<u>999</u>
	<u>6.0</u>	<u>6.79</u>	<u>23.9</u>	<u>.494</u>						<u>6.08</u>
WELL: <u>MW-6</u>										
DEPTH OF BORING: <u>17.45'</u>	<u>1.5</u>	<u>6.72</u>	<u>20.7</u>	<u>.276</u>	<input type="checkbox"/>	<input type="checkbox"/>				
DEPTH TO WATER: <u>8.63'</u>	<u>3.0</u>	<u>6.66</u>	<u>20.4</u>	<u>.266</u>	<input type="checkbox"/>	<input type="checkbox"/>				
WATER COLUMN: <u>8.82'</u>	<u>4.5</u>	<u>6.69</u>	<u>20.3</u>	<u>.292</u>	<input type="checkbox"/>	<input type="checkbox"/>				
WELL DIAMETER: <u>2"</u>									Amount	Type
WELL VOLUME: <u>≈1.5 gal</u>									<input type="checkbox"/>	Other
COMMENTS:									<u>Sal: .01</u>	<u>Turb: 48 D.O.: 6.65</u>
									<u>.01</u>	<u>238</u>
									<u>.01</u>	<u>999</u>
									<u>.01</u>	<u>855</u>
	<u>6.0</u>	<u>6.68</u>	<u>20.2</u>	<u>.290</u>						<u>6.84</u>

ANALYTICAL RESULTS AND CHAIN OF CUSTODY RECORD

CHROMALAB, INC.

Environmental Services (SDB)

October 22, 1996

Submission #: 9610209

ACC ENVIRONMENTAL CONSULTANTS
7977 CAPWELL DRIVE, SUITE 100
OAKLAND, CA 94621

Attn: Misty Kaltreider

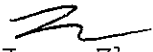
RE: Analysis for project 2425 ENCINAL AVE, number 6039-5.0.

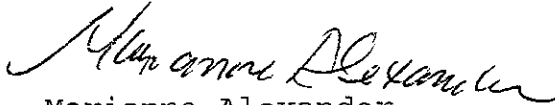
REPORTING INFORMATION

Samples were received cold and in good condition on October 15, 1996. They were refrigerated upon receipt and analyzed as described in the attached report. ChromaLab followed EPA or equivalent methods for all testing reported.

No discrepancies were observed or difficulties encountered with the testing.

For Gas/BTEX: Samples received unpreserved.


June Zhao
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

October 22, 1996

Submission #: 9610209

ACC ENVIRONMENTAL CONSULTANTS

Atten: Misty Kaltreider

Project: 2425 ENCINAL AVE
Received: October 15, 1996

Project#: 6039-5.0

re: 5 samples for Gasoline and BTEX compounds analysis.
Method: EPA 5030/8015M/8020A

Matrix: WATER

Sampled: October 14, 1996


Run#: 3650

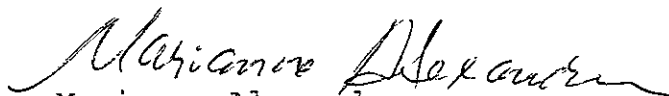
Analyzed: October 18, 1996

Spl#	CLIENT SPL ID	Gasoline (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
103858	MW-1	1000	58	4.2	40	25
103859	MW-3	610	48	3.6	31	37
103860	MW-4	2300	130	8.4	3.4	5.6
103861	MW-5	N.D.	N.D.	N.D.	N.D.	N.D.
103862	MW-6	N.D.	N.D.	N.D.	N.D.	N.D.

Note: Report not complete without cover page.

Reporting Limits	50	0.50	0.50	0.50	0.50
Blank Result	N.D.	N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)	78.2	91.0	93.2	85.9	89.3


June Zhao
Chemist


Marianne Alexander
Gas/BTEX Supervisor

CHROMALAB, INC.
SAMPLE RECEIPT CHECKLIST

Client Name ACC Date/Time Received 10/15/94 1124
Project 2425 ENCINAL AVE Received by J Lundberg Date / Time
Reference/Subm # 30239/9610209 Carrier name _____
Checklist completed by: C Rowley 10/16/94 Logged in by MP 10/15/94
Signature Date Matrix H2O Initials / Date

- Shipping container in good condition? NA Yes No
- Custody seals present on shipping container? Intact Broken Yes No
- Custody seals on sample bottles? Intact Broken Yes No
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Samples intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- VOA vials have zero headspace? NA Yes No
- Trip Blank received? NA Yes No
- All samples received within holding time? Yes No
- Container temperature? 4.3°C
- pH upon receipt _____ pH adjusted _____ Check performed by: _____ NA

Any NO response must be detailed in the comments section below. If items are not applicable, they should be marked NA.

Client contacted? _____ Date contacted? _____
Person contacted? _____ Contacted by? _____

Regarding? _____

Comments: pH checked by chemist.
No preservative - HOLD TIME EXPIRES 10/21/94

Corrective Action: _____

209/103858 - 103858

30239

CHROMALAB, INC.

Environmental Services (SDB) (DOHS 1094)

SUBM #: 9610209 REP: PM
CLIENT: ACC
DUE: 10/22/96
REF #: 30239

Chain of Custody

DATE 10/14/96 PAGE 1 OF 1

PROJ MGR					ANALYSIS REPORT																	NUMBER OF CONTAINERS		
COMPANY					TPH - Gasoline (EPA 5030, 8015)	TPH - Gasoline (5030, 8015) w/BTEX (EPA 602, 8020)	TPH - Diesel, TEPH (EPA 3510/3550, 8015)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240, 524.2)	BASE/NEUTRALS, ACIDS (EPA 625/627, 8270, 525)	TOTAL OIL & GREASE (EPA 5520, B+F, E+F)	PCB (EPA 608, 8080)	PESTICIDES (EPA 608, 8080)	TOTAL RECOVERABLE HYDROCARBONS (EPA 418.1)	LUFT METALS: Cd, Cr, Pb, Zn, Ni	CAM METALS (17)	PRIORITY POLLUTANT METALS (13)	TOTAL LEAD	EXTRACTION (TCLP, STLC)				
ADDRESS					SAMPLERS (SIGNATURE)	(PHONE NO.)	(FAX NO.)																	
SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.																				
MW-1	10/14/96	14:15	H ₂ O		X	X																3		
MW-3	10/14/96	15:45	H ₂ O		X	X																	3	
MW-4	10/14/96	15:00	H ₂ O		X	X																	3	
MW-5	10/14/96	13:30	H ₂ O		X	X																	3	
MW-6	10/14/96	16:30	H ₂ O		X	X																	3	

PROJECT INFORMATION				SAMPLE RECEIPT			
PROJECT NAME 2425 Encinal Ave		TOTAL NO OF CONTAINERS 15		HEAD SPACE			
PROJECT NUMBER 6039-5.0		REC'D GOOD CONDITION/COLD		CONFORMS TO RECORD			
P.O. # 6039-5.0		TAT		STANDARD 5-DAY		OTHER	
SPECIAL INSTRUCTIONS/COMMENTS.							

RELINQUISHED BY 1		RELINQUISHED BY 2		RELINQUISHED BY 3	
(SIGNATURE) <i>Eloy Cisneros</i>	(TIME) 11:24	(SIGNATURE)	(TIME)	(SIGNATURE) <i>Jeff Lindberg</i>	(TIME) 12:50
(PRINTED NAME) Eloy Cisneros	(DATE) 10/15/96	(PRINTED NAME)	(DATE)	(PRINTED NAME) Jeff Lindberg	(DATE) 10/15/96
(COMPANY) ACC Environmental		(COMPANY)		(COMPANY) Chromalab	
RECEIVED BY 1		RECEIVED BY 2		RECEIVED BY (LABORATORY) 3	
(SIGNATURE) <i>Jeff Lindberg</i>	(TIME) 11:24	(SIGNATURE)	(TIME)	(SIGNATURE) <i>Mimic Pak</i>	(TIME) 12:50
(PRINTED NAME) Jeff Lindberg	(DATE) 10/15/96	(PRINTED NAME)	(DATE)	(PRINTED NAME) Mimic Pak	(DATE) 10/15/96
(COMPANY) Chromalab		(COMPANY)		(LAB) Chromalab	