REPORT OF
QUARTERLY GROUND-WATER MONITORING

ALAMEDA COUNTY ALCOPARK FACILITY
165 13TH STREET
OAKLAND, CALIFORNIA

Prepared For:

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Prepared By:

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Project No. 6-90-5042

April 22, 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:

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UNDER THE PROFESSIONAL SUPERVISION OF:

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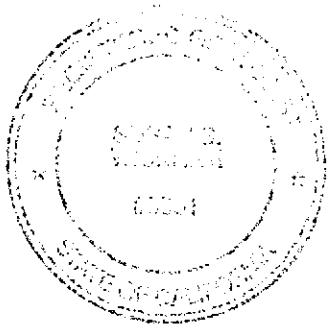

Project No. 6-90-5042

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1.0 INTRODUCTION

This report presents the results of the November, 1991 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 leaded and unleaded gasoline, and two 10,000 gallon underground storage tanks.

This quarterly ground-water monitoring report contains documentation of ESE's field activities and analytical results for ground-water samples collected on November 25, 1991, and a discusion 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 November 25, 1991, ESE performed quarterly ground-water monitoring at the site. ESE obtained depth to water information, and purged and sampled three on-site 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 on-site ground water.

Ground-water samples were collected from monitoring wells MW-1, MW-4 and MW-5 on November 25, 1991. 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 a Poly-Vinyl-Chloride (PVC) positive displacement hand pump. The hand pumps were 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-1 for Quality Assurance/Quality Control (QA/QC) purposes. The duplicate sample provides a check on

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

4.1 Ground-Water Flow

The average depth to ground water at the site on November 25, 1991 was about 21.5-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 November 25, 1991 was towards the east at a gradient of about 0.002 foot per foot (Figure 3 - Ground-Water Elevations, November 25, 1991).

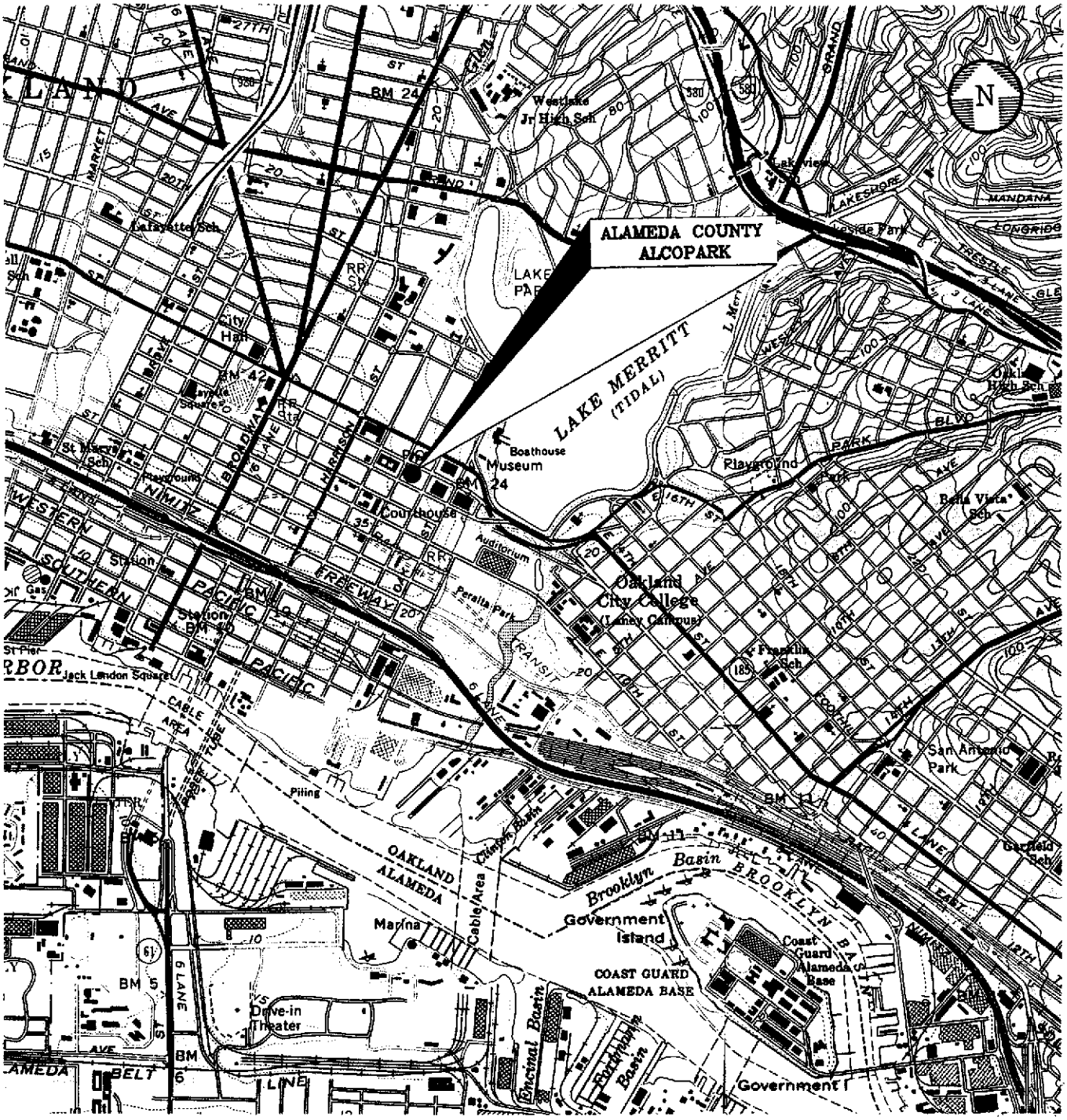
4.2 Ground-Water Sample Analysis

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 810 ug/L, 1,400 ug/L and 190 ug/L, respectively. Benzene was detected in the ground-water samples from wells MW-1 and MW-5 at concentrations of 9.3 ug/L and 2.7 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 (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 or related to nearby (offsite) conditions. However, these fluctuations may account for the fluctuations in concentrations of petroleum hydrocarbons observed in ground-water samples from the on site monitoring wells.



ESE
A CH2M HILL COMPANY

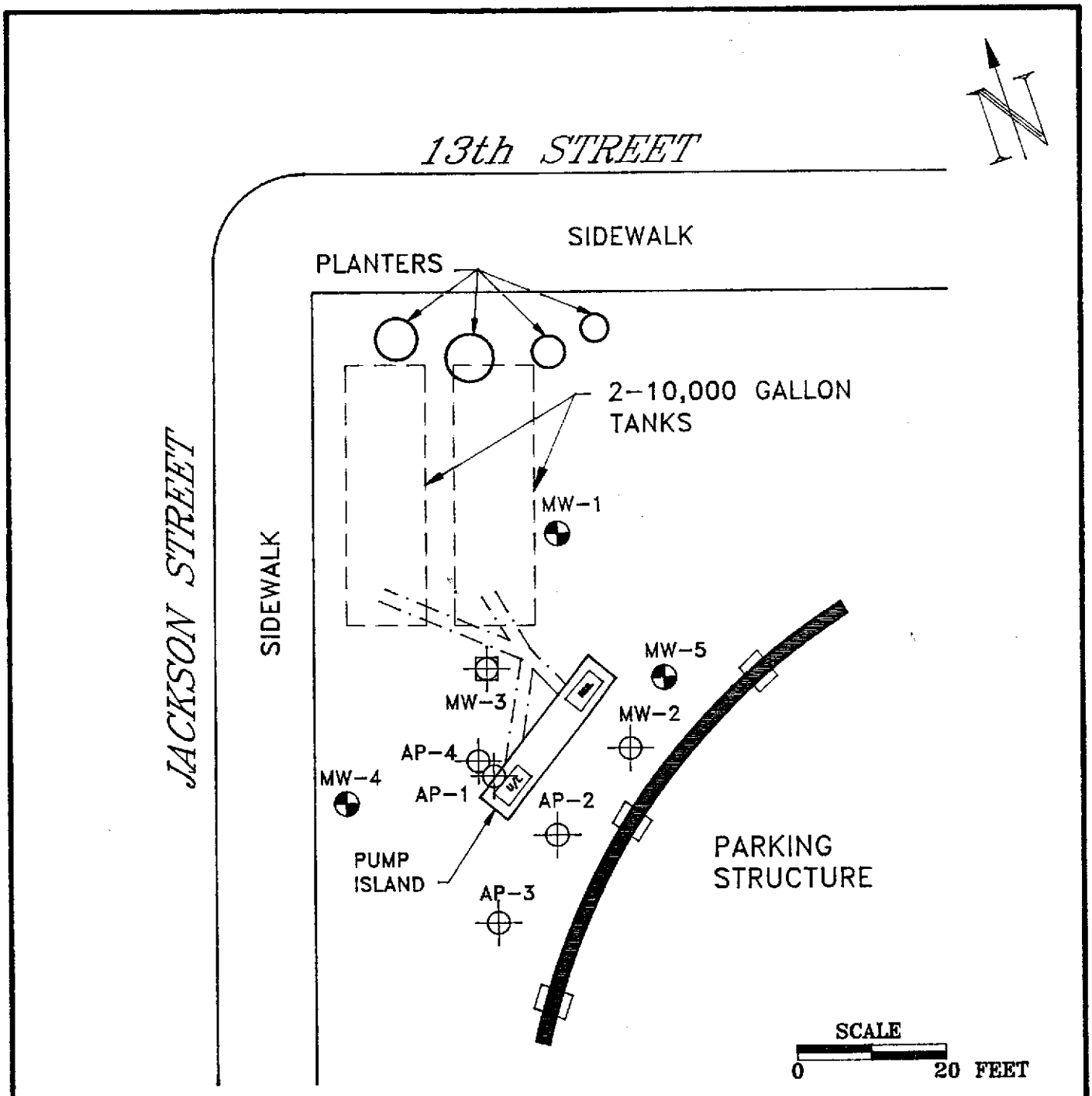
Environmental Science & Engineering, Inc.

ALEMEDA COUNTY
ALCOPARK
OAKLAND, CALIFORNIA

FIGURE 1
LOCATION MAP

DRAWN BY	APPROVED BY	REVISED
DWR		

DATE	FILE NAME	PROJ. NO.
10/91	P2TOP010	6-90-5042



LEGEND

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

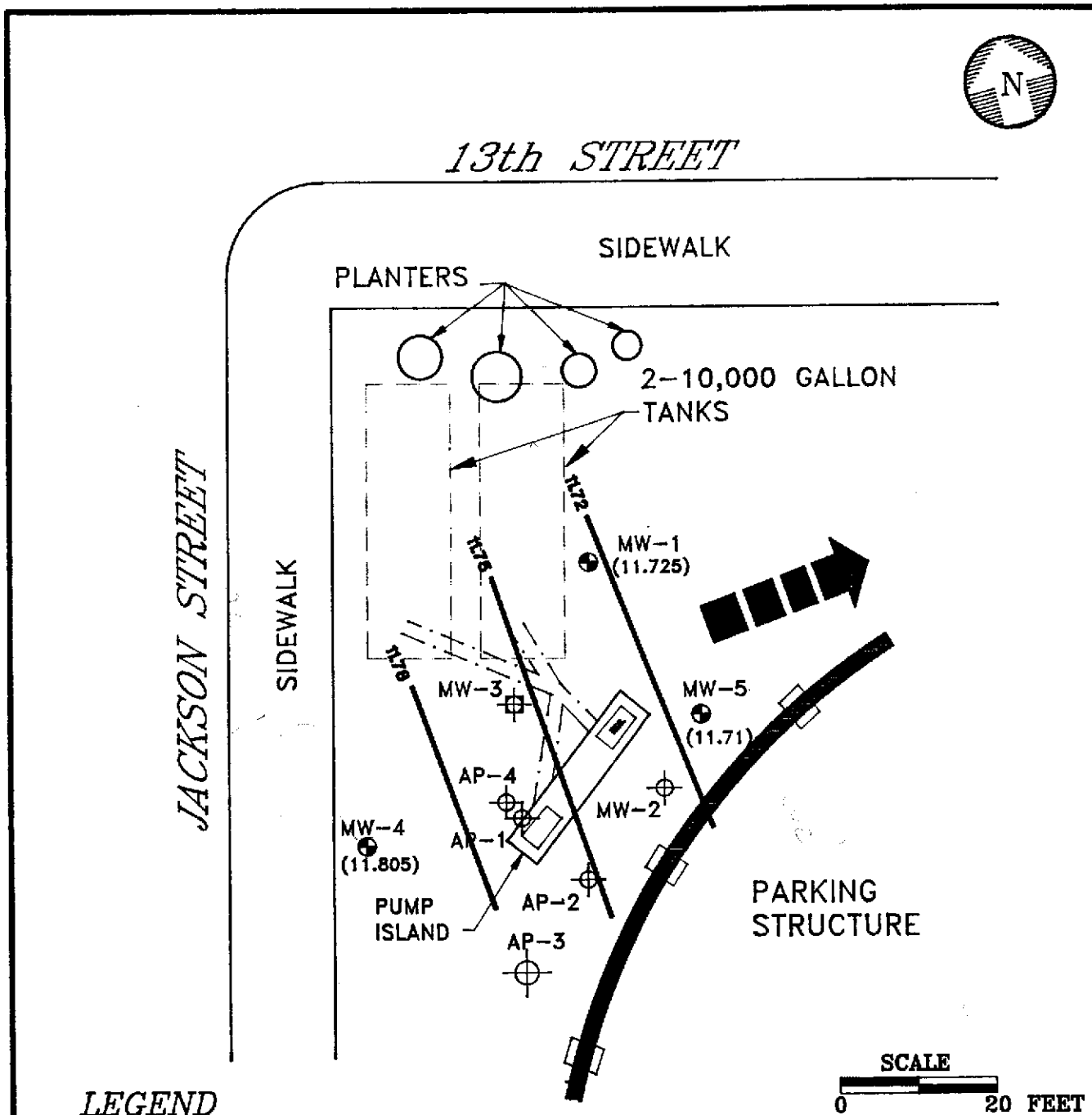
ESE A CALCOMP COMPANY
Environmental Science & Engineering, Inc.

ALAMEDA COUNTY
ALCOPARK
OAKLAND, CA

FIGURE 2
SITE PLAN

DRAWN BY	APPROVED BY	REVISED
DWR		

DATE	FILE NAME	PROJ. NO.
5/91	F2SP10	6-90-5042



LEGEND

- SOIL BORING
- GROUND-WATER MONITORING WELL
- VADOSE MONITORING WELL
- UNDERGROUND PIPING
- (11.71) GROUND-WATER ELEVATION (ft)
- 1175 GROUND-WATER ELEVATION CONTOUR (ft)
- APPROXIMATE GROUND-WATER FLOW DIRECTION

CONTOUR INTERVAL = 0.03 FEET

Environmental Science & Engineering, Inc.
A CALCORP COMPANY

ALAMEDA COUNTY
ALCOPARK
OAKLAND, CA

FIGURE 3
GROUND-WATER ELEVATIONS
NOVEMBER 25, 1991

DRAWN BY	APPROVED BY	REVISED
DWR		12/91

DATE	FILE NAME	PROJ. NO.
5/91	F3GWE10	6-90-5042

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	21.275	11.725
MW-4	33.63	21.825	11.805
MW-5	33.01	21.30	11.71

Notes:

Depth to ground water measured by Environmental Science & Engineering, Inc., on November 25, 1991.

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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	11/25/91	810	--	9.3	<0.5	7.8	32
MW-1D	11/25/91	790	--	9.1	<0.5	7.8	34
MW-4	11/25/91	1,400	<50	<0.5	1.7	8.6	3.6
MW-5	11/25/91	190	--	2.7	<0.5	0.8	2.5
TRIP	11/25/91	--	--	--	--	--	--

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

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TABLE 3

GROUND-WATER TRENDS
ALAMEDA COUNTY, ALCOPARK SITE

Well MW-1

	March 1989	July 1990	October 1990	January 1991	April 1991	August 1991	November 1991
GW-Elevation (ft)	12.2	12.3	12.1	11.9	11.8	11.8	11.7
TPH-G (ug/L)	ND	1500	1200	270	230	8,300	810
TPH-D (ug/L)	--	--	--	--	--	--	--
Benzene (ug/L)	21	200	ND	23	ND	370	9.3
Ethylbenzene (ug/L)	0.4	ND	2.2	ND	ND	64	ND
Toluene (ug/L)	3.9	45	7.3	1.5	ND	ND	7.8
Total Xylenes (ug/L)	4.5	53	46	3.1	ND	120	32

Well MW-4

GW-Elevation (ft)	12.4	12.5	12.2	12.0	13.0	11.8	11.8
TPH-G (ug/L)	--	--	--	--	170	ND	1,400
TPH-D (ug/L)	ND	ND	ND	ND	130	ND	ND
Benzene (ug/L)	13	0.8	120	230	12	87	ND
Ethylbenzene (ug/L)	1.0	ND	1.1	1.2	ND	1.2	1.7
Toluene (ug/L)	1.4	ND	1.2	2.8	ND	0.8	8.6
Total Xylenes (ug/L)	ND	ND	0.9	2.0	2.3	0.8	3.6

TABLE 3
(Continued)

	Well MW-5						
	March 1989	July 1990	October 1990	January 1991	April 1991	August 1991	November 1991
GW-Elevation (ft)	12.2	12.4	12.1	11.9	12.3	11.5	11.7
TPH (ug/L)	ND	670	120	120	ND	ND	190
TPH-D (ug/L)	--	--	--	--	--	--	--
Benzene (ug/L)	ND	0.8	13	3.2	ND	20	2.7
Ethylbenzene (ug/L)	ND	ND	ND	ND	ND	ND	ND
Toluene (ug/L)	ND	ND	ND	ND	ND	0.5	0.8
Total Xylenes (ug/L)	ND	ND	ND	ND	ND	ND	2.5

Notes:

GW-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

APPENDIX A

GROUND-WATER SAMPLING DATA FORMS

WELL PURGING AND SAMPLING DATA

Date: 11/25 Project Number: 690-5042 Project Name: Alameda

Well Number: MW-1 Boring Diameter: _____ Casing Diameter: 4"

Column of Fluid in Well

depth to product: 0
depth to water: 21.275
total depth of well: 35
column of product: 0
column of water: _____

Volume to be Removed

gal per ft Annular Space = _____
column of water X _____
volume of annular space = _____
gal per ft of casing = _____
column of water X 13.725
volume of casing = 0.653 gal per foot
total volume = 8.96
number of vol to remove X 3
total vol to remove = 26.9

method of measuring fluid: Well Sounder

method of purging well: Hand pump rate: _____

method of decon: Alconox & Water

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

Initial	Clear	Clear	NO	NO
During				
Final				

Field Analysis	Initial	During		Final
time	_____	_____	_____	_____
conductivity (1000)	.75	.72	.76	.67
pH	_____	_____	_____	_____
temperature	72.4	68.9	66.3	66.2

method of measurement: Hydac 9

Total volume purged: 25 gal Comments: _____

Sample Number: _____ Amount of Sample: _____

Signed/Sampler: [signature] Date: 11-25-91

Signed/Reviewer: [signature] Date: 12-2-91

WELL PURGING AND SAMPLING DATA

Date: 11/25 Project Number: 6-90-504 Project Name: ALCOPARK

Well Number: MW-4 Boring Diameter: _____ Casing Diameter: 2"

Column of Fluid in Well

depth to product	0
depth to water	21.825
total depth of well	35
column of product	0
column of water	_____

Volume to be Removed

gal per ft Annular Space	= _____
column of water	X _____
volume of annular space	= _____
gal per ft of casing	= 0.167
column of water	X 13.175
volume of casing	= 2.2
total volume	= 3
number of vol to remove	X 3
total vol to remove	= 6.6

method of measuring fluid Well Sounder

method of purging well Hand pump. rate _____

method of decon Alconox & Water.

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

Initial Muddy, Brown, Yes, No

During _____

Final _____

Field Analysis	Initial	During	During	Final
time	_____	_____	_____	_____
conductivity (x1000)	.70	.67	.73	.69
pH	_____	_____	_____	_____
temperature	67.4 (1)	65.9 (3)	65.8 (6)	65.5 (10)
method of measurement	_____			

Total volume purged 10 gal Comments _____

Sample Number _____ Amount of Sample _____

Signed/Sampler _____ Date 11-25-91

Signed/Reviewer _____ Date 12-2-92

WELL PURGING AND SAMPLING DATA

Date: 11/25 Project Number: 690.5042 Project Name: ALCOPARK

Well Number: MW-5 Boring Diameter: _____ Casing Diameter: 4"

Column of Fluid in Well

depth to product	0
depth to water	21.03
total depth of well	~~35~~
column of product	0
column of water	_____

Volume to be Removed

gal per ft Annular Space	= _____
column of water	X _____
volume of annular space	= _____
gal per ft of casing	= 0.653
column of water	X 13.7
volume of casing	= 8.95
total volume	= _____
number of vol to remove	X 3
total vol to remove	= 26.85

method of measuring fluid Well Sounder

method of purging well Hand Pump. rate _____

method of decon Alconox & Water

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

Initial Cloudy, Tan, Yes, Yes

During _____

Final _____

Field Analysis	Initial	During		Final
time	_____	_____	_____	_____
conductivity (x100)	076	.77	_____	_____
pH	_____	_____	_____	_____
temperature	65.8	65.2	_____	_____

method of measurement Hydac 9.

Total volume purged 3 Gal. Comments _____

Sample Number MW-5 Amount of Sample _____

Signed/Sampler _____ Date 11-25-91

Signed/Reviewer _____ Date 12-2-9

APPENDIX B

LABORATORY ANALYTICAL REPORTS: GROUND-WATER SAMPLES

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 11/26/91
DATE REPORTED: 12/11/91

LABORATORY NUMBER: 105892

CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING

PROJECT ID: 6-90-5042

LOCATION: ALAMEDA-ALCO PARK

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 105892
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-90-5042
LOCATION: ALAMEDA - ALCO PARK

DATE RECEIVED: 11/26/91
DATE ANALYZED: 11/30/91
DATE REPORTED: 12/11/91

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
TVH by California DOHS Method/LUFT Manual October 1989
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
105892-1	MW-1	810	9.3	ND(0.5)	7.8	32
105892-2	MW-4	1,400	ND(0.5)	1.7	8.6	3.6
105892-3	MW-5	190	2.7	ND(0.5)	0.8	2.5
105892-4	DUP	790	9.1	ND(0.5)	7.8	34

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	87

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 105892
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-90-5042
LOCATION: ALAMEDA-ALCO PARK

DATE RECEIVED: 11/26/91
DATE EXTRACTED: 12/06/91
DATE ANALYZED: 12/11/91
DATE REPORTED: 12/11/91

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)
105892-2	MW-4	ND	ND	50

ND = Not detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	18
RECOVERY, %	84