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TELECOPIER: (415) 451-1527

June 11, 1991

Mr. Gil Wistar
Hazardous Materials Specialist
Alameda County Health Care Services Agency
80 Swan Way, Room 200
Oakland, California 94261

Re: Connell Auto Center
3093 Broadway, Oakland, California

Dear Gil:

Enclosed are the results of the latest round of investigations at the above referenced facility. As you can see by the work conducted to date, we went beyond the scope of work originally contemplated in our past communication. This is the reason why it has taken us a little longer to get you a final report. Please be advised that we will be meeting with the property owners in the near future to discuss the implementation of the recommendations contained in the report by Subsurface Consultants, Inc. dated June 3, 1991.

Please contact me if you have any questions concerning the above.

Very truly yours,

FITZGERALD, ABBOTT & BEARDSLEY

By Jonathan W. Redding
Jonathan W. Redding

JWR:rr
Enclosure
cc: Connell Mailing List

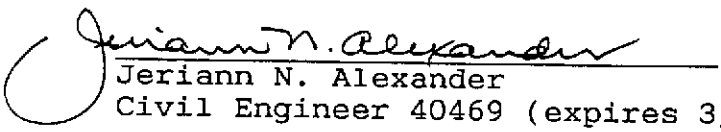
6/11/91 (C004)

PHASE II HYDROCARBON
CONTAMINATION ASSESSMENT
CONNELL OLDSMOBILE
3093 BROADWAY
OAKLAND, CALIFORNIA
SCI 447.026

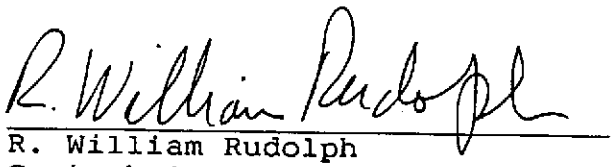
Prepared for:

Mr. Jonathan Redding
Fitzgerald, Abbott & Beardsley
1221 Broadway, 21st Floor
Oakland, California 94612-1837

By:



Jeriann N. Alexander
Civil Engineer 40469 (expires 3/31/95)



R. William Rudolph
Geotechnical Engineer 741 (expires 12/31/92)

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

June 3, 1991

I INTRODUCTION

This report presents the results of the Phase II hydrocarbon contamination assessment conducted by Subsurface Consultants, Inc. (SCI) at the Connell Oldsmobile facility in Oakland, California. The facility is situated at the southwest corner of the intersection of Hawthorne Avenue and Broadway, as shown on the Site Plan, Plate 1.

On December 18, 1989, three underground fuel storage tanks containing gasoline, diesel and waste oil were removed from the site. Elevated levels of oil and grease, diesel, gasoline and fuel constituents (BTEX) were encountered in soil samples from beneath the tanks. Perched water within the excavation contained detectable concentrations of BTEX. Contaminated soil near the tanks was removed and stockpiled on-site. The excavation was backfilled with imported material. Tank removal activities were summarized more thoroughly in a letter dated March 22, 1990.

Following tank and contaminated soil removal, SCI performed a preliminary contamination assessment at the site. SCI's study indicated that:

1. Soil and groundwater have been impacted by previous releases of gasoline and diesel fuel,
2. Soil contamination exists near the previous tanks and near the groundwater surface downgradient of the tanks,
3. Free product was observed to be floating on the water surface, 35 feet from the tank area, and
4. 1,2-DCA was detected in groundwater.

The results of the investigation were presented in the report dated December 7, 1990.

Mr. Gilbert Wistar, hazardous materials specialist with the Alameda County Health Care Services Agency (ACHCSA), reviewed the report and issued a letter (dated January 7, 1991) requiring that (1) the limits of downgradient groundwater contamination be defined and (2) the lateral and vertical extent of soil contamination be evaluated.

SCI was retained in February 1991 to begin evaluating the limits of groundwater contamination. To date, SCI's services have consisted of (1) exploring subsurface conditions by drilling six test borings, (2) analyzing selected soil samples, (3) evaluating impacts to groundwater by completing the borings as monitoring wells and analyzing groundwater from the wells, (4) performing a level survey to establish well head elevations for the wells, and (5) determining the groundwater flow direction and gradient.

In 1989, Levine-Fricke (LF) conducted a soil and groundwater investigation at the Broadway Medical Plaza property, situated north of Hawthorne Avenue across from the Connell facility. LF has been monitoring groundwater within 4 wells on the property since the investigation. Data generated to date by LF, which was available in public records, has been included in this report.

II FIELD INVESTIGATION

Subsurface conditions were investigated by drilling six test borings. The test borings were completed as groundwater monitoring wells and are designated Monitoring Well 2 (MW2) through Monitoring Well 7 (MW7). MW1 was installed by SCI during Phase I. Well locations are shown on Plate 1.

A level survey was performed to determine the top of casing (TOC) elevation for each well. In addition, spot elevations were determined to evaluate groundsurface relief in the study area. To incorporate analytical and water surface elevation data generated to date by LF into this study, the SCI well elevations were referenced to an arbitrary benchmark established by LF on the Broadway Medical Plaza property. The depth to groundwater, below the TOC for MW1 through MW7, was measured by SCI. A representative of LF measured water depths within wells LF2, LF3 and LF4.

Rigorous quality control and quality assurance protocols were followed during our field investigation. A detailed discussion of our field procedures is provided in Appendix A.

III ANALYTICAL TESTING

Selected soil and groundwater samples were analyzed by Curtis & Tompkins, Ltd. (C&T), a laboratory certified by the DHS for hazardous waste and water testing. C&T has performed the analytical testing during previous phases of the study.

The samples were analyzed for those constituents previously detected which included; total volatile hydrocarbons (TVH), total extractable hydrocarbons (TEH), total oil and grease (TOG), purgeable halocarbons and benzene, toluene, ethylbenzene, xylene (BTEX). Summaries of the analytical test results for Phase I and II are presented in Tables 1 and 2. Table 2 also includes data available for LF wells. Contaminant concentrations in water are also presented on Plate 2. Descriptions of the sample preparation and analytical test methods, analytical test reports and Chain-of-Custody records are presented in Appendix B.

Table 1. Summary of Contaminant Concentrations in Soil

Sample	TVH (mg/kg)[1]	TEH (mg/kg)	TOG (mg/kg)	B (ug/kg)[2]	T (ug/kg)	E (ug/kg)	X (ug/kg)	Purgeable Halocarbons (ug/kg)
B1 @ 8.0'[3]	63	ND[4]	ND	17	ND	1000	1600	--[5]
B1 @23.0'	2700	ND	ND	16000	120000	50000	220000	--
B1 @33.0'	4	ND	ND	110	200	52	290	--
B1 @43.0'	ND	ND	ND	6.0	22	7	41	--
B2 @ 1.5'	--	--	ND	--	--	--	--	--
B2 @ 3.0'	--	--	ND	--	--	--	--	--
B2 @ 5.5'	--	--	ND	--	--	--	--	--
B2 @10.5'	--	--	ND	--	--	--	--	--
B2 @15.0'	ND	ND	ND	ND	ND	ND	25	--
B2 @25.5'	ND	ND	ND	ND	11	ND	29	--
B3 @15.5'	ND	ND	ND	ND	10	ND	25	--
B3 @25.5'	0.8	ND	ND	ND	200	170	800	--
B3 @35.5'	ND	ND	ND	ND	21	7.3	41	--
B4 @14.0'	2.3	ND	ND	11	38	31	150	--
B4 @24.5'	370	ND	ND	450	10000	770	30000	--
B4 @34.5'	ND	ND	ND	6.1	29	6.7	37	--
MW1 @15.5'[6]	510	1100	610	640	6500	3400	14000	ND
MW1 @30.5'	5500	ND	ND	16300	170000	98000	520000	ND
MW1 @34.5'	2.0	ND	ND	ND	2200	15	79	--
MW3 @ 20.5	ND	ND	ND	ND	ND	ND	ND	ND
MW4 @ 20.5	100	ND	ND	260	2500	1700	7300	ND
MW4 @ 31.0	2.7	ND	ND	76	380	54	290	ND
MW5 @ 20.0	ND	ND	--	ND	6.9	ND	ND	--
MW6 @ 21.0	3.2	ND	--	350	500	28	160	--
MW6 @ 30.5	ND	ND	--	ND	ND	ND	ND	--
MW7 @ 20.5	ND	ND	--	ND	2	ND	ND	--

---

[1] mg/kg = milligrams per kilogram

[2] ug/kg = micrograms per kilogram

[3] B = Boring

[4] ND = None Detected, chemicals not present at concentrations above detection limits

[5] -- = Test not performed

[6] MW = Monitoring Well; MW1 was initially referred to as Sample 5

Table 2. Summary of Contaminant Concentrations in Water

Well	Sample Event Date	TVH ug/l[1]	TEH ug/l	TOG ug/l	B ug/l	T ug/l	E ug/l	X ug/l	Chloro-benzene ug/l	Dichloro-benzene ug/l	Purgeable Halocarbons ug/l
MW1[2]	Oct 90	620,000	ND[3]	ND	33,000	50,000	7,900	41,000	ND	ND	2,000 DCA[4]
MW2	Mar 91	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW3	Mar 91	ND	ND	ND	ND	0.6	ND	ND	ND	ND	ND
MW4	Mar 91	150,000	ND	ND	20,000	38,000	2,800	14,000	ND	ND	610 DCA
MW5	Mar 91	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW6	Mar 91	80,000	ND	ND	12,000	13,000	1,100	5,400	ND	ND	1,400 DCA, 200 Dibromo-chloromethane
MW7	Mar 91	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LF2[5]	Mar 89	8,300	ND	--[6]	870	ND	ND	ND	--	--	--
	May 89	5,500	ND	--	17	ND	ND	27	--	--	--
	Oct 89	ND	ND	--	16	ND	23	ND	10	ND	--
	Jan 90	2,000	ND	--	34	ND	39	9.2	20	510	--
	Apr 90	3,200	630	--	22	15	36	3.2	10	4.3	--
	Oct 90	690	ND	--	10	ND	20	2.0	8.0	2.5	--
LF3	Mar 89	ND	ND	--	ND	ND	ND	ND	--	--	--
	Oct 89	ND	ND	--	ND	ND	ND	ND	ND	ND	--
	Jan 90	ND	ND	--	ND	ND	ND	ND	ND	ND	--
	Apr 90	ND	ND	--	ND	ND	ND	ND	ND	ND	--
	Oct 90	ND	ND	--	ND	ND	ND	ND	ND	ND	--
LF4	May 89	ND	ND	--	ND	ND	ND	ND	--	--	--
	Oct 89	ND	ND	--	ND	ND	ND	1.6	ND	ND	--
	Jan 90	ND	58	--	ND	ND	ND	ND	ND	ND	--
	Apr 90	ND	ND	--	ND	ND	ND	0.6	ND	ND	--
	Oct 90	ND	ND	--	ND	ND	ND	ND	ND	ND	--

---

[1] ug/l = micrograms per liter = parts per billion = ppb
[2] MW1 was initially referred to as Sample 5
[3] ND = None detected, chemicals not present at concentrations above detection limits
[4] DCA = 1,2-dichloroethane
[5] LF = Levine-Fricke
[6] --, Test not requested

IV SITE CONDITIONS

A. Regional Setting

The site was developed by cutting into the eastern flank of a minor structural uplift on the Oakland alluvial plain referred to as "Pill Hill." The groundsurface in the area slopes moderately down toward the east and southeast. The groundsurface continues to slope downward across Broadway and toward Glen Echo Creek, a southerly flowing inlet to Lake Merritt.

B. Surface Conditions

The Connell Oldsmobile facility is situated on the south side of Hawthorne Avenue, between Broadway and Webster Street. The facility consists of a high one-story building with a slab-on-grade floor. Asphalt and concrete-paved accessways extend along the west and south sides of the structure; sidewalks extend along the north and east sides. The previous tanks were located beneath the sidewalk adjacent to the north side of the facility, as shown on Plate 1.

C. Soil Conditions

The study indicates that the site is underlain by interbedded layers of alluvium. The alluvial soils consist of varying gradations of sand, silt, clay and gravel. Our interpretation of subsurface conditions is presented on Plates 3 and 4. While the soils appear to primarily consist of low permeable materials, such as clayey sands and silts, and silty clays, more permeable zones do exist. A saturated sand and gravel layer exists along the east

side of the site. The top of this layer is situated between 15 and 30 feet below the groundsurface, and deepens toward the east and south. The layer appears to thin toward the hills to the west. LF data appears to indicate that stream channel deposits exist near the groundsurface below Hawthorne Avenue.

D. Groundwater Conditions

Groundwater levels have been measured periodically using a well sounder and/or a tape with water sensitive paste. LF has provided water level data on two occasions. Water level readings are summarized in Table 4.

Table 4. Groundwater Elevations

Well	TOC Elev[1] (ft)	Date	Groundwater Depth[2] (ft)	Groundwater Elev (ft)
MW1	94.48	10/03/90	26.40	68.08
		03/05/91	27.46	67.02
		03/18/91	26.88	67.60
		04/12/91	25.49	68.99
MW2	94.81	03/05/91	27.86	66.95
		03/18/91	27.46	67.35
		04/12/91	26.98	67.83
MW3	90.08	03/06/91	23.17	66.91
		03/18/91	22.76	67.32
		04/12/91	22.51	67.57
MW4	88.84	03/05/91	23.79	65.05
		03/18/91	22.30	66.54
		04/12/91	21.85	66.99
MW5	84.84	03/18/91	26.31	58.53
		04/12/91	26.41	58.43
MW6	85.62	03/18/91	25.82	59.80
		04/12/91	27.23	58.39
MW7	85.41	03/18/91	21.63	63.78
		04/12/91	22.13	63.28
LF2	91.19	10/03/90	21.34	69.85
		03/06/91	21.93	69.26
LF3	89.09	10/03/90	19.15	69.94
		03/06/91	19.87	69.22
LF4	90.65	10/03/90	22.19	68.46
		03/06/91	22.87	67.78

[1] Reference datum, arbitrary benchmark established by Levine Fricke

[2] Measured below TOC

The data in Table 4, indicates that the groundwater flow direction and gradient vary significantly across the site. Groundwater contours for the March 1991 readings are presented on Plate 5.

Free floating gasoline was observed on the groundwater surface in wells MW1, MW4 and MW6. Product thicknesses range from [illegible] 26 inches. The actual thickness of product on the water surface is difficult to measure due to capillary forces which can cause product to accumulate in wells. However, the average product thickness is about 1 inch in MW1 and about 10 inches in MW4.

V CONCLUSIONS AND RECOMMENDATIONS

A. Free Floating Product

The color of the free floating product appears to indicate that it is leaded gasoline. At this time, the product appears to be from the same source. The lateral extent of the free product plume extends beyond the downgradient well (MW6) as shown on Plate 2.

B. Contaminant Concentrations in Groundwater

Studies to date indicate that elevated concentrations of dissolved gasoline and its constituents (BTEX) have been detected in groundwater. Two volatile organic compounds (1,2-Dichloroethane (DCA) and dibromochloromethane) were also detected in the water. DCA is a gasoline additive[1,2] and has also been used as an industrial solvent[2,3]. Dibromochlorethane is used in refrigerants, pesticides, fire extinguishers, and propellants[2].

---

[1] Leaking Underground Fuel Tank Field Manual, Appendix I, Chemical Composition of Gasoline, October 1989.

[2] Groundwater Chemicals Desk Reference, John H. Montgomery, 1990.

[3] Hawleys Condensed Chemical Dictionary, N. Irving Sax, 1987.

The source of gasoline and BTEX appears to be previous releases from the underground storage tanks. However, the source of DCA and dibromochlormethane are uncertain since they were not detected in the soil samples analyzed previously from below the tanks, nor have they been detected in the unsaturated zone soils. We suspect, however, that the DCA may be associated with the free floating gasoline. DCA is a hydrophilic compound, i.e. it has an affinity for water. As a result, DCA within the gasoline would rapidly migrate into groundwater. Since the DCA plume appears to coincide with the product plume, it appears that the DCA exists as a dissolved constituent in groundwater.

Dissolved contaminants have not been detected in wells MW2, MW3, MW5 and MW7 and, accordingly, the southerly extent of the plume appears defined. Reportedly, free floating product has never been observed in LF4. In addition, only relatively low concentrations of petroleum hydrocarbons and xylene have been detected. Therefore, it appears that the northerly contaminant boundary exists along the south side of Hawthorne Avenue. To date the downgradient extent of contamination and the possibility of an additional upgradient source have not been determined.

C. Recommendations

Because of the presence of significant quantities of gasoline floating on the groundwater surface, we recommended that interim remediation consisting of free product recovery be implemented. Product recovery should be accomplished by using a low-flow skimming pump within the existing wells where free product has been

observed; i.e., MW1, MW4 and MW6. The recovered product should be pumped directly into suitable waste containers for subsequent recycling.

Further investigation is recommended to define the extent of soil and groundwater contamination, and to begin evaluating final remedial measures. We suggest the next phase of investigation include one monitoring well located further downgradient of MW6. A proposed well location is shown on Plate 5. The well should be installed, developed and sampled in a manner consistent with the protocol described in Appendix A.

Prior to implementing a new phase of work, we suggest that this report be submitted to Mr. Gilbert Wistar of the ACHCSA for his review and comment.

List of Attached Plates

Plate 1	Site Plan
Plate 2	Contaminant Concentrations in Groundwater
Plates 3 and 4	Cross Sections
Plate 5	Groundwater Contours

Appendix

A	Investigation Protocol
B	Analytical Testing

Distribution

10 copies: Mr. Jonathan Redding
Fitzgerald, Abbott & Beardsley
1221 Broadway, 21st Floor
Oakland, California 94612-1837

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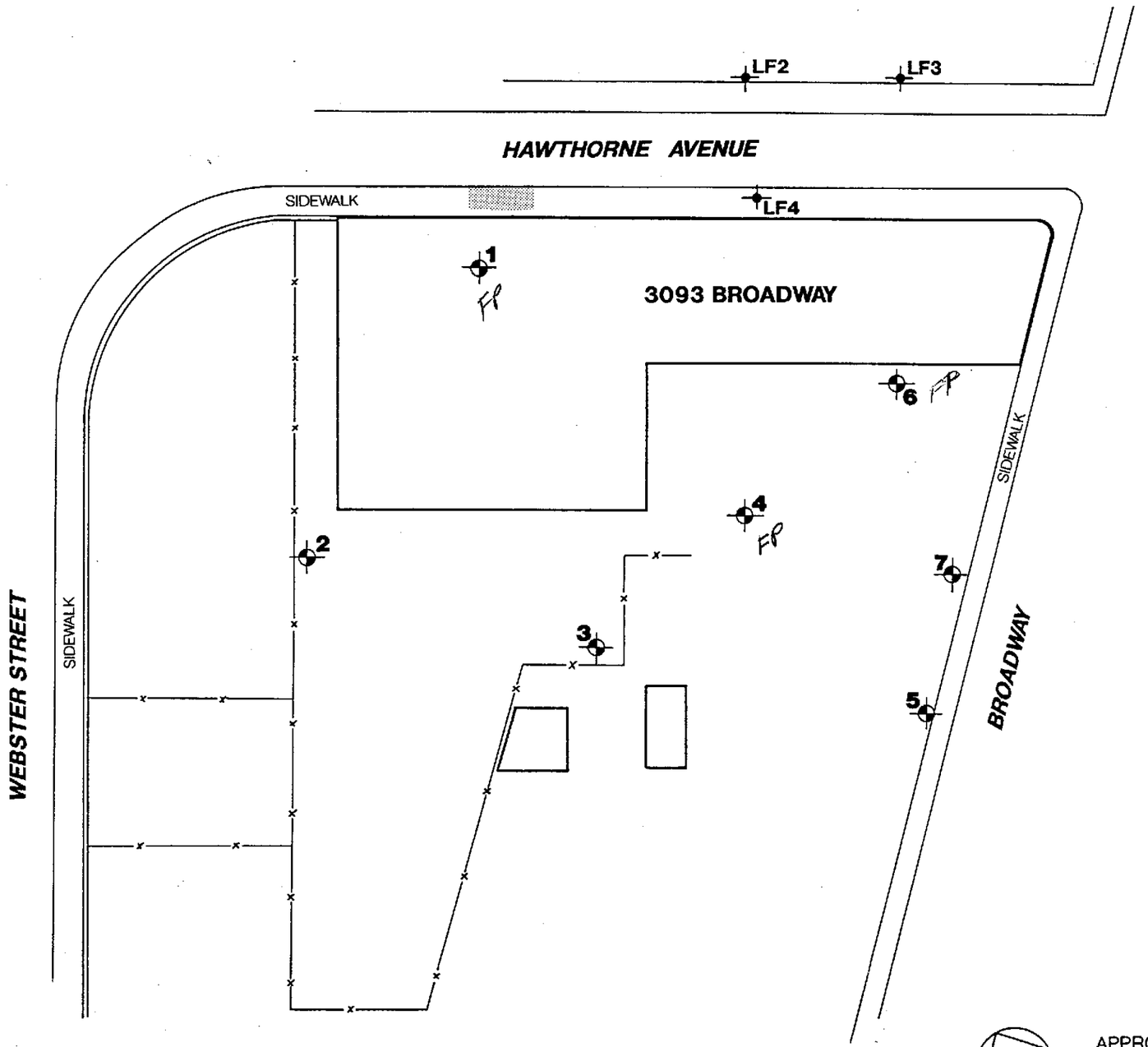
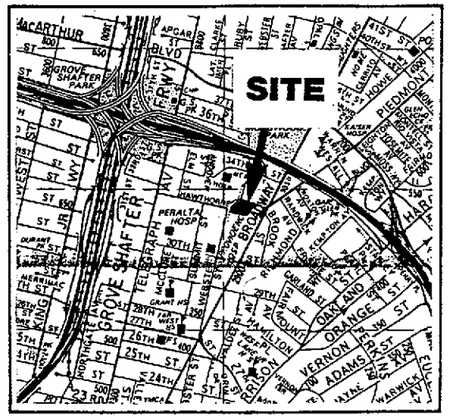




VICINITY MAP

- SCI MONITORING WELL
- LEVINE FRICKE MONITORING WELL
- —x— FENCE
- RETAINING WALL
- PREVIOUS TANK AREA

N

APPROXIMATE SCALE (feet)

0 60 120

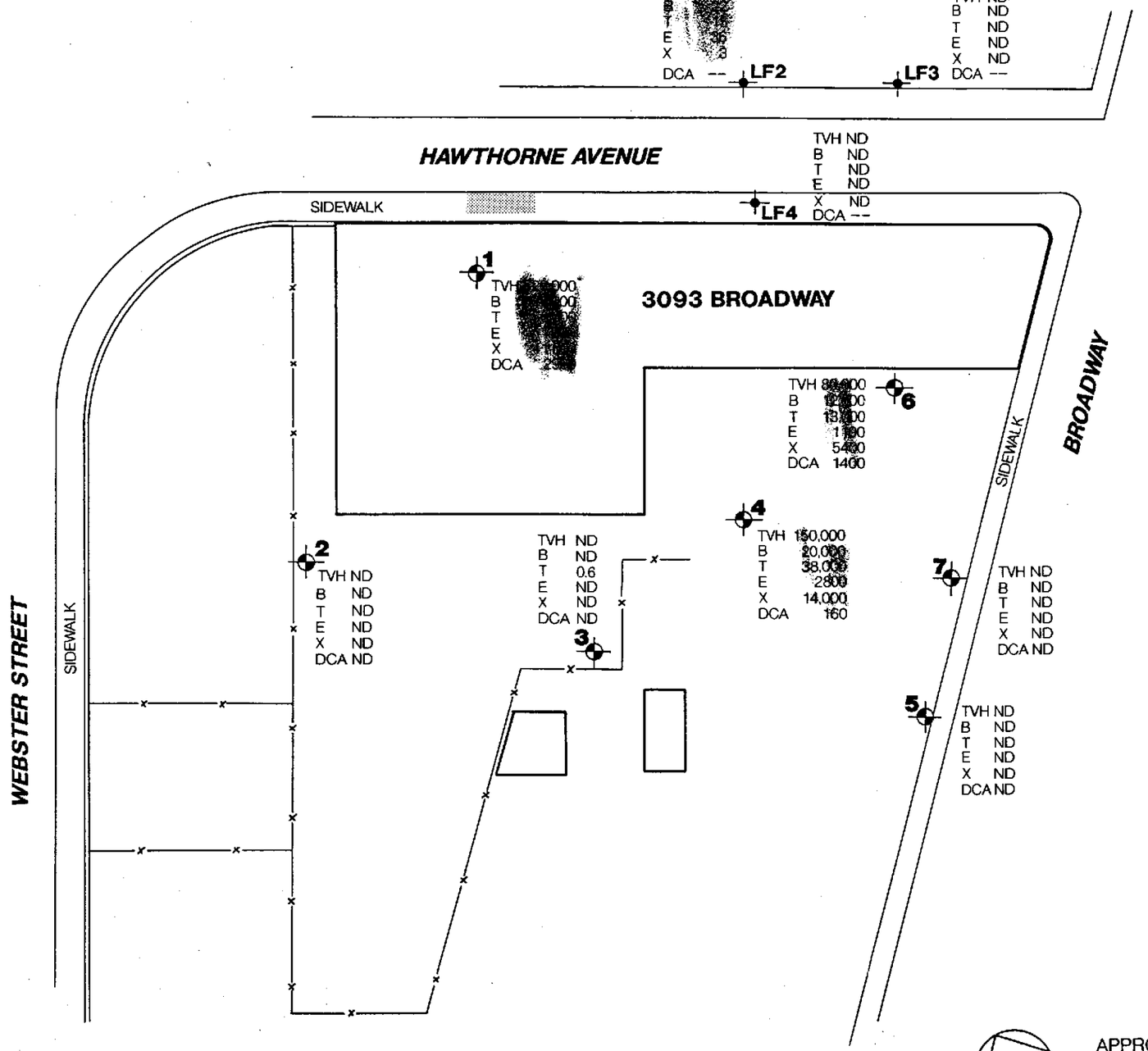
SITE PLAN

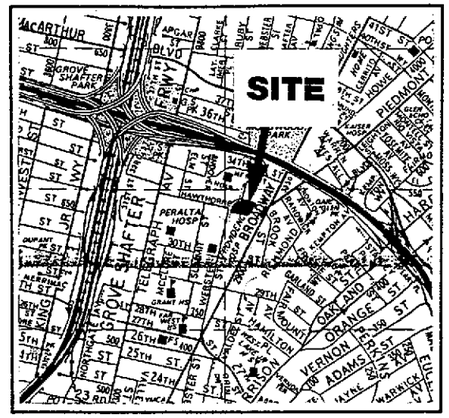
Subsurface Consultants

CONNELL OLDSMOBILE – OAKLAND, CA

JOB NUMBER	DATE	APPROVED
447.026	4/17/91	

PLATE 1





VICINITY MAP

4 SCI MONITORING WELL

LF2 LEVINE FRICKE MONITORING WELL

—x— FENCE

RETAINING WALL

GROUNDWATER CONTOUR

PREVIOUS TANK AREA

TVH TOTAL VOLATILE HYDROCARBONS (ppb)

B BENZENE (ppb)

T TOLUENE (ppb)

E ETHYLBENZENE (ppb)

X XYLENE (ppb)

DCA 1,2–DICHLOROETHANE (ppb)

N

APPROXIMATE SCALE (feet)

0 60 120

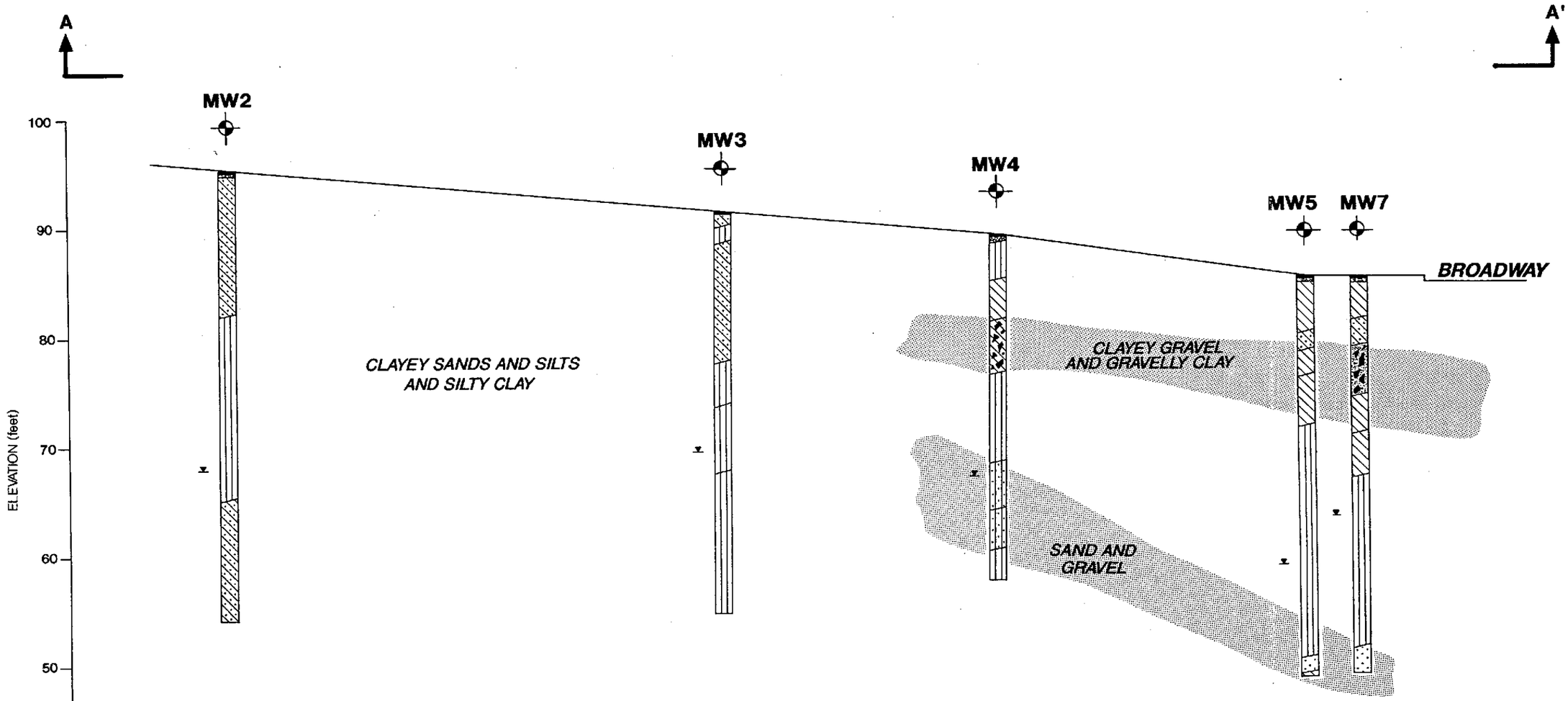
CONTAMINANT CONCENTRATIONS IN GROUNDWATER, MARCH 1991

Subsurface Consultants

CONNELL OLDSMOBILE – OAKLAND, CA

JOB NUMBER	DATE	APPROVED
447.026	4/17/91	

PLATE 2



HORIZONTAL SCALE: 1" = 30'

▼ MARCH 1991 WATER LEVELS

CROSS SECTION A – A'

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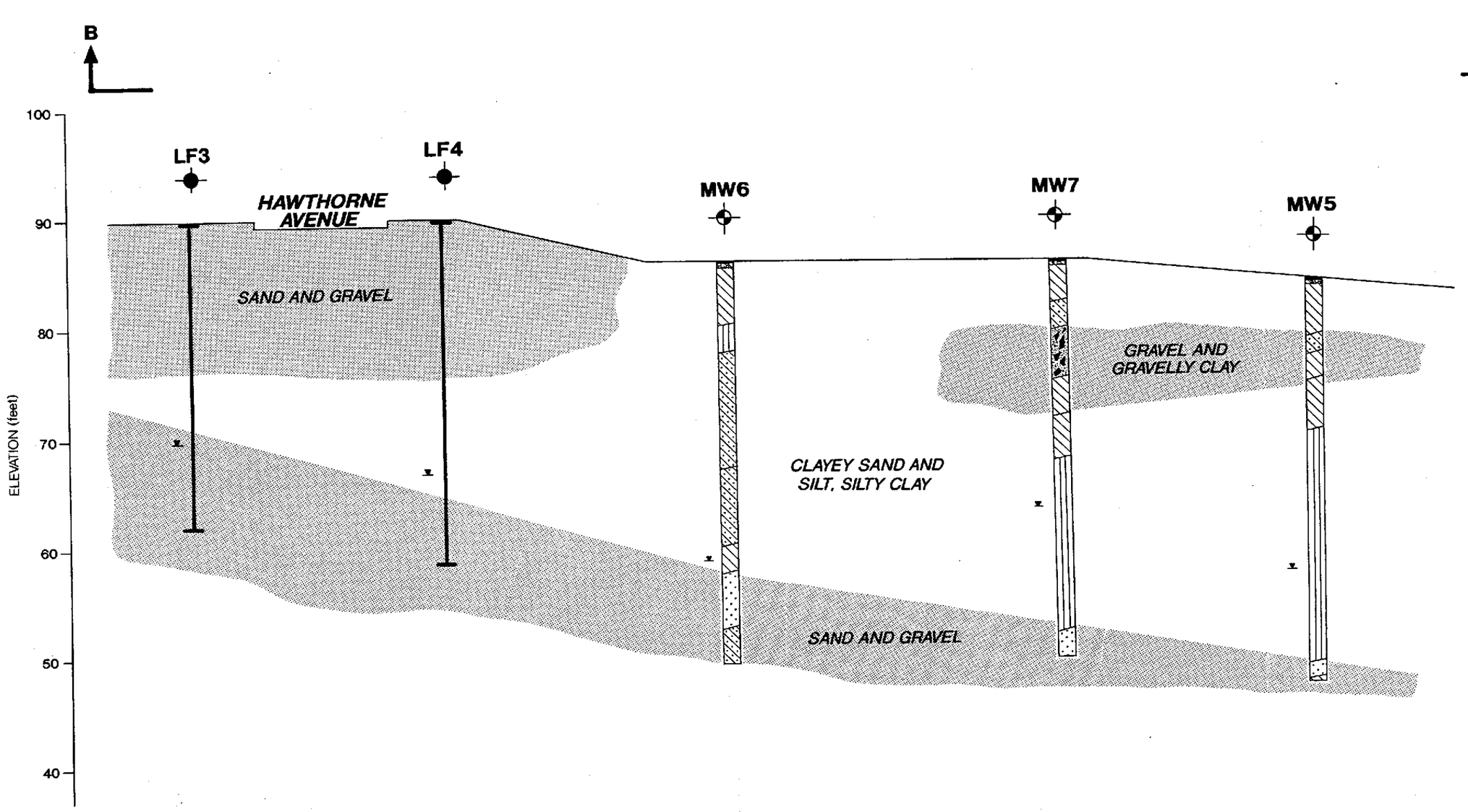
CONNELL OLDSMOBILE – OAKLAND, CA

JOB NUMBER	DATE	APPROVED	PLATE
447.026	4/18/91		3



HORIZONTAL SCALE: 1" = 30'

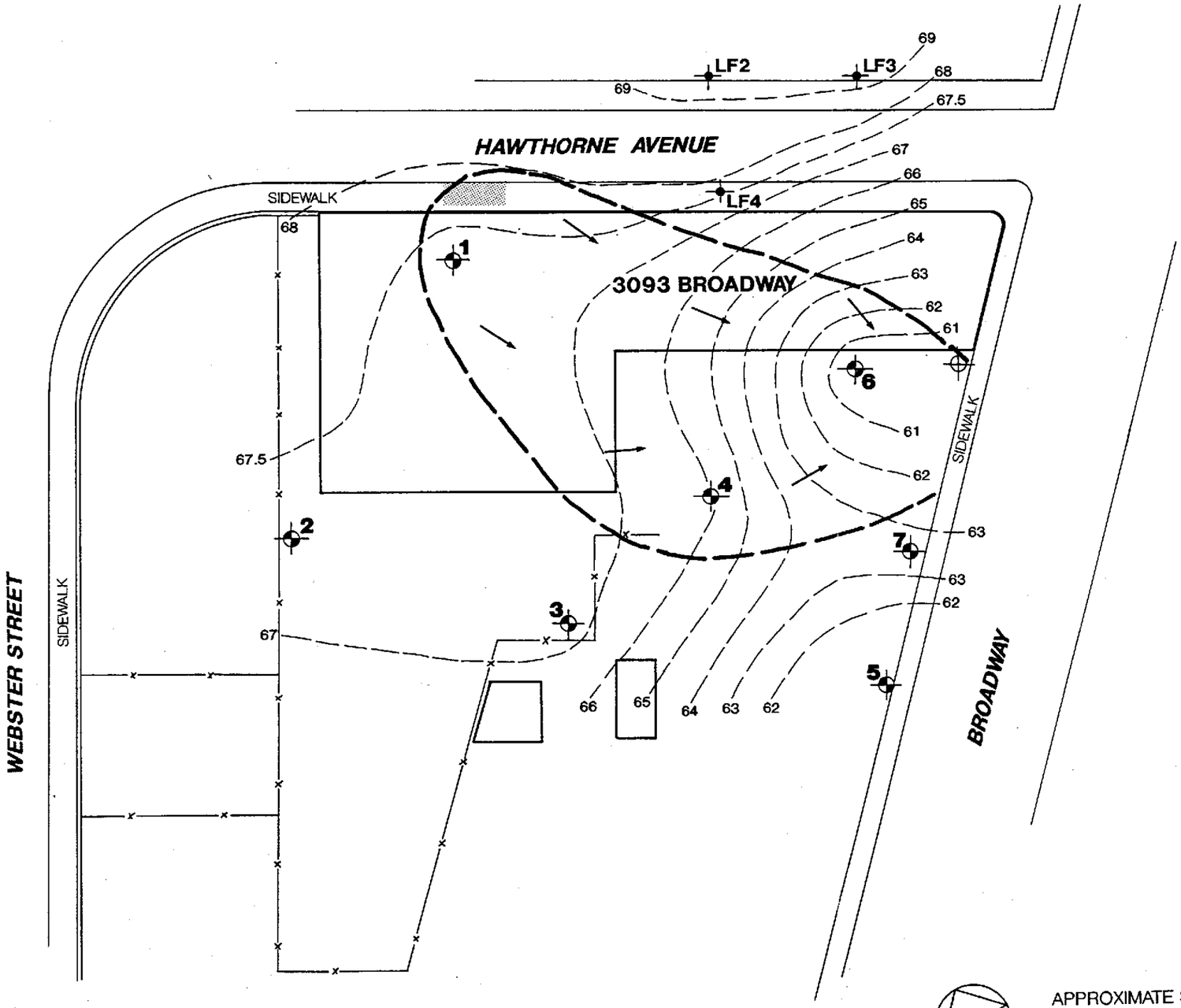
▼ MARCH 1991 WATER LEVELS

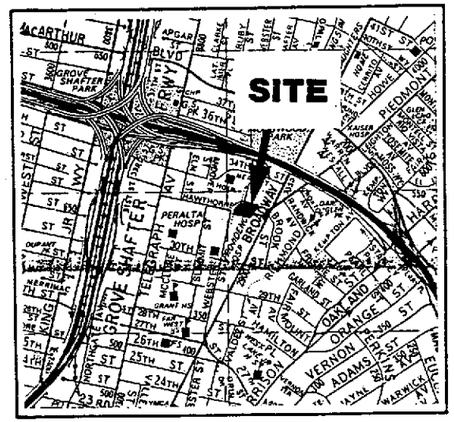
CROSS SECTION B – B'

Subsurface Consultants

CONNELL OLDSMOBILE – OAKLAND, CA

JOB NUMBER	DATE	APPROVED	PLATE
447.026	4/18/91		4





VICINITY MAP

- SCI MONITORING WELL
- SCI PROPOSED MONITORING WELL
- LEVINE FRICKE MONITORING WELL
- FENCE
- RETAINING WALL
- GROUNDWATER CONTOUR
- PREVIOUS TANK AREA
- EXTENT OF DISSOLVED & FREE PRODUCT PLUMES
- FLOW DIRECTION

N

APPROXIMATE SCALE (feet)

0 60 120

GROUNDWATER CONTOURS

Subsurface Consultants

CONNELL OLDSMOBILE – OAKLAND, CA

JOB NUMBER	DATE	APPROVED
447.026	4/17/91	

PLATE 5

APPENDIX A
INVESTIGATION PROTOCOL

A. Test Borings

The test borings were drilled using a trailer-mounted drill rig equipped with 8-inch diameter hollow stem augers. Our field engineer observed drilling operations, prepared detailed logs of the test borings and obtained undisturbed samples of the materials encountered. Test boring logs are presented on Plates A1 through A7. Soils are classified in accordance with the Unified Soil Classification System described on Plate A8.

A California Drive Sampler having an outside diameter of 2.5 inches and an inside diameter of 2.0 inches was used to obtain soil samples. The number of blows required to drive the sampler the final 12 inches of each 18-inch penetration were recorded and are presented on the test borings logs. Drilling and sampling equipment was thoroughly steam-cleaned prior to each use to reduce the likelihood of cross-contamination between samples and/or borings.

Soil samples were retained in 2.0-inch diameter brass liners. Teflon sheeting was placed over the ends of the soil liners; the liners were subsequently capped and sealed with duct tape. The shoe sample from each drive was retained in a plastic bag and screened for volatile organics using an Organic Vapor Meter (OVM). OVM measurements are recorded on the logs of the test borings. The sealed liners were placed in ice-filled coolers and remained iced

until delivery to the analytical laboratory. Chain-of-custody records accompanied the samples.

B. Groundwater Monitoring Wells

At the completion of drilling, a monitoring well was installed in each test boring. Well schematics are shown on the respective test boring log. In general, the wells consist of 2-inch diameter, Schedule 40 PVC pipe having flush-threaded joints. The pipe was steam-cleaned prior to being placed in the borehole.

The lower 15 feet of each well consists of machine-slotted well screen having 0.02-inch slots. The remaining portion of the wells consist of blank pipe. The wells are provided with a bottom cap and a locking top cap. The well screen is encased in a filter composed of Lonestar No. 3 washed sand. The filter sand was placed by carefully pouring it through the annulus between the hollow stem of the auger and the well casing. Periodically, the augers were raised to allow the sand to fill the annulus between the casing and the borehole. The filter extends from just below the bottom of the well to at least one foot above the top of the screened section. A one-foot thick bentonite pellet seal was placed above the sand filter. The annulus above the seal was backfilled with cement grout. The grout mixture consists of portland cement mixed with clean water. It was placed in a manner similar to the sand filter. The monitoring well was completed below grade and is protected by a traffic-rated valve box clearly marked as "Monitoring Well".

The wells were developed at least 24 hours after the grout seal was placed to allow for proper set up. Initially, the depth

to water was measured below the top of the well casing using an electric sounder. The wells were then developed by removing water with a steam-cleaned airlift pump. After the wells were allowed to recharge to within 80 percent of their initial level, they were purged of about three gallons of water and then sampled with a precleaned dedicated Teflon sampling device. Well development and purge water were placed in a depression created on top of the stockpiled soil and allowed to evaporate.

Groundwater samples were retained in chilled, pre-cleaned containers supplied by the laboratory. The type of containers used is dependent on the type of analysis to be performed. A summary of containers used is presented below.

Groundwater Sample Containers

Analysis	Container	Field Preparation
TEH, EPA 8015 modified	Glass, liter	NA
TOG, SMWW 5520	Glass, liter	NA
Purgeable halocarbons and Aromatics EPA 8010/8020	Glass, 40 milliliters	NA

Water samples were placed in ice-filled coolers and remained iced until delivery to the analytical laboratory. Chain-of-custody records accompanied the samples to the laboratory.

C. In-situ Hydraulic Conductivity Testing

The in-situ hydraulic conductivity of the alluvial materials encountered in well MW1 was evaluated by conducting a "Bail Test" in the well. The bail test consisted of evacuating the water in the well and then recording the rate at which recharge occurred. The data was then interpreted using a method defined by Hvorslev (1951). Recovery data and calculations were presented in the December 7, 1990 report.

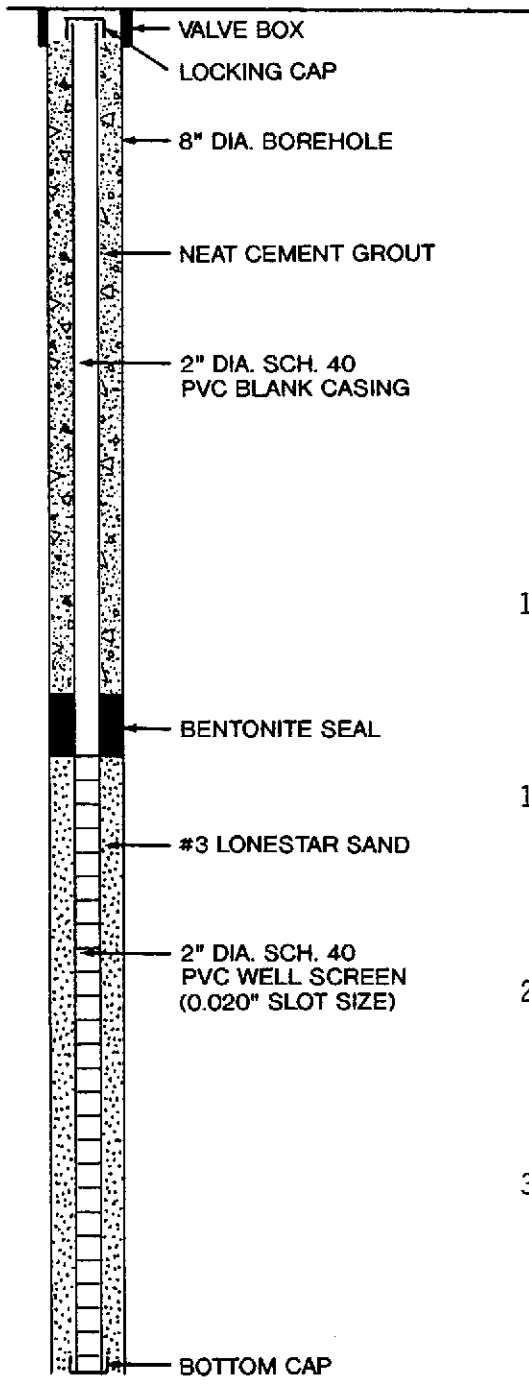
D. Product Thickness

During the field investigation, free floating hydrocarbon product was encountered on the water surface in wells MW1, MW4 and MW6. The thickness of the product was measured as the difference between levels indicated on a steel tape using water and gasoline sensitive pastes. Product thicknesses varied from about 1 to 18 inches in MW1, 10 to 12 inches in MW4, and 3 to 26 inches in MW6 during the study. However, we judge that these thicknesses may not be representative of actual conditions.

It is very difficult to accurately measure product thickness within a formation using a monitoring well due to capillary forces. An attempt was made to measure the "true" product thickness in MW1 and MW4 by removing the product and allowing it to recharge. Following this procedure, product thicknesses varied from about 1 inch in MW1 to 10 inches in MW4, which in our opinion are likely more representative of actual conditions.

LOG OF TEST BORING MW1

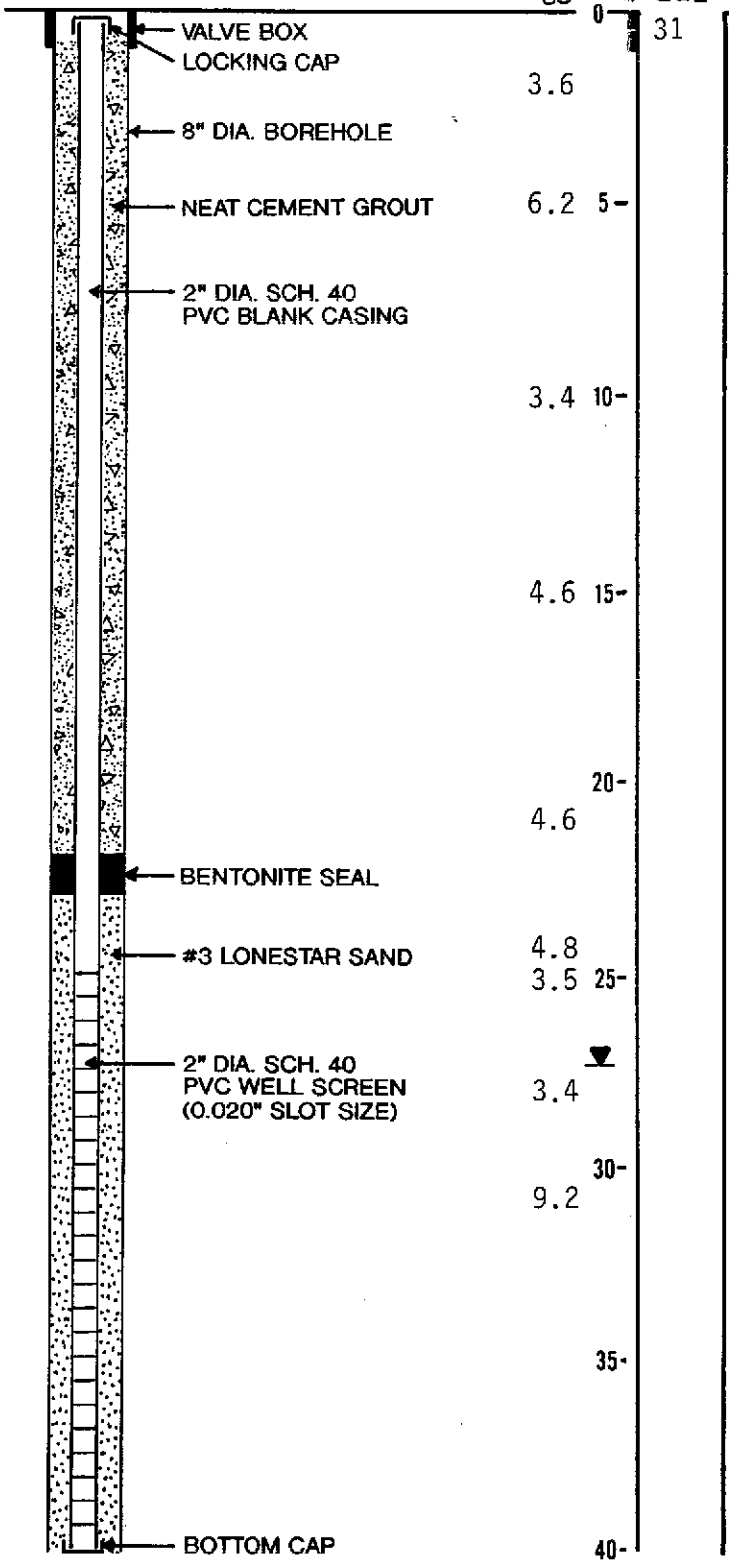
EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 9/28/90
ELEVATION 94.48 feet



OVM (ppm)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	
	0			CONCRETE SLAB - 5" thick
			15	BLACK SILTY SAND (SM) medium dense, moist (fill)
			18	BROWN SILTY CLAY (CL) medium stiff, moist, with some sand
	5		19	BROWN SILTY CLAY (CL) medium stiff, moist
				RED BROWN CLAYEY SAND (SC) medium dense, moist
300	10		21	color change to light gray
12,000	15		47*	very strong petroleum odor
				BROWN SANDY SILT (ML) dense, moist
1150	20		31	color change to gray below 23 feet
2000	25 ▼		36	GROUNDWATER LEVEL APRIL 12, 1991
3000	30		29*	
	▽ 35		31*	GROUNDWATER LEVEL DURING DRILLING
	40			

Subsurface Consultants	CONNELL OLDSMOBILE - OAKLAND, CA		PLATE A1
	JOB NUMBER 447.026	DATE 10/17/90	APPROVED

LOG OF TEST BORING
MW2



OVM (ppm)	DEPTH (FT)	BLOWS PER FOOT
	0	31
3.6		
6.2	5	
3.4	10	
4.6	15	
	20	
4.6		
4.8		
3.5	25	
3.4		
	30	
9.2		
	35	
	40	

GROUNDWATER NOT ENCOUNTERED
DURING DRILLING

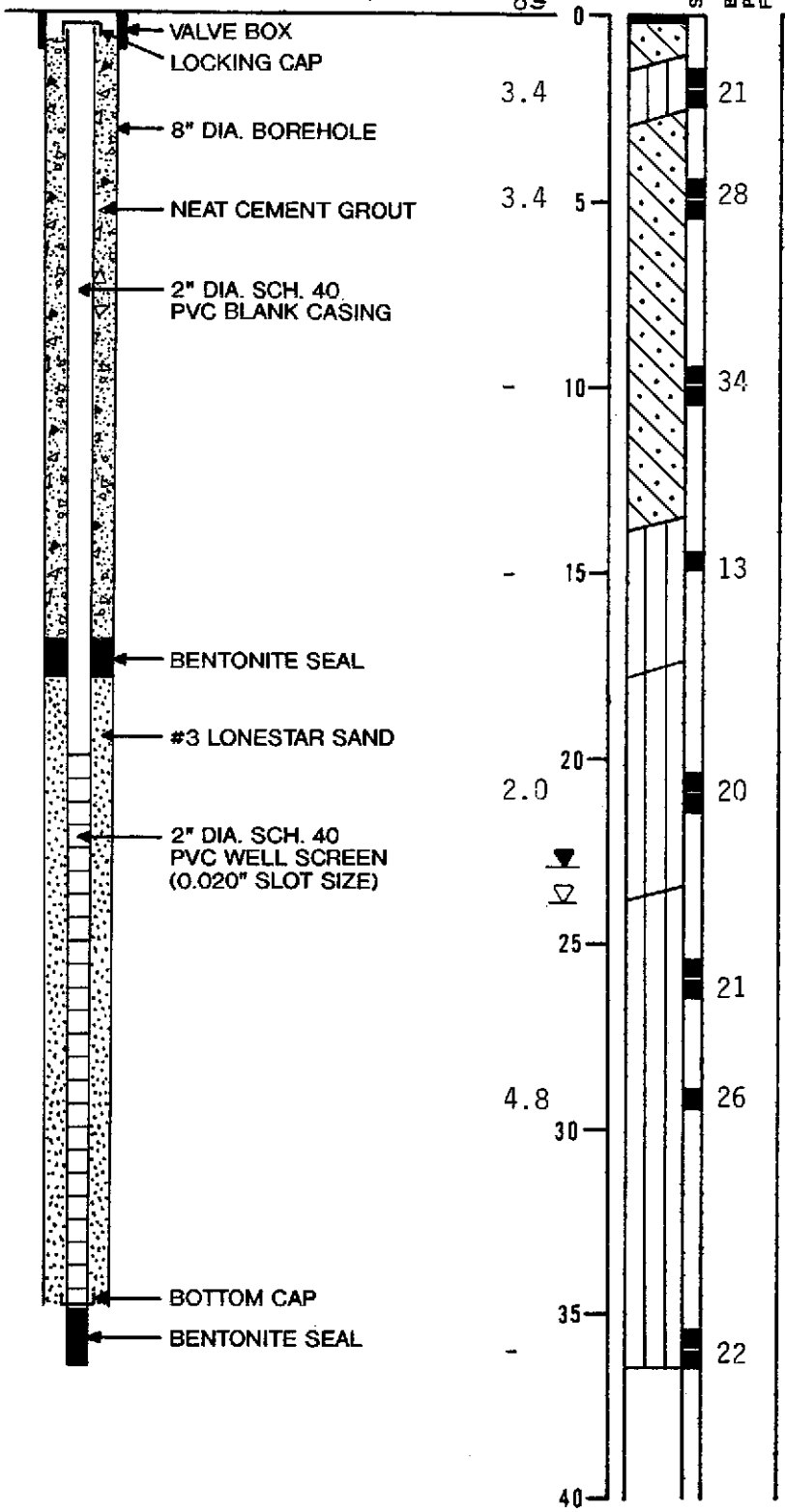
CONNELL OLDSMOBILE - OAKLAND, CA

NUMBER	DATE	APPROVED
47.026	3/8/91	

PLATE
A2

LOG OF TEST BORING MW3

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 2/25/91
ELEVATION 90.08 feet



OVM (ppm)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	
	0			ASPHALTIC CONCRETE - 3" thick
3.4			21	RED BROWN CLAYEY SAND (SC) medium dense, moist (fill)
3.4	5		28	OLIVE GRAY SANDY SILT (ML) stiff, moist
				RED BROWN CLAYEY SAND (SC) stiff, moist color change to light brown at 7 feet
	10		34	color change to red brown at 12 feet
	15		13	LIGHT GRAY BROWN CLAYEY SILT (ML) medium stiff, moist
				LIGHT GRAY BROWN CLAYEY SANDY SILT (ML) stiff, moist
	20			
2.0			20	GROUNDWATER LEVEL APRIL 12, 1991
				GROUNDWATER LEVEL DURING DRILLING
	25			LIGHT GRAY CLAYEY SILT (ML) stiff, moist
			21	
4.8			26	
	30			
	35		22	
	40			

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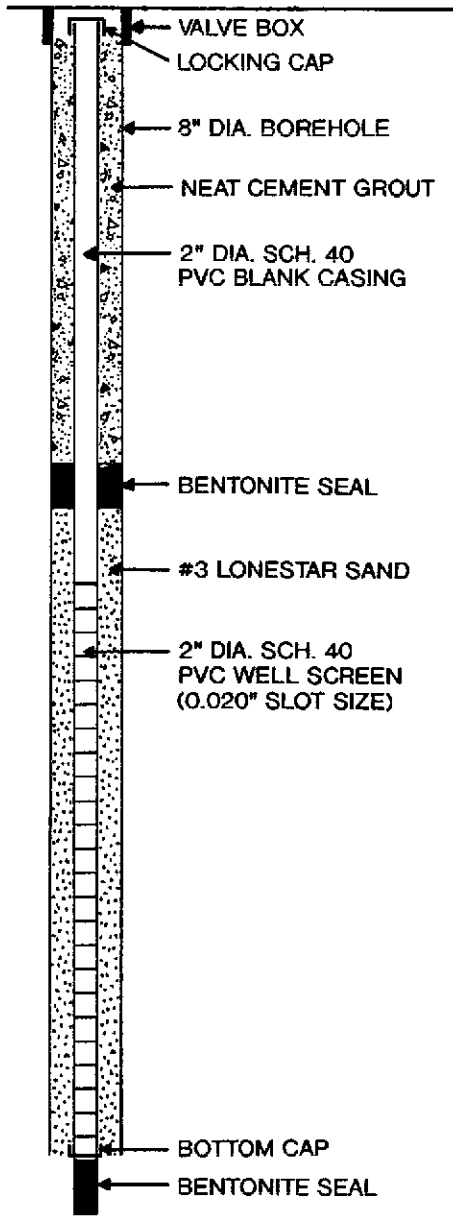
CONNELL OLDSMOBILE - OAKLAND, CA

JOB NUMBER 447.026 | DATE 3/8/91 | APPROVED

PLATE A3

LOG OF TEST BORING MW4

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 2/26/91
ELEVATION 88.84 feet



OVM (ppm)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	
	0			ASPHALTIC CONCRETE - 3" thick BASE ROCK - 6" thick
14			10	DARK GRAY CLAYEY SILT (ML) medium stiff, moist
3.4	5		16	MOTTLED BROWN SILTY CLAY (CL) medium stiff, moist
3.4	10		64	RED BROWN CLAYEY GRAVEL (GC) very dense, moist, with cobbles to 2" diameter and sand
220	15		13	LIGHT GRAY BROWN CLAYEY SILT (ML) medium stiff, moist
4500 10,000+	20		18	RED BROWN GRAVELLY SAND (SM-SP) dense, moist, with some clayey sand lenses
			44	GROUNDWATER LEVEL APRIL 12, 1991 GROUNDWATER LEVEL DURING DRILLING
4000 400	25		26	GRAY BROWN SILTY SAND (SM-SP) medium dense, wet, fine grained
	30			GRAY BROWN CLAYEY SILT (ML) stiff, moist
6800			25	
	35			
	40			

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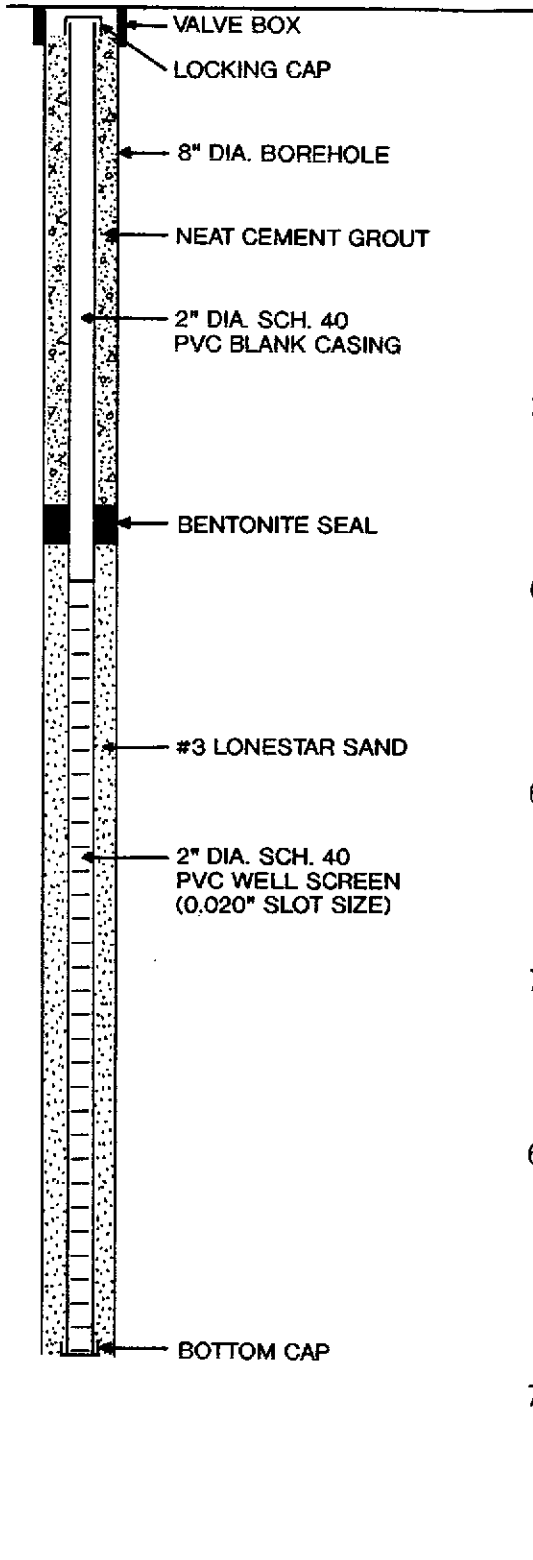
JOB NUMBER	DATE	APPROVED
447.026	3/8/91	

PLATE A4

LOG OF TEST BORING MW5

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 3/8/91
ELEVATION 84.84 feet



OVM (ppm)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	
	0			ASPHALTIC CONCRETE - 3" thick BASE ROCK - 4" thick MOTTLED GRAY BROWN SILTY CLAY (CL) medium stiff, moist
	5			DARK GRAY CLAYEY SAND (SC) medium dense, moist, with chert fragments BROWN GRAVELLY CLAY (CL) medium stiff to stiff, moist, with chert fragments
2.0	10		14	BROWN SILTY CLAY (CL) stiff, moist
				GRAY BROWN CLAYEY SILT (ML) stiff, moist
6.0	15		23	
6.2	20		21	
7.6	25		21	increase in sand content below 24 feet and wet
		▼		GROUNDWATER LEVEL APRIL 12, 1991
6.2	30		30	
		▽		GROUNDWATER LEVEL DURING DRILLING
	35			BROWN GRAVELLY SAND (SW) very dense, wet, medium grained
7.6			30/5"	BROWN SILTY CLAY (CL) stiff, moist
	40			

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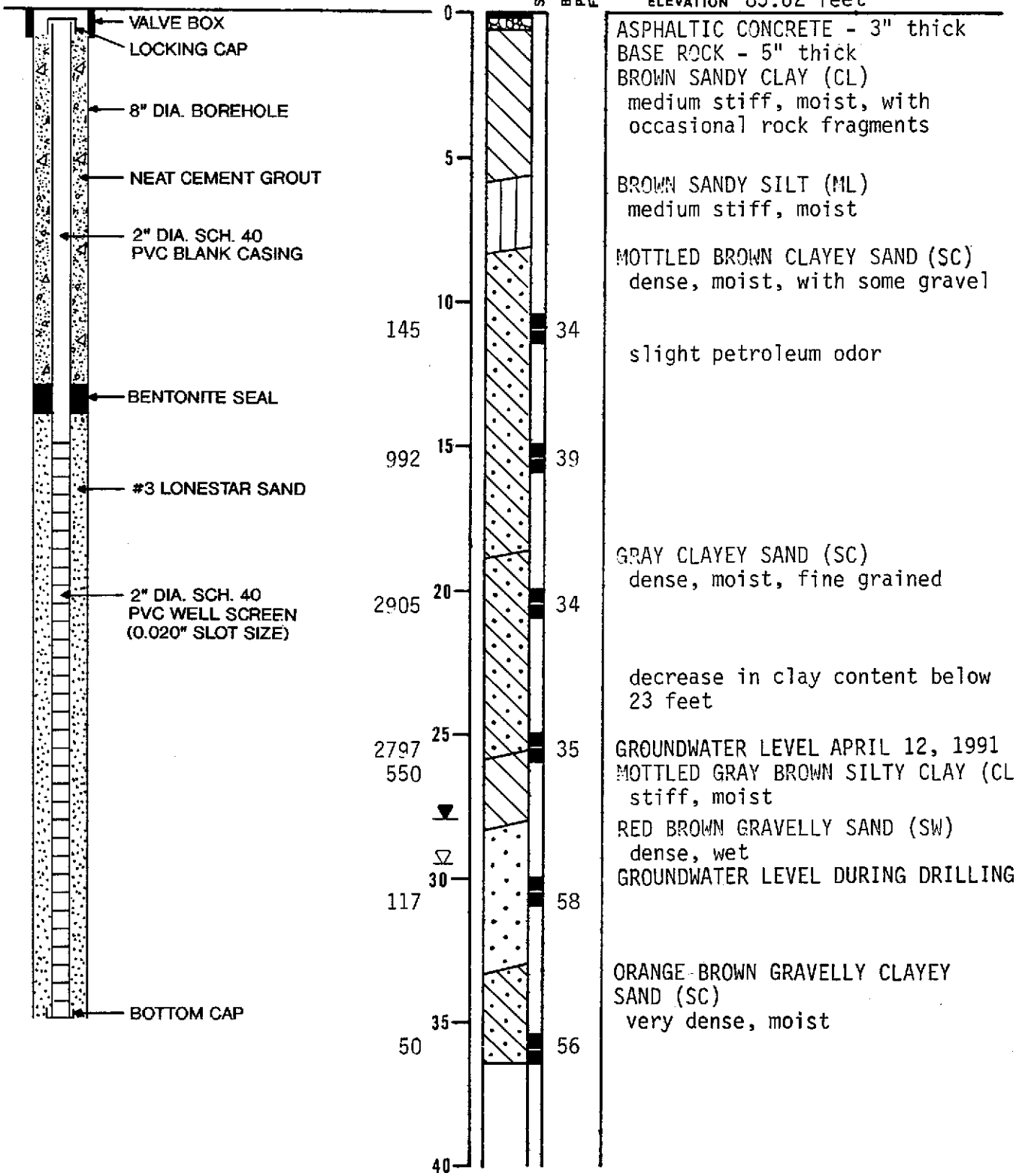
CONNELL OLDSMOBILE - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
447.026	3/13/91	

PLATE A5

LOG OF TEST BORING MW6

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 3/8/91
ELEVATION 85.62 feet



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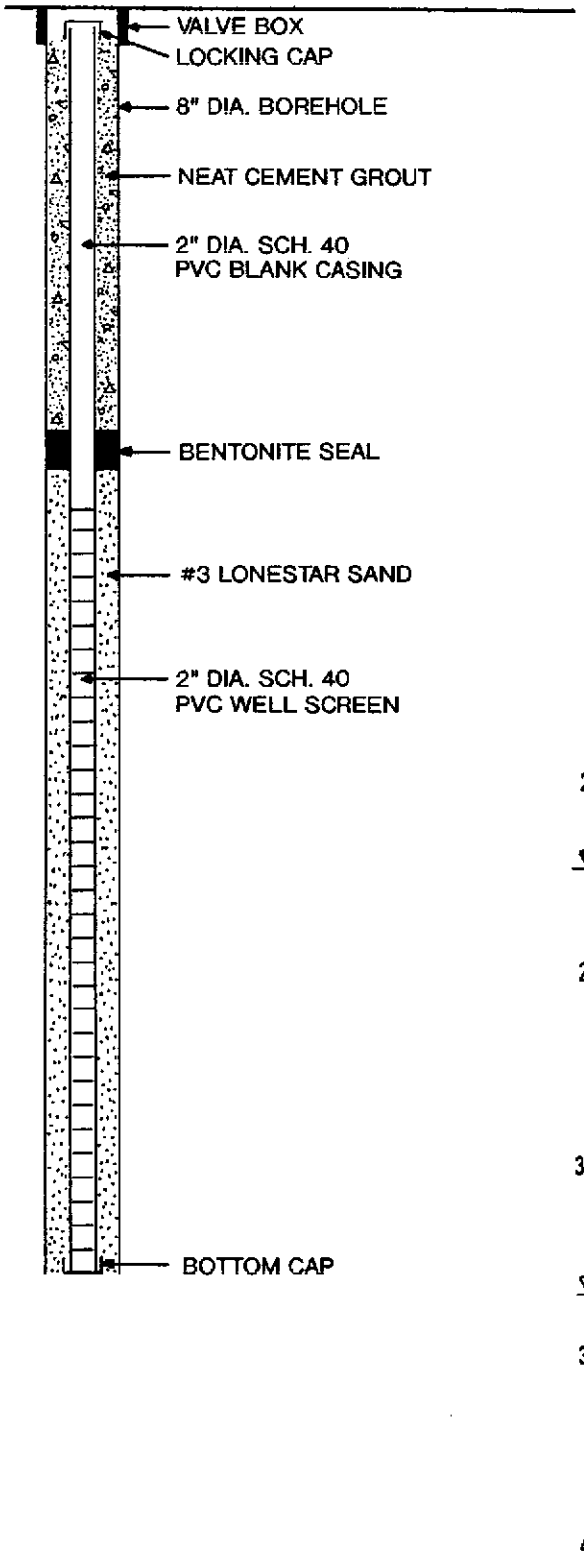
CONNELL OLDSMOBILE - OAKLAND, CA

JOB NUMBER 447.026 | DATE 3/13/91 | APPROVED

PLATE A6

LOG OF TEST BORING MW7

EQUIPMENT 8" Hollow Stem Auger
DATE DRILLED 3/8/91
ELEVATION 85.41 feet



OVM (ppm)	DEPTH (FT)	SAMPLE	BLOWS PER FOOT	
	0			ASPHALTIC CONCRETE - 3" thick BASE ROCK - 4" thick DARK BROWN GRAVELLY CLAY (CL) medium stiff, moist
	5			BROWN CLAYEY SAND (SC) medium dense, moist, with occasional rock fragment BROWN SANDY GRAVEL (GW) medium dense, moist
	10			BROWN GRAVELLY CLAY (CL) stiff, moist, with some sand
	15		28	BROWN SILTY CLAY (CL) stiff, moist
	20		28	BROWN CLAYEY SILT (ML) stiff, moist
	▼			GROUNDWATER LEVEL APRIL 12, 1991
	25		41	color change to gray below 24 feet
	30			
	▽			GROUNDWATER LEVEL DURING DRILLING
	35		35	BROWN SILTY SAND (SM-SP) very dense, wet
	40			

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JOB NUMBER	DATE	APPROVED
447.026	3/13/91	

PLATE A7

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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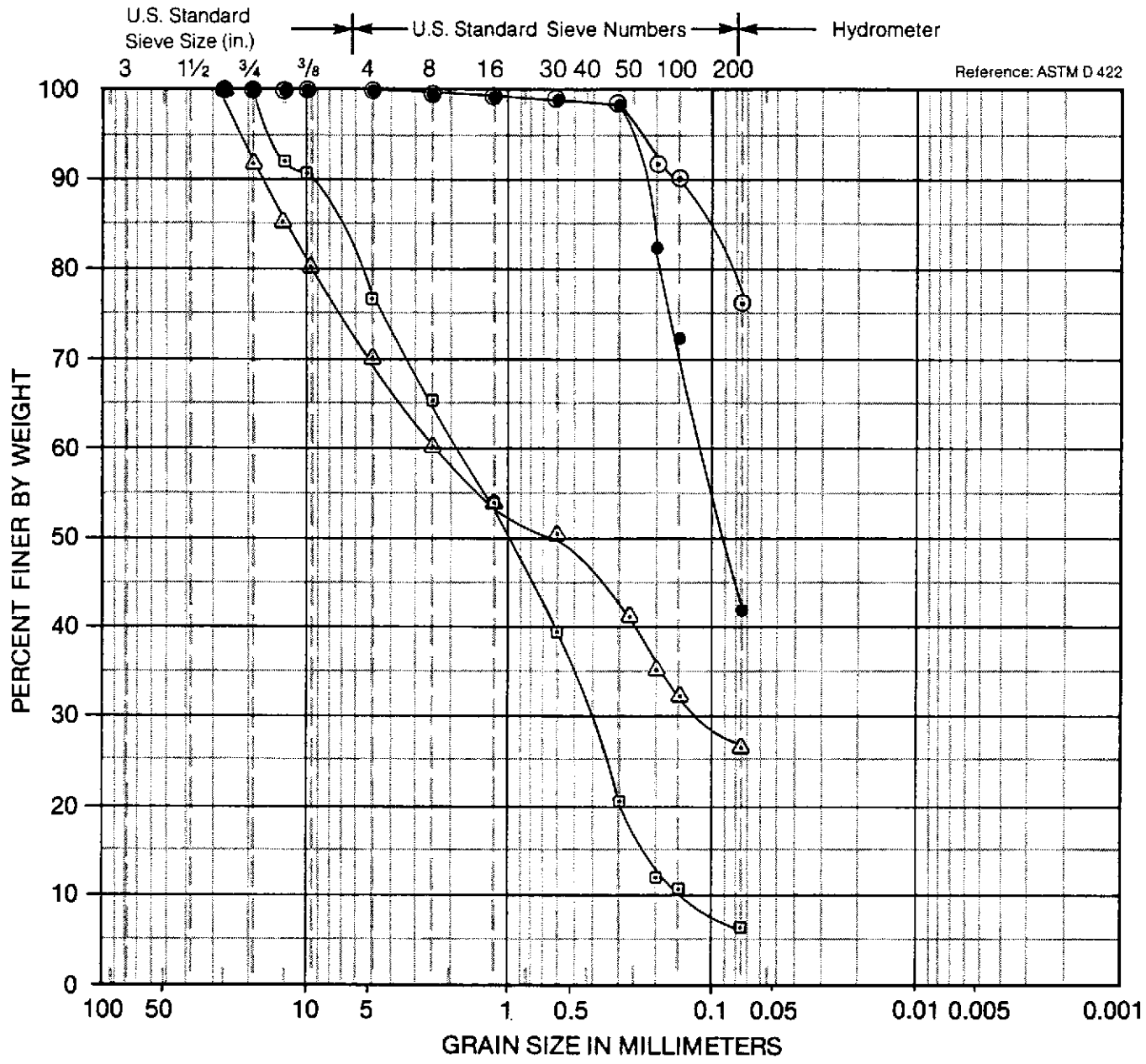
CONNELL OLDSMOBILE - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
447.026	4/18/91	

PLATE **A8**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Sample Source	Classification
△	MW-1 @ 15.0'	RED BROWN GRAVELLY CLAYEY SAND (SC)
●	MW-2 @ 35.5'	GRAY BROWN CLAYEY SAND (SC)
⊙	MW-3 @ 26.0'	GRAY CLAYEY SILT (ML)
⊡	MW-4 @ 22.5'	BROWN GRAVELLY SAND (SW-SM)

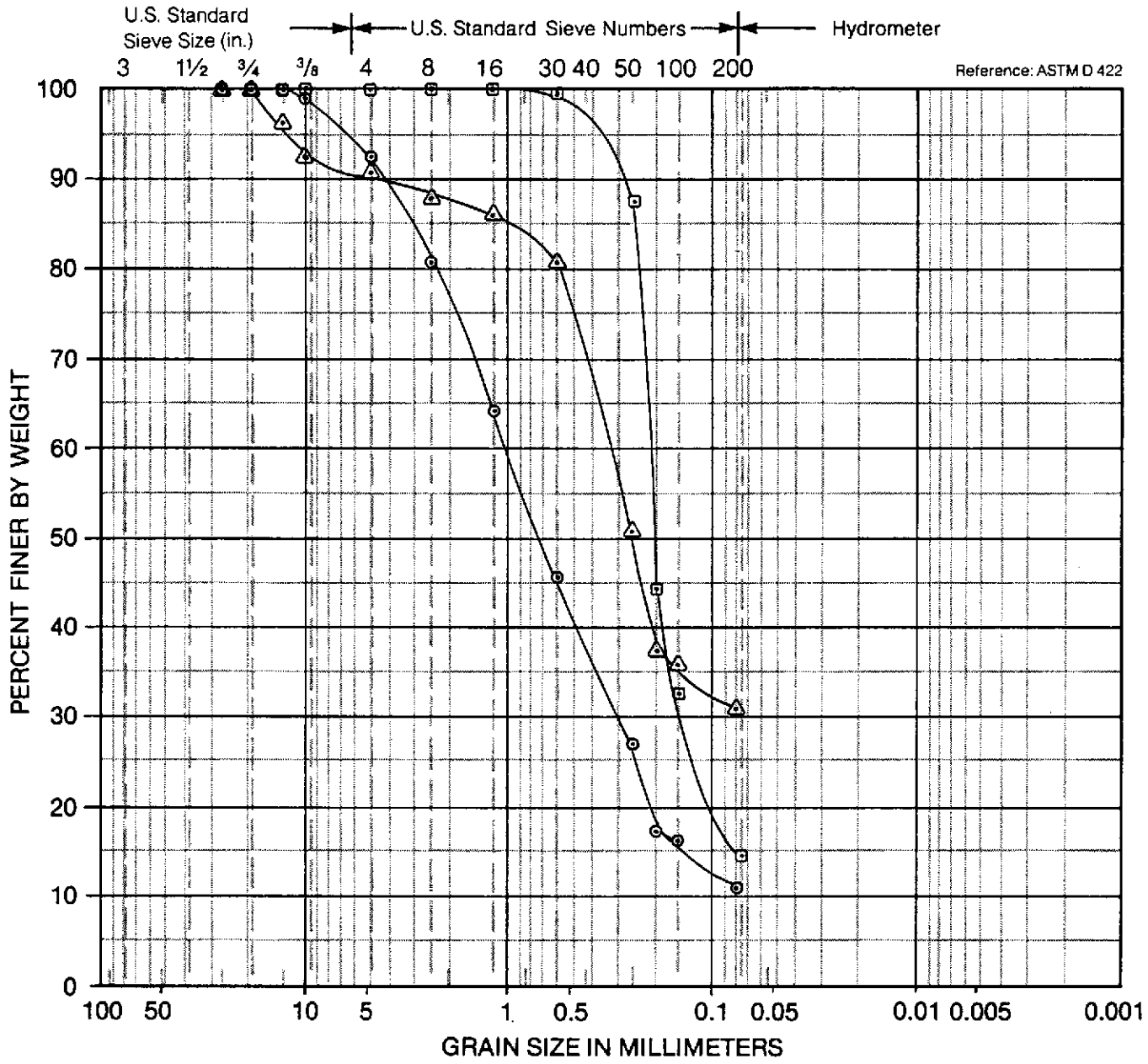
PARTICLE SIZE ANALYSIS

Subsurface Consultants

CONNELL OLDSMOBILE - OAKLAND, CA

JOB NUMBER 447.026 | DATE 4/17/91 | APPROVED

PLATE A9



COBBLES	GRAVEL: COARSE	GRAVEL: FINE	SAND: COARSE	SAND: MEDIUM	SAND: FINE	SILT OR CLAY

Symbol	Sample Source	Classification
▫	MW-4 @ 26.0'	BROWN SILTY SAND (SM)
⊙	MW-5 @ 36.0'	BROWN GRAVELLY SAND (SW-SM)
△	MW-6 @ 25.0'	GRAY CLAYEY SAND (SC)

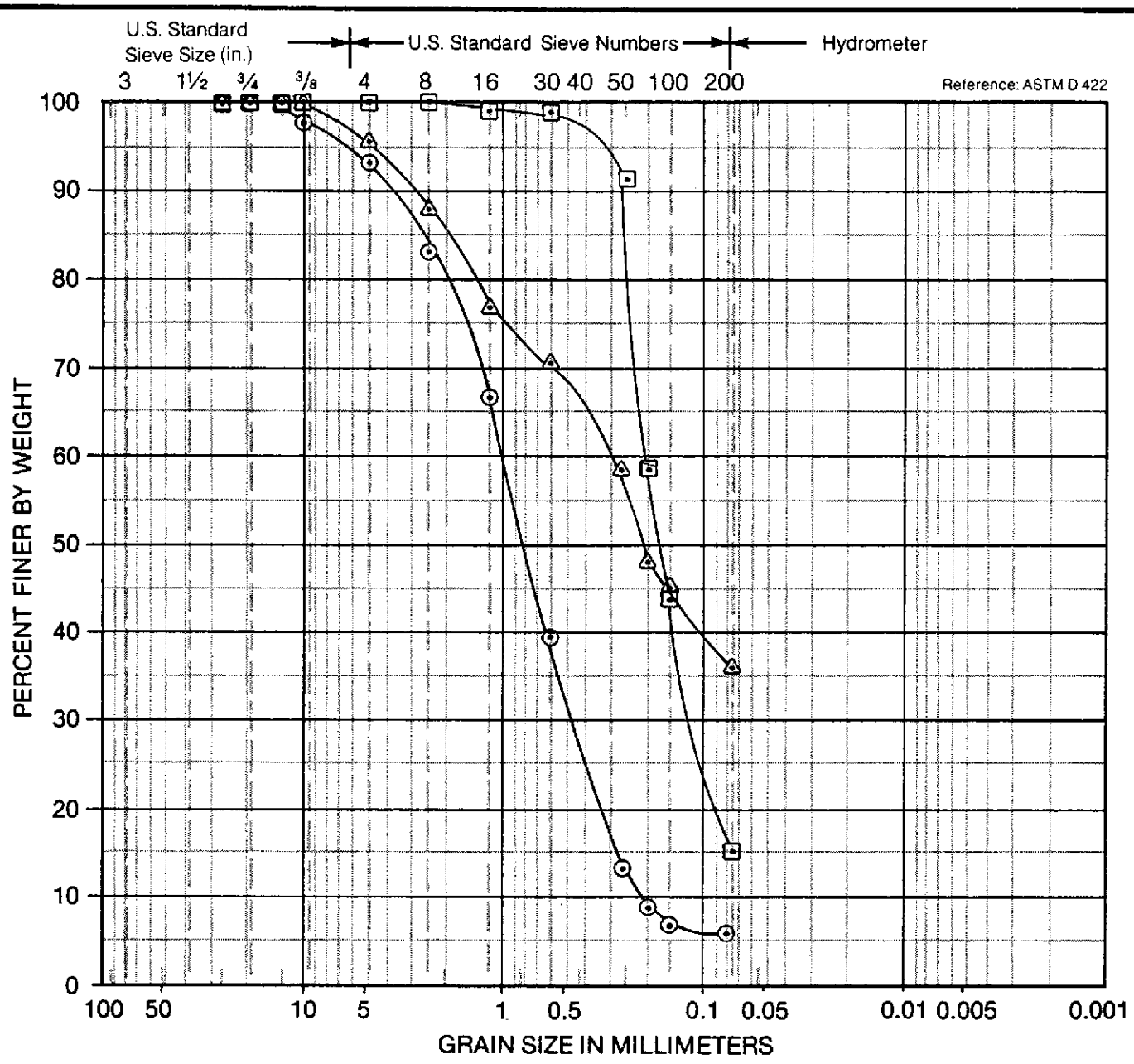
PARTICLE SIZE ANALYSIS

Subsurface Consultants

CONNELL OLDSMOBILE - OAKLAND, CA

JOB NUMBER 447.026 | DATE 4/5/91 | APPROVED

PLATE A10



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Sample Source	Classification
⊙	MW-6 @ 30.0'	BROWN GRAVELLY SAND (SW-SM)
△	MW-6 @ 35.5'	BROWN GRAVELLY CLAYEY SAND (SC)
⊡	MW-7 @ 35.0'	BROWN SILTY SAND (SM)

PARTICLE SIZE ANALYSIS

Subsurface Consultants

CONNELL OLDSMOBILE - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
447.026	4/5/91	

PLATE A11

APPENDIX B
ANALYTICAL TESTING

A. Chemical Characterization

Analytical testing of soil and groundwater was provided by Curtis & Tompkins, Ltd., a State of California Department of Health Services (DHS) certified laboratory. The analytical tests were performed on individual samples. A summary of sample preparation and test methods are presented below.

Test Analysis	Sample Preparation Method	Analysis Method
Total Volatile Hydrocarbons	EPA 5030	EPA 8015 Mod.
Total Extractable Hydrocarbons	EPA 3550	EPA 8015 Mod.
Total Oil and Grease	EPA 3550	SMWW17:5520F
Purgeable Halocarbons	EPA 5030	EPA 8010
BTEX	EPA 5030	EPA 8020

Analytical test reports and chain-of-custody documents are attached.

B. Aquifer Characterization

In addition to the chemical analyses, grain size distribution tests were performed by SCI on selected samples. The tests included mechanical sieve analysis and percent passing a #200 sieve determinations, performed in accordance with ASTM D-422. The results of the grain size distribution tests are presented on Plates A9 through A11.

Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: Connell Oldsmobile

SCI Job Number: 447.010

Project Contact at SCI: J. Alexander

Sampled By: J. Wolfe

Analytical Laboratory: Curtis & Tompkins

Analytical Turnaround: Normal

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
108.0	S	T	9/27/90		BTXE+TVH TEH, TOG	~ 5520
1023.0	S	T	✓		BTXE+TVH TEH, TOG	✓ 5520
1033.0	S	T	✓		BTXE+TVH TEH, TOG	~ 5520
1043.0	S	T	✓		BTXE+TVH TEH, TOG	~ 5520
201.5	S	T	9/27/90		TOG	SM WW 5520
203.0	S	T	✓		TOG	~ 5520
205.6	S	T	✓		TOG	~ 5520
2010.5	S	T	✓		TOG	~ 5520

* * * * * *

Released by: Dennis Aleman Date: 10-5-90

Released by Courier: Date:

Received by Laboratory: Date:

Relinquished by Laboratory: Nancy Ward Date: 10/5/90

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: Connell Oldsmobile

SCI Job Number: 447.010

Project Contact at SCI: J. Alexander

Sampled By: J. Wolfe

Analytical Laboratory: Curtis & Tompkins

Analytical Turnaround: Normal

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
2@15.0	S	T	9/27/90		TVH+BTXE	SMWW 5520
					TEH, TOG	SMWW 5540
2@25.5	✓	✓	✓		TVH + BTXE	
					TEH, TOG	
3@15.5	S	T	9/27/90		TVH+BTXE	
					TEH, TOG	5520
3@25.5	✓	✓	✓		TVH+BTXE	
					TEH, TOG	5520
3@35.5	✓	✓	✓		TVH + BTXE	
					TEH, TOG	5520
4@14.0	S	T	9/28/90		TVH+BTXE	
					TEH, TOG	5520
4@24.5	✓	✓	✓		TVH+BTXE	
					TEH, TOG	5520
4@34.5	✓	✓	✓		TVH+BTXE	
					TEH, TOG	5520

* * * * * *

Released by: Dennis Alexander Date: 10-5-90

Released by Courier: Date:

Received by Laboratory: Nancy J. Wh Date: 10/5/90

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
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Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: Connell Oldsmobile

SCI Job Number: 447.010

Project Contact at SCI: J. Alexander

Sampled By: J. Wolfe

Analytical Laboratory: Curtis & Tompkins

Analytical Turnaround: Normal

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
5@15.5	S	T	9/28/90		TVH+BTXE TEH, TOG 8010	SMWW 5520
5@30.5	S	T	9/28/90		TVH+BTXE TEH, TOG	8010 SMWW 5520
5@34.5	S	T	9/28/90		TVH+BTXE TEH, TOG	SMWW 5520
5	W	3 liter 4 VOAs	10/5/90		TVH+BTXE TEH, TOG 8010	SMWW 5520
*	*	*	*	*	*	*

Released by: Dennis Alexander Date: 10-5-90

Released by Courier: _____ Date: _____

Received by Laboratory: Nancy J. Wilson Date: 10/5/90

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

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

DATE RECEIVED: 10/05/90
DATE REPORTED: 10/19/90

LAB NUMBER: 101851

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 19 SOIL SAMPLES AND 1 WATER SAMPLE

PROJECT #: 447.010
LOCATION: CONNELL OLDSMOBILE

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101851
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 447.010
LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 10/05/90
DATE EXTRACTED: 10/10/90
DATE ANALYZED: 10/19/90
DATE REPORTED: 10/19/90

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	REPORTING LIMIT (mg/Kg)
101851-1	1 @ 8.0	ND	ND	100
101851-2	1 @ 23.0	ND	ND	100
101851-3	1 @ 33.0	ND	ND	1.0
101851-4	1 @ 43.0	ND	ND	1.0
101851-9	2 @ 15.0	ND	ND	1.0
101851-10	2 @ 25.5	ND	ND	1.0
101851-11	3 @ 15.5	ND	ND	1.0
101851-12	3 @ 25.5	ND	ND	10
101851-13	3 @ 35.5	ND	ND	1.0
101851-14	4 @ 14.0	ND	ND	1.0
101851-15	4 @ 24.5	ND	ND	10
101851-16	4 @ 34.5	ND	ND	1.0
101851-17	5 @ 15.5	ND	1,100	100
101851-18	5 @ 30.5	ND	ND	100
101851-19	5 @ 34.5	ND	ND	1.0

ND = Not Detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	7
RECOVERY, %	93

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101851
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 447.010
LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 10/05/90
DATE EXTRACTED: 10/10/90
DATE ANALYZED: 10/17/90
DATE REPORTED: 10/19/90

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)
101851-20	5	ND	ND	500

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	7
RECOVERY, %	82

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101851
CLIENT: SUBSURFACE CONSULTANTS
JOB NUMBER: 447.010
JOB LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 10/05/90
DATE ANALYZED: 10/11/90
DATE REPORTED: 10/19/90

Total Volatile Hydrocarbons with BTXE in Soils & Wastes
TVH by California DOHS Method/LUFT Manual October 1989
BTXE by EPA 5030/8020

LAB ID	CLIENT ID	TVH AS GASOLINE (mg/Kg)	BENZENE (ug/Kg)	TOLUENE (ug/Kg)	ETHYL BENZENE (ug/Kg)	TOTAL XYLENES (ug/Kg)
101851-1	1 @ 8.0	63	17	ND(10)	1,000	1,600
101851-2	1 @ 23.0	2,700	16,000	120,000	50,000	220,000
101851-3	1 @ 33.0	4.0	110	200	52	290
101851-4	1 @ 43.0	ND(1.0)	6.0	22	7.0	41
101851-9	2 @ 15.0	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	25
101851-10	2 @ 25.5	ND(1.0)	ND(5.0)	11	ND(5.0)	29
101851-11	3 @ 15.5	ND(1.0)	ND(5.0)	10	ND(5.0)	25
101851-12	3 @ 25.5	8.8	ND(5.0)	290	170	800
101851-13	3 @ 35.5	ND(1.0)	ND(5.0)	21	7.3	41
101851-14	4 @ 14.0	2.3	11	38	31	150
101851-15	4 @ 24.5	370	450	10,000	770	30,000
101851-16	4 @ 34.5	ND(1.0)	6.1	29	6.7	37
101851-17	5 @ 15.5	510	640	6,500	3,400	14,000
101851-18	5 @ 30.5	5,500	16,300	170,000	98,000	520,000
101851-19	5 @ 34.5	2.0	ND(5.0)	2,200	15	79

ND = NONE DETECTED AT OR ABOVE THE REPORTING LIMIT

QA/QC SUMMARY

RPD, %	<1
RECOVERY, %	93

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101851
CLIENT: SUBSURFACE CONSULTANTS
JOB NUMBER: 447.010
JOB LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 10/05/90
DATE ANALYZED: 10/12/90
DATE REPORTED: 10/19/90

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)
101851-20	5	620,000	33,000	50,000	7,900	41,000

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

QA/QC SUMMARY

RPD, %	<1
RECOVERY, %	90

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101851-17
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 447.010 - CONNELL OLDSMOBILE
SAMPLE ID: 5 @ 15.5

DATE RECEIVED: 10/05/90
DATE ANALYZED: 10/10/90
DATE REPORTED: 10/19/90

EPA 8010: Volatile Halocarbons in Soil & Wastes
Extraction Method: EPA 5030 - Purge & Trap

Compound	RESULT ug/Kg	REPORTING LIMIT ug/Kg
chloromethane	ND	200
bromomethane	ND	200
vinyl chloride	ND	200
chloroethane	ND	200
methylene chloride	ND	100
trichlorofluoromethane	ND	100
1,1-dichloroethene	ND	100
1,1-dichloroethane	ND	100
1,2-dichloroethene (total)	ND	100
chloroform	ND	100
freon 113	ND	100
1,2-dichloroethane	ND	100
1,1,1-trichloroethane	ND	100
carbon tetrachloride	ND	100
bromodichloromethane	ND	100
1,2-dichloropropane	ND	100
cis-1,3-dichloropropene	ND	100
trichloroethylene	ND	100
1,1,2-trichloroethane	ND	100
trans-1,3-dichloropropene	ND	100
dibromochloromethane	ND	100
2-chloroethylvinyl ether	ND	200
bromoform	ND	100
tetrachloroethylene	ND	100
1,1,2,2-tetrachloroethane	ND	100
chlorobenzene	ND	100
1,3-dichlorobenzene	ND	100
1,2-dichlorobenzene	ND	100
1,4-dichlorobenzene	ND	100

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

Duplicate: Relative % Difference	37
Spike: Average % Recovery	69

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101951-18
CLIENT: SUBSURFACE CONSULTANTS
JOB #: 447.010 - CONNELL OLDSMOBILE
SAMPLE ID: 5 @ 30.5

DATE RECEIVED: 10/05/90
DATE ANALYZED: 10/11/90
DATE REPORTED: 10/19/90

EPA 8010: Volatile Halocarbons in Soil & Wastes
Extraction Method: EPA 5030 - Purge & Trap

Compound	RESULT ug/Kg	REPORTING LIMIT ug/Kg
chloromethane	ND	2000
bromomethane	ND	2000
vinyl chloride	ND	2000
chloroethane	ND	2000
methylene chloride	ND	1000
trichlorofluoromethane	ND	1000
1,1-dichloroethene	ND	1000
1,1-dichloroethane	ND	1000
1,2-dichloroethene (total)	ND	1000
chloroform	ND	1000
freon 113	ND	1000
1,2-dichloroethane	ND	1000
1,1,1-trichloroethane	ND	1000
carbon tetrachloride	ND	1000
bromodichloromethane	ND	1000
1,2-dichloropropane	ND	1000
cis-1,3-dichloropropene	ND	1000
trichloroethylene	ND	1000
1,1,2-trichloroethane	ND	1000
trans-1,3-dichloropropene	ND	1000
dibromochloromethane	ND	1000
2-chloroethylvinyl ether	ND	2000
bromoform	ND	1000
tetrachloroethylene	ND	1000
1,1,2,2-tetrachloroethane	ND	1000
chlorobenzene	ND	1000
1,3-dichlorobenzene	ND	1000
1,2-dichlorobenzene	ND	1000
1,4-dichlorobenzene	ND	1000

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

Duplicate: Relative % Difference	1
Spike: Average % Recovery	96

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 101851-20
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 447.010
SAMPLE ID: 5

DATE RECEIVED: 10/05/90
DATE ANALYZED: 10/11/90
DATE REPORTED: 10/19/90

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	200
bromomethane	ND	200
vinyl chloride	ND	200
chloroethane	ND	200
methylene chloride	ND	100
trichlorofluoromethane	ND	100
1,1-dichloroethene	ND	100
1,1-dichloroethane	ND	100
1,2-dichloroethene (total)	ND	100
chloroform	ND	100
freon 113	ND	100
1,2-dichloroethane	2,900	100
1,1,1-trichloroethane	ND	100
carbon tetrachloride	ND	100
bromodichloromethane	ND	100
1,2-dichloropropane	ND	100
cis-1,3-dichloropropene	ND	100
trichloroethylene	ND	100
1,1,2-trichloroethane	ND	100
trans-1,3-dichloropropene	ND	100
dibromochloromethane	ND	100
2-chloroethyl vinyl ether	ND	200
bromoform	ND	100
tetrachloroethene	ND	100
1,1,2,2-tetrachloroethane	ND	100
chlorobenzene	ND	100
1,3-dichlorobenzene	ND	100
1,2-dichlorobenzene	ND	100
1,4-dichlorobenzene	ND	100

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	6
RECOVERY, %	95

Curtis & Tompkins, Ltd.

LAB NUMBER: 101851
CLIENT: SUBSURFACE CONSULTANTS
PROJECT # : 447.010
LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 10/05/90
DATE ANALYZED: 10/12/90
DATE REPORTED: 10/19/90

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

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
101851-1	1 @ 8.0	ND	mg/Kg	50
101851-2	1 @ 23.0	ND	mg/Kg	50
101851-3	1 @ 33.0	ND	mg/Kg	50
101851-4	1 @ 43.0	ND	mg/Kg	50
101851-5	2 @ 1.5	ND	mg/Kg	50
101851-6	2 @ 3.0	ND	mg/Kg	50
101851-7	2 @ 5.5	ND	mg/Kg	50
101851-8	2 @ 10.5	ND	mg/Kg	50
101851-9	2 @ 15.0	ND	mg/Kg	50
101851-10	2 @ 25.5	ND	mg/Kg	50
101851-11	3 @ 15.5	ND	mg/Kg	50
101851-12	3 @ 25.5	ND	mg/Kg	50
101851-13	3 @ 35.5	ND	mg/Kg	50
101851-14	4 @ 14.0	ND	mg/Kg	50
101851-15	4 @ 24.5	ND	mg/Kg	50
101851-16	4 @ 34.5	ND	mg/Kg	50
101851-17	5 @ 15.5	610	mg/Kg	50
101851-18	5 @ 30.5	ND	mg/Kg	50
101851-19	5 @ 34.5	ND	mg/Kg	50

ND = Not detected at or above reporting limit

QA/QC SUMMARY

RPD, %	1
RECOVERY, %	81

Curtis & Tompkins, Ltd.

LAB NUMBER: 101851
CLIENT: SUBSURFACE CONSULTANTS
PROJECT # : 447.010

DATE RECEIVED: 10/05/90
DATE ANALYZED: 10/12/90
DATE REPORTED: 10/19/90

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

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
101851-20	5	ND	mg/L	20

ND = Not detected at or above reporting limit

QA/QC SUMMARY

RPD, %	<1
RECOVERY, %	80

Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: Connell Oldsmobile.

SCI Job Number: 447.026

Project Contact at SCI: J. Alexander

Sampled By: J. Bermudez

Analytical Laboratory: C&T

Analytical Turnaround: 5day per N.W.

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
MW2	W	1liter 2VOA	3/1/91		TVH/BTXE TEH, TOG 8010	
MW3	W	1liter 2VOA	3/1/91		TVH/BTXE TEH, TOG 8010	
MW4	W	1liter 2VOA	3/1/91		TVH/BTXE TEH, TOG 8010	

* * * * * *

Released by: [signature] Received by: _____ Date: 03/04/91

Released by: _____ Received by: _____ Date: _____

Received by Laboratory: Nancy Wilson Date: 3/4/91

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: Connell Oldsmobile

SCI Job Number: 447.026

Project Contact at SCI: J. Alexander

Sampled By: J. Bermudez

Analytical Laboratory: Curtis & Tompkins

Analytical Turnaround: 5day as per N.W.

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
MW3 @ 20.5'	S	T	2/26/91		TVH / BTXE TEH, TOG 8010	
MW4 @ 20.5	S	T	2/27/91		TVH/BTXE TEH, TOG 8010	
MW4@31	S	T	2/27/91		TVH/BTXE TEH, TOG 8010	

* * * * * *

Released by: [signature] Received by: _____ Date: 03/04/91

Released by: _____ Received by: _____ Date: _____

Received by Laboratory: Nancy Wilson Date: 3/4/91

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

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

DATE RECEIVED: 03/04/91
DATE REPORTED: 03/11/91

LAB NUMBER: 103126

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 3 SOIL SAMPLES & 3 WATER SAMPLES

PROJECT ID: 447.026
LOCATION: CONNELL OLDSMOBILE

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103126
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 03/04/91
DATE EXTRACTED: 03/04/91
DATE ANALYZED: 03/08/91
DATE REPORTED: 03/11/91

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

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
103126-1	MW2	ND	ND	50
103126-2	MW3	ND	ND	50
103126-3	MW4	ND	ND	500

ND = Not detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	6
RECOVERY, %	91

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103126
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 03/04/91
DATE EXTRACTED: 03/04/91
DATE ANALYZED: 03/08/91
DATE REPORTED: 03/11/91

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	REPORTING LIMIT* (mg/Kg)
103126-4	MW3 @ 20.5'	ND	ND	1.0
103126-5	MW4 @ 20.5'	ND	ND	1.0
103126-6	MW4 @ 31	ND	ND	1.0

ND = Not detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	21
RECOVERY, %	120

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103126
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 03/04/91
DATE ANALYZED: 03/05/91
DATE REPORTED: 03/11/91

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

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
103126-1	MW2	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103126-2	MW3	ND(50)	ND(0.5)	0.6	ND(0.5)	ND(0.5)
103126-3	MW4	150,000	20,000	38,000	2,800	14,000

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

QA/QC SUMMARY

RPD, %	1
RECOVERY, %	85

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103126
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 03/04/91
DATE ANALYZED: 03/07/91
DATE REPORTED: 03/11/91

Total Volatile Hydrocarbons with BTXE in Soils & Wastes
TVH by California DOHS Method/LUFT Manual October 1989
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (mg/Kg)	BENZENE (ug/Kg)	TOLUENE (ug/Kg)	ETHYL BENZENE (ug/Kg)	TOTAL XYLENES (ug/Kg)
103126-4	MW3 @ 20.5'	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
103126-5	MW4 @ 20.5'	100	260	2,500	1,700	7,300
103126-6	MW4 @ 31	2.7	76	380	54	290

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

QA/QC SUMMARY

RPD, %	1
RECOVERY, %	83

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103126-1
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 447.026
LOCATION: CONNELL OLDSMOBILE
SAMPLE ID: MW2

DATE RECEIVED: 03/04/91
DATE ANALYZED: 03/05/91
DATE REPORTED: 03/11/91

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-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

RPD, %	15
RECOVERY, %	94

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103126-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 447.026
LOCATION: CONNELL OLDSMOBILE
SAMPLE ID: MW3

DATE RECEIVED: 03/04/91
DATE ANALYZED: 03/06/91
DATE REPORTED: 03/11/91

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-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

RPD, %	2
RECOVERY, %	81

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103126-3
CLIENT: SUBSURFACE CONSULTANTS
PROJECT #: 447.026
LOCATION: CONNELL OLDSMOBILE
SAMPLE ID: MW4

DATE RECEIVED: 03/04/91
DATE ANALYZED: 03/06/91
DATE REPORTED: 03/11/91
DATE REISSUED: 04/16/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	REPORTING LIMIT ug/L
chloromethane	ND	200
bromomethane	ND	200
vinyl chloride	ND	200
chloroethane	ND	200
methylene chloride	ND	100
trichlorofluoromethane	ND	100
1,1-dichloroethene	ND	100
1,1-dichloroethane	ND	100
1,2-dichloroethene (total)	ND	100
chloroform	ND	100
freon 113	ND	100
1,2-dichloroethane	610	100
1,1,1-trichloroethane	ND	100
carbon tetrachloride	ND	100
bromodichloromethane	ND	100
1,2-dichloropropane	ND	100
cis-1,3-dichloropropene	ND	100
trichloroethylene	ND	100
1,1,2-trichloroethane	ND	100
trans-1,3-dichloropropene	ND	100
dibromochloromethane	ND	100
2-chloroethylvinyl ether	ND	200
bromoform	ND	100
tetrachloroethene	ND	100
1,1,2,2-tetrachloroethane	ND	100
chlorobenzene	ND	100
1,3-dichlorobenzene	ND	100
1,2-dichlorobenzene	ND	100
1,4-dichlorobenzene	ND	100

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	81

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103126-4
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
SAMPLE ID: MW3 @ 20.5'

DATE RECEIVED: 03/04/91
DATE ANALYZED: 03/06/91
DATE REPORTED: 03/11/91

EPA 8010: Volatile Halocarbons in Soil & Wastes
Extraction Method: EPA 5030 - Purge & Trap

Compound	RESULT ug/Kg	REPORTING LIMIT ug/Kg
chloromethane	ND	10
bromomethane	ND	10
vinyl chloride	ND	10
chloroethane	ND	10
methylene chloride	ND	5.0
trichlorofluoromethane	ND	5.0
1,1-dichloroethene	ND	5.0
1,1-dichloroethane	ND	5.0
1,2-dichloroethene (total)	ND	5.0
chloroform	ND	5.0
freon 113	ND	5.0
1,2-dichloroethane	ND	5.0
1,1,1-trichloroethane	ND	5.0
carbon tetrachloride	ND	5.0
bromodichloromethane	ND	5.0
1,2-dichloropropane	ND	5.0
cis-1,3-dichloropropene	ND	5.0
trichloroethylene	ND	5.0
1,1,2-trichloroethane	ND	5.0
trans-1,3-dichloropropene	ND	5.0
dibromochloromethane	ND	5.0
2-chloroethylvinyl ether	ND	10
bromoform	ND	5.0
tetrachloroethylene	ND	5.0
1,1,2,2-tetrachloroethane	ND	5.0
chlorobenzene	ND	5.0
1,3-dichlorobenzene	ND	5.0
1,2-dichlorobenzene	ND	5.0
1,4-dichlorobenzene	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD,%	2
Recovery,%	81

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103126-5
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
SAMPLE ID: MW4 @ 20.5'

DATE RECEIVED: 03/04/91
DATE ANALYZED: 03/06/91
DATE REPORTED: 03/11/91

EPA 8010: Volatile Halocarbons in Soil & Wastes
Extraction Method: EPA 5030 - Purge & Trap

Compound	RESULT ug/Kg	REPORTING LIMIT ug/Kg
chloromethane	ND	10
bromomethane	ND	10
vinyl chloride	ND	10
chloroethane	ND	10
methylene chloride	ND	5.0
trichlorofluoromethane	ND	5.0
1,1-dichloroethene	ND	5.0
1,1-dichloroethane	ND	5.0
1,2-dichloroethene (total)	ND	5.0
chloroform	ND	5.0
freon 113	ND	5.0
1,2-dichloroethane	ND	5.0
1,1,1-trichloroethane	ND	5.0
carbon tetrachloride	ND	5.0
bromodichloromethane	ND	5.0
1,2-dichloropropane	ND	5.0
cis-1,3-dichloropropene	ND	5.0
trichloroethylene	ND	5.0
1,1,2-trichloroethane	ND	5.0
trans-1,3-dichloropropene	ND	5.0
dibromochloromethane	ND	5.0
2-chloroethylvinyl ether	ND	10
bromoform	ND	5.0
tetrachloroethylene	ND	5.0
1,1,2,2-tetrachloroethane	ND	5.0
chlorobenzene	ND	5.0
1,3-dichlorobenzene	ND	5.0
1,2-dichlorobenzene	ND	5.0
1,4-dichlorobenzene	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD,%	2
Recovery,%	81

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103126-6
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
SAMPLE ID: MW4 @ 31

DATE RECEIVED: 03/04/91
DATE ANALYZED: 03/06/91
DATE REPORTED: 03/11/91

EPA 8010: Volatile Halocarbons in Soil & Wastes
Extraction Method: EPA 5030 - Purge & Trap

Compound	RESULT ug/Kg	REPORTING LIMIT ug/Kg
chloromethane	ND	10
bromomethane	ND	10
vinyl chloride	ND	10
chloroethane	ND	10
methylene chloride	ND	5.0
trichlorofluoromethane	ND	5.0
1,1-dichloroethene	ND	5.0
1,1-dichloroethane	ND	5.0
1,2-dichloroethene (total)	ND	5.0
chloroform	ND	5.0
freon 113	ND	5.0
1,2-dichloroethane	ND	5.0
1,1,1-trichloroethane	ND	5.0
carbon tetrachloride	ND	5.0
bromodichloromethane	ND	5.0
1,2-dichloropropane	ND	5.0
cis-1,3-dichloropropene	ND	5.0
trichloroethylene	ND	5.0
1,1,2-trichloroethane	ND	5.0
trans-1,3-dichloropropene	ND	5.0
dibromochloromethane	ND	5.0
2-chloroethylvinyl ether	ND	10
bromoform	ND	5.0
tetrachloroethylene	ND	5.0
1,1,2,2-tetrachloroethane	ND	5.0
chlorobenzene	ND	5.0
1,3-dichlorobenzene	ND	5.0
1,2-dichlorobenzene	ND	5.0
1,4-dichlorobenzene	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD,%	2
Recovery,%	81

Client: Subsurface Consultants

Laboratory Login Number: 103126

Project Name: Connell Oldsmobile
Project Number: 447.026

Report Date: 11 March 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

Lab ID	Sample ID	Matrix	Sampled	Received	Ordered	Analyzed	Result	Units	RL	Method	Analyst	QC Batch
103126-001	MW2	Water	01-MAR-91	04-MAR-91	04-MAR-91	05-MAR-91	ND	mg/L	5	SMWW 17:5520BF	TR	1012
103126-002	MW3	Water	01-MAR-91	04-MAR-91	04-MAR-91	05-MAR-91	ND	mg/L	5	SMWW 17:5520BF	TR	1012
103126-003	MW4	Water	01-MAR-91	04-MAR-91	04-MAR-91	05-MAR-91	ND	mg/L	5	SMWW 17:5520BF	TR	1012

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

Analyst

Curtis & Tompkins, Ltd.

QC Batch Report

Client: Subsurface Consultants
Project Name: Connell Oldsmobile
Project Number: 447.026

Laboratory Login Number: 103126
Report Date: 11 March 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

QC Batch Number: 1012

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	5	mg/L	SMWW 17:5520BF	05-MAR-91

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	99%	SMWW 17:5520BF	05-MAR-91
BSD	96%	SMWW 17:5520BF	05-MAR-91

		Control Limits
Average Spike Recovery	98%	80% - 120%
Relative Percent Difference	2.7%	< 20%

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 103126

Project Name: Connell Oldsmobile
Project Number: 447.026

Report Date: 11 March 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

Lab ID	Sample ID	Matrix	Sampled	Received	Ordered	Analyzed	Result	Units	RL	Method	Analyst	QC Batch
103126-004	MW3 @ 20.5'	Soil	26-FEB-91	04-MAR-91	04-MAR-91	05-MAR-91	ND	mg/Kg	50	SMWW 17:5520EF	TR	1013
103126-005	MW4 @ 20.5'	Soil	26-FEB-91	04-MAR-91	04-MAR-91	05-MAR-91	ND	mg/Kg	50	SMWW 17:5520EF	TR	1013
103126-006	MW4 @ 31	Soil	26-FEB-91	04-MAR-91	04-MAR-91	05-MAR-91	ND	mg/Kg	50	SMWW 17:5520EF	TR	1013

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

Analyst

Curtis & Tompkins, Ltd.

QC Batch Report

Client: Subsurface Consultants
Project Name: Connell Oldsmobile
Project Number: 447.026

Laboratory Login Number: 103126
Report Date: 11 March 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **QC Batch Number: 1013**

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	50	mg/Kg	SMWW 17:5520EF	05-MAR-91

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	94%	SMWW 17:5520EF	05-MAR-91
BSD	86%	SMWW 17:5520EF	05-MAR-91

		Control Limits
Average Spike Recovery	90%	80% - 120%
Relative Percent Difference	8.6%	< 20%

Curtis & Tompkins, Ltd.

Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: Connell Oldsmobile

SCI Job Number: 447.026

Project Contact at SCI: J. Alexander

Sampled By: T. Tebb

Analytical Laboratory: Curtis & Tompkins

Analytical Turnaround: 5 day as per N.W.

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
MW5@20	S	T	3/8/91		~~EPA 8010~~ TVH/BTXE, TEH, ~~TOG~~	
MW6@21	S	T	3/8/91		TVH/BTXE TEH, ~~TOG~~ ~~EPA 8010~~	
MW6@30.5	S	T	3/8/91		TVH/BTXE TEH, ~~TOG~~ ~~EPA 8010~~	
MW7@20.5	S	T	3/8/91		TVH/BTXE TEH, ~~TOG~~ ~~EPA 8010~~	

* * * * * *

Released by: D. Alexander Received by: _____ Date: 3-11-91

Released by: _____ Received by: _____ Date: _____

Received by Laboratory: Nancy Wu Date: 3/11/91

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

Curtis & Tompkins, Ltd.

VERBAL ADDITIONS / CANCELLATIONS TO ANALYSIS REQUEST SHEET

CLIENT: SCI DATE: 3/12/91

REQUESTED BY: Jeri Alexander TIME: am pm

RECORDED BY: NW

Current Lab ID (Previous Lab ID)	Client ID	Circle matrix	Specify add or cancel	Analysis	Due date
103190 1-4 (-)	All	(soil) water other		5520EF 8010	3/15
(-)		soil water other			
(-)		soil water other			
(-)		soil water other			
(-)		soil water other			
(-)		soil water other			
(-)		soil water other			
(-)		soil water other			

Original in job jacket. Copies to analytical departments.

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

DATE RECEIVED: 03/11/91
DATE REPORTED: 03/19/91

LAB NUMBER: 103190

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: FOUR SOIL SAMPLES

PROJECT ID: 447.026
LOCATION: CONNELL OLDSMOBILE

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103190
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 03/11/91
DATE ANALYZED: 03/14/91
DATE REPORTED: 03/19/91

Total Volatile Hydrocarbons with BTXE in Soils & Wastes
TVH by California DOHS Method/LUFT Manual October 1989
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (mg/Kg)	BENZENE (ug/Kg)	TOLUENE (ug/Kg)	ETHYL BENZENE (ug/Kg)	TOTAL XYLENES (ug/Kg)
103190-1	MW 5 @ 20	ND(1.0)	ND(5.0)	6.9	ND(5.0)	ND(5.0)
103190-2	MW 6 @ 21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
103190-3	MW 6 @ 30.5	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
103190-4	MW 7 @ 20.5	ND(1.0)	ND(5.0)	17	ND(5.0)	ND(5.0)

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: 103190
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 03/11/91
DATE EXTRACTED: 03/12/91
DATE ANALYZED: 03/19/91
DATE REPORTED: 03/19/91

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	REPORTING LIMIT* (mg/Kg)
103190-1	MW 5 @ 20	ND	ND	1
103190-2	MW 6 @ 21	ND	ND	1
103190-3	MW 6 @ 30.5	ND	ND	1
103190-4	MW 7 @ 20.5	ND	ND	1

ND = Not Detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	22
RECOVERY, %	91

Subsurface Consultants

CHAIN OF CUSTODY RECORD
& ANALYTICAL TEST REQUEST

Project Name: Connell Oldsmobile

SCI Job Number: 447.026

Project Contact at SCI: J. Alexader

Sampled By: J. Bermudez

Analytical Laboratory: C&T

Analytical Turnaround: 5 Day Rev N.W.

Sample ID	Sample Type[1]	Container Type[2]	Sampling Date	Hold	Analysis	Analytical Method
MW 5	W	1 liter 2 VOA	3/15/91		TVH/BTXE TEH, HOG 8010	
MW 67	W	1 liter 2 VOA	3/15/91		TVH/BTXE TEH, HOG 8010	
MW 76	W	1 liter 2 VOA	3/15/91		TVH/BTXE TEH, ~~BTXE~~ HOG 8010	

* * * * * *

Released by: [signature] Received by: _____ Date: _____

Released by: _____ Received by: _____ Date: _____

Received by Laboratory: Nancy Wilson Date: 3/18/91

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

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2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 03/18/91
DATE REPORTED: 03/25/91

LAB NUMBER: 103249

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: THREE WATER SAMPLES

PROJECT ID: 447.026
LOCATION: CONNELL OLDSMOBILE

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103249
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 03/18/91
DATE EXTRACTED: 03/18/91
DATE ANALYZED: 03/21/91
DATE REPORTED: 03/25/91
DATE REISSUED: 04/16/91

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)
103249-1	MW 5	ND	ND	50
103249-2	MW 7	ND	ND	50
103249-3	MW 6	ND	ND	50

ND = Not detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	11
RECOVERY, %	117

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103249
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
LOCATION: CONNELL OLDSMOBILE

DATE RECEIVED: 03/18/91
DATE ANALYZED: 03/19/91
DATE REPORTED: 03/25/91
DATE REISSUED: 04/16/91

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)
103249-1	MW 5	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103249-2	MW 7	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103249-3	MW 6	80,000	12,000	13,000	1,100	5,400

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: 103249-1
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
SAMPLE ID: MW 5

DATE RECEIVED: 03/18/91
DATE ANALYZED: 03/18/91
DATE REPORTED: 03/25/91

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, %	10
RECOVERY, %	93

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103249-3
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
SAMPLE ID: MW 6

DATE RECEIVED: 03/18/91
DATE ANALYZED: 03/19/91
DATE REPORTED: 03/25/91
DATE REISSUED: 04/16/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	20
bromomethane	ND	20
vinyl chloride	ND	20
chloroethane	ND	20
methylene chloride	ND	10
trichlorofluoromethane	ND	10
1,1-dichloroethene	ND	10
1,1-dichloroethane	ND	10
1,2-dichloroethene (total)	ND	10
chloroform	ND	10
freon 113	ND	10
1,2-dichloroethane	1,400	40
1,1,1-trichloroethane	ND	10
carbon tetrachloride	ND	10
bromodichloromethane	ND	10
1,2-dichloropropane	ND	10
cis-1,3-dichloropropene	ND	10
trichloroethylene	ND	10
1,1,2-trichloroethane	ND	10
trans-1,3-dichloropropene	ND	10
dibromochloromethane	160	10
2-chloroethyl vinyl ether	ND	20
bromoform	ND	10
tetrachloroethene	ND	10
1,1,2,2-tetrachloroethane	ND	10
chlorobenzene	ND	10
1,3-dichlorobenzene	ND	10
1,2-dichlorobenzene	ND	10
1,4-dichlorobenzene	ND	10

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	10
RECOVERY, %	93

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103249-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.026
SAMPLE ID: MW 7

DATE RECEIVED: 03/18/91
DATE ANALYZED: 03/18/91
DATE REPORTED: 03/25/91
DATE REISSUED: 04/16/91

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, %	10
RECOVERY, %	93

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 103249

Project Name: Connell Oldsmobile
Project Number: 447.026

Report Date: 17 April 91

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

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
103249-001	MW 5	Water	15-MAR-91	18-MAR-91	19-MAR-91	ND	mg/L	5	TR	1065
103249-002	MW 7	Water	15-MAR-91	18-MAR-91	19-MAR-91	ND	mg/L	5	TR	1065
103249-003	MW 6	Water	15-MAR-91	18-MAR-91	19-MAR-91	ND	mg/L	5	TR	1065

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

Curtis & Tompkins, Ltd.

QC Batch Report

Client: Subsurface Consultants
Project Name: Connell Oldsmobile
Project Number: 447.026

Laboratory Login Number: 103249
Report Date: 17 April 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%