SMITH-EMERY GEOSERVICES
A MEMBER OF THE SMITH-EMERY COMPANIES, ESTABLISHED 1904
HUNTERS POINT SHIPYARD, BUILDING 114
P.O. BOX 880550
SAN FRANCISCO, CALIFORNIA 94188-0550
PHONE 415/330-3000
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#3586

May 14, 1996

SEG File No. 90404
SEG Report No. 96-180

Alameda County Department of Environmental Health (ACDEH)
1131 Harbor Bay Parkway, #250
Alameda, California 94502-6577

Attn: Mr. Barney Chan

Smith-Emery GeoServices herein submits a copy of our report entitled **"Quarter 1, 1996 Groundwater Monitoring, 3925 Alameda Avenue, Oakland, California."** If there are any questions regarding this report, please contact us.

Respectfully submitted,
SMITH-EMERY GEOSERVICES

RICK WIDEBROOK
Project Geologist

KRIS JOHNSON
C.E.G. 1915, R.E.A. 3965
Vice President

cc: Mr. Richard Smooke
Smooke and Sons Investment Company
405 Mateo Street
Los Angeles, California 90013-2219

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1131 Harbor Bay Parkway, Suite #250
Alameda, California 94502-6577

Attn: Mr. Barney Chan

REPORT - QUARTER 1, 1996 GROUNDWATER MONITORING
3925 ALAMEDA AVENUE
OAKLAND, CALIFORNIA

Gentlemen:

INTRODUCTION

In accordance with your request, Smith-Emery GeoServices is pleased to present this report of quarterly groundwater monitoring for the above referenced site. The location of the site is shown on Vicinity Map, Plate 1. The locations of the monitoring wells and the calculated groundwater gradient are presented on the Plot Plan, Plate 2.

The details of the monitoring well installation were presented in Smith-Emery GeoServices Report No. 95-187, dated August 22, 1995.

PURPOSE

The purpose of this work is to continue to monitor the extent and concentrations of hydrocarbons in the subsurface downgradient of the former tank location and the adjacent Ekotek site. This quarterly monitoring program was initiated at the request of the Alameda County Department of Environmental Health.

SCOPE OF SERVICES

Smith-Emery GeoServices' scope of services for the quarterly groundwater monitoring at 3925 Alameda Avenue, Oakland, California included:

- Groundwater level measurements
- Monitoring well purging
- Groundwater sampling and analytical testing
- Calculation of groundwater gradient and flow direction
- Presentation of this report of our findings

WELL MEASUREMENT

Groundwater level measurements were taken in groundwater monitoring wells MW1, MW2, and MW3 on March 29, 1996. Static water levels and well depths were measured to the nearest one-hundredth of a foot using an electronic groundwater level indicator. The top of the well casings were surveyed by a licensed engineer and used as reference points from mean sea level during this sampling event. Well measurement and survey data obtained for the three wells are presented in Table 1 on the following page.

The gradient is approximately three tenths of one vertical foot over 100 horizontal feet (0.3%) at a direction of South4°West. A current gradient map showing the surveyed monitoring well locations and flow direction is included as the Plot Plan, Plate 2.

TABLE 1: Well Measurement Data

Well I.D.	Date of Measurement	Casing Elevation	Depth to water from top of casing	Water Elevation, Mean Sea Level
MW-1	3-29-96	8.73'	9.58'	-0.85'
MW-2	3-29-96	8.42'	9.20'	-0.78'
MW-3	3-29-96	9.26'	9.95'	-0.69'

Gradient: 0.3% @ S4°W

Note: The benchmark elevation was set referenced to City of Oakland survey monument BM-19NW24 at elevation 9.664 feet above mean sea level. Per the USGS topographical map for the Oakland East Quadrangle, the ground surface elevation at the site is approximately 10 feet above mean sea level.

WATER PURGING

The monitoring wells were purged and sampled according to established guidelines and the approved workplan (previously submitted). Prior to sampling, the depth to water was measured with respect to a reference point at the top of the casing using an electronic water level meter, accurate to the nearest one-hundredth of a foot. A transparent bailer was then used to sample the surface of the water table in the wells for the purpose of observing any free product. In wells MW1, MW2, and MW3, no visible free product was noticed. In MW1, and MW2, a slight petroleum odor was noticed in the purge water.

Each well was purged with a one gallon development bailer after checking for free product. A minimum of 3 well volumes had been removed from each well. Water quality parameters of conductivity, temperature, and pH were monitored during the purging, and water levels were allowed to recover prior to taking samples. Detailed records of well purging and sampling data appear in Appendix I - Well Purge Data Sheets.

Groundwater samples were obtained in clean disposable Teflon bailers equipped with a flow control valve. Water samples for EPA Method 8015M/602 were placed in EPA-approved 40 ml vials capped with Teflon backed caps, and 1L glass bottles with Teflon backed caps. No air bubble or headspace was present in the samples taken. All samples were then labeled and placed in zip lock bags, preserved at approximately four degrees Celsius on blue ice, and transported with appropriate chain-of-custody documentation to a state-certified laboratory.

ANALYTICAL PROGRAM

Analytical tests on the samples taken for this project were performed by state-certified laboratories of North State Environmental in South San Francisco. The detailed results of all analytical work are contained in Appendix II - Report of Analytical Results.

Groundwater Samples

The groundwater samples obtained on 3/29/96 from the wells MW1, MW2, and MW3 were analyzed on 4/1/96 by Standard Method EPA 8015M/602 for Gasoline, Diesel, Kerosene, Motor Oil, and BTEX (Benzene, Toluene, Ethylbenzene, and Xylenes). A summary of the analytical results is presented in the following table.

Table 2 - ANALYTICAL FINDINGS

MONITORING WELL SAMPLINGS

TEST: BTEX, TPH AS GASOLINE, DIESEL, MOTOR OIL, AND KEROSENE

ID	Gas-oline mg/L	Diesel Fuel mg/L	Kero-sene mg/L	Motor Oil mg/L	Benzene mg/L	Toluene mg/L	Ethyl benzene mg/L	Xylene mg/L	MBTE mg/L	Pb mg/L
MW1	12	ND	4	ND	0.730	0.089	0.300	0.180	0.270	ND
MW2	6	ND	2	ND	0.640	0.300	0.190	0.490	0.078	ND
MW3	0.3	ND	0.2	ND	0.002	0.002	0.015	0.009	0.006	ND

Note: ND - Not Detected

CONCLUSIONS

General Discussion

This sampling event occurred near the end of the wet season of the hydrologic year. In this quarter, the groundwater beneath the project site was flowing in a direction of S4°W with a slope of approximately 0.3 percent. Analysis of our readings confirms that the present direction of groundwater flow has shifted about 36 degrees toward the south since the previous quarter, and in addition, groundwater elevations rose nearly one foot since the last measurement on December 07, 1995, with a flatter slope of 0.3% as compared to the previous 0.6%. The groundwater gradients surrounding the project site may vary through time due to natural or man-made influences, such as subsurface recharge zones, tidal influences, subsurface geology, or groundwater extraction wells, and will influence the groundwater at the subject site.

Observations

Over the past four quarters of monitoring, we have observed that kerosene was measurable in the wells when the water table elevation is higher than -1.25 feet mean sea level. The kerosene was not measurable at the end of the dry season, when the water table was at its lowest. During the three quarters when kerosene was observed, kerosene concentration was highest when the water table was highest, in the wet season of the hydrologic year when groundwater migration is typically greater.

The foregoing year of groundwater monitoring at this site has concluded with the following significant observations:

1. The Ekotek site, situated 150 feet to the north, is the only documented kerosene source in the area,
2. groundwater flow direction was approximately due south for two quarters of the year,
3. kerosene was not observable on the subject site during the dry season,
4. measurable kerosene concentrations were intermittent and correlated to water table rises,
5. hydrocarbon concentrations were decreasing through time,
6. the subject site has not contained a source of contamination to the groundwater since the on-site tanks were removed in 1988,
7. and, off-site sources of groundwater contamination continued to impact the subject site.

Summary and Conclusions

These readings and observations support the conclusion that the plume of kerosene originated from an off-site source located upgradient of the subject site. Furthermore, gasoline concentrations measured in the on-site wells decreased by ~85% since the start of monitoring, while kerosene concentrations decreased by ~50%. Following removal of the on-site source of the leak in March 1988, the continuing degradation of the plumes is a strong indicator that migration of the plumes has stabilized. The latest groundwater concentration of gasoline is 12 mg/L and lower, and further biodegradation of the gasoline plume appears likely for the project site.

A complete year of the monitoring program requested by the County has been performed. It is our opinion that remediation of the subject site will be unfeasible as long as groundwater impacted by

the off-site source is migrating onto the subject site. The subject site's groundwater contamination continues to decrease through time, presumably due to natural passive bioremediation. No drinking water sources or surface water have been impacted, nor does the site present a significant risk to human health or the environment due to its industrialized location. Therefore, it follows from the data that the subject site is in the low-risk class of groundwater cases, and we recommend that closure of the subject site be granted following review by the Local Oversight Program.

nope

LIMITS OF LIABILITY

The findings, conclusions and recommendations contained in this report are based on site conditions as they existed at the time of our investigation, and we further assume the explorations to be representative of the subsurface conditions throughout the site.

The factual data and interpretations pertain to the specific project described in this report and are solely for the use of **Smooke and Sons Investment Company.** and are not applicable to any other project or site. Any reliance on this document by any other person or entity shall be at that party's sole risk.

Our investigation was performed using the standard of care and level of skill ordinarily exercised under similar circumstances by reputable Environmental Assessors and Geologists currently practicing in these or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

The following plates and appendices complete this report.

Plate 1	Vicinity Map
Plate 2	Plot Plan with Groundwater Gradient
Appendix I	Well Purge Data Sheets
Appendix II	Analytical Results
	Chain of Custody

Respectfully submitted,

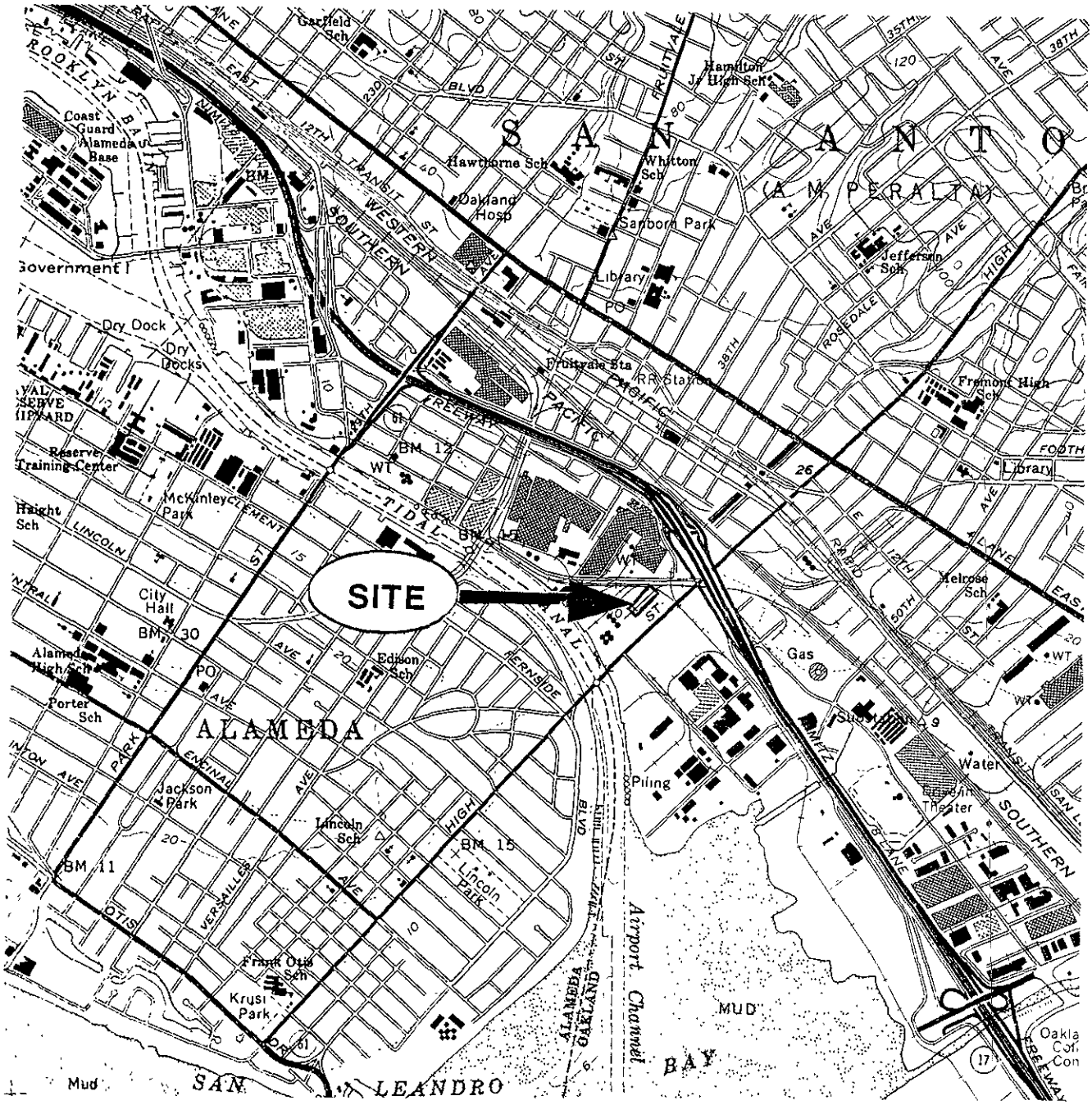
SMITH-EMERY GEOSERVICES

RICK WIDEBROOK
Project Geologist

Reviewed and approved by,

KRIS JOHNSON
C.E.G. 1915, R.E.A. 3965
Vice President

SCALE: 1" = 2000'



REFERENCE:
U.S.D.I. - GEOLOGICAL SURVEY
OAKLAND EAST QUADRANGLE
ALAMEDA COUNTY, CALIFORNIA

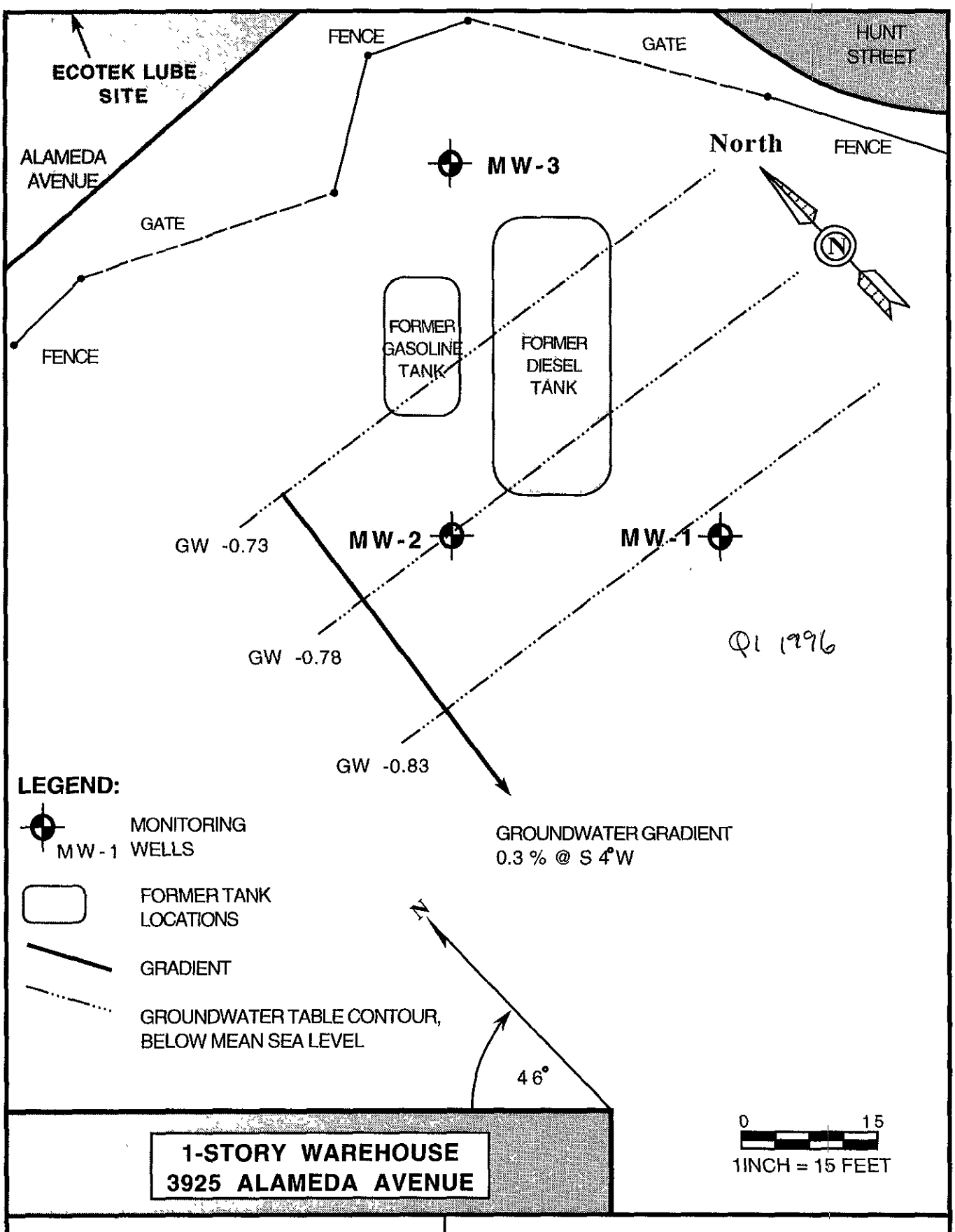
VICINITY MAP

FILE REVIEW
SMOOKE & SONS
3925 ALAMEDA AVENUE
OAKLAND, CALIFORNIA

SMITH-EMERY GEOSERVICES

JOB NO: 90404

PLATE 1



SMOOKE & SONS INVESTMENT CO.
3925 ALAMEDA AVENUE
OAKLAND, CALIFORNIA

QUARTERLY MONITORING

SMITH-EMERY GEOSERVICES

SEG Job No. 90404 **PLATE 2**

APPENDIX I

WELL PURGE DATA SHEETS

SMITH-EMERY COMPANY

WATER QUALITY FIELD SAMPLING DATA SHEET

VOLUME = 1/4 π D^2H

= π r^2 H

1 cubic foot = 7.48 gallons
1 gallons = 0.134 cubic foot

Project Name: SMOOKE OAKLAND Project Number: 90404

Samplers: RICK WIDERROOK

Well No.: MW1 (-19.5TD) Date Sampled: 3-29-96

Starting Time: _____ Ending Time: _____

Volume Single Well: 6.5 GAL Purge Rate: 1GAL/MIN

Purge Volume: 20 GAL Starting Water Level: -9.58

Ending Water Level: -9.62 Purge Method: Bailer

	Time	T (°C.)	pH	Conductivity (Siemens) µMhos/cm	Turbidity NTU	ORP	Description/ Purged Volume
6.5	12:15	18.0	6.9	1,060			GRAY BROWN CLOUDY SLIGHT HC ODOR/SHEEN
13.0	12:25	20.5	6.9	1,080			UNCHANGED
19.5	12:30	20.5	6.9	1,040			SLIGHTLY CLEARER

SMITH-EMERY COMPANY

WATER QUALITY FIELD SAMPLING DATA SHEET

VOLUME = 1/4 Π D^2H
= π r^2 H

1 cubic foot = 7.48 gallons
1 gallons = 0.134 cubic foot

Project Name: SMOOKE OAKLAND Project Number: 90404

Samplers: RICK WIDEBROOK

Well No.: MW 2 (-19.5 TD) Date Sampled: 3-29-96

Starting Time: 1:00 Ending Time: 1:25

Volume Single Well: Purge Rate:

Purge Volume: 6 20 Gallons Starting Water Level: -9.20

Ending Water Level: -9.23 Purge Method: Bailer

GALS	Time	T (°C.)	pH	Conductivity (~~Siemens~~)	Turbidity NTU	ORP	Description/ Purged Volume
6.5	1:05	21°	6.4	1500			BROWN CLOUDY WITH SLIGHT HC ODOR, NO SHEEN
13.0	1:10	21.5°	6.4	1350			SLIGHTLY CLEAR
19.5	1:15	21.5	6.9	1530			" "

SMITH-EMERY COMPANY

WATER QUALITY FIELD SAMPLING DATA SHEET

VOLUME = 1/4 Π D^2 H
= πr^2 H

1 cubic foot = 7.48 gallons
1 gallons = 0.134 cubic foot

Project Name: SMOOKE OAKLAND Project Number: 90404

Samplers: RICK WIDEBROOK

Well No.: MW3 (-19.5' TD) Date Sampled: 3-29-96

Starting Time: _____ Ending Time: _____

Volume Single Well: _____ Purge Rate: _____

Purge Volume: _____ Starting Water Level: -9.95

Ending Water Level: -10.35 Purge Method: Bailer

	Time	T (°C.)	pH	Conductivity (~~Siemens~~) µMhos/cm	Turbidity NTU	ORP	Description/ Purged Volume
6.5	1500	20.1	7.0	1,300			LT BROWN, CLOUDY NO SHEEN OR ODOR
13	2:00	20.0	7.0	1,310			SAME
19	2:10	20.0	7.0	1275			SAME

APPENDIX II

ANALYTICAL RESULTS

North State Environmental
Chemical Waste Disposal · Trucking · Consulting

CERTIFICATE OF ANALYSIS

JOB NO: 96-188
CLIENT: SMITH EMERY
PROJECT NAME: SMOOKE-OAKLAND

DATE SAMPLED: 03-29-96
DATE EXTRACTED: 04-01-96
DATE ANALYZED: 04-01-96

BTXEM AND GASOLINE RANGE ORGANICS BY EPA METHOD 8020/5030 AND 8015 M
KEROSINE RANGE HYDROCARBONS BY EPA METHOD 8015 M
LEAD BY EPA METHOD 7420

Sample No.	Client ID	Analyte	Result	
96-188-01	MW1-Q1-96	MTBE	270	ug/L
	Water	Benzene	730	ug/L
		Toluene	89	ug/L
		Ethylbenzene	300	ug/L
		Xylenes	180	ug/L
		Gasoline	12	mg/L
		* Kerosine range	4	mg/L
		Lead	ND	
96-188-02	MW2-Q2-96	MTBE	78	ug/L
	Water	Benzene	640	ug/L
		Toluene	300	ug/L
		Ethylbenzene	190	ug/L
		Xylenes	490	ug/L
		Gasoline	6	mg/L
		* Kerosine range	2	mg/L
		Lead	ND	
96-188-03	MW3-Q3-96	MTBE	6	ug/L
	Water	Benzene	2	ug/L
		Toluene	2	ug/L
		Ethylbenzene	15	ug/L
		Xylenes	9	ug/L
		Gasoline	0.3	mg/L
		* Kerosine range	0.2	mg/L
		Lead	ND	

* Fuel most closely matches kerosine or jet fuel pattern.

P O Box 5624 • South San Francisco, California 94083 • 415-588-2838 FAX 588-1950

North State Environmental
Chemical Waste Disposal · Trucking · Consulting

C E R T I F I C A T E O F A N A L Y S I S

JOB NO: 96-188
CLIENT: SMITH EMERY
PROJECT NAME: SMOOKE-OAKLAND

DATE SAMPLED: 03-29-96
DATE EXTRACTED: 04-01-96
DATE ANALYZED: 04-01-96

BTXEM AND GASOLINE RANGE ORGANICS BY EPA METHOD 8020/5030 AND 8015 M
KEROSINE RANGE HYDROCARBONS BY EPA METHOD 8015 M
LEAD BY EPA METHOD 7420

Quality Control Quality Assurance Summary:Water

Analyte	Method	Reporting limit		Blank	MS/MSD Recovery	RPD
MTBE	8020	0.5	ug/L	ND	AVG 88%	2
Benzene	8020	0.5	ug/L	ND		
Toluene	8020	0.5	ug/L	ND		
Ethylbenzene	8020	0.5	ug/L	ND		
Xylenes	8020	1	ug/L	ND		
Gasoline	8015/5030	50	ug/L	ND	AVG 95%	1
Diesel	8015 M	50	ug/L	ND	AVG 99%	15
Lead	7420	0.5	mg/L	ND	AVG 106%	4

ELAP CERTIFICATION NUMBER 1753

Reviewed and Approved by

John Murphy
Laboratory Director

P.O Box 5624 • South San Francisco, California 94083 • 415-588-2838 FAX 588-1950

96-088

North State Environmental Analytical Laboratory

Chain of Custody/Request for Analysis

(415) 588-9652

Client: SMITH-EMERY	Phone: 330-3000	Report to: RICE WIDEBROOK	Turnaround Time: STD
Mailing Address:		Billing to:	8 Hr ☐ 24 Hr ☐ 40 Hr ☐ 5 Days ☐ Other ☐
Site Address: SMOOKE OAKLAND		PO # / Billing Reference: SMOOKE - OAKLAND	
Sampler: RICK WIDEBROOK	Date:		

Sample ID:	Sample Description	Container # / type	Sampling Time/Date	ANALYSIS REQUESTED: TPH-D	TPH-G/BTEX	BTEX	O+G	FUEL SCAN	TOTAL LOAD				Remarks
MW1-Q1-96		2 VOA, 1 L	12:30 / 3-29-96		✓			✓	✓				
MW2-Q2-96		" "	1:25 / "		✓			✓	✓				
MW3-Q3-96		" "	2:00 / "		✓			✓	✓				

Relinquished by: Christina Angeles	Date: 4/1/96	Time: 915	Received by: NSE		Yes / No
Relinquished by:	Date:	Time:	Received by:	Were samples Preserved ?	✓
Relinquished by:	Date:	Time:	Received in lab by:	In good condition ?	✓

ANALYTICAL PROGRAM

Analytical tests on the samples taken for this project were performed by state-certified laboratories of North State Environmental in South San Francisco. The detailed results of all analytical work are contained in Appendix II - Report of Analytical Results.

Groundwater Samples

The groundwater samples obtained on 3/29/96 from the wells MW1, MW2, and MW3 were analyzed on 4/1/96 by Standard Method EPA 8015M/602 for Gasoline, Diesel, Kerosene, Motor Oil, and BTEX (Benzene, Toluene, Ethylbenzene, and Xylenes). A summary of the analytical results is presented in the following table.

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MW2	6	ND	2	ND	0.640	0.300	0.190	0.490	0.078	ND
MW3	0.3	ND	0.2	ND	0.002	0.002	0.015	0.009	0.006	ND

Note: ND - Not Detected