



Environmental  
Science &  
Engineering, Inc.

*Copy To Rowi*

SEP 3 1992

TO: Alameda County  
General Services Agency  
4400 MacArthur Boulevard  
Oakland, California 94619

DATE: September 2, 1992

ATTN: Mr. Jim de Vos

JOB NUMBER: 6-92-5394

SUBJECT: Alameda County ALCOPARK Facility

WE ARE TRANSMITTING THE FOLLOWING:

- One draft copy of the Report of Quarterly Ground Water Monitoring for the Alameda County ALCOPARK Facility.

DIST:  
LB  
FILE  
ORIGINATOR

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

BY

*Michael K. Edmonson*  
\_\_\_\_\_  
Michael Edmonson  
Project Geologist

# **DRAFT**

## **REPORT OF QUARTERLY GROUND WATER MONITORING**

**ALAMEDA COUNTY ALCOPARK FACILITY  
165 13TH STREET  
OAKLAND, CALIFORNIA**

### **Prepared For:**

**Mr. Jim de Vos  
Alameda County General Services Agency  
4400 MacArthur Boulevard  
Oakland, California 94619**

### **Prepared By:**

**Environmental Science & Engineering, Inc.  
4090 Nelson Avenue, Suite J  
Concord, California 94520**

**Project No. 6-92-5394**

**August 31, 1992**

This report has been prepared by Environmental Science & Engineering, Inc. for the exclusive use of Alameda County General Health Services as it pertains to their site located at 165 13th Street, Oakland, Alameda County, California. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by other geologists and engineers practicing in this field. No other warranty, expressed or implied, is made as to professional advice in this report.

REPORT PREPARED BY:

**DRAFT**

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Michael K. Edmonson  
Project Geologist

UNDER THE PROFESSIONAL REVIEW AND SUPERVISION OF:

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Susan S. Wickham, R.G.  
Senior Hydrogeologist  
California Registered Geologist No. 3851

Project No. 6-92-5394

# DRAFT

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## 1.0 INTRODUCTION

# DRAFT

This report presents the results of the June, 1992 ground water monitoring activities performed by Environmental Science & Engineering, Inc. (ESE) at the Alameda County ALCOPARK facility. The ALCOPARK facility is located at 165 13th Street, Oakland, California (Figure 1 - Location Map). The site is an Alameda County fueling station located adjacent to the northwest corner of the ALCOPARK parking and vehicle maintenance structure operated by Alameda County at the corner of 13th and Jackson Streets, Oakland, California. The fueling station facility's layout, illustrated in Figure 2 - Site Plan, consists of a single pump island for dispensing unleaded gasoline, and two 10,000 gallon underground storage tanks. Leaded gasoline had previously been stored and dispensed at this facility.

This quarterly ground water monitoring report contains documentation of ESE's field activities and analytical results for ground water samples collected on June 11, 1992 and a discussion of the results.

### 1.1 Scope of Work

The scope of work for this monitoring event was the following:

- Measure the depth to water in monitoring wells MW-1, MW-4 and MW-5;
- Collect ground-water samples from monitoring wells MW-1, MW-4 and MW-5;
- Analyze the ground water samples for Total Petroleum Hydrocarbons as Gasoline (TPH-G) and the aromatic compounds Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX) (wells MW-1, MW-4 and MW-5), and Total Petroleum Hydrocarbons as Diesel (TPH-D) (well MW-4); and
- Review the field and laboratory data and prepare a technical report of the investigation.

## 2.0 BACKGROUND

During a fuel line integrity test performed by Scott Company of Oakland on January 24, 1989 a leak was found in the vapor recovery line below the unleaded gasoline dispenser. Hunter/Gregg, Inc. (Hunter), now ESE, completed a hand auger boring directly below where the piping leak was found. Soil samples obtained from the boring showed elevated levels of Total Petroleum Hydrocarbons (TPH) and BTEX. Alameda County General Services Agency (ACGSA) authorized Hunter (now ESE) to perform a Phase I site characterization to assess the lateral and vertical extent of the petroleum hydrocarbons in the soil and ground water on site. This site characterization was performed in March 1989, and the results were presented in a report dated May 1989.

For the Phase I Site Characterization, Hunter drilled and sampled five soil borings, and installed three ground water monitoring wells and two vapor monitoring wells in those borings. Analysis of soil and ground-water samples from that phase of the investigation showed nondetectable concentrations of TPH, and elevated concentrations of BTEX in soil and ground water. Only Benzene was above the State of California drinking water action levels, with concentrations of 21 ug/L (micrograms per liter or parts per billion) in MW-1, 13 ug/L in MW-4, and nondetectable in MW-5. Soil and ground water analytical results for the initial hand auger sampling, and site characterization investigation are presented in Hunter's Phase I Site Characterization report (Hunter, 1989). In the conclusion of that report, Hunter (now ESE) recommended quarterly monitoring of ground water, and no further action concerning the soil at the site.

Since the completion of the Phase I Site Investigation ESE (formerly Hunter) has conducted ground water monitoring activities at the site on a quarterly basis.

## 3.0 GROUND WATER MONITORING

On June 11, 1992, ESE performed quarterly ground water monitoring at the site. ESE obtained depth to water information, and purged and sampled three onsite ground water monitoring wells. The objective of the ground water level survey is to estimate the direction and gradient of ground water flow at the site. The objective of the sampling program is to monitor the extent and magnitude of hydrocarbon constituents, if any, in onsite ground water.

Ground water samples were collected from monitoring wells MW-1, MW-4 and MW-5 on June 11, 1992. Ground water sampling data forms are included as Appendix A. The samples were collected from the wells subsequent to the removal of approximately three well-casing volumes of ground water from each well. The wells were purged using an electric submersible pump. The pump was cleaned prior to use in each well using an Alconox® soap and tap water solution followed by a tap water rinse. The temperature and conductivity of the ground water removed from each well during the purging process was monitored periodically for stabilization to ensure the collection of samples representative of the aquifer surrounding each well. Ground water samples were collected from each well using a new disposable polyethylene bailer lowered into the well using new nylon cord. The ground water was decanted from the bailers into appropriately preserved 40 milliliter and one liter amber-glass bottles. The sample bottles were immediately labeled and placed on ice and under chain of custody form for transport to Curtis and Tompkins Analytical Laboratory, Limited (C&T) of Berkeley, California, a State-Certified laboratory.

A duplicate sample was collected from monitoring well MW-4 for Quality Assurance/Quality Control (QA/QC) purposes. The duplicate sample provides a check on

# DRAFT

ESE sample collection and laboratory sample handling procedures. A laboratory supplied trip blank, consisting of deionized water, was placed in the cooler with the ground water samples transported to the laboratory, also for QA/QC purposes. The trip blank is to ensure that no transfer of volatile compounds occurred between samples on the trip to the laboratory.

The purged ground water and the cleaning solutions were contained in Department of Transportation (DOT) approved 55-gallon drums and stored on site pending laboratory analysis and proper disposal.



## 4.0 RESULTS

# DRAFT

### 4.1 Ground Water Flow

The average depth to ground water at the site on June 11, 1992 was about 20.4-feet below ground surface. Ground water elevations are presented on Table 1. Ground water elevations were calculated utilizing the depth to water measurements and the surveyed top of casing elevations. The estimated direction of ground water flow beneath the site on June 11, 1992 was towards the east (Figure 3 - Ground Water Elevations).

### 4.2 Ground Water Sample Analysis

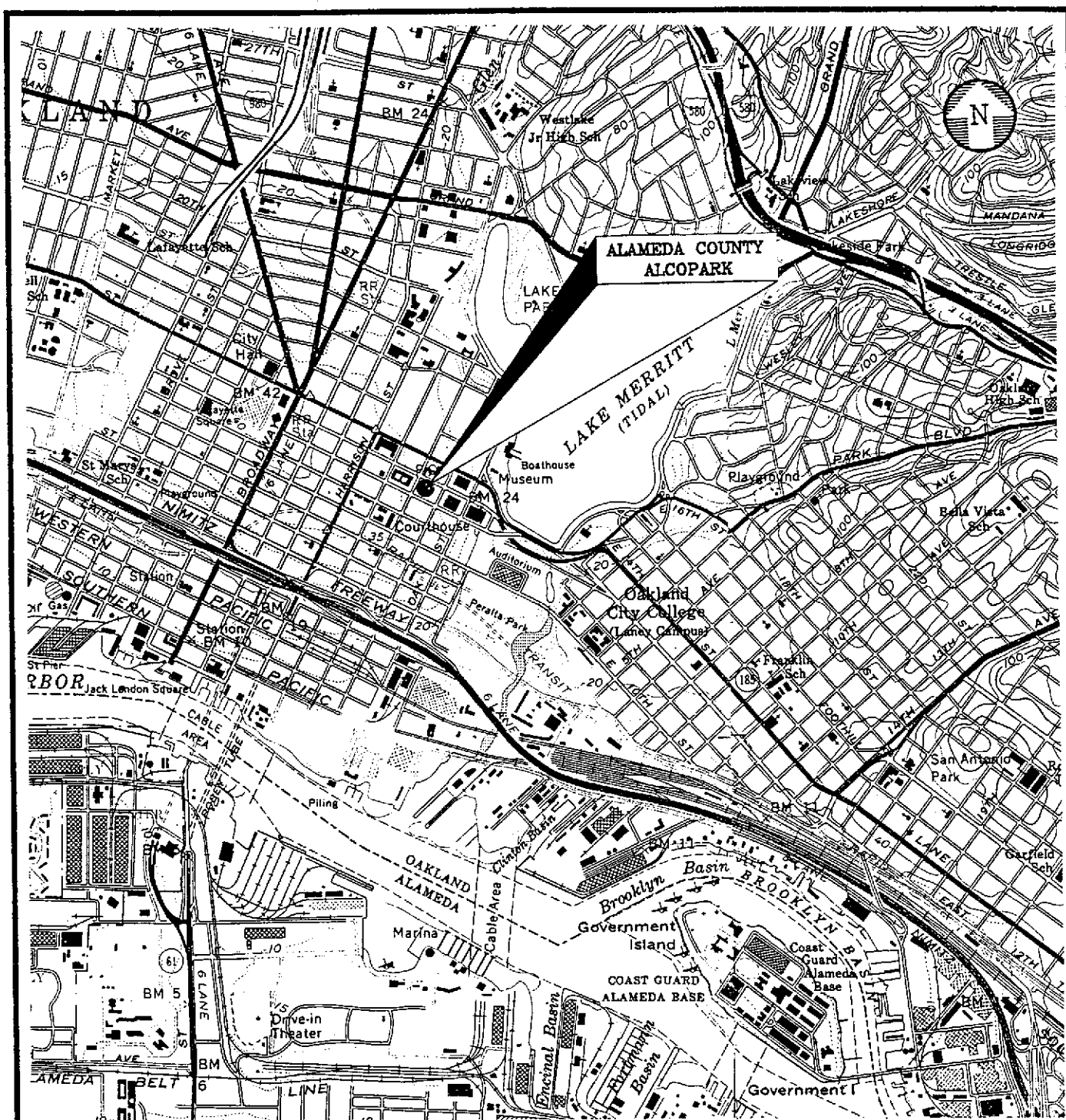
The ground water samples from wells MW-1 and MW-5 and the duplicate sample were analyzed for TPH-G and BTEX. The ground water sample from well MW-4 was analyzed for TPH-D, TPH-G and BTEX. TPH-D, TPH-G and the BTEX analyses were performed by Modified EPA Method 8015, EPA Method 8015 and EPA Method 8020, respectively. The laboratory analytical results are presented on Table 2. The laboratory analytical reports are presented as Appendix B.

TPH-D was not detected in the ground water sample from well MW-4. TPH-G was detected in the ground water sample from wells MW-1, MW-4 and MW-5 at concentrations of 2,600 ug/L, 560 ug/L and 150 ug/L, respectively. Benzene was detected in the ground water samples from wells MW-1, MW-4 and MW-5 at concentrations of 810 ug/L, 150 ug/L and 37 ug/L, respectively.

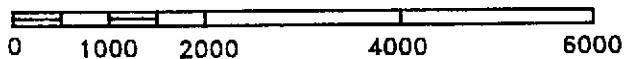
## 4.3 Trends

Table 3 - Ground Water Trends, lists concentrations of petroleum hydrocarbons detected in ground water samples and relative ground water elevations for the wells at the site. Due to fluctuations over time (observed since March 1989) in the ground water flow direction and concentrations of TPH-G, TPH-D and BTEX in ground water samples from the wells, no trends can be identified. The ground water flow direction fluctuates, as observed during site monitoring, from a northerly flow direction to a southeasterly flow direction. The cause of the fluctuations of the direction of ground water flow is probably due to seasonal conditions or related to nearby (offsite) conditions. However, these fluctuations in the direction of ground water flow may account for the fluctuations in concentrations of petroleum hydrocarbons observed in ground water samples from the on site monitoring wells.

Concentrations of Benzene in ground water samples collected from wells MW-1 and MW-5 were the highest detected for each well since quarterly ground water monitoring was initiated for the site. The concentration of Benzene detected in well MW-4 was the second highest detected since the monitoring program began.



SCALE: 1" = 2000'



Environmental  
Science &  
Engineering, Inc.

ALEMEDA COUNTY  
ALCOPARK  
OAKLAND, CALIFORNIA

FIGURE 1  
LOCATION MAP

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DATE 10/91	FILE NAME F2TOP010	PROJ. NO. 6-90-5042



13th STREET

JACKSON STREET

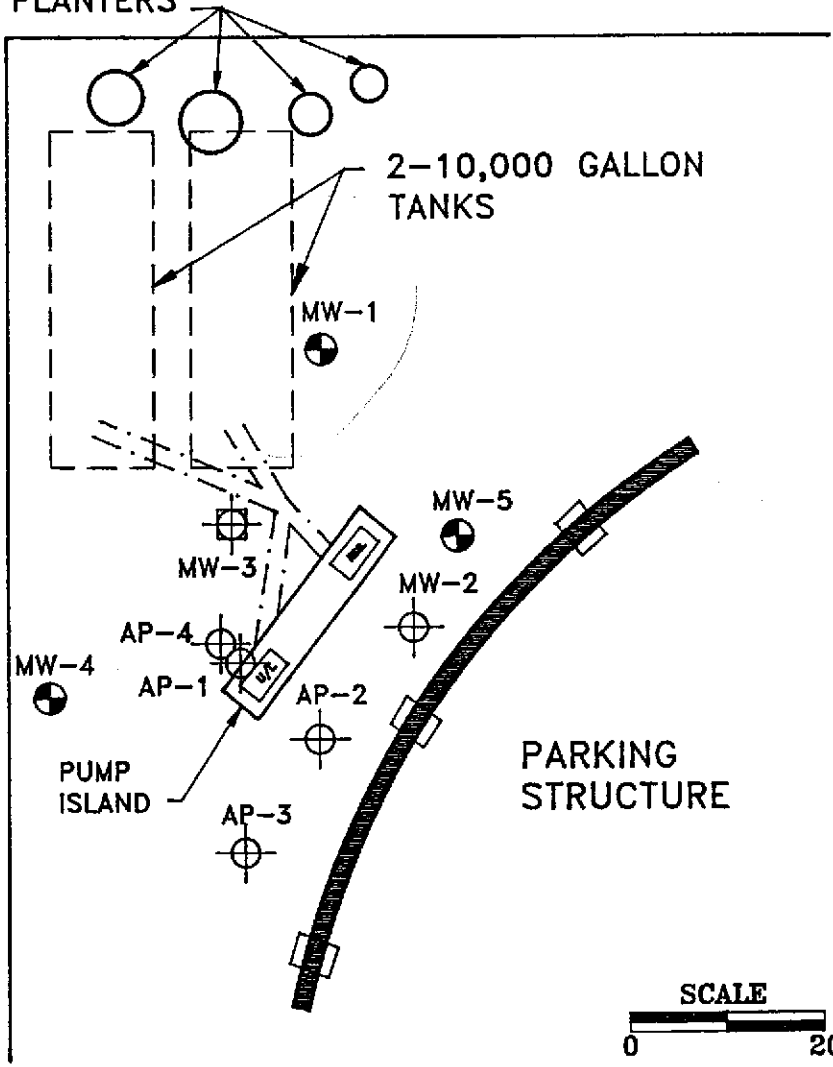
SIDEWALK

PLANTERS

2-10,000 GALLON TANKS

SIDEWALK

PARKING STRUCTURE



**LEGEND**

- SOIL BORING
- GROUND-WATER MONITORING WELL
- VADOSE MONITORING WELL
- UNDERGROUND PIPING

ALAMEDA COUNTY ALCOPARK OAKLAND, CA	
FIGURE 2 SITE PLAN	
DRAWN BY DWR	APPROVED BY
DATE 5/91	FILE NAME F2SP10
REVISD PROJ. NO. 6-90-5042	



13th STREET

JACKSON STREET

SIDEWALK

PLANTERS

SIDEWALK

2-10,000 GALLON TANKS

MW-1  
(12.71)

MW-5  
(12.68)

MW-4  
(12.80)

MW-2

AP-4

AP-1

AP-2

PUMP ISLAND

AP-3

PARKING STRUCTURE

12.70

SCALE

0 20 FEET

LEGEND

× SOIL BORING

◆ GROUND WATER MONITORING WELL

● VADOSE MONITORING WELL

==:== UNDERGROUND PIPING

(12.80) GROUND WATER ELEVATION (ft)

—12.70 GROUND WATER ELEVATION CONTOUR (ft)

↗ APPROXIMATE GROUND WATER FLOW DIRECTION



Environmental  
Science &  
Engineering, Inc.

ALAMEDA COUNTY  
ALCOPARK  
OAKLAND, CA

FIGURE 3  
GROUND WATER ELEVATIONS  
SEPTEMBER 10, 1992

DRAWN BY DWR	APPROVED BY	REVISED 10/92 MKE
DATE 5/91	FILE NAME 53941003	PROJ. NO. 6-92-5394

TABLE 1

GROUND WATER ELEVATIONS  
ALAMEDA COUNTY, ALCOPARK SITE

Well Number	Reference Elevation (feet)	Depth to Ground Water (feet)	Ground Water Elevation (feet)
MW-1	33.00	20.15	12.85
MW-4	33.63	20.70	12.93
MW-5	33.01	20.16	12.85

Notes:

Depth to ground water measured by Environmental Science & Engineering, Inc. (ESE) on June 11, 1992.

TABLE 2

ANALYTICAL RESULTS: GROUND WATER  
ALAMEDA COUNTY, ALCOPARK SITE

Well Number	Date Sampled	TPH-G (ug/L)	TPH-D (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
MW-1	06/11/92	2,600	--	810	16	21	42
MW-4	06/11/92	560	<50	150	1.8	1.8	1.1
MW-4D	06/11/92	370	--	110	1.0	1.0	0.8
MW-5	06/11/92	150	--	37	<0.5	<0.5	<0.5

NOTES:

TPH-G = Total Petroleum Hydrocarbons as Gasoline

TPH-D = Total Petroleum Hydrocarbons as Diesel

ug/L = Micrograms per liter or parts per billion

-- = Not analyzed

< = Less than listed detection limit

TABLE 3

**GROUND WATER TRENDS  
ALAMEDA COUNTY, ALCOPARK SITE**

Well Number	Date	Ground Water Elevation (feet)	TPH-G (ug/L)	TPH-D (ug/L)	Benzene (ug/L)	Ethyl-benzene (ug/L)	Toluene (ug/L)	Total Xylenes (ug/L)
MW-1	March 1989	12.2	ND	--	21	0.4	3.9	4.5
	July 1990	12.3	1500	--	200	ND	45	53
	October 1990	12.1	1200	--	ND	2.2	7.3	46
	January 1991	11.9	270	--	23	ND	1.5	3.1
	April 1991	11.8	230	--	ND	ND	ND	ND
	August 1991	11.8	8,300	--	370	64	ND	120
	November 1991	11.7	810	--	9.3	ND	7.8	32
	June 1992	12.85	2,600	--	810	16	21	42
MW-4	March 1989	12.4	--	ND	13	1.0	1.4	ND
	July 1990	12.5	--	ND	0.8	ND	ND	ND
	October 1990	12.2	--	ND	120	1.1	1.2	0.9
	January 1991	12.0	--	ND	230	1.2	2.8	2.0
	April 1991	13.0	170	130	12	ND	ND	2.3
	August 1991	11.8	ND	ND	87	1.2	0.8	0.8
	November 1991	11.8	1,400	ND	ND	1.7	8.6	3.6
	June 1992	12.93	560	ND	150	1.8	1.8	1.1



TABLE 3

GROUND WATER TRENDS  
ALAMEDA COUNTY, ALCOPARK SITE

Well Number	Date	Ground Water Elevation (feet)	TPH-G (ug/L)	TPH-D (ug/L)	Benzene (ug/L)	Ethyl-benzene (ug/L)	Toluene (ug/L)	Total Xylenes (ug/L)
MW-5	March 1989	12.2	ND	--	ND	ND	ND	ND
	July 1990	12.4	670	--	0.8	ND	ND	ND
	October 1990	12.1	120	--	13	ND	ND	ND
	January 1991	11.9	120	--	3.2	ND	ND	ND
	April 1991	12.3	ND	--	ND	ND	ND	ND
	August 1991	11.5	ND	--	20	ND	0.5	ND
	November 1991	11.7	190	--	2.7	ND	0.8	2.5
	June 1992	12.85	150	--	37	ND	ND	ND

NOTES:

Ground Water Elevation = Elevation of ground water in feet relative to a common datum.

TPH-G = Total Petroleum Hydrocarbons as Gasoline

TPH-D = Total Petroleum Hydrocarbons as Diesel

ft = Feet

ug/L = Micrograms per liter or parts per billion (ppb)

ND = Not detected at laboratory method detection limit

-- = Not analyzed for listed compound

**WELL PURGING AND SAMPLING DATA**

Date: 6-11 Project Number: 6-90-5042 Project Name: Alcopack  
 Well Number: MW-5 Boring Diameter: \_\_\_\_\_ Casing Diameter: 4"

Column of Fluid in Well	Volume to be Removed
depth to product <u>0</u>	gal per ft Annular Space = _____
depth to water <u>20.16'</u>	column of water X _____
total depth of well <u>35.10'</u>	volume of annular space = _____
column of product <u>0</u>	gal per ft of casing = _____
column of water <u>14.94</u>	column of water X _____
	volume of casing = <u>.66</u>
	total volume = <u>9.8</u>
	number of vol to remove X <u>3</u>
	total vol to remove = <u>29.4 gal</u>

method of measuring fluid Well-Sounder  
 method of purging well 2" Grundfos rate \_\_\_\_\_  
 method of decon Alconox & Water

Physical appearance of water (clarity, color, particulates, odor)  
 Initial Clean Clear NO Yes.  
 During \_\_\_\_\_  
 Final \_\_\_\_\_

Field Analysis	Initial	During	Final
time	_____	_____	_____
conductivity <sup>X1000</sup>	<u>094</u>	<u>091</u>	<u>096</u>
pH	<u>6.63</u>	<u>6.60</u>	<u>6.68</u>
temperature	<u>68.7°</u> <u>10</u>	<u>65.8°</u> <u>20</u>	<u>65°</u> <u>30</u>
method of measurement	<u>Hydax 9.</u>		

Total volume purged 30 gal. Comments Dry at 20 gal  
15 min. later 10 gal. more.

Sample Number MW-5 Amount of Sample 30 cans  
 Signed/Sampler [Signature] Date 6-11-92  
 Signed/Reviewer [Signature] Date 6-20-92

**PURGING AND SAMPLING DATA**

Number: 6-90-5042 Project Name: Alcapark.  
 Casing Diameter: \_\_\_\_\_ Casing Diameter: 2"

**Volume to be Removed**

$\phi$  gal per ft Annular Space = \_\_\_\_\_  
 X \_\_\_\_\_  
0.70 column of water = \_\_\_\_\_  
35.10 volume of annular space = \_\_\_\_\_  
 $\phi$  gal per ft of casing = \_\_\_\_\_  
 X \_\_\_\_\_  
14.40' column of water = 0.66  
 volume of casing = 2.39  
 total volume = \_\_\_\_\_  
 number of vol to remove X 3  
 total vol to remove = 7.07 gal

Fluid Well Sander  
 1 2" Ground Gas rate \_\_\_\_\_  
Monox & Water

of water (clarity, color, particulates, odor)

Yellow NO NO  
Yellow/Brown Yes Yes

Initial	During	Final
<u>1.012</u>	<u>1.001</u>	<u>1.008</u>
<u>6.079</u>	<u>6.057</u>	<u>6.068</u>
<u>71.3°</u> 2.5	<u>68.0</u> 5.0	<u>67.02</u> 10 gal

Measurement \_\_\_\_\_  
 ed 10 gal Comments Dry after  
over 10 min 3 gal seccover / 10 min 3-4 gal.

Amount of Sample 8 Vials 11/10  
 Date 6-11-92  
 Date 6-10-92

**WELL PURGING AND SAMPLING DATA**

Date: 6-11 Project Number: 6-90-5042 Project Name: Alcopark  
 Well Number: MW-4 Boring Diameter: \_\_\_\_\_ Casing Diameter: 4"

Column of Fluid in Well	Volume to be Removed
depth to product <u>∅</u>	gal per ft Annular Space = _____
depth to water <u>20.15'</u>	column of water X _____
total depth of well <u>34.30'</u>	volume of annular space = _____
column of product <u>∅</u>	gal per ft of casing = _____
column of water <u>14.15'</u>	column of water X _____
	volume of casing = <u>-.66</u>
	total volume = <u>9.33</u>
	number of vol to remove X <u>3</u>
	total vol to remove = <u>28 gal</u>

method of measuring fluid Well Sander  
 method of purging well 2" Gravel Pkg rate \_\_\_\_\_  
 method of decon Alconox & Water

**Physical appearance of water (clarity, color, particulates, odor)**

Initial Clean Clear NO NO  
 During / / / /  
 Final \_\_\_\_\_

Field Analysis	Initial	During	Final
time	_____	_____	_____
conductivity	_____	<u>096</u>	<u>092</u>
pH	<del>6.62</del>	<u>6.59</u>	<u>6.52</u>
temperature	<del>68.5</del>	<u>68.5</u> <sup>°</sup>	<u>66.5</u> <sup>°</sup>
method of measurement	_____	<u>Hydra 9</u>	_____

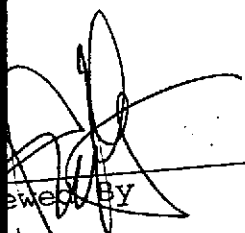
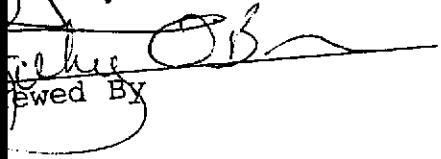
Total volume purged 30 gal Comments Dry one  
 Time \_\_\_\_\_

Sample Number MW-4 Amount of Sample 3 Vials  
 Signed/Sampler [Signature] Date 6-11-92  
 Signed/Reviewer [Signature] Date 6-20-92

JUN 23 1992  
Laboratories, Since 1878  
486-0900 CONCORD

DATE RECEIVED: 06/12/92  
DATE REPORTED: 06/19/92

ENGINEERING

  
Reviewed By  
  
Reviewed By

Los Angeles



DATE SAMPLED: 06/11/92  
 DATE RECEIVED: 06/12/92  
 DATE ANALYZED: 06/17/92  
 DATE REPORTED: 06/19/92

BTXE in Aqueous Solutions  
 LUFT Manual October 1989  
 78020

BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
810	16	21	42
150	1.8	1.8	1.1
37	ND(0.5)	ND(0.5)	ND(0.5)
110	1.0	1.0	0.8

Reporting limit; Reporting limit

RPD, %	RECOVERY, %
2	100
7	101



LABORATORY NUMBER: 107655  
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING  
PROJECT ID: 6-90-5042  
LOCATION: ALCOPARK

DATE SAMPLED: 06/11/92  
DATE RECEIVED: 06/12/92  
DATE EXTRACTED: 06/15/92  
DATE ANALYZED: 06/16/92  
DATE REPORTED: 06/19/92

Extractable Petroleum Hydrocarbons in Aqueous Solutions  
California DOHS Method  
LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
107655-2	MW-4	ND	ND	50

ND = Not detected at or above reporting limit.

\*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	8
RECOVERY, %	98

CHAIN OF CUSTODY RECORD



Environmental Science & Engineering, Inc.

4090 Nelson Avenue  
Suite J  
Concord, CA 94520

(415) 685-4053

Fax (415) 685-5323

DATE 6/12/92 PAGE 1 OF 1

PROJECT NAME Alcopark

ADDRESS Oakland

PROJECT NO. 6-90-5042

SAMPLED BY Paul Marsden

LAB NAME Curtis & Tompkin

ANALYSES TO BE PERFORMED

MATRIX

NUMBER OF CONTAINERS

REMARKS (CONTAINER, SIZE, ETC.)

SAMPLE #	DATE	TIME	LOCATION
1 MW-1	6/11	1405	Oakland
2 MW-4		1310	
3 MW-5		1430	
4 Dup.		<del>1405</del> 1330	ppm.

I.P.H. grab / BTEX  
I.P.H. dissolved BTEX

MATRIX

Water

3  
4  
3  
3

3 boxes

1 liter

RELINQUISHED BY: (signature)  
Paul Marsden

RECEIVED BY: (signature)  
Tony E. Walker C+T

date time  
6-12-92 1305

REPORT RESULTS TO:  
Mike E.

SPECIAL SHIPMENT REQUIREMENTS

TOTAL NUMBER OF CONTAINERS

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS

REC'D GOOD COND'TN/COLD

CONFORMS TO RECORD

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):