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March 7, 2005 Work Plan 0363.W1

Mr. Robert Schultz Alameda County Environmental Health Services 1131 Harbor Bay Parkway Alameda, CA 94502-6577

SUBJECT:

WORK PLAN SOIL AND GROUNDWATER INVESTIGATION

ACEH File #RO-2848 TD Rowe Facility 8134 Capwell Drive

Oakland, CA

Dear Mr. Schultz:

P&D Environmental, a division of Paul H. King, Inc. (P&D) is pleased to present this work plan for investigation of petroleum hydrocarbons in soil and groundwater in the vicinity of the former UST pit at the subject site. The scope of work includes drilling to collect soil and groundwater samples at three locations designated as B5 through B7. This work plan is prepared in response to your January 19, 2005 work plan request letter. The elements of this work plan address the items requested in your letter. The conduit study and the 2,000-foot radius well survey requested in your letter are provided under separate cover because of the large volume of attachments associated with those investigations.

BACKGROUND

P&D's understanding of historical site investigations is based on review of the following documents.

- August 6 or August 9, 1999 (different parts of the report have different dates) Underground Storage Tank Removal Report prepared by ACC Environmental Consultants (ACC).
- September 9, 2004 Additional Subsurface Investigation Report prepared by ACC,
- September 28, 2004 Opinion Letter Subsurface Investigation Results prepared by ACC.

Review of the August, 1999 Underground Storage Tank (UST) Removal Report indicates that two 3,000-gallon capacity fiberglass USTs were removed from the site on April 16, 1999. The USTs were reported to have stored gasoline that was used to supply fuel to delivery trucks operated by TD Rowe. The report stated that the USTs had not been used for three years prior to their removal. Mr. Stephen Craford of the Oakland Fire Department was onsite to observe UST removal and sample collection. At the time of UST removal, no holes were observed in either UST. However, it appeared that the fittings on one UST were damaged. The pit was reported to have been excavated to a depth of approximately six feet below the ground surface, and groundwater was observed in the pit at depths ranging from 4 to 6 feet below the ground surface. The groundwater level in the pit was reported to have been directly observed to be tidally influenced. Soil exposed in the walls of the pit consisted of brown silty sand.

Significant staining was reported to have been observed and petroleum hydrocarbon odors were detected in the UST pit. A total of four sidewall soil samples were collected at the soil-groundwater interface (samples TDR-Pit-N, TDR-Pit-S, TDR-Pit-E, TDR-Pit-W), and one pit water sample was collected (TDR-Pit). In addition, one soil stockpile sample designated as TDR-SP1 through SP8 was collected. The samples were analyzed for TPH-G, BTEX, Fuel Oxygenates (TBA, MTBE, DIPE, ETBE and TAME by EPA Method 8260) and Total Lead. The sample results showed elevated TPH-G concentrations on the north wall of the pit and in the pit water. The ratio of TPH-G to benzene in one soil sample and the absence of BTEX in the remaining soil samples indicated the gasoline was aged and degraded.

On April 29, 1999 approximately 150 tons of petroleum-impacted soil was removed from the north wall of the pit, extending the pit dimensions approximately 4 feet to the north. Following over-excavation of the pit, two confirmation soil samples were collected from the north wall (samples TDR-NWall-1 and TDRNWall-2). The samples were analyzed for TPH-G, BTEX, Fuel Oxygenates, and Total Lead. Based on the confirmation soil sample results, it was concluded that over-excavation activities successfully removed residual petroleum in the soil.

On May 18, 1999 approximately 800 gallons of water was removed from the pit by a vacuum truck prior to backfilling the pit. The surface of the water was reported to have been skimmed in order to remove as much product as possible. A groundwater sample was collected from the pit (sample Pit-2) and analyzed for TPH-G, BTEX, Fuel Oxygenates and Total Lead.

Review of the ACC report summary tables shows that the only fuel oxygenate listed in the column heading is MTBE, and that the Table 1 soil sample analytical results incorrectly identify the MTBE units as mg/kg instead of ug/kg. Similarly, all of the Table 2 water sample analytical results are incorrectly reported as mg/kg and should be reported as ug/L with the exception of lead, which should be reported as mg/L. It appears that the January 19, 2005 Alameda County Environmental Health Department (ACEH) work plan request letter incorrectly identified residiual MTBE at the site as 57 mg/kg and not 57 ug/kg based on review of the report summary tables.

The report concluded that following over-excavation of the UST pit, confirmation soil sample results did not show detectable concentrations of petroleum hydrocarbons, and that after removal of petroleum-impacted groundwater from the pit, petroleum concentrations in groundwater decreased significantly.

Review of the City of Oakland UST removal application attached with the report shows that the USTs were identified in the application as containing both gasoline and diesel fuel. Review of the

Uniform Hazardous Waste Manifest attached to the report dated April 16, 1999 shows that 950 gallons of liquid identified as "Rinse Aide" was removed from the site.

The UST pit soil sample results are summarized in Table 1, and the UST pit groundwater sample results are summarized as Table 2 of this work plan. Figure 2 of the ACC report showing the UST pit, the sample collection locations, and the area of over-excavation is attached with this work plan as Figure 2. The ACC Figure incorrectly shows the site building extending to Capwell Drive.

Review of the September 9, 2004 Additional Subsurface Investigation Report documents the drilling of four soil borings designated as TDR-B1 through TDR-B4 on August 24, 2004. The boreholes were continuously cored using Geoprobe push technology. One soil sample was collected from each borehole at a depth of 4.0 feet below the ground surface, and one groundwater sample was collected from each borehole. Groundwater was reported to have been encountered at an estimated depth of 7.0 feet below the ground surface in each of the boreholes. The soils samples at the 4-foot depth from boreholes B1 and B2 and the groundwater samples from boreholes B1, B3 and B4 were analyzed for TPH-G, BTEX and MTBE by EPA Method 8260B.

Review of the boring logs for the boreholes shows that all of the boreholes were drilled to a total depth of 8 feet below the ground surface. The boring logs show that subsurface conditions consisted of silty clay to a depth of approximately 4 feet below the ground surface in all of the borings except TDR-B3, where silty clay was encountered to a depth of approximately 3 feet below the ground surface. Below the silty clay, silty sand with varying amounts of gravel was encountered to the total depths explored. The boring logs show that a mild gasoline odor was reported in the silty clay in all of the borings except for TDR-B1, where a gasoline odor was reported. Similarly, a strong gasoline odor was reported in the silty sand from all of the boreholes except for TDR-B1, where no gasoline odor was reported. Photoionization Detector (PID) values re reported on the boring logs at depths of 4 and 8 feet below the ground surface. The three boreholes where PID values were measured in the silty clay (B1, B2 and B4) showed PID values ranging from 1.4 to 1.8 ppm. In borehole B3, the 4-foot depth sample was located in silty sand, and was 82.0 ppm. In all of the boreholes the 8-foot depth PID reading was 21.1 or 22 ppm except for borehole B3, where 74.2 ppm was reported.

Review of the report text shows that the silty clay layer is identified as extending to a depth of approximately 6 feet below the ground surface, not the 3 or 4 feet below the ground surface shown on the boring logs. The report also identifies the soil sample and groundwater samples as being summarized in Tables 3 and 4. However, the soil and groundwater sample results are summarized in Tables designated as Table 1 and Table 2, respectively in the ACC report.

The soil sample results are summarized in Table 3, and the groundwater sample results are summarized as Table 4 of this work plan. Figure 2 of the ACC report showing the borehole locations is attached with this work plan as Figure 2.

Based on the sample results, ACC concluded that no significant source of impact to soil or groundwater is present, impacted groundwater appears to be confined to the site and offsite migration and potential human exposure is minimal to nonexistent, offsite migration of dissolved-phase petroleum hydrocarbons is limited in the horizontal extent and is relatively well defined, and the sample results indicate that significant natural attenuation of the petroleum hydrocarbons is occurring. The ACC report concluded by requesting case closure.

Review of the September 28, 2004 ACC Opinion Letter shows that reference to Table 1 of the August 1999 report still references MTBE concentrations in mg/kg instead of ug/kg. In addition, the letter references RWQCB RBSLs, which were superseded in 2003 by ESLs. The letter does not address TPH-G groundwater sample results from borehole B3 of 4900 ug/L exceeding the RWQCB guideline value of 500 ug/L, and does not explicitly address the potential risk to occupants of the building at the site from soil vapor migration into the building.

The results of the conduit study and the 2,000-foot radius well survey requested in the January 19, 2005 ACEH work plan request letter are provided in P&D's Conduit Study and Well Survey Report. The results of these investigations are discussed below.

CONDUIT STUDY RESULTS

On February 14, 2005 personnel from California Utility Surveys of San Ramon, California performed an underground utility survey at and near the subject site. A copy of the map showing the locations of the utilities identified during the survey is attached with this work plan as Figure 3.

Review of Figure 3 shows that a 10-inch diameter storm drain is identified to the north and west of the former UST pit, and a natural gas pipe is identified to the south of the former UST pit. The storm drain lateral for the property connects to the storm drain main near the curb for Capwell Drive. The storm drain main is oriented parallel to Capwell Drive, and is located between Capwell Drive and the subject site building. An 8-inch diameter sanitary sewer main is located between the storm drain and the subject site building. The location of the sanitary sewer lateral was not identified by the surveyor. The gas pipe extends from the vicinity of the northwest corner of the property beneath Capwell Drive to the gas main on the opposite side of the street.

The locations of the utilities and the boreholes drilled by ACC are shown in Figure 4. Borehole B4 appears to be located in the vicinity of the storm drain main and the sanitary sewer main. The absence of detectable concentrations of petroleum hydrocarbons in the groundwater grab sample

collected from borehole B4 suggests that petroleum hydrocarbons have not migrated preferentially in the storm drain lateral to the trenches for the mains.

The depth of burial of the natural gas pipe is unknown. The location of the gas pipe relative to the detected concentrations of petroleum hydrocarbons in borehole B3 suggest that the natural gas pipe trench could potentially intersect the petroleum hydrocarbon plume detected in borehole B3, and that the trench could potentially be a conduit for preferential migration of petroleum hydrocarbons from the plume area.

WELL SURVEY RESULTS

P&D requested that the Alameda County Public Works Agency (ACPWA) and the California Department of Water Resources (DWR) perform a 2000-foot radius well search for the subject site. A total of 84 wells were identified by the ACPWA and a total of 88 files with a total of 173 wells were identified by the DWR. Comparison of the section and tract numbers in the study area with the two databases identified a total of four wells in the study area, with a fifth well that is questionable based on the absence of a specific street address. All of these wells consist of shallow groundwater monitoring wells that extend to a maximum depth of 33 feet. Three of the wells are located approximately 1600 feet from the site, and one well is located approximately 1,000 feet from the site. The well with the questionable address could be located approximately 200 feet from the site. Based on the available information for petroleum hydrocarbons in groundwater at the site, none of the wells are considered likely to have been impacted by petroleum hydrocarbons at the site.

SCOPE OF WORK

To address the requested work plan elements in the January 19, 2005 ACEH letter, P&D will perform the following tasks.

- Obtain permits.
- Prepare a health and safety plan.
- Arrange for borehole drilling at three locations for collection of soil and groundwater samples.
- Arrange for construction of three wells at the site.
- Arrange for the wellheads to be surveyed.
- Develop the wells.
- Arrange for borehole soil and groundwater sample analysis for TPH-G, BTEX and fuel oxygenates.
- Monitor the wells to evaluate site groundwater flow direction and passive bioremediation indicators.
- Report preparation.

Each of these is discussed below.

Obtain Permits

A permit will be obtained from the ACPWA for the drilling of soil borings and construction of groundwater monitoring wells at three locations.

Health and Safety Plan Preparation

A health and safety plan will be prepared for the scope of work identified in this work plan.

Soil Boring Oversight and Sample Collection

Boreholes will be drilled at a total of three locations identified as B5 through B7 on Figure 4 of this work plan to characterize subsurface conditions at and in the vicinity of the former UST pit at the subject site. Borehole B5 will be drilled to evaluate the extent of petroleum hydrocarbons in soil and groundwater to the northwest of borehole B3. Borehole B6 will be drilled to evaluate the extent of petroleum hydrocarbons in soil and groundwater to the southeast of borehole B3, adjacent to the building, and in the vicinity of the natural gas utility trench. Borehole B7 will be drilled in the UST pit in the vicinity of former sample number TDR-Pit-N (the sample exhibiting the highest petroleum concentrations detected at the site) to evaluate the vertical extent of petroleum hydrocarbons in soil and groundwater.

All of the boreholes will be continuously cored using GeoProbe push technology. The soil from all of the borings will be logged in the field in accordance with standard geologic field techniques and the Unified Soil Classification System. All soil samples from the boreholes will be evaluated with a Photoionization Detector (PID) equipped with a 10.3 eV bulb and calibrated using a 100 ppm isobutylene standard. Soil samples will be retained for laboratory analysis at 5-foot intervals to a depth of 10 feet below the last detected PID reading. In the event that no organic vapors are detected, soil samples will be collected to a depth of 10 feet below the water table. Groundwater is anticipated at a depth of approximately 5 feet below the ground surface.

The soil samples will be retained for laboratory analysis in six-inch long sections of the cellulose acetate tube liners that are used during drilling to line the core barrel sampler. The ends of the selected section of tube will be sequentially covered with aluminum foil and plastic endcaps. The tube will then be labeled and stored in a cooler with ice pending delivery to the laboratory. Chain of custody procedures will be observed for all sample handling.

One groundwater grab sample will be collected from each borehole when groundwater is first encountered using polypropylene tubing with a stainless steel foot valve. In addition, for vertical characterization of groundwater quality, one groundwater grab sample will be collected from the bottom of each borehole using a Hydropunch. The water sample will be collected from the Hydropunch using polypropylene tubing with a stainless steel foot valve. The samples will be placed into 40-milliliter VOAs and stored in a cooler with ice pending delivery to the laboratory. Chain of custody procedures will be observed for all sample handling.

All drilling and sampling equipment will be cleaned with an Alconox solution followed by a clean water rinse prior to use in each borehole. Following completion of sample collection activities, the boreholes will be filled with neat cement grout. Any soil or water generated during drilling will be stored in labeled drums at the site pending characterization and disposal.

Well Construction

To evaluate groundwater flow direction at the site and water quality for intrinsic bioremediation indicators a total of three groundwater monitoring wells will be constructed. Following receipt of the soil and groundwater sample results, groundwater monitoring wells designated as MW1, MW2 and MW3 will be constructed at locations immediately adjacent to each of borehole locations B5, B6 and B7, respectively. The wells will be drilled with 8-inch outside diameter hollows stem augers. The wells will be constructed to a total depth of 10 feet below the ground surface, and will consist of 2-inch diameter Schedule 40 PVC pipe with the bottom 5 feet constructed of 0.010-inch factory slot screen. The well screen will be surrounded with #2/12 washed sack sand to a height of one foot above the top of the screen. Bentonite pellets will be placed in the borehole above the filter sand to a height of one foot above the sand. The remaining annular space will be filled with neat cement grout to approximately one foot below the ground

surface. The tops of the wells will be covered with traffic-rated locking well lids. The well lids will be secured around the wellhead with concrete.

Although the proposed well locations are relatively close together, P&D anticipates that the well locations will be adequate to characterize the tidally influenced water level fluctuations at the site reported by ACC. In addition, the proposed well locations will allow monitoring of water quality for intrinsic bioremediation indicators at locations anticipated to be located both inside the groundwater plume (B7/MW3) and at locations at the edge of or outside the plume (B5/MW1 and B6/MW2).

Wellhead Surveying

The wellhead elevations and locations will be surveyed vertically and horizontally by a State-licensed surveyor in accordance with State of California Water Resources Control Board (SWRCB) Geotracker guidelines to allow determination of groundwater flow direction at the site.

Well Development

At least 72 hours after construction, the wells will be developed by surging and over-pumping until the water discharged from the wells is relatively clear. Prior to development, the wells will be monitored for depth to water using an electric water level indicator with an accuracy of 0.01 feet, and for the presence of free product and sheen using a transparent bailer. Water removed from the wells during development will be stored in labeled drums onsite, pending analysis and appropriate disposal.

Monitor the Wells

Beginning at least 48 hours after well development, the three wells will be monitored daily for one week for depth to groundwater to evaluate groundwater flow direction at the site. Depth to water will be monitored using an electric water level indicator with an accuracy of 0.01 feet. In addition, the water quality in each well will be monitored in situ for indicators of intrinsic bioremediation using a downhole probe. The downhole probe will monitor for the parameters of pH, dissolved oxygen, redox potential (ORP) and conductivity. In addition to intrinsic bioremediation indicators, groundwater conductivity will be evaluated to determine groundwater potability.

On each day of monitoring, each well will be purged of a minimum of 5 casing volumes of water to ensure that representative water quality is monitored at each well. Field parameters will be monitored prior to the beginning of purging and during purging. Purged water will be stored in labeled drums on site pending characterization and disposal.

Arrange for Sample Analysis

All of the soil and groundwater samples will be analyzed at a State-accredited hazardous waste testing laboratory for Total Petroleum Hydrocarbons as Gasoline using EPA Method 5030 in conjunction with Modified EPA Method 8015, and for BTEX and fuel oxygenates using EPA Method 8260. Groundwater potability will be evaluated in the field by measuring conductivity rather than collecting water samples for Total Dissolved Solids analysis.

Report Preparation

Upon receipt of the laboratory analytical results, a report will be prepared. The report will document soil and groundwater sample collection procedures and sample results, as well as the construction of the wells and the monitoring results from the wells. The report will include a site plan detail showing the drilling locations, boring logs, well construction diagrams, tables summarizing the sample results and well monitoring results, recommendations based on the sample and monitoring results, and the stamp of an appropriately registered professional.

Should you have any questions, please do not hesitate to contact us at (510) 658-6916.

Sincerely,

P&D Environmental

Taul M. King

Paul H. King

California Registered Geologist #5901

Expires 12/31/05

Attachment: Table 1, UST Pit Soil Sample Analytical Results

Table 2, UST Pit Water Sample Analytical Results Table 3, Soil Boring Soil Sample Analytical Results

Table 4, Soil Boring Groundwater Sample Analytical Results

Figure 1, Site Location Map

Figure 2, Site Plan Detail Showing ACC UST Pit Sample Collection Locations

Figure 3, Site Vicinity Map Showing Underground Utilities

Figure 4, Site Vicinity Map Showing ACC Boring Locations and Proposed Boring

Locations

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TABLE 1 - UST PIT SOIL SAMPLE ANALYTICAL RESULTS

			\			Fuel Oxygenates μg/kg					
Sample ID	TPHg mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl- Benzene mg/kg	Xylenes mg/kg	TBA	MTBE	DIPE	ETBE	TAME	Lead mg/kg
TDR- Pit-N	5,900	ND<6.2	8.3	66	420	ND<60	09>QN	ND<120	ND<60	ND<60	5.8
TDR- Pit-S	10	ND<0.62	ND<0.62	ND<0.62	ND<0.62	42	ND<36	ND<72	ND<36	ND<36	10
TDR- Pit-E	73	ND<0.62	ND<0.62	ND<0.62	ND<0.62	ND<46	ND<46	ND<92	ND<46	ND<46	ND<5.0
TDR- Pit-W	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	57	32	ND<10	ND<5.0	ND<5.0	6.1
TDR- NWall-1	ND<1.0	ND<0.0050	ND<0.0050	ND<0,0050	ND<0.0050	ND<5.0	ND<5.0	ND<10	ND<5.0	ND<5.0	6.7
TDR- NWall-2	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<18	ND<18	ND<35	ND<18	ND<18	5.6
ESL	400	0.38	9.3	13	1.5	110	5,600				750

mg/kg = milligrams per kilogram μg/kg = micrograms per kilogram

ND = Not Detected

TPHg = Gasoline

ESL = Environmental Screening Level established by San Francisco Bay Regional Water Quality Control Board (July 2003, Updated Feb 2004, Table B Shallow Soils (≤ 3m bgs) Groundwater is NOT a Current or Potential Source of Drinking Water.)

Fuel Oxygenates (by EPA 8260)

TBA = Tertiary Butyl Alcohol

MTBE = Methyl Tertiary Butyl Ether

DIPE = Di-Isopropyl Ether

ETBE = Ethyl Tertiary Butyl Ether

TAME = Tertiary Amyl Methyl Ether

TABLE 2 - UST PIT WATER SAMPLE ANALYTICAL RESULTS

		!				Fuel Oxygenates µg/L					
Sample ID	TPHg μg/L	Benzene μg/L	Toluene μg/L	Ethyl-Benzene µg/L	Xylenes μg/L	TBA	MTBE	DIPE	ETBE	TAME	Lead mg/L
TDR-Pit	99,000	220	500	1,500	14,000	ND<500	ND<500	ND<1,000	ND<500	ND<500	0.82
Pit-2	3,200	40	3.1	11	54	NA	ND<5.0	NA	NA	NA	0.037
ESL	500	46	130	290	13	18,000	1,800				0.0025

 $\mu g/L = micrograms per liter$ mg/L = milligrams per liter

ND = Not Detected

NA = Not Analyzed

TPHg = Gasoline

Fuel Oxygenates (by EPA 8260)

TBA = Tertiary Butyl Alcohol

MTBE = Methyl Tertiary Butyl Ether

DIPE = Di-Isopropyl Ether

ETBE = Ethyl Tertiary Butyl Ether

TAME = Tertiary Amyl Methyl Ether

 $ESL = Environmental Screening Level established by San Bay Francisco Regional Water Quality Control Board (July 2003, Updated Feb 2004, Table B Shallow Soils (<math>\leq 3m$ bgs) Groundwater is NOT a Current or Potential Source of Drinking Water.)

Analytical results from the pit water sample collected after overexcavation (Pit-2) indicate a significant reduction in concentrations of TPHg and BTEX constituents when compared to the original water sample.

TABLE 3 - SOIL BORING SOIL SAMPLE ANALYTICAL RESULTS

Sample ID	TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylene	MTBE
TDR-B1-4.0	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005
TDR-B2-4.0	ND<1.0	ND<0,005	ND<0.005	ND<0.005	ND<0.005	0.0098
ESL	400	0.38	9.3	13	1.5	5,600

ND = Not DetectedTPHg = Gasoline

Soil sample results are in milligrams per kilogram (mg/kg).

 $ESL = Environmental Screening Level established by San Francisco Bay Regional Water Quality Control Board (July 2003, Updated Feb 2004, Table B Shallow Soils (<math>\leq 3m$ bgs) Groundwater is NOT a Current or Potential Source of Drinking Water.)

TABLE 4 - SOIL BORING GROUNDWATER SAMPLE ANALYTICAL RESULTS

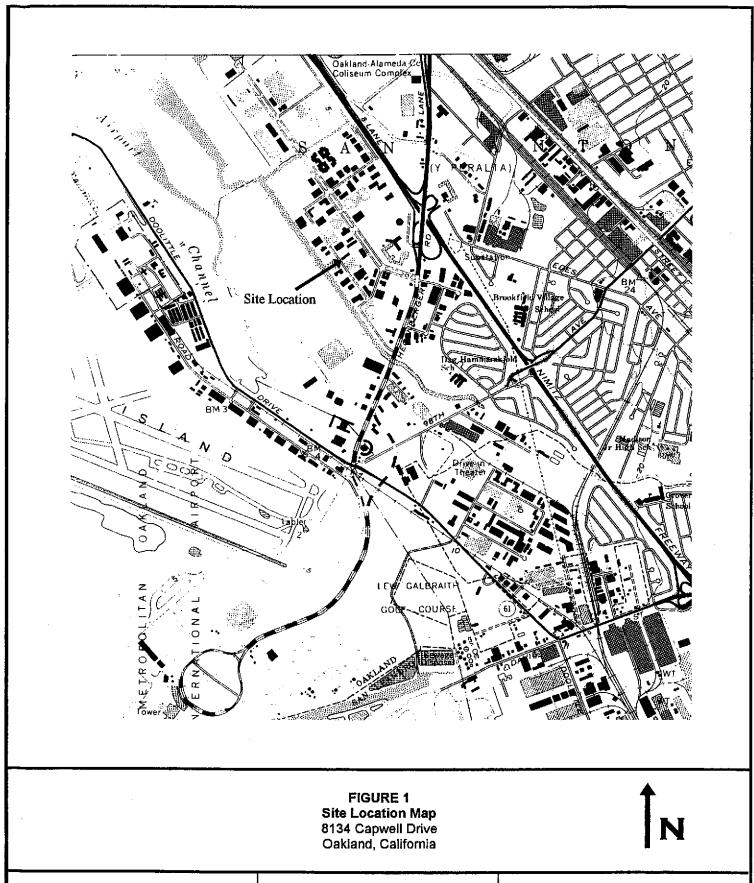
Sample ID	TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylene	MTBE
TDR-B1-W	ND<50	ND<50	ND<50	ND<50	ND<1.0	1.5
TDR-B3-W	4,900	3.0	ND<2.5	9,8	ND<5.0	72
TDR-B4-W	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	ND<0.50
ESL	500	46	130	290	13	1,800

ND = Not Detected

TPHg = Gasoline

Water sample results are in micrograms per liter(µg/L).

 $ESL = Environmental Screening Level established by San Francisco Bay Regional Water Quality Control Board (July 2003, Updated Feb 2004, Table B Shallow Soils (<math>\leq 3m$ bgs) Groundwater is NOT a Current or Potential Source of Drinking Water.)



Base Map From: U.S. Geological Survey San Leandro, Calif. Photorevised 1980

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