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ENVIRONMENTAL
PROTECTION
97 FEB 24 PM 3:37

February 20, 1997

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

RE: Groundwater Monitoring Report
2425 Encinal Avenue, Alameda, California
ACC Project No. 96-6039-2.7

Dear Mr. Chrissanthos:

The enclosed report describes the materials and procedures used during the groundwater investigation performed at 2425 Encinal Avenue, Alameda, California. This work was performed to determine whether the bacteria at the site are aerobic or facultative and adaptable to either aerobic or anaerobic conditions that will in fact utilize supplemental oxygen if introduced. The work was performed in accordance with requests from Alameda County Health Care Services Agency (ACHCSA) and included monitoring and collecting groundwater samples from wells MW-1, MW-2a, and MW-3, which are located within the impacted groundwater plume.

Results of the groundwater study indicated that bacteria exist within the groundwater that can utilize oxygen. Natural bioremediation is occurring slowly as illustrated by the low dissolved oxygen levels in the groundwater samples.

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

Sincerely,

Misty C. Kaltreider
Senior Project Geologist

/mck:mcr

cc: Ms. Juliet Shin, ACHCSA

A·C·C
ENVIRONMENTAL
CONSULTANTS

GROUNDWATER MONITORING REPORT

February 20, 1997

2425 Encinal Avenue
Alameda, California

Prepared For:
Mr. Steve Chrissanthos
Alameda Cellars

ACC Project No. 96-6039-2.6

OAKLAND ▪ SACRAMENTO
SEATTLE ▪ LOS ANGELES

A·C·C
ENVIRONMENTAL
CONSULTANTS

GROUNDWATER MONITORING REPORT

2425 Encinal Avenue
Alameda, California

ACC Project No. 96-6039-2.7

Prepared for:

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

February 20, 1997

Prepared by: _____
Misty C. Kaltreider
Senior Project Geologist

Reviewed by: _____
David R. DeMent, RG
Registered Geologist

REGISTERED GEOLOGIST
DAVID R. DEMENT
NO. 5874
STATE OF CALIFORNIA

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OAKLAND • LOS ANGELES • SACRAMENTO • SEATTLE

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A·C·C ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING REPORT
2425 Encinal Avenue
Alameda, California

1.0 INTRODUCTION

On behalf of Mr. Steve Chrissanthos and 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 determine whether the bacteria at the site are aerobic or facultative and adaptable to either aerobic or anaerobic conditions that will in fact utilize supplemental oxygen if introduced. The work was performed in accordance with requests from Alameda County Health Care Services Agency (ACHCSA) and included monitoring and collecting groundwater samples from wells MW-1, MW-2a, and MW-3. These wells are located within the impacted groundwater plume identified in the vicinity of two former 10,000-gallon gasoline underground storage tanks (USTs). The project objectives were to: 1) obtain groundwater samples from three existing monitoring wells and analyze the water samples for dissolved oxygen (DO), biochemical oxygen demand (BOD), and heterotrophic platecount (HPC); and 2) 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 below detectable concentrations 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 December 12, 1996, the Alameda County Health Care Services Agency (ACHCSA) requested that in-field testing and additional analytical analysis be performed on the groundwater at the site to evaluate whether bacteria would utilize supplemental oxygen for the biodegradation process. This report documents the findings from the groundwater monitoring evaluation.

3.0 GROUNDWATER MONITORING AND SAMPLING

ACC conducted groundwater monitoring on January 24, 1997. Work at the site included measuring depth to water, subjectively evaluating groundwater in the wells, and purging and sampling the wells for laboratory analysis. Only monitoring wells MW-1, MW-2a, and MW-3, located within the impacted zone, were analyzed for bacterial indicators.

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). Groundwater monitoring data obtained at the site is included in Appendix 1.

In addition, groundwater monitoring was performed before, during, and after purging to evaluate the groundwater for intrinsic parameters of biodegradation. Monitoring included measuring temperature, DO, salinity, turbidity, and pH with the use of a Horiba® U-10 meter in a continuous flow-cell. The parameter results for January 24, 1997, are summarized in Table 1.

TABLE 1 - MONITORING PARAMETERS

Well No.- Gallons Removed	pH	Temp (°C)	Conductivity (ms/cm)	DO (mg/L)	Salinity	Turbidity (units)
MW-1 - 2.0	6.65	18.9	0.740	2.14	0.03	150
4.0	6.71	19.0	0.745	2.53	0.03	70
6.0	6.68	19.3	0.745	2.33	0.03	120
8.0	6.70	19.4	0.743	1.89	0.03	112
MW-2a - 1.5	6.60	17.9	0.561	3.02	0.02	96
3.0	6.60	18.2	0.554	3.35	0.02	75
4.5	6.60	18.6	0.545	2.87	0.02	63
6.0	6.61	18.8	0.547	3.57	0.02	59
MW-3-1.6	6.65	18.0	0.288	2.88	0.01	315
3.2	6.63	18.3	0.305	3.20	0.01	650
4.8	6.70	18.6	0.310	2.73	0.01	425
6.4	6.72	18.8	0.308	2.53	0.01	408

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

3.2 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. The well monitoring worksheet is included as Appendix 1.

Wells were sampled using a disposable polyethylene bailer attached to new string. From monitoring wells MW-1, MW-2a, and MW-3, 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 wells MW-1 through MW-3 were submitted to Sequoia Analytical following chain of custody protocol. Groundwater samples collected were analyzed for DO, HPC, and BOD. Analytical results are summarized in Table 2. Copies of the chain of custody record and laboratory analytical reports are included in Appendix 2.

TABLE 2 - GROUNDWATER SAMPLE ANALYTICAL RESULTS

Sample Number	Dissolved Oxygen (mg/L)	Heterotrophic Plate Count (CFU/mL)	Biochemical Oxygen Demand (mg/L)
MW-1	1.3	130	5.7
MW-2a	1.3	140	4.5
MW-3	2.9	>5,700	2.7

Notes: *mg/L = milligrams per liter approximately equal to ppm*
CFU = colony forming unit

5.0 DISCUSSION

This additional groundwater investigation was performed in accordance with a request from ACHCSA to determine whether bacteria at the site will utilize supplemental oxygen to help degrade the overall constituent plume. Based on results of the study, detectable concentrations of DO exist in the groundwater; however, the levels of DO do not appear to be enough to support abundant bacteria colonies to degrade the petroleum hydrocarbons in the groundwater at an acceptable rate. The HPC results indicate that bacteria is present in the groundwater. However, only in well MW-3 is there sufficient DO to promote bacteria growth. ACC believes that the additional DO reported in well MW-3 is likely due to the location of the well in relation to uncapped landscaping areas. DO from surface water percolation and aeration of the soil aid in increasing the DO concentration in the area around well MW-3. The areas around wells MW-1 and MW-2a are covered with asphalt or concrete cap and therefore do not receive adequate amounts of aeration to enhance bacteria growth.

6.0 CONCLUSIONS

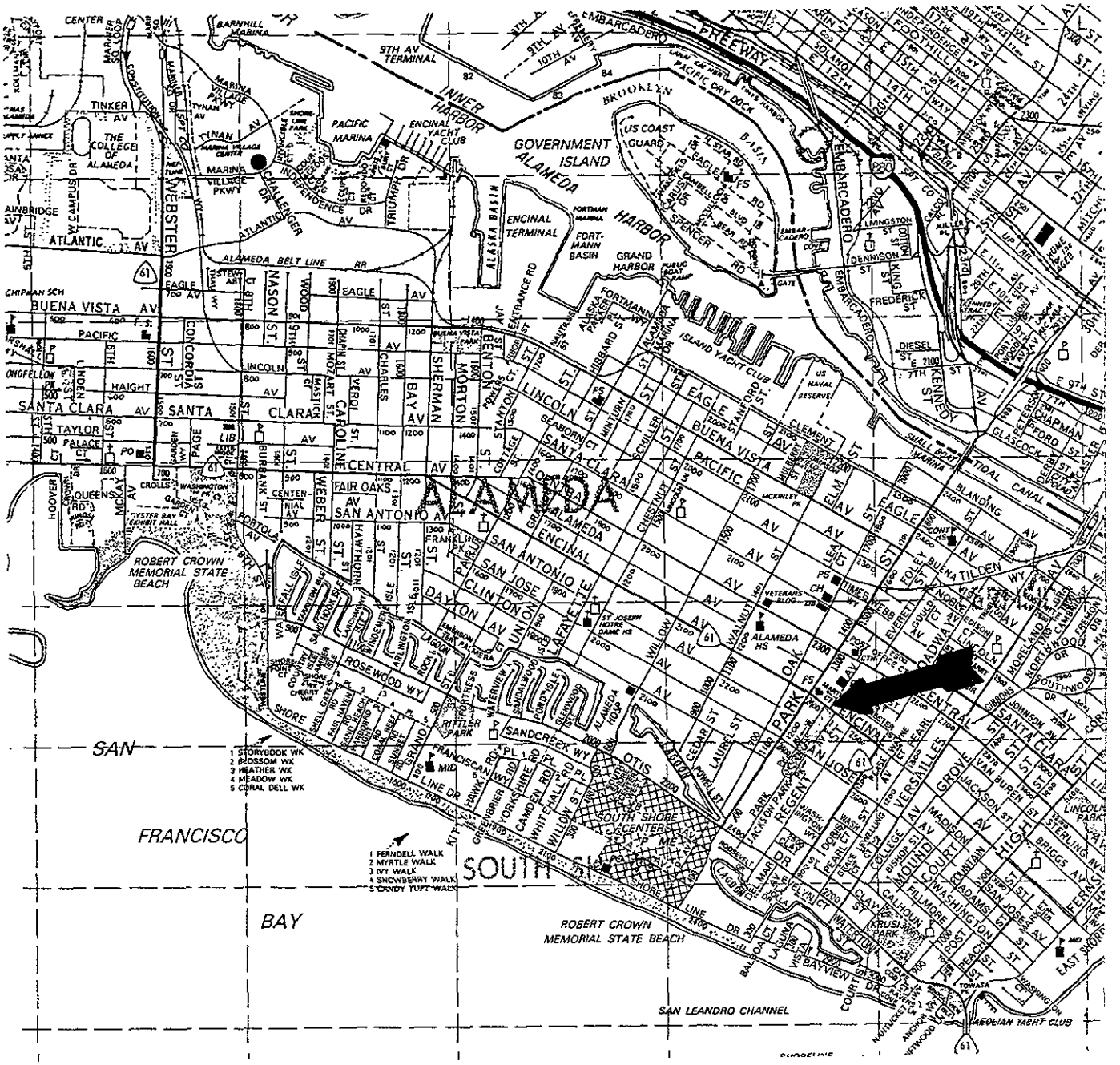
Based on the work completed to date and the analysis results from previous groundwater monitoring events, the following conclusions can be made:

- 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, especially in areas that are capped, 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 fluctuate as a result of changing water levels, but the overall concentrations will decrease with time. This slow decrease has been documented in the groundwater sampling and analysis performed at the site since 1993.

7.0 RECOMMENDATIONS

Bacteria concentrations within areas that are receiving additional DO through natural processes and surface aeration are greater than areas that show lower DO measurements. Based on these results, adding supplemental oxygen to the groundwater will help aid in bacteria growth and promotion of plume degradation. In addition, strategically placed oxygen releasing compound (ORC®) will help plume migration control. ACC recommends ORC® be injected in the groundwater around the impacted zone.



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
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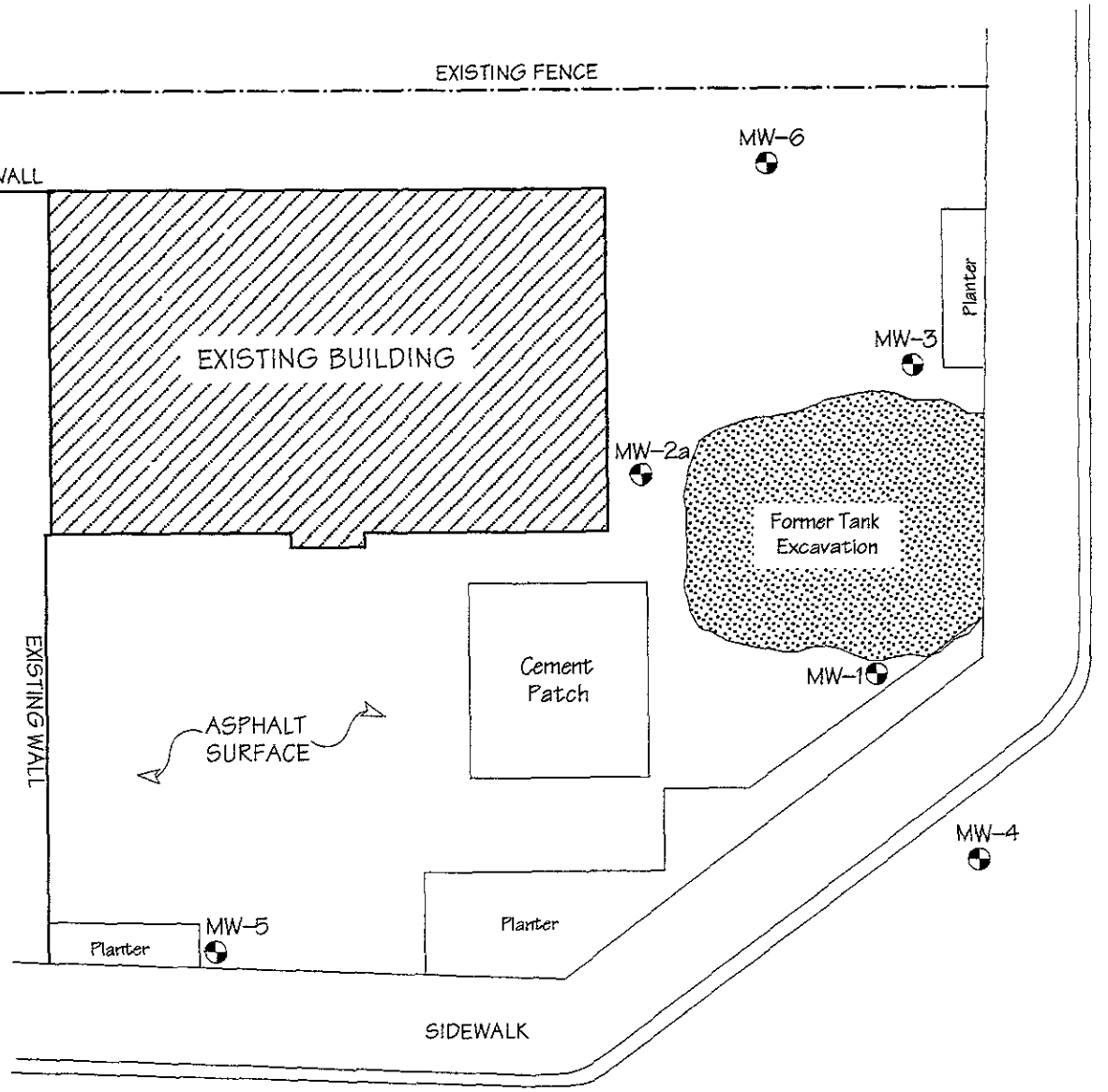

ENCINAL AVENUE

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:	6039-2.5		

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N E W S

WELL MONITORING WORKSHEET

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ACC MONITORING WELL WORKSHEET

JOB NAME: Alameda Cellars	PURGE METHOD: Pump
SITE ADDRESS: 2425 Encinal Ave	SAMPLED BY: Eloy Cisneros
JOB #: 6039-5.0	LABORATORY: Sequoia
DATE: 1/24/97	ANALYSIS: D.O., Hetertrophic Platecount, Oxygen Demand
Onsite Drum Inventory SOIL:	MONITORING ☒ DEVELOPING ☐
EMPTY: WATER: 1=100%	SAMPLING ☒

WELL: MW-1

DEPTH OF BORING: 17.29'
DEPTH TO WATER: 5.15'
WATER COLUMN: 12.14'
WELL DIAMETER: 2"
WELL VOLUME: ≈ 2.0gal
COMMENTS:

PURGE VOLUME (Gal)	HYDAC READINGS pH	Temp. (F)	Cond. ms/cm	OBSERVATIONS
2.0	6.65	18.9	.740	☐ Froth ☐ Sheen
4.0	6.71	19.0	.745	☒ Odor Type gas
6.0	6.68	19.3	.745	☐ Free Product
				Amount_____Type_____
				☐ Other
				D.O.: 2.14 Turb: 150 Sal: .03
				2.53 70 .03
				2.33 120 .03
8.0	6.70	19.4	.743	1.89 112 .03

WELL: MW-2a

DEPTH OF BORING: 14.16'
DEPTH TO WATER: 5.29'
WATER COLUMN: 8.87'
WELL DIAMETER: 2"
WELL VOLUME: ≈ 1.5gal
COMMENTS:

PURGE VOLUME (Gal)	HYDAC READINGS pH	Temp. (F)	Cond. ms/cm	OBSERVATIONS
1.5	6.60	17.9	.561	☐ Froth ☐ Sheen
3.0	6.60	18.2	.554	☒ Odor Type gas
4.5	6.60	18.6	.545	☐ Free Product
				Amount_____Type_____
				☐ Other
				D.O.: 3.02 Turb: 96 Sal: .02
				3.35 75 .02
				2.87 63 .02
6.0	6.61	18.8	.547	3.57 59 .02

WELL: MW-3

DEPTH OF BORING: 14.42'
DEPTH TO WATER: 4.91'
WATER COLUMN: 9.61'
WELL DIAMETER: 2"
WELL VOLUME: ≈ 1.6gal
COMMENTS:

PURGE VOLUME (Gal)	HYDAC READINGS pH	Temp. (F)	Cond. ms/cm	OBSERVATIONS
1.6	6.65	18.0	.288	☐ Froth ☐ Sheen
3.2	6.73	18.3	.305	☒ Odor Type gas
4.8	6.70	18.6	.310	☐ Free Product
				Amount_____Type_____
				☐ Other
				D.O.: 2.88 Turb: 315 Sal: .01
				3.20 650 .01
				2.73 425 .01
6.4	6.72	18.8	.308	2.53 408 .01

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ANALYTICAL RESULTS AND CHAIN OF CUSTODY RECORD

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

ACC Environmental Consultants
7977 Capwell Dr, Ste 100
Oakland, CA 94621
Attention: Misty Kaltreider

Client Project ID: 2425 Encinal Avenue
Sample Descript: Water
Analysis for: Dissolved Oxygen
First Sample #: 701-1274

Sampled: Jan 24, 1997
Received: Jan 24, 1997

Analyzed: Jan 24, 1997
Reported: Jan 30, 1997

LABORATORY ANALYSIS FOR: Dissolved Oxygen

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L	QC Batch Number	Instrument ID
701-1274	MW-1	0.10	1.3	IN012497360100A	Manual
701-1275	MW-2A	0.10	1.3	IN012497360100A	Manual
701-1276	MW-3	0.10	2.9	IN012497360100A	Manual

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1271

Jim Bava
Project Manager

Sequoia Analytical

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ACC Environmental Consultants
7977 Capwell Dr, Ste 100
Oakland, CA 94621
Attention: Misty Kaltreider

Client Project ID: 2425 Encinal Avenue
Sample Descript: Water
First Sample #: 701-1274

Reported: Jan 24, 1997

BACTERIOLOGICAL ANALYSIS: HETEROTROPHIC PLATE COUNT

Sample Number	Date Sampled and Received	Sample Description	Heterotrophic Plate Count CFU/mL
701-1274	1/24/97	MW-1	130
701-1275	1/24/97	MW-2A	140
701-1276	1/24/97	MW-3	>5700

SEQUOIA ANALYTICAL #1210

Jim Bava
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

ACC Environmental Consultants
7977 Capwell Dr, Ste 100
Oakland, CA 94621
Attention: Misty Kaltreider

Client Project ID: 2425 Encinal Avenue
Sample Descript: Water
Analysis for: Biochemical Oxygen Demand
First Sample #: 701-1274

Sampled: Jan 24, 1997
Received: Jan 24, 1997
Analyzed: Jan 24, 1997
Reported: Jan 30, 1997

LABORATORY ANALYSIS FOR: Biochemical Oxygen Demand

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L	QC Batch Number	Instrument ID
701-1274	MW-1	1.0	5.7	IN012497405100A	Manual
701-1275	MW-2A	1.0	4.5	IN012497405100A	Manual
701-1276	MW-3	1.0	2.7	IN012497405100A	Manual

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL, #1210

Jim Bava
Project Manager

Sequoia Analytical

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ACC Environmental Consultants
7977 Capwell Dr, Ste 100
Oakland, CA 94621
Attention: Misty Kaltreider

Client Project ID: 2425 Encinal Avenue
Matrix: Liquid
QC Sample Group: 7011274-276
Reported: Jan 30, 1997

QUALITY CONTROL DATA REPORT

Analyte:	Biochemical Oxygen Demand	Dissolved Oxygen
QC Batch#:	IN012497	IN012497
	405100A	360100A
Analy. Method:	EPA 405.1	EPA 360.1
Prep. Method:	-	EPA 3601
Analyst:	L. Huang	B. Nguyen
Duplicate Sample #:	97011377-01A	7011500
Prepared Date:	1/24/97	1/24/97
Analyzed Date:	1/29/97	1/24/97
Instrument I.D.#:	Manual	Manual
Sample Concentration:	3.6 mg/L	9.8 mg/L
Dup. Sample Concentration:	3.6 mg/L	9.9 mg/L
RPD:	*0.0*	*1.0*
RPD Limit:	0-30	0-30

SEQUOIA ANALYTICAL, #1271 & #1210

Jim Bava
Project Manager

** RPD = Relative % Difference

SEQUOIA ANALYTICAL
CHAIN OF CUSTODY

❑ 680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600 FAX (415) 364-9233
❑ 819 West Striker Ave. • Sacramento, CA 95834 • (916) 921-9600 FAX (916) 921-0100
❑ 1900 Bates Ave., Suite LM • Concord, CA 94520 • (510) 686-9600 FAX (510) 686-9689

Company Name: ACC Environmental	Project Name: 2425 Encinal Avenue
Address: 7977 Capwell Drive, Suite 100	Billing Address (if different):
City: Oakland State: CA Zip Code: 94621	
Telephone: (510) 638-8400 FAX #: (510) 638-8404	P.O. #: 6039-5
Report To: Misty Kaltreider Sampler: Eloy Cisneros	QC Data: ❑ Level A (Standard) ❑ Level B ❑ Level C ❑ Level D

Turnaround Time: ❑ 10 Working Days ❑ 3 Working Days ❑ 2 - 8 Hours ❑ 7 Working Days ❑ 2 Working Days ❑ 5 Working Days ❑ 24 Hours

❑ Drinking Water ❑ Waste Water ☒ Other

Analyses Requested: D.O. TDS HRC

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	Comments
1. MW-1	1/24/97/10:15AM	H_2O	3			7011274
2. MW-2a	1/24/97/9:40AM	H_2O	3			7011275
3. MW-3	1/24/97/9:15AM	H_2O	3			7011276
4.						
5.						
6.						
7.						
8.						
9.						
10.						

Pink - Client
Yellow - Sequoia
White - Sequoia

Relinquished By: Eloy Cisneros	Date: 1/24/97	Time: 1235	Received By:	Date: 1/24/97 Time: 1235
Relinquished By:	Date: 1/24	Time: 1620	Received By:	Date: Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date: 1/24/97 Time: 1620

Were Samples Received in Good Condition? ❑ Yes ❑ No Samples on Ice? ❑ Yes ❑ No Method of Shipment_____ Page __ of __