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August 18, 1992

SFO28830.BB.RP

Mr. Brian Oliva
Alameda County Health Agency
Division of Hazardous Materials
80 Swan Way, Room 200
Oakland, CA 94621

Subject: **Soil and Groundwater Investigations at Del Monte Plant 35 located at 1250 Park Avenue and 4204 Hollis Street in Emeryville, California**

Dear Mr. Oliva:

This letter reports the results of the soil and groundwater investigations conducted on July 7, 1992 at Del Monte Plant 35 located at 4204 Hollis Street and 1250 Park Avenue in Emeryville, California. The investigations were conducted as part of the "Remediation Activities Plan for Del Monte Plant 35" (RAP) submitted to the Alameda County Health Agency (ACHA) on June 26, 1992.

Two separate investigations were conducted at Plant 35 on July 7, 1992. A soil sample and groundwater sample were collected from a borehole drilled on Hollis Street in the hydraulically downgradient direction of the Plant 35 - West Parcel. The purpose of collecting these samples was to determine if chlorinated hydrocarbon compounds in the groundwater beneath the West Parcel has migrated off the Del Monte property.

The other investigation at Plant 35 consisted of collecting soil and groundwater samples from two boreholes drilled adjacent to the 20,000-gallon closed-in-place underground fuel oil tank located on the East Parcel. The tank was closed-in-place with grout in 1985. The purpose of this investigation was to determine if benzene, toluene, ethylbenzene, and xylenes (BTEX); total petroleum hydrocarbons (TPH) as diesel; and TPH as fuel oil are present in the soil and groundwater beneath the closed-in-place tank.

Background

Del Monte Plant 35 is located on approximately 13 acres of land in an industrial area of Emeryville, California. Del Monte separates the Plant 35 property into the West and East Parcels (Figure 1). The West Parcel is approximately 2 acres in size and is located

at 4204 Hollis Street and the East Parcel is approximately 11 acres in size and is located at 1250 Park Avenue.

Del Monte acquired the Plant 35 property in 1927 or 1928. Former operations at Plant 35 included fish oil processing and fruit canning. From 1971 to 1989 Del Monte leased the southwest corner of the West Parcel to two medical research companies. Plant 35 has not been operating and the buildings have been vacated since the end of 1989. No hazardous chemicals or wastes are stored on the property.

The initial 5 to 8 feet of soil beneath Plant 35 is fill material which is composed primarily of clay containing gravels. The native soil beneath the fill is predominantly silty clay which extends from beneath the fill material to a depth of approximately 15 to 20 feet below ground surface.

Shallow groundwater exists beneath Plant 35 at a depth of approximately [redacted] feet below ground surface. This shallow groundwater generally flows west-northwestward toward the San Francisco Bay.

Del Monte removed four 50-gallon underground tanks from the West Parcel in March 1989 as described in "Property Assessment and Tank Removal Report, Del Monte Plant No. 35, Southwest Corner" (CH2M HILL, September 1989). These tanks were located adjacent to the building that Del Monte had previously leased to medical research companies. The tanks were used to store fuel oil; however, prior to removal of the tanks, tank content sampling revealed chlorinated solvents were present in the tanks. Subsequent soil and groundwater investigations revealed that the subsurface in the vicinity of the former fuel oil tanks has been impacted by the chlorinated solvents. Currently, groundwater monitoring from five groundwater monitoring wells in the vicinity of the former fuel oil tanks is conducted quarterly to assess halogenated hydrocarbon concentrations.

A 20,000-gallon underground tank is located on the East Parcel adjacent to the Del Monte boiler room building. In 1985, a soil and groundwater investigation was conducted in the vicinity of the tank. Although the exact sampling locations were not specified, low levels of extractable hydrocarbons and oil and grease were detected in the soil and groundwater. Following this investigation, the 20,000-gallon tank was filled-in-place with grout.

Hollis Street Investigation

A 7-inch diameter borehole was drilled on Hollis Street, approximately 100 feet north of the Hollis Street and Park Avenue intersection and approximately 32 feet west of the Del

Monte Plant 35 West Parcel property (Figure 2). The borehole was drilled by Kvilhaug Well Drilling & Pump Company, Inc. using a B61 Mobile Rig with hollow-stem augers. A soil sample was collected at a depth of five feet and a groundwater sample was collected from the borehole. The depth to groundwater was 8.5 feet below ground surface.

Sampling Methodology

Soil samples were collected by driving a split-spoon sampler lined with brass sleeves into the soil below the hollow stem augers. Immediately after collecting a soil sample, the brass sleeves containing the sample were sealed with Teflon tape and polyethylene end caps, labeled, and placed in an ice-filled cooler.

Groundwater sample collection was performed by initially purging approximately 25 gallons (approximately 3 borehole volumes) of groundwater from the borehole. The purged groundwater was measured for pH, conductivity, and temperature. Borehole purging was continued until the conductivity stabilized within 10 percent and the pH within 0.20. Upon completion of borehole groundwater purging, a temporary 2-inch diameter PVC well casing with 10 feet of 0.01-inch slotted well screen was installed. The well screen was positioned so that it intersected the groundwater table. After the well casing was installed, an additional gallon of groundwater was purged through the well casing with a PVC bailer. Then a groundwater sample was collected using a teflon bailer with a low flow attachment to reduce possible volatilization. Groundwater samples were collected in 40 ml VOA containers with laboratory preservatives, labeled, and immediately placed in an ice-filled cooler. Upon completion of sample collection, the well casing was removed from the borehole and the borehole was sealed with grout.

The samples were delivered to the BC Analytical Laboratory in Emeryville, California. The laboratory report is attached.

Investigation Results

The soil sample was collected at a depth of five feet below ground surface and was identified as HOL-1-5. This soil sample was analyzed for volatile organic compounds (EPA Method 601). The only compound detected in this soil sample was methylene chloride at 0.25 mg/kg.

The groundwater sample was identified as HOL-1 and also analyzed for volatile organic compounds (EPA Method 601). Two compounds were detected in this sample: trichloroethene (TCE) at 2.1 μg/l and tetrachloroethene (PCE) at 5.1 μg/l. The California Drinking Water Maximum Contaminant Level (MCL) for both of these

compounds is 5 μg/l. The concentrations of PCE and TCE found in sample HOL-1 are approximately one order of magnitude lower than the concentrations of these compounds in the Plant 35 - West Parcel monitoring wells. For comparison, Table 1 shows the results of the most recent quarterly monitoring event (July 17, 1992) at Plant 35 and the results of the HOL-1 sample.

Table 1 also contains analytical data for groundwater samples collected from Plant 35 monitoring wells located in background or upgradient areas (MW1 through MW6, shown on Figure 1) from the former fuel oil tank area. These wells were sampled in December 1988 and monitoring wells MW2, MW4, and MW6 were found to contain TCE or PCE at concentrations similar to the concentrations detected in sample HOL-1. In addition to TCE and PCE, another chlorinated hydrocarbon compound, 1,2-dichloroethane (1,2-DCA), was detected in monitoring wells MW1, MW2, MW3, MW5, and MW6.

Conclusion and Future Actions

The groundwater sample collected from borehole HOL-1 contained PCE at a concentration slightly above the MCL and TCE below the MCL, and both PCE and TCE concentrations in HOL-1 were approximately an order of magnitude lower than the PCE and TCE concentrations beneath the Plant 35 - West Parcel. Based on this, groundwater contamination from beneath the Plant 35 - West Parcel does not appear to be significantly migrating or has been attenuated downgradient (westward) from the property.

The concentrations of TCE and PCE detected in HOL-1 are within the concentrations of chlorinated hydrocarbons detected in upgradient and background well locations as shown on Table 1. The concentration of 1,2-DCA (8 μg/l) in monitoring well MW5, which is located at the east edge of the Plant 35 - East Parcel, suggests that low levels of chlorinated hydrocarbon compounds in the groundwater may be background in the this industrial area of Emeryville.

In order to remove the remaining source of chlorinated hydrocarbons, Del Monte plans to excavate as much as 100 cubic yards of unsaturated soil in the vicinity of the former fuel oil tanks area. A portion of this soil is currently beneath a building which Del Monte is planning to demolish prior to the excavation work. The unsaturated soil will be excavated to nondetectable or background levels; confirmatory soil sampling will be conducted within the excavation. Groundwater monitoring will continue after the excavation activities and Del Monte will evaluate the effectiveness of the source removal.

Closed-In-Place Tank Investigation

CH2M HILL conducted a soil and groundwater investigation of the 20,000-gallon closed-in-place fuel oil tank located on the East Parcel. The investigation was conducted according to the RAP.

The location of the underground tank was identified with the use of metal detection equipment operated by C.U. Surveys of San Leandro, California. Two 7-inch diameter boreholes (identified as T-1 and T-2) were drilled on the west side (downgradient) of each end of the tank (Figure 3). The boreholes were drilled by Kvilhaug Well Drilling & Pump Company, Inc. using a B61 Mobile Rig with hollow-stem augers. Two soil samples and one groundwater sample were collected from each borehole. The depth to groundwater in both boreholes was approximately 9.5 feet below ground surface.

The soil and groundwater sample collection methodology was the same as that used for the Hollis Street investigation.

Results

Two soil samples and one groundwater sample from each borehole were delivered to the BC Analytical Laboratory and analyzed for BTEX and TPH as diesel as recommended by the Tri-Regional Board Staff for fuel oil tank investigations (Regional Water Quality Control Board, Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, August 10, 1990). In addition, the soil and groundwater samples from boreholes T-1 and T-2 were analyzed for TPH as fuel oil. The laboratory data sheets are attached.

The two soil samples in each borehole were collected at 5 and 10 feet below ground surface. Table 2 summarizes the soil analytical results. The maximum concentrations of TPH as diesel and TPH as fuel oil were 1,800 mg/kg and 3,000 mg/kg, respectively. Benzene, toluene, and ethylbenzene were not detected in any of the soil samples.

One groundwater sample was collected for analyses from each borehole and the results are summarized in Table 3. Both groundwater samples contained benzene slightly above the MCL for benzene (1 μg/l). MCLs have not been established for TPH as diesel or TPH as fuel oil.

Conclusion and Future Actions

Petroleum hydrocarbons have impacted the soil and groundwater in the vicinity of the closed-in-place fuel oil tank. The predominant petroleum hydrocarbon constituents are TPH as diesel and TPH as fuel oil. Diesel and fuel oil constituents are less soluble and less mobile in the subsurface than the lighter petroleum hydrocarbon constituents (ie. gasoline).

The closed-in-place fuel oil tank is located immediately adjacent to a Del Monte building. Currently, excavation of the tank and soil is not possible without jeopardizing the building structure and worker safety. Del Monte is currently evaluating options for building demolition in order to excavate the tank and surrounding soil. Until the time of building demolition, the building and the asphalt and concrete ground surface provide an effective impermeable layer, preventing rain water infiltration to the subsurface in the vicinity of the closed-in-place tank.

If you have any questions or comments please call me at (510) 251 - 2888 (ext. 2118).

Sincerely,

CH2M HILL

Bern Baumgartner
Environmental Engineer

beb/
cc: Mr. Richard Hiett/Regional Water Quality Control Board
Mr. Dennis Byrne/Alameda County Health Agency
Mr. Ron Thibault/Del Monte
Mr. Lee Bosche/Del Monte
Mr. Bharat Shah/Del Monte
Mr. Mark Rosenquist/Del Monte
Mr. Steve Ronzone/Del Monte
Mr. Gene Sylls/Del Monte
Ms. Liz Dodge/CH2M HILL/SFO
Mr. Jeff Holloway/CH2M HILL/SFO

Table 1
Groundwater Quality
Del Monte Plant 35

WELL	Date	Concentration (μg/l)						
		1,2-DCE	1,1-DCE	1,2-DCA	TCE	PCE	VC	1,2-DP
HOL-1	7/07/92	<0.5	<0.5	<0.5	2.1	5.1	<0.5	<0.5
Wells in vicinity of former fuel oil tanks (monitored quarterly)								
MW7	7/17/92	93	<0.5	<0.5	51	30	1.8	<0.5
MW8	7/17/92	35	<2.0	<2.0	490	11	<2.0	<2.0
MW9	7/17/92	26	<0.5	<0.5	13	32	<0.5	<0.5
MW10	7/17/92	180	<1.0	<1.0	78	82	15	<1.0
MW11	7/17/92	26	<0.5	1.4	81	<0.5	<0.5	3.5
Other Del Monte wells (background sampling locations relative to fuel oil tank area)								
MW1	12/20/88	<5.0	<5.0	8.0	<5.0	<5.0	<10.0	<5.0
MW2	12/20/88	<5.0	<5.0	7.0	<5.0	8.0	<10.0	<5.0
MW3	12/20/88	<5.0	<5.0	7.0	<5.0	<5.0	<10.0	<5.0
MW4	12/21/88	<5.0	<5.0	<5.0	13	<5.0	<10.0	<5.0
MW4D	12/20/88	<5.0	<5.0	<5.0	<5.0	<5.0	<10.0	<5.0
MW5	12/21/88	<5.0	<5.0	8.0	<5.0	<5.0	<10.0	<5.0
MW6	12/06/88	<1.0	<2.0	8.8	1.6	<1.0	<5.0	<2.0
MCL		--	6.0	0.5	5.0	5.0	0.5	5.0

<0.5 - less than detection limit of 0.5 μg/l

DCE - Dichloroethene; DCA - Dichloroethane; TCE - Trichloroethene;
PCE - Tetrachloroethene; VC - Vinyl Chloride; DP - Dichloropropane

Reference for monitoring well MW1 through MW6 data: "Property Assessment Report, Del Monte Plant No. 35" (CH2M HILL, June 1989).

Table 2
Soil Analytical Results from Closed-In-Place Tank Investigation
Del Monte Plant 35 - East Parcel

Sample	Depth (ft, bgs)	Concentration (mg/kg)					
		Benzene	Toluene	Ethyl-Benzene	Xylenes	TPH-Diesel	TPH-Fuel Oil
T-1-5	5	<0.1	<0.1	<0.1	0.2	800	1,000
T-1-10	10	<0.03	<0.03	<0.03	0.05	260	500
T-2-5	5	<0.1	<0.1	<0.1	<0.1	1,100	<2,000
T-2-10	10	<0.6	<0.6	<0.6	0.9	1,800	3,000

<0.1 - below laboratory detection limit of 0.1 mg/kg
bgs - below ground surface
Differences in detection limits are attributed to sample dilution factor used by the laboratory.

Table 3
Groundwater Analytical Results from Closed-In-Place Tank Investigation
Del Monte Plant 35 - East Parcel

Sample	Date	Concentration (μg/l)					
		Benzene	Toluene	Ethyl-Benzene	Xylenes	TPH-Diesel	TPH-Fuel Oil
T-1	7/7/92	1.8	<1.0	1.8	7.4	40,000	<200,000
T-2	7/7/92	2.0	<1.0	2.0	9.0	100,000	<200,000
MCL		1.0	1,000	680	1,750	--	--

<1.0 - below laboratory detection limit of 1.0 μg/l

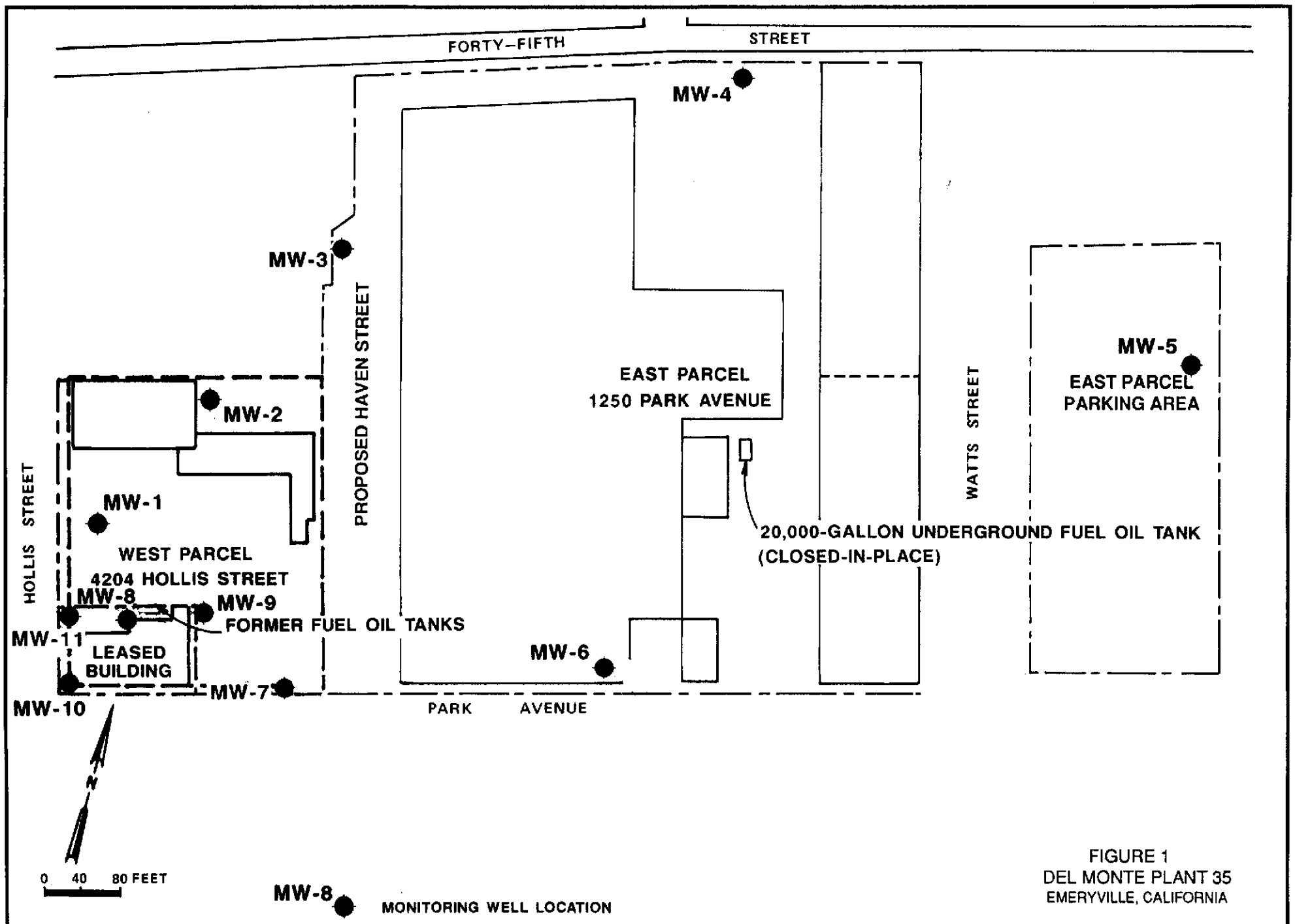

FIGURE 1
DEL MONTE PLANT 35
EMERYVILLE, CALIFORNIA

CH2M HILL

SFO28830.RC

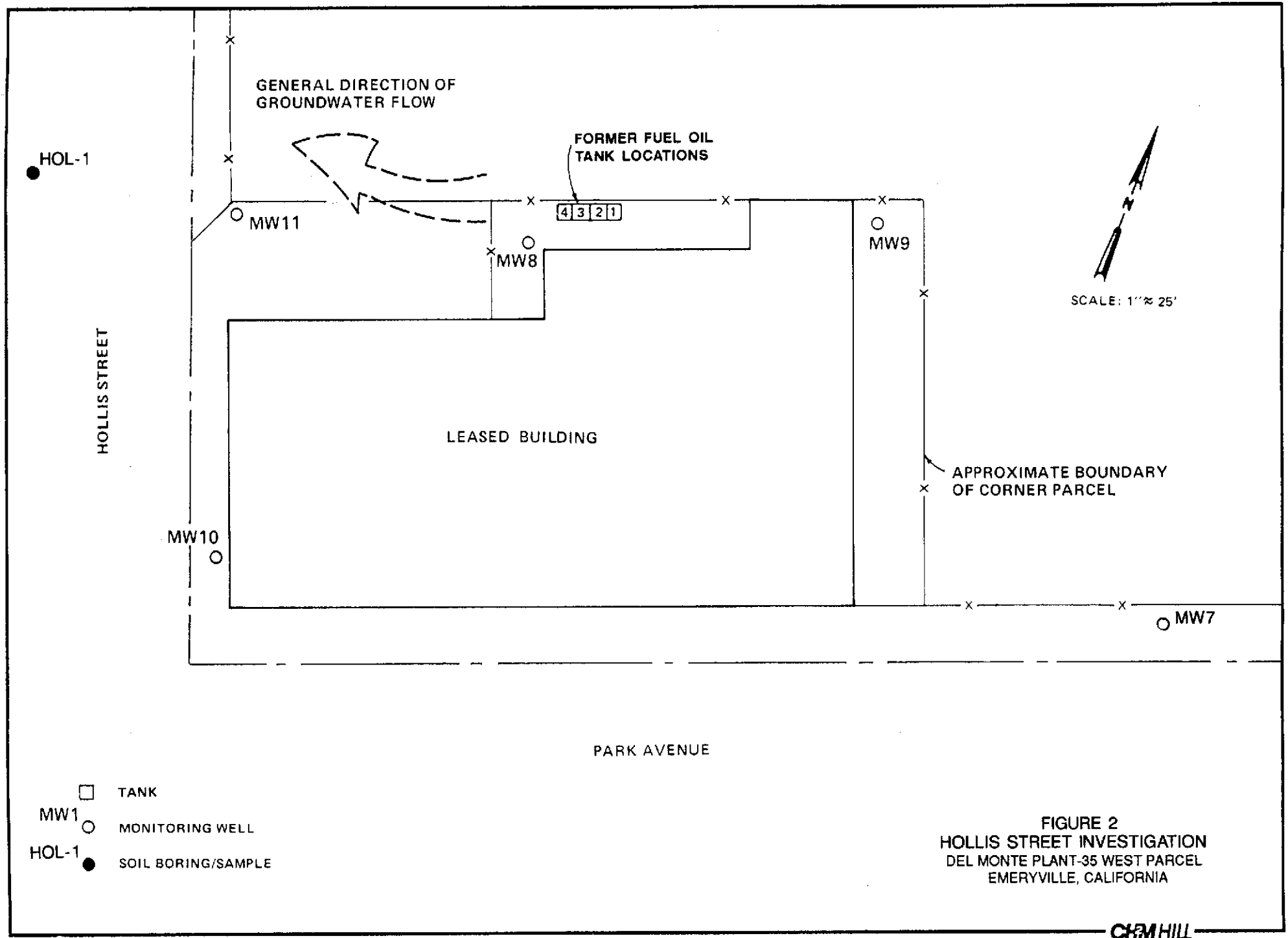

FIGURE 2
HOLLIS STREET INVESTIGATION
DEL MONTE PLANT-35 WEST PARCEL
EMERYVILLE, CALIFORNIA

CH2M HILL

SFO28830.RC

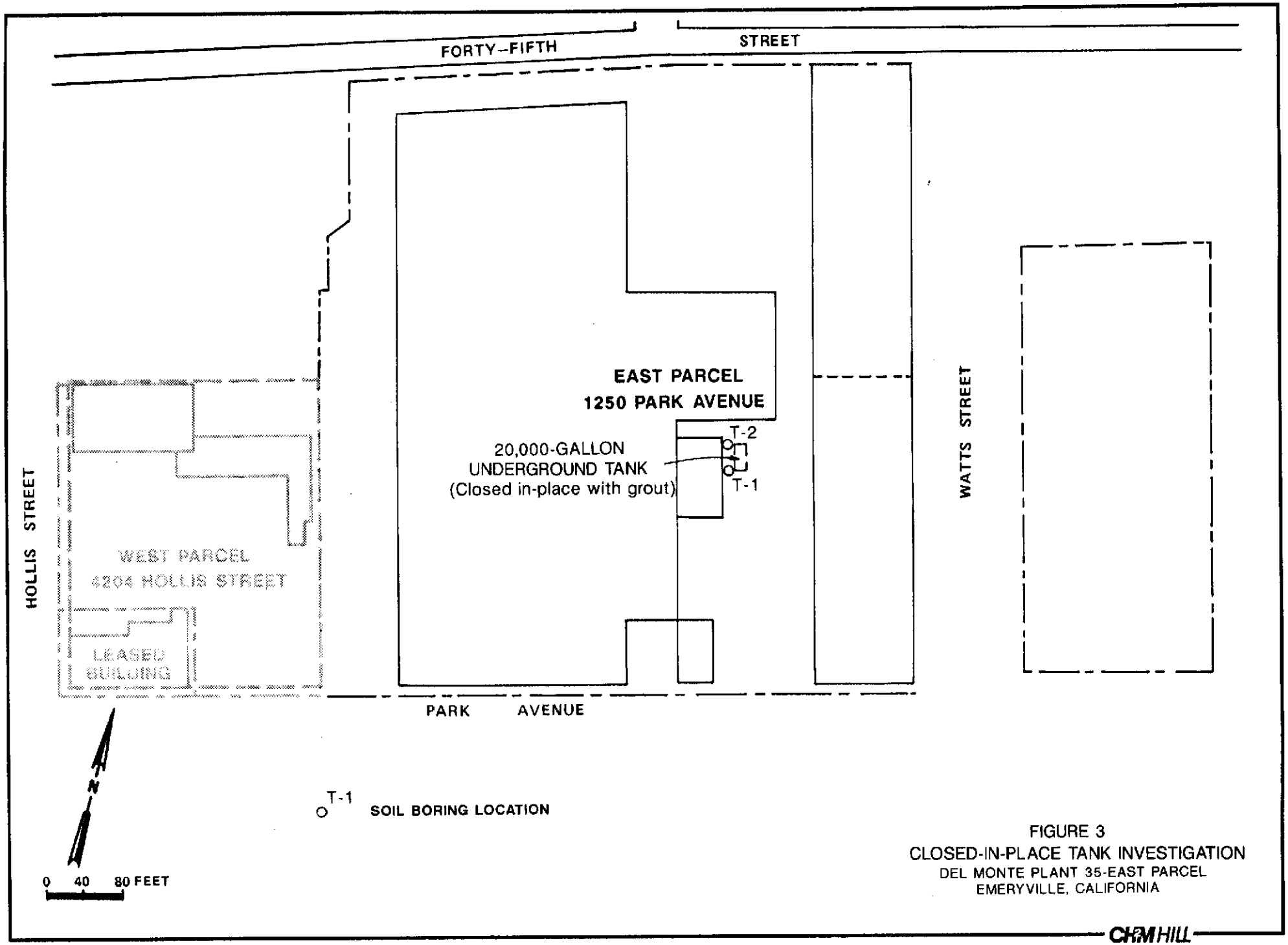

FIGURE 3
CLOSED-IN-PLACE TANK INVESTIGATION
DEL MONTE PLANT 35-EAST PARCEL
EMERYVILLE, CALIFORNIA

CH2M HILL

SFO28830.OS

B C Analytical

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Emeryville, CA 94608
510/428-2300
Fax: 510/547-3643

ANALYTICAL REPORT

RECEIVED
JUL 24 1992
CH2M HILL
SAN FRANCISCO

LOG NO: E92-07-125
Received: 08 JUL 92
Mailed: JUL 22 1992

Mr. Bern Baumgartner
CH2M Hill
1111 Broadway, Suite 1200
Oakland, California 94607-4046

Project: SFO28830.BB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
07-125-1	T-1-5	07 JUL 92
07-125-2	T-1-10	07 JUL 92
07-125-3	T-2-5	07 JUL 92
07-125-4	T-2-10	07 JUL 92

PARAMETER	07-125-1	07-125-2	07-125-3	07-125-4
TPH - Semivolatile Hydrocarbons				
Date Analyzed	07.20.92	07.20.92	07.20.92	07.20.92
Date Extracted	07.14.92	07.14.92	07.14.92	07.14.92
Dilution Factor, Times	100	20	200	200
C10 to C22 (as diesel), mg/kg	800	260	1100	1800
C18 to C35 (as oil), mg/kg	1000	500	<2000	3000
Approximate Character, .	DIESEL	DIESEL	DIESEL	DIESEL
Aromatic Hydrocarbons				
Date Analyzed	07.20.92	07.17.92	07.20.92	07.20.92
Dilution Factor, Times	4	1	4	20
Benzene, mg/kg	<0.1	<0.03	<0.1	<0.6
Ethylbenzene, mg/kg	<0.1	<0.03	<0.1	<0.6
Toluene, mg/kg	<0.1	<0.03	<0.1	<0.6
Total Xylene Isomers, mg/kg	0.2	0.05	<0.1	0.9

BCA

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LOG NO: E92-07-125

Received: 08 JUL 92

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Project: SFO28830.BB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, [illegible] WATER SAMPLES	DATE SAMPLED
07-125-6	T-1	07 JUL 92
07-125-7	T-2	07 JUL 92

PARAMETER	07-125-6	07-125-7		
TPH - Semivolatile Hydrocarbons				
Date Analyzed	07.18.92	07.18.92		
Date Extracted	07.11.92	07.11.92		
Dilution Factor, Times	500	500		
C10 to C22 (as diesel), ug/L	[illegible]	[illegible]		
C18 to C35 (as oil), ug/L	<200000	<200000		
Approximate Character, .	DIESEL	DIESEL		
Aromatic Hydrocarbons				
Date Analyzed	07.21.92	07.21.92		
Dilution Factor, Times	2	2		
Benzene, ug/L	1.8	2		
Ethylbenzene, ug/L	1.8	2		
Toluene, ug/L	<1	<1		
Total Xylene Isomers, ug/L	7.4	9		

BCA

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Project: SFO28830.BB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
07-125-8	HOL-1	07 JUL 92

PARAMETER	07-125-8
Halocarbons (EPA 601)	
Date Analyzed	07.17.92
Confirmation Date	07.18.92
Dilution Factor, Times	1
1,1,1-Trichloroethane, ug/L	<0.5
1,1,2,2-Tetrachloroethane, ug/L	<0.5
1,1,2-Trichloroethane, ug/L	<0.5
1,1-Dichloroethane, ug/L	<0.5
1,1-Dichloroethene, ug/L	<0.5
1,2-Dichloroethane, ug/L	<0.5
1,2-Dichlorobenzene, ug/L	<0.5
1,2-Dichloroethene (Total), ug/L	<0.5
1,2-Dichloropropane, ug/L	<0.5
1,3-Dichlorobenzene, ug/L	<0.5
1,4-Dichlorobenzene, ug/L	<0.5
2-Chloroethylvinylether, ug/L	<0.5
Bromodichloromethane, ug/L	<0.5
Bromomethane, ug/L	<0.5
Bromoform, ug/L	<0.5
Chlorobenzene, ug/L	<0.5
Carbon Tetrachloride, ug/L	<0.5
Chloroethane, ug/L	<0.5
Chloroform, ug/L	<0.5
Chloromethane, ug/L	<0.5
Dibromochloromethane, ug/L	<0.5
Dichlorodifluoromethane, ug/L	<0.5
Freon 113, ug/L	<0.5

BCA

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LOG NO: E92-07-125

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Oakland, California 94607-4046

Project: SFO28830.BB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
07-125-8	HOL-1	07 JUL 92

PARAMETER	07-125-8				
Methylene chloride, ug/L	<0.5				
Trichloroethene, ug/L	2.1				
Trichlorofluoromethane, ug/L	<0.5				
Tetrachloroethene, ug/L	5.1				
Vinyl chloride, ug/L	<0.5				
cis-1,2-Dichloroethene, ug/L	<0.5				
cis-1,3-Dichloropropene, ug/L	<0.5				
trans-1,2-Dichloroethene, ug/L	<0.5				
trans-1,3-Dichloropropene, ug/L	<0.5				

BCA

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LOG NO: E92-07-125

Received: 08 JUL 92

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Project: SFO28830.BB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
07-125-9	HOL-1D	07 JUL 92

PARAMETER	07-125-9
Sample Held, Not Analyzed	HELD

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1255 Powell Street
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Fax: 510/547-3643

LOG NO: E92-07-125

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Project: SFO28830.BB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
07-125-5	HOL-1-5	07 JUL 92

PARAMETER	07-125-5
EPA Method 8010	
Date Analyzed	07.18.92
Date Extracted	07.17.92
Confirmation Date	07.19.92
Dilution Factor, Times	1
1,1,1-Trichloroethane, mg/kg	<0.01
1,1,2,2-Tetrachloroethane, mg/kg	<0.01
1,1,2-Trichloroethane, mg/kg	<0.01
1,1-Dichloroethane, mg/kg	<0.01
1,1-Dichloroethene, mg/kg	<0.01
1,2-Dichloroethane, mg/kg	<0.01
1,2-Dichlorobenzene, mg/kg	<0.01
1,2-Dichloroethene (Total), mg/kg	<0.01
1,2-Dichloropropane, mg/kg	<0.01
1,3-Dichlorobenzene, mg/kg	<0.01
1,4-Dichlorobenzene, mg/kg	<0.01
2-Chloroethylvinylether, mg/kg	<0.01
Bromodichloromethane, mg/kg	<0.01
Bromomethane, mg/kg	<0.01
Bromoform, mg/kg	<0.01
Chlorobenzene, mg/kg	<0.01
Carbon Tetrachloride, mg/kg	<0.01
Chloroethane, mg/kg	<0.01
Chloroform, mg/kg	<0.01
Chloromethane, mg/kg	<0.01
Dibromochloromethane, mg/kg	<0.01
Dichlorodifluoromethane, mg/kg	<0.01

BCA

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LOG NO: E92-07-125

Received: 08 JUL 92

Mr. Bern Baumgartner
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1111 Broadway, Suite 1200
Oakland, California 94607-4046

Project: SF028830.BB

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
07-125-5	HOL-1-5	07 JUL 92

PARAMETER	07-125-5				
Freon 113, mg/kg	<0.01				
Methylene chloride, mg/kg	0.25				
Trichloroethene, mg/kg	<0.01				
Trichlorofluoromethane, mg/kg	<0.01				
Tetrachloroethene, mg/kg	<0.01				
Vinyl chloride, mg/kg	<0.01				
cis-1,2-Dichloroethene, mg/kg	<0.01				
cis-1,3-Dichloropropene, mg/kg	<0.01				
trans-1,2-Dichloroethene, mg/kg	<0.01				
trans-1,3-Dichloropropene, mg/kg	<0.01				

Edward Wilson, Laboratory Director

BCA

BATCH QC REPORT: Definitions and Terms

Accuracy	The ability of a procedure to determine the "true" concentration of an analyte
Precision	The reproducibility of a procedure demonstrated by the agreement between analyses performed on either duplicates of the same sample or a pair of duplicate spikes
Batch	A group of samples analyzed sequentially using the same calibration curve, reagents, and instrument
Laboratory Control Standard (LCS)	Laboratory reagent water spiked with known compounds and subjected to the same procedures as the samples. The LCS thus indicates the accuracy of the analytical method and, because it is prepared from a different source than the standard used to calibrate the instrument, it also serves to double-check the calibration
Matrix QC	Quality control tests performed on actual client samples. For most inorganic analyses, the laboratory uses a pair of duplicate samples and a spiked sample. For most organic analyses, the laboratory uses a pair of spiked samples (duplicate spikes)
LC Result	Laboratory result of an LCS analysis
LT Result	Expected result, or true value, of the LCS analysis
R1, R2 Result:	Result of the analysis of replicate aliquots of a sample, with R1 indicating the first analysis of the sample and R2 its corresponding duplicate; used to determine precision
S1, S2 Result	Result of the analysis of replicate spiked aliquots, with S1 indicating one spike of the sample and S2 the second spike; used to determine precision and accuracy
R Bar Result	The average of replicate analysis results
S Bar Result:	The average of spike analysis results
True value	The theoretical, or expected, result of a spike sample analysis
Percent Recovery	The percentage of analyte recovered. For LCS, the percent recovery calculation is: LC ÷ LT x 100 For spike recoveries, the percent recovery calculatiion is: $\frac{\text{(S Bar - Sample Concentration)}}{\text{Spike Amount}} \times 100$
Relative Percent Difference (RPD)	Calculated using one of the following: $\frac{(R1 - R2) \times 100}{(R1 + R2) \div 2}$ $\frac{(S1 - S2) \times 100}{(S1 + S2) \div 2}$
Blank Result	The result of the analysis of a method blank,which is reagent water that is analysed using the same reagents, instruments and procedures as the samples in a batch; used to determine laboratory contamination
Reporting Detection Limit (RDL)	BCA-assigned limit based on—but not the same as—method detection limits (MDLs) determined using EPA guidelines

: ORDER PLACED FOR CLIENT: CH2M Hill 9207125 :
: BC ANALYTICAL : EMVL LAB : 10:02:11 23 JUL 1992 - P. 1 :

SAMPLES...	SAMPLE DESCRIPTION..	DETERM.....	DATE.... ANALYZED	METHOD.....	EQUIP.	BATCH	ID.NO
9207125*1	T-1-5	3550.TPH	07.20.92	3550/8015	516-08	92207	7258
		5030,BTEX	07.20.92	5030/MEOH	516-23	92209	7867
9207125*2	T-1-10	3550.TPH	07.20.92	3550/8015	516-08	92207	7258
		5030,BTEX	07.17.92	5030/MEOH	516-23	92209	7867
9207125*3	T-2-5	3550.TPH	07.20.92	3550/8015	516-08	92207	7258
		5030,BTEX	07.20.92	5030/MEOH	516-23	92209	7867
9207125*4	T-2-10	3550.TPH	07.20.92	3550/8015	516-08	92207	7258
		5030,BTEX	07.20.92	5030/MEOH	516-23	92209	7867
9207125*6	T-1	TPH.3510	07.18.92	3510/8015	516-08	92174	7867
		TPHG,BTEX	07.21.92	5030/8015	516-19	92211	7867
9207125*7	T-2	TPH.3510	07.18.92	3510/8015	516-08	92174	7867
		TPHG,BTEX	07.21.92	5030/8015	516-19	92211	7867
9207125*8	HOL-1	VH.601	07.17.92	601	516-21	92289	7016
9207125*9	HOL-1D	HOLD	07.14.92			921	7266
9207125*5	HOL-1-5	8010	07.18.92	8010/MEOH	516-21	92288	7016

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Notes: Equipment = BC Analytical identification number for a particular piece of analytical equipment.

ID.NO = BC Analytical employee identification number of analyst.

BC ANALYTICAL

BATCH QC REPORT
ORDER: E9207125

DATE REPORTED : 07/23/92

LABORATORY CONTROL STANDARDS

PARAMETER	DATE ANALYZED	BATCH NUMBER	LC RESULT	LT RESULT	UNIT	PERCENT RECOVERY
TPH - Semivolatile Hydrocarbons						
C10 to C22 (as diesel)	07.20.92	92207	16	20	mg/kg	80
Aromatic Hydrocarbons						
Benzene	07.17.92	92209	1.2	1.4	mg/kg	86
Ethylbenzene	07.17.92	92209	1.4	1.4	mg/kg	100
Toluene	07.17.92	92209	1.3	1.5	mg/kg	87
Total Xylene Isomers	07.17.92	92209	3.0	3.3	mg/kg	91
Aromatic Hydrocarbons						
Benzene	07.17.92	92209	1.1	1.4	mg/kg	79
Ethylbenzene	07.17.92	92209	1.3	1.4	mg/kg	93
Toluene	07.17.92	92209	1.3	1.5	mg/kg	87
Total Xylene Isomers	07.17.92	92209	2.8	3.3	mg/kg	85
TPH - Semivolatile Hydrocarbons						
C10 to C22 (as diesel)	07.17.92	92174	240	400	ug/L	60
Aromatic Hydrocarbons						
Benzene	07.20.92	92211	20	20	ug/L	100
Ethylbenzene	07.20.92	92211	20	20	ug/L	100
Toluene	07.20.92	92211	21	20	ug/L	105
Total Xylene Isomers	07.20.92	92211	63	60	ug/L	105
Aromatic Hydrocarbons						
Benzene	07.20.92	92211	21	20	ug/L	105
Ethylbenzene	07.20.92	92211	20	20	ug/L	100
Toluene	07.20.92	92211	21	20	ug/L	105
Total Xylene Isomers	07.20.92	92211	63	60	ug/L	105
EPA Method 601						
1,1,1-Trichloroethane	07.17.92	92289	22	20	ug/L	110
1,1,2,2-Tetrachloroethane	07.17.92	92289	25	20	ug/L	125
1,1,2-Trichloroethane	07.17.92	92289	25	20	ug/L	125
1,1-Dichloroethane	07.17.92	92289	21	20	ug/L	105
1,1-Dichloroethene	07.17.92	92289	19	20	ug/L	95
1,2-Dichloroethane	07.17.92	92289	27	20	ug/L	135
1,2-Dichlorobenzene	07.17.92	92289	24	20	ug/L	120
1,2-Dichloroethene (Total)	07.17.92	92289	43	40	ug/L	108
1,2-Dichloropropane	07.17.92	92289	22	20	ug/L	110
1,3-Dichlorobenzene	07.17.92	92289	21	20	ug/L	105
1,4-Dichlorobenzene	07.17.92	92289	26	20	ug/L	130
2-Chloroethylvinylether	07.17.92	92289	21	20	ug/L	105

Note: For EPA method 601, the laboratory control standard recoveries for 1,2-Dichloroethane and cis-1,3-Dichloropropene exceeded the upper control limit, creating possible high bias in the sample. Both compounds were not detected in the sample.

BC ANALYTICAL

BATCH QC REPORT
ORDER: E9207125

DATE REPORTED : 07/23/92

LABORATORY CONTROL STANDARDS

PARAMETER	DATE ANALYZED	BATCH NUMBER	LC RESULT	LT RESULT	UNIT	PERCENT RECOVERY
Bromodichloromethane	07.17.92	92289	24	20	ug/L	120
Bromomethane	07.17.92	92289	25	20	ug/L	125
Bromoform	07.17.92	92289	13	20	ug/L	65
Chlorobenzene	07.17.92	92289	18	20	ug/L	90
Carbon Tetrachloride	07.17.92	92289	21	20	ug/L	105
Chloroethane	07.17.92	92289	25	20	ug/L	125
Chloroform	07.17.92	92289	28	20	ug/L	140
Chloromethane	07.17.92	92289	23	20	ug/L	115
Dibromochloromethane	07.17.92	92289	23	20	ug/L	115
Dichlorodifluoromethane	07.17.92	92289	8.6	20	ug/L	43
Freon 113	07.17.92	92289	19	20	ug/L	95
Methylene chloride	07.17.92	92289	20	20	ug/L	100
Trichloroethene	07.17.92	92289	21	20	ug/L	105
Trichlorofluoromethane	07.17.92	92289	19	20	ug/L	95
Tetrachloroethene	07.17.92	92289	21	20	ug/L	105
Vinyl chloride	07.17.92	92289	29	20	ug/L	145
cis-1,2-Dichloroethene	07.17.92	92289	22	20	ug/L	110
cis-1,3-Dichloropropene	07.17.92	92289	49	32	ug/L	153
trans-1,2-Dichloroethene	07.17.92	92289	21	20	ug/L	105
trans-1,3-Dichloropropene	07.17.92	92289	7.1	7.6	ug/L	93
EPA Method 8010						
1,1,2,2-Tetrachloroethane	07.18.92	92288	0.73	0.40	mg/kg	183
1,1-Dichloroethane	07.18.92	92288	0.66	0.40	mg/kg	165
Bromoform	07.18.92	92288	0.37	0.40	mg/kg	93
Chlorobenzene	07.18.92	92288	0.70	0.40	mg/kg	175
Chloromethane	07.18.92	92288	0.33	0.40	mg/kg	83
Trichloroethene	07.18.92	92288	0.97	0.40	mg/kg	243

BC ANALYTICAL

BATCH QC REPORT
ORDER: E9207125

DATE REPORTED : 07/23/92

MATRIX QC PRECISION (DUPLICATE SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	S1 RESULT	S2 RESULT	UNIT	RELATIVE ZDIFF
Diesel Hydrocarbons 3550/8015						
C10 to C22 (as diesel)	07.20.92	92207	37	35	mg/kg	6
Aromatic Hydrocarbons						
Benzene	07.17.92	92209	1.2	1.1	mg/kg	9
Ethylbenzene	07.17.92	92209	1.4	1.3	mg/kg	7
Toluene	07.17.92	92209	1.3	1.3	mg/kg	0
Total Xylene Isomers	07.17.92	92209	3.3	3.1	mg/kg	6
TPH - Semivolatile Hydrocarbons						
C10 to C22 (as diesel)	07.18.92	92174	600	670	ug/L	11
Aromatic Hydrocarbons						
Benzene	07.20.92	92211	410	420	ug/L	2
Ethylbenzene	07.20.92	92211	410	400	ug/L	2
Toluene	07.20.92	92211	420	450	ug/L	7
Total Xylene Isomers	07.20.92	92211	1300	1200	ug/L	8
EPA Method 601						
1,1,1-Trichloroethane	07.17.92	92289	15	15	ug/L	0
1,1-Dichloroethane	07.17.92	92289	25	25	ug/L	0
1,1-Dichloroethene	07.17.92	92289	26	23	ug/L	12
1,2-Dichloroethane	07.17.92	92289	18	17	ug/L	6
1,2-Dichloropropane	07.17.92	92289	15	15	ug/L	0
Bromodichloromethane	07.17.92	92289	16	14	ug/L	13
Bromoform	07.17.92	92289	7.2	6.1	ug/L	17
Carbon Tetrachloride	07.17.92	92289	15	14	ug/L	7
Chloroform	07.17.92	92289	20	19	ug/L	5
Dibromochloromethane	07.17.92	92289	15	14	ug/L	7
Methylene chloride	07.17.92	92289	13	13	ug/L	0
Trichloroethene	07.17.92	92289	15	14	ug/L	7
Tetrachloroethene	07.17.92	92289	31	27	ug/L	14
EPA Method 8010						
1,1,2,2-Tetrachloroethane	07.18.92	92288	0.78	0.77	mg/kg	1
1,1-Dichloroethane	07.18.92	92288	0.66	0.69	mg/kg	4
Bromoform	07.18.92	92288	0.36	0.37	mg/kg	3
Chlorobenzene	07.18.92	92288	0.63	0.71	mg/kg	12
Chloromethane	07.18.92	92288	0.33	0.29	mg/kg	13
Methylene chloride	07.18.92	92288	0.25	0.25	mg/kg	0
Trichloroethene	07.18.92	92288	0.92	0.95	mg/kg	3

BC ANALYTICAL

BATCH QC REPORT
ORDER: E9207125

DATE REPORTED : 07/23/92

MATRIX QC ACCURACY (SPIKES)

PARAMETER	DATE ANALYZED	BATCH NUMBER	SBAR RESULT	TRUE RESULT	RBAR RESULT	UNIT	PERCENT RECOVERY
Diesel Hydrocarbons 3550/8015							
C10 to C22 (as diesel)	07.21.92	92207	36	38	18	mg/kg	90
Aromatic Hydrocarbons							
Benzene	07.17.92	92209	1.15	1.4	1.2	mg/kg	SOR
Toluene	07.17.92	92209	1.3	1.5	1.3	mg/kg	SOR
TPH - Semivolatile Hydrocarbons							
C10 to C22 (as diesel)	07.18.92	92174	635	850	<50	ug/L	75
Aromatic Hydrocarbons							
Benzene	07.21.92	92211	415	400	1.8	ug/L	104
Ethylbenzene	07.21.92	92211	405	400	1.8	ug/L	101
Toluene	07.21.92	92211	435	400	<1	ug/L	109
Total Xylene Isomers	07.21.92	92211	1250	1200	7.4	ug/L	104
EPA Method 601							
1,1,1-Trichloroethane	07.17.92	92289	15	12	<0.5	ug/L	125
1,1-Dichloroethane	07.17.92	92289	25	23	11	ug/L	117
1,1-Dichloroethene	07.17.92	92289	24.5	21	9.0	ug/L	129
1,2-Dichloroethane	07.17.92	92289	17.5	12	<0.5	ug/L	146
1,2-Dichloropropane	07.17.92	92289	15	12	<0.5	ug/L	125
Bromodichloromethane	07.17.92	92289	15	12	<0.5	ug/L	125
Bromoform	07.17.92	92289	6.65	12	<0.5	ug/L	55
Carbon Tetrachloride	07.17.92	92289	14.5	12	0.8	ug/L	122
Chloroform	07.17.92	92289	19.5	12	<0.5	ug/L	163
Dibromochloromethane	07.17.92	92289	14.5	12	<0.5	ug/L	121
Methylene chloride	07.17.92	92289	13	12	<0.5	ug/L	108
Trichloroethene	07.17.92	92289	14.5	12	<0.5	ug/L	121
Tetrachloroethene	07.17.92	92289	29	29	17	ug/L	100
EPA Method 8010							
1,1,2,2-Tetrachloroethane	07.18.92	92288	0.775	0.39	<0.01	mg/kg	199
1,1-Dichloroethane	07.18.92	92288	0.675	0.39	<0.01	mg/kg	173
Bromoform	07.18.92	92288	0.365	0.39	<0.01	mg/kg	94
Chlorobenzene	07.18.92	92288	0.67	0.39	<0.01	mg/kg	172
Chloromethane	07.18.92	92288	0.31	0.39	<0.01	mg/kg	79
Trichloroethene	07.18.92	92288	0.935	0.39	<0.01	mg/kg	240

SOR = Spike Out of Range
(relative to high sample concentration)

BC ANALYTICAL

BATCH QC REPORT
ORDER: E9207125

DATE REPORTED : 07/23/92

METHOD BLANKS AND REPORTING DETECTION LIMIT (RDL)

PARAMETER	DATE ANALYZED	BATCH NUMBER	BLANK RESULT	RDL	UNIT	METHOD
TPH - Semivolatile Hydrocarbons						
Date Analyzed	07.20.92	92207	7.20.92	NA	Date	3550/8015
Date Extracted	07.20.92	92207	7.14.92	NA	Date	3550/8015
C10 to C22 (as diesel)	07.20.92	92207	0.18	1	mg/kg	3550/8015
C18 to C35 (as oil)	07.20.92	92207	0.35	10	mg/kg	3550/8015
Aromatic Hydrocarbons						
Date Analyzed	07.17.92	92209	7.17.92	NA	Date	5030/MEOH
Benzene	07.17.92	92209	0	0.03	mg/kg	5030/MEOH
Ethylbenzene	07.17.92	92209	0	0.03	mg/kg	5030/MEOH
Toluene	07.17.92	92209	0.0084	0.03	mg/kg	5030/MEOH
Total Xylene Isomers	07.17.92	92209	0.0090	0.03	mg/kg	5030/MEOH
TPH - Semivolatile Hydrocarbons						
Date Analyzed	07.17.92	92174	7.17.92	NA	Date	3510/8015
Date Extracted	07.17.92	92174	7.11.92	NA	Date	3510/8015
C10 to C22 (as diesel)	07.17.92	92174	3.1	50	ug/L	3510/8015
C18 to C35 (as oil)	07.17.92	92174	2.9	500	ug/L	3510/8015
Aromatic Hydrocarbons						
Date Analyzed	07.20.92	92211	7.20.92	NA	Date	5030/8015
Benzene	07.20.92	92211	0	0.5	ug/L	5030/8015
Ethylbenzene	07.20.92	92211	0.11	0.5	ug/L	5030/8015
Toluene	07.20.92	92211	0.12	0.5	ug/L	5030/8015
Total Xylene Isomers	07.20.92	92211	0.079	0.5	ug/L	5030/8015
EPA Method 601						
Date Analyzed	07.17.92	92289	7.17.92	NA	Date	601
1,1,1-Trichloroethane	07.17.92	92289	0	0.5	ug/L	601
1,1,2,2-Tetrachloroethane	07.17.92	92289	0	0.5	ug/L	601
1,1,2-Trichloroethane	07.17.92	92289	0	0.5	ug/L	601
1,1-Dichloroethane	07.17.92	92289	0	0.5	ug/L	601
1,1-Dichloroethene	07.17.92	92289	0	0.5	ug/L	601
1,2-Dichloroethane	07.17.92	92289	0	0.5	ug/L	601
1,2-Dichlorobenzene	07.17.92	92289	0	0.5	ug/L	601
1,2-Dichloroethene (Total)	07.17.92	92289	0	0.5	ug/L	601
1,2-Dichloropropane	07.17.92	92289	0	0.5	ug/L	601
1,3-Dichlorobenzene	07.17.92	92289	0	0.5	ug/L	601
1,4-Dichlorobenzene	07.17.92	92289	0	0.5	ug/L	601
2-Chloroethylvinylether	07.17.92	92289	0	0.5	ug/L	601
Bromodichloromethane	07.17.92	92289	0	0.5	ug/L	601

METHOD BLANKS AND REPORTING DETECTION LIMIT (RDL)

PARAMETER	DATE ANALYZED	BATCH NUMBER	BLANK RESULT	RDL	UNIT	METHOD
Bromomethane	07.17.92	92289	0	0.5	ug/L	601
Bromoform	07.17.92	92289	0	0.5	ug/L	601
Chlorobenzene	07.17.92	92289	0	0.5	ug/L	601
Carbon Tetrachloride	07.17.92	92289	0	0.5	ug/L	601
Chloroethane	07.17.92	92289	0	0.5	ug/L	601
Chloroform	07.17.92	92289	0	0.5	ug/L	601
Chloromethane	07.17.92	92289	0	0.5	ug/L	601
Dibromochloromethane	07.17.92	92289	0	0.5	ug/L	601
Dichlorodifluoromethane	07.17.92	92289	0	0.5	ug/L	601
Freon 113	07.17.92	92289	0	0.5	ug/L	601
Methylene chloride	07.17.92	92289	0	0.5	ug/L	601
Trichloroethene	07.17.92	92289	0	0.5	ug/L	601
Trichlorofluoromethane	07.17.92	92289	0	0.5	ug/L	601
Tetrachloroethene	07.17.92	92289	0	0.5	ug/L	601
Vinyl chloride	07.17.92	92289	0	0.5	ug/L	601
cis-1,2-Dichloroethene	07.17.92	92289	0	0.5	ug/L	601
cis-1,3-Dichloropropene	07.17.92	92289	0	0.5	ug/L	601
trans-1,2-Dichloroethene	07.17.92	92289	0	0.5	ug/L	601
trans-1,3-Dichloropropene	07.17.92	92289	0	0.5	ug/L	601
EPA Method 8010						
Date Analyzed	07.18.92	92288	7.18.92	NA	Date	8010/MEOH
Date Extracted	07.18.92	92288	7.17.92	NA	Date	8010/MEOH
1,1,1-Trichloroethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
1,1,2,2-Tetrachloroethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
1,1,2-Trichloroethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
1,1-Dichloroethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
1,1-Dichloroethene	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
1,2-Dichloroethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
1,2-Dichlorobenzene	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
1,2-Dichloroethene (Total)	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
1,2-Dichloropropane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
1,3-Dichlorobenzene	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
1,4-Dichlorobenzene	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
2-Chloroethylvinylether	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Bromodichloromethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Bromomethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Bromoform	07.18.92	92288	0	0.01	mg/kg	8010/MEOH

BC ANALYTICAL

BATCH QC REPORT
ORDER: E9207125

DATE REPORTED : 07/23/92

METHOD BLANKS AND REPORTING DETECTION LIMIT (RDL)

PARAMETER	DATE ANALYZED	BATCH NUMBER	BLANK RESULT	RDL	UNIT	METHOD
Chlorobenzene	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Carbon Tetrachloride	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Chloroethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Chloroform	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Chloromethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Dibromochloromethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Dichlorodifluoromethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Freon 113	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Methylene chloride	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Trichloroethene	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Trichlorofluoromethane	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Tetrachloroethene	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
Vinyl chloride	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
cis-1,2-Dichloroethene	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
cis-1,3-Dichloropropene	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
trans-1,2-Dichloroethene	07.18.92	92288	0	0.01	mg/kg	8010/MEOH
trans-1,3-Dichloropropene	07.18.92	92288	0	0.01	mg/kg	8010/MEOH

CHAIN OF CUSTODY RECORD

3510

BCA Log Number 9207125

Client name	Project or PO#
CH2M HILL	SF028830.BB
Address	**Phone #**
1111 BROADWAY, OAKLAND	251-2426
City, State, Zip	**Report attention**

Lab Sample number	Date sampled	Time sampled	Type* See key below	Sampled by / Sample description	Number of containers	BTEX (8015M)	TPH Diesel/Fuel Oil	601 Halocarbons	Analyses required	Analyses required	Hazardous sample Special handling required	Remarks
-1	7/7/92		SO	T-1-5	2	X	X					
-2				T-1-10	2	X	X					
-3				T-2-5	2	X	X					per Bern Baumgartner
-4				T-2-10	1	X	X					
-5				HOL-1-5	2			X				
-6			GW	T-1	6	X	X					
-7				T-2	5	X	X					
-8				HOL-1	4			X				
-9				HOL-1D	3							HOLD

	Signature	Print Name	Company	Date	Time
Relinquished by	Bern Baumgartner	BERN BAUMGARTNER	CH2M HILL	7/8/92	8:40 AM
Received by	Litvak	J. Litvak	BCA		
Relinquished by					
Received by					
Relinquished by					
Received by Laboratory					

B C ANALYTICAL

- ☑ 1255 Powell Street, Emeryville, CA 94608 (510) 428-2300
- ☐ 801 Western Avenue, Glendale, CA 91201 (818) 247-5737
- ☐ 1200 Gene Autry Way, Anaheim, CA 92805 (714) 978-0113

Note: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client's expense.

Disposal arrangements: _____

*KEY: WW—Wastewater SU—Surface Water SO—Soil SL—Sludge PE—Petroleum OT—Other NA—Nonaqueous GW—Groundwater AQ—Aqueous