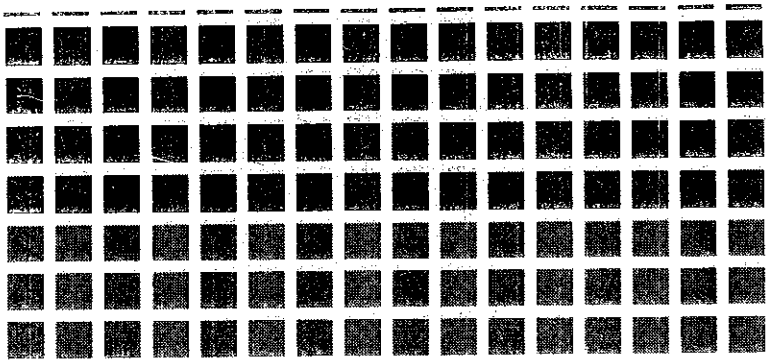
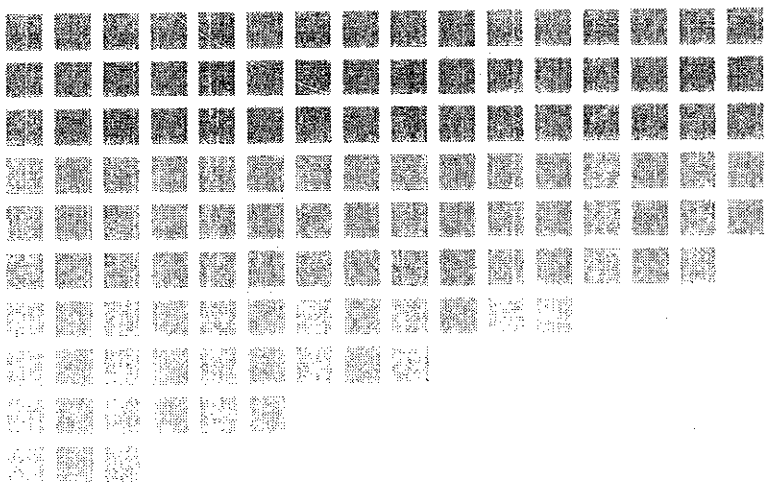




7-8-91

■ Subsurface Consultants, Inc.

GROUNDWATER CONTAMINATION ASSESSMENT
GASOLINE FUEL TANK AND FLOOR DRAIN
SUMP RELEASES
13TH AND JEFFERSON STREETS
OAKLAND, CALIFORNIA
SCI 430.013
J-0 8, 1991 STID 3673

Prepared for:

Mr. John Esposito
Bramalea Pacific
1221 Broadway, Suite 1800
Oakland, California 94612

By

Sean O. Carson
Civil Engineer 45074 (expires 3/31/94)

James P. Bowers
Geotechnical Engineer 157 (expires 3/31/95)

Subsurface Consultants, Inc.
171 - 12th Street, Suite 201
Oakland, California 94607
(415) 268-0461

July 8, 1991

I INTRODUCTION

This report records the results of a groundwater contamination assessment performed by Subsurface Consultants, Inc. (SCI) near the northwest corner of the intersection of 13th and Jefferson Streets in Oakland, California. The location of the site is shown on the Site Plan, Plate 1.

SCI has previously conducted studies to characterize the gasoline contamination that existed in the area. The results were recorded in a report dated August 22, 1989. Petroleum hydrocarbon (gasoline) contamination was detected in the soil and groundwater beneath the site. Subsequently, the gasoline contaminated soils were excavated to the lateral extent shown on Plate 1 and to depths of approximately 28 to 34 feet. Approximately 19,000 cubic yards of clean and contaminated soils were excavated during remediation efforts. Noncontaminated soils were stockpiled separately from the contaminated materials. The contaminated soils were aerated on-site until total volatile hydrocarbon (TVH) concentrations were less than 100 parts per million (ppm), and then disposed of off-site at a sanitary landfill. The excavation was then backfilled with the stockpiled clean soils, as well as imported materials. The results of gasoline contaminated soil remediation are documented in a report by SCI dated December 6, 1990.

A leaking floor drain sump and associated contaminated soils were remediated by excavation. The location of the sump and the approximate limits of the excavation are shown on the Site Plan, Plate 1. The sump previously contained oil and grease (O&G), low

concentrations of several heavy metals, methylene chloride and very low concentrations of PCBs. A soil sample obtained from 14 feet beneath the sump contained elevated concentrations of oil and grease, and kerosene. No volatile organics (EPA 8240) or PCB's (EPA 8080) were detected. Hydrocarbons were detected in the soil beneath the sump to depths of 26 feet below the groundsurface. During remediation, the bottom of the excavation was advanced to a depth of 28 feet. The bottom of the excavation was approximately 15 by 15 feet in plan. Sidewall and bottom samples were obtained at varying depths. Analytical results indicated that no detectable concentrations of hydrocarbons were present in the soils following excavation. The results of sump remediation are recorded in a report dated September 24, 1990.

The purpose of this groundwater contamination assessment was to evaluate groundwater quality impacts resulting from the previous gasoline and sump releases.

II FIELD INVESTIGATION

After soil remediation, eight (8) test borings were drilled to depths ranging between 36 and 42 feet and converted to monitoring wells. These borings were designated Borings 47 thru 49, 51 thru 54, and 59. The logs of these borings are attached. Monitoring Well 44 was drilled before soil remediation and was subsequently removed by excavation. MW-44 was approximately located where MW-54 now exists. Monitoring Wells 29, 31, 45 and 46 exist a significant

distance downgradient from the release areas and were installed as part of another unrelated gasoline contamination problem. For completeness, the logs of these borings are attached. The test borings were drilled using truck-mounted 8-inch diameter, hollow stem auger equipment. Boring 54 was drilled using 10-inch-diameter, hollow-stem auger equipment. This boring was subsequently converted to a 4-inch-diameter well for possible future use as an extraction well during groundwater remediation. Boring locations are shown on Plate 1.

A member of our engineering staff observed drilling and sampling operations and prepared detailed logs of the borings. Soil samples were obtained from the borings using a California Drive Sampler having an outside diameter of 2.5 inches and inside diameter of 2.0 inches. The sampler was driven with a 140-pound hammer having a drop of 30 inches. The blow counts required to drive the sampler the final 12 inches of an 18-inch penetration were recorded and are shown on the boring logs, Plates 2 through 13. Soils are classified in accordance with the Unified Soil Classification system described on Plate 14.

Soil samples were retained in brass sample liners. Samples for environmental analysis were capped and sealed with plastic tape. Teflon sheeting was placed between the caps and the soil samples. Upon sealing and labeling, the samples were promptly refrigerated on site in an ice chest. The samples remained under refrigeration until delivery to the analytical laboratory.

All augers, drill rods, samplers, well casing, etc., that were placed in the test borings were steam cleaned prior to their initial use and before each subsequent use to reduce the likelihood of cross contamination between borings.

The groundwater monitoring wells were constructed of 2-inch-diameter, Schedule 40 PVC pipe having flush threaded joints with the exception of Well 54. Well 54 has a 4-inch-diameter casing. The lower portion of the wells consists of machine slotted well screen having 0.020-inch wide slots. The annular space around the screened section was backfilled with Lonestar #3 sand. A bentonite seal, approximately 12 inches thick, was placed above the sand. The annulus above the bentonite seal was backfilled with a cement/bentonite grout. The wells were finished either above grade and secured by a lock and steel cover, or below grade and locked within Christy boxes. The specific details of the wells are shown on the boring logs.

The wells were developed by removing water with a Teflon air displacement pump until the water became relatively free of turbidity. After development, the wells were sampled with a precleaned Teflon sampler. The water samples were promptly refrigerated on-site in an ice chest. All samples remained refrigerated until delivery to the analytical laboratory. Chain-of-Custody documents accompanied all samples to the laboratory.

III GROUNDWATER LEVEL MEASUREMENTS

Groundwater levels were obtained by measuring the depth to groundwater from the top of casing (TOC) using an electronic well sounder. A level survey using an assumed elevation reference, was performed to determine the TOC elevation of each of the monitoring wells. A steel tape with water and gasoline sensitive pastes was used to check for free product in the wells. The water level data are presented in Table 1.

Table 1. Groundwater Elevation Data

Well	Date	TOC[1] Elevation (ft)	Groundwater Depth[2] (ft)	Groundwater Elevation (ft)
MW-47	09/24/90	100.50	27.28	73.22
	10/04/90		27.32	73.18
	12/03/90		27.38	73.12
	01/21/91		27.17	73.33
	03/13/91		26.85	73.65
	04/03/91		26.38	74.12
MW-48	07/18/90	102.40	29.08	73.32
	10/04/90		29.29	73.11
	12/03/90		29.28	73.12
	01/21/91		29.03	73.37
	03/13/91		28.72	73.68
	04/03/91		28.24	74.16
MW-49	12/03/90	101.73	28.44	73.29
	01/21/91		28.20	73.53
	03/13/91		27.79	73.94
	04/03/91		27.28	74.45
MW-51	10/04/90	102.64	28.57	74.07
	12/03/90		28.57	74.07
	01/21/91		28.44	74.20
	03/13/91		27.76	74.88
	04/03/91		27.32	75.32
MW-52	10/04/90	102.44	28.41	74.03
	12/03/90		28.38	74.06
	01/21/91		28.24	74.20
	03/13/91		27.57	74.87
	04/03/91		27.16	75.28
MW-53	09/24/90	101.28	27.44	73.84
	10/04/90		27.50	73.78
	12/03/90		27.46	73.82
	01/21/91		28.00	73.28
	03/13/91		27.00	74.28
MW-54	09/24/90	100.78	27.01	73.77
	10/04/90		27.30	73.48
	12/03/90		27.01	73.77
	01/21/91		27.28	74.64
	03/13/91	101.92[3]	27.40	74.52
MW-59	02/12/91	100.37	27.45	72.92
	03/13/91		27.60	72.77
	04/03/91		27.36	73.01

1 Top of Casing
2 Depth measured below top of casing
3 Well head damaged and repaired

Assumed datum: The elevation of the PG&E manhole in Martin Luther King, Jr. Way, near the northwest corner of the block, was assumed to have an elevation of 100 feet (see Plate 1)

IV SITE CONDITIONS

A. Site History

The northwest corner of the intersection of 13th and Jefferson Streets was occupied by the 20th Century Garage from 1930 to 1943. According to individuals who lived in the area, the facility dispensed gasoline. The floor drain sump was located as shown on the Site Plan, Plate 1. The location and ultimate disposition of the fuel tanks is uncertain. To date, we have been unable to locate any information documenting their location or removal. The property was subsequently purchased by the City of Oakland in the early 1940's and used as the Oakland Police Department (OPD) garage. The OPD garage was used to service/fuel city vehicles. Discussions with past city employees confirmed the presence of gasoline storage/dispensing facilities. However, specific details of the tank locations/capacities are unavailable. Unsubstantiated information suggests as many as three 3 fuel tanks existed beneath the site along 13th Street near its intersection with Jefferson Street. Excavations observed by SCI during past remediation activities, revealed sandy backfill and a pipeline extending from the southeast corner of the property below the sidewalks along Jefferson and 13th Streets. The pipes were typical of those used to dispense gasoline from underground tanks. However, no tanks were discovered. The estimated tank locations are shown on Plate 1.

So are the tanks still subsurface? Any tanks removed?

B. Subsurface Conditions

1. Soil Conditions

Our test borings indicate that soil conditions in the area are relatively uniform. The upper 12 to 15 feet of soil consists of clayey sands. These materials are medium dense and contain appreciable quantities of silt and clay. The imported fill used to backfill the remediation excavations consists of clayey sands from the block south of the site. Below the clayey surface layer, the sands contain significantly less silt and clay.

A clay aquitard exists at a depth of approximately 40 feet. This clay is stiff and possesses low permeability. The clay layer has been encountered in other borings in the area at similar depths.

2. Hydrogeologic Conditions

Groundwater was encountered at depths ranging from approximately 26.5 to 29.5 feet below the groundsurface. This depth corresponds to elevations of 72.5 to 75.5 feet (assumed datum). Based on this data, it is apparent that groundwater is flowing toward the north-northwest at an average gradient of about 0.7 percent. The direction of the groundwater flow is shown on Plate 1. This groundwater flow direction and gradient are consistent with those documented during other previous studies in the area. No free-floating hydrocarbon product was observed in any of the wells.

IV ENGINEERING AND ANALYTICAL TESTING

The engineering properties of the materials encountered were evaluated in our laboratory. The testing program included moisture content/dry density, percent passing a #200 sieve (0.074 mm), sieve analyses and permeability tests. The test results are presented on the boring logs. The sieve analysis results are presented on Plate 15. The permeability tests utilized constant head test methods. The results are presented below.

Table 2. Summary of Permeability Test Results

Boring	Depth (feet)	Permeability (cm/sec)	Soil Type
47	28.5	5.0×10^{-4}	Silty Sand (SM/SP)
49	30.5	2.2×10^{-4}	Silty Sand (SM/SP)
54	41.0	1.3×10^{-8}	Sandy Clay (CL)

Groundwater samples were analyzed by Curtis and Tompkins, Ltd., a California Department of Health Services (DHS) certified laboratory. The following analytical methods were utilized:

Total Volatile Hydrocarbons (TVH)	EPA 8015/5030
Total Extractable Hydrocarbons (TEH)	EPA 8015/3550
Oil and Grease (O&G)	SMWW 5520 B & F
Benzene, toluene, xylene, ethylbenzene (BTXE)	EPA 5030/8020

Halogenated Volatile Organics	EPA 8010
Polychlorinated Biphynels (PCBs)	EPA 8080/3510
Polynuclear Aromatics (PNAs)	EPA 8270/3520
Organic Lead	DHS-LUFT
Total Lead	EPA 7420
Ethylene Dibromide	EPA 504

The results of analyses are summarized in Tables 3 through 5. Analytical test reports are presented in the Appendix.

Table 3. Petroleum Hydrocarbon Concentrations in Groundwater

Well	Date	O&G[1] (ug/L)	TVH[2] (ug/L)	TEH[3] (ug/L)	B[4] (ug/L)	T[5] (ug/L)	X[6] (ug/L)	E[7] (ug/L)
MW-44[8]	05/16/87	--	25	--	840	910	2230	480
MW-47	04/06/90	--	ND	--	ND	ND	ND	ND
	10/04/90	--	--	--	ND	ND	ND	ND
	12/03/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
MW-48	04/06/90	--	ND	--	ND	ND	ND	ND
	07/18/90	ND	ND	ND	ND	ND	ND	ND
	10/04/90	--	--	110	ND	ND	ND	ND
	12/03/90	ND	ND	ND	ND	ND	ND	ND
	03/13/91	ND	ND	ND	ND	ND	ND	ND
MW-49	04/06/90	--	ND	--	ND	ND	ND	ND
	12/03/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
MW-51	04/06/90	--	ND	--	ND	ND	ND	ND
	10/04/90	--	--	--	ND	ND	ND	ND
	12/04/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
MW-52	04/06/90	--	ND	--	ND	ND	ND	ND
	10/04/90	--	--	--	ND	ND	ND	ND
	12/04/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
MW-53	09/21/90	--	ND	--	ND	ND	ND	ND
	10/04/90	--	ND	--	ND	ND	ND	ND
	12/04/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
MW-54	09/21/90	--	1700	--	ND	1.5	20	1.9
	10/04/90	--	1300	--	ND	0.7	12	28
	12/04/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
MW-59	03/13/91	--	ND	--	ND	ND	ND	ND

---

1 Oil and Grease
2 Total Volatile Hydrocarbons
3 Total Extractable Hydrocarbons
4 Benzene
5 Toluene
6 Xylene
7 Ethylbenzene
8 Destroyed during soil remediation

Table 4. Volatile Organic Chemical Concentrations in Groundwater

Well	Date	1,2 DCA[1] (ug/L)[3]	1,2 DCE[2] (ug/L)	Chloroform (ug/L)	Other EPA 8010 (ug/L)
MW-29	01/04/91	ND[4]	ND	ND	ND
MW-31	01/04/91	ND	ND	10	ND
MW-45	01/04/91	ND	ND	ND	ND
MW-46	01/04/91	ND	ND	ND	ND
MW-47	12/03/90	ND	11	ND	ND
	01/04/91	16	ND	ND	ND
	03/13/91	6.7	ND	ND	ND
MW-48	10/04/90	60	ND	ND	ND
	12/03/90	31	ND	ND	ND
	01/04/91	15	ND	ND	ND
	03/13/91	30	ND	ND	ND
MW-49	12/03/90	ND	ND	ND	ND
	03/03/91	ND	ND	ND	ND
MW-51	12/04/90	ND	ND	ND	ND
MW-52	12/04/90	ND	ND	1.3	ND
MW-53	10/04/90	ND	ND	1.2	ND
	12/04/90	ND	ND	1.9	ND
	03/13/91	ND	ND	2.0	ND
MW-54	10/04/90	ND	ND	1.6	ND
	12/04/90	ND	ND	1.5	ND
	01/04/91	ND	ND	ND	ND
	03/13/91	ND	ND	ND	ND
MW-59	03/13/91	ND	ND	ND	ND
	04/03/91	ND	ND	ND	ND

1 1,2 Dichloroethane
2 1,2 Dichloroethene
3 Micrograms/liter = parts per billion
4 None detected

Table 5. Contaminant Concentrations in Groundwater

Well	Date	PCB's[1] (ug/l)[3]	PNA's[2] (ug/l)	Total Lead (ug/l)	Organic Lead (ug/l)	Ethylene Dibromide (ug/l)
MW-47	10/04/90	--[4]	ND[5]	ND	--	--
MW-48	10/04/90	ND	ND	ND	--	--
	12/03/90	ND	--	--	--	--
MW-53	10/04/90	--	--	ND	ND	ND
	03/03/91	--	--	ND	--	ND
MW-54	10/04/90	--	ND	ND	ND	ND
	03/03/91	--	--	ND	--	ND

1 Polychlorinated Biphenyls, EPA Method 8080/3510
2 Polynuclear aromatic hydrocarbons, EPA Method 8270/3520
3 Micrograms/liter = parts per billion
4 Test not requested
5 None detected

V CONCLUSIONS

A. General

Our investigation indicates that gasoline and the volatile constituents of gasoline, i.e., benzene, toluene, xylene and ethylbenzene (BTXE) are no longer present in the groundwater at the 13th and Jefferson site at concentrations above the analytical detection limits. It appears that the excavation of gasoline contaminated soils at the site has successfully eliminated the (gasoline source.) The true source may be USTs we haven't been removed (see p. 7).

Relatively low concentrations of 1,2-dichloroethane (DCA) have been detected in Monitoring Wells 47 and 48. It is likely that the source of the DCA contamination was the leaking floor drain sump. Trace levels of chloroform were also detected in several of the monitoring wells. 1,2-Dichloroethene (DCE) was detected in Well 47 at a concentration of 11 mg/l on December 3, 1990. However, only DCA has been detected in the well since. We suspect that its presence may be associated with an analytical inconsistency. Our conclusions regarding gasoline and sump releases are discussed in more detail in the following sections.

B. 13th and Jefferson Gasoline Release

Gasoline contaminated soil and groundwater were detected during our previous investigations. Based on our observations during remediation, we estimate that the previous tank release areas are as indicated on Plate 1. Following soil remediation, monitoring wells were installed within the remediation area, and up and down gradient of the excavation to monitor groundwater quality.

Groundwater samples obtained from Monitoring Well 54 in September and October, 1990, contained low concentrations of gasoline and BTXE. The hydrocarbon concentrations were observed to decrease. The latest analytical data indicates that gasoline and its soluble constituents are currently not present in groundwater at concentrations above the analytical detection limits.

C. Floor Drain Sump Release

A floor drain sump previously existed adjacent to Monitoring Well 48 at the location shown on Plate 1. DCA concentrations ranging up to 60 ug/l have been detected in MW-48 with significantly lower concentrations in MW-47. MW-59 which is approximately 155 feet downgradient of the sump contains no detectible concentrations of DCA. Upgradient wells did not contain detectable concentrations of DCA.

Based on the analytical data generated to date, we estimate that the approximate extent of the dissolved product plume is that shown on Plate 1. The data suggests that the DCA plume extends not more than approximately 150 feet downgradient of the previous sump.

The contaminated soils beneath the sump were removed by excavation. DCA was not detected in the soil samples obtained to characterize the sump contamination problem. Consequently, the source of the DCA contamination is currently uncertain. In our opinion, it could be associated with sump releases having leached from the soil into groundwater or possibly be from the gasoline release because DCA is a minor constituent of some gasolines. However, given the lateral distribution of groundwater contamination, we judge that the sump is the most likely source of DCA groundwater contamination.

The DCA concentrations detected in groundwater exceed DHS action levels for drinking water (0.5 ug/l). The scope of any groundwater remediation will have to be negotiated with the RWQCB.

Trace levels of chloroform were detected in Monitoring Wells 31, 52, 53 and 54. The chloroform concentrations were well below the State of California maximum contamination level of 100 ug/l for drinking water. The source of chloroform, although unknown at this time, does not appear to be on-site. Because of the low concentrations, remediation and/or further study will likely not be required by the regulatory agencies.

D. Groundwater Remediation

Based on our investigation, we judge that the soil and groundwater contamination associated with the gasoline release near the intersection of 13th and Jefferson Streets has been adequately remediated and no further remedial actions are appropriate at this time. However, it may be necessary to initiate remediation of DCA contaminated groundwater downgradient of the previous floor drain sump. Since the City of Oakland Redevelopment Agency has a water treatment facility currently in operation on the site, we judge that from a cost standpoint it will be most appropriate to initiate groundwater remediation. We judge that the most appropriate remediation method will involve installing a groundwater extraction well downgradient of Well 48, removing water from the well by pumping, and treating the contaminated groundwater at the existing facility utilizing activated carbon filtering methods.

E. Future Monitoring

Groundwater quality monitoring should continue on a quarterly basis. We propose that future sampling be performed on Wells 47, 48, 49, 51, 52, 53, 54, and 59. We propose to delete Wells 29, 31, 45 and 46 from the monitoring program since it appears that the problem does not extend into this area. The water samples should be analyzed for total volatile hydrocarbons (EPA 8015), BTEX (EPA 8020), and volatile organic chemicals (EPA 8010).

List of Attached Plates:

Plate 1	Site Plan
Plate 2 thru 13	Logs of Borings 29, 31, 45 thru 49, 51 thru 54, and 59
Plate 14	Unified Soil Classification System
Plate 15	Particle Size Analysis

Appendix: Laboratory Test Reports
Chain-of-Custody Documents

Distribution:

1 copy: Mr. John Esposito
Bramalea Pacific
1221 Broadway, Suite 1800
Oakland, California 94612

1 copy: Ms. Lois Parr
City of Oakland Redevelopment Agency
1333 Broadway
Suite 900
Oakland, California 94612

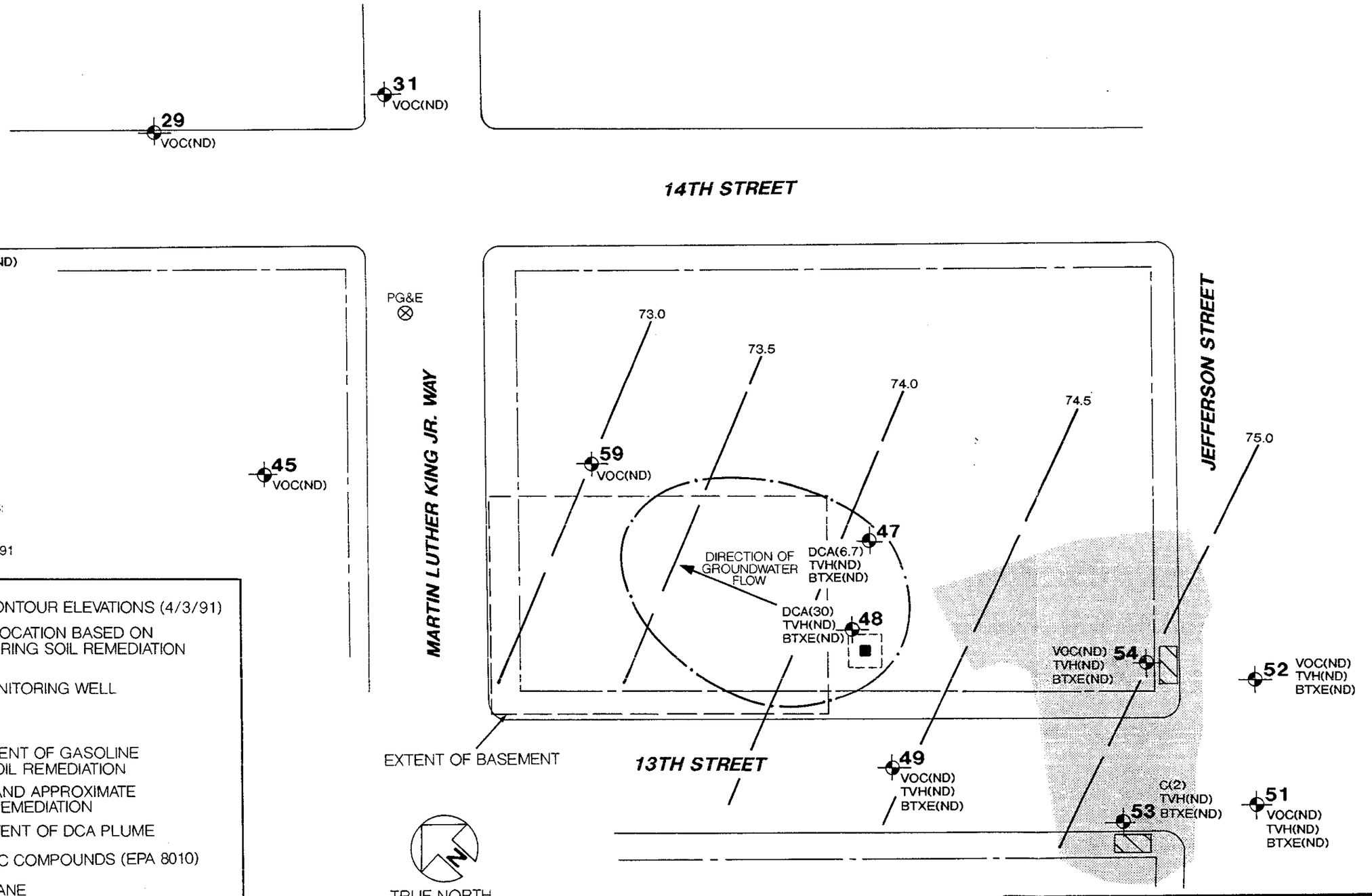
2 copies: Mr. Paul Smith
Alameda County Health Care Services Agency
80 Swan Way, Suite 200
Oakland, California 94621

1 copy: Mr. Lester Feldman
Regional Water Quality Control Board
1800 Harrison, Suite 700
Oakland, California 94612

1 copy: Mr. Donnell Choy
City of Oakland
505 14th Street, 12th Floor
Oakland, California 94612

1 copy: Mr. Roy Ikeda
Crosby, Heafey, Roach & May
1999 Harrison Street
Oakland, California 94612

SOC:JPB:RWR:sld



GROUNDWATER SAMPLING DATES:
WELLS 51,52 12/4/90
WELLS 29,31,45,46 1/4/91
WELLS 47,48,49,53,54,59 3/12/91

73.0	GROUNDWATER CONTOUR ELEVATIONS (4/3/91)
	PROBABLE TANK LOCATION BASED ON OBSERVATIONS DURING SOIL REMEDIATION
	TEST BORING/MONITORING WELL
	PROPERTY LINE
	APPROXIMATE EXTENT OF GASOLINE CONTAMINATED SOIL REMEDIATION
	PREVIOUS SUMP AND APPROXIMATE EXTENT OF SOIL REMEDIATION
	APPROXIMATE EXTENT OF DCA PLUME
VOC	VOLATILE ORGANIC COMPOUNDS (EPA 8010)
DCA	1,2 DICHLOROETHANE
C	CLOROFORM
TVH	TOTAL VOLATILE HYDROCARBONS
BTXE	BENZENE, TOLUENE, XYLENES, ETHYLBENZENE
ND	NONE DETECTED

TRUE NORTH

REFERENCE NORTH

APPROXIMATE SCALE (feet)
0 50 100

SITE PLAN

Subsurface Consultants

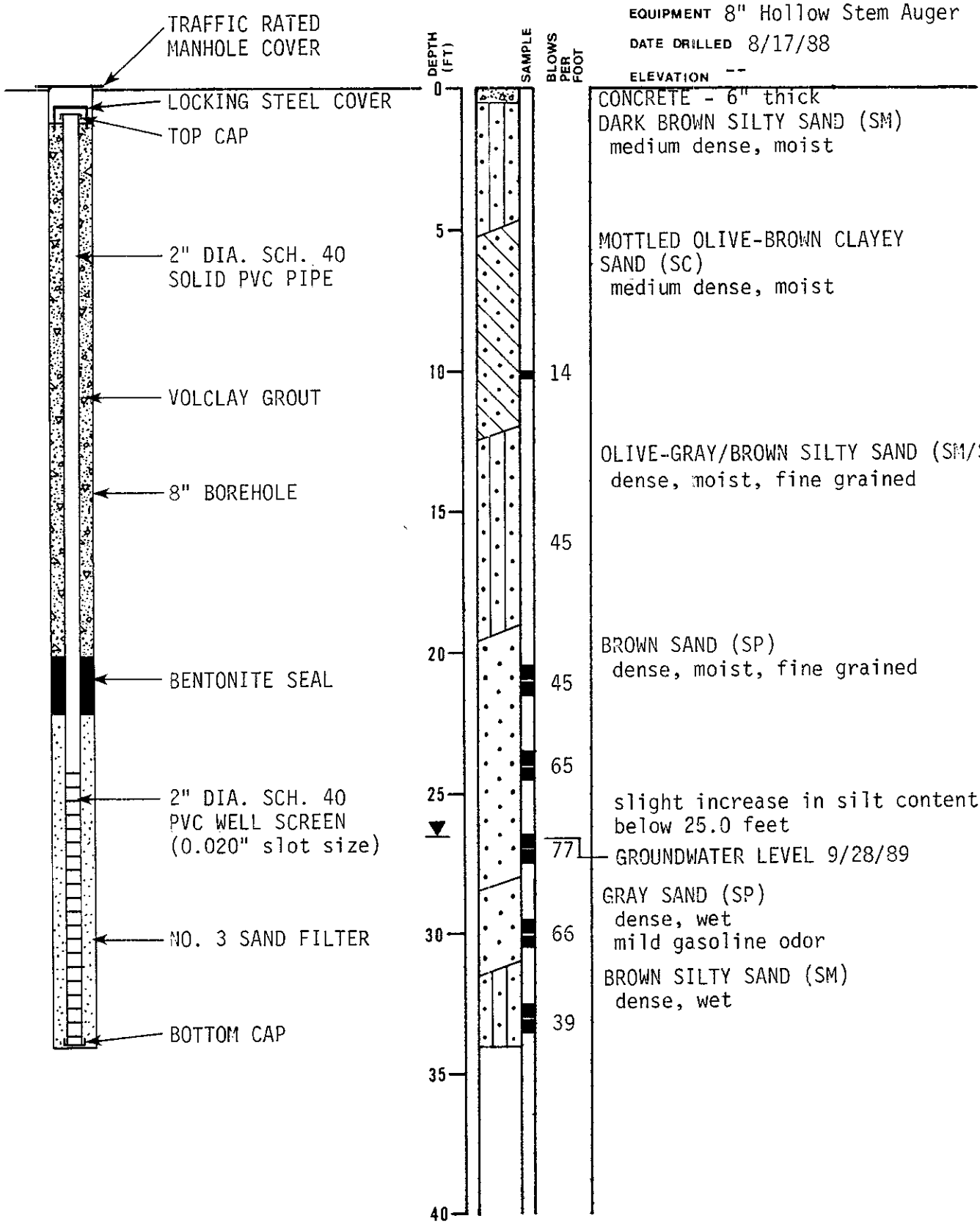
13TH & JEFFERSON – OAKLAND, CA

JOB NUMBER	DATE	APPROVED
430.013	3/27/91	

PLATE 1

LOG OF TEST BORING 29

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 8/17/88
ELEVATION --



Subsurface Consultants

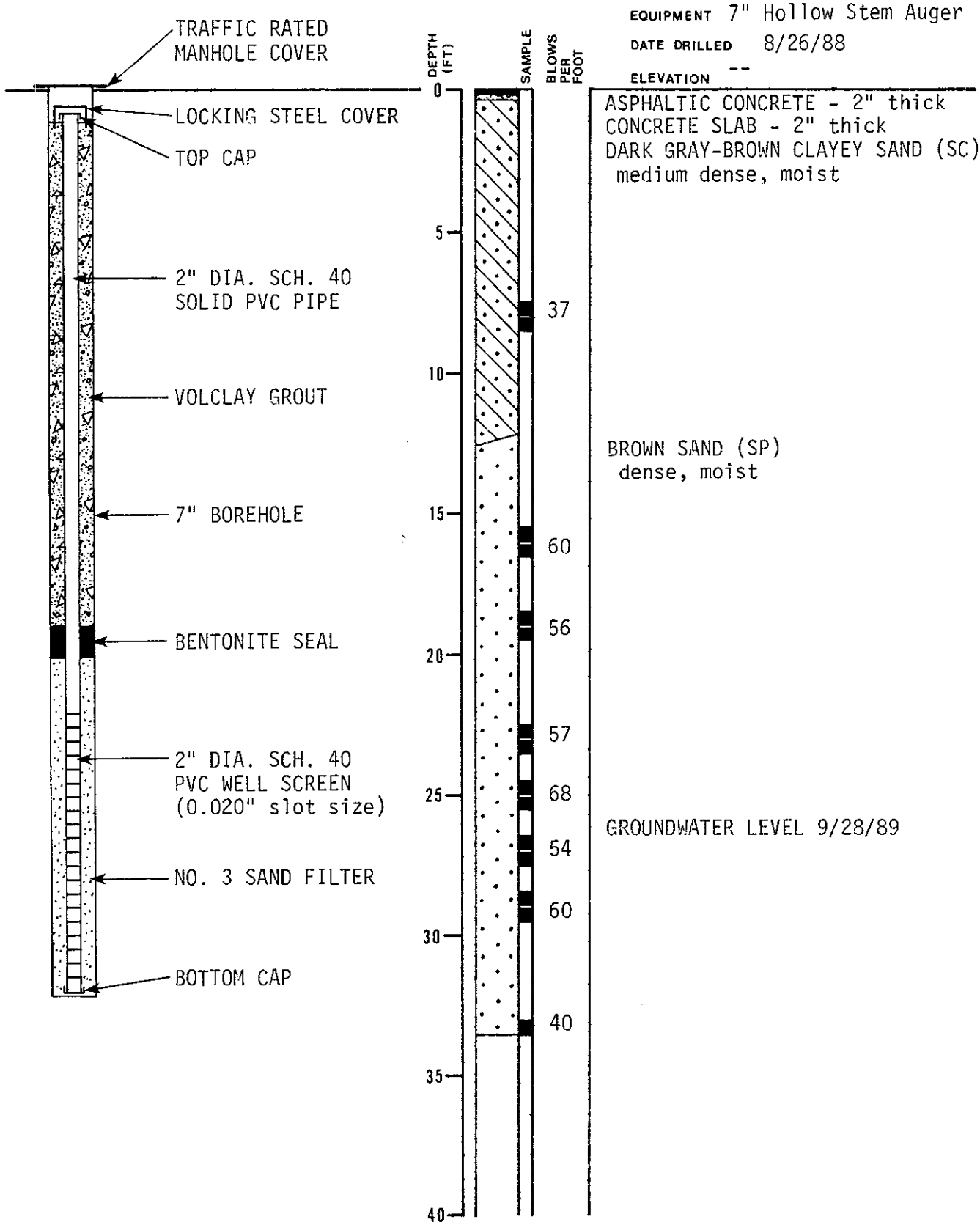
1330 MARTIN LUTHER KING, JR. WAY - OAK.

JOB NUMBER	DATE	APPROVED
430.002	9/6/88	

PLATE 2

LOG OF TEST BORING 31

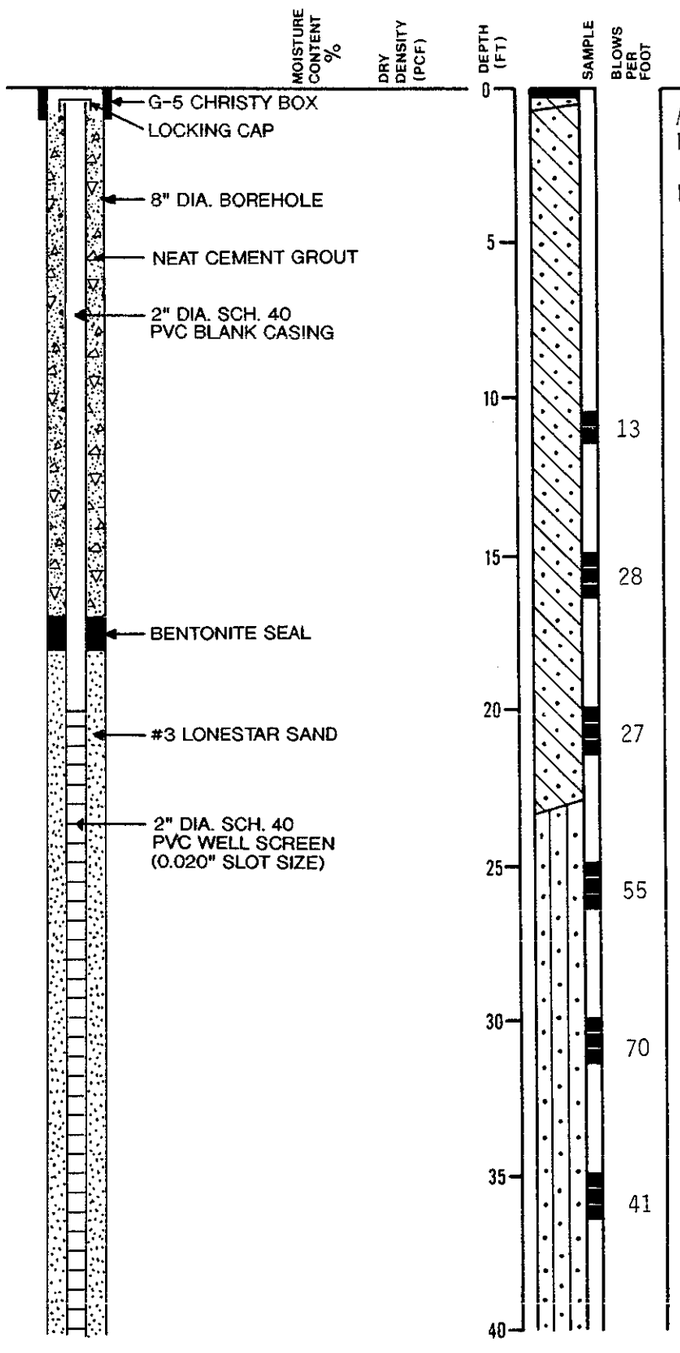
EQUIPMENT 7" Hollow Stem Auger
DATE DRILLED 8/26/88
ELEVATION --



Subsurface Consultants	1330 MARTIN LUTHER KING, JR. WAY - OAK.			PLATE
	JOB NUMBER	DATE	APPROVED	3
	430.002	9/6/88		

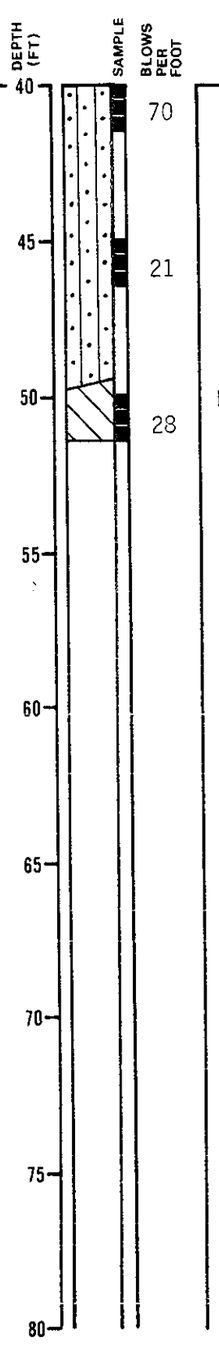
LOG OF TEST BORING 45

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 12/1/89
ELEVATION 100.90 feet



ASPHALTIC CONCRETE - 4" thick
BROWN CLAYEY SAND (SC)
medium dense, moist
BROWN CLAYEY SAND (SC)
medium dense, moist

BROWN SILTY SAND (SM-SP)
dense, moist



LIGHT BROWN SANDY CLAY (CL)
stiff, moist

Subsurface Consultants

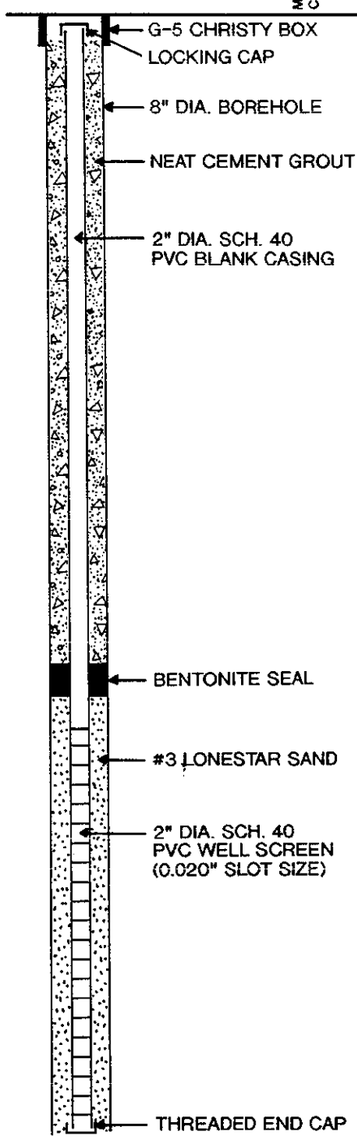
MARTIN LUTHER KING JR. WAY & 14TH

JOB NUMBER	DATE	APPROVED
430.010	3/7/91	

PLATE 4

LOG OF TEST BORING 46

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 11/28/89
ELEVATION 98.11 feet



MOISTURE CONTENT %	DRY DENSITY (PCF)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	
		0			CONCRETE SLAB - 3" thick
					LIGHT BROWN SAND (SP)
					medium dense, moist
					DARK BROWN CLAYEY SAND (SC)
					medium dense, moist
		5			BROWN CLAYEY SAND (SC)
					medium dense, moist
		10		17	
		15		37	clay content varies
		20		37	
		25		59	BROWN SILTY SAND (SM-SP)
					very dense, wet
				93/ 11"	GROUNDWATER LEVEL DURING DRILLING
		30		61	
		35		86	
		40			
		40		71	heaving sands during drilling
		45			
		50			
		55			
		60			
		65			
		70			
		75			
		80			

Subsurface Consultants

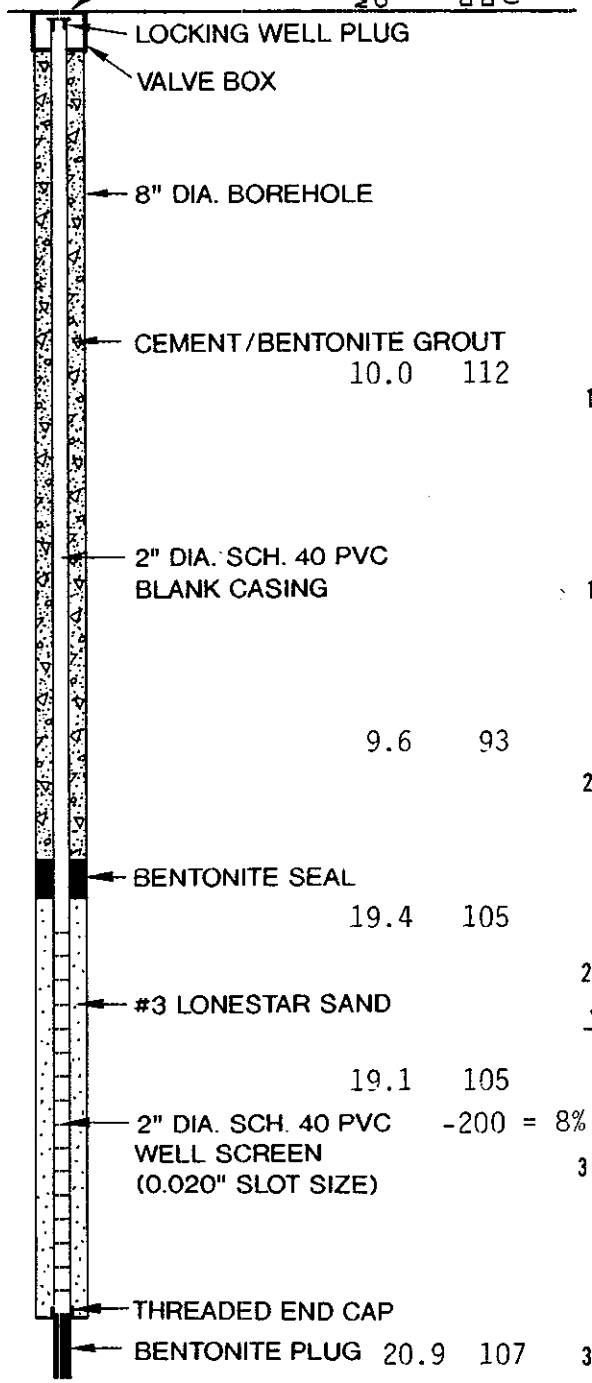
MARTIN LUTHER KING JR. WAY & 14TH

JOB NUMBER	DATE	APPROVED
430.010	3/7/91	

PLATE 5

LOG OF TEST BORING 47

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 3/15/90
TOC ELEVATION 100.50 feet



MOISTURE CONTENT %	DRY DENSITY (PCF)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	
		0			ASPHALTIC CONCRETE - 2" thick CONCRETE SLAB - 4" thick GRAY SILTY GRAVELLY SAND (SM) medium dense, moist (fill)
		5			GRAY-BROWN CLAYEY SAND (SC) dense, moist, fine to medium grained sand (fill)
					RED-BROWN CLAYEY SAND (SC) very dense, moist
10.0	112	10		77	contains silty lenses
9.6	93	15		76	color change to mottled gray and brown
		20			GRAY-BROWN SILTY SAND (SM-SP) dense, wet
19.4	105	25		50/ 5½"	
				50/ 5"	GROUNDWATER LEVEL 4/20/90
19.1	105			50/ 5"	
-200 = 8%		30			K = 5.0 x 10^{-4} cm/sec
20.9	107	35		50/ 4½"	
		40			

-200 = % passing #200 sieve (0.074mm)

SAMPLER TYPE:
CALIFORNIA DRIVE
O.D.: 2.5 inches I.D.: 2.0 inches
HAMMER WEIGHT: 140 pounds
HAMMER DROP: 30 inches

Subsurface Consultants

13th & JEFFERSON - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
430.003	4/19/90	

PLATE 6

LOG OF TEST BORING 48

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 3/15/90
ELEVATION 102.40 feet

WELL DETAILS see Test Boring 47

MOISTURE CONTENT %	DRY DENSITY (PCF)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	
		0			BROWN SILTY SAND (SM) loose to medium dense, with brick fragments and rubble (fill)
					BROWN CLAYEY SAND (SC) loose to medium dense, moist (fill)
		5			
		10			
11.4	100			11	
					BROWN CLAYEY SAND (SC) dense, moist
		15			
		20			
28.1	87			64	decrease in clay content
		25			
				95	GRAY-BROWN SILTY SAND (SM-SP) very dense, moist
				50/ 4½"	
			▼		GROUNDWATER LEVEL 4/20/90
		30		50/ 5"	
		35		50/ 5"	
		40			

Subsurface Consultants

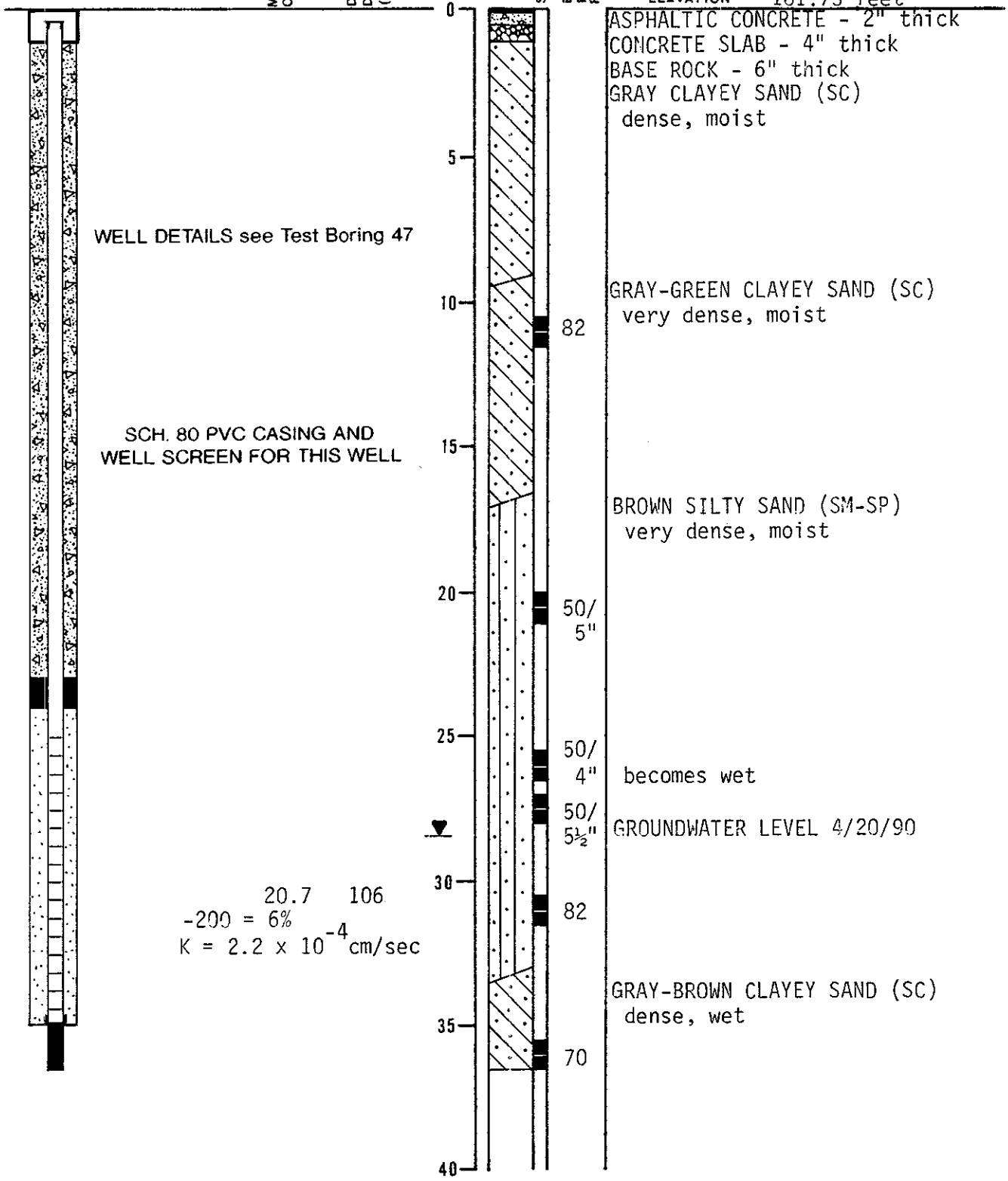
13th & JEFFERSON - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
430.003	4/23/90	

PLATE 7

LOG OF TEST BORING 49

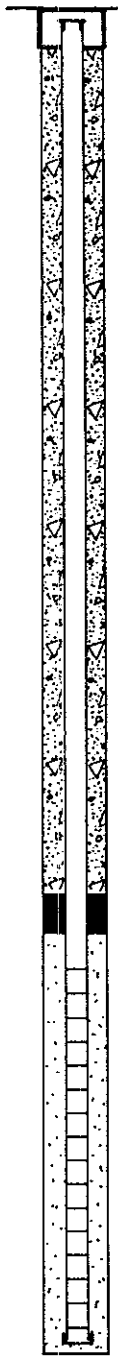
EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 3/15/90
ELEVATION 101.73 feet



Subsurface Consultants	13th & JEFFERSON - OAKLAND, CA			PLATE
	JOB NUMBER	DATE	APPROVED	8
	430.003	4/23/90		

LOG OF TEST BORING 51

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 3/20/90
ELEVATION 102.64 feet



WELL DETAILS see Test Boring 47

MOISTURE CONTENT %	DRY DENSITY (PCF)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	
		0			ASPHALTIC CONCRETE - 4" thick CONCRETE SLAB - 4" thick BASE ROCK - 6" thick BROWN CLAYEY GRAVELLY SAND (SC) medium dense, moist (fill)
		5			BROWN CLAYEY SAND (SC) medium dense, moist
		10			
		15			
		20			BROWN SILTY SAND (SM-SP) very dense, moist
		25		80	
					becomes wet
					GROUNDWATER LEVEL 4/20/90
15.1	115	30		50/5"	
		35		83	
		40			

Subsurface Consultants

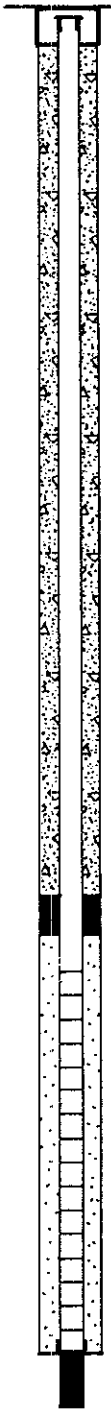
13th & JEFFERSON - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
430.003	4/23/90	

PLATE 9

LOG OF TEST BORING 52

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 3/20/90
ELEVATION 102.44 feet



WELL DETAILS see Test Boring 47

MOISTURE CONTENT %	DRY DENSITY (PCF)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	
		0			ASPHALTIC CONCRETE - 4" thick CONCRETE SLAB - 8" thick BROWN SILTY SAND (SM) medium dense, moist
		5			
		10			BROWN CLAYEY SAND (SC) medium dense, moist
		15		73	
		20		50/5"	GRAY-GREEN SILTY SAND (SM-SP) very dense, moist
		25		73	
		30		50/5"	GROUNDWATER LEVEL 4/20/90
20.6	104				
		35		50/5"	decrease in silt content
-200 = 5% 19.5	106				
		40			

Subsurface Consultants

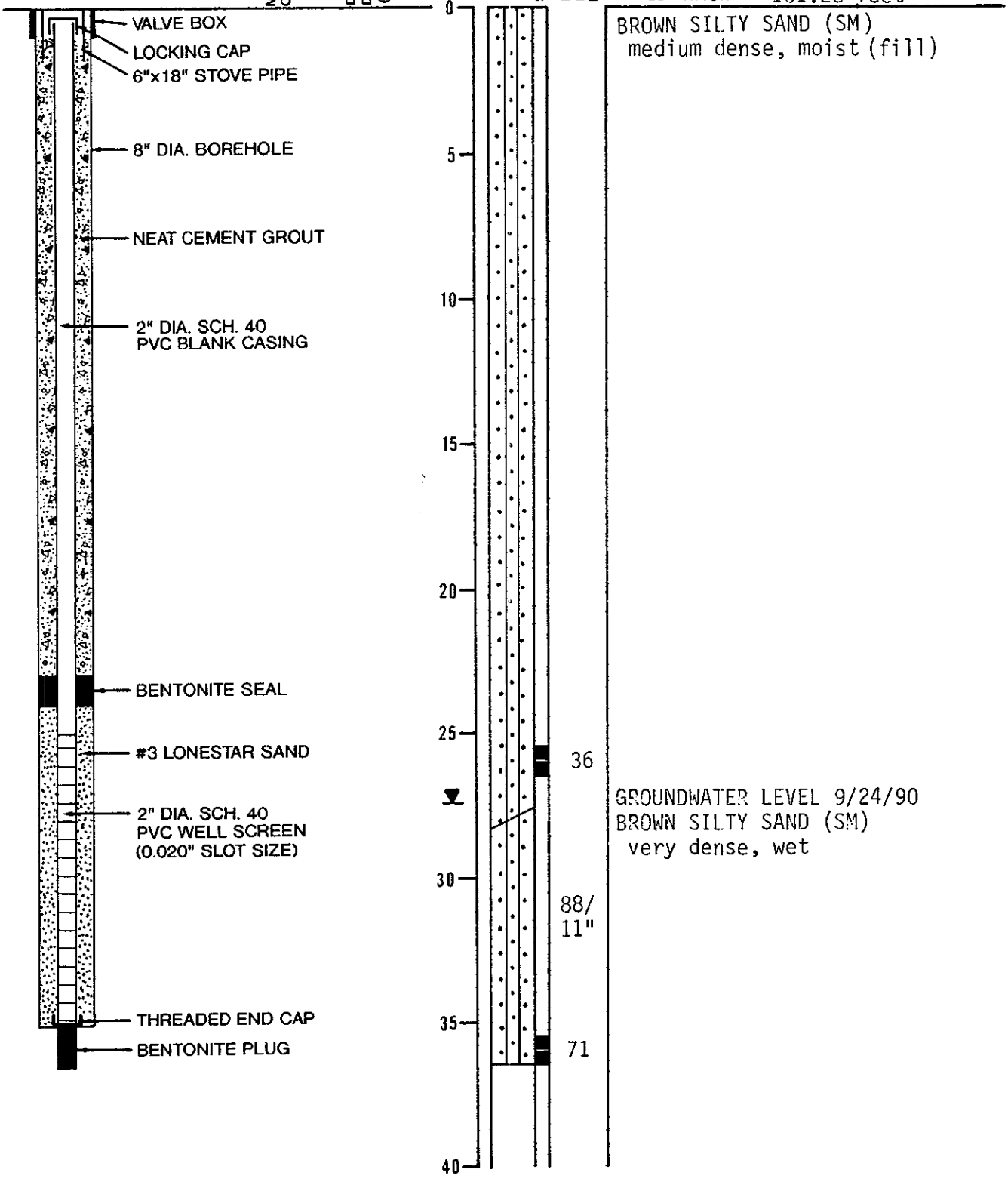
13th & JEFFERSON - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
430.003	4/23/90	

PLATE 10

LOG OF TEST BORING 53

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 9/19/90
ELEVATION 101.28 feet



Subsurface Consultants

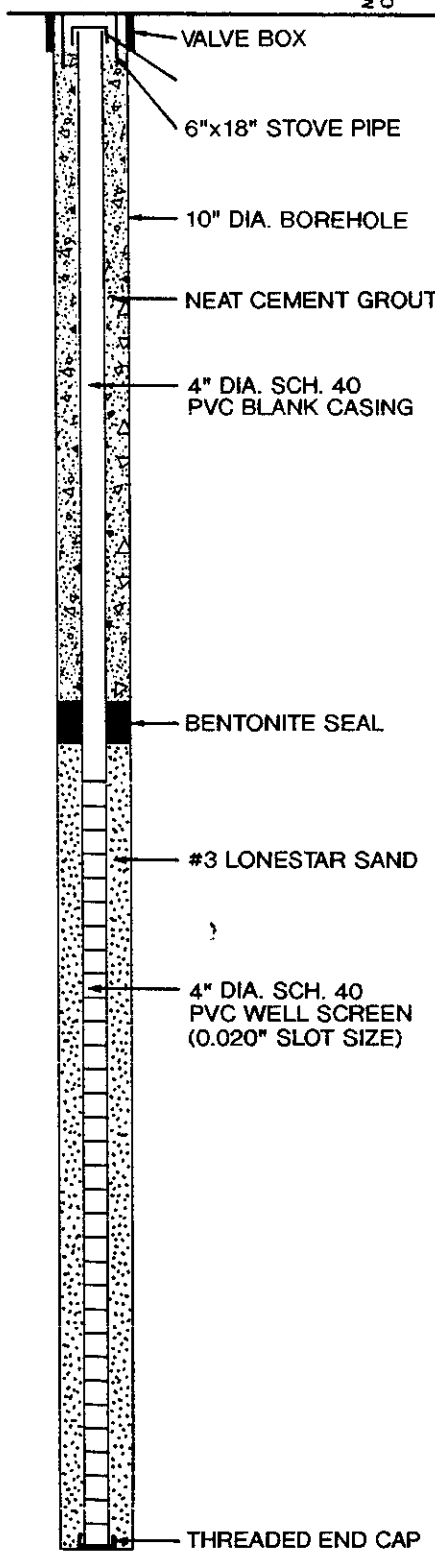
13TH & JEFFERSON - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
430.003	12/6/90	

PLATE 11

LOG OF TEST BORING 54

EQUIPMENT 10" Hollow Stem Auger
DATE DRILLED 9/19/90
TOC ELEVATION 101.92 feet



MOISTURE CONTENT %	DRY DENSITY (PCF)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	
		0			BROWN SILTY SAND (SM) medium dense, moist (fill)
		5			
		10			
		15			concrete debris at 16 feet
		20			
		25		41	GROUNDWATER LEVEL 9/24/90
		30		28	
		35		54	BROWN SILTY SAND (SM-SP) very dense, wet
		40			
		40			BENTONITE PLUG K=1.3x10^{-8}cm/sec
		45			
		50			
		55			
		60			
		65			
		70			
		75			
		80			
				23	BROWN SANDY CLAY (CL) stiff, moist

Subsurface Consultants

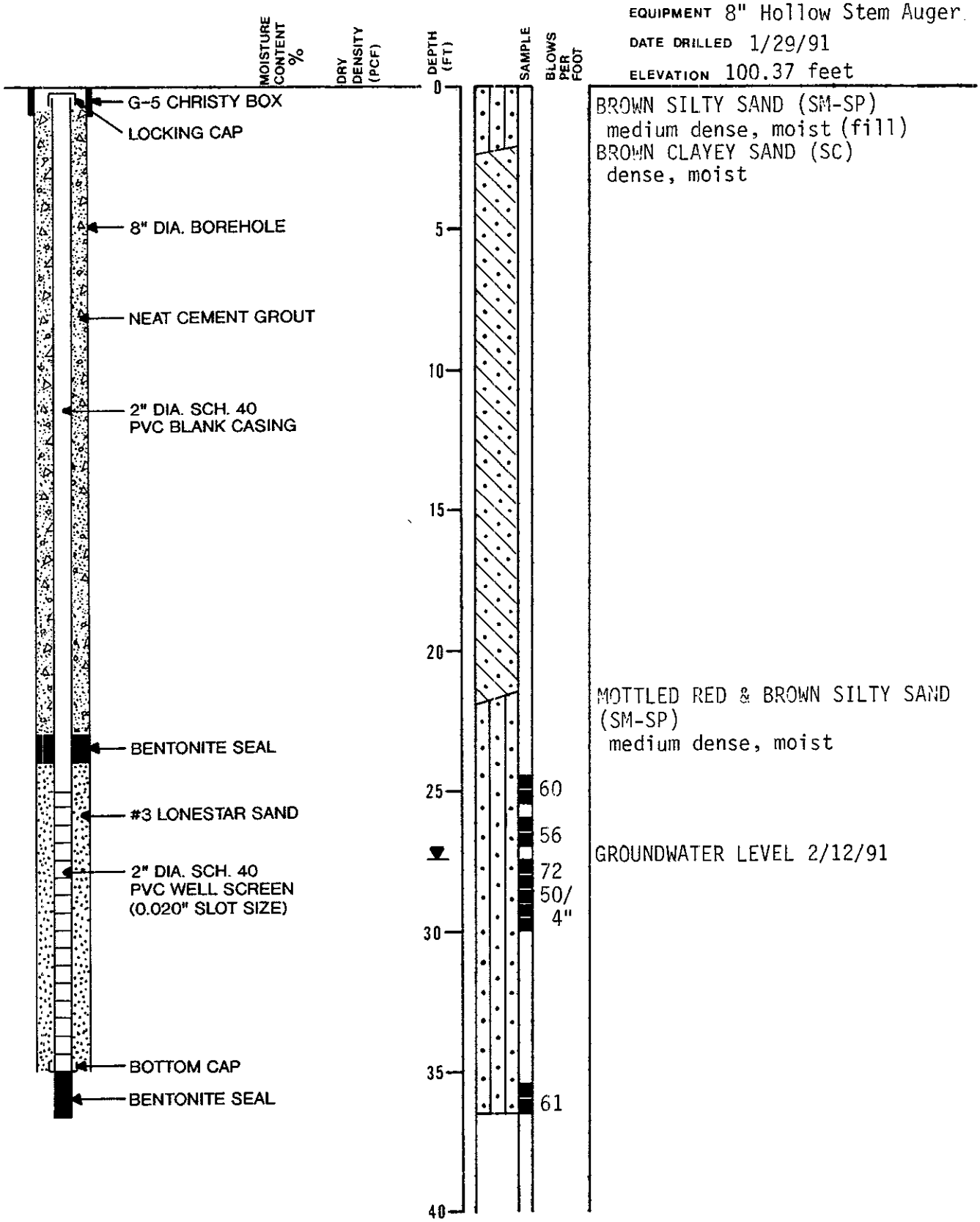
1330 MARTIN LUTHER KING, JR. WAY - OAK

JOB NUMBER 430.003 | DATE 12/6/90 | APPROVED

PLATE 12

LOG OF TEST BORING 59

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 1/29/91
ELEVATION 100.37 feet



Subsurface Consultants

13TH & JEFFERSON - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
430.013	2/28/91	

PLATE 13

GENERAL SOIL CATEGORIES			SYMBOLS	TYPICAL SOIL TYPES
COARSE GRAINED SOILS More than half is larger than No. 200 sieve	GRAVEL More than half coarse fraction is larger than No. 4 sieve size	Clean Gravel with little or no fines	GW	Well Graded Gravel, Gravel-Sand Mixtures
			GP	Poorly Graded Gravel, Gravel-Sand Mixtures
		Gravel with more than 12% fines	GM	Silty Gravel, Poorly Graded Gravel-Sand-Silt Mixtures
			GC	Clayey Gravel, Poorly Graded Gravel-Sand-Clay Mixtures
	SAND More than half coarse fraction is smaller than No. 4 sieve size	Clean sand with little or no fines	SW	Well Graded Sand, Gravelly Sand
			SP	Poorly Graded Sand, Gravelly Sand
		Sand with more than 12% fines	SM	Silty Sand, Poorly Graded Sand-Silt Mixtures
			SC	Clayey Sand, Poorly Graded Sand-Clay Mixtures
FINE GRAINED SOILS More than half is smaller than No. 200 sieve	SILT AND CLAY Liquid Limit Less than 50%		ML	Inorganic Silt and Very Fine Sand, Rock Flour, Silty or Clayey Fine Sand, or Clayey Silt with Slight Plasticity
			CL	Inorganic Clay of Low to Medium Plasticity, Gravelly Clay, Sandy Clay, Silty Clay, Lean Clay
			OL	Organic Clay and Organic Silty Clay of Low Plasticity
	SILT AND CLAY Liquid Limit Greater than 50%		MH	Inorganic Silt, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silt
			CH	Inorganic Clay of High Plasticity, Fat Clay
			OH	Organic Clay of Medium to High Plasticity, Organic Silt
HIGHLY ORGANIC SOILS			PT	Peat and Other Highly Organic Soils

UNIFIED SOIL CLASSIFICATION SYSTEM

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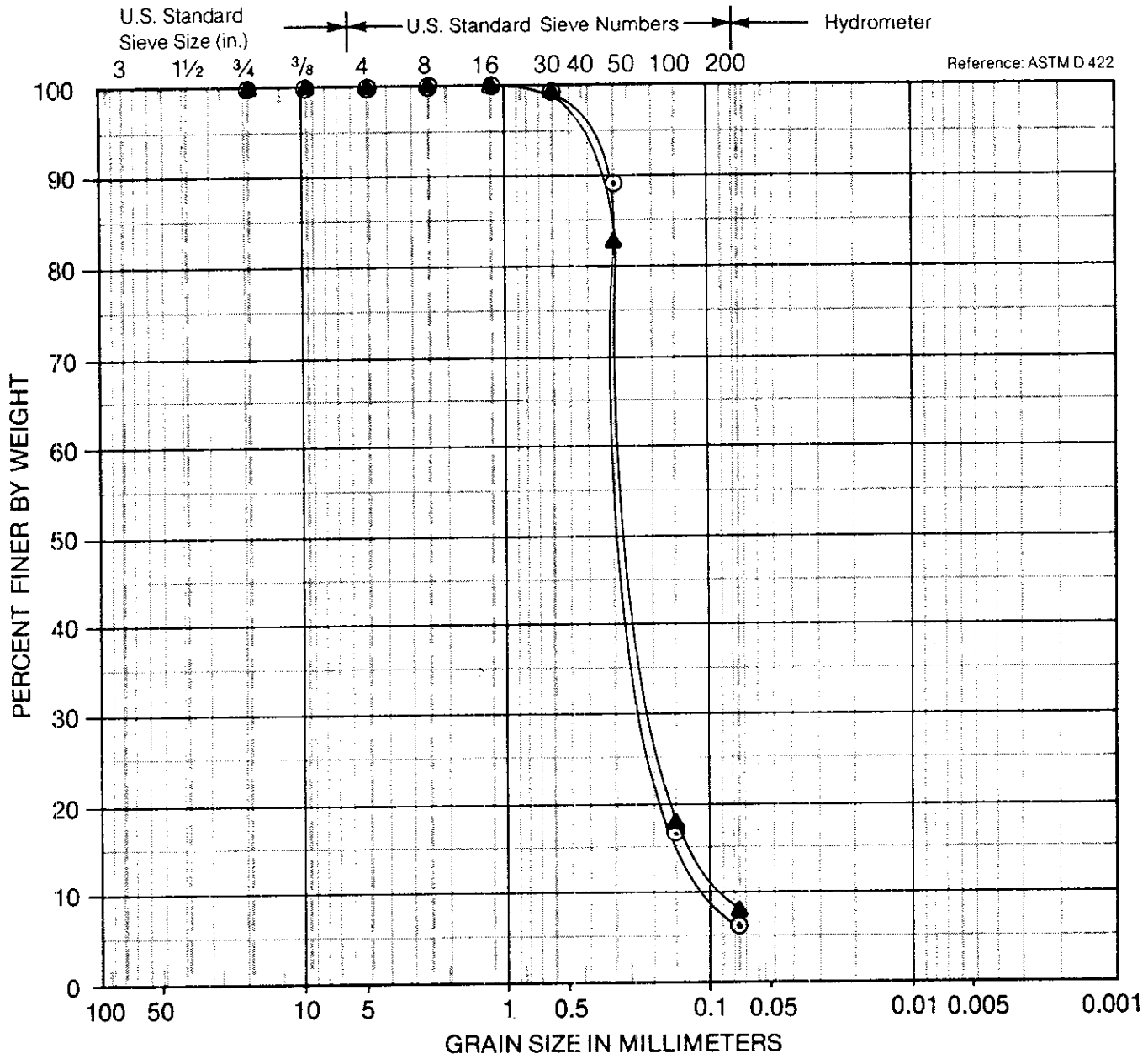
13TH & JEFFERSON - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
430.013	4/5/91	

PLATE 14



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Sample Source	Classification
◭	Boring 47 @ 29.0'	BROWN SILTY SAND (SM-SP)
⊙	Boring 49 @ 31.0'	BROWN SILTY SAND (SM-SP)

PARTICLE SIZE ANALYSIS

Subsurface Consultants

13TH & JEFFERSON - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
430.013	4/5/91	

PLATE 15

Appendix

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

DATE RECEIVED: 04/09/90
DATE REPORTED: 04/13/90

LAB NUMBER: 100116

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 5 WATER SAMPLES

PROJECT #: 430.003
LOCATION: 13TH & JEFFERSON

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

LABORATORY NUMBER: 100116
CLIENT: SUBSURFACE CONSULTANTS
JOB NUMBER: 430.003
JOB LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 04/09/90
DATE ANALYZED: 04/12/90
DATE REPORTED: 04/13/90

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

LAB ID	CLIENT ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
100116-1	47	ND(50)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
100116-2	48	ND(50)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
100116-3	49	ND(50)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
100116-4	51	ND(50)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
100116-5	52	ND(50)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)

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

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	108

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

DATE RECEIVED: 09/24/90
DATE REPORTED: 09/25/90

LAB NUMBER: 101723

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 2 WATER SAMPLES

PROJECT #: 430.003
LOCATION: 13TH & JEFFERSON

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101723
CLIENT: SUBSURFACE CONSULTANTS
JOB NUMBER: 430.003
JOB LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 09/24/90
DATE ANALYZED: 09/24/90
DATE REPORTED: 09/25/90

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

LAB ID	CLIENT ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
101723-1	MW-53	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
101723-2	MW-54	1,700	ND(0.5)	1.5	1.9	20

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

QA/QC SUMMARY	
RPD, %	5
RECOVERY, %	104

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

DATE RECEIVED: 10/04/90
DATE REPORTED: 10/11/90

LAB NUMBER: 101834

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 2 WATER SAMPLES

PROJECT #: 430.003
LOCATION: 13TH & JEFFERSON

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101834
CLIENT: SUBSURFACE CONSULTANTS
JOB NUMBER: 430.003
JOB LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/05/90
DATE REPORTED: 10/05/90

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

LAB ID	CLIENT ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
101834-1	MW-54	1,300	ND(0.5)	0.7	2.8	12
101834-2	MW-53	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

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

QA/QC SUMMARY

RPD, %	1
RECOVERY, %	94

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101834
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/04/90
DATE REPORTED: 10/08/90

ANALYSIS: LEAD
ANALYSIS METHOD: EPA 7420

LAB ID	CLIENT ID	RESULT	UNITS	REPORTING LIMIT
101834-1	MW-54	ND	mg/L	0.05
101834-2	MW-53	ND	mg/L	0.05

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	<1
RECOVERY, %	99

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101834
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/04/90
DATE REPORTED: 10/08/90

ANALYSIS: ORGANIC LEAD
ANALYSIS METHOD: EPA 7420
METHOD: CA DHS METHOD, LUFT MANUAL OCT 1989

LAB ID	CLIENT ID	RESULT	UNITS	REPORTING LIMIT
101834-1	MW-54	ND	mg/L	0.1
101834-2	MW-53	ND	mg/L	0.1

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	102

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101834-1
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 430.003 - 13TH & JEFFERSON
SAMPLE ID: WM-54

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/05/90
DATE REPORTED: 10/11/90

POLYNUCLEAR AROMATIC HYDROCARBONS IN WATER BY EPA METHOD 8270

COMPOUND	RESULTS ug/L	REPORTING LIMIT ug/L
Naphthalene	ND	5.0
Acenaphthylene	ND	5.0
Acenaphthene	ND	5.0
Fluorene	ND	5.0
Phenanthrene	ND	5.0
Anthracene	ND	5.0
Pyrene	ND	5.0
Benzo(a)anthracene	ND	5.0
Chrysene	ND	5.0
Benzo(b)fluoranthene	ND	5.0
Benzo(k)fluoranthene	ND	5.0
Fluoranthene	ND	5.0
Benzo(a)pyrene	ND	5.0
Indeno(1,2,3-cd)pyrene	ND	5.0
Dibenzo(a,h)anthracene	ND	5.0
Benzo(ghi)perylene	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SURROGATE RECOVERY

Nitrobenzene-d5	68 %
2-Fluorobiphenyl	63 %
Terphenyl-d14	51 %

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101834
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/09/90
DATE REPORTED: 10/09/90

ANALYSIS: ETHYLENE DIBROMIDE
ANALYSIS METHOD: AB 1803

LAB ID	CLIENT ID	RESULT	UNITS	REPORTING LIMIT
101834-1	MW-54	ND	ug/L	0.05
101834-2	MW-53	ND	ug/L	0.05

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	107

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101834-1
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
SAMPLE ID: MW-54

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/04/90
DATE REPORTED: 10/08/90

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	1.6	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	88

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101834-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
SAMPLE ID: MW-53

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/04/90
DATE REPORTED: 10/08/90

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	1.2	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	88

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

DATE RECEIVED: 10/04/90
DATE REPORTED: 10/16/90

LAB NUMBER: 101842

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 4 WATER SAMPLES

PROJECT #: 430.003
LOCATION: 13TH & JEFFERSON

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101842
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 430.003
LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 10/04/90
DATE EXTRACTED: 10/16/90
DATE ANALYZED: 10/17/90
DATE REPORTED: 10/16/90

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

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT (ug/L)
101842-2	48	ND	110	50

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	7
RECOVERY, %	82

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101842
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/09/90
DATE REPORTED: 10/16/90

ANALYSIS: LEAD
ANALYSIS METHOD: EPA 7420

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
101842-1	47	ND	mg/L	0.05
101842-2	48	ND	mg/L	0.05

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	4
RECOVERY, %	103

Curtis & Tompkins, Ltd.

LAB NUMBER: 101842-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
SAMPLE ID: 48

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/15/90
DATE REPORTED: 10/16/90

POLYCHLORINATED BIPHENYLS (PCBs)
ANALYSIS METHOD: EPA 8080
EXTRACTION METHOD: EPA 3510

AROCLOR TYPE	RESULT (ug/L)	REPORTING LIMIT (ug/L)
AROCLOR 1221	ND	1.0
AROCLOR 1232	ND	1.0
AROCLOR 1016	ND	1.0
AROCLOR 1242	ND	1.0
AROCLOR 1248	ND	1.0
AROCLOR 1254	ND	1.0
AROCLOR 1260	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	22
RECOVERY, %	111

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101842-1
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 430.003
SAMPLE ID: 47

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/10/90
DATE REPORTED: 10/16/90

Polynuclear Aromatic Hydrocarbons in Water by EPA 8270
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Naphthalene	ND	5.0
Acenaphthylene	ND	5.0
Acenaphthene	ND	5.0
Fluorene	ND	5.0
Phenanthrene	ND	5.0
Anthracene	ND	5.0
Fluoranthene	ND	5.0
Pyrene	ND	5.0
Benzo(a)anthracene	ND	5.0
Chrysene	ND	5.0
Benzo(b)fluoranthene	ND	5.0
Benzo(k)fluoranthene	ND	5.0
Benzo(a)pyrene	ND	5.0
Indeno(1,2,3-cd)pyrene	ND	5.0
Dibenzo(a,h)anthracene	ND	5.0
Benzo(g,h,i)perylene	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SURROGATE RECOVERY

Nitrobenzene-d5	76%
2-Fluorobiphenyl	57%
Terphenyl-d14	43%

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101842-2
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 430.003
SAMPLE ID: 48

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/10/90
DATE REPORTED: 10/16/90

Polynuclear Aromatic Hydrocarbons in Water by EPA 8270
Extraction Method: EPA 3520

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Naphthalene	ND	5.0
Acenaphthylene	ND	5.0
Acenaphthene	ND	5.0
Fluorene	ND	5.0
Phenanthrene	ND	5.0
Anthracene	ND	5.0
Fluoranthene	ND	5.0
Pyrene	ND	5.0
Benzo(a)anthracene	ND	5.0
Chrysene	ND	5.0
Benzo(b)fluoranthene	ND	5.0
Benzo(k)fluoranthene	ND	5.0
Benzo(a)pyrene	ND	5.0
Indeno(1,2,3-cd)pyrene	ND	5.0
Dibenzo(a,h)anthracene	ND	5.0
Benzo(g,h,i)perylene	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SURROGATE RECOVERY	
Nitrobenzene-d5	72%
2-Fluorobiphenyl	57%
Terphenyl-d14	44%

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101842-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
SAMPLE ID: 48

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/12/90
DATE REPORTED: 10/16/90

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	60	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	12
RECOVERY, %	102

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101842-1
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 430.003
SAMPLE ID: 47

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/12/90
DATE REPORTED: 10/16/90

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	102

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101842-2
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 430.003
SAMPLE ID: 48

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/12/90
DATE REPORTED: 10/16/90

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	102

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101842-3
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 430.003
SAMPLE ID: 51

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/12/90
DATE REPORTED: 10/16/90

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	102

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101842-4
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 430.003
SAMPLE ID: 52

DATE RECEIVED: 10/04/90
DATE ANALYZED: 10/12/90
DATE REPORTED: 10/16/90

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	1.0
Toluene	ND	1.0
Ethyl Benzene	ND	1.0
Total Xylenes	ND	1.0
Chlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	102

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

DATE RECEIVED: 12/04/90
DATE REPORTED: 12/11/90

LAB NUMBER: 102456

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 7 WATER SAMPLES

PROJECT #: 430.003
LOCATION: 13th & Jefferson

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LAB NUMBER: 102456
CLIENT: SUBSURFACE CONSULTANTS
PROJECT # : 430.003

DATE RECEIVED: 12/04/90
DATE ANALYZED: 12/05/90
DATE REPORTED: 12/11/90

ANALYSIS: HYDROCARBON OIL AND GREASE
METHOD: SMWW 17:5520 B&F

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
102456-2	48	ND	mg/L	20

ND = Not detected at or above reporting limit

QA/QC SUMMARY

RPD, %	4
RECOVERY, %	90

Curtis & Tompkins, Ltd.

LAB NUMBER: 102456-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT: 430.003
SAMPLE ID: 48

DATE RECEIVED: 12/04/90
DATE EXTRACTED: 12/07/90
DATE ANALYZED: 11/09/90
DATE REPORTED: 12/11/90

POLYCHLORINATED BIPHENYLS (PCBs)
ANALYSIS METHOD: EPA 8080
EXTRACTION METHOD: EPA 3510

AROCLOR TYPE	RESULT (ug/L)	REPORTING LIMIT (ug/L)
AROCLOR 1221	ND	1.0
AROCLOR 1232	ND	1.0
AROCLOR 1016	ND	1.0
AROCLOR 1242	ND	1.0
AROCLOR 1248	ND	1.0
AROCLOR 1254	ND	1.0
AROCLOR 1260	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	92

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102456-2
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 430.003
LOCATION: 13Th/Jefferson

DATE RECEIVED: 12/04/90
DATE EXTRACTED: 12/05/90
DATE ANALYZED: 12/10/90
DATE REPORTED: 12/11/90

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

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
102456-2	48	ND	ND	50

ND = Not detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY	
RPD, %	6
RECOVERY, %	85

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102456
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.003
JOB LOCATION: 13Th/Jefferson

DATE RECEIVED: 12/04/90
DATE ANALYZED: 12/06/90
DATE REPORTED: 12/11/90

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

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
102456-1	47	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
102456-2	48	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
102456-3	49	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
102456-4	51	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
102456-5	52	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
102456-6	53	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
102456-7	54	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

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

QA/QC SUMMARY

RPD, %	<1
RECOVERY, %	86

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102456-1
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
SAMPLE ID: 47

DATE RECEIVED: 12/04/90
DATE ANALYZED: 12/05/90
DATE REPORTED: 12/11/90

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	11	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	87

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102456-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
SAMPLE ID: 48

DATE RECEIVED: 12/04/90
DATE ANALYZED: 12/05/90
DATE REPORTED: 12/11/90

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	31	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	87

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102456-3
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
SAMPLE ID: 49

DATE RECEIVED: 12/04/90
DATE ANALYZED: 12/05/90
DATE REPORTED: 12/11/90

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	87

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102456-4
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
SAMPLE ID: 51

DATE RECEIVED: 12/04/90
DATE ANALYZED: 12/05/90
DATE REPORTED: 12/11/90

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	87

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102456-5
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
SAMPLE ID: 52

DATE RECEIVED: 12/04/90
DATE ANALYZED: 12/05/90
DATE REPORTED: 12/11/90

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	1.3	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	87

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102456-6
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
SAMPLE ID: 53

DATE RECEIVED: 12/04/90
DATE ANALYZED: 12/05/90
DATE REPORTED: 12/11/90

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	1.9	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	87

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102456-7
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 430.003
SAMPLE ID: 54

DATE RECEIVED: 12/04/90
DATE ANALYZED: 12/05/90
DATE REPORTED: 12/11/90

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	1.5	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	87

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

DATE RECEIVED: 01/04/91
DATE REPORTED: 01/09/91

LAB NUMBER: 102670

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: SEVEN WATER SAMPLES

PROJECT #: 430.010
LOCATION: MLK EXTRACTION

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102670-1
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.010
SAMPLE ID: MW-29

DATE RECEIVED: 01/04/91
DATE ANALYZED: 01/07/91
DATE REPORTED: 01/09/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	97

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102670-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.010
SAMPLE ID: MW-31

DATE RECEIVED: 01/04/91
DATE ANALYZED: 01/07/91
DATE REPORTED: 01/09/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	10	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	97

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102670-3
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.010
SAMPLE ID: MW-45

DATE RECEIVED: 01/04/91
DATE ANALYZED: 01/07/91
DATE REPORTED: 01/09/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	97

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102670-4
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.010
SAMPLE ID: MW-46

DATE RECEIVED: 01/04/91
DATE ANALYZED: 01/07/91
DATE REPORTED: 01/09/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	97

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102670-5
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.010
SAMPLE ID: MW-47

DATE RECEIVED: 01/04/91
DATE ANALYZED: 01/07/91
DATE REPORTED: 01/09/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	16	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	97

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 102670-6
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.010
SAMPLE ID: MW-48

DATE RECEIVED: 01/04/91
DATE ANALYZED: 01/07/91
DATE REPORTED: 01/09/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	15	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	97

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 102670-7
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.010
SAMPLE ID: MW-54

DATE RECEIVED: 01/04/91
DATE ANALYZED: 01/07/91
DATE REPORTED: 01/09/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	97

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

DATE RECEIVED: 03/13/91
DATE REPORTED: 03/21/91

LAB NUMBER: 103232

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: EIGHT WATER SAMPLES

PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON GW

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103232
CLIENT: SUBSURFACE CONSULTANTS
LOCATION: 13TH & JEFFERSON GW

DATE RECEIVED: 03/13/91
DATE ANALYZED: 03/15/91
DATE REPORTED: 03/21/91

ANALYSIS: LEAD
ANALYSIS METHOD: EPA 7420

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
103232-6	53	ND	mg/L	0.06
103232-7	54	ND	mg/L	0.06

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	1
RECOVERY, %	94

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103232
CLIENT: SUBSURFACE CONSULTANTS
LOCATION: 13TH & JEFFERSON GW

DATE RECEIVED: 03/13/91
DATE ANALYZED: 03/18/91
DATE REPORTED: 03/21/91

ANALYSIS: Ethylene Dibromide (EDB)
ANALYSIS METHOD: EPA 504

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
103232-6	53	ND	ug/L	0.03
103232-7	54	ND	ug/L	0.03

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	12
RECOVERY, %	101

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103232
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON GW

DATE RECEIVED: 03/13/91
DATE ANALYZED: 03/19/91
DATE REPORTED: 03/21/91

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

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
103232-1	47	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103232-2	48	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103232-3	49	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103232-4	51	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103232-5	52	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103232-6	53	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103232-7	54	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103232-8	59	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

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

QA/QC SUMMARY

RPD, %	4
RECOVERY, %	87

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103232
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON GW

DATE RECEIVED: 03/13/91
DATE EXTRACTED: 03/13/91
DATE ANALYZED: 03/16/91
DATE REPORTED: 03/21/91

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

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
103232-2	48	ND	ND	50

ND = Not detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	4
RECOVERY, %	113

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103232-1
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
SAMPLE ID: 47

DATE RECEIVED: 03/13/91
DATE ANALYZED: 03/15/91
DATE REPORTED: 03/21/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	6.7	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	15
RECOVERY, %	99

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103232-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
SAMPLE ID: 48

DATE RECEIVED: 03/13/91
DATE ANALYZED: 03/15/91
DATE REPORTED: 03/21/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	30	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	15
RECOVERY, %	99

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103232-3
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
SAMPLE ID: 49

DATE RECEIVED: 03/13/91
DATE ANALYZED: 03/15/91
DATE REPORTED: 03/21/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	15
RECOVERY, %	99

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103232-6
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
SAMPLE ID: 53

DATE RECEIVED: 03/13/91
DATE ANALYZED: 03/15/91
DATE REPORTED: 03/21/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	2.0	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	15
RECOVERY, %	99

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103232-7
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
SAMPLE ID: 54

DATE RECEIVED: 03/13/91
DATE ANALYZED: 03/15/91
DATE REPORTED: 03/21/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	15
RECOVERY, %	99

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103232-8
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
SAMPLE ID: 59

DATE RECEIVED: 03/13/91
DATE ANALYZED: 03/15/91
DATE REPORTED: 03/21/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	15
RECOVERY, %	99

Client: Subsurface Consultants

Laboratory Login Number: 103232

Project Name: 13TH & JEFFERSON GW
Project Number: 430.013

Report Date: 21 March 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

Lab ID	Sample ID	Matrix	Sampled	Received	Ordered	Analyzed	Result	Units	RL	Method	Analyst	QC Batch
103232-002	#48	Water	13-MAR-91	13-MAR-91	14-MAR-91	19-MAR-91	ND	mg/L	5	5520BF	TR	1065

ND = Not Detected at or above Reporting Limit (RL).

Analyst

Curtis & Tompkins, Ltd.

QC Batch Report

Client: Subsurface Consultants
Project Name: 13TH & JEFFERSON GW
Project Number: 430.013

Laboratory Login Number: 103232
Report Date: 21 March 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

QC Batch Number: 1065

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	5	mg/L	5520BF	19-MAR-91

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	86%	5520BF	19-MAR-91
BSD	81%	5520BF	19-MAR-91

		Control Limits
Average Spike Recovery	84%	80% - 120%
Relative Percent Difference	6.1%	< 20%

Curtis & Tompkins, Ltd.

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

DATE RECEIVED: 04/03/91
DATE REPORTED: 04/09/91

LAB NUMBER: 103425

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 1 WATER SAMPLE

PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON GW

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103425-1
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
SAMPLE ID: MW-59

DATE RECEIVED: 04/03/91
DATE ANALYZED: 04/05/91
DATE REPORTED: 04/09/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2-dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	2.0
2-chloroethyl vinyl ether	ND	1.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	7
RECOVERY, %	98

Subsurface Consultants

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name: 13th + Jefferson

SCI Job Number: 430.003

Project Contact at SCI: Sean Carson

Sampled By: John Wolfe, Chris O'Dea

Analytical Laboratory: Curtis-Tompkins

Analytical Turnaround: Normal

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
47	W	1 liter 3 VOAs	4/6/90		TVH/BTXE	8015/602
48	W	"	"		" "	" "
49	W	"	"		" "	" "
51	W	"	"		" "	" "
52	W	"	"		" "	" "

* * * * * *

Released by: [signature] Date: 4/9/90

Released by Courier: _____ Date: _____

Received by Laboratory: Nancy A Patten Date: 4/9/90

Relinquished by Laboratory: _____ Date: _____

Received by: _____ Date: _____

[1] Sample Type: W = water, S = soil, O = other (specify)

[2] Container Type: V = VOA, P = plastic, G = glass, T = brass tube, O = other (specify)

Notes to Laboratory:

-Notify SCI if there are any anomalous peaks on GC or other scans

-Questions/clarifications...contact SCI at (415) 268-0461

Subsurface Consultants

101723

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name: 13th + Jefferson

SCI Job Number: 430.003

Project Contact at SCI: Sean Carson

Sampled By: Fernando Velez

Analytical Laboratory: Curtis + Tompkins

Analytical Turnaround: 5 day

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
1 MW-53	W	V×6	9/21/90		TVH/BTXE	8015/8020/5
2 MW-54	W	V×6	9/21/90		TVH/BTXE	8015/8020/503

* * * * * *

Released by: [signature] Date: SEP-24-90

Released by Courier: Date:

Received by Laboratory: Mary Printon Date: 9/24/90 10:10

Relinquished by Laboratory: Date:

Received by: Date:

[1] Sample Type: W = water, S = soil, O = other (specify)
[2] Container Type: V = VOA, P = plastic, G = glass, T = brass tube, O = other (specify)

Notes to Laboratory:
-Notify SCI if there are any anomalous peaks on GC or other scans
-Questions/clarifications...contact SCI at (415) 268-0461

Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: 13th + Jefferson GW

SCI Job Number: 430.003

Project Contact at SCI: Sean Carson

Sampled By: Fernando Velez

Analytical Laboratory: Curtis + Tompkins

Analytical Turnaround: Normal

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
47	W	V×2	10/4/90		BTXE	EPA 8020
		6L×1			PNAs only	EPA 8270
		P.1			Total Lead	AA
48	W	6L×1	10/4/90		TEH	8015/3550
		VX2			BTXE	8020
					O+G	SMWW 5520 B+F
		P			Total Lead	AA
					PCBs only	EPA 8080
					PNAs only	EPA 8270
		V×2			* VOCs Methylene Chloride	EPA 8010

* * * * * *

Released by: [signature] Date: 10-04-90

Released by Courier: Date:

Received by Laboratory: Mary Printen Date: 10/4/90 4pm

Relinquished by Laboratory: Date:

Received by: Date:

[1] Sample Type: W = water, S = soil, O = other (specify)
[2] Container Type: V = VOA, P = plastic, G = glass, T = brass tube, O = other (specify)

Notes to Laboratory:
-Notify SCI if there are any anomalous peaks on GC or other scans
-Questions/clarifications...contact SCI at (415) 268-0461

Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: 13th + Jefferson GW

SCI Job Number: 430.003

Project Contact at SCI: Sean Casey

Sampled By: Fernando Velez

Analytical Laboratory: Curtis + Tompkins

Analytical Turnaround: Normal

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
[redacted]						
S1	W	V×2	10/4/90		BTXE	EPA 8020
S2	W	V×2	10/4/90		BTXE	EPA 8020

* * * * * *

Released by: [signature] Date: 10-04-90

Released by Courier: _____ Date: _____

Received by Laboratory: [signature] Date: 10/4/90 4pm

Relinquished by Laboratory: _____ Date: _____

Received by: _____ Date: _____

[1] Sample Type: W = water, S = soil, O = other (specify)
[2] Container Type: V = VOA, P = plastic, G = glass, T = brass tube, O = other (specify)

Notes to Laboratory:
-Notify SCI if there are any anomalous peaks on GC or other scans
-Questions/clarifications...contact SCI at (415) 268-0461

Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: 13th + Jefferson GW

SCI Job Number: 430.003

Project Contact at SCI: Sean Carson

Sampled By: Fernando Velez

Analytical Laboratory: Curtis + Tompkins

Analytical Turnaround: Rapid

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
MW-54	W	V x 2	10/4/90	*	TVH/BTXE	TOP prior *
		V x 2			VOCs	EPA 8010
		V x 2			EDB	DHS-AB1803
		P x 1			TEL	DHS-LUFT
		P x 1			Total Lead	AA
		G x 1			PNAs only	EPA 8270
MW-53	W	V x 2	10/4/90		TVH/BTXE	
		P x 1			Total Lead	AA
		P x 1			TEL	DHS-LUFT
		V x 2			EDB	DHS-AB1803
		V x 2			VOCs	EPA 8010
*		*	*	*	*	*

Released by: [signature] Date: 10/4/90

Released by Courier: _____ Date: _____

Received by Laboratory: [signature] Date: 10/4/90 1230

Relinquished by Laboratory: _____ Date: _____

Received by: _____ Date: _____

[1] Sample Type: W = water, S = soil, O = other (specify)
[2] Container Type: V = VOA, P = plastic, G = glass, T = brass tube, O = other (specify)

Notes to Laboratory:
-Notify SCI if there are any anomalous peaks on GC or other scans
-Questions/clarifications...contact SCI at (415) 268-0461

Subsurface Consultants

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name: 13th + Jefferson

SCI Job Number: 430.003

Project Contact at SCI: Sean Carson

Sampled By: Fernando Velez

Analytical Laboratory: Curtis + Tompkins

Analytical Turnaround: 5 day

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
47	W	V x 4	12/3/90		VOC's TVH/BTXE	EPA 8010 EPA 8015/8020/5030
48	W	V x 4	12/3/90		VOCs TVH/BTXE	
	W	G x 3			TEH PCB's O+G	EPA 8015/3550 EPA 8090 SM WW 5520 E
49	W	V x 4	12/3/90		VOC's TVH/BTXE	EPA 8010 EPA 8015/8020/5030
51	W	V x 4	12/4/90		VOC's TVH/BTXE	
52	W	V x 4	12/4/90		VOC's TVH/BTXE	
53	W	V x 4	12/4/90		VOC's TVH/BTXE	
54	W	V x 4	12/4/90		VOC's TVH/BTXE	

* * * * * *

Released by: [signature] Date: 12/4/90

Released by Courier: _____ Date: _____

Received by Laboratory: [signature] Date: 12-4-90 A:OC

Relinquished by Laboratory: _____ Date: _____

Received by: _____ Date: _____

[1] Sample Type: W = water, S = soil, O = other (specify)

[2] Container Type: V = VOA, P = plastic, G = glass, T = brass tube, O = other (specify)

Notes to Laboratory:

-Notify SCI if there are any anomalous peaks on GC or other scans

-Questions/clarifications...contact SCI at (415) 268-0461

16267-0

Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: MLK

SCI Job Number: 430.010

Project Contact at SCI: Sean Carson

Sampled By: John Wolfe

Analytical Laboratory: Curtis & Tompkins

Analytical Turnaround: 5 day

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
MW-29 1	W	2 VOAs	1-4-90		8010 →	
MW-31 2	W	"	"		8010 →	
MW-45 3	W	"	"		8010 →	
MW-46 4	W	"	"		8010 →	
MW-47 5	W	"	"		8010 →	
MW-48 6	W	"	"		8010 →	
MW-54 7	W	"	"			

* * * * * *

Released by: [signature] Received by: _____ Date: 01-04-91

Released by: _____ Received by: _____ Date: _____

Received by Laboratory: [signature] Date: 1/4/91

Released by Laboratory: _____ Date: _____

Released by: _____ Date: _____

1 Sample Type: W = Water, S = Soil, O = Other (specify)
2 Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, O = Other (specify)

NOTES TO LABORATORY:
- Notify SCI if there are any anomalous peaks on GC or other scans
- Questions/clarifications - Contact SCI at (415) 268-0461

Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: 13th + Jefferson GW

SCI Job Number: 430.013

Project Contact at SCI: Sean Carson

Sampled By: Fernando Velez

Analytical Laboratory: Curtis + Tompkins

Analytical Turnaround:

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
47	W	V x 5	3/13/91		VOCs TVH/BTXE	8010 8015/5030
48	W	V x 5 G x 2	3/13/91		VOCs TVH/BTXE	TEH + O+G 8010
49	W	V x 5	3/13/91		VOCs TVH/BTXE	8015/8020/5030
51	W	V x 2	3/13/91		TVH/BTXE	
52	W	V x 2	3/13/91		TVH/BTXE	
53	W	V x 8 P x 1	3/13/91		TVH/BTXE VOCs EDB	tot. lead
54	W	V x 8 P x 1	3/13/91		TVH/BTXE VOCs EDB	tot. lead
59	W	V x 5	3/13/91		TVH/BTXE VOCs	

* * * * * *

Released by: [signature] Received by: 03/13/91 Date:

Released by: Received by: Date:

Received by Laboratory: [signature] Date: 3/13/91

Released by Laboratory: Date:

Released by: Date:

1 Sample Type: W = Water, S = Soil, O = Other (specify)
2 Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, O = Other (specify)

NOTES TO LABORATORY:
- Notify SCI if there are any anomalous peaks on GC or other scans
- Questions/clarifications - Contact SCI at (415) 268-0461

Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: 13th + Jefferson GW

SCI Job Number: 430.013

Project Contact at SCI: Sean Carson

Sampled By: Jairo Lopez

Analytical Laboratory: Curtis + Tompkins

Analytical Turnaround: Rapid

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
MW-59	W	V.3	4/3/91		VOC's	EPA 8010

* * * * * *

Released by: Jairo Lopez Received by: _____ Date: 04-03-91

Released by: _____ Received by: _____ Date: _____

Received by Laboratory: _____ Date: 4/3/91 14:00

Released by Laboratory: _____ Date: _____

Released by: _____ Date: _____

1 Sample Type: (W) = Water, S = Soil, O = Other (specify)
2 Container Type: (V) = VOA, P = Plastic, G = Glass, T = Brass Tube, O = Other (specify)

NOTES TO LABORATORY:
- Notify SCI if there are any anomalous peaks on GC or other scans
- Questions/clarifications - Contact SCI at (415) 268-0461

James P. Bowers, PE
R. William Rudolph, Jr., PE

January 29, 1992
SCI 430.014

STD
3623

Mr. Paul Smith
Alameda County Health Care Services Agency
80 Swan Way, Room 200
Oakland, California 94621

City of Oakland
Old Firehouse

Quarterly Groundwater Monitoring
Floor Drain Sump
13th and Jefferson Streets
Oakland, California

Dear Mr. Smith:

This letter records the results of the June, September and December 1991 groundwater sampling and analytical testing events performed by Subsurface Consultants, Inc. (SCI) for [illegible] at the referenced site. Well locations are shown on the attached Site Plan, Plate 1.

Background

SCI previously documented the removal of a concrete floor drain sump and associated contaminated soils in a report dated September 24, 1990. A groundwater Contamination Assessment report by SCI dated July 8, 1991, presents the monitoring well installation details and the results of previous sampling events. SCI submitted a remediation plan to Alameda County Health Care Services Agency (ACHCSA) on July 9, 1991. The letter described SCI's proposal to remediate DCA[1] contaminated groundwater by pumping it into the storm drain with an existing on-site carbon absorption system. The plan is currently under ACHCSA review.

Quarterly Monitoring

Groundwater levels in the wells were measured on June 13, September 11, and December 12, 1991. The groundwater level measurements, including previous readings, are summarized in Table 1.

[1] DCA = 1,2-Dichloroethane

92 JAN 30 AM 11:04

Subsurface Consultants, Inc.
171 12th Street • Suite 201 • Oakland, California 94607 • Telephone 415-268-0461 • FAX 415-268-0137

Prior to sampling, the wells were purged of at least 4 well volumes of water using a Teflon bailer. The purged water was disposed of in the existing groundwater treatment plant on-site.

The water samples were retained in pre-cleaned containers, placed in an iced cooler, and kept refrigerated until delivery to the analytical laboratory. The samples were accompanied by chain-of-custody records, copies of which are attached.

Analytical testing was performed by Curtis & Tompkins, Ltd., a State of California Department of Health Services certified analytical laboratory for the tests performed. Water samples were analytically tested for the following:

1. Total volatile hydrocarbons (TVH), sample preparation and analysis using EPA Method 5030 (purge and trap extraction) and 8015 (gas chromatograph coupled to a flame ionization detector);

2. Benzene, toluene, xylene and ethylbenzene (BTXE), sample preparation and analysis using EPA Method 5030 and 8020 (gas chromatograph coupled to a photo-ionization detector);

3. Total extractable hydrocarbons (TEH), sample preparation and analysis using EPA Methods 3550 (sonication) and 8015 (modified gas chromatograph coupled to a flame ionization detector);

4. Hydrocarbon Oil and Grease (O&G), sample preparation and analysis using SMWW 17:5520 E&F; and

5. Volatile organic chemicals (EPA 8010), sample preparation and analysis using EPA method 5030 (purge and trap) and 8010 (gas chromatograph coupled to an electrolytic conductivity detector).

TVH and BTXE analyses were performed on the samples to monitor for the presence of gasoline contamination from another source. The results of the analyses are summarized in Tables 2 and 3. Copies of the analytical test reports are attached.

Conclusions

The groundwater flow direction has changed significantly during the last quarter. Groundwater is currently flowing toward the southwest. The change is a result of construction dewatering at the City Center Garage 2 site located between 12th and 13th

Streets, and Martin Luther King Jr. Way and Jefferson Street. Construction dewatering began on November 11, 1991 and will reportedly continue until mid-February 1992.

The most recent analytical test results indicate that 16 ug/L of 1,2-DCA is present in groundwater obtained from Well 48. This concentration is consistent with previous analytical data. Well 48 is the well closest to the former floor drain sump. DCA was not detected in any other wells during this sampling event at concentrations in excess of analytical detection limits. There is no indication that the DCA plume is migrating significantly down gradient, as Well 59 remains free of detectable concentrations of DCA contamination.

As stated previously, the groundwater flow direction has changed significantly during the last quarter. We understand that the condition is temporary. Once dewatering is halted, we anticipate that the flow direction will return to that previously documented. If plans change and construction dewatering continues for a longer period of time, it may be appropriate to modify our monitoring program.

None of the wells being monitored contain hydrocarbon contamination at concentrations in excess of analytical detection limits. We recommend that monitoring for volatile organic chemicals (EPA 8010) continue on a quarterly basis.

If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

Sean O. Carson
Civil Engineer 45074 (expires 3/31/94)

James P. Bowers
Geotechnical Engineer 157 (expires 3/31/95)

SOC:JPB:vb

Attachments: Table 1 - Groundwater Elevation Data

Table 2 - Halogenated Volatile Organic Chemical Concentrations in Groundwater

Table 3 - Petroleum Hydrocarbon Concentrations in Groundwater

Plate 1 - Site Plan
Chain-of-Custody Records
Analytical Test Reports

1 copy: Ms. Lois Parr
Oakland Redevelopment Agency
1333 Broadway, Suite 900
Oakland, California 94612

1 copy: Mr. John Esposito
Bramalea Pacific
1111 Broadway, Suite 1400
Oakland, California 94607

1 copy: Mr. Eddy So
Regional Water Quality Control Board
2101 Webster Street, Room 500
Oakland, California 94612

1 copy: Mr. Donnell Choy
City of Oakland
505 14th Street, 12th Floor
Oakland, California 94612

Table 1. Groundwater Elevation Data

Well	Date	TOC[1] Elevation (ft)	Groundwater Depth[2] (ft)	Groundwater Elevation (ft)
MW-47	09/24/90	100.50	27.28	73.22
	10/04/90		27.32	73.18
	12/03/90		27.38	73.12
	01/21/91		27.17	73.33
	03/13/91		26.85	73.65
	04/03/91		26.38	74.12
	06/13/91		28.39	72.11
	09/10/91		27.08	73.42
	12/12/91		27.95	72.55
MW-48	07/18/90	102.40	29.08	73.32
	10/04/90		29.29	73.11
	12/03/90		29.28	73.12
	01/21/91		29.03	73.37
	03/13/91		28.72	73.68
	04/03/91		28.24	74.16
	06/13/91		29.47	72.93
	09/10/91		28.94	73.46
	12/12/91		30.39	72.01
MW-49	12/03/90	101.73	28.44	73.29
	01/21/91		28.20	73.53
	03/13/91		27.79	73.94
	04/03/91		27.28	74.45
	06/13/91		27.66	74.07
	09/10/91		28.04	73.69
	12/12/91		30.45	71.28
MW-51	10/04/90	102.64	28.57	74.07
	12/03/90		28.57	74.07
	01/21/91		28.44	74.20
	03/13/91		27.76	74.88
	04/03/91		27.32	75.32
	06/13/91		28.82	73.82
	09/10/91		28.00	74.64
MW-52	10/04/90	102.44	28.41	74.03
	12/03/90		28.38	74.06
	01/21/91		28.24	74.20
	03/13/91		27.57	74.87
	04/03/91		27.16	75.28
	06/13/91		29.41	73.03
	09/10/91		27.85	74.59
MW-53	09/24/90	101.28	27.44	73.84
	10/04/90		27.50	73.78
	12/03/90		27.46	73.82
	01/21/91		28.00	73.28
	03/13/91		27.00	74.28
	06/13/91		27.61	73.67
	08/12/91	Well Abandoned		
MW-54	09/24/90	100.78	27.01	73.77
	10/04/90		27.30	73.48
	12/03/90		27.01	73.77
	01/21/91		27.28	74.64
	03/13/91	101.92[3]	27.40	74.52
	06/13/91		28.93	72.99
	09/10/91		27.66	74.26
	12/12/91		28.88	73.04
MW-59	02/12/91	100.37	27.45	72.92
	03/13/91		27.60	72.77
	04/03/91		27.36	73.01
	06/13/91		28.01	72.36
	09/10/91		28.00	72.37
	12/12/91		28.53	71.84

1 Top of Casing
2 Depth measured below top of casing
3 Well head damaged and repaired

Assumed datum: The elevation of the PG&E manhole in Martin Luther King, Jr. Way, near the northwest corner of the block, was assumed to have an elevation of 100 feet (see Plate 1)

Table 2. Petroleum Hydrocarbon Concentrations in Groundwater

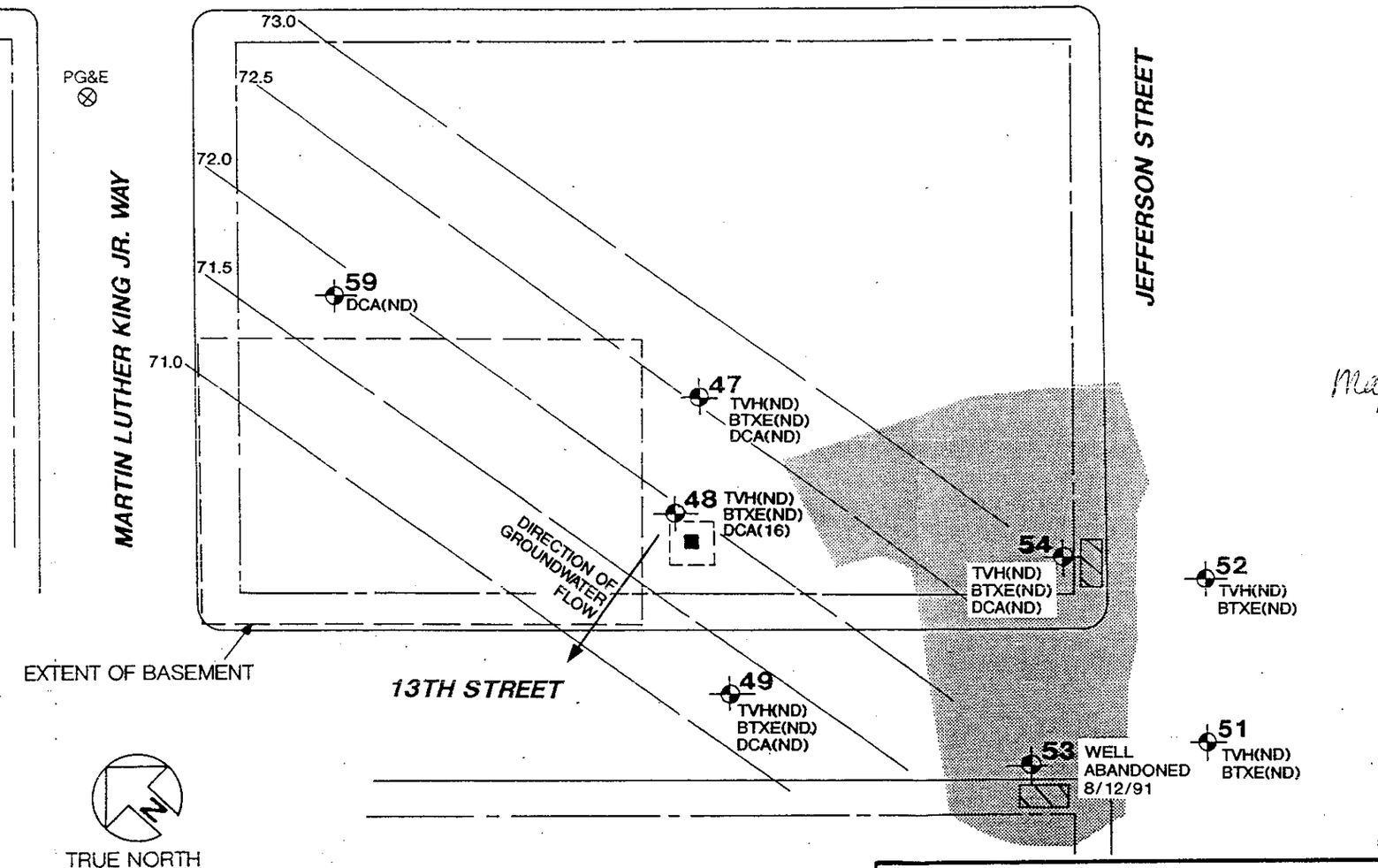
Well	Date	O&G[1] (ug/L)	TVH[2] (ug/L)	TEH[3] (ug/L)	B[4] (ug/L)	T[5] (ug/L)	X[6] (ug/L)	E[7] (ug/L)
MW-47	04/06/90	--	ND[8]	--	ND	ND	ND	ND
	10/04/90	--	--	--	ND	ND	ND	ND
	12/03/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
	06/13/91	--	ND	--	ND	ND	ND	ND
	09/11/91	--	ND	--	ND	ND	ND	ND
	12/12/91	--	ND		ND	ND	ND	ND
MW-48	04/06/90	--	ND	--	ND	ND	ND	ND
	07/18/90	ND	ND	ND	ND	ND	ND	ND
	10/04/90	--	--	110	ND	ND	ND	ND
	12/03/90	ND	ND	ND	ND	ND	ND	ND
	03/13/91	ND	ND	ND	ND	ND	ND	ND
	09/11/91	ND	ND	ND	ND	ND	ND	ND
	12/12/91	ND	ND	ND	ND	ND	ND	ND
MW-49	04/06/90	--	ND	--	ND	ND	ND	ND
	12/03/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
	06/13/91	--	ND	--	ND	ND	ND	ND
	09/11/91	--	ND	--	ND	ND	ND	ND
	12/12/91		ND		ND	ND	ND	ND
MW-51	04/06/90	--	ND	--	ND	ND	ND	ND
	10/04/90	--	--	--	ND	ND	ND	ND
	12/04/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
	06/13/91	--	ND	--	ND	ND	ND	ND
	09/11/91	--	ND	--	ND	ND	ND	ND
MW-52	04/06/90	--	ND	--	ND	ND	ND	ND
	10/04/90	--	--	--	ND	ND	ND	ND
	12/04/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
	06/13/91	--	ND	--	ND	ND	ND	ND
	09/11/91	--	ND	--	ND	ND	ND	ND
MW-53	09/21/90	--	ND	--	ND	ND	ND	ND
	10/04/90	--	ND	--	ND	ND	ND	ND
	12/04/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
	06/11/91	--	ND	--	ND	ND	ND	ND
	08/12/91	Well Abandoned						
MW-54	09/21/90	--	1700	--	ND	1.5	20	1.9
	10/04/90	--	1300	--	ND	0.7	12	28
	12/04/90	--	ND	--	ND	ND	ND	ND
	03/13/91	--	ND	--	ND	ND	ND	ND
	06/13/91	--	ND	--	ND	ND	ND	ND
	09/11/91	--	ND	--	ND	ND	ND	ND
	12/12/91		ND		ND	ND	ND	ND
MW-59	03/13/91	--	ND	--	ND	ND	ND	ND

1 Oil and Grease
2 Total Volatile Hydrocarbons
3 Total Extractable Hydrocarbons
4 Benzene
5 Toluene
6 Xylene
7 Ethylbenzene
8 ND = Non-detectable, see analytical test reports for detection limits

Table 3.
Halogenated Volatile Organic Chemical Concentrations in Groundwater

Well	Date	1,2 DCA[1] (ug/L)[3]	1,2 DCE[2] (ug/L)	Chloroform (ug/L)	Other EPA 8010 (ug/L)
MW-29	01/04/91	ND[4]	ND	ND	ND
MW-31	01/04/91	ND	ND	10	ND
MW-45	01/04/91	ND	ND	ND	ND
MW-46	01/04/91	ND	ND	ND	ND
MW-47	12/03/90	ND	11	ND	ND
	01/04/91	16	ND	ND	ND
	03/13/91	6.7	ND	ND	ND
	06/13/91	ND	ND	ND	ND
	09/11/91	ND	ND	ND	ND
	12/12/91	ND	ND	ND	ND
MW-48	10/04/90	60	ND	ND	ND
	12/03/90	31	ND	ND	ND
	01/04/91	15	ND	ND	ND
	03/13/91	30	ND	ND	ND
	06/19/91	6.1	ND	ND	ND
	09/11/91	5.3	ND	ND	ND
	12/12/91	16	ND	ND	ND
MW-49	12/03/90	ND	ND	ND	ND
	03/03/91	ND	ND	ND	ND
	06/13/91	5.0	ND	ND	ND
	09/11/91	ND	ND	ND	ND
	12/12/91	ND	ND	ND	ND
MW-51	12/04/90	ND	ND	ND	ND
	06/13/91	ND	ND	1.0	ND
MW-52	12/04/90	ND	ND	1.3	ND
	06/13/91	ND	ND	2.0	ND
MW-53	10/04/90	ND	ND	1.2	ND
	12/04/90	ND	ND	1.9	ND
	03/13/91	ND	ND	2.0	ND
	06/13/91	ND	ND	8.0	ND
	08/12/91	Well abandoned			
MW-54	10/04/90	ND	ND	1.6	ND
	12/04/90	ND	ND	1.5	ND
	01/04/91	ND	ND	ND	ND
	03/13/91	ND	ND	ND	ND
	06/13/91	ND	ND	1.0	ND
MW-59	03/13/91	ND	ND	ND	ND
	04/03/91	ND	ND	ND	ND
	09/11/91	ND	ND	ND	ND
	12/12/91	ND	ND	ND	ND

1 1,2 Dichloroethane
2 1,2 Dichloroethene
3 Micrograms/liter = parts per billion
4 None detected, see test reports for detection limits



Map

NOTE: WELL 53 was abandoned by pressure grouting 8/12/91.

- 73.0 — GROUNDWATER CONTOUR ELEVATIONS (12/12/91)
- PROBABLE TANK LOCATION BASED ON OBSERVATIONS DURING SOIL REMEDIATION
- TEST BORING/MONITORING WELL
- PROPERTY LINE
- APPROXIMATE EXTENT OF GASOLINE CONTAMINATED SOIL REMEDIATION
- TVH — TOTAL VOLATILE HYDROCARBONS
- BTXE — BENZENE, TOULENE, XYLENES, ETHYLBENZENE
- VOC — VOLATILE ORGANIC COMPOUNDS (EPA 8010)
- DCA — 1,2 DICHLOROETHANE
- ND — NONE DETECTED
- PREVIOUS SUMP AND APPROXIMATE EXTENT OF SOIL REMEDIATION
- ALL CONCENTRATIONS IN ug/L OR PARTS PER BILLION (ppb)

SITE PLAN

Subsurface Consultants

13TH & JEFFERSON – OAKLAND, CA

JOB NUMBER	DATE	APPROVED
430.013	1/29/92	

PLATE 1

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

DATE RECEIVED: 06/13/91
DATE REPORTED: 06/27/91

LAB NUMBER: 104126

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13th & JEFFERSON GW

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 104126
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13th & JEFFERSON GW

DATE RECEIVED: 06/13/91
DATE ANALYZED: 06/22/91
DATE REPORTED: 06/27/91

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

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
104126-1	47	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104126-2	49	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104126-3	51	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104126-4	52	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104126-5	53	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104126-6	54	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

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

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	111

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 104126-1
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13th & JEFFERSON GW
SAMPLE ID: 47

DATE RECEIVED: 06/13/91
DATE ANALYZED: 06/19/91
DATE REPORTED: 06/27/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	2.0
2-chloroethyl vinyl ether	ND	1.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	103

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 104126-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13th & JEFFERSON GW
SAMPLE ID: 49

DATE RECEIVED: 06/13/91
DATE ANALYZED: 06/19/91
DATE REPORTED: 06/27/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	5.0	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	103

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 104126-3
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13th & JEFFERSON GW
SAMPLE ID: 51

DATE RECEIVED: 06/13/91
DATE ANALYZED: 06/19/91
DATE REPORTED: 06/27/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	1.0	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	103

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 104126-4
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13th & JEFFERSON GW
SAMPLE ID: 52

DATE RECEIVED: 06/13/91
DATE ANALYZED: 06/19/91
DATE REPORTED: 06/27/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	2.0	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	103

Curtis & Tompkins, Ltd

LABORATORY NUMBER: 104126-5
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13th & JEFFERSON GW
SAMPLE ID: 53

DATE RECEIVED: 06/13/91
DATE ANALYZED: 06/19/91
DATE REPORTED: 06/27/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	8.0	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	103

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 104126-6
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13th & JEFFERSON GW
SAMPLE ID: 54

DATE RECEIVED: 06/13/91
DATE ANALYZED: 06/19/91
DATE REPORTED: 06/27/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	1.0	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	103

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 104126-6
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13th & JEFFERSON GW
SAMPLE ID: 54

DATE RECEIVED: 06/13/91
DATE ANALYZED: 06/19/91
DATE REPORTED: 06/27/91
DATE REVISED: 09/27/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	1.0	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	103

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 104126-7
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13th & JEFFERSON GW
SAMPLE ID: 59

DATE RECEIVED: 06/13/91
DATE ANALYZED: 06/19/91
DATE REPORTED: 06/27/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	103

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

DATE RECEIVED: 09/11/91
DATE REPORTED: 09/17/91

LABORATORY NUMBER: 105131

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 105131
CLIENT: SUBSURFACE CONSULTANTS, INC.
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 09/11/91
DATE ANALYZED: 09/14/91
DATE REPORTED: 09/17/91

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

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
105131-1	MW-47	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105131-2	MW-48	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105131-3	MW-49	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105131-4	MW-51	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105131-5	MW-52	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105131-6	MW-54	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

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

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	95

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 105131

Project Name: 13th & Jefferson GW
Project Number: 430.013

Report Date: 17 September 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **METHOD:** SMWW 17:5520BF

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
105131-002	MW-48	Water	10-SEP-91	11-SEP-91	16-SEP-91	ND	mg/L	5	TR	2641

ND = Not Detected at or above Reporting Limit (RL).

Curtis & Tompkins, Ltd.

QC Batch Report

Client: Subsurface Consultants
Project Name: 13th & Jefferson GW
Project Number: 430.013

Laboratory Login Number: 105131
Report Date: 17 September 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) QC Batch Number: 2641

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	5	mg/L	SMWW 17:5520BF	16-SEP-91

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	89%	SMWW 17:5520BF	16-SEP-91
BSD	91%	SMWW 17:5520BF	16-SEP-91

		Control Limits
Average Spike Recovery	90%	80% - 120%
Relative Percent Difference	2.1%	< 20%

Curtis & Tompkins Ltd.

LABORATORY NUMBER: 105131
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 09/11/91
DATE EXTRACTED: 09/12/91
DATE ANALYZED: 09/15/91
DATE REPORTED: 09/17/91

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

LAB ID	SAMPLE ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
105131-2	MW-48	ND	ND	50

ND = Not Detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	10
RECOVERY, %	85

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 105131-1
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON
SAMPLE ID: MW-47

DATE RECEIVED: 09/11/91
DATE ANALYZED: 09/13/91
DATE REPORTED: 09/17/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	23
RECOVERY, %	92

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 105131-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON
SAMPLE ID: MW-48

DATE RECEIVED: 09/11/91
DATE ANALYZED: 09/13/91
DATE REPORTED: 09/17/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	5.3	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	23
RECOVERY, %	92

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 105131-3
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON
SAMPLE ID: MW-49

DATE RECEIVED: 09/11/91
DATE ANALYZED: 09/13/91
DATE REPORTED: 09/17/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	23
RECOVERY, %	92

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 105131-7
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON
SAMPLE ID: MW-59

DATE RECEIVED: 09/11/91
DATE ANALYZED: 09/13/91
DATE REPORTED: 09/17/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	23
RECOVERY, %	92

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

DATE RECEIVED: 12/12/91
DATE REPORTED: 12/23/91

LABORATORY NUMBER: 106030

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON GW

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 106030

Project Name: 13th & Jefferson GW
Project Number: 430.013

Report Date: 23 December 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **METHOD:** SMWW 17:5520BF

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
106030-002	MW-48	Water	12-DEC-91	12-DEC-91	18-DEC-91	ND	mg/L	5	TR	3711

ND = Not Detected at or above Reporting Limit (RL).

Curtis & Tompkins, Ltd.

QC Batch Report

Client: Subsurface Consultants
Project Name: 13th & Jefferson GW
Project Number: 430.013

Laboratory Login Number: 106030
Report Date: 23 December 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **QC Batch Number: 3711**

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	5	mg/L	SMWW 17:5520BF	18-DEC-91

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	89%	SMWW 17:5520BF	18-DEC-91
BSD	85%	SMWW 17:5520BF	18-DEC-91

		Control Limits
Average Spike Recovery	87%	80% - 120%
Relative Percent Difference	4.5%	< 20%

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 106030
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.012
LOCATION: 13TH & JEFFERSON GW

DATE RECEIVED: 12/12/91
DATE EXTRACTED: 12/18/91
DATE ANALYZED: 12/20/91
DATE REPORTED: 12/23/91

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

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
106030-2	MW-48	ND	ND	50

ND = Not detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	5
RECOVERY, %	119

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 106030
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON GW

DATE RECEIVED: 12/12/91
DATE ANALYZED: 12/18/91
DATE REPORTED: 12/23/91

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

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
106030-1	MW-47	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
106030-2	MW-48	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
106030-3	MW-49	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
106030-4	MW-54	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

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

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	83

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 106030-1
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON GW
SAMPLE ID: MW-47

DATE RECEIVED: 12/12/91
DATE ANALYZED: 12/18/91
DATE REPORTED: 12/23/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
Chloromethane	ND	2.0
Bromomethane	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	ND	1.0
Trichlorofluoromethane	ND	1.0
1,1-Dichloroethene	ND	1.0
1,1-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freon 113	ND	1.0
1,2-Dichloroethane	ND	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
1,2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

Surrogate Recovery, %	112

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 106030-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON GW
SAMPLE ID: MW-48

DATE RECEIVED: 12/12/91
DATE ANALYZED: 12/18/91
DATE REPORTED: 12/23/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
Chloromethane	ND	2.0
Bromomethane	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	ND	1.0
Trichlorofluoromethane	ND	1.0
1,1-Dichloroethene	ND	1.0
1,1-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freon 113	ND	1.0
1,2-Dichloroethane	16	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
1,2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

Surrogate Recovery, %	110

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 106030-3
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON GW
SAMPLE ID: MW-49

DATE RECEIVED: 12/12/91
DATE ANALYZED: 12/18/91
DATE REPORTED: 12/23/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
Chloromethane	ND	2.0
Bromomethane	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	ND	1.0
Trichlorofluoromethane	ND	1.0
1,1-Dichloroethene	ND	1.0
1,1-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freon 113	ND	1.0
1,2-Dichloroethane	ND	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
1,2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

Surrogate Recovery, %	113

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 106030-5
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON GW
SAMPLE ID: MW-59

DATE RECEIVED: 12/12/91
DATE ANALYZED: 12/18/91
DATE REPORTED: 12/23/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
Chloromethane	ND	2.0
Bromomethane	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	ND	1.0
Trichlorofluoromethane	ND	1.0
1,1-Dichloroethene	ND	1.0
1,1-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freon 113	ND	1.0
1,2-Dichloroethane	ND	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
1,2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

Surrogate Recovery, %	112

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 106030
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 430.013
LOCATION: 13TH & JEFFERSON GW
SAMPLE ID: METHOD BLANK

DATE ANALYZED: 12/18/91
DATE REPORTED: 12/23/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
Chloromethane	ND	2.0
Bromomethane	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	ND	1.0
Trichlorofluoromethane	ND	1.0
1,1-Dichloroethene	ND	1.0
1,1-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freon 113	ND	1.0
1,2-Dichloroethane	ND	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
1,2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

Surrogate Recovery, %	111

Curtis & Tompkins, Ltd.

MS/MSD SUMMARY SHEET FOR EPA 8010\8020

Operator: AV
Analysis date: 12/18/91
Sample type: WATER
Sample ID: 105943-2

Spike file: 351W/X015
Spike dup file: 351W/X016
Instrument: GC12
Sequence Name: dec 17

8010 MS/MSD DATA (spiked at 20 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	23.49	117 %	OK	60 - 133
Trichloroethene	23.26	116 %	OK	88 - 125
Chlorobenzene	21.17	106 %	OK	90 - 127
SPIKE DUP COMPOUNDS				
1,1-Dichloroethene	22.36	112 %	OK	60 - 133
Trichloroethene	22.78	114 %	OK	88 - 125
Chlorobenzene	21.74	109 %	OK	90 - 127
SURROGATES				
BROMOBENZENE (MS)	108.00	108 %	OK	98 - 115
BROMOBENZENE (MSD)	109.00	109 %	OK	98 - 115

8020 MS/MSD DATA (spiked at 20 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
Benzene	23.42	117 %	OK	62 - 120
Toluene	23.19	116 %	OK	61 - 121
Chlorobenzene	17.85	89 %	OK	84 - 115
SPIKE DUP COMPOUNDS				
Benzene	22.88	114 %	OK	62 - 120
Toluene	22.60	113 %	OK	61 - 121
Chlorobenzene	19.42	97 %	OK	84 - 115
SURROGATES				
BROMOBENZENE (MS)	101.00	101 %	OK	91 - 107
BROMOBENZENE (MSD)	101.00	101 %	OK	91 - 107

RPD DATA

8010 COMPOUNDS	SPIKE	SPIKE DUP	RPD	STATUS	LIMITS
1,1-Dichloroethene	23.49	22.36	5 %	OK	<= 14
Trichloroethene	23.26	22.78	2 %	OK	<= 14
Chlorobenzene	21.17	21.74	3 %	OK	<= 13
8020 COMPOUNDS					
Benzene	23.42	22.88	2 %	OK	<= 11
Toluene	23.19	22.60	3 %	OK	<= 13
Chlorobenzene	17.85	19.42	8 %	OK	<= 13

104126

Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: 13th + Jefferson GW

SCI Job Number: 430.013

Project Contact at SCI: Sean Carson

Sampled By: Fernando Velez

Analytical Laboratory: Curtis + Tomplkins

Analytical Turnaround: Normal

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method EPA
47	W	V x 5	6/13/91		TVH/BTXE VOC's	8015/8020 / 5030 8010
~~48~~	~~W~~	~~V x 5~~	~~6/13/91~~		~~TVH/BTXE VOC's~~	~~8015/8020/5030 8010~~
		~~G x 2~~			~~O+G TRH~~	~~SMWW 5520 E 8015/3550~~
49	W	V x 5	6/13/91		TVH/BTXE VOC's	8015/8020/5030 8010
51	W	V x 5	6/13/91		TVH/BTXE VOC's	8015/8020/5030 8010
52	W	V x 5	6/13/91		TVH/BTXE VOC's	8015/8020/5030 8010
53	W	V x 5	6/13/91		TVH/BTXE VOC's	8015/8020/5030 8010
54	W	V x 5	6/13/91		TVH/BTXE VOC's	8015/8020/5030 8010
59	W	V x 3	6/13/91		VOC's	8010

* * * * * *

Released by: [signature] Received by: _____ Date: 6/13/91

Released by: _____ Received by: _____ Date: _____

Received by Laboratory: [signature] Date: 6/13/91 14:50

Released by Laboratory: _____ Date: _____

Released by: _____ Date: _____

[1] Sample Type: W = Water, S = Soil, O = Other (specify)
[2] Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, O = Other (specify)

NOTES TO LABORATORY:
- Notify SCI if there are any anomalous peaks on GC or other scans
- Questions/clarifications - Contact SCI at (415) 268-0461

CHAIN OF CUSTODY FORM

PAGE ______ OF ______

PROJECT NAME: 13th + Jefferson

JOB NUMBER: 430.013

LAB: Curtis + Tompkins Ltd

PROJECT CONTACT: Sean Carson

TURNAROUND: 5 day

SAMPLED BY: Marianne Watada

REQUESTED BY: Sean Carson

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX: WATER	SOIL	WASTE	AIR	CONTAINERS: VOA	LITER	PINT	TUBE	METHOD PRESERVED: HCL	H_2SO_4	HNO_3	ICE	NONE	SAMPLING DATE: MONTH	DAY	YEAR	TIME	NOTES	ANALYSIS REQUESTED: TVH/BTXE EPA 8020/8015/5030	VOCs EPA 8010	TEH 8015/3550	O+G SMWW 17: 5520
	MW-47	X				5									12	12	91			X	X		
	MW-48	X				5	2								↓	↓	↓			X	X	X	X
	MW-49	X				5									↓	↓	↓			X	X		
	MW-54	X				3									↓	↓	↓			X			
	MW-59	X				3									↓	↓	↓				X		

COMMENTS & NOTES:

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
Marianne Watada	12/12/91 4:40		
		[signature] Keane	12/12/91 4:35

Subsurface Consultants, Inc.
171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607
(510) 268-0461 • FAX: 510-268-0137

CHAIN OF CUSTODY FORM

PAGE 1 OF _____

PROJECT NAME: 13th + Jefferson

JOB NUMBER: 430.013 LAB: Curtis + Tompkins Ltd

PROJECT CONTACT: Sean Carson TURNAROUND: 5 day

SAMPLED BY: Craig Fletcher / Maryann Watada REQUESTED BY: Sean Carson

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX						CONTAINERS						METHOD PRESERVED					SAMPLING DATE				NOTES	ANALYSIS REQUESTED												
		WATER	SOIL	WASTE	AIR			VOA	LITER	PINT	TUBE			HCL	H_2SO_4	HNO_3	ICE	NONE	MONTH	DAY	YEAR	TIME			TVH/BTXE EPA 8015/5030	VOC's EPA 8010/8015/3550	TEH 8015/3550	O&G SM5520 E&F							
	MW-47	X						5						X			X		09	10	91			X	X											
	MW-48	X						5	2					X			X							X	X	X	X								
	MW-49	X						5						X			X							X	X										
	MW-51	X						3						X			X							X											
	MW-52	X						3						X			X							X											
	MW-54	X						3						X			X							X											
	MW-59	X						3						X			X								X										

COMMENTS & NOTES:

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
[signature]	9/11/91 10:15	[signature]	9/11/91 10:15
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME

Subsurface Consultants, Inc.

171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607

(510) 268-0461 · FAX: 510-268-0137

STATE OF CALIFORNIA PETE WILSON, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
2101 WEBSTER STREET, SUITE 500
OAKLAND, CA 94612

Phone: (415) 464-1255
FAX: (415) 464-1380

FACSIMILE COVER SHEET

To: Jne Paul Smith

Fax Number: 415-568-3706

From: Eddy So

Subject: Bramalea Pacific at 15/Jefferson St.

Total pages including cover sheet: 2

If you are having any problems receiving this, please call sender.

Comments:

Re our teleconversation, pls find enclosed for yr info N provide, if U can, those available for my perusal Thanks. (Any Ques call me!).

Fax: 568-3706

ask.

LIA - ACHD [redacted]

18th. / Jefferson St. Drain dump Remediation Plan (1,2 DCA contaminated Gw)

Site Name: Bramalea Pacific

Issues: (Request following info. from RP.)

1. Technical info about the existing carbon adsorption system including system design, carbon column performance curve, current contaminants being treated by the system.

2. Provide me with all rationales to substantiate the selection of the referred location of the extraction well, if any available.

3. What contingency plan will be provided in case of that

(a) pump and/or other plumbing fixtures breakdown?

(b) carbon columns reach to the saturation capacity?

(c) the untreated Gw storage tank rupture or fails due to other mechanical reasons (such as corrosion / cracks in weld lines)

4. How the treatment system monitoring program is modified to suit for the introduction of DCA into the system.

5. An estimate of the duration for P/p-2-treat operation.

6. Clean up level for 1,2-DCA?

7. What is the current usage of the treated water of the treatment plant?

James P. Bowers, PE
R. William Rudolph, Jr., PE

LETTER OF TRANSMITTAL

TO: Mr. John Esposito
Bramalea Pacific
1111 Broadway, Suite 1400
Oakland, CA 94612

DATE: July 8, 1991
PROJECT 13th & Jefferson Streets/Gasoline Fuel Tank/Floor Drain Sump
SCI JOS NUMBER: 430.013

WE ARE SENDING YOU:

X 1 copies of our final report	X if you have any questions, please call
a draft of our report	for your review and comment
a Service Agreement	please return an executed copy
a proposed scope of services	for geotechnical services
specifications	with our comments
grading/foundation plans	with Chain of Custody documents
soil samples/groundwater samples	X for your use
an executed contract	

REMARKS:

COPIES TO: (1) Ms. Lois Parr, City of Oakland Redevelopment Agency, 1333 Broadway #900, Oakland, CA
(1) Mr. Lester Feldman, RWQCB, 1800 Harriosn, #700, Oakland, CA 94612
(1) Mr. Donnell Choy, City Attorney, 505 14th Street, 12th Floor, Oakland, CA
(1) Mr. Roy Ikeda, Crosby, Heafey, Roach & May, 1999 Harrison St., Oakland, CA
√(2) Mr. Paul Smith, ACHCSA, 40 Swan Way, #200, Oakland, CA 94621

BY: Sean Carson
Sean O. Carson (cccc)

Subsurface Consultants, Inc.
171 12th Street • Suite 201 • Oakland, California 94607 • Telephone 415-268-0461