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SEWER LATERAL INVESTIGATION REPORT
DESERT PETROLEUM STATION #793
4035 PARK BOULEVARD, OAKLAND, CA
JULY 3, 1996

PURPOSE AND SCOPE

The following report documents the collection and analysis of soil and ground water samples from selected locations near the City of Oakland sanitary sewer main and lateral trenches serving the Brighton Street and Hampel Street neighborhood in the vicinity of the former Desert Petroleum Service Station #793 located at 4035 Park Boulevard, Oakland, CA. Western Geo-Engineer's (WEGE) workplan for the investigation was approved by the Alameda County Environmental Health Services on January 23, 1996 (see Appendix D). Implementation of the workplan began on May 1, 1996.

SITE LOCATION AND DESCRIPTION

Former Desert Petroleum Station #793 is an inactive service station, located at the northwest corner of the intersection of Park Blvd. and Hampel Street at 4035 Park Blvd., Oakland, California (Figure 1). The site is located in projected section 32; T1S; R3W; MDB&M at an approximate elevation of 210 feet above mean sea level (Figure 2).

Figure 3 shows the relationship of the site to the surrounding neighborhood and to the north-south and east-west sewer laterals that transect the backyards of the neighboring properties. The investigation was conducted in the back and front yards of properties located at 4006, 4026, and 4032 Brighton Avenue, and 1227, 1215, and 1211 Hampel Street, Oakland, CA.

PREVIOUS WORK AT THE SITE

Resna Industries' Water Works Corporation (8/21/90 and 9/19/90) and Levine-Fricke (9/8/93) collected soil and ground water samples from six soil borings situated near the north-south portion of the sewer lateral in the site vicinity previous to WEGE's current investigation (see Figure 3, and Tables 2 and 3).

Of the two soil borings initially installed immediately east of the north-south sewer lateral (DPO-SS1 and DPO-SS2), only the southern boring, DPO-SS2, showed traces of Benzene, Toluene, Ethylbenzene and Xylenes (BTEX). Soil borings DPO-SB1 and DPO-SB2, installed west of the north-south sewer lateral, both showed Total Petroleum Hydrocarbons as Gasoline (TPH-G) concentrations

just SB1 + SB2

at depths between 5 and 10 feet below ground surface (bgs) with a maximum TPH-G concentration of 390 mg/kg at 5 feet bgs in DPO-SB1. A grab water sample from DPO-SB1 showed a TPH-G concentration of 74 mg/L.

Soil and ground water samples collected from soil boring SB-A, installed west of the sewer lateral and south of former Desert Petroleum Station #793, did not show TPH-G or BTEX concentrations above laboratory detection limits. Soil and ground water samples collected from SB-B, installed west of the sewer lateral and north of former Desert Petroleum Station #793 showed 400 mg/kg TPH-G in soil at 12.5 feet bgs and 210 mg/l TPH-G in water.

WEGE SOIL PROBE SURVEY

Location of Test Holes

WEGE drilled a total of 23 Soil Probe Survey (SPS) test holes at selected locations near the sewer mains and laterals servicing the neighboring properties in the vicinity of former Desert Petroleum Station #793. Two of the test holes were used to collect vapor samples and the 21 remaining test holes were used to collect soil and water samples.

The test hole locations were similar to the locations proposed in the workplan. Actual field placement of a given test hole was dependent on the landscaping configuration of the properties and the previous results of on-site laboratory analysis of soil and ground water samples. Soil and water samples were collected from properties where written permission by owners and tenants had been granted to Western Geo-Engineers (Appendix E).

Collection and Analysis of Vapor, Soil, and Water Samples

Vapor samples were collected from the base of the test hole at vapor sample locations V1 and V2. Soil samples were collected from approximately the 4.5, 6.5, and 8.5 foot depth intervals at SPS test holes TP1, TP2, TP3, and TP17. See Table 1 for the actual sample collection depths. See Appendix A for a description of the methods and procedures used to collect and analyze the samples.

Results of the Soil Probe Survey

The two vapor samples collected from V1 and V2 did not show Total Fuel Hydrocarbons (TFH) concentrations above the WEGE laboratory detection limit of 0.05 mg/L.

The concentrations of TFH in the 34 soil samples analyzed from the 21 SPS test holes ranged from 0.202 mg/kg at 4.5 feet bgs in TP3 to 1395 mg/kg in TP9 at 8.6 feet bgs. Benzene concentrations in these soil samples ranged from a maximum of 21.7 mg/kg at

Brighton

8.6 feet bgs in TP9 to less than laboratory detection limits in 11 of the 34 soil samples (Table 1).

Water samples were collected from 11 of the 21 SPS test holes. Floating product was found in SPS test hole TP9. Sampling procedures did not allow an accurate measurement of product thickness at TP9. TFH concentrations in water at the other 10 test holes ranged from 0.031 mg/L in TP3 to 46.5 mg/L in TP14. Benzene concentrations ranged from a maximum of 7.99 mg/L at TP14 to less than laboratory detection limits in 3 of the 11 water samples. The remaining SPS test holes did not produce water after 24 hours.

CONFIRMATION SOIL BORINGS

Collection of Soil Samples

In order to confirm the results of the SPS, WEGE also collected soil and water samples from five soil borings (BH1-BH5) for certified laboratory analysis (Figure 3).

The five soil borings were drilled with a three inch diameter hand auger. Soil borings BH1, BH2, BH3, and BH5 were drilled to total depths ranging from 5.3 to 10 feet bgs. Soil boring BH4 was drilled to 14 feet bgs without encountering water.

Soil samples were collected from the bucket of the auger at depths ranging from 5 to 10.5 feet bgs in each of the five soil borings (see Table 2). The soil samples were collected in 2 inch X 6 inch brass sleeves.

Small portions of the soil samples (1-4 grams) that were collected from the hand auger bucket at selected sampling intervals were placed in pre-weighed 40 ml VOA vials for analysis in the WEGE mobil laboratory and comparison with the certified laboratory results (Tables 1 and 2).

Lithology

The WEGE geologist maintained a log of the materials encountered while augering the five soil borings (Appendix B). Below a thin surface layer of top soil, the soil borings encountered a dark brown silty clay. This dark brown clay graded into a light brown, moist, expanding clay at depths ranging from 5 to 7 feet bgs. The northwest sloping contact between the two clays was visible in the walls of the UST overexcavation at 4035 Park Boulevard at approximately 12-17 feet bgs.

Preservation of Soil Samples

After field screening, the sample sleeve ends were sealed with aluminum foil and further protected with plastic caps. The caps were secured to the metal sleeves with duct tape. The samples were labeled with ID#, location, depth, date, time, sampler's initials, and analyses to be performed. The samples were placed in an ice chest at 4^0C and delivered with accompanying chain of custody documentation to American Environmental Network (AEN) for certified laboratory analysis.

Collection of Water Samples

Machine slotted two inch diameter PVC casing was placed in each of the boreholes upon completion to create temporary ground water monitoring wells. Soil borings BH4 did not produce measureable amounts of water after 24 hours.

The water in the well casings at the remaining four temporary wells was then depleted with a disposable polyethylene bailer. Water level in a temporary well was allowed to return to its initial elevation prior to sampling. Water samples were collected in a disposable polyethylene bailer and decanted with no headspace into two 40 ml VOA vials containing 0.5 ml HCL as a preservative. A water sample was also decanted into one sealed 250 cc glass container for dissolved oxygen measurements. The water samples were labeled and preserved as described above for the soil samples.

Certified Laboratory Analysis of Soil and Water Samples

Ten soil samples and four water samples from soil borings BH1-BH5 were analyzed by AEN for concentrations of TPH-G using EPA method 5030/GCFID and BTEX compounds using EPA method 8020.

Soil samples collected from the deepest sample interval at each soil boring were also analyzed by NEI/GTEL Laboratories, .Inc. for concentrations of total organic carbon using method CFA 18.0.

Results of Certified Laboratory Analysis

The results from the certified laboratory analysis of soil samples collected from the five soil borings are listed in Table 2. The results from the certified analysis of the water samples from the four productive temporary wells are listed in Table 3. The certified laboratory report is included as Appendix C.

Nine of the 10 soil samples did not show TPH-G or BTEX concentrations above the laboratory detection limits. The soil sample from 10 feet bgs at BH1 showed a TPH-G concentration of 31 mg/kg. Benzene concentrations were below the laboratory detection limits of 0.005 mg/kg. A soil sample collected in August 1990 from 10 feet bgs at SB-2, located in the immediate vicinity of BH1, showed a TPH-G concentration of 230 mg/kg.

The concentration of TPH-G in water at the four productive temporary wells ranged from a maximum of 150 mg/L at BH1 to less than laboratory detection limits of 50 ug/L at BH2. Benzene concentrations ranged from a maximum of 32 mg/L at BH1 to 2.2 ug/L at BH2. A water sample collected in September 1993 from SB-B, located in the vicinity of BH1 showed a TPH-G concentration of 210 mg/L.

Analysis of Water Samples for Dissolved Oxygen Concentrations

Water collected from the four producing temporary wells was analyzed within 5 minutes of collection time for concentrations of dissolved oxygen in the WEGE mobile laboratory using a Hach Spectrometer Model 2000 (See Appendix A). Dissolved oxygen concentrations ranged from 7.1 mg/L at BH3 to 1.3 mg/L at BH5 (Table 1). The water sample from BH2 was too turbid to produce accurate dissolved oxygen measurements.

Timed Recharge of Temporary Monitor Wells

Depth to water was measured from the top of the temporary well casings using an electrical probe with a known volume (one bailer) in place in the water column. The bailer was extracted from the water column and periodic measurements of depth to water were recorded along with elapsed time since extraction until the water level had returned to its initial elevation.

This "slug test" data was used to determine the hydraulic conductivity (K) for the screened portion of the aquifer in the vicinity of the four temporary wells (see Appendix A for Slug Test Calculations).

The calculated hydraulic conductivities and water elevation gradients between the four temporary wells were used to calculate ground water velocities in the vicinity of the four productive temporary wells (Appendix A). The ground water velocities ranged from 4.1 feet /year at BH1 to 385 feet/year at BH5 (Table 4). The calculated ground water velocities and total organic carbon concentrations in soil at the four temporary wells were used to calculate the retarded velocities of BTEX compounds as a result of retention by organic carbon in the soil (see Appendix A).

The resulting calculated retarded velocities for benzene ranged from 2.98 feet/year at BH1 to 70 feet /year at BH2 (Table 4).

DISCUSSION OF RESULTS

Soil

Figure 4 shows an estimate of the lateral extent of TPH-G concentrations > 10 mg/kg in soil between 8 and 10 feet bgs based on certified and uncertified laboratory analysis of soil samples collected from the five soil borings and 21 SPS test holes. Soil contamination by TPH-G at this depth is generally confined to within 25-50 feet of the north-south and east-west sewer lateral trenches and conforms with the estimated lateral extent of TPH-G ground water contamination (see Figure 6).

Figure 5 shows an estimate of the lateral extent of TPH-G concentrations in soil between 5 and 6 feet bgs, based on certified and uncertified laboratory analysis of soil samples collected from the five soil borings and 21 SPS test holes. Soil contamination by TPH-G at this depth is generally confined to the immediate vicinity of the sewer lateral trenches. The small area of shallow soil contamination noted near SPS test hole TP11 is probably not associated with the Desert Petroleum Station #793 source. The chromatogram produced from the soil sample collected at this location showed TFH concentrations in the diesel rather than gasoline range.

Water

Figure 6 shows an estimate of the lateral extent of TPH-G in ground water in concentrations > 1 mg/L. Floating product was found at SPS test hole TP9 and its estimated areal extent is also noted. The low TPH-G concentrations in water at SPS test hole TP18, located in the apparent downgradient direction from monitor well RS-7, and the pooling of ground water contamination to the east of the underground utility trench that bisects Brighton Avenue indicate that the utility trench may be acting as a barrier to contaminant migration.

CONCLUSIONS AND RECOMMENDATIONS

The certified and uncertified analytical laboratory results from soil, water, and vapor samples collected at the site indicate that the migration of gasoline range hydrocarbons along the sewer main and lateral trenches from 4035 Park Blvd. has impacted ground water, and to a lesser extent, soil in portions of all the properties where the current investigation was conducted. The limited areal extent of significant soil impact at shallow depths (<6 feet bgs) indicates that contaminant migration away from the sewer laterals and mains has been primarily through ground water transport.

The reduced dissolved oxygen levels measured at BH1 and BH5, within the ground water contaminant plume, when compared to dissolved oxygen levels at BH3, suggests that natural attenuation of the plume is occurring. This is further substantiated by the reduced TPH-G concentrations observed at the 10 foot depth between soil samples collected at SB-2 in August 1990 and BH1 in May 1996 and between the TPH-G in ground water observed at SB-B in September 1993 and BH1 in May 1996.

Neither of the vapor samples, collected from soil adjacent to the dwelling at 4006 Brighton Avenue (V1), or in the middle of the deeper soil and ground water contaminant plume (V2), showed any soil migration of vapor phase hydrocarbon contaminants.

In view of the evidence that gasoline range hydrocarbon migration from 4035 Park Blvd through the Hampel Street and Brighton Avenue neighborhood appears to be restricted to deeper soil and ground water, WEGE recommends that a Risk Based Corrective Action study be conducted for the site. The study would assess the potential health risks posed by the current levels of soil and ground water contamination and establish whether remediation is necessary along with appropriate cleanup goals.

LIMITATIONS

The discussion presented in this report is based on the following:

1. The observations and data collected by field personnel.

2. The results of laboratory analyses performed by a state certified analytical laboratory.

3. Our understanding of the regulations of Alameda County and the State of California.

Changes in ground water conditions can occur due to variations in rainfall, temperature, local and regional water use, and local construction practices. In addition, variations in the soil and ground water conditions could exist beyond the points explored in this investigation.

State Certified Laboratory analytical results are included in this report. This laboratory follows EPA and State of California approved procedures; however, WEGE is not responsible for errors in these laboratory results.

The services performed by Western Geo-Engineers, a corporation under California Registered Geologist #3037 and/or Contractors License #513857, have been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the State of California and Alameda County. Our work and/or

supervision of remediation and/or abatement operations, active or preliminary at this site is no way meant to imply that we are owners or operators of this site. Please note that the known contamination of soil and/or ground water must be reported to the appropriate agencies in a timely manner. No other warranty expressed or implied, is made.

If you have any questions concerning this report or if we can be of further assistance, please do not hesitate to contact us at (916) 668-5300.

Jack E. Napper
R.G.#3037

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

David P. Threlfall
Project Geologist

TABLE 1

UNCERTIFIED WEGE LABORATORY RESULTS FROM [redacted]MPLES

DESERT PETROLEUM STATION #793, SEWER LATERAL INVESTIGATION

4035 PARK BOULEVARD, OAKLAND, CA

SAMPLE LOCATION	DEPTH (FEET)	[redacted] (PPM)	[redacted] (PPM)	TOLUENE (PPM)	ETHYLB (PPM)	XYLENES (PPM)	D. OXYGEN (PPM)
[redacted] SAMPLES FROM HAND AUGERED SOIL BORINGS							
BH1 PURGE		[redacted]	[redacted]	14.601	2.180	16.025	
BH1 SAMP		[redacted]	[redacted]	22.021	2.912	18.814	2.4
BH2		0.078	<0.001	<0.001	<0.002	<0.007	
BH2 SAMP		0.053	<0.001	<0.001	<0.002	<0.007	
BH3 SAMP		5.000	1.361	0.580	0.524	4.505	7.1
BH5 SAMP		0.198	0.237	<0.001	<0.002	<0.007	1.3
[redacted]PLES FROM SPS TEST HOLES							
TP2		0.128	0.004	<0.001	<0.002	<0.007	
TP3		0.031	<0.001	<0.001	<0.002	<0.007	
[redacted]		[redacted]	0.691	0.993	0.390	4.231	
TP5		0.043	<0.001	<0.001	<0.002	<0.007	
TP6		0.396	<0.001	<0.001	<0.002	<0.007	
TP8		0.191	0.025	0.019	<0.002	<0.007	
TP9		FLOATING PRODUCT					
TP14		46.495	7.991	1.516	1.503	11.681	
TP15		3.333	0.978	0.835	0.190	1.846	
TP16		0.239	0.015	<0.001	<0.002	<0.007	
TP18		0.105	0.006	<0.001	<0.002	<0.007	
[redacted] SAMPLES FROM HAND AUGERED SOIL BORINGS							
BH1-10	10	80.827	3.037	5.418	1.271	7.099	
BH2-5	5.5	<0.05	<0.001	<0.002	<0.003	<0.009	
BH3	8.5	2.275	0.130	<0.006	<0.008	<0.025	
BH3	10.5	4.572	0.186	<0.008	<0.011	0.207	
BH5	6.6	0.944	<0.005	<0.008	<0.010	<0.030	
[redacted]AMPLES FROM SPS TEST HOLES							
TP1	4.5	2.049	0.018	<0.014	<0.018	<0.057	
TP1	6.5	0.306	<0.002	<0.004	<0.005	<0.015	
TP1	8.5	0.369	<0.004	<0.007	<0.009	<0.026	
TP1	9.25	0.860	0.028	<0.005	<0.006	<0.018	
TP2	4.5	0.378	<0.003	<0.004	<0.006	<0.017	
TP2	6.5	0.955	<0.003	<0.005	<0.007	<0.002	

PPM

TH= total fuel HCs

TABLE 1

[redacted] LABORATORY RESULTS FROM [redacted] → which are these?

DESERT PETROLEUM STATION #793, SEWER LATERAL INVESTIGATION

4035 PARK BOULEVARD, OAKLAND, CA

all soil

SAMPLE LOCATION	DEPTH (FEET)	TPH (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLB (PPM)	XYLENES (PPM)	D. OXYGEN (PPM)
TP3	4.5	0.202	<0.004	<0.004	<0.005	<0.017	
TP3	9	0.918	<0.011	<0.018	<0.023	<0.069	
TP4	4.5	0.500	0.010	<0.005	<0.006	<0.019	
TP4	6.5	2.621	0.048	<0.006	<0.008	<0.024	
TP4	8.5	25.117	0.278	0.918	0.358	3.320	
TP5	5	0.370	<0.003	<0.005	<0.007	<0.021	
TP5	6	0.225	<0.004	<0.007	<0.009	<0.027	
TP5	8.25	1.454	0.027	0.113	<0.008	<0.025	
TP6	8.5	13.060	0.081	0.032	<0.007	0.499	
TP7	7	0.335	<0.005	<0.008	<0.010	<0.030	
TP8	8.5	139.276	1.445	3.524	1.117	9.964	
TP9	4.5	61.381	1.772	1.253	0.609	2.388	} hmm...
TP9	6.5	94.504	3.339	5.194	0.881	5.652	
TP9	8.6	1394.525	21.732	98.261	15.274	129.890	
TP10	8.5	6.886	0.318	0.230	<0.008	0.214	
TP11	6.5	41.374	0.311	0.040	<0.013	<0.041	} heavy HCs: >C10
TP11	8	1.728	0.004	0.024	<0.008	<0.024	
TP12	8.25	0.364	<0.003	<0.005	<0.006	<0.020	
TP13	9	0.471	<0.004	<0.007	<0.009	<0.026	
TP14	7	17.090	0.910	<0.005	<0.007	<0.020	
TP14	10	[redacted]		3.656	10.144	88.611	
TP15	9	182.649	4.987	10.195	4.001	31.842	
TP16	8.5	1.040	0.011	<0.007	<0.008	<0.026	
TP17	8.5	0.363		<0.006	<0.008	0.024	
TP18	6.5	1.782	0.033	<0.008	<0.010	0.149	
TP19	8	0.851	0.016	<0.008	<0.010	<0.031	
TP20	7.5	0.567	0.017	<0.006	<0.008	<0.024	

near or in FP

TABLE 1

UNCERTIFIED WEGE LABORATORY RESULTS FROM [redacted]

DESERT PETROLEUM STATION #793, SEWER LATERAL INVESTIGATION

4035 PARK BOULEVARD, OAKLAND, CA

soil

SAMPLE LOCATION	DEPTH (FEET)	TPH (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLB (PPM)	XYLENES (PPM)	D. OXYGEN (PPM)
TP21	8.25	0.883	0.018	<0.006	<0.007	<0.02233	
VAPOR SAMPLES FROM SPS TEST HOLES							
V1	2.5	<0.05	<0.001	<0.001	<0.001	<0.005	

FID chromatograph

RESULTS FROM PID

TP2	7	1.902
TP3	6.5	1.319
TP6	4.5	1.037
TP6	7	3.262
TP6	8.5	24.594
BH1	5	<0.43
TP7	4.5	1.313
TP8	4.5	0.802
TP8	7	<0.35
TP10	4.5	<0.3
TP11	4.5	<0.4
TP11	6.5	21.108
TP12	4.5	<0.4
TP13	4.5	<0.4
TP13	6.5	0.659
TP14	4.5	0.588
TP14	6.5	36.769
TP15	4.5	1.365
TP15	6.5	<0.33
TP16	4.5	<0.30
TP16	6.5	<0.32
BH3	8.5	4.759
BH3	10.5	10.082
BH4	8.5	<0.25
BH5	2.5	<0.16
BH5	8.5	<0.47
V2	2.5	<0.05

TPH = TOTAL FUEL HYDROCARBONS (GASOLINE RANGE)

PPM = MILLIGRAMS/KILOGRAM (SOIL) = MILLIGRAMS/LITER (WATER)

ETHYLB = ETHYLBENZENE

D. OXYGEN = DISSOLVED OXYGEN

< LESS THAN SYMBOL INDICATES THAT CONCENTRATION IS BELOW STATED LABORATO

TABLE 2

[redacted] ANALYTICAL RESULTS FROM SOIL SAMPLES

DESERT PETROLEUM STATION #793, SEWER LATERAL INVESTIGATION

OAKLAND, CA

total org. carbon

SAMPLE ID	DATE SAMPLED	SAMPLED BY	DEPTH BGS (FEET)	TPH GASOLINE (MG/KG)	BENZENE (MG/KG)	TOLUENE (MG/KG)	E. BENZENE (MG/KG)	XYLENES (MG/KG)	TOC (MG/KG)
DPO-SS1	07/24/90	RESNA	3.50	<1.0	<0.005	<0.005	<0.005	<0.005	
DPO-SS2	07/24/90	RESNA	5.00	<1.0	0.005	<0.005	<0.005	0.011	
DPO-SB1	08/21/90	RESNA	5.00	390	2.5	17	9.4	47	
DPO-SB2	08/21/90	RESNA	5.00	41	0.31	1.4	0.92	4.4	
DPO-SB2	08/21/90	RESNA	10.00	230	3.5	21	5	43	
DPO-SB2	08/21/90	RESNA	15.00	<1.0	0.052	0.13	0.019	0.099	
DPO-SB2	08/21/90	RESNA	20.00	<1.0	0.03	0.033	0.01	0.03	
DPO-SB3	09/19/90	RESNA	15.00	<1.0	<0.005	<0.005	<0.005	0.007	
SB-A	09/08/93	LEVINE/F	5.00	<0.2	<0.005	<0.005	<0.005	<0.005	
SB-A	09/08/93	LEVINE/F	15.00	<0.2	<0.005	<0.005	<0.005	<0.005	
SB-B	09/08/93	LEVINE/F	5.00	<0.2	<0.005	<0.005	<0.005	<0.005	
SB-B	09/08/93	LEVINE/F	12.50	400	1.7	17	8.2	44	
LF-1	09/09/93	LEVINE/F	6.00	<0.2	<0.005	<0.005	<0.005	<0.005	
LF-1	09/09/93	LEVINE/F	15.00	<0.2	<0.005	<0.005	<0.005	<0.005	
1996									
BH1-5'	05/01/96	WEGE	5.00	< 0.2	< 0.005	< 0.005	< 0.005	< 0.005	
BH1-10'	05/01/96	WEGE	10.00	31	< 0.005	0.16	0.22	0.71	390
BH2-5.5'	05/02/96	WEGE	5.50	< 0.2	< 0.005	< 0.005	< 0.005	< 0.005	2400
BH3-5'	05/02/96	WEGE	5.00	< 0.2	< 0.005	< 0.005	< 0.005	< 0.005	
BH3-8.5'	05/02/96	WEGE	8.50	< 0.2	< 0.005	< 0.005	< 0.005	< 0.005	
BH3-10.5'	05/02/96	WEGE	10.50	< 0.2	0.009	< 0.005	< 0.005	0.021	340
BH4-6.5'	05/02/96	WEGE	6.50	< 0.2	< 0.005	< 0.005	< 0.005	< 0.005	
BH4-8.5'	05/02/96	WEGE	8.50	< 0.2	< 0.005	< 0.005	< 0.005	< 0.005	460
BH5-5'	05/02/96	WEGE	5.00	< 0.2	< 0.005	< 0.005	< 0.005	< 0.005	
BH5-6.5'	05/02/96	WEGE	6.50	< 0.2	< 0.005	< 0.005	< 0.005	< 0.005	5700

TPH-G = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE, ANALYZED BY EPA METHOD 5030/GCFID

BTEX ANALYZED BY EPA METHOD 8020

TOC= TOTAL ORGANIC CARBON

WEGE = WESTERN GEO-ENGINEERS

RESNA = RESNA INDUSTRIES

LEVINE/F = LEVINE-FRICKE

< LESS THAN SYMBOL INDICATES THAT CONCENTRATIONS ARE BELOW STATED LABORATORY DETECTION LIMITS

TABLE 3

[redacted] ANALYTICAL RESULTS FROM WATER SAMPLES

DESERT PETROLEUM STATION #793, SEWER LATERAL INVESTIGATION

OAKLAND, CA

SAMPLE ID	DATE SAMPLED	SAMPLED BY	TPH GASOLINE (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	E. BENZENE (UG/L)	XYLENES (UG/L)
DP-SB1-W	08/21/90	RESNA	740000	110000	130000	13000	73000
GW-SB-B	09/08/93	LEVINE/F	[redacted]	[redacted]	51000	37000	21000
GW-SB-A	09/09/93	LEVINE/F	<50	<0.5	<0.5	<0.5	<2
LP-1	09/13/93	LEVINE/F	<50	<0.5	<0.5	<0.5	<2
1996							
BH1-WATER	05/01/96	WEGE	150000	33000	28000	3300	13000
BH2-WATER	05/02/96	WEGE	< 50	2.2	2	< 0.5	< 2
BH3-WATER	05/02/96	WEGE	39000	2300	1800	1500	7100
BH5-WATER	05/02/96	WEGE	470	270	< 0.5	< 0.5	< 2

TPH-G = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE, ANALYZED BY EPA METHOD 5030/GCFID

BTEX ANALYZED BY EPA METHOD 602

WEGE = WESTERN GEO-ENGINEERS

RESNA = RESNA INDUSTRIES

LEVINE/F = LEVINE-FRICKE

< LESS THAN SYMBOL INDICATES THAT CONCENTRATIONS ARE BELOW STATED LABORATORY DETECTION L

TABLE 4

RETARDED VELOCITIES OF BTEX COMPOUNDS

DESERT PETROLEUM STATION #793, SEWER LATERAL INVESTIGATION

4035 PARK BOULEVARD, OAKLAND, CA

WELL	K	GRADIENT	COMPOUND	Koc	Oc	Kd	Pb	ne	v	vc
									ft/year	ft/year
BH1	0.15	0.015	benzene	97	0.0004	0.03783	2.0	0.2	4.1	2.98
BH2	2.90	0.044	benzene	97	0.0024	0.2328	2.0	0.2	232.9	69.97
BH3	0.11	0.0625	benzene	97	0.0003	0.03298	1.9	0.2	12.5	9.54
BH5	4.80	0.044	benzene	97	0.0057	0.5529	1.9	0.2	385.4	61.65
BH1	0.15	0.015	toluene	242	0.0004	0.09438	1.9	0.2	4.1	2.17
BH2	2.90	0.044	toluene	242	0.0024	0.5808	1.9	0.2	232.9	35.73
BH3	0.11	0.0625	toluene	242	0.0003	0.08228	1.9	0.2	12.5	7.04
BH5	4.80	0.044	toluene	242	0.0057	1.3794	1.9	0.2	385.4	27.33
BH1	0.15	0.015	xylene	552	0.0004	0.21528	1.9	0.2	4.1	1.35
BH2	2.90	0.044	xylene	552	0.0024	1.3248	1.9	0.2	232.9	17.14
BH3	0.11	0.0625	xylene	552	0.0003	0.18768	1.9	0.2	12.5	4.51
BH5	4.80	0.044	xylene	552	0.0057	3.1464	1.9	0.2	385.4	12.48
BH1	0.15	0.015	ethylbenzene	622	0.0004	0.24258	1.9	0.2	4.1	1.24
BH2	2.90	0.044	ethylbenzene	622	0.0024	1.4928	1.9	0.2	232.9	15.34
BH3	0.11	0.0625	ethylbenzene	622	0.0003	0.21148	1.9	0.2	12.5	4.17
BH5	4.80	0.044	ethylbenzene	622	0.0057	3.5454	1.9	0.2	385.4	11.11
BH1	0.15	0.015	n-octane	6800	0.0004	2.652	1.9	0.2	4.1	0.16
BH2	2.90	0.044	n-octane	6800	0.0024	16.32	1.9	0.2	232.9	1.49
BH3	0.11	0.0625	n-octane	6800	0.0003	2.312	1.9	0.2	12.5	0.55
BH5	4.80	0.044	n-octane	6800	0.0057	38.76	1.9	0.2	385.4	1.04

K = HYDRAULIC CONDUCTIVITY

Koc = organic carbon-water partition coefficient

Oc = Organic carbon

Kd = retardation factor

Pb = dry bulk density gm/ml

ne = effective porosity

n = volumetric moisture content

I = ground water gradiant

v = ground water veolocity = KI/ne

vc = retarded veolocity = v/[1+(Pb/n) Kd]

-WEGE-

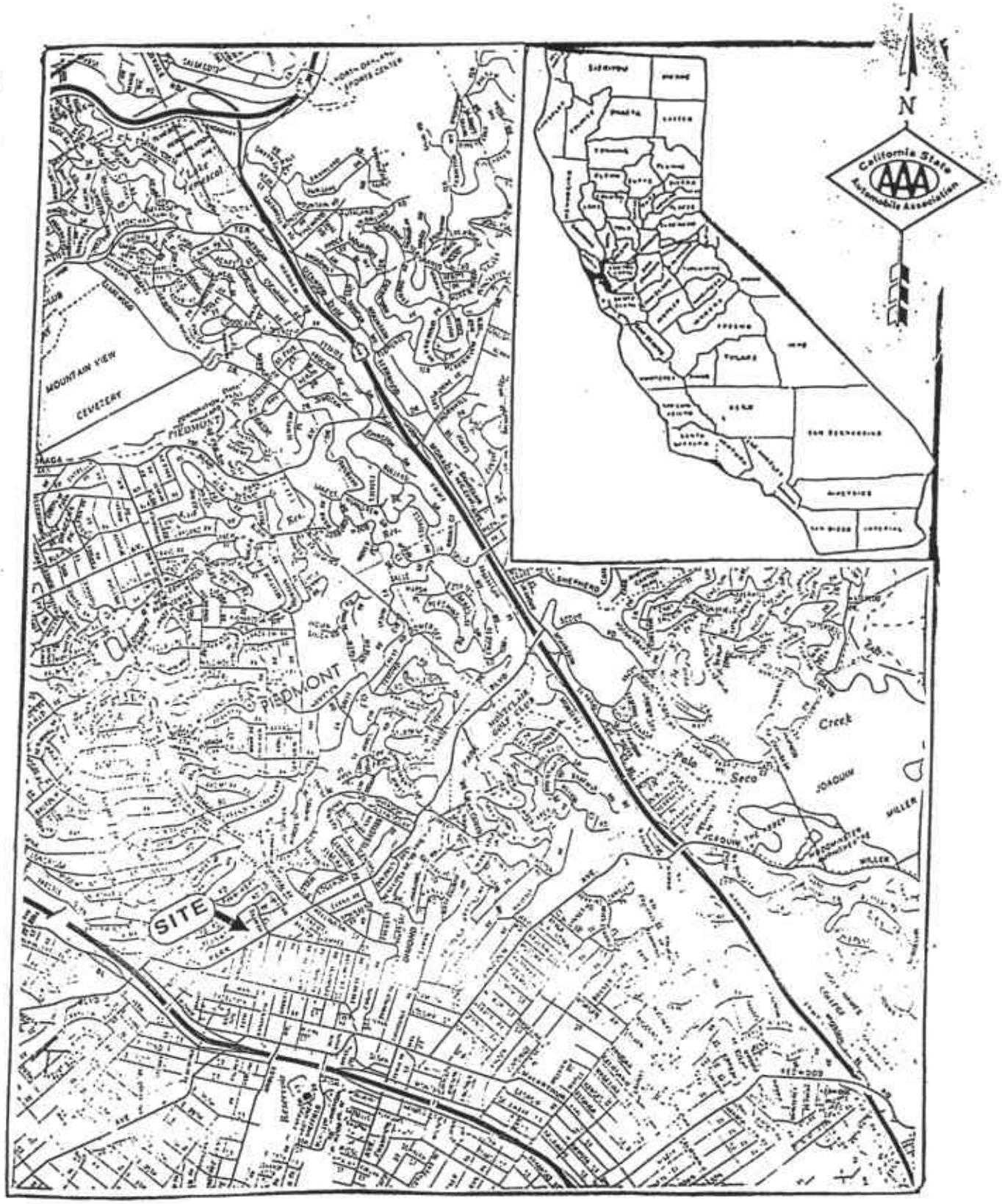


FIGURE 1

Location (AAA Map)

- WEGE- ESTERN
GEO-ENGINEERS

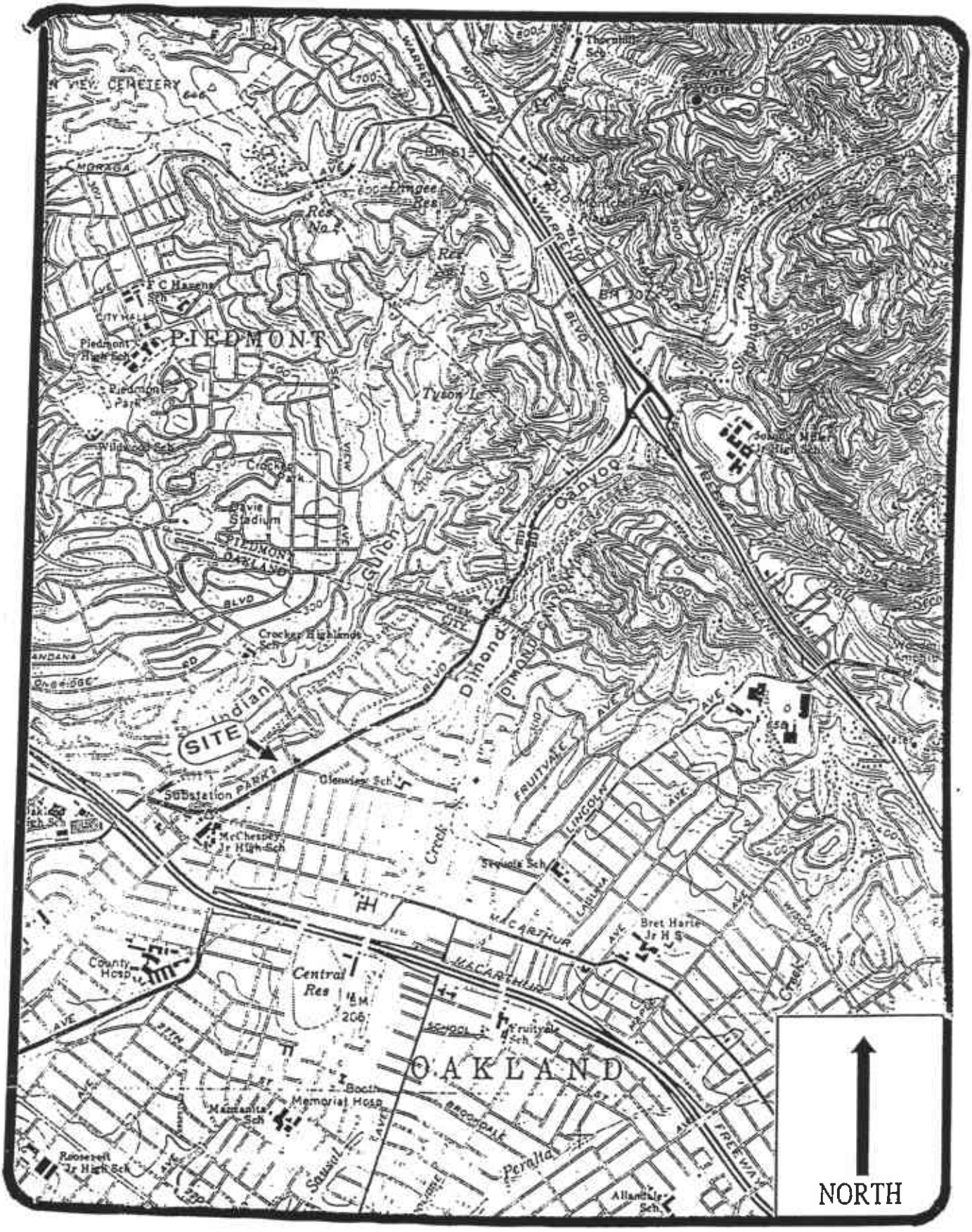
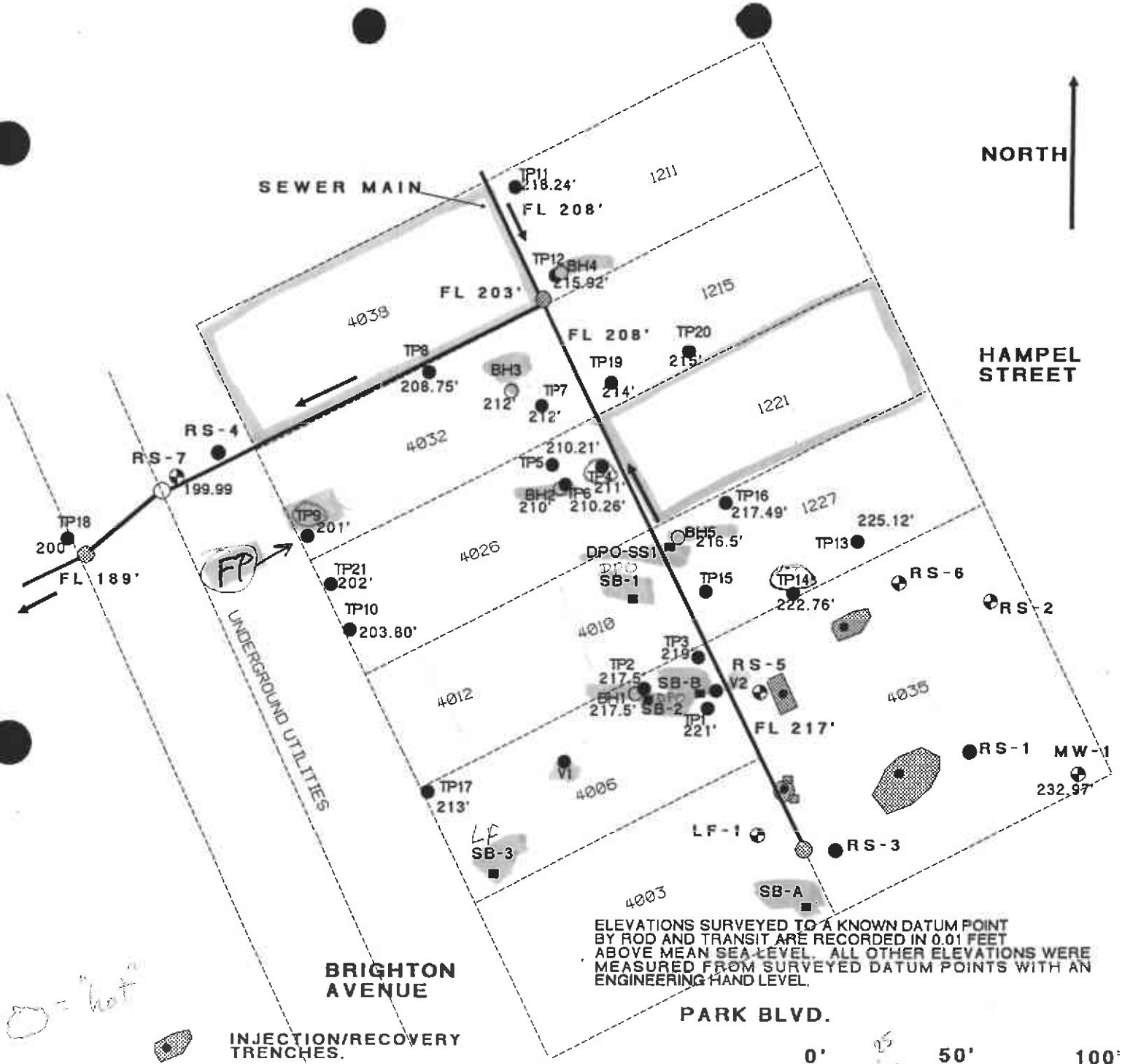


FIGURE 2,, USGS TOPOGRAPHIC MAP



INJECTION/RECOVERY TRENCHES.

FL 217' FLOW LEVEL OF SEWER

SEWER MANHOLE

SOIL BORING LOCATIONS RESNA AND LEVINE-FRICKE 1990-1993

MW-1 MONITOR WELL LOCATION WITH ID*

TP1 SOIL PROBE SURVEY TEST PROBE LOCATIONS FROM MAY 1,2,7, 1996

BH1 HAND AUGERED BOREHOLES, DRILLED MAY 1&2, 1996

V1 VAPOR TEST HOLE LOCATION FROM SOIL PROBE SURVEY

FIGURE 3

SEWER LATERAL INVESTIGATION

SOIL PROBE SURVEY AND BOLEHOLE SAMPLE LOCATIONS WITH GROUND SURFACE ELEVATIONS IN FEET AMSL.

DESERT PETROLEUM STATION #793
4035 PARK BLVD..
OAKLAND, CALIFORNIA 94602

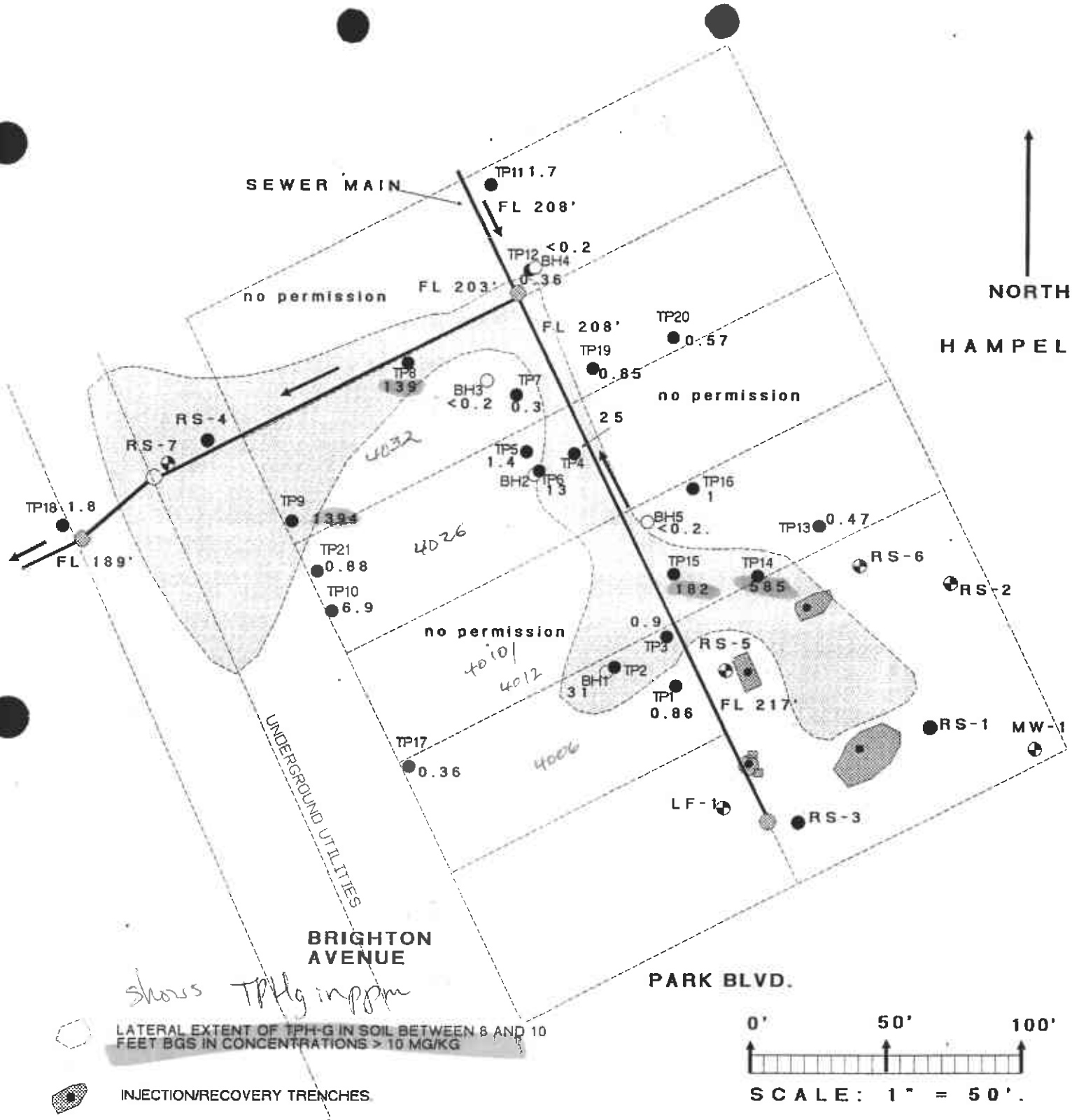
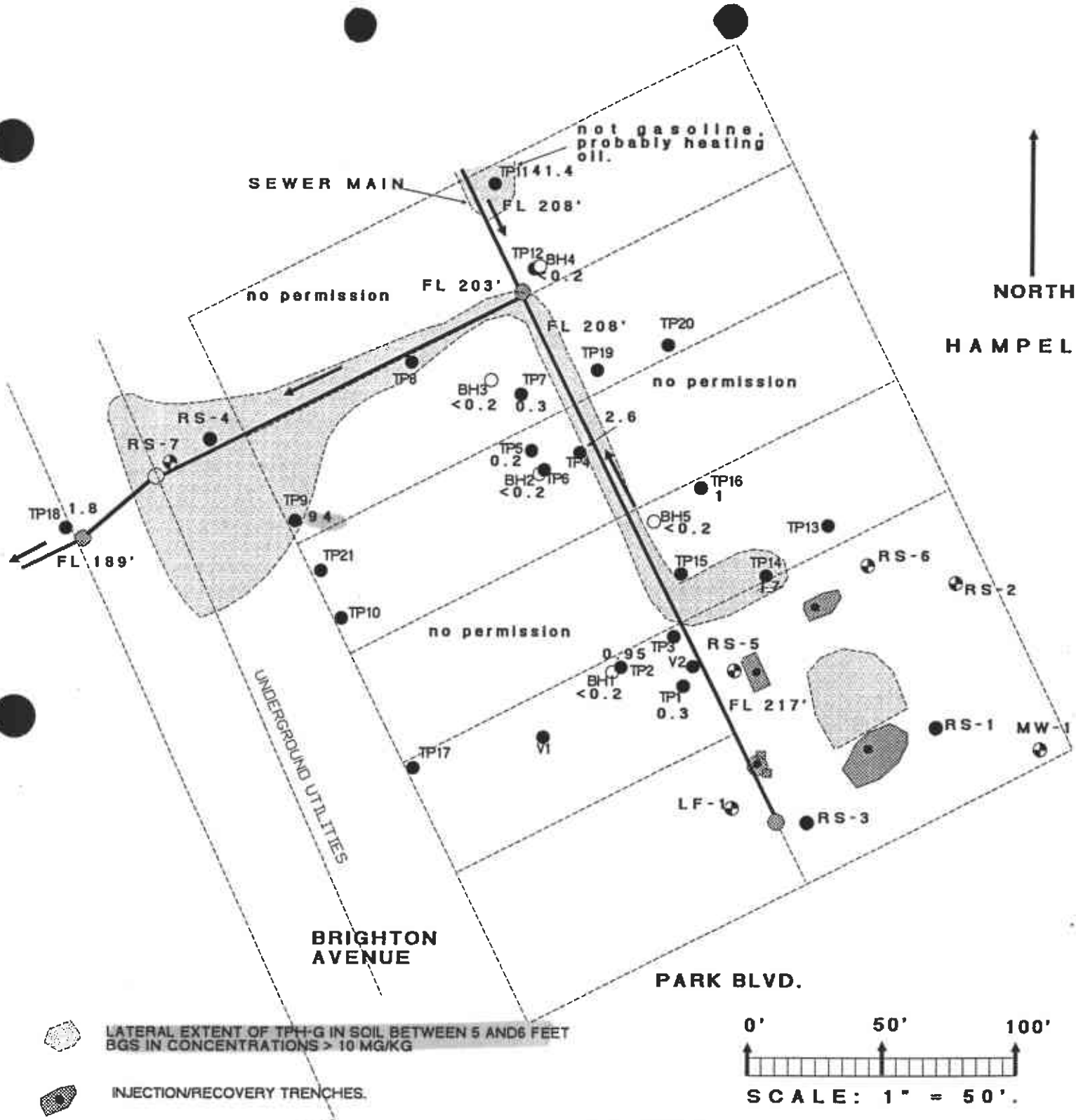


FIGURE 4

SEWER LATERAL INVESTIGATION

CERTIFIED AND UNCERTIFIED ANALYTICAL LABORATORY RESULTS FROM SOIL SAMPLES BETWEEN 8 AND 10 FEET BGS FROM SOIL BORINGS AND SPS TEST HOLES

DESERT PETROLEUM STATION #793
4035 PARK BLVD..
OAKLAND, CALIFORNIA 94602



LATERAL EXTENT OF TPH-G IN SOIL BETWEEN 5 AND6 FEET BGS IN CONCENTRATIONS > 10 MG/KG

INJECTION/RECOVERY TRENCHES.

SEWER MANHOLE

MW-1 MONITOR WELL LOCATION WITH ID#

TP1 150 SOIL PROBE SURVEY TEST PROBE LOCATIONS FROM MAY 1, 2, 7 1996 WITH TFH CONCENTRATIONS IN SOIL IN MG/KG BY UNCERTIFIED WEGE LABORATORY

H1 150 HAND AUGERED BOREHOLES, DRILLED MAY 1&2, 1996 WITH TPH-G CONCENTRATIONS IN SOIL IN MG/KG BY CERTIFIED LABORATORY ANALYSIS.

V1 VAPOR TEST HOLE LOCATION FROM SPS

FIGURE 5

SEWER LATERAL INVESTIGATION

CERTIFIED AND UNCERTIFIED ANALYTICAL LABORATORY RESULTS FROM SOIL SAMPLES BETWEEN 5 AND 6 FEET BGS FROM SOIL BORINGS AND SPS TEST HOLES

DESERT PETROLEUM STATION #793
4035 PARK BLVD..
OAKLAND, CALIFORNIA 94602

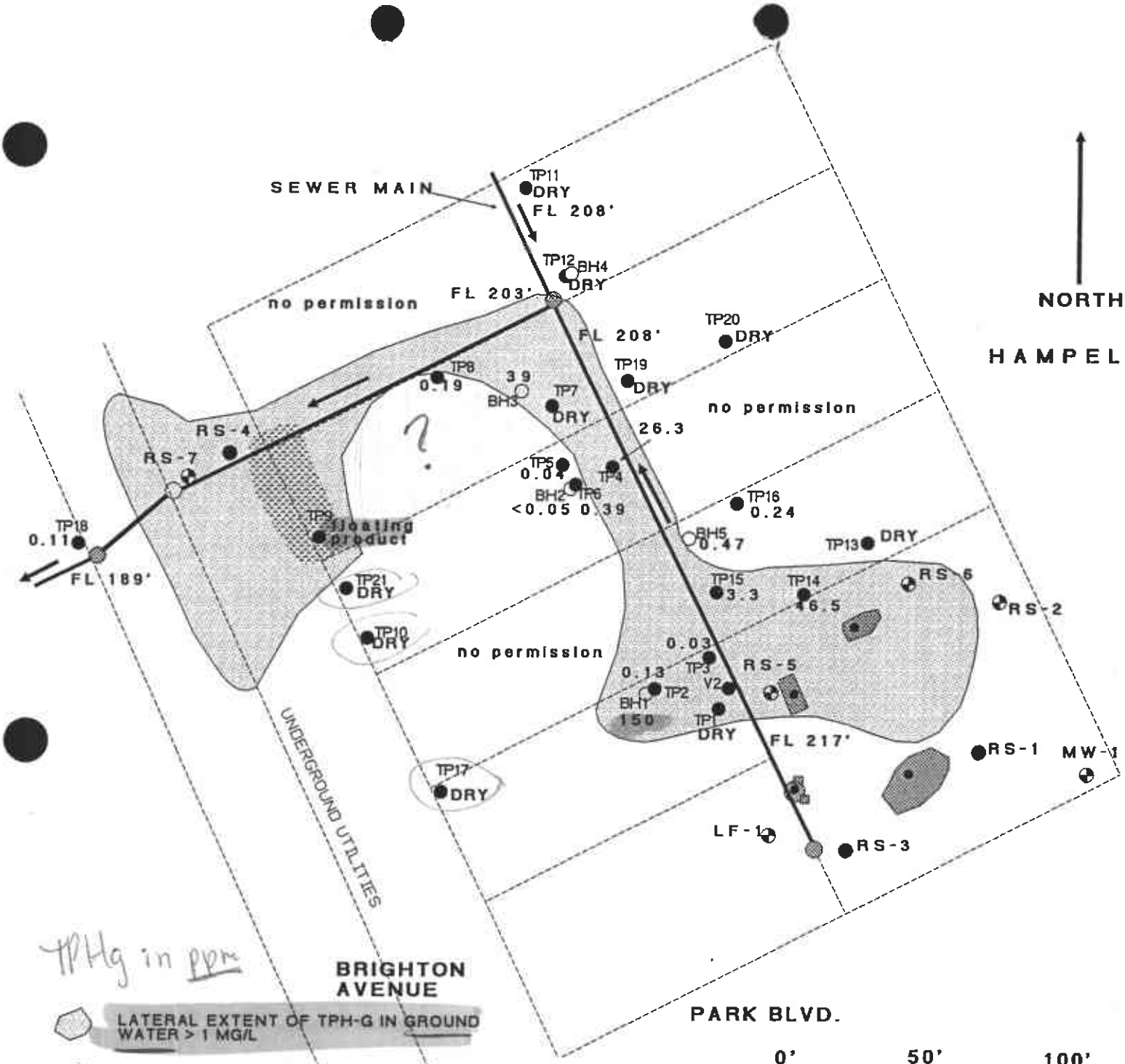


FIGURE 6

SEWER LATERAL INVESTIGATION

CERTIFIED AND UNCERTIFIED ANALYTICAL LABORATORY RESULTS FROM WATER SAMPLES COLLECTED FROM SOIL BORINGS AND SPS TEST HOLES

DESERT PETROLEUM STATION #793
4035 PARK BLVD..
OAKLAND, CALIFORNIA 94602

APPENDIX A

SPS METHODS AND PROCEDURES

DISSOLVED OXYGEN ANALYSIS

CALCULATIONS FOR:
HYDRAULIC CONDUCTIVITY
GROUND WATER VELOCITIES
RETARDED BTEX VELOCITIES

APPENDIX A
SOIL PROBE SURVEY: METHODS AND PROCEDURES

SOIL SAMPLES

Soil samples were collected by first driving a 5/8 inch diameter steel rod to the desired sampling depth with a slide hammer. A steel sampler with an inner plunger and a 3/8" by 2" brass sleeve fitted to the end was used to gather a small (1 to 4 grams) soil plug of the relatively undisturbed soil from the base of the hole. The sample was placed into a pre-weighed 40 ml VOA Vial and sealed.

The soil sample was examined under an Ultraviolet (U.V.) scope for petroleum fluorescence. The sample was then weighed, placed on a hot plate. After the sample had reached equilibrium, a headspace sample was obtained from the sealed sample container with a 1 cc syringe and injected into a FID (flame ionizing detector) chromatograph.

WATER SAMPLES

When water was encountered in a test hole it was sampled by lowering 1/4" tubing into the hole and pulling the water sample to the surface using the vacuum provided by a 60 cc syringe. The samples were collected in 40 ml VOA vials. The water was examined under the UV. scope for petroleum fluorescence and then placed on a hot plate. After the sample has reached equilibrium a sample of the headspace was collected with a 1 cc syringe and injected into a calibrated FID chromatograph. The resulting chromatograms are examined for volatile organics.

VAPOR SAMPLES

Vapor samples were collected by lowering 1/4 inch tubing into the test hole and pulling vapors to surface using the vacuum provided by a 60 cc syringe. The volume of the tubing from the base of the borehole to a sampling port fitted with a 1 cc syringe positioned below the vacuum source was calculated to determine the amount of air displacement necessary for vapors to reach the sampling point. Once the calculated amount of air had been displaced with the 60 cc syringe a clamp was placed across the sampling port, isolating the it from the 60 cc syringe, and a vapor sample was extracted with the 1 cc syringe and injected into the FID chromatograph.

CALIBRATION

The chromatograph was calibrated prior to sampling using known concentrations of the compounds to develop standard chromatograms. Concentrations of Total Fuel Hydrocarbons (TFH) and BTEX constituents were calculated by comparing the chromatograms of known standards to chromatograms produced by the soil, water, or vapor samples.

APPENDIX A

CALCULATING K (Hydraulic conductivity)

The K was calculated using the Bouwer and Rice Slug Test Model using the following formula:

$K = re^2 \ln(Re/Rw)/(2Le)\ 1/t\ \ln(y_0/y_t)$

rc = The radius of the well.

rw = The radius of the bore hole.

re = The equivalent radius of the well.

a. re is the equivalent radius of the well taking in account the effect of the gravel pack on the volume of the well.

b. re = the square root of $[((1-n) \times rc^2) + (n \times rw^2)]$, n being the porosity of the gravel pack. This is usually around 30 percent.

Le = The length of screened well below the water table.

a. Le usually = Bottom well (bw) - Depth to water (dw), but in some cases it may be less than this if the well is screened only over a portion of the aquifer.

Lw = The length of cassing below the water table.

h = Aquifer thickness, the distance from the water table to a aquatard in an unconfined aquifer.

y = the drawdown = the depth to water in the bailed well from the original depth of water.

Re = The effective radial distances over which the drawdown y is dissipated by the formation.

Re is not directly determinable.

Bouwer and Rice provided a graph of A, B, and C values for the calculation of ln(Re/rw) form a known Value of Le/Rw. The values derived from the chart depend on the well geometries.
If Lw is less than h the following equation is used.

$\ln(Re/rw) = [(1.1/\ln(Lw/rw)) + (A+B\ln[(h-Lw)/rw])/(Le/rw)]^{-1}$

If Lw equals h the following equation is used.

$\ln(Re/rw) = [\ (1.1/\ln(Lw/rw) + C/(Le/rw)]^{-1}$

To find the ys to use in the formula, the drawdown y was plotted on the log scale of semilog paper against recovery time (t). The straight line portion of the graph is used to determine the y1 and y2 with t being the difference between the times of y1 and y2. If there is a problem from gravel pack drainage the graph will show two strait line portions. The second less steep strait line is used.

EXPECTED GROUND WATER VELOCITYS.

The average ground water velocity (v)=KI/ne

I = ground water gradient, the change in head h over a change in distance l = h/ l = (h1-h2)/l

ne = effective porosity ~ 0.2.

HYDROCARBON MIGRATION

Hydrocarbon compounds do not normally travel through the aquifer at the same rate as ground water. The rate of migration is usually slowed by retention of the compound molecules by organic carbon in the soil. The amount this slows the migration of the compounds is called the retardation factor (Kd).

The Kd is effected by the amount of Organic carbon (Oc) in the soil and the compound's tendency to move from the water into the soil, ie the soil-water partition coefficient(Koc). An estimated or pratical Kd can be calculated:

Kd = Oc x Koc.

The retarded velocity can be found by the following formula:
$v_c = v/[1+(P_b/n)(Kd)]$
P_b = bulk density ~ 1.9 gm/cm^3
n = volumetric moisture content~0.20.

REFERENCES

Bouwer, Herman. 1989. The Bourwe and Rice Slug Test - An Update. Ground Water, v. 27, n. 3, pp. 304-309

C.W. Fetter, Applied Hydrology, 2nd edition, 1988.

1. Enter the stored program number for dissolved oxygen.

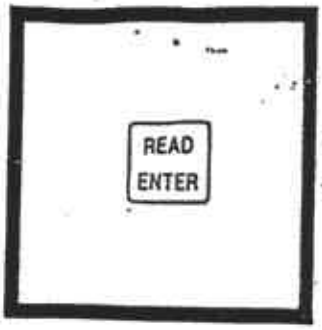
Press: 4 4 5 READ/ENTER

The display will show:
DIAL nm TO 535

Note: Or, use the up and down arrows to scroll the display to: 445 mg/l O_2 HRDO and press: READ/ENTER

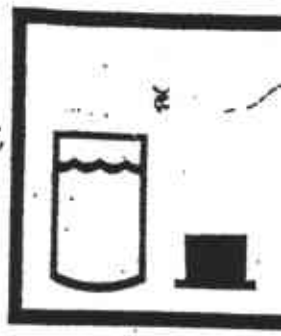
Note: Samples must be analyzed on site and cannot be stored; see Sampling and Storage below.

2. Rotate the wavelength dial until the small display shows:
535 nm

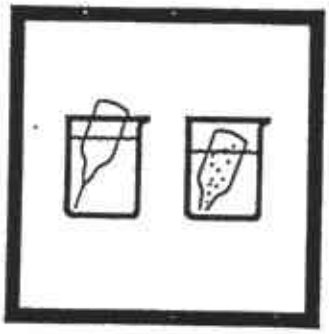


3. Press: READ/ENTER

The display will show:
mg/l O_2 HRDO

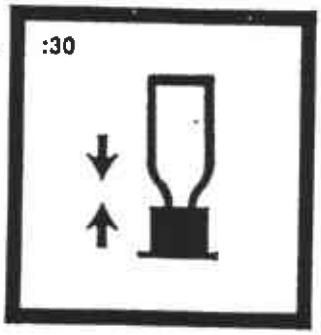


4. Fill a zeroing vial (the blank) with at least 10 mL of sample. Fill a blue ampul cap with sample.



5. Fill a High Range Dissolved Oxygen AccuVac Ampul with sample.

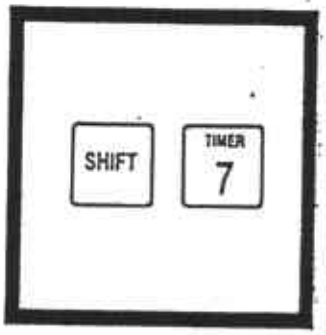
Note: Keep the tip immersed while the ampul fills completely.



6. Without inverting the ampul, immediately place the ampul cap that has been filled with sample securely over the tip of the ampul. Shake the ampul for approximately 30 seconds.

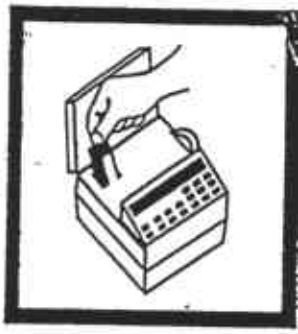
Note: A small amount of the undissolved HRDO Reagent does not affect results.

Note: The cap prevents contamination with atmospheric oxygen.



7. Press: SHIFT TIMER

A two-minute reaction period enables oxygen, which was degassed during aspiration, to redissolve and react.



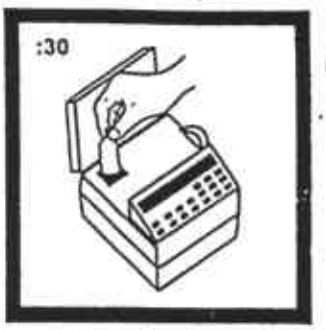
8. Place the AccuVac Vial Adapter into the cell holder.

Note: Place the grip tab at the rear of the cell holder.

9. When the timer beeps, the display will show:
mg/l O_2 HRDO
Shake the ampul for 30 seconds.

10. Place the blank into the cell holder. Close the light shield.

11. Press: ZERO
The display will show:
WAIT
then:
0.0 mg/l O_2 HRDO



12. Place the AccuVac ampul into the cell holder. Close the light shield. Wait approximately 30 seconds for the air bubbles to disperse from the light path.

Press: READ/ENTER

The display will show:
WAIT
then the result in mg/L dissolved oxygen will be displayed.

Note: In the constant-on mode, pressing READ/ENTER is not required. WAIT will not appear. When the display stabilizes, read the result.

SAMPLING AND STORAGE

The foremost consideration in sampling with the High Range Dissolved Oxygen AccuVac Ampul is to prevent the sample from becoming contaminated with atmospheric oxygen. This is accomplished by capping the ampul with an ampul cap in the interval between breaking open the ampul and reading the absorbance. If the ampul is securely capped, the ampul should be safe from contamination for several hours. The absorbance will decrease by approximately 3% during the first hour and will not change significantly afterwards.

Sampling and sample handling are important considerations in obtaining meaningful results. The dissolved oxygen content of the water being tested can be expected to change with depth, turbulence, temperature, sludge deposits, light, microbial action, mixing, travel time and other factors. A single dissolved oxygen test rarely reflects the accurate over-all condition of a body of water. Several samples taken at different times, locations and depths are recommended for most reliable results. Samples must be tested immediately upon collection although only a small error results if the absorbance reading is taken several hours later.

ACCURACY CHECK

The results of this procedure may be compared with the results of a titrimetric procedure or dissolved oxygen meter.

PRECISION

In a single laboratory, using a standard solution of 7.22 mg/L O_2 determined by the Winkler method and two representative lots of reagent with the DR/2000, a single operator obtained a standard deviation of ± 0.20 mg/L O_2.

INTERFERENCES

The following do not interfere at a level of 10 mg/L which is in excess of naturally occurring levels of Cr^{3+}, Mn^{2+}, Fe^{2+}, Ni^{2+}, Cu^{2+} and NO_2^-.

APPENDIX B

BOREHOLE LOGS

-WEGE-
WESTERN GEO-ENGINEERS

PAGE 1 OF 1

BORING: BH-1
DATE DRILLED: 5 / 1 / 9 6

▌ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DESERT PETROLEUM DP793	GEOLOGIST: G. CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 Park Boulevard Oakland, CA.	DRILLER: G. CONVERSE	TOTAL DEPTH: 10.5FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER: 9.5'	CASING: 2" F480 PVC, 0.020 slot

REMARKS: HAND AUGERED AND SET TEMPORARY CASING TO SAMPLE SOIL AND GROUND WATER.

DEPTH (FT)	SAMPLE No.	BLOWS/5 FT	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
2.5'				CLAY, dark brown, silty, moist, no odor. (CH-ML)		Boring performed in backyard of 4006 Brighton Avenue, near sewer lateral.
5.0'	BH1 -5		0			
7.5'				CLAY, light brown, expanding, moist, no odor. (CH)		
▼ 10.0'	BH1 -10		80	CLAY, dark green/grey, silty, wet, trace degraded petroleum odor. (CH-ML)		water first encountered during drilling at 9.5'. 24 hours later at 6.82'.
12.5'						
15.0'				TOTAL DEPTH 10.5'		

ppmv vapor colume is actual mg/L gasoline range hydrocarbons in soil using a FID-GC, non certified.

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

-WEGE-
WESTERN GEO-ENGINEERS

PAGE 1 OF 1

BORING: BH-2
DATE DRILLED: 5 / 2 / 9 6

▌SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DESERT PETROLEUM DP793	GEOLOGIST: G. CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 Park Boulevard Oakland, CA.	DRILLER: G. CONVERSE	TOTAL DEPTH: 5.4FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER: 4.5'	CASING: 2" F480 PVC, 0.020 slot

REMARKS: HAND AUGERED AND SET TEMPORARY CASING TO SAMPLE SOIL AND GROUND WATER.

DEPTH (FT)	SAMPLE No.	BLOWS/5 FT	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
				Top Soil		Boring performed in backyard of 4026 Brighton Avenue, near sewer lateral.
2.5'				CLAY, dark brown, silty, moist, no odor. (CH-ML)		
▼ 5.0'	BH2-5		0			water first encountered during drilling at 4.5'. 6 hours later at 2.3'.
7.5'				TOTAL DEPTH 5.4'		
10.0'						
12.5'						
15.0'						
				ppmv vapor colume is actual mg/L gasoline range hydrocarbons in soil using a FID-GC, non certified.		

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STATE OF CALIFORNIA

-WEGE-

WESTERN GEO-ENGINEERS

BORING: BH-3

DATE DRILLED: 5 / 2 / 9 6

▌ SAMPLE INTERVAL

▼ WATER

BORE HOLE LOG

PROJECT: DESERT PETROLEUM DP793	GEOLOGIST: G. CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 Park Boulevard Oakland, CA.	DRILLER: G. CONVERSE	TOTAL DEPTH: 10.5FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER: 10.0'	CASING: 2" F480 PVC, 0.020 slot

REMARKS: HAND AUGERED AND SET TEMPORARY CASING TO SAMPLE SOIL AND GROUND WATER.

DEPTH (FT)	SAMPLE No.	BLOWS/5 FT	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
2.5'				CLAY, dark brown, silty, moist, no odor. (CH-ML)		Boring performed in backyard of 4032 Brighton Avenue, near sewer lateral.
5.0'				CLAY, blue/grey, silty, moist, no odor. (CH-ML)		
7.5'	BH3 -8.5		2.2	CLAY, light brown, expanding, moist, no odor. (CH)		water first encountered during drilling at 10'. 4 hours later at 8.25'.
10.0' ▼	BH3-10.5		4.5			
12.5'						
15.0'				TOTAL DEPTH 10.5'		

ppmv vapor colume is actual mg/L gasoline range hydrocarbons in soil using a FID-GC, non certified.

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

-WEGE-

WESTERN GEO-ENGINEERS

BORING: BH-4

DATE DRILLED: 5 / 2 / 9 6

▮ SAMPLE INTERVAL

▼ WATER

BORE HOLE LOG

PROJECT: DESERT PETROLEUM DP793	GEOLOGIST: G. CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 Park Boulevard Oakland, CA.	DRILLER: G. CONVERSE	TOTAL DEPTH: 14.0 FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER:	CASING: 2" F480 PVC, 0.020 slot

REMARKS: HAND AUGERED AND SET TEMPORARY CASING TO SAMPLE SOIL AND GROUND WATER.

DEPTH (FT)	SAMPLE No.	BLOWS/5 FT	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
2.5'				CLAY, dark brown, silty, moist, no odor. (CH-ML)		Boring performed in backyard of 1211 N. Hampiel Avenue, near sewer lateral.
5.0'						
7.5'	BH 4			CLAY, light brown, expanding, moist, no odor. (CH)		
10.0'	BH4 -8.5		0			
12.5'						Boring deepened to 14.0 feet on 5/6/96. Formation refusal in gravel. still no water.
15.0'				GRAVEL, angular, no odor		
				TOTAL DEPTH 14.0'		
				ppmv vapor colume is actual mg/L gasoline range hydrocarbons in soil using a FID-GC, non certified.		

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

-WEGE-

WESTERN GEO-ENGINEERS

BORING: BH-5

DATE DRILLED: 5 / 2 / 9 6

▌ SAMPLE INTERVAL

▼ WATER

BORE HOLE LOG

PROJECT: DESERT PETROLEUM DP793	GEOLOGIST: G. CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 Park Boulevard Oakland, CA.	DRILLER: G. CONVERSE	TOTAL DEPTH: 8.5FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER: 6.0'	CASING: 2" F480 PVC, 0.020 slot

REMARKS: HAND AUGERED AND SET TEMPORARY CASING TO SAMPLE SOIL AND GROUND WATER.

DEPTH (FT)	SAMPLE No.	BLOWS/5 FT	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
				Top Soil		Boring performed in backyard of 1227 N. Hampiel Avenue, near sewer lateral.
2.5'	BH5-2.5		0	CLAY, light brown, silty, no odor. (CH-ML)		
5.0' ▼	BH5-5		0	CLAY, dark brown, silty, moist, no odor. (CH-ML)		
7.5'						
10.0'	BH5-8.5		0			Water first encountered during drilling at 6.0', after purging at 6.4'.
12.5'						
15.0'				TOTAL DEPTH 8.5'		
				ppmv vapor colume is actual mg/L gasoline range hydrocarbons in soil using a FID-GC, non certified.		

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

APPENDIX C

CERTIFIED ANALYTICAL
LABORATORY REPORT

COC DOCUMENTATION

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

WESTERN GEO-ENGINEERING
1386 E. BEAMER STREET
WOODLAND, CA 95776-6003

ATTN: DAVE THRELFALL
CLIENT PROJ. ID: DP793

P.O. NUMBER: 586N

REPORT DATE: 05/20/96

DATE(S) SAMPLED: 05/01/96

DATE RECEIVED: 05/08/96

AEN WORK ORDER: 9605117

PROJECT SUMMARY:

On May 8, 1996, this laboratory received 3 (1 water & 2 soil) sample(s).

Client requested sample(s) be analyzed for chemical parameters. Portion for total organic carbon was subcontracted to a DOHS certified laboratory; subcontract report will follow at a later date. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-1
AEN LAB NO: 9605117-01
AEN WORK ORDER: 9605117
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/01/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	32,000 *	50	ug/L	05/15/96
Toluene	108-88-3	28,000 *	50	ug/L	05/15/96
Ethylbenzene	100-41-4	3,300 *	50	ug/L	05/15/96
Xylenes, Total	1330-20-7	13,000 *	200	ug/L	05/15/96
Purgeable HCs as Gasoline	5030/GCFID	150 *	5	mg/L	05/15/96

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-05
AEN LAB NO: 9605117-02
AEN WORK ORDER: 9605117
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/01/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	5	ug/kg	05/14/96
Toluene	108-88-3	ND	5	ug/kg	05/14/96
Ethylbenzene	100-41-4	ND	5	ug/kg	05/14/96
Xylenes, Total	1330-20-7	ND	5	ug/kg	05/14/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	05/14/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-10
AEN LAB NO: 9605117-03
AEN WORK ORDER: 9605117
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/01/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	20	ug/kg	05/14/96
Toluene	108-88-3	160 *	20	ug/kg	05/14/96
Ethylbenzene	100-41-4	220 *	20	ug/kg	05/14/96
Xylenes, Total	1330-20-7	710 *	60	ug/kg	05/14/96
Purgeable HCs as Gasoline	5030/GCFID	31 *	4	mg/kg	05/14/96

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9605117

CLIENT PROJECT ID: DP793

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9605117
INSTRUMENT: F
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
05/15/96	BH-1	01	95
QC Limits:			70-130

DATE ANALYZED: 05/13/96
SAMPLE SPIKED: 9605083-10
INSTRUMENT: F

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	17.3	96	1	85-109	17
Toluene	57.0	106	1	87-111	16
Hydrocarbons as Gasoline	500	116	6	66-117	19

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9605117
INSTRUMENT: E
MATRIX: SOIL

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
05/14/96	BH-05	02	110
05/14/96	BH-10	03	100
QC Limits:			70-130

DATE ANALYZED: 05/13/96
SAMPLE SPIKED: LCS
INSTRUMENT: E

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/kg)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	34.5	102	10	60-120	20
Toluene	105	104	17	60-120	20
Hydrocarbons as Gasoline	1000	110	19	60-120	20

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

Reporting Information:

1. Client: WESTERN GEO-ENGINEERS
Address: 286 E. BEAMER ST. WOODLAND, CA 95776-6003
Contact: DAVE THREFALL
Alt. Contact: GEORGE CONVERSE

American Environmental Network
3440 Vincent Road, Pleasant Hill, CA 94523
Phone (510) 930-9090
FAX (510) 930-0256

AEN

R-1,2 F
R-3,5-4

Page 1 of 1

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY

Lab Job Number: 9605117
Lab Destination:
Date Samples Shipped:
Lab Contact:
Date Results Required:
Date Report Required:
Client Phone No.:
Client FAX No.:

Address Report To:

2. SAME

Send Invoice To:

3. (916) 668-5300
(FAX 916) 662-0273

Send Report To: 1 or 2 (Circle one)

Client P.O. No.: SP6N Client Project I.D. No.: DP 793

Sample Team Member (s) SPS

Lab Number	Client Sample Identification	Air Volume	Date/ Time Collected	Sample Type*	Pres.	No. of Cont.	Type of Cont.	ANALYSIS: TPH-g / BTEX	ANALYSIS: Total Org. Carbon	Comments / Hazards
01AB	BH-1		5/1/96 14:50	7	HCl	2	40-VOA	X		
02A	BH-05		5/1/96	8	—	1	2" Brass	X		
03A	BH-10		5/1/96	8	—	1	2" Brass	X	X	

Please make separate Report (This copy only)

NTRT

Relinquished by: (Signature)	DATE 5/8/96	TIME 1400	Received by: (Signature)
Relinquished by: (Signature)	DATE 5/8/96	TIME 16:10	Received by: (Signature)
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)
Method of Shipment			Lab Comments

DATE 5-8-96 TIME 14:00
DATE 5-8-96 TIME 1630
DATE TIME

*Sample type (Specify): 1) 37mm 0.8 µm MCEF 2) 25mm 0.8 µm MCEF 3) 25mm 0.4 µm polycarb. filter
4) PVC filter, diam. ____ pore size ____ 5) Charcoal tube 6) Silica gel tube 7) Water 8) Soil 9) Bulk Sample
10) Other ____ 11) Other ____

COPIES: WHITE - JOB FILE YELLOW - PROJECT FILE PINK - CLIENT

NEI/GTEL
ENVIRONMENTAL LABORATORIES, INC.

Midwest Region
4211 May Avenue
Wichita, KS 67209
(316) 945-2624
(800) 633-7936
(316) 945-0506 (FAX)

May 24, 1996

Robin Byars
American Environmental Network
3440 Vincent Road
Pleasant Hill, CA 94523

RE: GTEL Client ID: ANE01ANE01
Login Number: W6050220
Project ID (number): 96050117
Project ID (name): AMERICAN ENVIRONMENTAL NETWORK/PLEASANT HILL/CA

Dear Robin Byars:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 05/10/96.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes. This report is to be reproduced only in full.

NEI/GTEL is certified by the Department of Health Service under Certification Number 1845.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Terry R. Loucks
Laboratory Director

Project Coordinator

Project ID (Number): ANE01.ANE01
96050117
Project ID (Name): American Environmental Network
Work Order Number: W6-05-0220
Date Reported: 05-24-96

ANALYTICAL RESULTS

Inorganics in Soil

GTEL Sample Number			01			
Client Identification			BH-10			
Date Sampled			05-01-96			
Date Analyzed			05-23-96			
Analyte	Method	QL* & Units	Concentration			
Total Organic Carbon	CFA 18.0[a]	100 mg/Kg	**390**			
Percent Solids			85.6			

* Quantitation Limit.

NA Not applicable

a California Fertilizer Association, Soil Testing Procedures for California, CFA-SIC Publication, 1980.

Reporting Inform

1. Client: AEN
Address:
Contact: ROBIN BYARS
Alt. Contact: BILL SVOBODA

American Environmental Network
3440 Vincent Road, Pleasant Hill, CA 94523
Phone (510) 930-9090
FAX (510) 930-0256

AEN

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY

Lab Job Number:
Lab Destination: GTEL ENVIRONMENTAL
Date Samples Shipped: 5/9/96
Lab Contact:
Date Results Required: STANDARD
Date Report Required: ↓
Client Phone No.:
Client FAX No.:

Address Report To:

2. #1

Send Invoice To:

3. #1

Send Report To: (1) or 2 (Circle one)

Client P.O. No.: 9605117 Client Project I.D. No.: DP 793

Sample Team Member (s)

Lab Number	Client Sample Identification	Air Volume	Date/ Time Collected	Sample Type*	Pres.	No. of Cont.	Type of Cont.	ANALYSIS: TOC	Comments / Hazards
01	BH-10	—	5/1/96	8	COLD	1	JAR	X	PLEASE FAX RESULTS AS SOON AS AVAILABLE
02									
03									
04									
05									
06									
07									
08									
09									
10									
11									
12									
13									

6° Seal a Meal
09499043149

Relinquished by: (Signature) Ronald C. Jensen	DATE 5/9/96	TIME 13:15	Received by: (Signature)
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature)
Method of Shipment			Lab Comments

DATE TIME: 5-10-96 0900

*Sample type (Specify): 1) 37mm 0.8 µm MCEF 2) 25mm 0.8 µm MCEF 3) 25mm 0.4 µm polycarb. filter
4) PVC filter, diam. ____ pore size ____ 5) Charcoal tube 6) Silica gel tube 7) Water (8) Soil 9) Bulk Sample
10) Other ____ 11) Other ____

COPIES: WHITE - JOB FILE YELLOW - PROJECT FILE PINK - CLIENT

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172 AIHA Accreditation: 11134

WESTERN GEO-ENGINEERING
1386 E. BEAMER STREET
WOODLAND, CA 95776-6003

ATTN: DAVE THRELFALL
CLIENT PROJ. ID: DP793

REPORT DATE: 05/20/96

DATE(S) SAMPLED: 05/02/96-05/08/96

DATE RECEIVED: 05/08/96

AEN WORK ORDER: 9605116

P.O. NUMBER: 587N

PROJECT SUMMARY:

On May 8, 1996, this laboratory received 13 (10 soils & 3 water) sample(s).

Client requested 11 sample(s) be analyzed for chemical parameters; two samples were placed on hold. Portions for total organic carbon were subcontracted to a DOHS certified laboratory; subcontract report will follow at a later date. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-2
AEN LAB NO: 9605116-01
AEN WORK ORDER: 9605116
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/02/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	2.2 *	0.5	ug/L	05/15/96
Toluene	108-88-3	2.0 *	0.5	ug/L	05/15/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/15/96
Xylenes, Total	1330-20-7	ND	2	ug/L	05/15/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.05	mg/L	05/15/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-2-5.5
AEN LAB NO: 9605116-02
AEN WORK ORDER: 9605116
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/02/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	5	ug/kg	05/15/96
Toluene	108-88-3	ND	5	ug/kg	05/15/96
Ethylbenzene	100-41-4	ND	5	ug/kg	05/15/96
Xylenes, Total	1330-20-7	ND	5	ug/kg	05/15/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	05/15/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-3
AEN LAB NO: 9605116-03
AEN WORK ORDER: 9605116
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/02/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	2,300 *	10	ug/L	05/15/96
Toluene	108-88-3	1,800 *	10	ug/L	05/15/96
Ethylbenzene	100-41-4	1,500 *	10	ug/L	05/15/96
Xylenes, Total	1330-20-7	7,100 *	40	ug/L	05/15/96
Purgeable HCs as Gasoline	5030/GCFID	39 *	1	mg/L	05/15/96

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-3-5
AEN LAB NO: 9605116-04
AEN WORK ORDER: 9605116
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/02/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	5	ug/kg	05/15/96
Toluene	108-88-3	ND	5	ug/kg	05/15/96
Ethylbenzene	100-41-4	ND	5	ug/kg	05/15/96
Xylenes, Total	1330-20-7	ND	5	ug/kg	05/15/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	05/15/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-3-8.5
AEN LAB NO: 9605116-05
AEN WORK ORDER: 9605116
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/02/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	5	ug/kg	05/15/96
Toluene	108-88-3	ND	5	ug/kg	05/15/96
Ethylbenzene	100-41-4	ND	5	ug/kg	05/15/96
Xylenes, Total	1330-20-7	ND	5	ug/kg	05/15/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	05/15/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-3-10.5
AEN LAB NO: 9605116-06
AEN WORK ORDER: 9605116
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/08/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	9 *	5	ug/kg	05/15/96
Toluene	108-88-3	ND	5	ug/kg	05/15/96
Ethylbenzene	100-41-4	ND	5	ug/kg	05/15/96
Xylenes, Total	1330-20-7	21 *	5	ug/kg	05/15/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	05/15/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-4-6.5
AEN LAB NO: 9605116-07
AEN WORK ORDER: 9605116
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/02/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	5	ug/kg	05/15/96
Toluene	108-88-3	ND	5	ug/kg	05/15/96
Ethylbenzene	100-41-4	ND	5	ug/kg	05/15/96
Xylenes, Total	1330-20-7	ND	5	ug/kg	05/15/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	05/15/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-4-8.5
AEN LAB NO: 9605116-08
AEN WORK ORDER: 9605116
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/02/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	**EPA 8020**				
Benzene	71-43-2	ND	5	ug/kg	05/15/96
Toluene	108-88-3	ND	5	ug/kg	05/15/96
Ethylbenzene	100-41-4	ND	5	ug/kg	05/15/96
Xylenes, Total	1330-20-7	ND	5	ug/kg	05/15/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	05/15/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-5
AEN LAB NO: 9605116-11
AEN WORK ORDER: 9605116
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/02/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	270 *	0.5	ug/L	05/16/96
Toluene	108-88-3	ND	0.5	ug/L	05/16/96
Ethylbenzene	100-41-4	ND	0.5	ug/L	05/16/96
Xylenes, Total	1330-20-7	ND	2	ug/L	05/16/96
Purgeable HCs as Gasoline	5030/GCFID	0.47 *	0.05	mg/L	05/16/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-5-5
AEN LAB NO: 9605116-12
AEN WORK ORDER: 9605116
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/02/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	5	ug/kg	05/15/96
Toluene	108-88-3	ND	5	ug/kg	05/15/96
Ethylbenzene	100-41-4	ND	5	ug/kg	05/15/96
Xylenes, Total	1330-20-7	ND	5	ug/kg	05/15/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	05/15/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

WESTERN GEO-ENGINEERING

SAMPLE ID: BH-5-6.5
AEN LAB NO: 9605116-13
AEN WORK ORDER: 9605116
CLIENT PROJ. ID: DP793

DATE SAMPLED: 05/02/96
DATE RECEIVED: 05/08/96
REPORT DATE: 05/20/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	ND	5	ug/kg	05/15/96
Toluene	108-88-3	ND	5	ug/kg	05/15/96
Ethylbenzene	100-41-4	ND	5	ug/kg	05/15/96
Xylenes, Total	1330-20-7	ND	5	ug/kg	05/15/96
Purgeable HCs as Gasoline	5030/GCFID	ND	0.2	mg/kg	05/15/96

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9605116

CLIENT PROJECT ID: DP793

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9605116
INSTRUMENT: F, H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
05/15/96	BH-2	01	90
05/15/96	BH-3	03	122
05/16/96	BH-5	11	97
QC Limits:			70-130

DATE ANALYZED: 05/16/96
SAMPLE SPIKED: 9605159-05
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	22.2	100	1	85-109	17
Toluene	73.9	92	1	87-111	16
Hydrocarbons as Gasoline	500	113	3	66-117	19

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9605116
INSTRUMENT: E
MATRIX: SOIL

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
05/15/96	BH-2-5.5	02	102
05/15/96	BH-3-5	04	101
05/15/96	BH-3-8.5	05	101
05/15/96	BH-3-10.5	06	99
05/15/96	BH-4-6.5	07	101
05/15/96	BH-4-8.5	08	102
05/15/96	BH-5-5	12	105
05/15/96	BH-5-6.5	13	103
QC Limits:			70-130

DATE ANALYZED: 05/15/96
SAMPLE SPIKED: LCS
INSTRUMENT: E

Laboratory Control Sample Recovery

Analyte	Spike Added (ug/kg)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	34.5	100	9	60-120	20
Toluene	105	107	8	60-120	20
Hydrocarbons as Gasoline	1000	116	10	60-120	20

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

*** END OF REPORT ***

Reporting Information

1. Client: [redacted] GEO-ENGINEERS
Address: 1386 E. BEAMER ST
WOODLAND, CA 95776-6003
Contact: DAVE THRELFALL
Alt. Contact: GEORGE CONVERSE

American Environmental [redacted]twork
3440 Vincent Road, Pleasant Hill, CA 94523
Phone (510) 930-9090
FAX (510) 930-0256

AEN

R4,S-5
R3,S-4

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY

Lab Job Number: 9605116
Lab Destination:
Date Samples Shipped:
Lab Contact:
Date Results Required:
Date Report Required:
Client Phone No.:
Client FAX No.:

Address Report To:
2. Same

Send Invoice To:
3. (916) 668-5300
FAX (916) 662-0273

Send Report To: 1 or 2 (Circle one)

Client P.O. No.: 587N Client Project I.D. No.: DP 793

Sample Team Member (s): SPS

Please make Separate Report (This Copy only)

Lab Number	Client Sample Identification	Air Volume	Date/ Time Collected	Sample Type*	Pres.	No. of Cont.	Type of Cont.	ANALYSIS: TPH-g / BTEX	ANALYSIS: Total Org. Carbon	Comments / Hazards
01AB	BH-2		5/2/96/15:45	7	HCl	2	40-VOA	X		
02A	BH-2-5.5		5/2/96/09:00	8	—	1	2" Brass	X	X	
03AB	BH-3		5/2/96/17:15	7	HCl	2	40-VOA	X		
04A	BH-3-5		5/2/96/10:30	8	—	1	2" Brass	X		
05A	BH-3-8.5		5/2/96/10:40	8	—	1	"	X		
06A	BH-3-10.5		5/2/96/10:45	8	—	1		X	X	
07A	BH-4-6.5		5/2/96/12:10	8	—	1		X		
08A	BH-4-8.5		5/2/96/12:15	8	—	1		X	X	
09A	BH-4-12		5/2/96/11:00	8	—	1				Hold
10A	BH-4-14		5/2/96/10:30	8	—	1	2" Brass			Hold
11AB	BH-5-		5/2/96/13:45	7	HCl	2	40-VOA	X		
12A	BH-5-5		5/2/96	8	—	1	2" Brass	X		
13A	BH-5-6.5		5/2/96	8	—	1	2" Brass	X	X	

		DATE	TIME			DATE	TIME
Relinquished by: (Signature)		5/8/96	1400	Received by: (Signature)		5-8-96	1400
Relinquished by: (Signature)		5/8/96	1630	Received by: (Signature)	Lori L. Pruett	5-8-96	1630
Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		DATE	TIME
Method of Shipment				Lab Comments			

*Sample type (Specify): 1) 37mm 0.8 µm MCEF 2) 25mm 0.8 µm MCEF 3) 25mm 0.4 µm polycarb. filter
4) PVC filter, diam. ____ pore size ____ 5) Charcoal tube 6) Silica gel tube 7) Water 8) Soil 9) Bulk Sample
10) Other ____ 11) Other ____

COPIES: WHITE - JOB FILE YELLOW - PROJECT FILE PINK - CLIENT

NEI/GTEL
ENVIRONMENTAL LABORATORIES, INC.

Midwest Region
4211 May Avenue
Wichita, KS 67209
(316) 945-2624
(800) 633-7936
(316) 945-0506 (FAX)

May 24, 1996

Robin Byars
American Environmental Network
3440 Vincent Road
Pleasant Hill, CA 94523

RE: GTEL Client ID: ANE01ANE01
Login Number: W6050223
Project ID (number): 9605116
Project ID (name): AMERICAN ENVIRONMENTAL NETWORK/PLEASANT HILL/CA

Dear Robin Byars:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 05/10/96.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes. This report is to be reproduced only in full.

NEI/GTEL is certified by the Department of Health Service under Certification Number 1845.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,
GTEL Environmental Laboratories, Inc.

Terry R. Loucks
Laboratory Director

Project ID (Number): ANE01.ANE01
9605116
Project ID (Name): American Environmental Network
Work Order Number: W6-05-0223
Date Reported: 05-24-96

ANALYTICAL RESULTS

Inorganics in Soil

GTEL Sample Number			01	02	03	04
Client Identification			BH-2-5.5	BH-3-10.5	BH-4-8.5	BH-5-6.5
Date Sampled			05-02-96	05-02-96	05-02-96	05-02-96
Date Analyzed			05-23-96	05-23-96	05-23-96	05-23-96
Analyte	Method	QL* & Units	Concentration			
Total Organic Carbon	CFA 18.0[a]	100 mg/Kg	**2400**	**340**	**460**	**5700**
Percent Solids			81.7	77.8	76.6	81.8

* Quantitation Limit.

NA Not applicable

a California Fertilizer Association, Soil Testing Procedures for California, CFA-SIC Publication, 1980.

Reporting Information:

1. Client: WESTERN GEO-ENGINEERS
Address: 1386 E. BEAMER ST.
WOODLAND, CA 95776-6003
Contact: DAVE THREFALL
Alt. Contact: GEORGE CONVERSE

American Environmental Network
3440 Vincent Road, Pleasant Hill, CA 94523
Phone (510) 930-9090
FAX (510) 930-0256

AEN

R-7,) F
R-3,5-4

Page 1 of 1

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY

Lab Job Number: 9605117
Lab Destination:
Date Samples Shipped:
Lab Contact:
Date Results Required:
Date Report Required:
Client Phone No.:
Client FAX No.:

Address Report To:

2. SAME

Send Invoice To:

3. (916) 668-5300
(FAX 916) 662-0273

Send Report To: 1 or 2 (Circle one)

Client P.O. No.: 586N Client Project I.D. No.: DP 793

Sample Team Member (s) SPS

Lab Number	Client Sample Identification	Air Volume	Date/ Time Collected	Sample Type*	Pres.	No. of Cont.	Type of Cont.	ANALYSIS: TPH-g / BTEX	ANALYSIS: Total Org. Carbon	Comments / Hazards
01AB	BH-1		5/1/96 14:50	7	HCl	2	40-VOA	X		NTAT
02A	BH-05		5/1/96	8	—	1	2" Brass	X		
03A	BH-10		5/1/96	8	—	1	2" Brass	X	X	

Please make separate Report. (This copy only)

		DATE	TIME			DATE	TIME
Relinquished by: (Signature)		5/8/96	1400	Received by: (Signature)		5-8-96	14:00
Relinquished by: (Signature)		5/8/96	16:30	Received by: (Signature)		5-8-96	1630
Relinquished by: (Signature)		DATE	TIME	Received by: (Signature)		DATE	TIME
Method of Shipment				Lab Comments			

*Sample type (Specify): 1) 37mm 0.8 µm MCEF 2) 25mm 0.8 µm MCEF 3) 25mm 0.4 µm polycarb. filter
4) PVC filter, diam. _____ pore size _____ 5) Charcoal tube 6) Silica gel tube 7) Water 8) Soil 9) Bulk Sample
10) Other _____ 11) Other _____

COPIES: WHITE - JOB FILE YELLOW - PROJECT FILE PINK - CLIENT

APPENDIX D

REGULATORY CORRESPONDENCE

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ARNOLD PERKINS, DIRECTO

January 23, 1996
STID 1248

ALAMEDA COUNTY CC4580
ENVIRONMENTAL HEALTH SERVICES
1131 HARBOR BAY PKWY., #250
ALAMEDA CA 94502-6577

John Rutherford
Desert Petroleum Inc.
PO Box 1601
Oxnard CA 93032

RE: Desert Petroleum site #793, 4035 Park Blvd., Oakland CA 94602

Dear Mr. Rutherford,

Since my last letter to you, dated 7/27/95, the following documents have been received in this office:

1) your letter dated 8/14/95

2) "Over-excavation and Quarterly Ground Water Sample Report," dated 11/24/95, prepared by Western Geo-Engineers (WEGE)

3) "Workplan to Further Evaluate Extent of Soil and Ground Water Contamination Associated with Former Desert Petroleum Station #793," dated 11/30/95, prepared by WEGE

This letter addresses the third item, the workplan. **The workplan is acceptable with the following provisions and understandings:**

a) The collection of soil and water samples in Task 1 will be considered as a screening method only. The onsite lab will not be state-certified, nor will EPA methods be used to analyze the samples. The analysis will be Total Volatile Organics (TVO) in the gasoline and diesel range in mg/kg for soil, and mg/L for water, using a FID analyzer. Some vapor samples will also be analyzed (for health risk purposes).

b) You are requested to analyze some soil and water samples in Task 1 for TPH-gasoline and BTEX by EPA standard methods, in order to verify the results obtained via the screening methods. The rate of sample analysis should be one (via EPA methods) in six samples collected (via screening methods). The vacuum used to obtain water samples (as described on page 3 of the workplan) is actually a closed system, thus minimizing any escape of volatiles.

c) Task 2 should include the collection of soil AND water samples, and their analysis by EPA approved methods, in order to ensure QA/QC. The water samples will be collected by 0.5" bailers inserted into 1" diameter PVC casing with a 0.02 slotted screen. Water

samples will be collected after a minimum of 30 minutes in order for the water to stabilize. The workplan as written involves the collection of water samples in Task 1, via the closed vacuum system.

d) The destruction of boreholes should be as per Zone 7, Alameda County Flood Control and Water Conservation District

I discussed these items with George Converse of WEGE today. The results from this investigation will be utilized in a Corrective Action Workplan (CAP).

Please contact me at least 2 business days in advance by telephone prior to field work. If you have any questions or comments, please contact me directly at 510-567-6761.

Sincerely,

Jennifer Eberle
Hazardous Materials Specialist

cc: Kevin Graves, RWQCB
Cheryl Gordon, SWRCB, UST CleanUp Fund
George Converse, WEGE, 1386 E. Beamer St., Woodland CA 95776
Tom Peacock/file

je.1248-B

APPENDIX E

PROPERTY OWNER AND TENNANT AUTHORIZATION TO CONDUCT SEWER LATERAL INVESTIGATION

LAW OFFICES OF
JAMES B. WICKERSHAM
3200 A DANVILLE BLVD., SUITE 202
POST OFFICE BOX 1058
ALAMO, CALIFORNIA 94507
TELEPHONE (510) 831-1325
FAX (510) 831-8554

April 5, 1996

George L. Converse
Western Geo-Engineers
1386 East Beamer Street
Woodland, CA 95776-6003

Re: Desert Petroleum/Walton
Property Address: 4035 Park Blvd. and
4006 Brighton Avenue, Oakland, CA

Dear Mr. Converse:

Enclosed please find an authorization to enter the property owned by Gerald L. Starrett at 4006 Brighton Avenue, Oakland, California.

Mr. Starrett has executed the enclosed form with the understanding that you will notify the tenants at the subject property prior to entering onto the property to do the necessary investigation.

The tenants are Ms. Gigi Jory and Ms. Stephanie Harris. Their telephone number is (510) 530-2160.

Should there be any questions concerning the foregoing, please contact me at your earliest convenience.

Very truly yours,

James B. Wickersham
JBW:ak
cc: Lou Carpiac
Gerald Starrett
-

I GERALD L. STARRETT (3-26-96),
(Name of Property Owner) (date)
owner of the property located at 4006 BRIGHTON AVE as shown in Assessors book __, page ___, parcel ___, hereby give permission to Western Geo-Engineers to perform the soil and ground water investigation along the sewer lateral and within my property lines, as located on Figure 1. I understand that the investigation is being performed as requested by Alameda County Health and the sole purpose is for gathering soil and ground water information and ground water samples to document the site investigation efforts that are ongoing at 4035 Park Boulevard, Oakland, California.

G. Starrett

1. Subject to informing G. STARRETT complete scope of work to be done.

I _____ (4-18-96),
(Name of ~~Property Owner~~ Grantee) (Date)
owner of the property located at 4006 Brighton Ave, Oakland, CA hereby give my permission to Western Geo-Engineers to perform a soil and ground water investigation along the sewer lateral and within my property boundaries as located on attached Figure 1. I understand that the investigation is being performed at the request of the Alameda County Health Department and the sole purpose of the investigation is to gather soil and ground water information as part of site investigation efforts that are ongoing at 4035 Park Boulevard, Oakland, California.

I Paula Dudley (4/18/96),
(Name of Property Owner) (Date)
owner of the property located at 4026 Brighton Ave, Oakland CA hereby give my permission to Western Geo-Engineers to perform a soil and ground water investigation along the sewer lateral and within my property boundaries as located on attached Figure 1. I understand that the investigation is being performed at the request of the Alameda County Health Department and the sole purpose of the investigation is to gather soil and ground water information as part of site investigation efforts that are ongoing at 4035 Park Boulevard, Oakland, California.

I DAVID AZLSWANG (4-22-96),
(Name of Property Owner) (Date)
owner of the property located at 4032 Brighton Ave, Oakland, CA hereby give my permission to Western Geo-Engineers to perform a soil and ground water investigation along the sewer lateral and within my property boundaries as located on attached Figure 1. I understand that the investigation is being performed at the request of the Alameda County Health Department and the sole purpose of the investigation is to gather soil and ground water information as part of site investigation efforts that are ongoing at 4035 Park Boulevard, Oakland, California.

I Richard D Campbell (4/24/96),
(Name of Property Owner) (Date)

owner of the property located at 1227 Hampel St, Oakland, CA hereby give my permission to Western Geo-Engineers to perform a soil and ground water investigation along the sewer lateral and within my property boundaries as located on attached Figure 1. I understand that the investigation is being performed at the request of the Alameda County Health Department and the sole purpose of the investigation is to gather soil and ground water information as part of site investigation efforts that are ongoing at 4035 Park Boulevard, Oakland, California.

Richard D Campbell

I Brian Gerstho (_____),
(Name of Tenant) (date)

tenant of the property located at 1227 Hannah St. Oakland, CA hereby give permission to Western Geo-Engineers to perform a soil and ground water investigation along the sewer lateral and within my property boundaries as located on attached Figure 1. I understand that the investigation is being performed at the request of the Alameda County Health Department and the sole purpose of the investigation is to gather soil and ground water information as part of site investigation efforts that are ongoing at 4035 Park Boulevard, Oakland, California.

Brian Gerstho

I _____ (4/22/96).
(Name of Property Owner) (Date)

owner of the property located at 1219 Hampel St, Oakland, CA. hereby give my permission to Western Geo-Engineers to perform a soil and ground water investigation along the sewer lateral and within my property boundaries as located on attached Figure 1. I understand that the investigation is being performed at the request of the Alameda County Health Department and the sole purpose of the investigation is to gather soil and ground water information as part of site investigation efforts that are ongoing at 4035 Park Boulevard, Oakland, California.

I Drake McClung (4/30/95),
(Name of Property Owner) (Date)

owner of the property located at 1211 Hampel St, Oakland CA hereby give my permission to Western Geo-Engineers to perform a soil and ground water investigation along the sewer lateral and within my property boundaries as located on attached Figure 1. I understand that the investigation is being performed at the request of the Alameda County Health Department and the sole purpose of the investigation is to gather soil and ground water information as part of site investigation efforts that are ongoing at 4035 Park Boulevard, Oakland, California.