

SMITH-EMERY GEOSERVICES

**Well Installation and Environmental Sampling
3925 Alameda Avenue
Oakland, California**

for

Smooke and Sons Investment Company

July 21, 1995

SEG File No. 90404
SEG Report No. 95-187

SMITH-EMERY GEOSERVICES

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INTRODUCTION

This report describes the well installation and the results of environmental sampling conducted for Smooke and Sons Investment Company, on the site located at 3925 Alameda Avenue in the City of Oakland, California. The site is currently occupied by Bobac Oakland C.F.S. Corporation. The location of the site in relationship to existing streets is shown on the Vicinity Map, Plate No. 1. Our work was authorized by Mr. Paul Wren of Smooke and Sons Investment Company on April 14, 1995. The following reports were reviewed in preparation for this project:

- "Workplan for Subsurface Exploration, 3925 Alameda Avenue, Oakland, California" prepared by ENGEO Incorporated, dated September 15, 1993.
- "Report on Soil and Ground-Water Sampling With Laboratory Testing, Oakland, California" prepared by ENGEO Incorporated, dated March 24, 1994.

PURPOSE

The study was undertaken to assess the subsurface soil and water conditions at the site related to the type and concentrations of hydrocarbons located beneath a former underground storage tank area. The placement of the wells was designed to facilitate a preliminary estimation of the extent of groundwater contamination, and to provide access for quarterly groundwater sampling.

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SCOPE OF SERVICES

The scope of our services included the services outlined in the monitoring workplan, SEG Report No. 95-154. This report covers services completed prior to the start of the project's quarterly monitoring phase. These included implementation of the OSHA-required Health and Safety Plan, well permit processing, drilling and installation of three monitoring wells, surveying of wellhead elevations to a mean sea level datum, development of wells, sampling of groundwater and soil, analysis of the groundwater and soil samples, interpretation of the data obtained, and preparation of this report.

HEALTH AND SAFETY PLAN

As per OSHA guidelines, a site-specific health and safety plan detailing field procedures and protocols was prepared as part of the workplan. The purpose of this document was to provide health and safety guidance at such times that hydrocarbon contaminations were encountered during the investigation. Smith-Emery GeoServices was responsible for implementing the provisions of this document in the field.

REGIONAL AND SITE HYDROGEOLOGY

The site is located in the East Bay Plain of the Coast Range physiographic province. The land survey for this site referenced city benchmark BM19NW24 at the corner of Alameda Avenue

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and Eighth Street, which has an elevation of 9.664 feet above mean sea level. The survey of the well casings indicate that the site's surface elevations range from approximately 9 feet above mean sea level along the Alameda Avenue frontage, to approximately 8 feet at the rear of the property. The surface in the general area slopes gently southwest toward the Tidal Canal of the Alameda Harbor, which lies 3/8ths of a mile to the southwest.

The East Bay Plain is comprised of flat alluvial lowlands with bay and tidal marshes, much of which have been overlain with artificial fill. The geologic units beneath the site consist of unconsolidated, permeable-to-impermeable interbeds of fine-to-coarse-grained sediments of Quaternary Age alluvial and estuarine deposits. These unconsolidated deposits are estimated to occur from the ground surface to a depth of approximately 1000 feet, according to USGS Professional Paper 943.

The major groundwater-bearing materials beneath the East Bay Plain occur at depth ranging from 50 feet to 1,000 feet below ground surface. Groundwater from these aquifers is presently used mostly for irrigation and industrial purposes.

Groundwater-bearing soil layers within a shallow aquifer were encountered at a depth of approximately 5 feet and greater. The groundwater gradient was calculated from initial well measurements to be 0.003 feet per foot in a flow direction of S55°E, with depths-to-water in

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the range of 9.5 to 10.5 feet. The flow direction is shown on the Plot Plan, Plate No. 2. Depth to groundwater data and wellhead elevations are presented in Table 2. The shallow aquifer was apparently intersected by the original tank installations, which have been documented to be deeper than 8.5 feet, allowing leakage of fuel hydrocarbons to impact groundwater.

FIELD EXPLORATION

Monitoring Well Borings

On May 31, 1995, Smith-Emery GeoServices arranged for a licensed driller to install three four-inch diameter P.V.C. groundwater monitoring wells. The locations are shown on the Plot Plan, Plate No. 2. An explanation of the symbols and notations used on the boring logs is presented on Plates No. 3 and 4. The placement of the monitoring wells was based on assumed groundwater conditions, the location of the former fueling station, and discussions with Mr. Barney Chan of the Alameda County Health Care Services Agency, who is providing regulatory oversight. The cross section of the upper surface is known as Plate No. 6. Details of well materials and construction, and boring logs of the monitoring wells appear on Plates No. 6 through 8.

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Subsurface Conditions

The borings ranged in total depth from 20 feet to 21.5 feet below ground surface. All soils were visually classified by a geologist in the field in accordance with the Unified Soil Classification System. The surface condition in the area of the wells is asphaltic concrete (AC) pavement four inches thick underlain by an aggregate base ten inches thick, underlain by artificial fill two feet thick, which is composed primarily of silt and sand. Below the fill, the upper soil is a layer of black silty clay that ranged in thickness from one foot in MW-3 to over seven feet in MW-2. This clay is underlain by green-gray silt grading into a green-gray sand in a zone lying at depths between 4.5 and 10.5 feet. The soils below the green-gray silt and sand consist of moist to wet gray-green sands mixed with silt and clay, interfingering with thin lenses of silt and clay. All soil cuttings generated during the excavation of the borings were placed in appropriately labeled 55-gallon drums and stored within the site's secured lot. Disposal of soil and groundwater has been arranged on the owner's behalf.

Groundwater

Shallow groundwater was encountered initially in each of the borings at approximately 10.5 feet below the surface, as indicated by increased moisture found in the cuttings and samples. This shallow aquifer apparently lies in the permeable silts and sands at the depths between 10 feet to 20 feet. The piezometric groundwater surface was found to have stabilized at a depth

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of approximately 9.5 to 10.5 feet below ground, at the last well measurement on June 21, 1995.

Soil Sampling

A SEG geologist logged the borings using the Unified Soil Classification System. Geotechnical and environmental soil samples were obtained from the wells using an 18-inch long California-Modified split barrel sampler holding two and half inch diameter brass sleeves. A registered geologist was present during the placement of all wells and borings. The down-hole sampler was driven by a 140 pound hammer with a 30-inch cable drop. All drilling augers and down-hole equipment were steam-cleaned prior to use for each well boring.

The environmental samples were obtained in six-inch long brass sleeves, with each end sealed by a teflon sheet before being closed with an air-tight plastic cap. Environmental samples were labeled with sampling point identification, date and time sampled, then stored at approximately four degrees Celsius, and transported to the state-certified laboratory under chain-of-custody documentation. Proper environmental sampling protocol and decontamination procedures were observed in accord with applicable EPA regulations.

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The sampling equipment was cleaned with an Alconox solution and double-rinsed in deionized water prior to taking each sample. Drill cuttings and sample tube splits were screened for volatile organics by a photo-ionization detector (PID) calibrated with zero gas and 49 ppm hexane. The results of the field PID screening are presented on the Boring Logs, Plates No. 6 - 8.

WELL CONSTRUCTION & DEVELOPMENT

Permit No. 95289 for the installation of three groundwater monitoring wells at the site was authorized by the Zone 7 Water Agency of Alameda County. A copy of the completed permit is provided in Appendix A. Monitoring Wells MW1, MW2, and MW3 were constructed on May 31, 1995, in accordance with California DWR Bulletin 74-90 guidelines. The locations for the three wells are presented on the Plot Plan, Plate No. 2. The elevation of all wells and water levels are referenced to mean sea level surveyed from a City of Oakland benchmark, BM 19NW24, located at the intersection of Eighth Street and Alameda Avenue. The USGS Oakland East Quadrangle topographic map indicates that local surface elevation is approximately 9 feet above mean sea level.

The wells were constructed using four-inch I.D. Schedule 40 PVC casing and slotted PVC screen (0.020 inch opening), set in a No. 2/12 clean washed filter sand. MW1 was screened over a 15 foot interval from 5.5 feet to 20.5 feet below ground surface. MW2 was screened

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over a 15 foot interval from 5 feet to 20 feet below ground surface. MW3 was screened over a 14 foot interval from 5 feet to 19 feet below ground surface. Each screened zone was surged to settle the filter sand before placing a one-foot layer of bentonite chips as a seal. The remainder of the annular space was backfilled with a concrete slurry to the surface. The surface of the wells were completed with a locking expansion plug and a water tight, traffic-rated housing in a concrete slurry. An inspector from the SCVWD observed the placement of the surface grout of the three wells. Groundwater monitoring well construction details are presented in the Boring Logs on Plates No. 6 through 8.

Smith-Emery GeoServices observed well development of the three monitoring wells by Blaine Tech Services on June 16, 1995. The well's concrete annular seals had been allowed to set over 72 hours prior to developing the wells. Each well was surged for at least five minutes over five foot intervals to remove fines and create a gradation between filter material and native soil. Each well was then pumped with a Middleburg air-bladder pump during development to remove water and sediment.

Temperature, pH, conductivity, and turbidity were monitored periodically during well development. Development continued until temperature, pH, turbidity, and conductivity parameters stabilized. Imhoff cones were utilized to measure the settleable fraction of solids in the development water in order to assess the effectiveness of the development operation.

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Final Imhoff cone readings were 1.0ml/1000ml or less, well below the national well standard of 10ml/1000ml. After approximately 10 to 15 well volumes were removed from each well, the wells were recapped and allowed to recover.

All development water was drummed, labeled, and stored on site under the control of the owner pending disposal. Groundwater monitoring well development data recorded by Smith-Emery GeoServices and Blaine Tech Services are shown in Appendix A. The total volume of water removed and final Imhoff solids readings for each well is shown in Table 1, Well Development Results.

TABLE 1 - Well Development Results

<u>Well I.D.</u>	<u>Volume Removed</u>	<u>One Well Volume</u>	<u>Final pH</u>	<u>Final Conductivity</u>	<u>Final Temperature</u>	<u>Final Imhoff</u>
MW-1	75 gallons	4.9 gal.	7.5	800 µmhos	62.0 F.	1.0ml/L
MW-2	70 gallons	6.9 gal.	7.3	900 µmhos	62.8 F.	0.1 ml/L
MW-3	54 gallons	2.3 gal.	7.3	900 µmhos	61.6 F.	1.0ml/L

WELL ELEVATION SURVEY

The top of each well head casing was surveyed by Mr. Lutz Kunze, a California-licensed civil engineer, to determine the groundwater gradient. The City of Oakland survey monument BM19NW24, at the intersection of Eighth Street and Alameda Avenue, was used as the

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reference above mean sea level (MSL). A level and rod were then used to determine the elevation of each well head with respect to the benchmark. A tape was used to measure the horizontal distances of the wells from the northeast corner of the main building on site.

WATER SAMPLING

Smith-Emery GeoServices returned on June 21, 1995 to purge and sample the monitoring wells according to established guidelines. Prior to sampling, the depth to water and to the bottom of the well were 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. A light sheen and petroleum odors were noticed in the well purge water from each well. Purging, which occurred a minimum of 24 hours after well development, was performed at a rate one gallon per minute. Three to four well volumes were removed from each well. Recharge rates in wells MW1 and MW2 were relatively rapid. MW3 had a slow recharge rate. Measured levels of turbidity were stabilized prior to taking samples. Detailed records of well purging and sampling data appear in Appendix A.

Each well's groundwater sample was obtained in a new disposable teflon bailer equipped with a flow control valve. Water samples for volatiles analysis were placed in EPA-approved 40-ml vials capped with teflon-backed septa. Water samples for kerosene and diesel analysis

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were placed in 1-liter glass bottles with teflon-backed caps. No air bubble or headspace was allowed in the samples taken. All samples were then labeled, 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.

WELL MEASUREMENT

Groundwater level measurements were taken in groundwater monitoring wells MW1, MW2, and MW3 on June 22, 1995. Static water levels and well depths were measured to the nearest one-hundredth of a foot using an electronic level indicator. The top of the well casings were surveyed at the time of monitoring well water sampling. The top of each casing was permanently notched as a repeatable measurement point during this investigation. Well measurement and survey data obtained for the three wells are presented in Table 2.

TABLE 2 - Well Measurement Data

<u>Date of Well I.D.</u>	<u>Date of Measurement</u>	<u>Top of Casing Elevation MSL</u>	<u>Depth to Water from Top of Casing</u>	<u>Water Elevation MSL</u>
MW-1	6-21-95	8.73'	9.30'	-0.57'
MW-2	6-21-95	8.42'	8.89'	-0.47'
MW-3	6-21-95	9.26'	9.75'	-0.49'

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.

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The gradient is relatively flat, varying less than one-third of one vertical foot over 100 horizontal feet at S55°E. A current gradient map showing the surveyed monitoring well locations and flow direction is included as the Plot Plan, Plate No. 2.

ANALYTICAL PROGRAM

Analytical tests on the samples for this project were performed by Pace Incorporated, a state-certified laboratory. The detailed results of all analytical work are contained in Appendix B, Analytical Data and Chain-of-Custody. Representative analytical results are presented in the following tables, Table 3 - Soil Samples, and Table 4 - Groundwater Samples. A site schematic of the wells showing summarized analytical data is presented on Plate No. 2A.

Soil Samples

Selected soil samples obtained from the monitoring well borings were analyzed by Standard Method EPA 8015/8020 (CA LUFT) for Gasoline/BTEX (Benzene, Toluene, Ethylbenzene, and Xylenes), and by EPA 8015M for diesel and kerosene. Two soil samples were selected from each soil boring for analysis. Samples not tested were archived by the testing laboratory.

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Groundwater Samples

The groundwater samples obtained from the wells MW1, MW2, and MW3 were analyzed by Standard Method EPA 8015/8020 (CA LUFT) for Gasoline/BTEX (Benzene, Toluene, Ethylbenzene, and Xylenes), and for diesel and kerosene by EPA 8015M.

ANALYTICAL FINDINGS

Table 3 - SOIL SAMPLES

MONITORING WELL BORINGS,

Date sampled 5/31/95; Date analyzed 6/07/95

Sample Name	TPH Gasoline ppm	TPH Diesel ppm	TPH Kerosene ppm	Benzene ppb	Toluene ppb	Ethylbenzene ppb	Xylene ppb
MW1-10.0	68	68	26	0.28	ND	0.31	0.50
MW1-13.5	200	310	130	1.3	0.52	2.50	6.4
MW2-11.0	880	73	35	1.0	2.2	14.0	36.0
MW2-14.0	4.1	26	ND	0.78	0.025	0.045	0.026
MW3-15.5	ND	130	ND	0.0012	0.0015	0.0022	0.006
MW3-18.0	ND	11	ND	ND	ND	0.0022	0.0066

ND = Not Detected

ppm = milligrams/Kg

ppb = micrograms/Kg

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Table 4 - GROUNDWATER SAMPLES

MONITORING WELLS,

Date sampled 6/21/95; Date analyzed 6/30/95

Sample Name	TPH Gasoline ppm	TPH Diesel ppm	TPH Kerosene ppm	Benzene ppb	Toluene ppb	Ethyl-benzene ppb	Xylene ppb
MW1-A	81	9.8	8.2	11,000	720	1,800	3,900
MW2-A	7.6	5.9	4.9	1,500	180	7.2	1,100
MW3-A	0.140	1.9	ND	0.54	0.52	1.7	5

MTBE
ppb
900
110
ND.

ND - Not Detected

ppm = milligrams/Kg

ppb = micrograms/Kg

SUMMARY

The site is adjacent and downgradient of the Ecotek Lube facility, which is the suspected source of a kerosene plume that extends under the subject site. Two on-site underground storage tanks, one 10,000-gallon diesel and one 1,000-gallon gasoline, were removed from the subject property in March of 1988. Analytical evidence of a gasoline and a diesel release was found under the tanks at the time of removal. Additional soil and water analyses in March of 1994 confirmed gasoline, diesel, kerosene, and BTEX contamination of the shallow subsurface in the immediate vicinity of the former tank pit. The purpose of this investigation was to monitor the extent and concentrations of hydrocarbons in the subsurface vicinity of the former tank locations.

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The soil samples from 10 feet and 13.5 feet depth in Monitoring Well MW1 tested positive for gasoline, diesel, kerosene, and BTEX. The soil samples from 11 feet depth in MW2 tested positive for gasoline, diesel, kerosene, and BTEX, while the MW2 soil sample from 14 feet depth tested positive for gasoline, diesel and BTEX, but negative for kerosene. The soil samples from 15.5 feet and 18 feet depth in MW3 tested positive for diesel and BTEX, but negative for gasoline and kerosene.

Groundwater from MW1 and MW2 tested positive for gasoline, diesel, kerosene, and BTEX. Groundwater from MW3 tested positive for gasoline, diesel, and BTEX, but tested negative for kerosene.

Groundwater Gradient

Prior to well placement, the anticipated direction of groundwater flow was estimated to be generally to the south. Review of the data from the monitoring wells allows us to conclude that the groundwater beneath the project site is presently flowing in a direction of S55°E with a very slight gradient of one-third of one percent. This gradient direction places the Ecotek Lube site upgradient from the wells on the subject site. Furthermore, the present gradient places MW1 downgradient of the former tank locations, and MW2 and MW3 crossgradient of the former tank locations. However, the regional groundwater gradients surrounding the

project site may historically change direction and slope due to seasonal geohydrological cycles, subsurface recharge zones, subsurface geology, or groundwater extraction wells.

Site Contamination

The analyses of the soil and water samples taken from the monitoring wells revealed hydrocarbons and BTEX in all the soil and water samples tested from the monitoring wells. Monitoring Well MW3 returned the lowest overall results for the analytes tested. Monitoring Well MW1 had the highest results for diesel and for kerosene soil contaminations, while MW2 had the highest result for gasoline soil contamination. The highest concentrations of contaminants in the groundwater samples were found in MW1, the well most downgradient of the former tank area. The lowest concentrations of groundwater contaminants were found in MW3, the well most upgradient of the former tank area.

It is our opinion that the zone of soil contamination extends beyond the tank excavation zone, and that the groundwater plume encompasses the tank excavation zone and extends downgradient of it. The hydrocarbon contamination, being less dense than water, has migrated along the top of the shallow aquifer, flowing in the local downgradient direction to the southeast. The plume spread beyond the tank zone and marginally crossgradient in the measured direction of flow.

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The upper vertical limit of the hydrocarbon groundwater plume will be the top of the water table at approximately ten feet below ground surface. The horizontal limits of the gasoline and diesel plume could not be estimated using the currently available set of data from the three monitoring wells and the soil borings performed by this office and borings sampled by another consultant.

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.

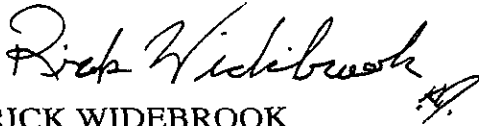
Our investigation was performed using the standard of care level of skill ordinarily exercise under similar circumstances by reputable Environmental Assessors and Geologists currently practicing in these or similar localities. No other warranty, expressed or implied, is made as to the conclusions and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

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Respectfully submitted,
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Staff Geologist

RW/KJ/ld

Reviewed and approved by,



KRIS JOHNSON
Vice President
R.G.5932, C.E.G. 1915, R.E.A. 3965

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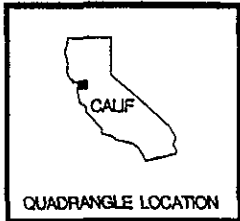
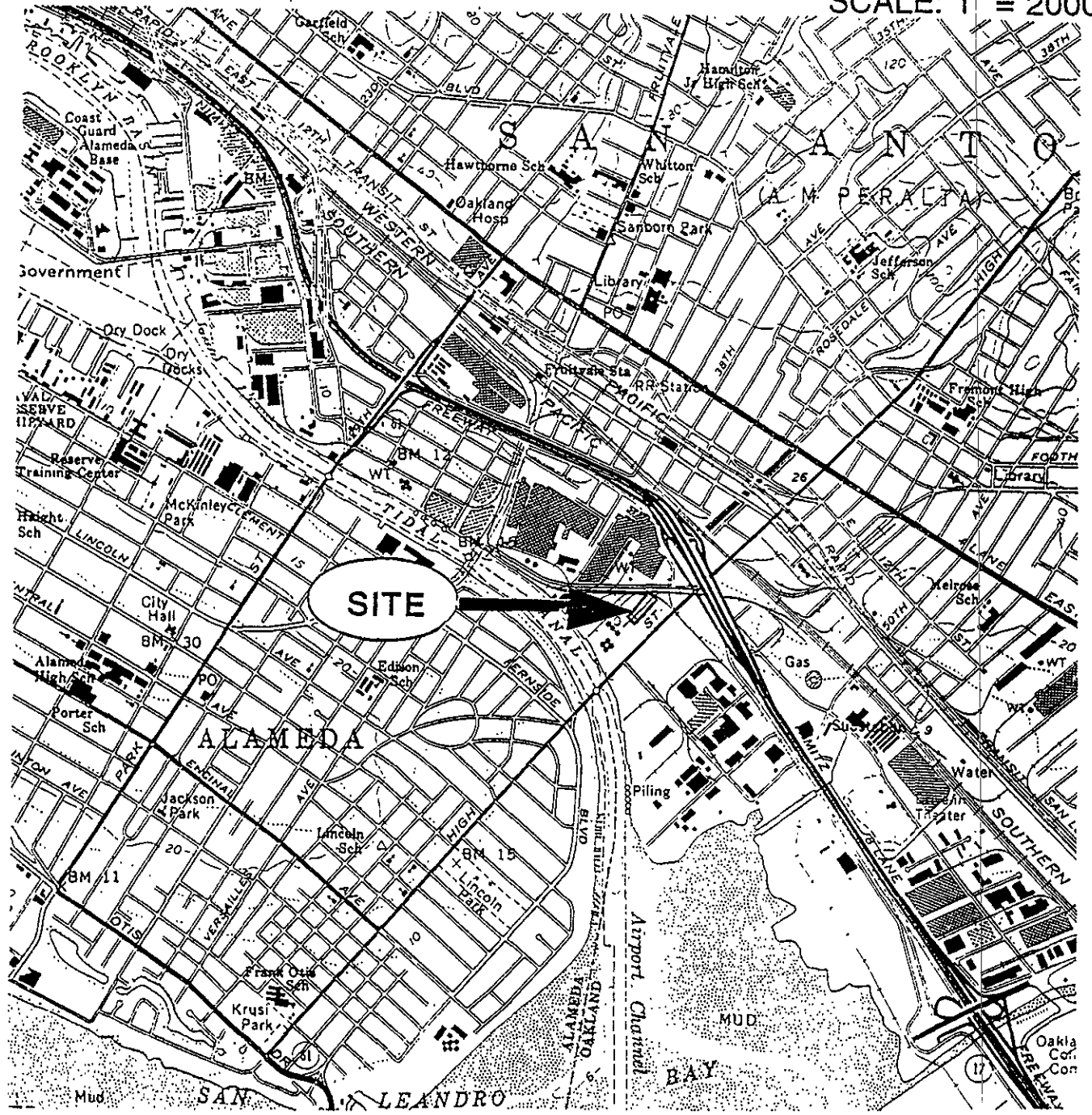
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PLATES



SCALE: 1" = 2000'

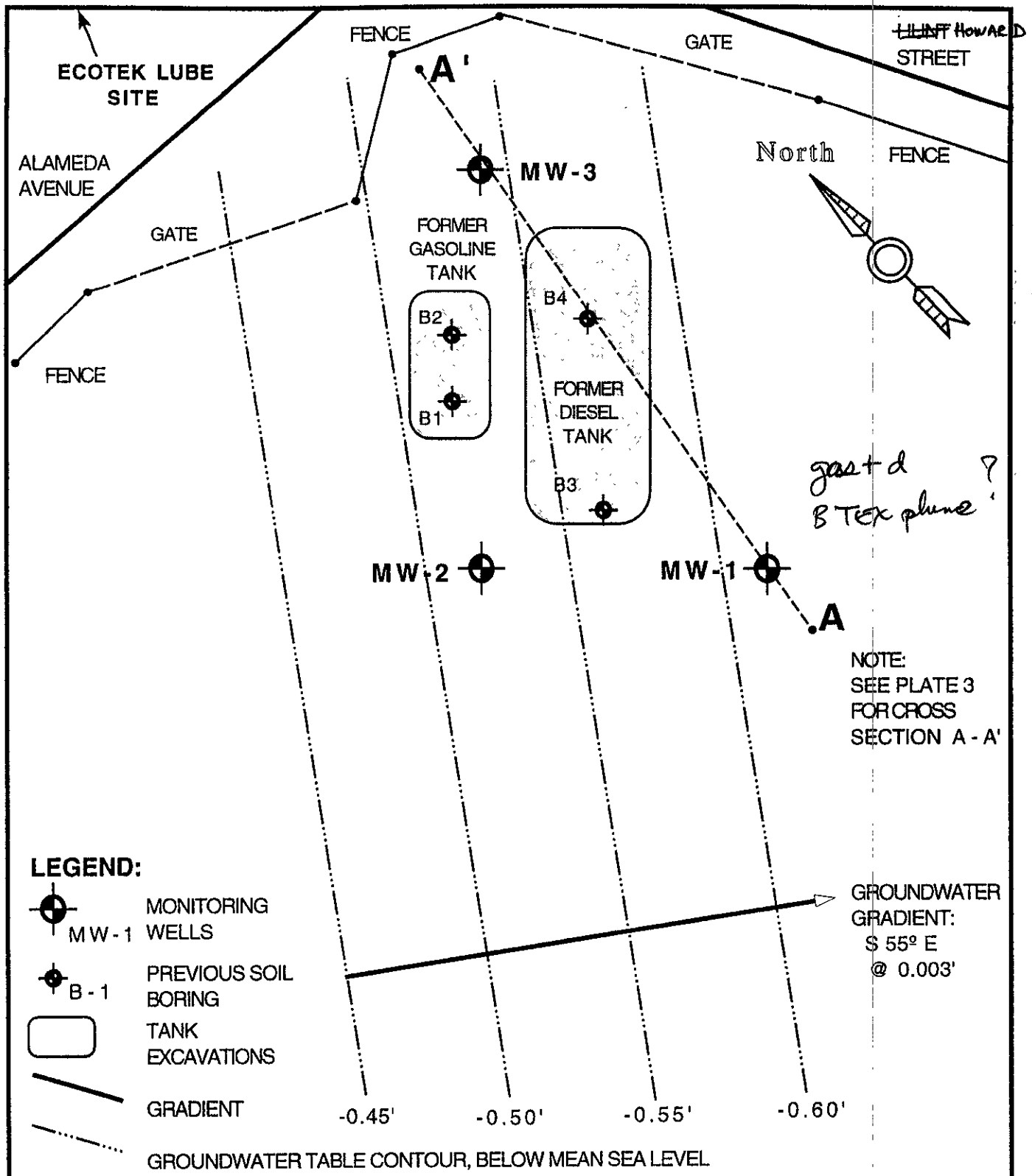


REFERENCE:
U.S.D.I. - GEOLOGICAL SURVEY
OAKLAND EAST QUADRANGLE
ALAMEDA COUNTY, CALIFORNIA

VICINITY MAP
FILE NO. 90404

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

SMITH-EMERY GEOSERVICES
TECHNICAL ILLUSTRATION BY P.M. PLATE 1



**1-STORY WAREHOUSE
3925 ALAMEDA AVENUE**

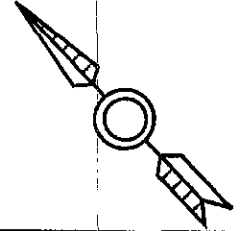
*SMOOKE & SONS INVESTMENT CO.
3925 ALAMEDA AVENUE
OAKLAND, CALIFORNIA*

SITE SCHEMATIC
SMITH-EMERY GEOSERVICES
SEG Job No. 90404 **PLATE 2**

PPM	G	D	K
SOIL @ 15.5'	ND	130	ND
SOIL @ 18'	ND	130	ND
WATER	0.14	1.9	ND



North

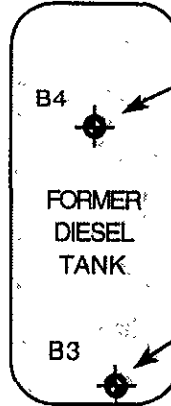


PPM	G	D	K
SOIL	22	26	ND
WATER	92	2.3	0.4

FORMER GASOLINE TANK

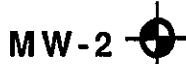


PPM	G	D	K
SOIL	22	26	ND

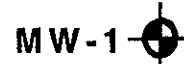


PPM	G	D	K
SOIL	370	150	150

PPM	G	D	K
SOIL	ND	ND	ND
WATER	9.8	2.4	3.2



PPM	G	D	K
SOIL @ 11'	880	73	35
SOIL @ 14'	4.1	26	ND
WATER	7.6	5.9	1.6



PPM	G	D	K
SOIL @ 10'	68	68	26
SOIL @ 13.5'	200	310	130
WATER	81	9.8	8.2

LEGEND:



MONITORING WELLS



MARCH 1994 SOIL BORINGS (ENGE0)



TANK EXCAVATIONS

NOTES:

G = GASOLINE; D=DIESEL; K=KEROSENE
 ND= NOT DETECTED
 (BTEX RESULTS NOT INCLUDED)

SAMPLE DATES:

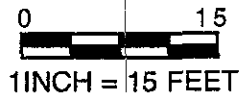
SMITH-EMERY DATA

MW 1,2,& 3: 5/31/95 SOILS
 6/21/95 WATER

ENGE0 DATA

B 1,2,3,& 4: 3/7/94 SOILS

**1-STORY WAREHOUSE
 3925 ALAMEDA AVENUE**



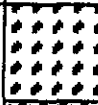
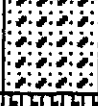


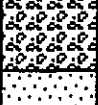






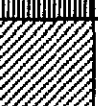
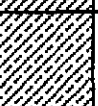
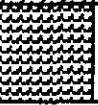

SMOOKE & SONS INVESTMENT CO.
 3925 ALAMEDA AVENUE
 OAKLAND, CALIFORNIA

**SUMMARY OF
 ANALYTICAL RESULTS**

SMITH-EMERY GEOSERVICES

SEG Job No. 90404

PLATE 2A

MAJOR SUBDIVISIONS			GROUP SYMBOL	TYPICAL DESCRIPTIONS				
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.			
				GP	POORLY GRADED GRAVELS, OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.			
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES.			
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES.			
	SAND AND SANDY SOILS	MORE THAN 50% OF COARSE FRACTION RETAINED ON A NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.		
					SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.		
		MORE THAN 50% OF COARSE FRACTION PASSING A NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)			SM	SILTY SANDS, SAND-SILT MIXTURES.	
						SC	CLAYEY SANDS, SAND-CLAY MIXTURES.	
			SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50.			ML	INORGANIC SILTS, SANDY SILTS, AND CLAYEY SILTS OF LOW PLASTICITY.
							CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY; GRAVELLY, SANDY OR SILTY CLAYS, LEAN CLAYS.
SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50.			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY.			
				MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS. ELASTIC SILTS.			
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.			
				OH	ORGANIC CLAYS AND SILTY CLAYS OF MEDIUM TO HIGH PLASTICITY.			
HIGHLY ORGANIC SOILS				PT	PEAT AND OTHER HIGHLY ORGANIC SOILS.			

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE CLASSIFICATIONS

SOIL CLASSIFICATION CHART

UNIFIED SOIL CLASSIFICATION SYSTEM

SMITH-EMERY GEOSERVICES






PLATE 3

KEY TO LOG OF BORINGS

SYMBOL TYPE OF TEST

COMP	COMPACTION CHARACTERISTICS
TX	TRIAxIAL COMPRESSION TEST
DS	DIRECT SHEAR TEST
UC	UNCONFINED COMPRESSION TEST
C	CONSOLIDATION TEST
EXP	PERCENT EXPANSION
EI	EXPANSION INDEX
SA	SIEVE ANALYSIS (+ #200 ONLY)
-200	% PASSING #200 SIEVE
HA	HYDROMETER ANALYSIS (- #200 ONLY)
AL	ATTERBERG LIMITS
SE	SAND EQUIVALENT
P	PERMEABILITY
R	R-VALUE
Gs	SPECIFIC GRAVITY
S	SOLUBLE SULFATES
pH	HYDROGEN ION CONTENT
RE	RESISTIVITY
CL	CHLORIDE
COLL	COLLAPSE TEST

KEY TO SAMPLES

	INDICATES DEPTH OF UNDISTURBED SAMPLE
	INDICATES DEPTH OF BULK SAMPLE
	INDICATES DEPTH OF SAMPLING ATTEMPT WITH NO RECOVERY
	INDICATES DEPTH OF STANDARD PENETRATION TEST (SPT)
	WATER TABLE

NOTE ON SAMPLERS

Undisturbed samples are obtained with a sampler having an O.D. of 3.25 inches and an I.D. of 2.5 inches. The SPT sampler is 2 inches O.D.; the bit has an I.D. of 1.4 inches and the split barrel has an I.D. of 1.5 inches. Unless practical refusal is encountered, the samplers are driven 18 inches into the soil using a 140 pound weight falling 30 inches. The blow count for the final 12 inches is recorded on the boring logs.

NOTES:

The descriptions on the boring logs apply only at the specific boring location and at the time the borings were made. They are not warranted to be representative of subsurface conditions. Soil and rock descriptions are based on commonly accepted geotechnical methods of identification and classification and are based on our professional judgement and experience. Field descriptions have been modified where appropriate to reflect laboratory test results. The stratification of soil layers is represented with approximate boundaries and the transition between soil types may be gradual.

KEY TO LOG OF BORINGS

SMITH-EMERY GEOSERVICES

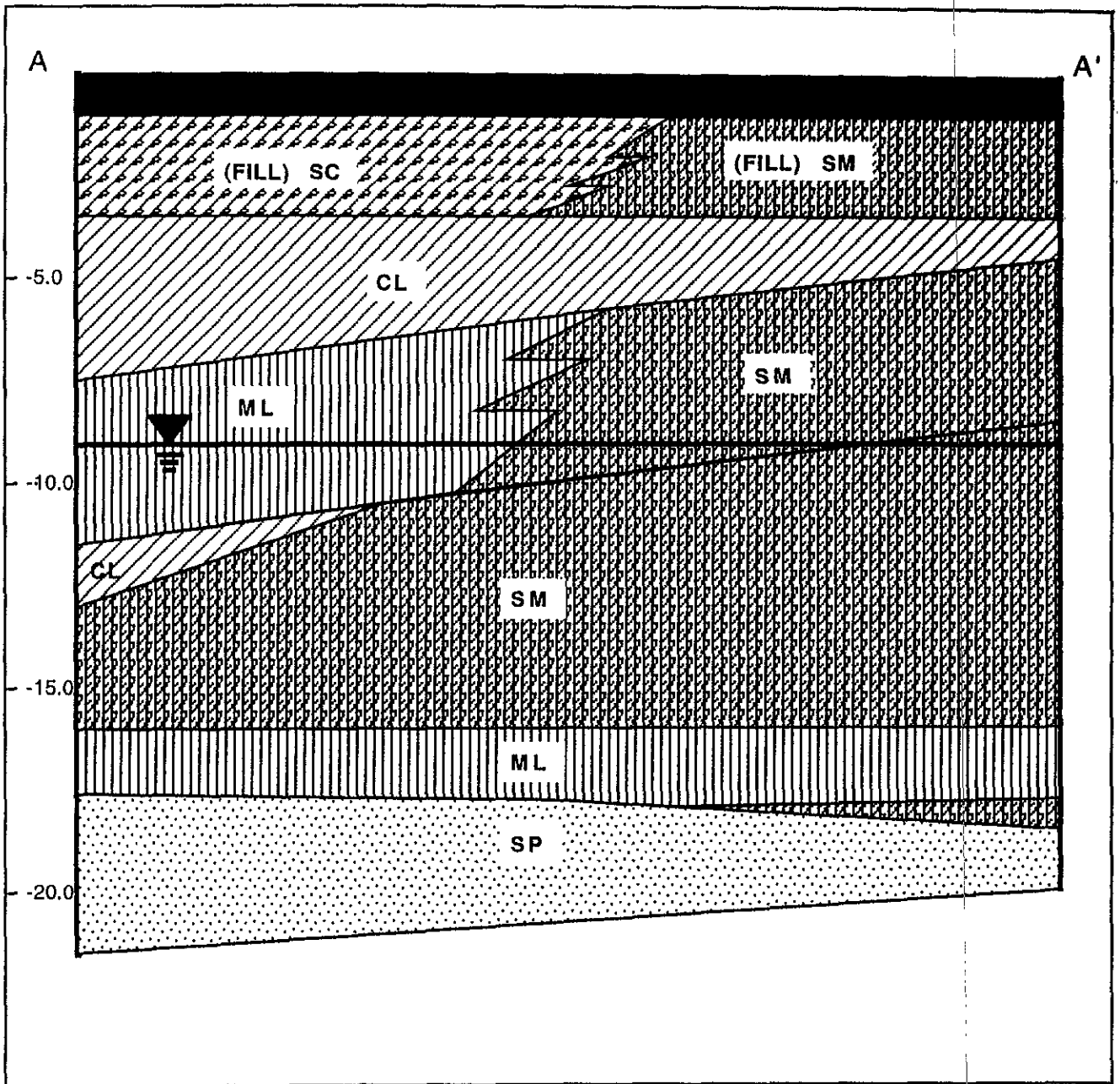
PLATE 4

NORTH

MW-1

SOUTH

MW-3



HORIZONTAL SCALE	VERTICAL SCALE
1" = 8.75 FEET	1.2" = 5 FEET

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

CROSS SECTION A - A'

SMITH-EMERY GEOSERVICES

SEG Job No. 90404 PLATE 5

WELL INFORMATION

WELL MW-1

REFERENCE: MEAN SEA LEVEL

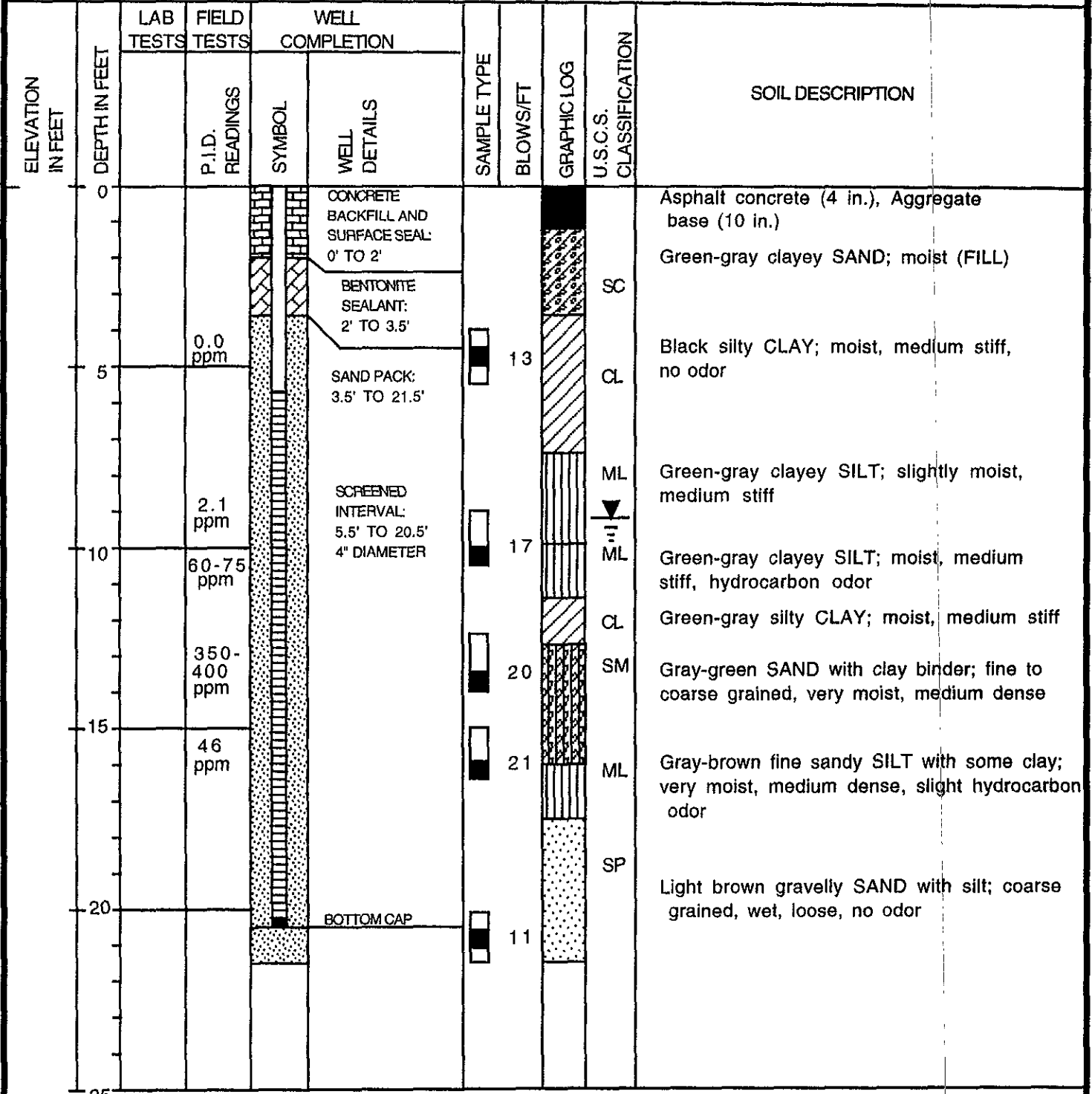
TOP OF CASING ELEVATION (ft): +8.73

WELL SCREEN ELEVATION - TOP (ft): +3.73

WELL SCREEN ELEVATION - BOTTOM (ft): -11.77

TOP OF CASING ELEVATION: 8.73 FEET

DATUM: MSL, CITY MONUMENT BM 19NW24



WELL TERMINATED @ 21.5 FEET ON 5/31/95.
 WELL INSTALLED ON 5/31/95.
 GROUNDWATER DEPTH AT 11 FEET FOLLOWING WELL INSTALLATION.

LOG OF WELL

SMOOKE & SONS INVESTMENT COMPANY

FILE NO.: 90404

LOGGED BY: P.M.

SMITH-EMERY GEOSERVICES

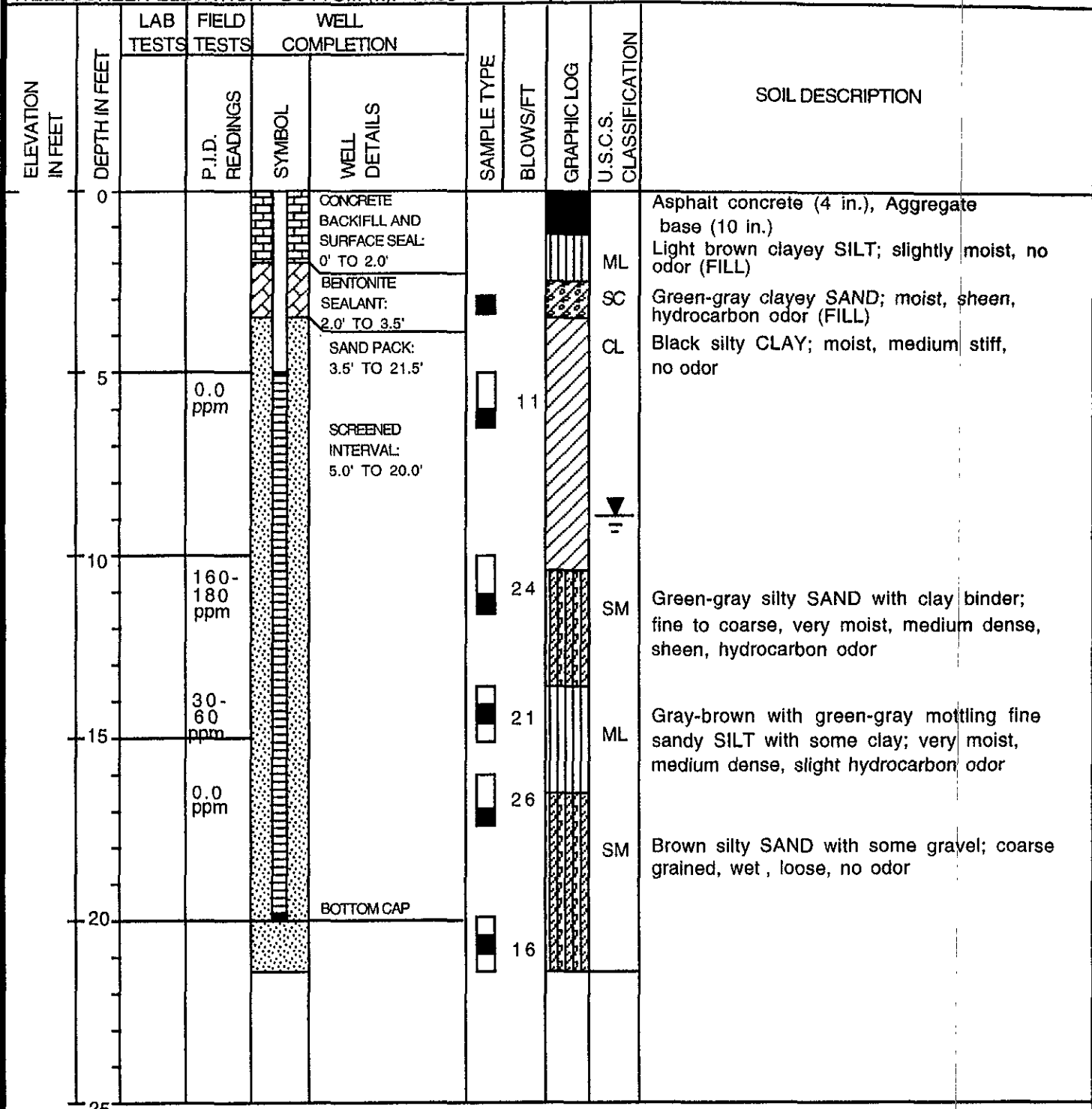
PLATE NO.: 6

WELL INFORMATION

WELL MW-2

REFERENCE: MEAN SEA LEVEL
 TOP OF CASING ELEVATION (ft): +8.42
 WELL SCREEN ELEVATION - TOP (ft): +3.42
 WELL SCREEN ELEVATION - BOTTOM (ft): -11.58

TOP OF CASING ELEVATION: 8.42 FEET
 DATUM: MSL, CITY MONUMENT BM 19NW24



WELL TERMINATED @ 21.5 FEET ON 5/31/95.
 WELL INSTALLED ON 5/31/95.
 GROUNDWATER DEPTH AT 10 FEET FOLLOWING WELL INSTALLATION.

LOG OF WELL

SMOOKE & SONS INVESTMENT COMPANY	
FILE NO.: 90404	LOGGED BY: P.M.
SMITH-EMERY GEOSERVICES	PLATE NO.: 7

WELL INFORMATION

REFERENCE: MEAN SEA LEVEL

TOP OF CASING ELEVATION (ft): +9.26

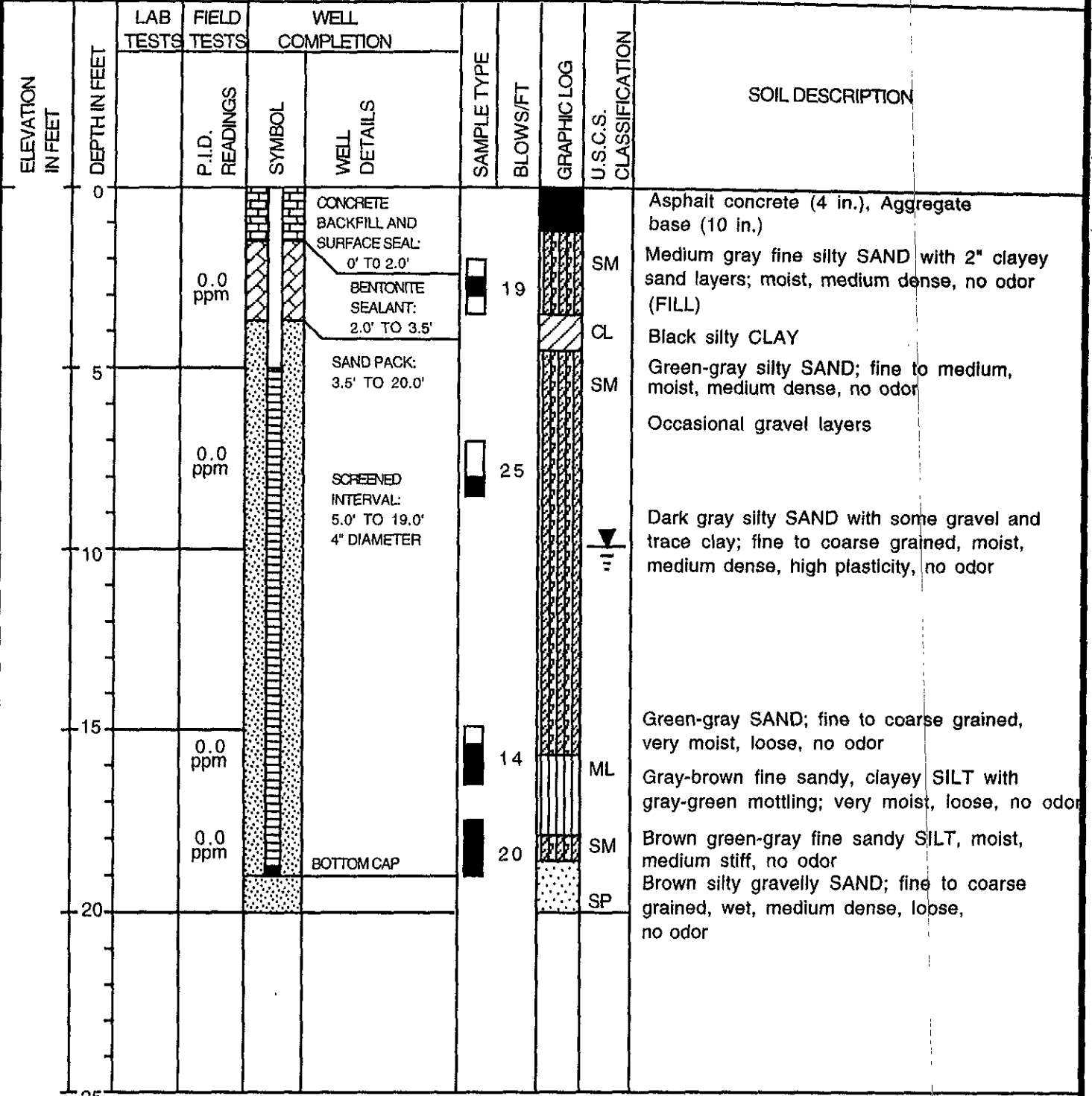
WELL SCREEN ELEVATION - TOP (ft): +4.26

WELL SCREEN ELEVATION - BOTTOM (ft): -9.74

WELL MW-3

TOP OF CASING ELEVATION: 9.26

DATUM: MSL, CITY MONUMENT BM 19NW24



WELL TERMINATED @ 20 FEET ON 5/31/95.
GROUNDWATER DEPTH MEASURED AT 12 FEET.
WELL INSTALLED ON 5/31/95.

LOG OF WELL

SMOOKE & SONS INVESTMENT COMPANY

FILE NO.: 90404

LOGGED BY: P.M.

SMITH-EMERY GEOSERVICES

PLATE NO.: 8

TYPICAL WELL DIAGRAM

Above Grade Well Cover
Set in Concrete

Grout Seal:

Type: Cement grout

Blank Casing

Diameter: 2 inch, minimum
Type: PVC

Seal:

Type: Bentonite-granular
or pellets.
Thickness: 1 foot minimum.

Top filter depth:
minimum 1-foot above
top of screen

Filter Material:

To be determined
from sieve analysis

Screen:

Type: PVC
Diameter: 2 inch minimum
Slot size: 0.01-0.03 inch
(based on filter design)
Length: Maximum 25 feet,
10 feet above static water
level and 15 feet below.

Hollow Stem Boring
(minimum 7 inch diameter)

SMITH-EMERY GEOSERVICES

PLATE 9

SMITH-EMERY GEOSERVICES

Smooke and Sons Investment Company
July 21, 1995

SEG File No. 90404
SEG Report No. 95-187

APPENDIX A

WATER QUALITY DATA



ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE

PLEASANTON, CALIFORNIA 94588

VOICE (510) 484-2500

FAX (510) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 3925 ALAMEDA AVENUE
CARLAND, CA

PERMIT NUMBER 95289

LOCATION NUMBER _____

CLIENT

Name SMOKE & SONS INVESTMENT CO
Address P.O. BOX 1311 Voice 213-624-8361
City LOS ANGELES, CA Zip 90053-1311

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT

Name KRIS JOHNSON, SENIOR GEOLOGIST
SMITH - EMERY CO. Fax 415 330 3080
Address P.O. BOX 880550 Voice 415 330 3000
City SAN FRANCISCO CA Zip 94188

TYPE OF PROJECT

Well Construction	Geotechnical Investigation
Cathodic Protection _____	General _____
Water Supply _____	Contamination _____
Monitoring <u>X</u>	Well Destruction _____

PROPOSED WATER SUPPLY WELL USE

Domestic _____ Industrial N/A Other _____
Municipal _____ Irrigation _____

DRILLING METHOD:

Mud Rotary _____ Air Rotary _____ Auger X
Cable _____ Other _____

DRILLER'S LICENSE NO. 374152

WELL PROJECTS

Drill Hole Diameter	<u>10</u> in.	Maximum	
Casing Diameter	<u>4</u> in.	Depth	<u>20</u> ft.
Surface Seal Depth	<u>2</u> ft.	Number	<u>3</u>

GEOTECHNICAL PROJECTS

Number of Borings _____ N/A Maximum
Hole Diameter _____ in. Depth _____ ft.

ESTIMATED STARTING DATE May 3, 1995

ESTIMATED COMPLETION DATE _____

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Kris Johnson Date 5/8/95

A. GENERAL

1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER WELLS, INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong
Wyman Hong

Date 10 May 95

SMITH-EMERY GEOSERVICES

WELL DEVELOPMENT DATA

SITE TYPE

SITE ID S MOORE

WELL MW1

ELEVATION DATUM:

DEPTH TO BOTTOM F 14.91, I 16.72

PROJECT NO. 90404

STATIC WATER LEVEL (INITIAL) 9.04

DATE(S) INSTALLED 5-31-95

(FINAL) 9.58

DATE(S) DEVELOPED 6-16-95

MEASURING POINT TOP OF CASING

PUMP (TYPE) MIDDLEBURG AIR

CASING I.D. 4"

PUMP CAP. 1.2 G/MIN

ONE WELL VOLUME 4.9 G

BAILER (TYPE) 1

HYDROLOGIST WIDEBROOK

(CAPACITY)

TIME	VOLUME OF WATER REMOVED	pH	SPECIFIC CONDUCTANCE	TEMP	NTU'S	CEP	NOTATIONS: (CLARITY, ODOR, PARTICULATES, COLOR)
9:14	5	7.8	1500	63.4	> 200		DARK BROWN. HEAVY SILT
9:18	10	7.8	1200	61.8	> 200		SAME
9:22	15	7.9	1000	62.0	> 200		SILTY. LT. SHADEN
9:26	20	7.8	1000	61.4	> 200		SLIGHT GRAY CLOR
9:34	25	7.8	1000	61.2	> 200		BROWN, BEGIN TO CLEAR
9:38	30	7.8	1000	61.8	> 200		SAME
9:43	35	7.7	900	61.8	> 200		SAME
9:47	40	7.6	800	61.6	> 200		BROWN. GRAY CLOR
9:53	45	7.6	800	62.0	> 200		SAME
9:57	50	7.5	800	62.4	> 200		SAME
10:02	55	7.5	800	62.4	> 200		GOOD RECHARGE
10:05	60	7.5	900	62.2	> 200		LT. BROWN ; ODOR
10:09	65	7.5	800	62.0	> 200		SAME
10:14	70	7.5	800	62.0	> 200		LIGHTER
10:20	75	7.5	800	62.0	193		"
							FINISHED @ 10:50

Vol = 1/4 π D²

Schedule 40 PVC pipe: 2" = 0.16 gallons/foot

SMITH-EMERY GEOSERVICES

Smooke and Sons Investment Company
July 21, 1995

SEG File No. 90404
SEG Report No. 95-187

APPENDIX B

ANALYTICAL DATA AND CHAIN-OF-CUSTODY

June 13, 1995

Mr. Rick Widebrook
Smith-Emery Company
P.O. Box 880550
Hunter's PT Shipyard #114
San Francisco, CA 94188

RE: PACE Project Number: 701710
Client Project ID: ALAMEDA/HUNT ST.

Dear Mr. Widebrook:

Enclosed are the results of analyses for samples received on June 1, 1995. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Carol Reid
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

DATE: 06/13/95
PAGE: 1

Smith-Emery Company
P.O. Box 880550
Hunter's PT Shipyard #114
San Francisco, CA 94188

PACE Project Number: 701710
Client Project ID: ALAMEDA/HUNT ST.

Attn: Mr. Rick Widebrook
Phone: (415)330-3000 xx124

PACE Sample No: 70127527
Client Sample ID: MW-1 @ 10.0
Date Collected: 05/31/95
Date Received: 06/01/95

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Soil								
Gasoline	68000	ug/kg	20000	06/07/95	CA LUFT	MDW		
Benzene	280	ug/kg	100	06/07/95	CA LUFT	MDW	71-43-2	
Toluene	ND	ug/kg	100	06/07/95	CA LUFT	MDW	108-88-3	
Ethyl Benzene	310	ug/kg	100	06/07/95	CA LUFT	MDW	100-41-4	
Xylene (Total)	500	ug/kg	200	06/07/95	CA LUFT	MDW	1330-20-7	
a,a,a-Trifluorotoluene (S)	103	%		06/07/95	CA LUFT	MDW	2164-17-2	
4-Bromofluorobenzene (S)	96	%		06/07/95	CA LUFT	MDW	460-00-4	
GC								
TPH in Soil by 8015 Modified								
Diesel Fuel	68	mg/kg	5	06/06/95	TPH by EPA 8015M	DLA		1
Kerosene	26	mg/kg	10	06/06/95	TPH by EPA 8015M	DLA		
n-Pentacosane (S)	85	%		06/06/95	TPH by EPA 8015M	DLA	629-99-2	
Date Extracted				06/02/95				

REPORT OF LABORATORY ANALYSIS

DATE: 06/13/95
PAGE: 2

PACE Project Number: 701710
Client Project ID: ALAMEDA/HUNT ST.

PACE Sample No: 70127584
Client Sample ID: MW-1 @ 13.5

Date Collected: 05/31/95
Date Received: 06/01/95

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Soil								
Gasoline	200000	ug/kg	40000	06/07/95	CA LUFT	MDW		
Benzene	1300	ug/kg	200	06/07/95	CA LUFT	MDW	71-43-2	
Toluene	520	ug/kg	200	06/07/95	CA LUFT	MDW	108-88-3	
Ethyl Benzene	2500	ug/kg	200	06/07/95	CA LUFT	MDW	100-41-4	
Xylene (Total)	6400	ug/kg	400	06/07/95	CA LUFT	MDW	1330-20-7	
a,a,a-Trifluorotoluene (S)	109	%		06/07/95	CA LUFT	MDW	2164-17-2	
4-Bromofluorobenzene (S)	96	%		06/07/95	CA LUFT	MDW	460-00-4	
GC								
TPH in Soil by 8015 Modified								
Diesel Fuel	310	mg/kg	5	06/06/95	TPH by EPA 8015M	DLA		1
Kerosene	130	mg/kg	10	06/06/95	TPH by EPA 8015M	DLA		
n-Pentacosane (S)	92	%		06/06/95	TPH by EPA 8015M	DLA	629-99-2	
Date Extracted				06/02/95				



ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

DATE: 06/13/95
PAGE: 3

PACE Project Number: 701710
Client Project ID: ALAMEDA/HUNT ST.

PACE Sample No: 70127592
Client Sample ID: MW-2 @ 11.0

Date Collected: 05/31/95
Date Received: 06/01/95

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Soil								
Gasoline	880000	ug/kg	50000	06/07/95	CA LUFT	MDW		
Benzene	1000	ug/kg	250	06/07/95	CA LUFT	MDW	71-43-2	
Toluene	2200	ug/kg	250	06/07/95	CA LUFT	MDW	108-88-3	
Ethyl Benzene	14000	ug/kg	250	06/07/95	CA LUFT	MDW	100-41-4	
Xylene (Total)	36000	ug/kg	500	06/07/95	CA LUFT	MDW	1330-20-7	
a,a,a-Trifluorotoluene (S)	116	%		06/07/95	CA LUFT	MDW	2164-17-2	
4-Bromofluorobenzene (S)	115	%		06/07/95	CA LUFT	MDW	460-00-4	
GC								
TPH in Soil by 8015 Modified								
Diesel Fuel	73	mg/kg	5	06/06/95	TPH by EPA 8015M	DLA		
Kerosene	35	mg/kg	10	06/06/95	TPH by EPA 8015M	DLA		
n-Pentacosane (S)	78	%		06/06/95	TPH by EPA 8015M	DLA	629-99-2	
Date Extracted				06/02/95				



ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

DATE: 06/13/95
PAGE: 4

PACE Project Number: 701710
Client Project ID: ALAMEDA/HUNT ST.

PACE Sample No: 70127659
Client Sample ID: MW-2 @ 14.0

Date Collected: 05/31/95
Date Received: 06/01/95

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Soil								
Gasoline	4100	ug/kg	1000	06/08/95	CA LUFT	MDW		
Benzene	780	ug/kg	5	06/08/95	CA LUFT	MDW	71-43-2	
Toluene	25	ug/kg	5	06/08/95	CA LUFT	MDW	108-88-3	
Ethyl Benzene	45	ug/kg	5	06/08/95	CA LUFT	MDW	100-41-4	
Xylene (Total)	26	ug/kg	10	06/08/95	CA LUFT	MDW	1330-20-7	
a,a,a-Trifluorotoluene (S)	106	%		06/08/95	CA LUFT	MDW	2164-17-2	
4-Bromofluorobenzene (S)	95	%		06/08/95	CA LUFT	MDW	460-00-4	
GC								
TPH in Soil by 8015 Modified								
Diesel Fuel	26	mg/kg	5	06/06/95	TPH by EPA 8015M	DLA		
Kerosene	ND	mg/kg	10	06/06/95	TPH by EPA 8015M	DLA		
n-Pentacosane (S)	94	%		06/06/95	TPH by EPA 8015M	DLA	629-99-2	
Date Extracted				06/02/95				



ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

DATE: 06/13/95
PAGE: 5

PACE Project Number: 701710
Client Project ID: ALAMEDA/HUNT ST.

PACE Sample No: 70127667
Client Sample ID: MW-3 @ 15.5

Date Collected: 05/31/95
Date Received: 06/01/95

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Soil								
Gasoline	ND	ug/kg	200	06/08/95	CA LUFT	MDW		
Benzene	1.2	ug/kg	1	06/08/95	CA LUFT	MDW		
Toluene	1.5	ug/kg	1	06/08/95	CA LUFT	MDW	71-43-2	
Ethyl Benzene	2.2	ug/kg	1	06/08/95	CA LUFT	MDW	108-88-3	
Xylene (Total)	6	ug/kg	2	06/08/95	CA LUFT	MDW	100-41-4	
a,a,a-Trifluorotoluene (S)	105	%		06/08/95	CA LUFT	MDW	1330-20-7	
4-Bromofluorobenzene (S)	91	%		06/08/95	CA LUFT	MDW	2164-17-2	
GC								
TPH in Soil by 8015 Modified								
Diesel Fuel	130	mg/kg	5	06/06/95	TPH by EPA 8015M	DLA		
Kerosene	ND	mg/kg	10	06/06/95	TPH by EPA 8015M	DLA		2
n-Pentacosane (S)	140	%		06/06/95	TPH by EPA 8015M	DLA		
Date Extracted				06/02/95			629-99-2	



ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

DATE: 06/13/95
PAGE: 7

PACE Project Number: 701710
Client Project ID: ALAMEDA/HUNT ST.

PARAMETER FOOTNOTES

ND Not Detected
NC Not Calculable
PRL PACE Reporting Limit
(S) Surrogate
[1] Late hydrocarbons greater than C25 are present.
[2] Sample quantitated in the diesel range. The sample pattern does not match diesel pattern.



ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

DATE: 06/13/95
PAGE: 8

Smith-Emery Company
P.O. Box 880550
Hunter's PT Shipyard #114
San Francisco, CA 94188

PACE Project Number: 701710
Client Project ID: ALAMEDA/HUNT ST.

Attn: Mr. Rick Widebrook
Phone: (415)330-3000 xx124

QC Batch ID: 3689 QC Batch Method: CA LUFT Date of Batch: 06/02/95
Associated PACE Samples: 70127527 70127584 70127592 70127659 70127667

METHOD BLANK: 70128145
Associated PACE Samples:

Parameter	Units	70127527	70127584 Method Blank Result	70127592 PRL	70127659	70127667	70127675	Footnotes
Diesel Fuel	mg/kg		ND	5				
n-Pentacosane (S)	%		100					

LABORATORY CONTROL SAMPLE & LCSD: 70128152

Parameter	Units	70128160		Spike % Rec	LCSD Result	Spike Dup		RPD	Footnotes
		Spike Conc.	LCS Result			% Rec	% Rec		
Diesel Fuel	mg/kg	33	31	94	31	92	2		
n-Pentacosane (S)				100		95			



ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

DATE: 06/13/95
PAGE: 9

Smith-Emery Company
P.O. Box 880550
Hunter's PT Shipyard #114
San Francisco, CA 94188

PACE Project Number: 701710
Client Project ID: ALAMEDA/HUNT ST.

Attn: Mr. Rick Widebrook
Phone: (415)330-3000 xx124

QC Batch ID: 3759
Associated PACE Samples:

QC Batch Method: CA LUFT
70127527 70127584 70127592

70127659 70127667

Date of Batch: 06/06/95

METHOD BLANK: 70131115

Associated PACE Samples:

Parameter	Units	70127527	70127584	70127592	70127659	70127667	70127675
			Method Blank Result	PRL	Footnotes		
Gasoline	ug/kg		ND	200			
Benzene	ug/kg		ND	1			
Toluene	ug/kg		ND	1			
Ethyl Benzene	ug/kg		ND	1			
Xylene (Total)	ug/kg		ND	2			
a,a,a-Trifluorotoluene (S)	%		99				
4-Bromofluorobenzene (S)	%		95				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70131099 70131107

Parameter	Units	70124896	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Gasoline	ug/kg	ND	1000	580	58	580	58	0	

LABORATORY CONTROL SAMPLE & LCSD: 70130141 70130158

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Gasoline	ug/kg	1000	940	94	940	94	0	



ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

DATE: 06/13/95
PAGE: 10

PACE Project Number: 701710
Client Project ID: ALAMEDA/HUNT ST.

QUALITY CONTROL DATA PARAMETER FOOTNOTES

The Quality Control Sample Final Results listed above have been rounded to reflect an appropriate number of significant figures. Consistent with EPA guidelines unrounded concentrations have been used to calculate % Rec and RPD values.

ND Not Detected
NC Not Calculable
PRL PACE Reporting Limit
RPD Relative Percent Difference
(S) Surrogate

July 06, 1995

Mr. Rick Widebrook
Smith-Emery Company
P.O. Box 880550
Hunter's PT Shipyard #114
San Francisco, CA 94188

RE: PACE Project Number: 701975
Client Project ID: SMOOKE-MON WELLS

Dear Mr. Widebrook:

Enclosed are the results of analyses for samples received June 22, 1995 through June 23, 1995.
If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Carol Reid
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

DATE: 07/06/95
PAGE: 1

Smith-Emery Company
P.O. Box 880550
Hunter's PT Shipyard #114
San Francisco, CA 94188

PACE Project Number: 701975
Client Project ID: SMOOKE-MON WELLS

Attn: Mr. Rick Widebrook
Phone: (415)330-3000 xx124

PACE Sample No: 70153101 Date Collected: 06/21/95
Client Sample ID: MW1-A Date Received: 06/22/95

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	81000	ug/L	2500	06/30/95	CA LUFT	ADS		
Benzene	11000	ug/L	25	06/30/95	CA LUFT	ADS	71-43-2	
Toluene	720	ug/L	25	06/30/95	CA LUFT	ADS	108-88-3	
Ethyl Benzene	1800	ug/L	25	06/30/95	CA LUFT	ADS	100-41-4	
Xylene (Total)	3900	ug/L	50	06/30/95	CA LUFT	ADS	1330-20-7	
Methyl-tert-butyl Ether	400	ug/L	250	06/30/95	CA LUFT	ADS	1634-04-4	
a,a,a-Trifluorotoluene (S)	153	%		06/30/95	CA LUFT	ADS	2164-17-2	1
4-Bromofluorobenzene (S)	90	%		06/30/95	CA LUFT	ADS	460-00-4	



ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

DATE: 07/06/95
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PACE Project Number: 701975
Client Project ID: SMOOKE-MON WELLS

PACE Sample No: 70153119
Client Sample ID: MW2-A

Date Collected: 06/21/95
Date Received: 06/22/95

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	7600	ug/L	500	06/30/95	CA LUFT	ADS		
Benzene	1500	ug/L	5	06/30/95	CA LUFT	ADS	71-43-2	
Toluene	180	ug/L	5	06/30/95	CA LUFT	ADS	108-88-3	
Ethyl Benzene	7.2	ug/L	5	06/30/95	CA LUFT	ADS	100-41-4	
Xylene (Total)	1100	ug/L	10	06/30/95	CA LUFT	ADS	1330-20-7	
Methyl-tert-butyl Ether	110	ug/L	50	06/30/95	CA LUFT	ADS	1634-04-4	
a,a,a-Trifluorotoluene (S)	111	%		06/30/95	CA LUFT	ADS	2164-17-2	
4-Bromofluorobenzene (S)	96	%		06/30/95	CA LUFT	ADS	460-00-4	

REPORT OF LABORATORY ANALYSIS

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 PAGE: 3

PACE Project Number: 701975
 Client Project ID: SMOOKE-MON WELLS

PACE Sample No: 70153127
 Client Sample ID: MW3-A

Date Collected: 06/21/95
 Date Received: 06/22/95

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	140	ug/L	50	06/30/95	CA LUFT	ADS		
Benzene	0.54	ug/L	0.5	06/30/95	CA LUFT	ADS		
Toluene	0.52	ug/L	0.5	06/30/95	CA LUFT	ADS	71-43-2	
Ethyl Benzene	1.7	ug/L	0.5	06/30/95	CA LUFT	ADS	108-88-3	
Xylene (Total)	5	ug/L	1	06/30/95	CA LUFT	ADS	100-41-4	
Methyl-tert-butyl Ether	ND	ug/L	5	06/30/95	CA LUFT	ADS	1330-20-7	
a,a,a-Trifluorotoluene (S)	97	%		06/30/95	CA LUFT	ADS	1634-04-4	
4-Bromofluorobenzene (S)	87	%		06/30/95	CA LUFT	ADS	2164-17-2	
						ADS	460-00-4	

REPORT OF LABORATORY ANALYSIS

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PACE Project Number: 701975
Client Project ID: SMOOKE-MON WELLS

PACE Sample No: 70153168
Client Sample ID: MW1-A 8015

Date Collected: 06/22/95
Date Received: 06/23/95

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC								
8015 Fuel Fingerprint in Water								
Diesel Fuel	9.8	mg/L	0.05	06/30/95	TPH by EPA 8015M	DLA		
Motor Oil	1.4	mg/L	0.5	06/30/95	TPH by EPA 8015M	DLA		
Kerosene	8.2	mg/L	0.5	06/30/95	TPH by EPA 8015M	DLA		
n-Pentacosane (S)	84	%		06/30/95	TPH by EPA 8015M	DLA	629-99-2	
Date Extracted				06/27/95				

REPORT OF LABORATORY ANALYSIS

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PACE Project Number: 701975
 Client Project ID: SMOOKE-MON WELLS

PACE Sample No: 70153176
 Client Sample ID: MW2-A 8015

Date Collected: 06/22/95
 Date Received: 06/23/95

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC								
8015 Fuel Fingerprint in Water								
Diesel Fuel	5.9	mg/L	0.05	06/30/95	TPH by EPA 8015M	DLA		
Motor Oil	1.6	mg/L	0.5	06/30/95	TPH by EPA 8015M	DLA		
Kerosene	4.9	mg/L	0.5	06/30/95	TPH by EPA 8015M	DLA		
n-Pentacosane (S)	107	%		06/30/95	TPH by EPA 8015M	DLA	629-99-2	
Date Extracted				06/27/95				



ENVIRONMENTAL LABORATORIES

REPORT OF LABORATORY ANALYSIS

DATE: 07/06/95
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PACE Project Number: 701975
Client Project ID: SMOOKE-MON WELLS

PACE Sample No: 70153184
Client Sample ID: MW3-A 8015
Date Collected: 06/22/95
Date Received: 06/23/95

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC								
TPH in Water by 8015 Modified								
Diesel Fuel	1.9	mg/L	0.05	07/01/95	TPH by EPA 8015M	DLA		
Motor Oil	3	mg/L	0.5	07/01/95	TPH by EPA 8015M	DLA		
Kerosene	ND	mg/L	0.5	07/01/95	TPH by EPA 8015M	DLA		
n-Pentacosane (S)	0	%		07/01/95	TPH by EPA 8015M	DLA	629-99-2	2
Date Extracted				06/29/95				

DATE: 07/06/95
PAGE: 7

PACE Project Number: 701975
Client Project ID: SMOOKE-MON WELLS

PARAMETER FOOTNOTES

ND Not Detected
NC Not Calculable
PRL PACE Reporting Limit
(S) Surrogate
[1] Matrix interference.
[2] The surrogate could not be quantitated due to matrix interference.

QUALITY CONTROL DATA

DATE: 07/06/95
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Smith-Emery Company
P.O. Box 880550
Hunter's PT Shipyard #114
San Francisco, CA 94188

PACE Project Number: 701975
Client Project ID: SMOOKE-MON WELLS

Attn: Mr. Rick Widebrook
Phone: (415)330-3000 xx124

QC Batch ID: 4363
Associated PACE Samples: 70153168

QC Batch Method: EPA 3510
70153176

Date of Batch: 06/28/95

METHOD BLANK: 70157235
Associated PACE Samples:

Parameter	Units	70153168	70153176	PRL	Footnotes
			Method Blank Result		
Diesel Fuel	mg/L		0.22	0.05	1
n-Pentacosane (S)	%		70		

LABORATORY CONTROL SAMPLE & LCSD: 70157243

Parameter	Units	70157250		Spike % Rec	LCSD Result	Spike Dup		Footnotes
		Spike Conc.	LCS Result			% Rec	RPD	
Diesel Fuel	mg/L	1	1	105	0.94	94	11	2,3
n-Pentacosane (S)				80		75		

QUALITY CONTROL DATA

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Smith-Emery Company
P.O. Box 880550
Hunter's PT Shipyard #114
San Francisco, CA 94188

PACE Project Number: 701975
Client Project ID: SMOOKE-MON WELLS

Attn: Mr. Rick Widebrook
Phone: (415)330-3000 xx124

QC Batch ID: 4410
Associated PACE Samples: 70153101 70153119 70153127

QC Batch Method: CA LUFT
Date of Batch: 06/29/95

METHOD BLANK: 70162250
Associated PACE Samples:

Parameter	Units	Method Blank		Footnotes
		70153101	70153119	
Gasoline	ug/L	ND	50	
Benzene	ug/L	ND	0.5	
Toluene	ug/L	ND	0.5	
Ethyl Benzene	ug/L	ND	0.5	
Xylene (Total)	ug/L	ND	1	
Methyl-tert-butyl Ether	ug/L	ND	5	
a,a,a-Trifluorotoluene (S)	%	101		
4-Bromofluorobenzene (S)	%	87		

LABORATORY CONTROL SAMPLE & LCSD: 70160049

Parameter	Units	70160056		Spike % Rec	LCSD Result	Spike Dup		Footnotes
		Spike Conc.	LCS Result			% Rec	RPD	
Benzene	ug/L	100	100	103	100	103	0	
Toluene	ug/L	100	100	103	100	103	0	
Ethyl Benzene	ug/L	100	100	101	100	101	0	
Xylene (Total)	ug/L	300	300	100	300	100	0	
a,a,a-Trifluorotoluene (S)				103		103		
4-Bromofluorobenzene (S)				91		91		

REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

DATE: 07/06/95
PAGE: 10

Smith-Emery Company
P.O. Box 880550
Hunter's PT Shipyard #114
San Francisco, CA 94188

PACE Project Number: 701975
Client Project ID: SMOOKE-MON WELLS

Attn: Mr. Rick Widebrook
Phone: (415)330-3000 xx124

QC Batch ID: 4473
Associated PACE Samples: 70153184

QC Batch Method: EPA 3520

Date of Batch: 06/30/95

METHOD BLANK: 70162029
Associated PACE Samples:

70153184

Parameter	Units	Method Blank Result	PRL	Footnotes
Diesel Fuel	mg/L	ND	0.05	
Motor Oil	mg/L	ND	0.5	
Kerosene	mg/L	ND	0.5	
n-Pentacosane (S)	%	89		

LABORATORY CONTROL SAMPLE & LCSD: 70162037 70162045

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Diesel Fuel	mg/L	1	0.97	97	1.1	108	11	
n-Pentacosane (S)				110		114		

REPORT OF LABORATORY ANALYSIS

DATE: 07/06/95
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PACE Project Number: 701975
Client Project ID: SMOOKE-MON WELLS

QUALITY CONTROL DATA PARAMETER FOOTNOTES

The Quality Control Sample Final Results listed above have been rounded to reflect an appropriate number of significant figures. Consistent with EPA guidelines unrounded concentrations have been used to calculate % Rec and RPD values.

- ND Not Detected
- NC Not Calculable
- PRL PACE Reporting Limit
- RPD Relative Percent Difference
- (S) Surrogate
- [1] The blank exhibits extraction contamination, but the pattern is not seen in any of the samples.
- [2] The LCS exhibits the same pattern as the blank.
- [3] The LCSD exhibits the same pattern as the blank.



SMITH-EMERY COMPANY
The Full Service Independent Testing Laboratory, Established 1904

781 East Washington Boulevard
P.O. Box 880550, Hunter's Point Shipyard Bldg 114
5427 East La Palma Avenue

• Los Angeles, California 90021
• San Francisco, California 94188
• Anaheim, California 92807

• (213) 749-3411
• (415) 330-3000
• (714) 693-1026

• Fax: (213) 745-6372
• Fax: (415) 822-5864
• Fax: (714) 693-1034

CHAIN OF CUSTODY AND ANALYSIS REQUEST

DATE: 6/21/95 PAGE 1 OF 1
FILE NO. 90404 LAB NO. PAGE

701975

CLIENT NAME: SMOOLCE

PROJECT NAME: MON. WELLS PROJECT NO. 90404 P.O. NO. _____

ADDRESS: OAKLAND

PROJECT MANAGER: RICK WIDEBROOK PHONE #: 415 330 3000 FAX #: 330 3030

SAMPLER NAME: RICK WIDEBROOK *Rick Widbrook* (Signature)

TAT (Analytical Turn Around Time) 0 = Same Day, 1 = 24 Hour, 2 = 48 Hour, (Etc.) N = NORMAL

CONTAINER TYPES: B = Brass, G = Glass, P = Plastic, V = Voa Vial, O = Other:

ANALYSES REQUESTED:

<input type="checkbox"/> DIESEL	<input type="checkbox"/> 8015M GAS	<input type="checkbox"/> 602/8020 BTEX	<input type="checkbox"/> 418.1	<input checked="" type="checkbox"/> 8015M Hydrocarbon Range
---------------------------------	------------------------------------	--	--------------------------------	---

REMARKS:
CAROL: PLEASE RUN THIS SET UNDER THE SAME ANALYTICAL CRITERIA AS THE PREVIOUS SET FOR GAS, DIESEL, AND KEROSENE

SAMPLE CONDITION COMMENTS:

SAMPLE NO.	DATE SAMPLED	TIME SAMPLED	SAMPLE DESCRIPTION	MATRIX				TAT	CONTAINER	
				WATER	SOIL	SLUDGE	OTHER		#	TYPE
MW1-A	6/21/95	11:00	BROWN CLOUDY WATER	/				N	4	V
MW2-A	"	1:00	" " "	/				N	4	V
MW3-A	"	3:00	" " "	/				N	4	V

153101/153168
11/23/153135
153119/153170
11/23/153143
153127/153184
11/23/153150

Relinquished By: (Signature and Printed Name) <i>Rick Widbrook</i> RICK WIDEBROOK	Received By: (Signature and Printed Name) <i>M.A. Am...</i>	Date: <u>6/22/95</u>	Time: <u>10:30</u>
Relinquished By: (Signature and Printed Name) <i>M.A. Am...</i>	Received By: (Signature and Printed Name) <i>Nathan Allen</i>	Date: <u>6/22/95</u>	Time: <u>12:00</u>
Relinquished By: (Signature and Printed Name)	Received By: (Signature and Printed Name)	Date:	Time:

SAMPLE DISPOSITION:

1. Samples returned to client? YES NO

2. Samples will not be stored over 30 days, unless additional storage time is requested

3. Storage time requested: _____ days

By _____ Date _____

SPECIAL INSTRUCTIONS:



202838

CHAIN-OF-CUSTODY RECORD
Analytical Request

Client SMITH-EMERY GEO SERVICES
Address B.114 HUNTERS POINT
Phone 415 330-3000

Report To: RICK WIDEBROOK
Bill To: _____
P.O. # / Billing Reference _____
Project Name / No. 90404 SMOOKE

Pace Client No. _____
Pace Project Manager _____
Pace Project No. 701975
*Requested Due Date: _____

Sampled By (PRINT): RICK WIDEBROOK
Rick Widbrook
Sampler Signature _____ Date Sampled _____

NO. OF CONTAINERS	PRESERVATIVES				ANALYSES REQUEST	REMARKS
	UNPRESERVED	H ₂ SO ₄	HNO ₃	VOA		
					<u>HYDROCHLORIC</u> 	

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.
1	Sl. Cloudy WATER	12:00	WATER	153164
2	" " "	12:10	WATER	153174
3	" " "	12:15	WATER	153184
4				
5				
6				
7				
8				

COOLER NOS.	BAILERS	SHIPMENT METHOD		ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
		OUT DATE	RETURNED DATE					
					<i>Rick Widbrook</i>	<i>Heather Peter</i>	6/23/10	11:01
Additional Comments								
<i>see chilled Emu</i>								

ORIGINAL

SEE REVERSE SIDE FOR INSTRUCTIONS

SMITH-EMERY GEOSERVICES

Smooke and Sons Investment Company
July 18, 1995

SEG File No. 90404
SEG Report No. 95-187

APPENDIX C

FIELD EXPLORATION PROCEDURES

SMITH-EMERY GEOSERVICES

Smooke and Sons Investment Company
July 21, 1995

SEG File No. 90404
SEG Report No. 95-187

FIELD EXPLORATION PROCEDURES

SMITH-EMERY GEOSERVICES ENVIRONMENTAL INVESTIGATION FIELD EXPLORATION PROCEDURES

3925 Alameda Avenue
Oakland, California

A.1 SOIL SAMPLING PROCEDURES

1. Soil core samples are routinely obtained at every 5 foot interval. Additional samples are taken whenever a change in lithology occurs or if any other reason suggests that they may be useful.
2. When the hollow stem auger reaches the sampling depth, a split spoon sampler (2.5" outer diameter California) equipped with six three-inch brass tubes is driven 1.5 feet into the formation by repeatedly dropping a 140 pound weight a distance of 2.5 feet onto the sampler rods. The number of blows each for three consecutive 0.5 foot increments is recorded on the boring logs.
3. Soils brought up by the auger flights during drilling, and soil recovered by the split spoon sampler are described and recorded on a standard boring log form according to the Unified Soil Classification System (USCS) by a project geologist under the direct supervision of a State Registered Geologist or Geotechnical Engineer. In addition to the USCS classification, the soil is described by color, moisture content, mechanical strength, odor, and any other notable characteristics.
4. Soil from the driving tip and upper tube is inspected for the soil description. The middle tube is typically retained for screening for volatile organic vapors by head space analysis. Unless otherwise noted, the lower tube is designated for chemical analysis.
5. Any indication of odor from the fresh soil samples as they are removed from the split spoon sampler is recorded on the boring log.
6. All samples designated for analysis are sealed at each end with Teflon and plastic caps. Care is taken to retain the samples with a minimum of disturbance and flush with the ends of the tube if possible.
7. All sampling equipment is decontaminated after each sampling interval by complete disassembly of the sampler and brush cleaning of all parts in a nonphosphate solution bath, followed by a clear water rinse and a final deionized or distilled water rinse. The hollow stem auger flights and bits are steam cleaned before arrival on site and between borings.
8. All soil cuttings generated during the drilling of the borings were added to the existing stockpile of contaminated material and disposed of.
9. Upon completion of drilling activities, all borings were back-filled with hydrated bentonite chips.
10. Hand samples are obtained by driving a six-inch long clean brass tube into the formation and capping each end with Teflon sheets and plastic caps.

SMITH-EMERY GEOSERVICES

Smooke and Sons Investment Company
July 18, 1995

SEG File No. 90404
SEG Report No. 95-187

A.2 SAMPLE HANDLING AND ANALYSIS

1. After retrieval all samples are immediately labeled and placed in a chilled cooler with ice to 4 degrees centigrade. Care is taken to prevent freezing of samples.
2. If a mobile laboratory is being utilized on the site, the samples are immediately brought to the laboratory after they are sealed and placed in the laboratory refrigerator and maintained at 4 degrees centigrade.
3. Chain-of-Custody documentation is maintained from the sampler through the laboratory. The samples are kept in the custody of the sampler of record until he signs them over to the next custodian of record. The samples are either kept within sight of the custodian, or in a locked place. Samples are delivered to the laboratory within 24 hours of collection.
4. The number of samples designated for analysis is dictated by the job specifications, field observations and agency involvement. All samples collected are held in refrigeration at 4 degrees centigrade by the lab for further analysis if initial test results indicate that more analyses may be useful.
5. The laboratory is instructed to analyze the samples according to the needs of the job. Usually, the analysis is carried out by a method certified by a federal or state agency. Routine quality assurance/quality control (QA/QC) procedures include matrix spikes, matrix spike duplicates, equipment blanks, and surrogate recoveries.

SMITH-EMERY GEOSERVICES

Smooke and Sons Investment Company
July 21, 1995

SEG File No. 90404
SEG Report No. 95-187

APPENDIX D

REFERENCES

SMITH-EMERY GEOSERVICES

Smooke and Sons Investment Company
July 21, 1995

SEG File No. 90404
SEG Report No. 95-187

REFERENCES

Helley, E.J. and Lajoie, K.R., 1979. *Flatland deposits of the San Francisco Bay Region, California*. USGS Professional Paper No. 943. Washington, D.C.

California Department of Water Resources Bulletin 74-90, *California Well Standards*.

USGS Oakland East Quadrangle topographic map

Workplan for Subsurface Exploration, 3925 Alameda Avenue, Oakland, California, prepared by ENGEO Incorporated, September 15, 1993.

Report on Soil and Ground-Water Sampling With Laboratory Testing, 3925 Alameda Avenue, Oakland, California" prepared by ENGEO Incorporated, March 24, 1994.

SEG Report No. 95-154, Tank/Groundwater Monitoring Workplan, 3925 Alameda Avenue, Oakland, California

SEG Health & Safety Plan, 3925 Alameda Avenue, Oakland, California