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
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#3586

January 31, 1997

SEG File No. 90404
SEG Report No. 96-999

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 4, 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
Registered Environmental Assessor No. 6603

cc: Mr. Richard Smooke
Smooke and Sons Investment Company
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Alameda County Department of Environmental Health (ACDEH)
1131 Harbor Bay Parkway, Suite #250
Alameda, California 94502-6577

Attn: Mr. Barney Chan

REPORT - QUARTER 4, 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 original monitoring well installation were presented in Smith-Emery GeoServices Report No. 95-187, dated August 22, 1995. The Monitoring Well MW4 installation was reported in SEG Report No. 96-621, dated December 16, 1996.

PURPOSE

The purpose of this work is to continue to monitor the extent and concentrations of hydrocarbons in the subsurface downgradient of the former onsite tank location. 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, MW3, and MW4 on December 11, 1996. Static water levels and well depths were measured to the nearest one-hundredth of a foot using an electronic groundwater level indicator. The tops 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 below.

The gradient is approximately four tenths of one vertical foot over 100 horizontal feet (0.4%) at a direction of South48°West. An updated 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	12-11-96	8.73'	9.36'	-0.63'
MW-2	12-11-96	8.42'	9.00'	-0.58'
MW-3	12-11-96	9.26'	9.66'	-0.40'
MW-4	12-11-96	8.44'	9.42'	-0.98'

Gradient: 0.4% @ S48°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. No visible free product was noticed in the first bailer from each well. In MW1, MW2, and MW4, a slight petroleum odor and a transient, spotty sheen was noticed in the purge water. MW3 displayed no sheen or odor.

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 12/11/96 from the wells MW1, MW2, MW3, and MW4 were analyzed on 12/18/96 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
MW1	8.1	4.0	*	ND	2.6	0.073	0.300	0.200	0.340
MW2	5.2	3.0	*	ND	2.1	0.340	0.400	1.500	0.170
MW3	0.390	0.1	*	ND	0.002	0.002	0.015	0.009	0.006
MW4	2.4	2.0	*	ND	0.390	0.070	0.540	0.840	0.160

Note: ND - Not Detected
* = Chromatogram does not match diesel hydrocarbon pattern; may include kerosene.

TABLE 3 - WELL MONITORING HISTORY, 1995-1997

Well I.D.	Date of Meas.	Elevation (MSL)	Gradient	Flow Direction	TPH-G (mg/L)	Diesel (mg/L)	Kerosene (mg/L)	Mtr Oil (mg/L)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	MTBE (mg/L)
Q4 96 ROUTINE QUARTERLY MONITORING													
MW-1	12-11-96	-0.63'	0.4%	S48°W	8.1	4.0	---	---	2.60	0.073	0.300	0.200	0.340
MW-2	12-11-96	-0.58'			5.2	3.0	---	---	2.1	0.340	0.400	1.500	0.170
MW-3	12-11-96	-0.40'			0.39	0.1	---	---	0.003	0.002	0.020	0.012	0.005
MW-4	12-11-96	-0.98'			2.4	2.0	---	---	0.390	0.070	0.540	0.840	0.160
Q3 96 ROUTINE QUARTERLY MONITORING													
MW-1	9-20-96	-0.95'	0.68%	S36°W	2.2	---	---	---	0.570	0.030	0.110	0.800	0.070
MW-2	9-20-96	-0.92'			11.0	---	---	---	2.7	0.600	0.500	1.500	0.370
MW-3	9-20-96	-0.67'			0.37	---	---	---	0.004	ND	0.026	0.013	0.006
MW-4	9-20-96	-1.34'			12.0	---	---	---	0.890	0.120	1.100	2.000	0.260
Q2 96 ROUTINE QUARTERLY MONITORING													
MW-1	6-26-96	-1.23'	1.3%	S46°W	7	ND	3	ND	2.3	0.062	0.230	0.160	0.093
MW-2	6-26-96	-1.15'			5	ND	1	ND	1.0	0.170	0.150	0.290	0.120
MW-3	6-26-96	-1.59'			0.4	ND	0.6	ND	0.004	0.004	0.025	0.012	0.009
Q1 96 ROUTINE QUARTERLY MONITORING													
MW-1	3-29-96	-0.85'	0.3%	S4°W	12	ND	4	ND	0.730	0.089	0.300	0.180	0.270
MW-2	3-29-96	-0.78'			6	ND	2	ND	0.640	0.300	0.190	0.490	0.078
MW-3	3-29-96	-0.69'			0.3	ND	0.2	ND	0.002	0.002	0.015	0.009	0.006
Q4 95 ROUTINE QUARTERLY MONITORING													
MW-1	12-7-95	-1.59'	0.6%	S37°E	6	ND	ND	ND	0.343	0.032	0.133	0.184	---
MW-2	12-7-95	-1.41'			8	ND	ND	ND	0.240	0.200	0.108	0.402	---
MW-3	12-7-95	-1.38'			ND	ND	ND	ND	ND	ND	0.013	0.013	---
Q3 95 ROUTINE QUARTERLY MONITORING													
MW-1	9-22-95	-1.78'	2.2%	S8°W	11.0	5	3	ND	2.3	0.081	0.390	0.560	---
MW-2	9-22-95	-1.27'			7.2	3.5	2	ND	1.2	0.560	0.250	1.0	---
MW-3	9-22-95	-0.62'			0.130	1.9	ND	ND	0.001	0.001	0.012	0.013	---
					mg/kg								
SOIL BORINGS, (Engeo, Inc.)													
B1-2	3/7/94	---	---	---	22	26	ND	---	0.034	ND	0.680	0.110	---
B2-3	3/7/94	---	---	---	150	19	ND	---	ND	ND	0.970	1.400	---
B3-1	3/7/94	---	---	---	ND	ND	ND	---	0.029	ND	ND	0.007	---
B4-2	3/7/94	---	---	---	370	150	150		0.180	ND	0.800	2.500	---
B2-W	3/7/94	---	---	---	52	2.30	0.410	---	2.30	2.1	0.710	3.00	---
B2-W	3/7/94	---	---	---	9.8	2.40	3.20	---	2.40	0.045	0.100	0.082	---
TANK REMOVAL, (Engeo, Inc.)													
1 Soil	3/18/88	---	---	---	---	210	---	---	0.420.33		---	0.840	---
2 Soil	3/18/88	---	---	---	---	450	---	---	ND 3.3		---	79	---
3 Soil	3/18/88	---	---	---	720	---	---	---	6.6 110		---	150	---
4 Soil	3/18/88	---	---	---	190	---	---	---	0.24 9.6		---	32	---
5 Water	3/18/88	---	---	---	---	150	---	---	--- ---		---	---	---

---Notes:ND = not detected above the method detection limit.
--- = not applicable

CONCLUSIONS

General Discussion

This sampling event at the start of the wet season of the hydrologic year. In this quarter, the groundwater beneath the project site was flowing in a direction of S48°W with a slope of approximately 0.4 percent. Analysis of our readings confirms that the present direction of groundwater flow has shifted about 12 degrees toward the west since the previous quarter, and in addition, groundwater elevations have risen nearly three-tenths of a foot since the last measurement on September 20, 1996, with a shallower slope of 0.4% as compared to the previous 0.3%. 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.

Summary and Conclusions

The latest groundwater concentrations of gasoline are 8.1 mg/L and lower. Of the four wells, MW1 had the highest hydrocarbon levels, and MW3 had the lowest levels. This is the second sampling event that includes well MW4, which showed a drop in gasoline concentrations from 12 ppm to 2.4 ppm TPH-gasoline from last quarter, which was anticipated.

The hydrocarbons in the monitoring wells continue to follow the observed pattern of a temporary increase of concentrations measurable whenever the groundwater table rises significantly at the start of the wet season. However, the current quarterly values are lower than the corresponding values measured the last time the groundwater table was approximately at the current elevation.

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,

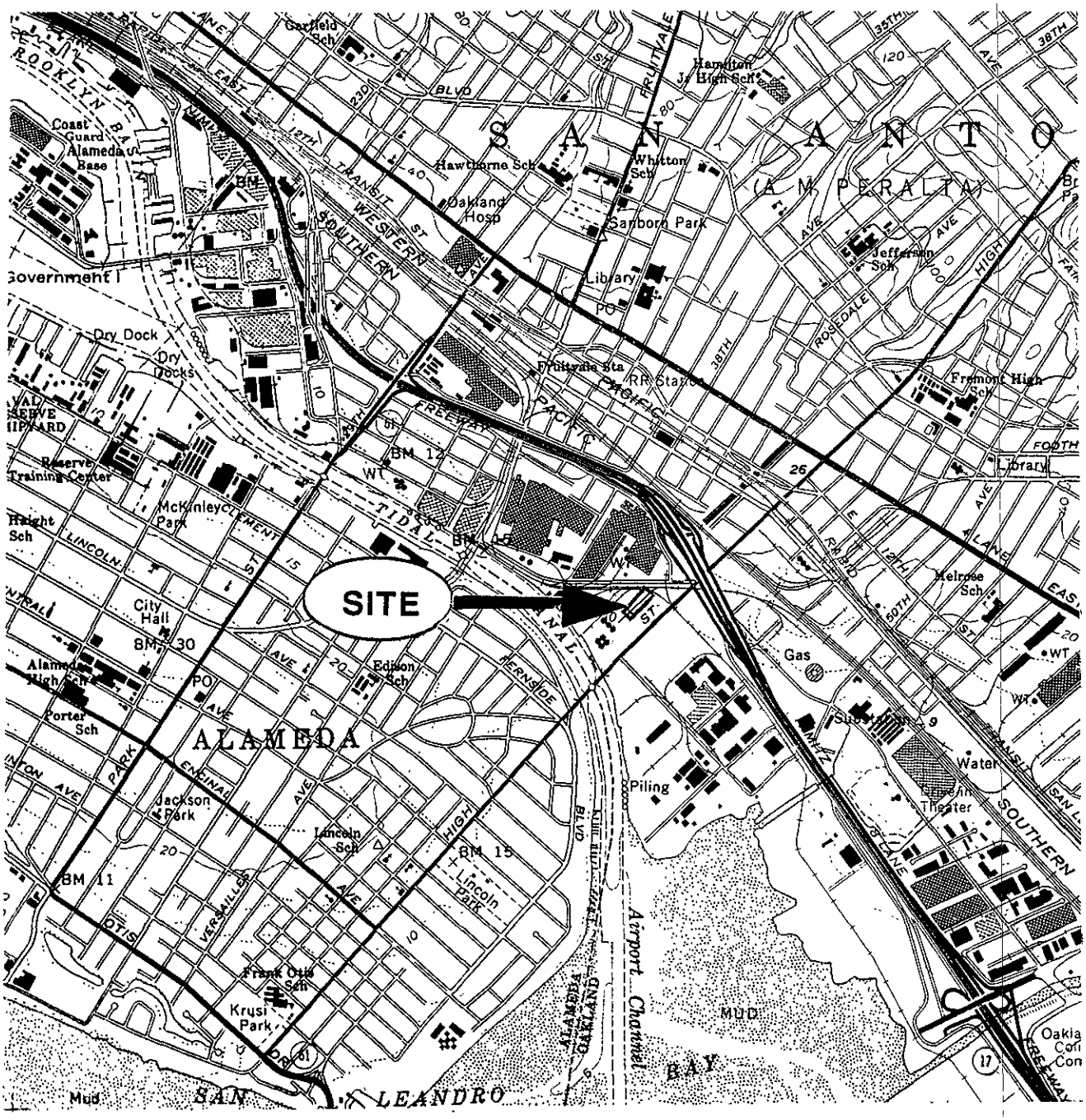
SMITH-EMERY GEOSERVICES

RICK WIDEBROOK
Project Geologist

Reviewed and approved by,

MILES GRANT
R.G. 5367
Registered Geologist

SCALE: 1" = 2000'



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

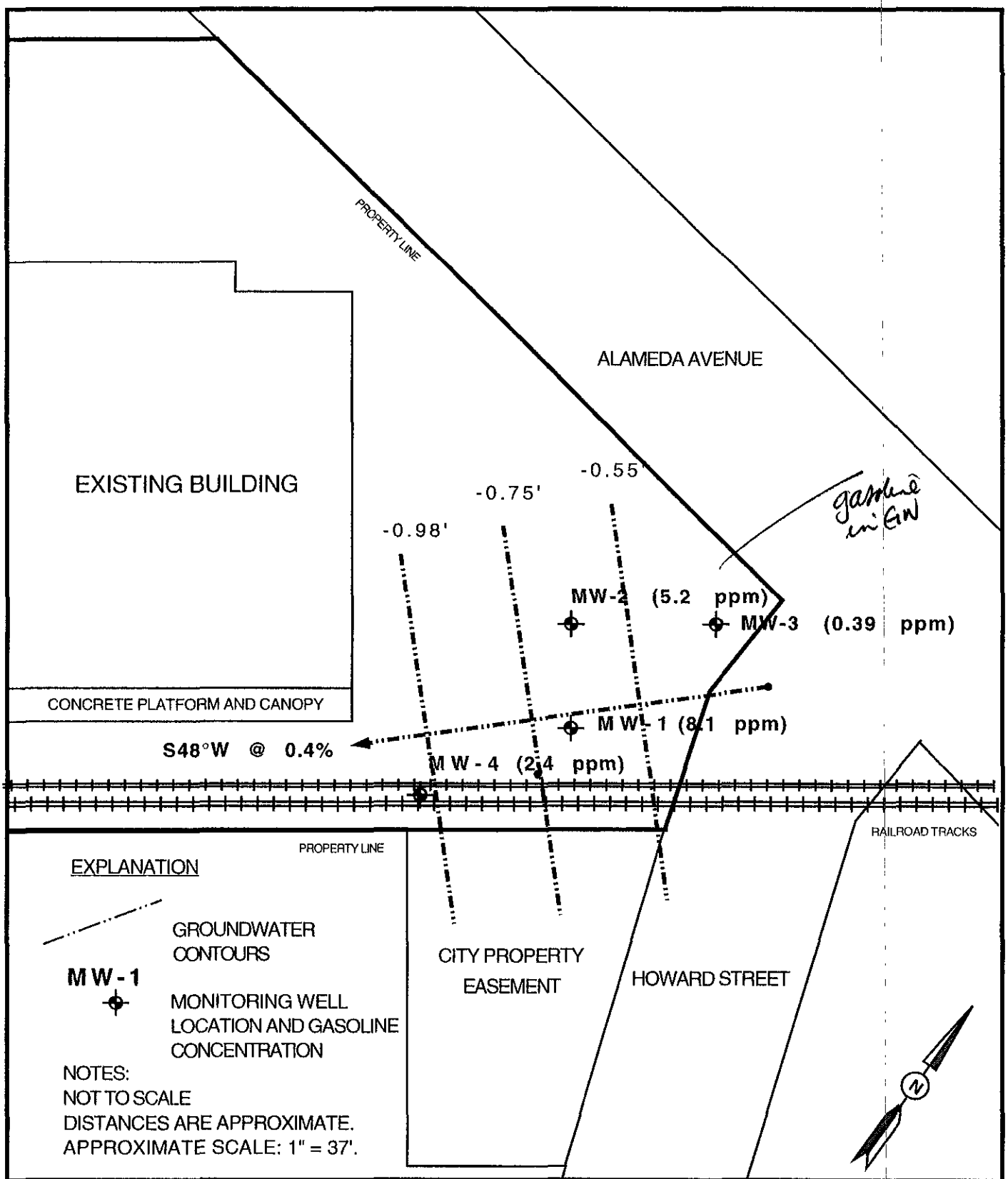
VICINITY MAP

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 GRADIENT

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
= $\pi r^2 H$

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

Project Name: SMOKE/OAKLAND Project Number: 90404

Samplers: RICK WILDBROOK

Well No.: MW - 1 Date Sampled: 12/11/96

Starting Time: 12:40 Ending Time:

D = 19.5' Volume Single Well: 6.5 Purge Rate:

Purge Volume: 20 gal Starting Water Level: -9.36'

Ending Water Level: ~9.32' Purge Method: Bailer

	Time	T (°C.)	pH	Conductivity (microMhos)	~~Turbidity NTU~~	~~ORP~~	Description/ Purged Volume
5 GAL.	1245	23		1240			GRAY-GREEN, VERY CLOUDY, STRONG HC ODOR, MODERATE SHEEN
10	1250	23		1221			UNCHANGED
15	1255	23		1220			UNCHANGED

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: SMOOK - OAKLAND Project Number: 90404

Samplers: RICK WIDERROOK

Well No.: MW-2 Date Sampled: 12/11/90

Starting Time: 11:55 Ending Time: 12:07

D = 20.0' Volume Single Well: 6.5 Purge Rate: 1.1 GAL/MIN

Purge Volume: 19.5 Starting Water Level: 9.0'

Ending Water Level: 8.93 Purge Method: Bailer

	Time	T (°C.)	pH	Conductivity (microMhos)	~~Turbidity~~ ~~NTU~~	~~ORP~~	Description/ Purged Volume
5 GAL.	11:55	23.0		1180			GRAY CLOUDY / SLIGHT SHEEN SLIGHT HC ODOR
10	12:00	23.5		1200			" "
15	12:03	23.0		1240			" "
20	12:07	23.5		1200			" "

SMITH-EMERY COMPANY

WATER QUALITY FIELD SAMPLING DATA SHEET

VOLUME = 1/4 π D ^{2}H
= π r ^{2} H

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

Project Name: SMOOT OAKLAND Project Number: 90404

Samplers: RICK WIDE BROOK

Well No.: MW3 Date Sampled: 12/11/96

Starting Time: 11:30 Ending Time: 2:25

D=20

Volume Single Well: ~~9~~ 6.5 GAL Purge Rate: 1.1 GAL/MIN

Purge Volume: 19.5 GAL Starting Water Level: 9.66'

Ending Water Level: 9.63 Purge Method: Bailer

	Time	T (°C.)	pH	Conductivity (microMhos)	~~Turbidity NTU~~	~~ORP~~	Description/ Purged Volume
5 GAL.	11:30	21.0	7.1	1500 µ			BROWN / CLOUDY NO SHEAN / NO ODOR
10 "	11:40	21.5		1440			" "
15 "	11:45	21.0		1480			" "
20 "	11:50	21.0		1480			" "

SMITH-EMERY COMPANY

WATER QUALITY FIELD SAMPLING DATA SHEET

VOLUME = 1/4 Π D ^{2}H
= π r ^{2} H

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

Project Name: SMOOK OAKLAND Project Number: 90404

Samplers: Rick Wildbrook

Well No.: MW-4 Date Sampled: 12/11/96

Starting Time: 12:15 Ending Time: 12:32

D = 19.5' Volume Single Well: 6.5 Purge Rate: 1.1 gal/min

Purge Volume: 19.5 Starting Water Level: -9.42

Ending Water Level: 9.34 Purge Method: Bailer

Time	T (°C.)	pH	Conductivity (microMhos)	~~Turbidity NTU~~	~~ORP~~	Description/ Purged Volume
12:15	22		3900			BROWN / VERY CLOUDY SLIGHT ODOR x Light sheen (5 gal)
12:20	21.5		3100			" "
12:28	22		6400			" "
12:32	22		7200			

APPENDIX II

ANALYTICAL RESULTS

North State Environmental
Chemical Waste Disposal · Trucking · Consulting

CERTIFICATE OF ANALYSIS

Lab No:	96-913	Date Sampled:	12-11-96
Client:	Smith Emery	Date Analyzed:	12-18-96
Project:	Smooke	Date Reported:	12-30-96

Gasoline Range Hydrocarbons by Method 8015 M
MTBE Benzene, Toluene, Ethylbenzene and Xylenes by Method 8020
Diesel range hydrocarbons by EPA method 8015M

SAMPLE NO	CLIENT ID	ANALYTE	METHOD	RESULT	
96-913-01	MW-1 WATER	MTBE	8020	340	ug/L
		Benzene	8020	2600	ug/L
		Toluene	8020	73	ug/L
		Ethylbenzene	8020	300	ug/L
		Xylenes	8020	200	ug/L
		Gasoline	8015M	8100	ug/L
		Diesel	8015M	4.0	mg/L *
96-913-02	MW-2 WATER	MTBE	8020	170	ug/L
		Benzene	8020	2100	ug/L
		Toluene	8020	340	ug/L
		Ethylbenzene	8020	400	ug/L
		Xylenes	8020	1500	ug/L
		Gasoline	8015M	5200	ug/L
		Diesel	8015M	3.0	mg/L *
96-913-03	MW-3 WATER	MTBE	8020	5.0	ug/L
		Benzene	8020	3.0	ug/L
		Toluene	8020	2.0	ug/L
		Ethylbenzene	8020	20	ug/L
		Xylenes	8020	12	ug/L
		Gasoline	8015M	390	ug/L
		Diesel	8015M	0.1	mg/L *

very high % benzene/gas ~30%

high [B/gas] ~45%

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

North State Environmental
Chemical Waste Disposal · Trucking · Consulting

CERTIFICATE OF ANALYSIS

Lab No:	96-913	Date Sampled:	12-11-96
Client:	Smith Emery	Date Analyzed:	12-18-96
Project:	Smooke	Date Reported:	12-30-96

Gasoline Range Hydrocarbons by Method 8015 M
MTBE Benzene, Toluene, Ethylbenzene and Xylenes by Method 8020
Diesel range hydrocarbons by EPA method 8015M

SAMPLE NO	CLIENT ID	ANALYTE	METHOD	RESULT	
96-913-04	MW-4 WATER	MTBE	8020	160	ug/L
		Benzene	8020	390	ug/L
		Toluene	8020	70	ug/L
		Ethylbenzene	8020	540	ug/L
		Xylenes	8020	840	ug/L
		Gasoline	8015M	2400	ug/L
		Diesel	8015M	2.0	mg/L *

16% B/gas

Quality Control/Quality Assurance Summary- WATER

Analyte	Method	Reporting Limit	Blank	MS/MSD Recovery	RPD
MTBE	8020	0.5 ug/L	ND	82	5
Benzene	8020	0.5 ug/L	ND	63	0
Toluene	8020	0.5 ug/L	ND	72	2
Ethylbenzene	8020	0.5 ug/L	ND	74	5
Xylenes	8020	1.0 ug/L	ND	74	5
Gasoline	8015M	50 ug/L	ND	83	5
Diesel	8015M	0.05 mg/L	ND	84	0

* Chromatogram does not match diesel hydrocarbon pattern.

ELAP Certificate NO: 1753

Reviewed and Approved:

Edward Chuan for

John A. Murphy, Laboratory Director

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

North State Environmental Analytical Laboratory

Chain of Custody/Request for Analysis

96-913

(415) 588-9652

Client: SEC	Phone:	Report to:	Turnaround Time: STD
Mailing Address:		Billing to:	8 Hr ☐ 24 Hr ☐
			40 Hr ☐ 5 Days ☐
Site Address: SMOOKE		PO # / Billing Reference: 90404 : Q496	Other ☐
Sampler: Rick Widebrook	Date: 12/11/96		

Sample ID:	Sample Description	Container # / type	Sampling Time/Date	ANALYSIS REQUESTED: TPH-D	TPH-G	BTEX MBTE	O+G						Remarks
MW1	WATER	1/2 G/V	2:00 12/11/96	✓	✓	✓							
MW2	"	" "	2:05 "	✓	✓	✓							
MW3	"	" "	2:10 "	✓	✓	✓							
MW4	"	" "	2:15 "	✓	✓	✓							
					4 x 1L Amber								
					8 x VOA								

					Yes	No
Relinquished by: Rick Widebrook	Date: 12/11/96 Time: 3:30	Received by: NSE				
Relinquished by:	Date: Time:	Received by:	Were samples Preserved ?	✓		
Relinquished by:	Date: Time:	Received in lab by: NSE	In good condition ?	✓		