RO-403

URS

October 29, 2004

Mr. Robert W. Schultz
Hazardous Material Specialist
Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

SUBJECT: Additional Investigation Workplan
Former BP Service Station #11133
2220 98th Avenue, Oakland, California
ACHCS Fuel Leak Case No. RO0000403

Dear Mr. Schultz:

On behalf of the Atlantic Richfield Company (RM- a BP affiliated Company), URS Corporation (URS) has prepared this Additional Investigation Workplan containing a Site Conceptual Model for the above referenced Site (the Site). This report was prepared in response to a letter from the Alameda County Health Care Services (ACHCS) to BP dated August 30, 2004 (Attachment A). This Workplan includes a discussion of the Site background, Site hydrogeology, Sensitive Receptor and Well Survey, Preferential Pathway Survey, Site Characterization, and Corrective Action Plan recommendations for further investigation and remediation.

SITE FEATURES AND BACKGROUND

The Site is a fenced lot containing an inactive former service station located at the northern corner of 98th Avenue and Bancroft Avenue in Oakland, California (Figure 1). The land use in the immediate vicinity of the Site is mixed commercial and residential. BP acquired the facility from Mobil Oil Corporation in 1989. In January 1994, BP transferred the property to TOSCO Marketing Company (TOSCO, now ConocoPhilips) and has not operated the facility since that time. TOSCO ceased gasoline retail operations at the Site in 1999.

The Site consists of a service station building, a restroom building, a canopy, former dispenser islands, and a remediation system and associated compound. The Site is covered with asphalt or concrete surfacing except for planters along the northern, eastern and parts of the western property boundaries and areas where the former underground storage tanks (USTs), product piping and dispensers were removed in 1998 (Figure 2).

In June 1987, Kaprealian Engineering, Inc. (Kaprealian) removed one 10,000-gallon, one 8,000-gallon and one 5,000-gallon single walled steel gasoline USTs from the southwestern part of the Site (Figure 2). Soil samples (samples A1, A2, B1, B2, and C1) were collected from the base of the tank cavity at depths of approximately 13.5 to 14 feet below ground surface (bgs). The analytical results of the respective soil samples detected Total Petroleum Hydrocarbons (TPH) at concentrations ranging between 12 and 420 parts per million (ppm)

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and benzene concentrations ranged between 0.74 ppm and 23 ppm (Attachment B). Subsequently, two 10,000-gallon and one 12,000-gallon USTs were installed at the former UST complex location.

In May 1988, three groundwater monitoring wells (MW-1, MW-2, MW-3) were installed onsite (Figure 2). The analytical results of soil and groundwater samples collected from MW-1 through MW-3 are included in Attachments B and C. TPH and benzene, toluene, ethyl benzene and xylenes (BTEX) concentrations in soil samples from MW-2 and MW-3 were non-detect to relatively low. However, the soil samples collected between 15 and 20 feet bgs from MW-1 reported TPH concentrations between non-detect and 210 ppm, and benzene concentrations between non-detect and 7.1 ppm. TPH and BTEX concentrations in groundwater samples from MW-2 and MW-3 were at relatively low to non-detect levels, while the groundwater sample from MW-1 reported 76,000 parts per billion (ppb) TPH and 29,000 ppb benzene.

In January 1990, Alton Geosciences (Alton) oversaw the advancement of eight soil borings to various depths ranging between 16 to 35 feet bgs and the installation of eight temporary wells (TW-1 through TW-8) at the Site (Figure 2). Temporary wells TW-2 and TW-3 were installed offsite. The respective temporary wells were installed as part of a Supplemental Site Investigation to conduct a qualitative groundwater survey. Soil samples were not collected for laboratory analysis from the respective well borings. The analytical results of groundwater samples collected from TW-1 through TW-8 and monitoring wells MW-1 through MW-3 are presented in Attachment C. Approximately 0.2 foot of free product was encountered in MW-1 and product sheen was noted in TW-4. TPH ranged between non-detect (<50 ppb) to 720,000 ppb in the remaining wells. Temporary wells TW-1 through TW-8 were subsequently abandoned by grouting.

In May and June 1990, Alton oversaw the advancement of five soil borings and installation of four groundwater monitoring wells (AW-1 through AW-4) and one recovery well (RW-1). Wells AW-1 and RW-1 were installed onsite and the remaining wells were installed offsite (Figure 2). The analytical results of soil samples collected from AW-1 through AW-4 and RW-1 reported non-detectable to relatively low concentrations of Total Petroleum Hydrocarbon-gasoline (TPH-g) and BTEX with a maximum of 33 ppm TPH-g at 25 feet bgs in RW-1 (Attachment B). In July 1990, pump test and slug test activities were conducted at the Site, during which, approximately 100-gallons of product/water was pumped from recovery well RW-1 and appropriately disposed offsite to control migration of free product at the Site.

In February 1991, as part of a Phase III-Supplemental Site Investigation Study, Alton oversaw the advancement of four soil borings (SBA-5 through SBA-8) and the installation of four monitoring wells (AW-5 through AW-8). Wells AW-5 and AW-6 were installed onsite and wells AW-7 and AW-8 were installed offsite (Figure 2). The analytical results of soil samples collected from SBA-5 through SBA-8 (AW-5 through AW-8) reported non-detect

concentrations of TPH-g and relatively low concentrations of BTEX with a maximum of 0.091 ppm benzene at 10.5 to 11 feet bgs in SBA-6 (Attachment B). Groundwater analytical results indicated moderate to high concentrations of TPH-g in AW-5, AW-6, and AW-8 with a maximum of 1,100 µg/L in AW-6, and low to moderate concentrations of BTEX in AW-5 through AW-8 with a maximum of 80 µg/L benzene in AW-6 (Attachment C). A groundwater monitoring program was subsequently initiated.

In March 1992, RESNA oversaw the advancement of three soil borings B-9 through B-11 in which three vapor extraction wells VW-1 through VW-3 were installed, respectively. The analytical results of soil samples collected from B-1 through B-11 reported non-detectable to relatively low concentrations of TPH-g and BTEX, except for 320 ppm of TPH-g in B-11 at 16.5 feet bgs (Attachment B). Groundwater samples were not collected from VW-1 through VW-3. In April 1992, a vapor extraction test (VET) was performed onsite using vapor extraction wells VW-1 through VW-3 to evaluate the feasibility of using vapor extraction as a remedial alternative at the Site. Based on the estimated effective radius of influence calculated from the VET, soil vapor extraction was identified as a feasible remedial alternative. A soil vapor extraction system (SVE) combined with a groundwater recovery and treatment system was identified as an effective remedial option for the Site. Also in April 1992, RESNA installed a GRS passive floating product removal system in RW-1 and initiated a program to manually remove the product collected by the system on a monthly basis.

In 1994, a SVE and treatment system was installed onsite and began operating in November 1994. The SVE system consisted of a Lamson Turbotron TBT-2600 cubic feet per minute (cfm) maximum capacity blower and ancillary equipment. The groundwater treatment system consisted of a Gas Space R 6p335A Aeration Tank and ancillary equipment. Both systems also had independent A-1, Retox 600 Regenerative Thermal Oxidizers of 600 cfm capacities. The SVE and treatment system was initially connected to eight vapor extraction wells (VEW-1 through VEW-8) and recovery well RW-1 (Figure 2). Vapor extraction wells VEW-4 through VEW-8 were installed in 1994 as part of the remediation system installed onsite. However, the drilling and installation activities associated with VEW-4 through VEW-8 are not on file and it is not known if soil or groundwater samples were collected from the respective borings. Vapor extraction well VEW-9 was installed and connected to the SVE and treatment system in April 1996 (Figure 2). The analytical results of soil samples collected from VEW-9 reported non-detect concentrations of TPH-g, BTEX and methyl tertiary butyl-ether (MTBE) (Attachment B).

Based on available records, the SVE and treatment system was operated until December 1998, with intermittent non-operational status. Based on available operational data for the SVE system, as of December 27, 1995, a total of approximately 13,495.8 pounds of hydrocarbons had been removed by the system from onsite soils. Based on available operational data for the groundwater treatment system, as of December 14, 1998, a total of approximately 344.4 pounds of hydrocarbons had been removed by the system from onsite

groundwater. A summary of the SVE and treatment system operational data and a schematic of the treatment system sampling locations are presented in Attachment D.

In 1994, EMCON collected supplemental soil boring samples at the Site. However, a report documenting the investigation results is not on file. A soil sample (TD-5-0.5) collected from 0.5 feet bgs at the southern most dispenser onsite reportedly had TPH-diesel (TPH-d) concentrations of 3,900 ppm and non-detect levels of TPH-g and BTEX (Figure 2, Attachment B).

In December 1996, Allisto drilled soil-boring AW-9 to further delineate the extent of petroleum hydrocarbons. Soil boring AW-9 was converted to monitoring well AW-9. The analytical results of soil samples collected from VEW-9 reported non-detect concentrations of TPH-g, BTEX and MTBE (Attachment B). Well AW-9 was subsequently included into the ongoing groundwater monitoring program.

In October 1998, Gettler-Ryan, Inc. (GR) oversaw the removal of two 10,000-gallon and one 12,000-gallon USTs and associated product piping. After the removal of the USTs and product piping, four tank-pit sidewall soil samples (SW-1 through SW-4) at approximately 12 feet bgs, two tank-pit groundwater samples (Water-1 and Water-2) and eight product piping soil samples (P1 through P8) were collected and analyzed (Figure 2 and Attachment B). The sidewall soil samples SW-1 through SW-4, which were collected at approximately 12 feet bgs reported non-detect levels of TPH-g and BTEX and less than 0.5 ppm of MTBE. The groundwater samples (Water-1 and Water-2) reported TPH-g concentrations ranging between 430 ppb and 3,700 ppb, benzene concentrations between 46 and 98 ppb, and MTBE concentrations between 1,200 and 4,100 ppb. The product piping soil samples (P1 through P8), which were collected at approximately 3.5 feet bgs reported a maximum of 1.2 ppm of TPH-g, a maximum of 0.067 ppm of benzene, and a maximum of 4.0 ppm of MTBE.

In May 2000, Newfields, Inc. (Newfields) performed a Risk-Based Corrective Action (RBCA) Evaluation for the Site using Oakland and ASTM RBCA processes. The residual gasoline and diesel constituent concentrations in onsite soils and groundwater were initially compared to concentrations presented in the Oakland RBCA Tier 1 and Tier 2 look-up tables, whose values are based on conservative, generic exposure and modeling parameters, resulting in conservative risk-based screening levels. Where site conditions exceeded Oakland RBCA Tier 1 and Tier 2 levels, those conditions were further assessed under the Oakland RBCA Tier 3 analysis. The Tier 3 analysis replaces some of the conservative generic assumptions of Tiers 1 and 2 with data that is representative of actual site conditions, thereby providing a more accurate representation of existing and potential future risks. Accordingly, the results of the Oakland RBCA Tier 3 evaluation indicated that the residual levels of petroleum hydrocarbons in onsite soils and groundwater were below City of Oakland and US EPA acceptable cancer risks and non-cancer risk levels. It was thereby concluded that onsite soil and groundwater conditions should not pose a risk to current and future onsite workers or off-site residents.

In December 2000, Newfields submitted a revised RBCA evaluation for the Site to ACHCS incorporating agency feedback and further detailing previously provided information. However, the conclusions remained the same as in the May 2000 RBCA for the Site.

In compliance with regulatory requests and feedback on the December 2000 Newfields RBCA evaluation, a supplemental investigation was conducted in October 2001 to assess inhalation potential exposure risks from residual subsurface hydrocarbon concentrations particularly to offsite residents. As part of the supplemental investigation, six soil borings (B-1 through B-6) were drilled in the eastern and southeastern property boundaries and soil, soil-vapor and groundwater samples were collected from the respective borings and analyzed (Figure 2, Attachment B). Two soil samples each were collected from borings B-1, B-2, B-3, B-5, and B-6, and four soil samples, including a duplicate, was collected from B-4 at depths ranging between 4.5 to 19.5 feet bgs. The analytical results of the respective soil samples reported a maximum of 1.6 micrograms per kilogram (mg/kg) of TPH-g, non-detect concentrations of benzene and MTBE, and low to mostly non-detect concentrations of remaining gasoline constituents (Attachment B). Three soil-vapor samples were collected from each boring B-1 through B-6 at 5 foot depth intervals between 5 and 15 feet bgs. The analytical results of the respective soil-vapor samples reported TPH-g concentrations ranging between 1.3 to 11 parts per million by volume (ppmv), BTEX concentrations ranging between 0.0033 to 0.34 ppmv, 0.0033 to 0.23 ppmv, 0.0027 to 0.15 ppmv, and 0.0031 to 0.59 ppmv, respectively. MTBE concentrations in the soil-vapor samples ranged between 0.0033 to 0.062 ppmv (Attachment B). One groundwater sample was collected from each boring B-1 through B-6 and the analytical results reported TPH-g concentrations ranging between <50 to 110,000 micro grams per liter (µg/L), benzene concentrations ranging between <2.0 to 30,600 µg/L, and MTBE concentrations ranging between <200 to 1,500 µg/L (Attachment C).

In May 2002, Montgomery Watson Hazra (MWH) performed a revised RBCA evaluation for the Site using Oakland and ASTM Tier 1 through Tier 3 RBCA values. This revised RBCA evaluation primarily incorporated the October 2001 supplemental investigation soil, soil-vapor and groundwater analytical results to adequately evaluate potential exposure risks to the residential properties adjacent to the Site. The risks to offsite residents were addressed by the soil vapor data collected adjacent to the offsite residential structures, as soil vapor data is considered more representative of potential offsite residential exposures than soil or groundwater data. Applicable exposure evaluation flowcharts, the Tier 1 through Tier 3 RBCA evaluation tables, and statistical analysis tables are presented in Attachment E. The results of the respective RBCA evaluation indicated that the theoretical upper-bound incremental lifetime cancer risks and non-cancer hazard indices associated with levels of TPH, BTEX, and MTBE in onsite soils and groundwater were below acceptable levels. Accordingly, it was concluded that no further action was necessary for the protection of human health at the Site. Further details of the respective RBCA evaluation can be found in the May 2002, Montgomery Watson Harza report titled *"Risk-Based Corrective Action Evaluation for BP Oil Site No. 11133, Oakland, CA"*.

To date, a total of twenty three groundwater monitoring and extraction wells have been installed at the Site and in the Site vicinity (Figure 2). These include thirteen groundwater monitoring wells, seven of which are onsite (MW-1, MW-2, MW-3, AW-1, AW-5, AW-6, and RW-1), and six are offsite (AW-2, AW-3, AW-4, AW-7, AW-8, and AW-9). Well RW-1 is a dual extraction and monitoring well. There are eight onsite vapor extraction wells (VW-1 through VW-3 and VEW-4 through VEW-8) and one offsite extraction well (VEW-9). The well construction diagrams are included in Attachment H, except for those of wells VEW-4 through VEW-8, which are not on file. A quarterly groundwater monitoring program was initiated at the Site in April 1991 and is ongoing on a modified sampling schedule. Since the first quarter of 2001, the monitoring program at the Site began operating on a semi-annual basis. Monitoring of offsite wells AW-7, AW-8 and AW-9 was discontinued in 1998. Monitoring of onsite well MW-2 and offsite well AW-3 was discontinued in 2000. Currently, wells MW-1, MW-3, AW-1, AW-4, AW-5, AW-6, RW-1 are monitored semi-annually (1st and 3rd quarters), well AW-2 is monitored annually (1st quarter), and wells MW-2, AW-3, AW-7, AW-8, and AW-9 are not sampled. Free product gauging of well RW-1 is conducted semi-annually and a summary of the free product removal program from wells RW-1 and MW-1 are provided in Attachment D. As of June 15, 2000, a total of 0.70 gallons of free product was removed from MW-1 and free product has not been encountered in MW-1 since June 1998. A sheen was noted in MW-1 during the third quarter 2004 monitoring session. As of February 2002, a total of 161.29 gallons of free product was removed from RW-1 and free product has not been encountered in RW-1 since September 2001.

The analytical results of the groundwater monitoring program are included as Attachment C. The most recent quarterly (third quarter 2004) groundwater monitoring results, groundwater flow direction, and groundwater contours are graphically presented in Figure 6. The analytical results of the third quarter 2004 groundwater monitoring session are as follows: Gasoline Range Organics (GRO) were detected above the laboratory reporting limits in six of the seven wells sampled at concentrations ranging from 1,100 µg/L (AW-5) to 47,000 µg/L (RW-1). Benzene was detected above the laboratory reporting limits in three wells at concentrations ranging from 320 µg/L (RW-1) to 2,600 µg/L (AW-1). MTBE was detected above the laboratory reporting limits in all six wells sampled at concentrations ranging from 3.3 µg/L (MW-3) to 4,600 µg/L (AW-6). Tert-butyl alcohol (TBA) was detected above the laboratory reporting limits in one well at a concentration of 1,600 µg/L (AW-5). Tert-amyl mether ether (TAME) above the laboratory reporting limits was detected in four wells at concentrations ranging from 9.6 µg/L (AW-4) to 1,600 µg/L (AW-6). No other fuel oxygenates were detected above their respective laboratory reporting limits.

SITE HYDROGEOLOGY

The Site elevation is approximately 40 feet above mean sea level, where regional topography slopes to the west (USGS Topographic Map, Oakland East Quadrangle -7.5 Minute Series). The topography of the surrounding area is characterized by valleys and gentle slopes. The underlying unit in this region consists of Undivided Quaternary deposits (QU). The QU units composition and physical properties vary, but consist predominantly of Temescal Formation, which probably includes covered or unrecognized San Antonio Formation and gravel, sand, and clay (Qg), as well as recent alluvium and colluvium and artificial fill. The Site is located in the 580-Square-mile Alameda Bay Plain Groundwater Basin. The water-bearing material is comprised of younger and older alluvium. The area is located within the Oakland Upland and Alluvial Plain, a groundwater subarea of the East Bay Plain. Groundwater in the water-bearing units of the Oakland Upland and Alluvial Plain meets recommended primary and secondary standards for drinking water.

According to the San Francisco Bay Regional Water Quality Control Board (SFRWQCB) *"East Bay Plain Groundwater Basin Beneficial Use Evaluation Report"*, Figure 19, June 1999, the groundwater in the Site area is designated as Zone A, which is identified as a moderate to significant drinking water resource (Attachment G). The shallow aquifer in Zone A is identified as a potential drinking water source and the deep aquifer is identified as existing or probable drinking water source (Attachment G). The most productive water wells in the Oakland Upland and Alluvial Plain are those completed within the older alluvium units. The older alluvium units in the area are reported to be approximately 500-600 feet thick. Lesser amounts of groundwater occur in the younger alluvium, fluvial deposits, interfluvial basin deposits, and Bay Mud estuarine deposits. These deposits are generally relatively thin (less than 120 feet thick) and yield only small amounts of groundwater to wells (Note: the aforementioned regional geological information sourced from RESNA 1993, *Remedial Action Plan,* or as indicated).

The Site is approximately 2 miles east of the San Leandro Bay, which is a small portion of the San Francisco Bay. The nearest surface water drainage is San Leandro Creek, approximately 1-¼-miles to the south, which drains into San Leandro Bay. Another creek, Arroyo Viejo is located approximately 1 mile north of the Site. Both creeks originate in the East Bay Hills and drain directly into San Leandro Bay.

The regional surface and groundwater flow in the region is to the southwest, towards San Francisco Bay. The historic groundwater flow direction at the Site between July 1992 and July 2004 has ranged between northwest through South through northeast but has predominantly been easterly and secondarily southeasterly (Attachment C). The groundwater flow directions in the western and eastern sections of the Site have predominantly been easterly and westerly, respectively, converging to a generally northwest-southeast trending potentiometric depression or trough across the center of the Site. The groundwater flow direction along the axis of the trough is generally to the east and southeast, which represent the overall predominant groundwater flow direction at the Site. During the same time frame, the hydraulic gradient has ranged between 0.02 to 0.30 feet per foot (Attachment C). A rose diagram indicating the historical hydraulic gradient direction at the Site is shown on Figure 3 and Figures 6 through 9. Between April 1991 and July 2004, the depth to groundwater beneath the Site and in the immediate vicinity has ranged between 6.77 to 28.51 feet bgs, with notable seasonal fluctuations (Attachment C). During the last five years since January 2000, the depth to groundwater at the Site and the immediate vicinity ranged between 8.40 and 23.11 feet bgs (Attachment C).

The Site is typically underlain by clay, silty clay, and clayey silt to depths of approximately 18 to 20 feet. The cross sections (Figures 4 and 5) show a silty sand lens at approximately three to four feet bgs and several silty sand and silty gravel lenses from approximately 13 to 17 feet bgs. Sandy clays, sandy silts, and silty sands are encountered at depths of approximately 19 to 40 feet bgs beneath the Site. The silty to clayey sand lens tapers to the south and is not encountered in downgradient well AW-4, which consists of silty clays to 35 feet bgs. The lens of sandy clays, sandy silts, and silty sands is underlain by silty clays, which extend to the total explored depth of all borings (Figures 4 and 5; Attachment H). Hydro-geologic cross-sections prepared by URS depicting the subsurface lithology are presented as Figures 3 through 5. Historic hydro-geologic cross-sections prepared by a previous consultant are presented in Attachment H. Copies of boring logs and well construction details are included as Attachment H.

Based on a Rising Head or Slug Test conducted at the Site in July 1990, the transmissivity, hydraulic conductivity, and linear velocity of the aquifer material at the Site were calculated to be 9.0 $feet^2$/day, 0.6 feet/day (2.1×10^{-4} centimeter/second), and 6.0×10^{-3} feet/day, respectively. These values were reported to be representative of low permeability soil encountered at the Site and are within accepted values for clayey to silty sand. The results of an aquifer pump test conducted at the Site in April 1991, on recovery well RW-1 with nine observation wells located between 35 and 135 feet from the pumping well reported storativity and transmissivity values of 0.3493 and 0.1491 $feet^2$/minute, respectively. Assuming a 25 feet screened interval for recovery well RW-1, the calculated hydraulic conductivity value is 8.588 feet/day (3.029×10^{-3} centimeter/second). This hydraulic conductivity value corresponds to typical published values for silty sands (Fetter, 1988).

SENSITIVE RECEPTOR AND WELL SURVEY

A sensitive receptors study was conducted for the Site in February 1991, which identified an elementary school as the nearest sensitive receptor located approximately 1,000 feet west and upgradient of the Site. San Leandro Creek was identified as the nearest surface water body and no known municipal or private water supply wells were identified within a ½ mile radius of the Site. The respective sensitive receptor survey results are included as Attachment G.

In October 2004, URS conducted a one-mile radius well survey for the Site (Attachment G). A review of the State of California Department of Water Resources (DWR) files and Environmental Data Resources, Inc. (EDR) files identified that eleven domestic wells, seven irrigation wells and one industrial well were located within one-mile radius of the Site (Attachment G). Fifteen well logs provided by DWR based on a requested one-mile well survey radius did not provide addresses and therefore, those well locations could not be determined. Nine of the identified domestic wells and four irrigation wells are located approximately 0.75 mile in the predominant downgradient direction of the Site. However, no wells were identified within a 2,000 feet radius of the Site. Two former leaking UST sites with closed regulatory status were identified within 2,000 feet of the Site, but available records do not indicate the presence of monitoring wells in association with the two sites.

According to the SFRWQCB *"East Bay Plain Groundwater Basin Beneficial Use Evaluation Report"*, Figures 16 and 17, June 1999, there is one irrigation and one industrial shallow well (less than 100 feet bgs), and one deep irrigation well (greater than 100 feet bgs) located within 0.5 miles of the Site (Attachment G). None of the identified wells are directly downgradient (east to southeast) of the Site.

Based on the sensitive receptor and well survey results, no sensitive receptors including wells were identified within a distance of the Site where the hydrocarbon impacted soil and groundwater at the Site may likely pose a threat.

PREFERENTIAL PATHWAY SURVEY

An underground utility Site survey was conducted in October 2004 by URS to identify potential migration pathways and conduits to assess the probability of the plume encountering preferential pathways and conduits that may promote the migration of petroleum hydrocarbons. The locations of underground utilities identified at the Site and in the immediate vicinity are shown in Figure 3. Geologic cross-sections showing the locations and depths of the identified underground utilities at the Site and in the immediate vicinity are presented in Figures 4 and 5. The underground utilities identified are as follows: sanitary sewer lines, storm drains, East Bay Municipal Utility District (EBMUD) water lines, Pacific Gas and Electric (PG&E) lines, and onsite remediation system associated trench lines. Locations of telephone and television cable utility information in the site vicinity could not be obtained and were identified as less likely to be of concern due to their generally shallow depths of approximately less than 5 feet bgs. Underground utilities of potential concern identified were onsite remediation system associated

trenching extending to approximate depths of less than 4-5 feet bgs, and sanitary sewer lines running directly beneath the south to southwestern section and north to northwestern section of the Site at approximate depths of 4 to 4.5 feet bgs (Figures 3 through 5). All other identified underground utilities were offsite and the underground utilities downgradient (east to southeast) of the Site do not extend beyond a maximum depth of approximately 6.5 feet bgs.

Historically, the depth to groundwater beneath the Site and in the immediate vicinity has ranged between 6.77 to 28.51 feet bgs (between April 1991 and July 2004) and has ranged between 8.40 and 23.11 feet bgs (during the last five years since January 2000), fluctuating seasonally (Attachment C). Accordingly, since the maximum approximate depths of the identified onsite and offsite underground utilities are above the typical average and occasional historic highs of the depth to groundwater at the Site and the immediate site vicinity, the identified underground utilities are unlikely to act as significant preferential conduits for dissolved hydrocarbon migration. Additionally, since no wells were identified within 2,000 feet of the Site, the potential for offsite wells acting as preferential conduits for dissolved hydrocarbon plume migration is not of concern.

CONTAMINANT SOURCE CHARACTERIZATION

A review of the analytical results of historical soil samples collected from the Site indicates that the lateral and vertical extents of hydrocarbon impacts on onsite soils have been characterized and are limited to the source areas, such as the former UST complex, dispensers and product piping locations. The historical soil analytical data is presented in Attachment B and the soil sample locations are shown in Figure 2.

Please note that the soil samples collected during the second UST removal and closure in October 1998 are considered representative of the soil conditions at the former UST complex location. The highest residual TPH-g concentrations in onsite soils are as follows: 320 mg/kg at 11 feet bgs in boring B-11 (VW-3), and 210 mg/kg at 15 feet bgs in boring MW-1. The next highest onsite residual TPH-g concentrations range between <0.05 mg/kg and 33 mg/kg. TPH-g was detected at low concentrations in soil samples collected near the former dispenser islands and product lines in the western portion of the site. TPH-G was also detected in several near-surface soil boring samples (within five feet bgs; B-1, B-2, and B-5) and one deep off-site soil boring location (AW-4, south of the site, 21 feet bgs) at low concentrations (0.084 to 1.6 mg/kg). The maximum concentration of TPH-d detected in onsite soils was 3,900 mg/kg collected at 0.5 feet bgs at surface soil sample location TD-5, which is located at the southern most dispenser island. No TPH-g or TPH-d was detected at the northern-most onsite soil boring sample (AW-6), eastern most onsite soil boring sample (AW-5), or in surface soil samples along the western extent of the former dispenser islands on the northwest portion of the site. Vertical TPH-g isoconcentration contours are plotted on the hydrogeologic cross-sections presented in Figures 4 and 5.

The residual benzene concentrations in onsite soils range between <0.0005 mg/kg to a maximum of 7.1 mg/kg at depths ranging from grade to approximately 30 feet bgs. According to the

statistical analysis conducted in the May 2002 MWH RBCA report for the Site, benzene was detected in approximately 50 percent of the soil samples collected at the site, whereas toluene, ethyl benzene and xylenes were detected in approximately 30 to 38 percent of the soil samples. Most of the higher benzene concentrations were detected along the "center axis" of the Site in the vicinity of the former dispensers and product lines, in soil samples running the length of the site northwest to southeast (P1 through RW-1), with lower concentrations detected throughout the remainder of the Site. Most of the benzene detections at the site occurred below 7 to 10 feet bgs, with the highest detection at 15 feet bgs. Toluene, ethyl benzene, and xylene concentrations showed a similar trend. MTBE was not historically analyzed for and was only detected in a few locations along the former UST areas and product line samples (P2, P5, P7, SW-2, SW-3, SW-4) on the northwestern portion of the site.

A comparison of TPH-g, BTEX and MTBE concentrations encountered in onsite soils against conservative Environmental Screening Levels (ESLs) selected from Vol II of the ESL document (ESL 2003), Table E-1b, Potential Indoor-Air Impact Screening Levels - Residential Exposure Scenario for BTEX and MTBE, and Table K-1, Direct- Exposure Screening Levels - Residential Exposure Scenario for TPH-g, indicate the following:

- Residual TPH-g concentrations in onsite soils do not exceed the Table K-1, Direct-Exposure Screening Levels - Residential Exposure Scenario value of 500 mg/kg for TPH-g.
- Residual toluene, ethyl benzene and xylene concentrations in onsite soils do not exceed their respective Table E-1b, Potential Indoor-Air Impact Screening Levels - Residential Exposure Scenario, which are as follows: 180 mg/kg for toluene, 4.7 mg/kg for ethyl benzene, and 45 mg/kg for xylenes.
- Residual benzene concentrations in onsite soils exceed the Table E-1b, Potential Indoor-Air Impact Screening Levels - Residential Exposure Scenario of 0.18 mg/kg for benzene only in the following locations, respective depths and at the following concentrations: 7.1 mg/kg at 15 feet bgs and 1.24 mg/kg at 20 feet bgs at MW-1; 0.470 mg/kg at AW-1 at 20 feet bgs; 0.230 mg/kg at 20 feet bgs and 1.0 mg/kg at 25 feet bgs at RW-1.
- Residual MTBE concentrations in onsite soils either exceed or is equal to the Table E-1b, Potential Indoor-Air Impact Screening Levels - Residential Exposure Scenario of 2.0 mg/kg for MTBE only in the following locations, respective depths and at the following concentrations: 4 mg/kg at 3.5 feet bgs at P2; and 2.0 mg/kg at 3.5 feet bgs at P7.

The analytical results of soil-vapor samples collected from boring B-1 through B-6 at 5 foot depth intervals between 5 and 15 feet bgs in October 2001 reported the following: TPH-g concentrations ranged between 1.3 to 11 parts per million by volume (ppmv); BTEX concentrations ranged between 0.0033 to 0.34 ppmv, 0.0033 to 0.23 ppmv, 0.0027 to 0.15 ppmv, and 0.0031 to 0.59 ppmv, respectively; and MTBE concentrations ranged between 0.0033 to 0.062 ppmv (Attachment B). A comparison of TPH-g/Gasoline Range Organics (GRO), BTEX and MTBE concentrations encountered in onsite soil vapor samples in October 2001 against

conservative Environmental Screening Levels (ESLs) selected from Vol II of the ESL document (ESL 2003), Table E-2, Shallow Soil Gas Screening Levels - Residential Exposure Scenario for TPH-g/GRO, BTEX and MTBE, indicate the following:

- TPH-g/GRO concentrations in onsite soil vapors exceeded the Table E-2, Shallow Soil Gas Screening Levels - Residential Exposure Scenario value of 2.3 ppmv for TPH-g/GRO only in the following locations, respective depths and at the following concentrations: B-1 at 5 feet bgs (6.6 ppmv) and 10 feet bgs (9.9 pmv); B-2 at 5 feet bgs (2.4 ppmv), 10 feet bgs (11 ppmv), and 15 feet bgs (4.2 ppmv); B-3 at 5 feet bgs (7.0 ppmv); B-5 at 5 feet bgs (6.2 ppmv); and B-6 at 5 feet bgs (4.2 ppmv), 10 feet bgs (2.3 ppmv), and 15 feet bgs (2.4 ppmv).
- Toluene, ethyl benzene, xylene and MTBE concentrations in onsite soil vapors did not exceed their respective Table E-2, Shallow Soil Gas Screening Levels - Residential Exposure Scenario values, which are as follows: 21.6 ppmv for toluene, 0.5 ppmv for ethyl benzene, 1.6 ppmv for total xylenes, and 2.6 ppmv for MTBE.
- Benzene concentrations in onsite soil vapors exceeded the Table E-2, Shallow Soil Gas Screening Levels - Residential Exposure Scenario value of 0.026 ppmv only in the following locations, respective depths and at the following concentrations: B-3 at 5 feet bgs (0.026 ppmv); and B-6 at 5 feet bgs (0.030 ppmv), at 10 feet bgs (0.029 ppmv), and 15 feet bgs (0.34 ppmv).

CONTAMINANT PLUME DEFINITION

A review of groundwater monitoring data for the Site indicates that the extent of the dissolved hydrocarbon plume has been defined in some directions and has not been adequately defined in others, particularly in the downgradient direction (east, southeast). The extent of the dissolved hydrocarbon plume is defined in the south by well AW-7, in the west by wells MW-2 and AW-2, in the northeast by wells AW-3 and AW-8, and in the southeast by well AW-9 (Figure 2). However, the extent of the dissolved hydrocarbon plume is not adequately defined east (downgradient) of the contaminant source area in the area between wells AW-4 and AW-8, and possibly remains inadequately defined north of wells AW-5 and AW-6 (Figure 2). Also wells AW-7, AW-8 and AW-9 have not been sampled since 1998, and wells MW-2 and AW-3 have not been sampled since 2000. Therefore, historical data from these wells may not reflect current conditions. A comparison of the most recent third quarter 2004 groundwater analytical results to the most conservative ESLs for groundwater that is a potential drinking water source (100 µg/L for TPH-g, 1.0 µg/L for benzene, and 5 µg/L for MTBE), and a review of the concentration trends of TPH-g, BTEX and MTBE over time for all wells with historic dissolved hydrocarbon detections (Attachment F) indicate the following:

- TPH-g/GRO, BTEX and MTBE concentrations in well MW-1, located in the immediate vicinity of the contaminant source area (former UST complex location) have overall indicated a decreasing trend. During the third quarter of 2004, TPH-g/GRO concentrations (18,000 µg/L) exceeded the TPH-g/GRO ESL for potential drinking water sources, and benzene and MTBE concentrations were non-detect (ND<50 µg/L).

However, the laboratory reporting limits for benzene and MTBE exceeded their respective ESLs for potential drinking water sources.

- TPH-g/GRO, BTEX and MTBE concentrations in upgradient wells MW-2 and AW-2 located west of the contaminant source area have historically indicated low to primarily non-detect levels.
- TPH-g/GRO, BTEX and MTBE concentrations in cross-gradient well AW-7 located south of the contaminant source area have historically indicated low to primarily non-detect levels.
- TPH-g/GRO, BTEX and MTBE concentrations in cross-gradient wells AW-3, AW-5 and AW-6 indicate varying trends, indicating an overall decreasing trend to consistently non-detect levels in AW-3. TPH-g/GRO, BTEX and MTBE concentrations indicate an overall decreasing trend in AW-5 after peaking in 1998, with BTEX concentrations consistently at non-detect levels. TPH-g/GRO and MTBE concentrations indicate an increasing trend in AW-6, while BTEX concentrations have remained consistently non-detect. During the third quarter of 2004, TPH-g/GRO and MTBE concentrations in AW-5 and AW-6 exceeded potential drinking water ESLs.
- TPH-g, BTEX and MTBE concentrations in wells MW-3, AW-1, AW-4, AW-8, AW-9, and RW-1 located in the general downgradient direction indicate an overall decreasing trend. TPH-g, BTEX and MTBE concentrations in wells AW-8 and AW-9 have consistently been non-detect. TPH-g and BTEX concentrations in MW-3 have consistently been non-detect since 2000, while MTBE concentrations indicate an overall decreasing trend and were below potential drinking water ESLs during the third of quarter 2004. TPH-g, BTEX and MTBE concentrations in AW-1, AW-4 and RW-1 exceeded their respective potential drinking water ESLs during the third quarter of 2004.

The TPH-g/GRO, benzene and MTBE iso-concentrations maps based on the analytical results of the third quarter 2004 and where necessary the first quarter 2004 and previous historical monitoring sessions indicate the following (Figures 7, 8 and 9):

- The core of the dissolved hydrocarbon plume with relatively elevated TPH-g/GRO, benzene and MTBE concentrations is primarily limited to the Site, and to the immediate offsite downgradient vicinity near well AW-4.
- A part of the dissolved hydrocarbon plume with relatively low TPH-g/GRO, benzene and MTBE concentrations has migrated offsite in the immediate site vicinity, primarily in the general downgradient direction (east, southeast)
- The migration of the dissolved hydrocarbon plume associated with the Site is not significant and accordingly, the potential threat of impact to downgradient receptors is unlikely to be of significant concern, except in the immediate downgradient offsite vicinity.

CORRECTIVE ACTION PLAN RECOMMENDATIONS

To assist in adequately defining the extent of the dissolved hydrocarbon plume, URS proposes initially conducting a comprehensive first quarter 2005 groundwater monitoring session involving all wells associated with the Site. Currently not all wells are being sampled, especially wells AW-3, AW-8 and AW-9, which are located in the general downgradient direction. The analytical results of the comprehensive first quarter 2005 groundwater monitoring session will assist in determining the appropriate locations to advance direct push borings for depth discrete soil and groundwater sampling to further define the extent of the plume, particularly in the general downgradient direction (east to southeast) and cross-gradient direction north of the Site. Based on the results of the depth discrete groundwater samples, the appropriate location(s) to install new groundwater monitoring wells will be determined.

Based on currently available analytical data, collection of depth discrete groundwater samples and/or installation of groundwater monitoring wells in the area between AW-4 and AW-8 on Springfield Road may possibly assist in adequately defining the downgradient direction of the plume (Figure 2). However, the first quarter 2005 analytical results of groundwater samples collected from AW-4, AW-8 and AW-9 will assist significantly in determining the appropriate locations for depth discrete groundwater sampling and will also assist in determining future monitoring well locations to adequately define the downgradient extent of the dissolved hydrocarbon plume (Figure 2). Also, if determined as necessary, depth discrete groundwater samples will also be collected north of wells AW-5 and AW-6 on 98th Avenue to assist in further defining the northern extent of the dissolved hydrocarbon plume (Figure 2).

Based on the assessment on the currently available analytical and hydrogeologic data, URS recommends the following corrective action plan:

- Analyze for bio-parameters during the 1st quarter comprehensive quarterly groundwater monitoring session and determine areas of the Site and the immediate vicinity where anaerobic and aerobic conditions exist. A Site-specific anaerobic and aerobic microbial parameter profiles will be determined. The profiles will evaluate the plate counts for total anaerobic and aerobic heterotrophic bacteria, contaminant degraders, macronutrients (i.e., ammonia phosphate and ortho-phosphate), Eh, pH, baseline dissolved oxygen (DO), alkalinity, biological oxygen demand (BOD), chemical oxygen demand (COD), total organic carbon (TOC) and total inorganic compounds (TIC) such as nitrate, sulfate, manganese, ferrous iron, ferric iron.
- Based on the results of the bio-parameters profiling, evaluate the effectiveness of using enhanced in-situ bioremediation technologies utilizing Oxygen Releasing Compounds (ORC), iSOC™ or ozone/peroxide injections to enhance aerobic degradation of hydrocarbons or utilizing bio-stimulant compounds (sulfates, other nutrients, etc.) to enhance anaerobic degradation of hydrocarbons, depending on microbial conditions.
- Monitor ongoing enhanced natural attenuation of hydrocarbons at the Site.

LIMITATIONS

This report is based on data, Site conditions and other information that is generally applicable as of the date of the report, and the conclusions and recommendations herein are therefore applicable only to that time frame. Background information including but not limited to previous field measurements, analytical results, Site plans and other data have been furnished to URS by Group Environmental Management Company, their previous consultants, and/or third parties, which URS has used in preparing this report. URS has relied on this information as furnished, and is neither responsible for nor has confirmed the accuracy of this information.

Analytical data provided by the Group Environmental Management Company approved laboratory has been reviewed and verified by the laboratory. URS has not performed an independent review of the data and is neither responsible for nor has confirmed the accuracy of this data. Field measurements have been supplied by a groundwater sampling subcontractor. URS has not performed an independent review of the field sampling data and is neither responsible for nor has confirmed the accuracy of this data.

If you have any questions or concerns, please contact Leonard Niles at (510) 874-1720.

Sincerely,

URS CORPORATION

Srijesh Thapa
Environmental Scientist

Leonard P. Niles, R.G. #5774, C.H.G. #35
Project Manager

CERTIFIED HYDROGEOLOGIST
LEONARD P. NILES
NO.HG357
EXP. 3/31/06
STATE OF CALIFORNIA

cc: Mr. Kyle Christie, BP, Environmental Resources Management,
(electronic file uploaded to ENFOS)
Ms. Liz Sewell, ConocoPhilips, 75 Broadway, Sacramento, California 95818

ATTACHMENTS

References
Figure 1 – Site Vicinity Map
Figure 2 – Site Map with Sample Locations
Figure 3 – Site Map with Cross-section Transects and Underground Utilities
Figure 4 – Hydrogeologic Cross-section A-A'
Figure 5 – Hydrogeologic Cross-section B-B'
Figure 6 – Groundwater Elevation Contour and Analytical Summary Map (Third Quarter 2004)
Figure 7 – GRO Isoconcentration Map (Third Quarter 2004)
Figure 8 – Benzene Isoconcentration Map (Third Quarter 2004)
Figure 9 – MTBE Isoconcentration Map (Third Quarter 2004)

Attachment A – ACHCS August 30, 2004 Letter
Attachment B – Historical Soil and Soil Vapor Analytical Data
Attachment C – Historical Groundwater Analytical and Gradient Data
Attachment D – Remediation System Operation Data and Product Removal Program Summary
Attachment E – RBCA Exposure Evaluation Flowcharts, Tiers 1, 2 and 3 Evaluations, and Statistical Analysis Results
Attachment F – Plots of Chemical Concentrations Vs. Time and Distance
Attachment G – Sensitive Receptor and Well Survey Results
Attachment H – Well Construction Details, Historic Hydrogeologic Cross-sections and Boring Logs

URS

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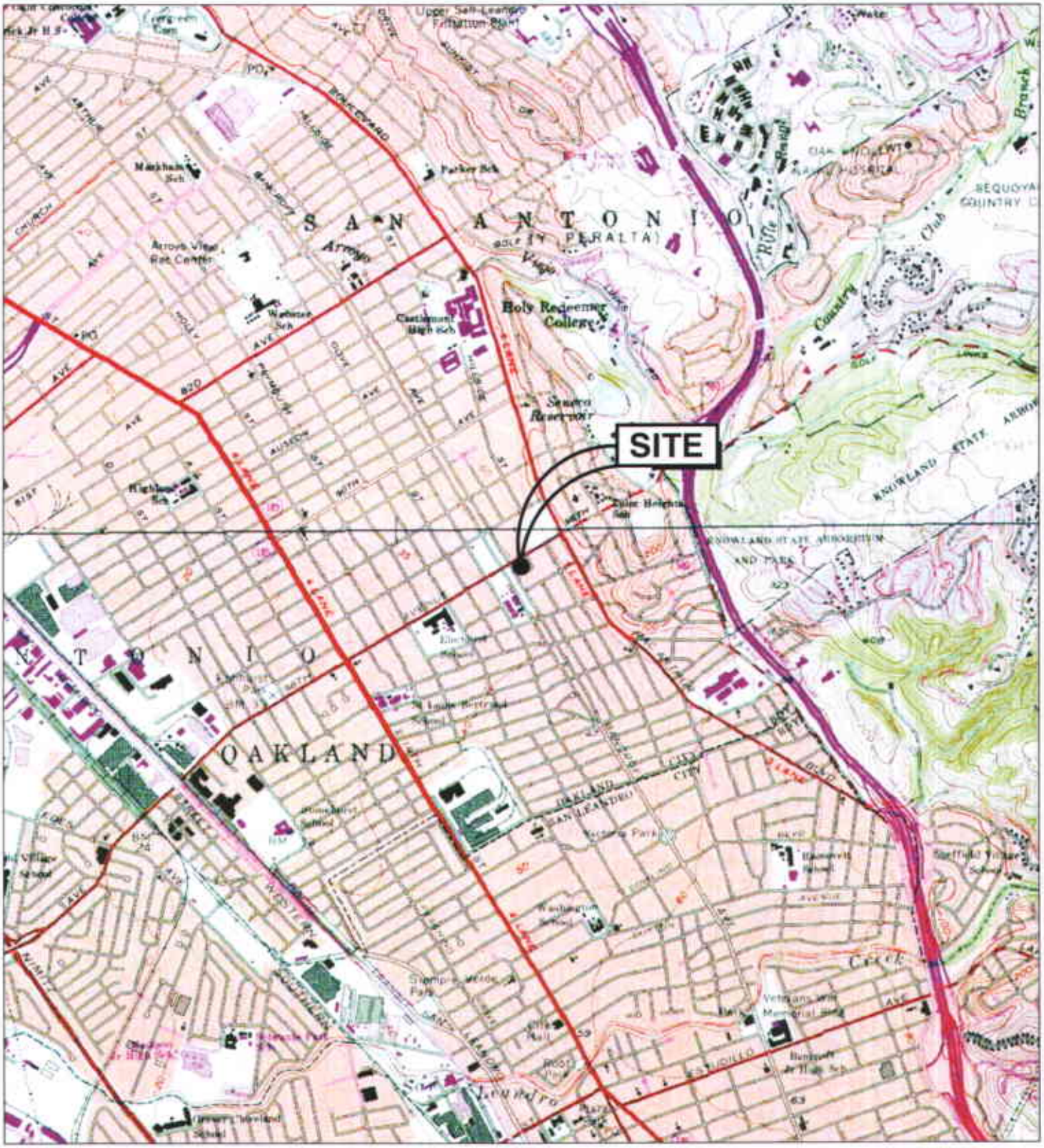

URS	Project No. 38486823 Former BP Service Station #11133 2220 98th Avenue Oakland, California	SITE VICINITY MAP	FIGURE 1

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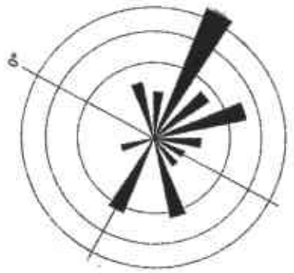
EXPLANATION

- Existing Monitoring Well
- Temporary Wells (January, 1990)
- Existing Vapor Extraction Well
- Existing Piping Vault
- Combined Groundwater Recovery/ Vapor Extraction Well
- TD-5 Tosco Dispenser Grab Sample Location (Dec. 1994)
- Grab Sample Location (Oct. 2001)
- Soil Sample Location (Oct. 1998)
- Trench/Excavation
- Existing Trench

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM



N=52
Interval= 10

Notes:

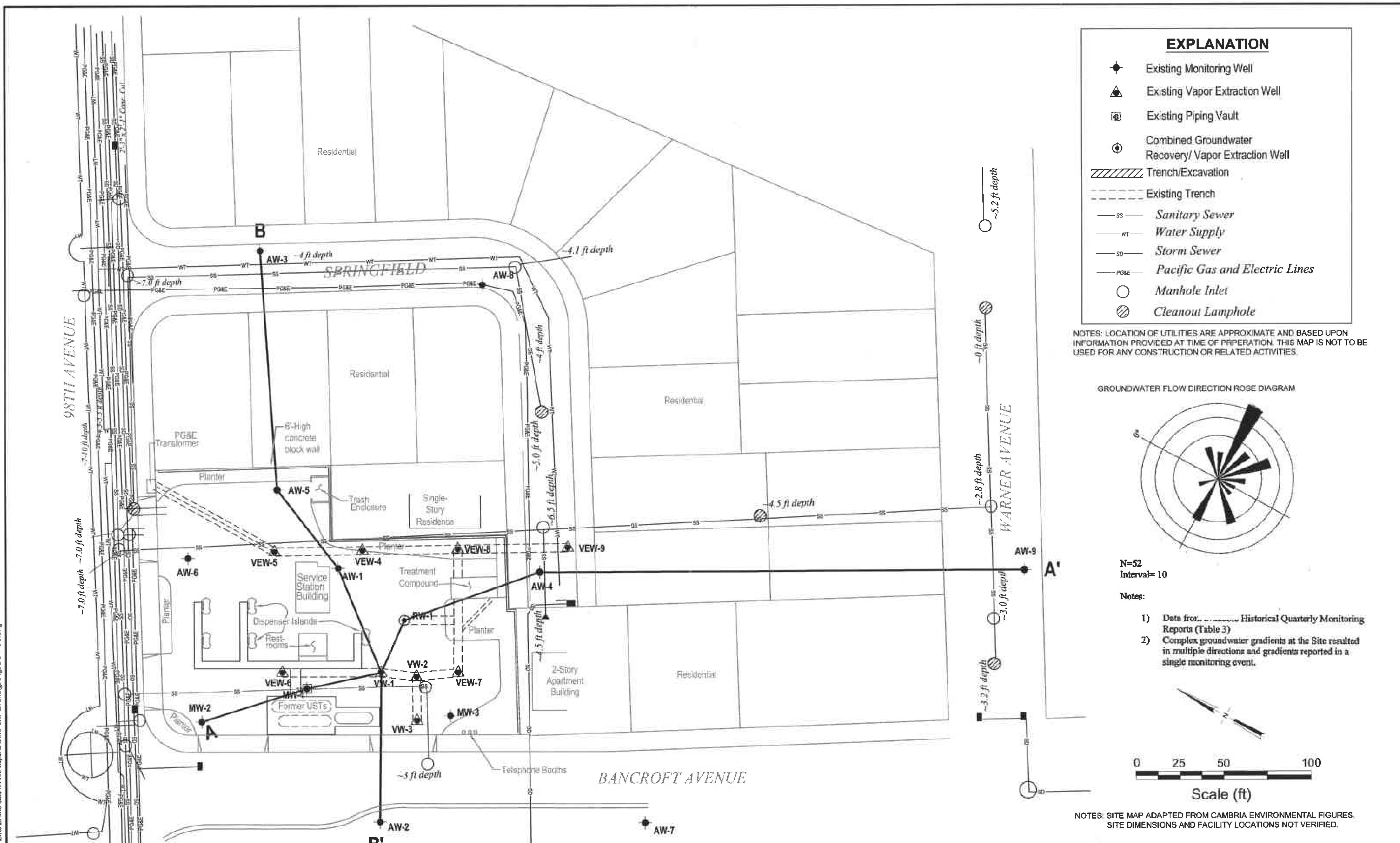
1) Data from available Historical Quarterly Monitoring Reports (Table 3)
2) Complex groundwater gradients at the Site resulted in multiple directions and gradients reported in a single monitoring event.

0 25 50 100

Scale (ft)

NOTES: SITE MAP ADAPTED FROM CAMBRIA ENVIRONMENTAL FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

URS	Project No. 38486823 Former BP Service Station #11133 2220 98th Avenue Oakland, California	SITE MAP WITH SAMPLE LOCATIONS	FIGURE 2



EXPLANATION
Existing Monitoring Well
Existing Vapor Extraction Well
Existing Piping Vault
Combined Groundwater Recovery/ Vapor Extraction Well
Trench/Excavation
Existing Trench
Sanitary Sewer
Water Supply
Storm Sewer
Pacific Gas and Electric Lines
Manhole Inlet
Cleanout Lamphole
NOTES: LOCATION OF UTILITIES ARE APPROXIMATE AND BASED UPON INFORMATION PROVIDED AT TIME OF PRPERATION. THIS MAP IS NOT TO BE USED FOR ANY CONSTRUCTION OR RELATED ACTIVITIES.
GROUNDWATER FLOW DIRECTION ROSE DIAGRAM
N=52
Interval= 10
Notes:
2) Complex groundwater gradients at the Site resulted in multiple directions and gradients reported in a single monitoring event.
0 25 50 100
Scale (ft)
NOTES: SITE MAP ADAPTED FROM CAMBRIA ENVIRONMENTAL FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.
98TH AVENUE
SPRINGFIELD
WARNER AVENUE
BANCROFT AVENUE
Residential
PG&E Transformer
6'-High concrete block wall
Planter
Trash Enclosure
Single-Story Residence
Service Station Building
Treatment Compound
Dispenser Islands
Rest-rooms
Former USTs
Telephone Booths
2-Story Apartment Building
B
B'
A
A'
AW-1
AW-2
AW-3
AW-4
AW-5
AW-6
AW-7
AW-9
MW-2
MW-3
MW-4
RW-1
VW-1
VW-2
VW-3
VEW-4
VEW-5
VEW-6
VEW-7
VEW-8
VEW-9
~4 ft depth
~4.1 ft depth
~7.0 ft depth
~5.2 ft depth
~0 ft depth
~4 ft depth
~5.0 ft depth
~6.5 ft depth
~4.5 ft depth
~2.8 ft depth
~3.0 ft depth
~3.2 ft depth
~3 ft depth

	Project No. 38486823	SITE MAP WITH CROSS SECTION TRANSECTS AND UNDERGROUND UTILITIES	FIGURE
URS	Former BP Service Station #11133 2220 98th Avenue Oakland, California		3

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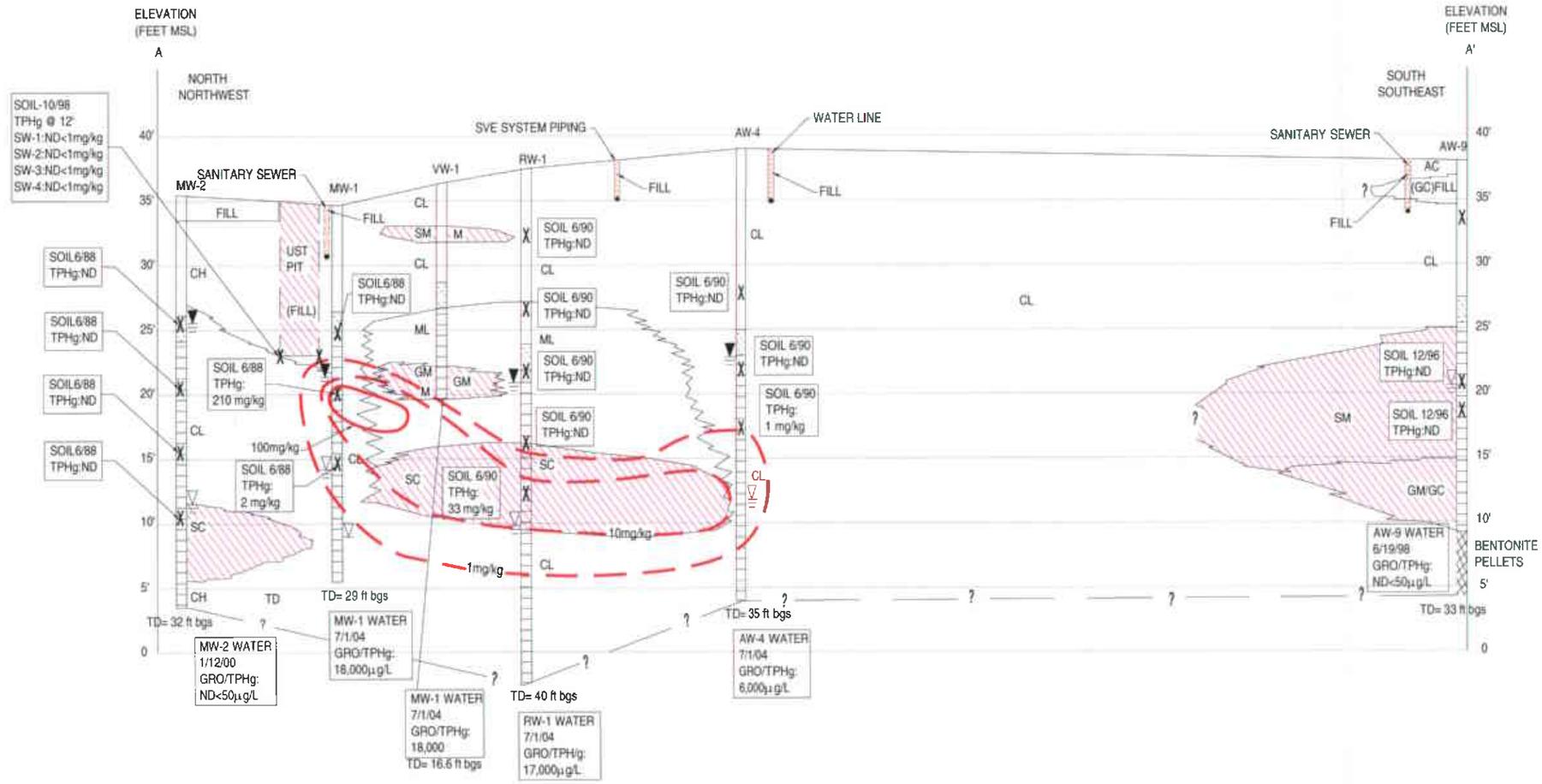

EXPLANATION

- WELL CASING
- FILTER PACK INTERVAL
- SCREENED INTERVAL
- FIRST ENCOUNTERED WATER WHILE DRILLING
- STATIC WATER LEVEL IN COMPLETED WELL, JULY 1, 2004
- MSL — FEET ABOVE MEAN SEA LEVEL
- X-SOIL-TPH-G 0.018mg/kg — SOIL SAMPLE ANANYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM
- WATER-GRO/TPH-G .75 µg/L — WATER SAMPLE ANANYTICAL RESULTS IN MICROGRAMS PER LITER
- ? CL SM — LITHOLOGY CONTACT; INFERRED WHERE DASHED OR QUERIED
- UST EXCAVATION; BACKFILLED WITH GRAVEL
- GP= GRAVEL, GW= GRAVEL } HIGH PERMEABILITY; SP= SAND, SW-SAND
- SM=SILTY SAND, GM=SILTY GRAVEL, GC=CLAYEY GRAVEL, SC=CLAYEY SAND } MODERATE PERMEABILITY
- ML=SILT, CL=CLAY, CH=CLAY } LOW PERMEABILITY
- UTILITY LINE BACKFILLED TRENCH
- 10 mg/kg — ISOCONCENTRATION CONTOUR, TPH-g IN mg/kg

0 50 100 — HORIZONTAL SCALE IN FEET

0 10 20 — VERTICAL SCALE IN FEET

URS	Project No. 38486828 Former BP Service Station #11133 2220 98th Avenue Oakland, California	HYDROGEOLOGIC CROSS-SECTION A-A'	FIGURE 4

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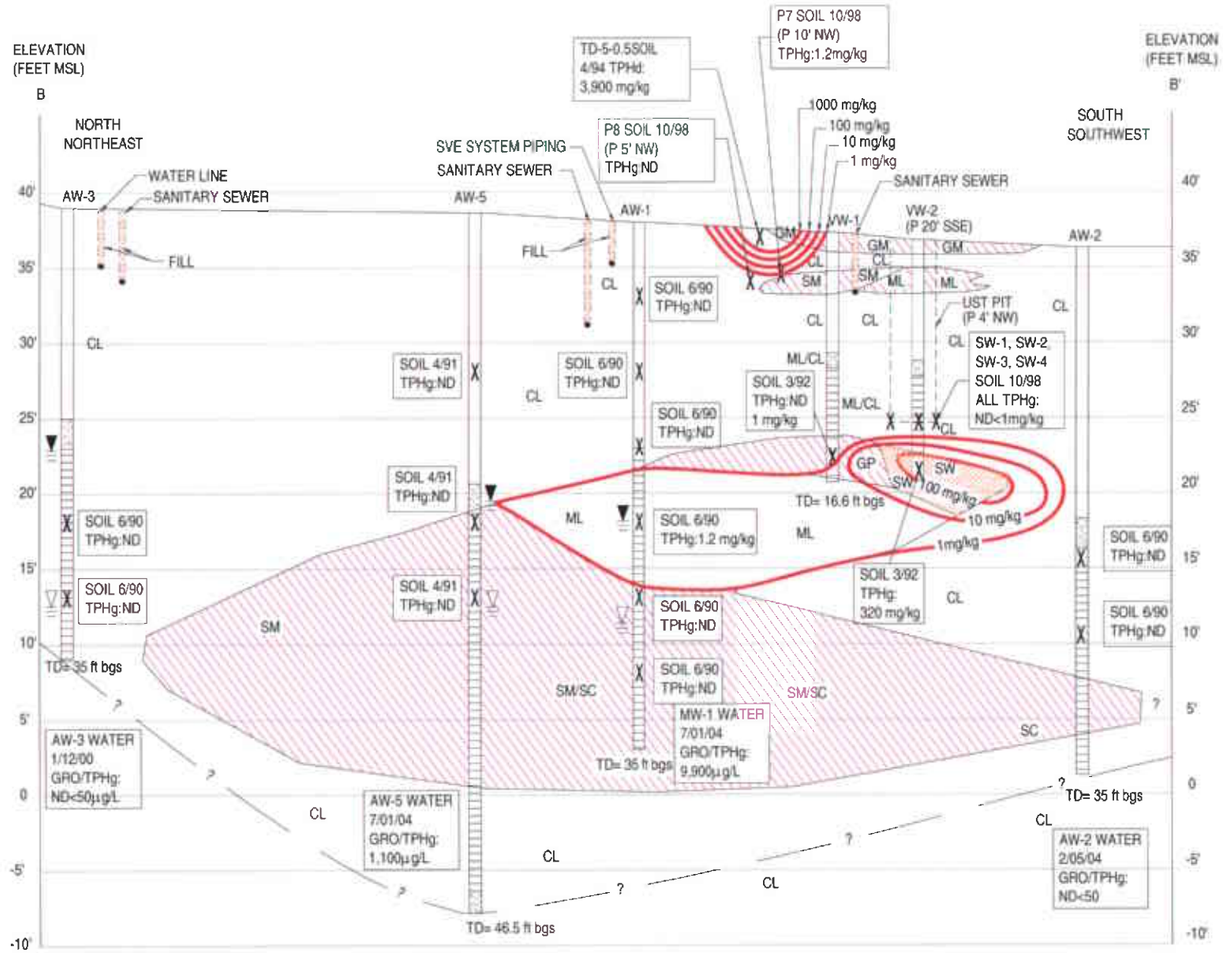


EXPLANATION

(P 20' SSE)	BORING IS PROJECTED, WITH DISTANCE IN FEET AND DIRECTION FROM CROSS-SECTION LINE.
	WELL CASING
	FILTER PACK INTERVAL
	SCREENED INTERVAL
	FIRST ENCOUNTERED WATER WHILE DRILLING
	STATIC WATER LEVEL IN COMPLETED WELL, JULY 1, 2004
MSL	FEET ABOVE MEAN SEA LEVEL
X-SOIL-TPH-G 0.018mg/kg	SOIL SAMPLE ANANYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM
WATER-GRO/TPH-G .75 µg/L	WATER SAMPLE ANANYTICAL RESULTS IN MICROGRAMS PER LITER

? CL SM	LITHOLOGY CONTACT; INFERRED WHERE DASHED OR QUERIED
	UST EXCAVATION; BACKFILLED WITH GRAVEL
	GP= GRAVEL GW= GRAVEL } HIGH PERMEABILITY SP= SAND SW-SAND
	SM=SILTY SAND GM=SILTY GRAVEL GC=CLAYEY GRAVEL } SC=CLAYEY SAND MODERATE PERMEABILITY
	ML=SILT CL=CLAY CH=CLAY } LOW PERMEABILITY

	UTILITY LINE BACKFILLED TRENCH
10 mg/kg	ISOCONCENTRATION CONTOUR TPH-g IN mg/kg

0 50 100
HORIZONTAL SCALE IN FEET

0 10 20
VERTICAL SCALE IN FEET

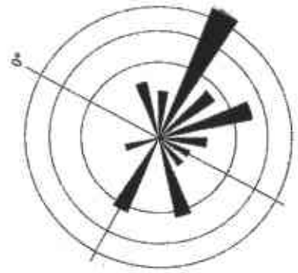
URS	Project No. 38486828 Former BP Service Station #11133 2220 98th Avenue Oakland, California	HYDROGEOLOGIC CROSS-SECTION B-B'	FIGURE 5

EXPLANATION

- Monitoring Well
- Vapor Extraction Well
- Combined Groundwater Recovery/ Vapor Extraction Well
- 0.08 — Groundwater Flow Gradient and Direction (Feet/Foot)
- 20.00 — Groundwater Elevation Contour (Feet above MSL)
- Well — Well Designation
- ELEV — Groundwater Elevation (Ft above MSL)
- GRO / Benzene / MTBE — GRO, Benzene and MTBE Concentrations in Micrograms Per Liter (µg/L)
- ND< — Not Detected at or Above Laboratory Reporting Limits
- NS — Not Sampled
- * — Not Used in Contours

NOTES: WELL AW-7 COULD NOT BE SAMPLED DUE TO INACCESSIBILITY. SITE MAP ADAPTED FROM CAMBRIA ENVIRONMENTAL FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM



N=52
Interval= 10

Notes:

1) Data from available Historical Quarterly Monitoring Reports
2) Complex groundwater gradients at the Site resulted in multiple directions and gradients reported in a single monitoring event.

0 25 50 100
Scale (ft)

URS	Project No. 38486815 Former BP Service Station #11133 2220 98th Avenue Oakland, California	GROUNDWATER ELEVATION CONTOUR AND ANALYTICAL SUMMARY MAP Third Quarter 2004 (July 1, 2004)	FIGURE 6

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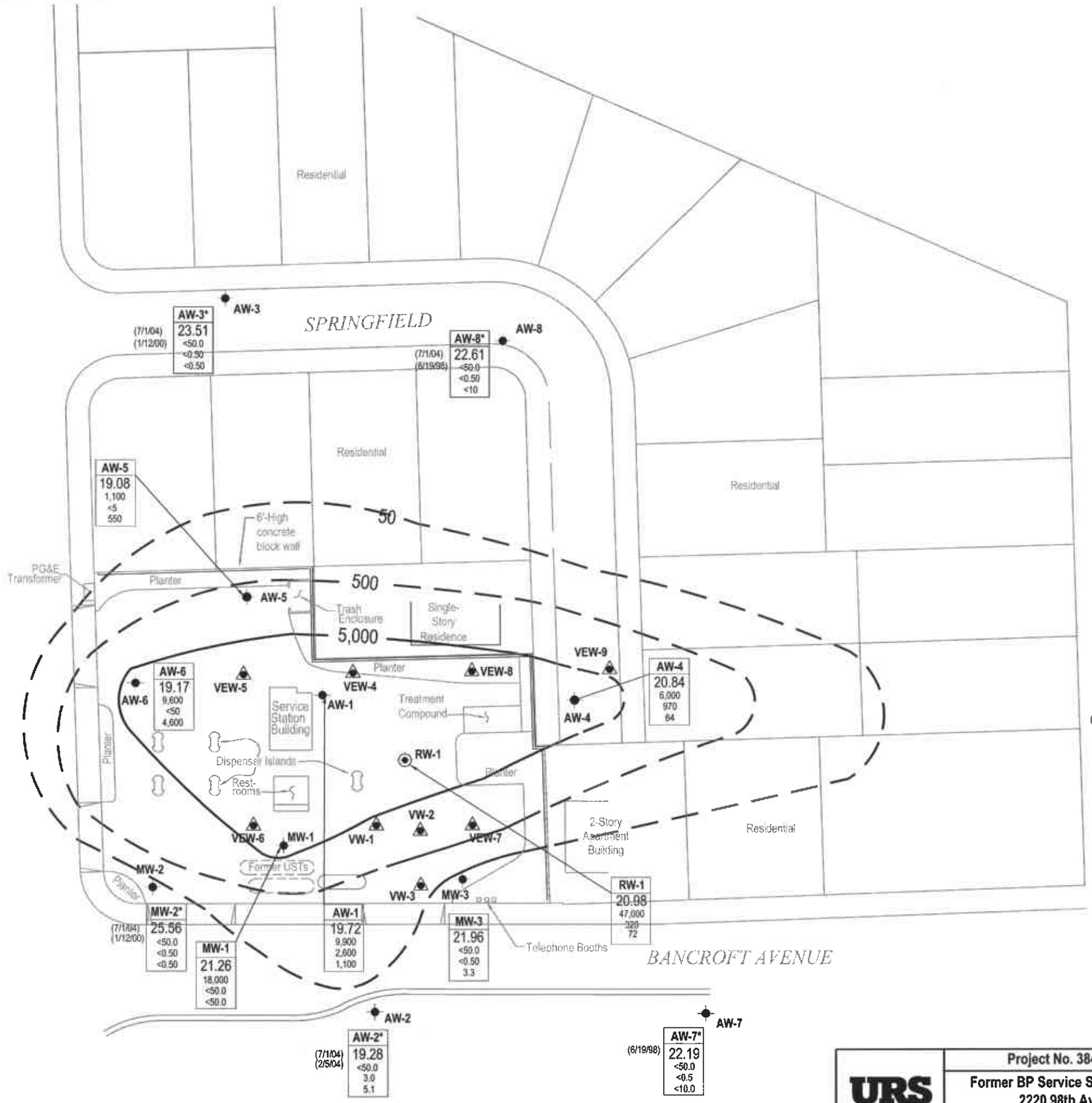
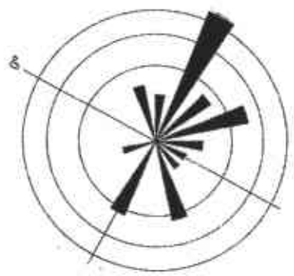


EXPLANATION

- Existing Monitoring Well
- Existing Vapor Extraction Well
- Combined Groundwater Recovery/ Vapor Extraction Well
- Well Designation
- ELEV — Groundwater Elevation (Ft above MSL)
- GRO, Benzene and MTBE Concentrations in Micrograms Per Liter (µg/L)
- ND< — Not Detected at or Above Laboratory Reporting Limits
- NS — Not Sampled
- * — Data from Previous Sampling Event, (date as marked)
- 50 — GRO Isoconcentration (µg/l)

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM



N=52
Interval= 10

Notes:

1) Data from available Historical Quarterly Monitoring Reports (Table 3)
2) Complex groundwater gradients at the Site resulted in multiple directions and gradients reported in a single monitoring event.

0 25 50 100
Scale (ft)

NOTES: SITE MAP ADAPTED FROM CAMBRIA ENVIRONMENTAL FIGURES.
SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

URS	Project No. 38486823 Former BP Service Station #11133 2220 98th Avenue Oakland, California	GASOLINE RANGE ORGANICS (GRO) ISOCONCENTRATION MAP Third Quarter 2004 (July 1, 2004)	FIGURE 7

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EXPLANATION

- Existing Monitoring Well
- Existing Vapor Extraction Well
- Combined Groundwater Recovery/ Vapor Extraction Well
- Well / ELEV / GRO / Benzene / MTBE — Well Designation; Groundwater Elevation (Ft above MSL); GRO, Benzene and MTBE Concentrations in Micrograms Per Liter (µg/L)
- ND< — Not Detected at or Above Laboratory Reporting Limits
- NS — Not Sampled
- * — Data from Previous Sampling Event, (date as marked)
- 50 — Benzene Isoconcentration (µg/l)

98TH AVENUE

SPRINGFIELD

BANCROFT AVENUE

WARNER AVENUE

Residential

AW-3* (7/1/04) (1/12/00): 23.57 / <50 / <0.50 / <0.50

AW-3

AW-8* (7/1/04) (6/19/98): 22.61 / <50 / <0.50 / <10

AW-8

AW-5: 19.08 / 1,100 / <5 / 550

AW-1: 19.72 / 9,900 / 2,600 / 1,100

RW-1: 20.98 / 47,000 / 320 / 72

AW-4: 20.84 / 6,000 / 970 / 64

AW-6: 19,17 / 9,600 / <50 / 4,600

MW-1: 21.26 / 38,000 / <50 / <50

MW-2* (7/1/04) (1/12/00): 25.56 / <50 / <0.5 / <0.5

MW-3: 21.96 / <50 / <0.5 / 3.3

AW-2* (7/1/04) (2/5/04): 19.28 / <50 / 3.0 / 5.0

AW-7* (6/19/98): 22.19 / <50.0 / <0.50 / <10.0

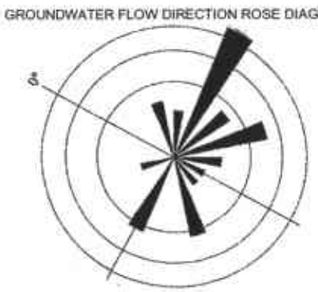
AW-9* (6/19/98): 28.82 / ND<50 / ND<0.5 / ND<10.0

0.5 — 5.0 — 50 — 500

6'-High concrete block wall; PG&E Transformer; Planter; Trash Enclosure; Single-Story Residence; Service Station Building; Treatment Compound; Dispenser Islands; Rest-rooms; Former USTs; 2-Story Apartment Building; Telephone Booths

VEW-4, VEW-5, VEW-6, VEW-7, VEW-8, VEW-9, VW-1, VW-2, VW-3

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM



N=52
Interval= 10

Notes:

1) Data from available Historical Quarterly Monitoring Reports (Table 3)
2) Complex groundwater gradients at the Site resulted in multiple directions and gradients reported in a single monitoring event.

0 25 50 100

Scale (ft)

NOTES: SITE MAP ADAPTED FROM CAMBRIA ENVIRONMENTAL FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

URS	Project No. 38486823 Former BP Service Station #11133 2220 98th Avenue Oakland, California	BENZENE ISOCONCENTRATION MAP Third Quarter 2004 (July 1, 2004)	FIGURE 8

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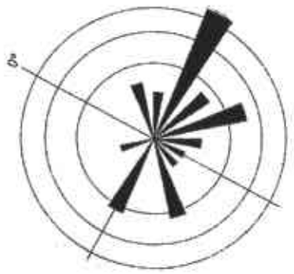
EXPLANATION

- Existing Monitoring Well
- Existing Vapor Extraction Well
- Combined Groundwater Recovery/ Vapor Extraction Well
- Well Designation
- Groundwater Elevation (Ft above MSL)
- GRO, Benzene and MTBE Concentrations in Micrograms Per Liter (µg/L)
- ND< Not Detected at or Above Laboratory Reporting Limits
- NS Not Sampled
- * Data from Previous Sampling Event, (date as marked)
- 50 MTBE Isoconcentration (µg/l)

Well
ELEV
GRO
Benzene
MTBE

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM



N=52
Interval= 10

Notes:

1) Data from available Historical Quarterly Monitoring Reports (Table 3)
2) Complex groundwater gradients at the Site resulted in multiple directions and gradients reported in a single monitoring event.

0 25 50 100
Scale (ft)

NOTES: SITE MAP ADAPTED FROM CAMBRIA ENVIRONMENTAL FIGURES.
SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

URS	Project No. 38486823 Former BP Service Station #11133 2220 98th Avenue Oakland, California	MTBE ISOCONCENTRATION MAP Third Quarter 2004 (July 1, 2004)	FIGURE 9

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ATTACHMENT A

ACHCS August 30, 2004 letter

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

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

August 30, 2004

Kyle Christie
Atlantic Richfield Company
6 Centerpointe Drive
LPR6-161
La Palma, CA 90623-1066

Subject: Fuel Leak Case No. RO0000403, BP No. 11133, Former Automobile Service Station at 2220 98th Avenue, Oakland, California

Dear Mr. Christie:

Alameda County Environmental Health (ACEH) has reviewed your recent groundwater monitoring report and the case file for the above-referenced site. Previous correspondence from BP suggested that the site would be redeveloped as a carwash. More recently, ACEH has received requests concerning residential redevelopment of the site. We request that you submit a site conceptual model and workplan for additional characterization by the due date specified below.

TECHNICAL REQUESTS

1. Site Conceptual Model

ACEH requests a Site Conceptual Model (SCM) that illustrates the relationship between contaminants, retention/transport media, and receptors. The SCM shall incorporate all aspects of the contaminant release investigation, including site geology, hydrogeology, release and cleanup history, residual and dissolved contamination, attenuation mechanisms, pathways to nearby receptors, and likely magnitude of potential impacts to receptors. The SCM is developed using readily available (existing) data and is used to identify data gaps that are subsequently filled as the investigation proceeds. Investigations continue until the SCM does not significantly change upon collection of additional information, and the SCM is said to be "validated." By clarifying major site issues, the validated SCM forms the foundation for developing the most cost-effective corrective action plan, and will help progress the case towards closure.

Technical guidance for developing SCMs is presented in ASTM 1689-95(2003)e1 *Standard Guide for Developing Conceptual Site Models for Contaminated Sties;* American Petroleum Institute Publication No. 4699 *Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE*, dated February 2000; EPA 510-B-97-001 *Expedited Site Assessment Tools for Underground Storage Tank Sites: A Guide for Regulators*, dated March 1997; and State Water Resources Control Board's *Guidelines for Investigation and Cleanup of MTBE and Other Ether-Based Oxygenates, Appendix C*, dated March 27, 2000.

At a minimum, the SCM for this project is to include the following:

A. A concise narrative discussion of the regional geologic and hydrogeologic setting. Include a list of technical references you reviewed.

B. A concise discussion of the on-site and off-site geology, hydrogeology, release source and history, secondary source areas, remediation status, risk assessment, plume migration, attenuation mechanisms, preferential pathways, and potential threat to downgradient receptors. The SCM shall include an analysis of the hydraulic flow system at and downgradient from the site, including potential vertical hydraulic gradients.

C. Local and regional maps showing location of sources, extent of soil and groundwater contamination for appropriate depth intervals (i.e., an interpretive drawings and isoconcentration maps—not a plot of laboratory results), rose diagram of recent and historical groundwater gradients, and locations of receptors. "Receptors" include, but are not limited to, all supply wells and surface water bodies within 2,000 feet of the source area, and all potentially impacted schools, hospitals, daycare facilities, residences, and other areas of heightened concern for vapor impact.

D. Geologic cross-sections (parallel and perpendicular to the contaminant plume axis) which include subsurface geologic features, depth to groundwater, man-made conduits, soil boring and sampling locations, monitoring well construction, and an interpretive drawing of the vertical extent of soil and groundwater contamination (i.e., an interpretive drawing—not a plot of laboratory results).

E. Exposure evaluation flowchart (similar to Figure 2 in ASTM's Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites).

F. Plots of chemical concentrations vs. time and vs. distance from the source. Plots should be shown for each monitoring well which has had detectable levels of contaminants.

G. Summary tables of chemical concentrations in each historically sampled media (including soil, groundwater and soil vapor).

H. Boring and well logs (including construction/screening), and a summary table indicating construction specifications for each monitoring and extraction well.

I. Identification and listing of specific data gaps that require further investigation during subsequent phases of work.

J. Proposed activities to investigate and fill data gaps identified above.

2. Conduit Study

The objectives of the conduit study are to 1) locate potential migration pathways and 2) evaluate the potential for contaminant migration via the identified pathways. We request that you perform a conduit study that details the potential migration pathways and potential conduits (utilities, storm drains, etc.) that may be present in the vicinity of the site. Provide a map showing the location and depth of all utility lines and trenches including sewers and storm drains within and near the plume area. The conduit study shall include a detailed survey of all wells (monitoring and production wells: active, inactive, standby, destroyed (sealed with concrete), abandoned (improperly destroyed); and dewatering, drainage, and cathodic protection wells) within a 2,000 ft radius of the site. The results of your conduit study shall contain all information required by 23 CCR, Section 2654(b). Submittal of maps showing the location of all wells identified in your study, and the use of tables to report the data collected as part of your survey are required. We recommend that you obtain well information from the State of California Department of Water Resources, at a minimum. Please include an analysis and interpretation of your findings, and report your results in the site conceptual model requested above.

3. Site Characterization

In October 2001, Cambria Environmental advanced soil borings B-1 through B-6 and detected up to 30,600 ug/L benzene and 1,500 ug/L MTBE in groundwater near the property boundary between the site and adjacent residences. At that time, local groundwater was thought to flow to the northwest or the north[1,2]. Since mid-2003, reports prepared by URS Corporation have indicated that groundwater flows from the site toward the southwest[3,4]. Based on the current understanding of flow direction, no subsurface investigation has been performed downgradient of borings B-1 through B-6. Offsite well AW-8 is located approximately 140 ft east-northeast (crossgradient or upgradient) of boring B-6. Offsite well AW-4 is located approximately 40 ft south (upgradient and crossgradient) of boring B-6. We request that you prepare a workplan for additional downgradient investigation.

Up to 1.38 ft of separate phase hydrocarbons (SPH) have been detected in onsite well RW-1. In addition, the groundwater concentrations detected in boring B-6 exceed 10% of the pure component solubility of benzene. Accordingly, your proposed scope of work should include tasks that will evaluate the potential presence of LNAPL beneath the downgradient residences.

The workplan must also propose tasks which investigate potential contaminant migration via preferential pathways identified in the conduit study requested above (Comment #2). Depending on the depth of subsurface utilities relative to historical groundwater depths, sampling within utility backfill and within conduits such as storm drains may be necessary. If necessary or prudent based on the findings of your conduit study, your workplan should propose tasks which will evaluate the potential for the storm drains beneath Springfield Street to influence dissolved contaminant migration from the site.

REPORT REQUEST

Please submit an *Additional Investigation Workplan* containing the SCM and conduit study requested above by **September 30, 2004**. CCR, Title 23, Chapter 16 requires your compliance with this request. If it appears as though significant delays are occurring or reports are not submitted as requested we will consider referring your case to the County District Attorney or other appropriate agency, for enforcement. Under California Health and Safety Code, Section 25299.76, you may be subject to civil penalties of up to $10,000 per day for each day of violation.

[1] Blaine Tech Services, 3rd Quarter 2001 Monitoring at 11133, September 25, 2001.
[2] Cambria Environmental Technology, First Quarter 2002 Groundwater Monitoring Report, April 30, 2002.
[3] URS Corporation, *Second 2003 Semi-Annual Groundwater Monitoring Report,* August 15, 2003.
[4] URS Corporation, *First 2004 Semi-Annual Groundwater Monitoring Report*, March 4, 2004.

Please call me at (510) 567-6719 with any questions regarding this case.

Sincerely,

Robert W. Schultz, R.G.
Hazardous Materials Specialist

cc: Scott Robinson, URS Corporation, 500 12th St., Ste. 200, Oakland, CA 94607-4014
Liz Sewell, ConocoPhillips, Risk Management & Remediation, 76 Broadway, Sacramento, CA 95818
First Interstate Bank of California, c/o Property Tax Dept. DC-17, P.O. Box 52085, Phoenix, AZ 85072
Donna Drogos, ACEH
Robert W. Schultz, ACEH

ATTACHMENT B

Historical Soil and Soil Vapor Analytical Data

RESNA
Working To Restore Nature

TABLE 1
RESULTS OF ANALYSES OF SOIL SAMPLES FROM TANK EXCAVATION
BP Oil Company Service Station No. 11133
2220 - 98th Avenue
Oakland, California

Sample Number	Sample Depth	TPHg	Benzene	Toluene	Total Xylenes
June 17, 1987					
A1	13.5	420	15	42	30
A2	13.5	16	2.3	2.2	0.95
B1	13.5	400	23	41	22
B2	14.0	150	4.6	11	12
C1	13.5	12	0.74	0.46	0.65

Results in parts per million (ppm)
< = less than detection limits
TPHg = Total petroleum hydrocarbons as gasoline

TABLE - 1

Results of Soil Analyses - Parts Per Million

Sample Number	Depth (feet)	TPH	Benzene	Toluene	Xylene	Ethylbenzene
MW-1	10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-1	15	210	7.1	20	23	4.5
MW-1	20	2	1.24	0.07	0.021	0.0035
MW-2	10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-2	15	<0.05	0.0007	0.0008	<0.0005	<0.0005
MW-2	20	<0.05	0.0008	<0.0005	<0.0005	<0.0005
MW-2	25	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-3	10	<0.05	0.00081	0.0018	<0.0005	0.0012
MW-3	15	<0.05	0.0007	0.0007	<0.0005	<0.0005
MW-3	20	<0.05	0.0016	0.0035	<0.0005	<0.0005
MW-3	25	<0.05	0.00076	0.0014	<0.0005	<0.0005

Results of Water Analyses - parts per billion

Sample Number	Depth (feet)	TPH	Benzene	Toluene	Xylene	Ethylbenzene
MW-1	16.583	76,000	29,000	23,000	12,000	2600
MW-2	23.833	ND	0.55	0.66	0.58	ND
MW-3	23.667	ND	ND	ND	ND	ND

* TPH = Total Petroleum Hydrocarbon
ND = Not Detected

RESNA
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TABLE 2
RESULTS OF ANALYSES OF SOIL SAMPLES FROM BORINGS
BP Oil Company Service Station No. 11133
2220 - 98th Avenue, Oakland, California
(page 1 of 2)

Boring Number	Sample Depth	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
June 1990						
AW-1	5.0	ND	ND	ND	ND	ND
AW-1	10.0	ND	0.011	ND	ND	ND
AW-1	15.0	ND	0.007	ND	ND	ND
AW-1	20.0	1.2	0.470	ND	ND	ND
AW-1	25.0	ND	0.013	ND	ND	ND
AW-1	30.0	ND	ND	ND	ND	ND
AW-2	21.0	ND	ND	ND	ND	ND
AW-2	26.0	ND	ND	ND	ND	ND
AW-3	21.0	ND	0.074	0.027	0.010	0.049
AW-3	26.0	ND	0.083	0.010	0.004	0.018
AW-4	11.0	ND	ND	ND	ND	ND
AW-4	16.0	ND	0.170	0.010	0.024	0.045
AW-4	21.0	1.0	0.150	0.013	0.040	0.090
RW-1	5.0	ND	ND	ND	ND	ND
RW-1	10.0	ND	0.006	ND	ND	ND
RW-1	15.0	ND	0.031	ND	ND	ND
RW-1	20.0	ND	0.230	0.088	0.010	0.040
RW-1	25.0	33.0	1.000	0.710	ND	2.300
April 1991						
SBA-5	10.5-11.0	<1	0.016	<0.003	<0.003	<0.003
(AW-5)	20.5-21.0	<1	0.020	<0.003	0.007	0.008
	25.5-26.0	<1	0.0077	<0.003	0.003	0.011
SBA-6	10.5-11.0	<1	0.091	0.022	0.008	0.040
(AW-6)	20.5-21.0	<1	<0.003	<0.003	<0.003	<0.003
	25.5-26.0	<1	0.005	0.010	<0.003	0.0066

Results in parts per million (ppm)
< = less than detection limits
TPHg = Total petroleum hydrocarbons as gasoline

RESNA
Working To Restore Nature

TABLE 2
RESULTS OF ANALYSES OF SOIL SAMPLES FROM BORINGS
BP Oil Company Service Station No. 11133
2220 - 98th Avenue, Oakland, California
(page 2 of 2)

Boring Number	Sample Depth	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
April 1991						
SBA-7	10.5-11.0	<1	<0.003	<0.003	<0.003	<0.003
(AW-7)	20.5-21.0	<1	<0.003	<0.003	<0.003	<0.003
	25.5-26.0	<1	<0.003	<0.003	<0.003	<0.003
SBA-8	10.5-11.0	<1	<0.003	<0.003	<0.003	<0.003
(AW-8)	20.5-21.0	<1	<0.003	<0.003	<0.003	<0.003
March 1992						
S-B9-16.0	9	<1	0.008	0.011	0.018	0.0064
S-B10-6.5	10	<1	<0.005	<0.005	<0.005	<0.005
S-B10-11.5	10	<1	<0.005	<0.005	<0.005	<0.005
S-B10-16.0	10	<1	<0.005	<0.005	<0.005	<0.005
S-B11-16.5	11	320	0.074	0.25	3.2	11

Results in parts per million (ppm)
< = less than detection limits
TPHg = Total petroleum hydrocarbons as gasoline

TABLE 1 - SUMMARY OF RESULTS OF SOIL SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11133
2220 98TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-025

BORI ID	SAMPLE DEPTH (feet)	DATE OF SAMPLING	TPH-G (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	MTBE (mg/kg)	LAB
AW-9	16.5-17	12/03/96	ND<0.1	ND<0.001	ND<0.002	ND<0.002	ND<0.002	ND<0.1	SPL
AW-9	19-19.5	12/03/96	ND<0.1	ND<0.001	ND<0.002	ND<0.002	ND<0.002	ND<0.1	SPL

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
MTBE	Methyl tert butyl ether
mg/kg	Milligrams per kilograms
SPL	Southern Petroleum Laboratories

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Table 1 - Chemical Analytical Data

Former Tosco BP Branded Facility No. 11133
2220 98th Avenue
Oakland, California

Sample ID	Date Collected	Sample Depth (feet)	TPHg (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-Benzene (ppm)	Xylenes (ppm)	MTBE (ppm)	Lead (ppm)
GASOLINE UST PIT (SOIL)									
SW1	10/1/98	12	ND	ND	ND	ND	ND	ND	NR
SW2	10/1/98	12	ND	ND	ND	ND	ND	0.43	NR
SW3	10/1/98	12	ND	ND	ND	ND	ND	0.099	NR
SW4	10/1/98	12	ND	ND	ND	ND	ND	ND	NR
PRODUCT LINES (SOIL)									
P1	10/1/98	3.5	ND	ND	ND	ND	0.029	ND	NR
P2	10/1/98	3.5	ND	ND	ND	ND	ND	4.0	NR
P3	10/1/98	3.5	ND	ND	ND	ND	ND	ND	NR
P4	10/1/98	3.5	ND	ND	ND	ND	ND	ND	NR
P5	10/1/98	3.5	ND	0.0085	0.047	0.0071	0.057	0.74	NR
P6	10/1/98	3.5	ND	ND	ND	ND	ND	ND	NR
P7	10/1/98	3.5	1.2[1]	0.067	0.090	ND	0.042	2.0	NR
P8	10/1/98	3.5	ND	ND	ND	ND	ND	ND	NR
STOCKPILES									
Comp A	10/1/98	NA	ND	ND	ND	ND	ND	ND	5.0
Comp B	10/1/98	NA	ND	ND	ND	ND	0.026	ND	1.4
Comp C	10/1/98	NA	ND	ND	ND	ND	ND	ND	2.4
Comp D	10/1/98	NA	ND	ND	ND	ND	ND	ND	2.0
Comp E	10/1/98	NA	ND	ND	ND	ND	ND	ND	ND
Comp F	10/1/98	NA	ND	ND	ND	ND	0.0091	ND	1.2

Table 1 - Chemical Analytical Data

Former Tosco BP Branded Facility No. 11133
2220 98th Avenue
Oakland, California

Sample ID	Date Collected	Depth to Water (feet)	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-Benzene (ppb)	Xylenes (ppb)	MTBE (ppb)	Lead (ppm)
GASOLINE UST PIT (WATER)									
Water-1	10/1/98	12.5	430	46	20	0.65	89	1,200	NR
Water-2	10/1/98	12.5	3,700	98	450	56	360	4,100	NR

EXPLANATION:
ND = none detected
NA = not applicable
ppm = parts per million
ppb = parts per billion
NR = analysis not requested

ANALYTICAL LABORATORY;
Sequoia Analytical (ELAP # 1271)

NOTES:
[1] = Laboratory report indicates unidentified hydrocarbons C6-C12

ANALYTICAL METHODS;
TPHg = Total petroleum hydrocarbons as gasoline according to EPA Method 8015 Modified.
BTEX = Benzene, toluene, ethylbenzene, and xylenes according to EPA Method 8020.
MTBE = Methyl tert-butyl ether according to EPA Method 8020.

Table
Soil Analytical Data
BP Site No. 11133
2220 98th Avenue, Oakland, California

Sample ID	Date Sampled	Sample Depth (feet bgs)	TPH-g (mg/kg)	TPH-d (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	Total Lead (mg/kg)
VEW-9	May-96	16.5	<0.1	NA	<0.001	<0.002	<0.002	<0.002	<0.1	NA
VEW-9	May-96	Composite	<0.1	NA	<0.001	<0.002	<0.002	<0.002	<0.1	4.0
TD-5-0.5	Dec-94	0.5	ND	**3,900**	ND	ND	ND	ND	NA	NA

Source: MWH 2002, "Risk-based Corrective Action (RBCA) Evaluation for BP Oil Facility No. 11133. March.

Abbreviations and Notes:

mg/kg = Milligrams per kilogram
MTBE = Methyl tert-butyl ether
TPH-g = Total petroleum hydrocarbons as gasoline
TPH-d = Total petroleum hydrocarbons as diesel
<n = Below detection limit of n mg/kg
NA = Not analyzed
ND = Not detected

CAMBRIA

Table 1. **Soil Analytical Data** - BP Site No. 11133, 2220 98th Avenue, Oakland, California

Sample ID (Depth in feet)	Date Sampled	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	Total Lead (mg/kg)
Analytical Method:		8015m	8021	8021	8021	8021	8021	6010
B-1-4.5	10/22/01	**0.49**	<0.005	<0.005	<0.005	<0.005	<0.005	-
B-1-13.5	10/22/01	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	-
B-2-5	10/22/01	**1.6**	<0.005	<0.005	<0.005	<0.005	<0.005	-
B-2-13.5	10/22/01	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	-
B-3-4.5	10/22/01	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	-
B-3-13.5	10/22/01	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	-
B-4-4.5	10/22/01	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	-
B-4-13.5	10/22/01	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	-
DUP	10/22/01	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	-
B-4-19.5	10/22/01	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	-
B-5-5.5	10/23/01	**0.084**	<0.005	<0.005	<0.005	<0.005	<0.005	-
B-5-19.5	10/23/01	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	-
B-6-5.5	10/23/01	<0.250	<0.005	<0.005	<0.005	**0.013**	<0.005	-
B-6-19.5	10/23/01	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	-
Composite	10/23/01	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<4.72

Abbreviations and Notes:

mg/kg = Milligrams per kilogram
MTBE = Methyl tert-butyl ether
TPHg = Total petroleum hydrocarbons as gasoline
<n = Below detection limit of n mg/kg
--- = Not analyzed

CAMBRIA

Table 2. **Soil-Vapor Analytical Data** - BP Site No. 11133, 2220 98th Avenue, Oakland, California

Sample ID (Depth in feet)	Date Sampled	TPHg (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethyl-benzene (ppmv)	Xylenes (ppmv)	MTBE (ppmv)	Oxygen (%)	Total Methane (%)	Carbon Dioxide (%)
Analytical Method:		TO-3	TO-3	TO-3	TO-3	TO-3	TO-3	D-1946	D-1946	D-1946
B-1-V1 (5')	10/22/01	6.6	0.0073	0.0062	<0.0020	0.0049	0.0038	-	-	-
B-1-V2 (10')	10/22/01	9.9	<0.0027	0.0033	<0.0027	0.0031	<0.0027	-	-	-
B-1-V3 (15')	10/22/01	1.8	0.0033	0.0096	<0.0025	0.0067	0.0050	-	-	-
B-2-V1 (5')	10/22/01	2.4	0.0080	0.0070	<0.0026	0.0038	<0.0026	22	<0.0026	0.28
B-2-V2 (10')	10/22/01	11	0.0062 a	0.0063	<0.0026	<0.0026	<0.0026	21	<0.0026	0.33
B-2-V3 (15')	10/22/01	4.5	0.0072	0.0072	<0.0025	0.0035	<0.0025	20	<0.0025	0.33
B-3-V1 (5')	10/22/01	7.0	0.026	0.019	<0.0025	0.0098	0.0047	-	-	-
B-3-V2 (10')	10/22/01	2.2	0.0079	0.0055	<0.0036	0.0039	<0.0036	-	-	-
B-3-V3 (15')	10/22/01	1.6	0.0064	0.0074	0.0027	0.0063	0.0040	-	-	-
B-4-V1 (5')	10/22/01	1.3	0.010 a	0.0082	<0.0029	0.0043	<0.0029	20	<0.0029	0.066
B-4-V2 (10')	10/22/01	1.3	0.0042 a	0.0060	<0.0026	0.0051	<0.0026	20	<0.0026	0.070
B-4-V3 (15')	10/22/01	2.1	0.013	0.011	0.0040 a	0.0090	0.0042	20	<0.0025	0.092
B-5-V1 (5')	10/23/01	6.2	0.023 a	0.020	<0.0040	0.012	0.0070	-	-	-
B-5-V2 (10')	10/23/01	2.0	0.0058	0.0094	<0.0024	0.0084	0.0033	-	-	-
B-5-V3 (15')	10/23/01	1.7	<0.0042 b	0.0055	<0.0042 b	<0.0042 b	<0.0042 b	-	-	-
B-6-V1 (5')	10/23/01	4.2	0.030 a	0.017	0.0078	0.11	0.0062	-	-	-
B-6-V2 (10')	10/23/01	2.3	0.029	0.060	0.0070	0.025	0.0061	-	-	-
B-6-V3 (15')	10/23/01	2.4	0.34	0.23	0.15	0.59	0.062	-	-	-

Abbreviations and Notes:

ppmv = Parts per million by volume
MTBE = Methyl tert-butyl ether
TPHg = Total petroleum hydrocarbons as gasoline
<n = Below detection limit of n ppmv or %
- = Not analyzed
a = Reported value may be biased due to apparent matrix interferences.
b = Elevated reporting limits due to high residual canister vacuum.

ATTACHMENT C

Historical Groundwater Analytical and Gradient Data

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-1	4/5/1991	--	38.11	25.44	--	12.67	4,100	1,500	69	100	83	--	--	SUP	--	
	4/1/1992	--	38.11	23.22	--	14.89	--	--	--	--	--	--	--	--	--	
	4/2/1992	--	38.11		--		11,000	1,800	210	210	490	--	--	APP	--	
	7/6/1992	--	38.11	24.89	--	13.22	6,500	4,000	40	290	530	--	--	ANA	--	
	10/7/1992	--	38.11	--	--	--	2,900	1,200	25	37	210	--	--	ANA	--	QC-1, e
	10/7/1992	--	38.11	26.55	--	11.56	4,700	1,500	41	47	300	--	--	ANA	--	
	1/14/1993	--	38.11	--	--	--	4,100	1,700	28	130	230	--	--	PACE	--	QC-1, e, m
	1/14/1993	--	38.11	23.73	--	14.38	2,800	830	31	140	240	--	--	PACE	--	
	4/22/1993	--	38.11	--	--	--	39,000	14,000	530	1,800	6,100	987	--	PACE	--	m
	7/15/1993	--	38.11	22.50	--	15.61	6,200	2,200	28	210	540	838	--	PACE	--	c, m
	10/21/1993	--	38.11	24.32	--	13.79	2,400	820	13	55	120	832	--	PACE	--	c, m
	1/27/1994	--	38.11	23.72	--	14.39	3,500	1,400	26	130	220	650	--	PACE	--	c, m
	4/21/1994	--	38.11	22.48	--	15.63	40,000	12,000	1,900	1,600	5,000	1,119	1.4	PACE	--	c, m
	9/9/1994	--	38.11	--	--	--	3,900	1,900	5.5	190	240	--	--	PACE	--	QC-1, e
	9/9/1994	--	38.11	23.04	--	15.07	3,500	1,600	5	200	250	--	2.1	PACE	--	m
	12/21/1994	--	38.11	21.70	--	16.41	7,600	3,100	36	370	320	855	1.6	PACE	--	
	1/30/1995	--	38.11	17.71	--	20.40	35,000	23,000	650	3,200	4,100	--	1.7	ATI	--	
	4/10/1995	--	38.11	--	--	--	56,000	17,000	2,000	3,900	10,000	--	--	ATI	--	QC-1, e
	4/10/1995	--	38.11	20.04	--	18.07	60,000	18,000	2,000	4,300	11,000	--	7.9	ATI	--	
	6/29/1995	--	38.11	--	--	--	86,000	12,000	8,400	4,800	18,000	--	--	ATI	--	QC-1, e
	6/29/1995	--	38.11	20.60	--	17.51	72,000	10,000	7,300	4,200	15,000	--	6.2	ATI	--	
	9/18/1995	--	38.11	21.87	--	16.24	--	--	--	--	--	--	--	--	--	
	9/19/1995	--	38.11		--		65,000	12,000	3,100	4,400	14,000	1,000	8.5	ATI	--	
	12/7/1995	--	38.11	22.06	--	16.05	25,000	8,700	<50	2,500	1,300	1,100	2.9	ATI	--	
	3/28/1996	--	38.11	16.91	--	21.20	24,000	11,000	<100	3,200	3,390	<1000	6.6	SPL	--	
	6/20/1996	--	38.11	20.82	--	17.29	38,000	6,900	1,100	3,200	7,300	<100	6.4	SPL	--	
	10/11/1996	--	38.11	23.20	--	14.91	33,000	8,500	69	3,300	4,230	580	6.3	SPL	--	
	1/2/1997	--	38.11	20.41	--	17.70	32,000	8,000	<50	3,100	2,300	700	6.7	SPL	--	
	4/14/1997	--	38.11	21.61	--	16.50	--	--	--	--	--	--	--	--	--	
	4/15/1997	--	38.11		--		31,000	5,000	160	2,400	4,540	340	5.4	SPL	--	
	7/2/1997	--	38.11	21.17	--	16.94	26,000	5,800	<100	2,600	2,200	<1000	6.2	SPL	--	
	9/30/1997	--	38.11	21.48	--	16.63	29,000	9,200	17	1,400	130	560	6.9	SPL	--	
	1/21/1998	--	38.11	20.02	--	18.09	50,000	6,900	450	3,200	4,450	720	5.8	SPL	--	
	4/9/1998	--	38.11	13.37	--	24.74	--	--	--	--	--	--	--	--	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133

2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-1	4/10/1998	--	38.11		--		46,000	5,800	1,900	3,000	7,400	1,000	4.3	SPL	--	
	6/19/1998	--	38.11	--	--	--	43,000	6,800	260	3,100	3,490	620	--	SPL	--	QC-1, e
	6/19/1998	--	38.11	19.12	--	18.99	42,000	6,600	200	3,000	3,350	660	4.9	SPL	--	
	11/30/1998	--	38.11	21.13	--	16.98	23,000	6,700	<25	3,100	130	710/820	--	SPL	--	g
	1/21/1999	--	38.11	20.77	--	17.34	25,000	4,800	54	2,800	780	1,000	--	SPL	--	
	4/30/1999	--	38.11	20.80	--	17.31	21,000	5,300	67	2,800	750	1,500	--	SPL	--	
	7/9/1999	--	38.11	20.41	--	17.70	11,000	3,000	<10	760	180	1,300	--	SPL	--	
	11/3/1999	--	38.11	20.82	--	17.29	--	--	--	--	--	--	--	---	--	
	1/12/2000	--	38.11	19.99	--	18.12	330,000	5,300	10	2,900	560	2,200	--	PACE	--	
	4/13/2000	--	38.11	20.14	--	17.97	--	--	--	--	--	--	--	---	--	
	5/24/2000	--	38.11	20.17	--	17.94	--	--	--	--	--	--	--	---	--	
	6/1/2000	--	38.11	23.05	--	15.06	--	--	--	--	--	--	--	---	--	
	6/8/2000	--	38.11	17.08	--	21.03	--	--	--	--	--	--	--	---	--	
	6/15/2000	--	38.11	16.93	--	21.18	--	--	--	--	--	--	--	---	--	
	7/26/2000	--	38.11	20.07	--	18.04	15,000	290	98	77	220	37,000	--	PACE	--	
	10/24/2000	--	38.11	20.10	--	18.01	--	--	--	--	--	--	--	---	--	
	1/19/2001	--	38.11	19.82	--	18.29	7,600	2,220	10.9	415	58.4	1,630	--	PACE	--	
	7/24/2001	--	38.11	19.86	--	18.25	9,600	2,140	6.34	281	43	1,440	--	PACE	--	
	1/18/2002	--	38.11	15.60	--	22.51	20,000	2,170	75.2	1,800	2,080	1,250	--	PACE	--	
	8/1/2002*	--	38.11	19.55	--	18.56	14,000	2,150	<12.5	197	42.4	1,120	--	PACE	--	
	1/16/2003	--	38.11	16.32	--	21.79	15,000	2,300	75	1,600	1,800	1,100	--	SEQ	--	p
	7/7/2003	--	38.11	19.80	SHEEN	18.31	9,700	1,600	<25	540	110	--	--	SEQ	--	q
	02/05/2004	--	38.11	18.75	--	19.36	12,000	2,000	<50	820	590	930	--	SEQM	6.7	odor
	07/01/2004	**P**	**38.11**	**19.72**	--	**18.39**	**9,900**	**2,600**	**<25**	**300**	**<25**	**1,100**	--	**SEQM**	**6.5**	
AW-2	4/5/1991	--	36.83	22.36	--	14.47	<50	<0.3	<0.3	<0.3	<0.3	--	--	SUP	--	
	4/1/1992	--	36.83	20.81	--	16.02	--	--	--	--	--	--	--	---	--	
	4/2/1992	--	36.83		--		130	25	2.3	0.7	2.1	--	--	APP	--	
	7/6/1992	--	36.83	23.57	--	13.26	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	10/7/1992	--	36.83	25.24	--	11.59	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	1/14/1993	--	36.83	20.82	--	16.01	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	4/22/1993	--	36.83	19.37	--	17.46	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	7/15/1993	--	36.83	21.29	--	15.54	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--	PACE	--	m
	10/21/1993	--	36.83	23.14	--	13.69	<50	1.3	1.1	0.9	2.1	<5.0	--	PACE	--	m

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-2	1/27/1994	--	36.83	22.34	--	14.49	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	4/21/1994	--	36.83	21.15	--	15.68	<50	<0.5	<0.5	<0.5	<0.5	<5.0	2	PACE	--	m
	9/9/1994	--	36.83	22.09	--	14.74	<50	<0.5	<0.5	<0.5	<0.5	--	4.1	PACE	--	m
	12/21/1994	--	36.83	20.12	--	16.71	<50	<0.5	<0.5	<0.5	<0.5	<5.0	2	PACE	--	m
	1/30/1995	--	36.83	16.65	--	20.18	<50	<0.50	<0.50	<0.50	<1.0	--	2.5	ATI	--	
	4/10/1995	--	36.83	16.22	--	20.61	<50	<0.50	<0.50	<0.50	<1.0	--	4.4	ATI	--	
	6/29/1995	--	36.83	17.55	--	19.28	<50	<0.50	<0.50	<0.50	<1.0	--	7.8	ATI	--	
	9/18/1995	--	36.83	19.87	--	16.96	--	--	--	--	--	--	--	---	--	
	9/19/1995	--	36.83	--	--	--	<50	<0.50	<0.50	<0.50	<1.0	<5.0	--	ATI	--	QC-1, e
	9/19/1995	--	36.83		--		<50	<0.50	<0.50	<0.50	<1.0	<5.0	4.5	ATI	--	
	12/7/1995	--	36.83	21.31	--	15.52	<50	<0.50	<0.50	<0.50	<1.0	<5.0	4.9	ATI	--	
	3/28/1996	--	36.83	15.61	--	21.22	<50	<0.5	<1	<1	<1	<10	4.1	SPL	--	
	6/20/1996	--	36.83	16.30	--	20.53	<50	<0.5	<1	<1	<1	<10	5.2	SPL	--	
	10/11/1996	--	36.83	19.60	--	17.23	<50	<0.5	<1.0	<1.0	<1.0	<10	6	SPL	--	
	1/2/1997	--	36.83	15.97	--	20.86	<50	<0.5	<1.0	<1.0	<1.0	<10	6.1	SPL	--	
	4/14/1997	--	36.83	17.19	--	19.64	<50	<0.5	<1.0	<1.0	<1.0	<10	5.3	SPL	--	
	7/2/1997	--	36.83	18.11	--	18.72	<50	<0.5	<1.0	<1.0	<1.0	<10	5.7	SPL	--	
	9/30/1997	--	36.83	18.52	--	18.31	<50	<0.5	<1.0	<1.0	<1.0	860	5.4	SPL	--	
	1/21/1998	--	36.83	14.46	--	22.37	160	13	<1.0	<1.0	<1.0	110	4.9	SPL	--	
	4/9/1998	--	36.83	12.85	--	23.98	--	--	--	--	--	--	--	---	--	
	4/10/1998	--	36.83		--		<50	<0.5	<1.0	<1.0	<1.0	<10	3.9	SPL	--	
	6/19/1998	--	36.83	14.37	--	22.46	60	<0.5	<1.0	<1.0	<1.0	<10	3.6	SPL	--	
	11/30/1998	--	36.83	16.90	--	19.93	--	--	--	--	--	--	--	---	--	
	1/21/1999	--	36.83	16.87	--	19.96	<50	<1.0	<1.0	<1.0	<1.0	<1.0	--	SPL	--	
	4/30/1999	--	36.83	17.01	--	19.82	--	--	--	--	--	--	--	---	--	
	7/9/1999	--	36.83	17.83	--	19.00	--	--	--	--	--	--	--	---	--	
	11/3/1999	--	36.83	19.74	--	17.09	--	--	--	--	--	--	--	---	--	
	1/12/2000	--	36.83	19.90	--	16.93	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	PACE	--	
	4/13/2000	--	36.83	19.75	--	17.08	--	--	--	--	--	--	--	---	--	
	7/26/2000	--	36.83	19.86	--	16.97	--	--	--	--	--	--	--	---	--	
	10/24/2000	--	36.83	18.77	--	18.06	--	--	--	--	--	--	--	---	--	
	1/19/2001	--	36.83		--		--	--	--	--	--	--	--	---	--	
	7/24/2001	--	36.83		--		--	--	--	--	--	--	--	---	--	f
	1/18/2002	--	36.83	15.17	--	21.66	<50	<0.5	<0.5	<0.5	<1.0	<0.5	--	PACE	--	f

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2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-2	8/1/2002*	--	36.83	17.17	--	19.66	--	--	--	--	--	--	--	---	--	
	1/16/2003	--	36.83	14.81	--	22.02	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	SEQ	--	p
	7/7/2003	--	36.83	16.65	--	20.18	--	--	--	--	--	--	--	---	--	
	02/05/2004	--	36.83	15.37	--	21.46	<50	3.0	<0.50	<0.50	<0.50	5.1	--	SEQM	--	
	07/01/2004	--	**36.83**	**17.55**	--	**19.28**	--	--	--	--	--	--	--	--	--	
AW-3	4/5/1991	--	39.13	23.90	--	15.23	5,200	980	450	95	310	--	--	SUP	--	
	4/1/1992	--	39.13	22.50	--	16.63	4,700	890	47	43	110	--	--	APP	--	
	7/6/1992	--	39.13	23.26	--	15.87	3,900	3,100	30	80	99	--	--	ANA	--	
	10/7/1992	--	39.13	24.75	--	14.38	5,000	2,600	<0.5	<0.5	59	--	--	ANA	--	
	1/14/1993	--	39.13	23.59	--	15.54	350	250	<0.5	<0.5	<0.5	--	--	PACE	--	m
	4/22/1993	--	39.13	19.42	--	19.71	240	71	2.4	0.6	4	--	--	PACE	--	m
	7/15/1993	--	39.13	20.09	--	19.04	650	71	2.8	1.5	1.1	37.3	--	PACE	--	c, m
	10/21/1993	--	39.13	--	--	--	170	6.1	2	1.7	4.4	--	--	PACE	--	QC-1, e
	10/21/1993	--	39.13	21.88	--	17.25	160	4.8	1.7	1.6	3.6	8.95	--	PACE	--	m
	1/27/1994	--	39.13	--	--	--	90	2.9	0.5	<0.5	<0.5	--	--	PACE	--	QC-1, e
	1/27/1994	--	39.13	22.33	--	16.80	92	2.1	<0.5	<0.5	<0.5	7.37	--	PACE	--	m
	4/21/1994	--	39.13	20.96	--	18.17	150	3.6	0.8	0.9	2.5	9.36	1.3	PACE	--	m
	9/9/1994	--	39.13	21.60	--	17.53	53	<0.5	<0.5	<0.5	<0.5	--	1.9	PACE	--	m
	12/21/1994	--	39.13		--		--	--	--	--	--	--	--	---	--	f
	1/30/1995	--	39.13		--		--	--	--	--	--	--	--	---	--	f
	4/10/1995	--	39.13		--		--	--	--	--	--	--	--	---	--	f
	6/29/1995	--	39.13	15.41	--	23.72	<50	<0.50	<0.50	<0.50	<1.0	--	8	ATI	--	
	9/18/1995	--	39.13	17.83	--	21.30	--	--	--	--	--	--	--	---	--	
	9/19/1995	--	39.13		--		61,000	11,000	2,900	4,100	13,000	790	7.4	ATI	--	
	12/7/1995	--	39.13	--	--	--	<50	<0.50	<0.50	<0.50	<1.0	<5.0	--	ATI	--	QC-1, e
	12/7/1995	--	39.13	19.27	--	19.86	<50	<0.50	<0.50	<0.50	<1.0	<5.0	3.4	ATI	--	
	3/28/1996	--	39.13	--	--	--	<50	<0.5	<1	<1	<1	<10	--	SPL	--	QC-1, e
	3/28/1996	--	39.13	13.85	--	25.28	<50	<0.5	<1	<1	<1	<10	4.1	SPL	--	
	6/20/1996	--	39.13	--	--	--	<50	<0.5	<1	<1	<1	<10	--	SPL	--	QC-1, e
	6/20/1996	--	39.13	14.47	--	24.66	<50	<0.5	<1	<1	<1	<10	4.2	SPL	--	
	10/11/1996	--	39.13	--	--	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	SPL	--	QC-1, e
	10/11/1996	--	39.13	17.97	--	21.16	<50	<0.5	<1.0	<1.0	<1.0	<10	4.7	SPL	--	
	1/2/1997	--	39.13	13.00	--	26.13	<50	<0.5	<1.0	<1.0	<1.0	<10	5.6	SPL	--	

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Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-3	4/14/1997	--	39.13	14.36	--	24.77	<50	<0.5	<1.0	<1.0	<1.0	<10	5	SPL	--	
	4/15/1997	--	39.13	--	--	--	<50	<0.5	<1.0	<1.0	<1.0	<10	--	SPL	--	QC-1, e
	7/2/1997	--	39.13	15.87	--	23.26	<50	<0.5	<1.0	<1.0	<1.0	<10	5.4	SPL	--	
	9/30/1997	--	39.13	17.50	--	21.63	<250	<2.5	<5.0	<5.0	<5.0	810	5.7	SPL	--	
	1/21/1998	--	39.13	--	--	--	150	<0.5	<1.0	<1.0	1.2	110	--	SPL	--	QC-1, e
	1/21/1998	--	39.13	11.98	--	27.15	140	<0.5	<1.0	<1.0	<1.0	99	4.6	SPL	--	
	4/9/1998	--	39.13	9.45	--	29.68	--	--	--	--	--	--	--	--	--	
	4/10/1998	--	39.13	--	--	--	<50	<0.5	<1.0	1.4	1.7	<10	--	SPL	--	QC-1, e
	4/10/1998	--	39.13		--		<50	<0.5	<1.0	<1.0	1.6	<10	4.5	SPL	--	
	6/19/1998	--	39.13	12.13	--	27.00	<50	<0.5	<1.0	<1.0	<1.0	<10	4.4	SPL	--	
	11/30/1998	--	39.13	15.91	--	23.22	--	--	--	--	--	--	--	--	--	
	1/21/1999	--	39.13	15.93	--	23.20	<50	<1.0	<1.0	<1.0	<1.0	<1.0	--	SPL	--	
	4/30/1999	--	39.13	15.98	--	23.15	--	--	--	--	--	--	--	--	--	
	7/9/1999	--	39.13	14.58	--	24.55	--	--	--	--	--	--	--	--	--	
	11/3/1999	--	39.13	17.43	--	21.70	--	--	--	--	--	--	--	--	--	
	1/12/2000	--	39.13	18.30	--	20.83	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	PACE	--	
	4/13/2000	--	39.13	18.89	--	20.24	--	--	--	--	--	--	--	--	--	
	7/26/2000	--	39.13	18.67	--	20.46	--	--	--	--	--	--	--	--	--	
	10/24/2000	--	39.13	18.98	--	20.15	--	--	--	--	--	--	--	--	--	
	1/19/2001	--	39.13	16.74	--	22.39	--	--	--	--	--	--	--	--	--	
	7/24/2001	--	39.13	18.55	--	20.58	--	--	--	--	--	--	--	--	--	
	1/18/2002	--	39.13	14.49	--	24.64	--	--	--	--	--	--	--	--	--	
	8/1/2002*	--	39.13	14.27	--	24.86	--	--	--	--	--	--	--	--	--	
	1/16/2003	--	39.13	14.25	--	24.88	--	--	--	--	--	--	--	--	--	
	7/7/2003	--	39.13	14.70	--	24.43	--	--	--	--	--	--	--	--	--	
	02/05/2004	--	39.13	14.61	--	24.52	--	--	--	--	--	--	--	--	--	
	07/01/2004	--	39.13	15.62	--	23.51	--	--	--	--	--	--	--	--	--	
AW-4	4/5/1991	--	39.08	25.12	--	13.96	110,000	40,000	13,000	2,000	5,500	--	--	SUP	--	
	4/1/1992	--	39.08	--	--	--	210,000	55,000	23,000	2,900	7,000	--	--	APP	--	QC-1, e
	4/1/1992	--	39.08	23.56	--	15.52	230,000	57,000	31,000	2,900	7,600	--	--	APP	--	
	7/6/1992	--	39.08	25.87	--	13.21	38,000	16,000	5,400	2,000	6,100	--	--	ANA	--	
	10/7/1992	--	39.08	27.53	--	11.55	120,000	41,000	26,000	4,700	13,000	--	--	ANA	--	
	1/14/1993	--	39.08	24.12	--	14.96	62,000	18,000	14,000	2,700	7,700	1,400	--	PACE	--	c, m

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133

2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-4	4/22/1993	--	39.08	21.47	--	17.61	18,000	1,100	2,100	320	3,500	--	--	PACE	--	m
	7/15/1993	--	39.08	23.30	--	15.78	21,000	820	2,300	590	3,800	1,978	--	PACE	--	c, m
	10/21/1993	--	39.08	25.08	--	14.00	11,000	570	83	630	2,300	4,600	--	PACE	--	c, m
	1/27/1994	--	39.08	24.61	--	14.47	12,000	420	460	600	2,200	6,400	--	PACE	--	c, m
	4/21/1994	--	39.08	--	--	--	14,000	71	160	29	1,200	13,000	--	PACE	--	QC-1, e
	4/21/1994	--	39.08	22.96	--	16.12	12,000	110	250	150	1,900	16,010	1.5	PACE	--	m
	9/9/1994	--	39.08	23.85	--	15.23	9,700	75	64	280	2,000	--	2.1	PACE	--	
	12/21/1994	--	39.08		--		--	--	--	--	--	--	--	---	--	f
	1/30/1995	--	39.08		--		--	--	--	--	--	--	--	---	--	f
	4/10/1995	--	39.08	18.07	--	21.01	3,700	69	8.7	44	130	--	8.5	ATI	--	
	6/29/1995	--	39.08	19.25	--	19.83	8,000	62	190	190	1,100	--	7.5	ATI	--	
	9/18/1995	--	39.08	20.73	--	18.35	--	--	--	--	--	--	--	---	--	
	9/19/1995	--	39.08		--		12,000	660	1,600	200	1,900	7,100	8.3	ATI	--	
	12/7/1995	--	39.08	22.49	--	16.59	41,000	8,400	7,200	710	6,300	5,200	3.6	ATI	--	
	3/28/1996	--	39.08	16.49	--	22.59	--	--	--	--	--	--	--	---	--	f
	6/20/1996	--	39.08	16.00	--	23.08	<50	<0.5	<1	<1	<1	12	--	SPL	--	
	10/11/1996	--	39.08	19.52	--	19.56	36,000	12,000	5,500	<25	3,800	880/1000	6.2	SPL	--	g
	1/2/1997	--	39.08	--	--	--	<50	61	3.8	3.5	8.1	110	--	SPL	--	QC-1, e
	1/2/1997	--	39.08	15.80	--	23.28	<50	<0.5	<1.0	<1.0	<1.0	22	6.4	SPL	--	
	4/14/1997	--	39.08	17.01	--	22.07	--	--	--	--	--	--	--	---	--	
	4/15/1997	--	39.08		--		<50	<0.5	<1.0	<1.0	<1.0	<10	5.4	SPL	--	
	7/2/1997	--	39.08	19.68	--	19.40	<50	21	<1.0	<1.0	<1.0	41	4.1	SPL	--	
	9/30/1997	--	39.08	22.71	--	16.37	--	--	--	--	--	--	--	---	--	f
	1/21/1998	--	39.08	15.89	--	23.19	13,000	2,900	<10	230	314	3,100	3.9	SPL	--	
	4/9/1998	--	39.08	13.50	--	25.58	--	--	--	--	--	--	--	---	--	
	4/10/1998	--	39.08		--		890	<0.5	<1	<1	<1	730	4.9	SPL	--	
	6/19/1998	--	39.08	14.75	--	24.33	60	<0.5	<1.0	<1.0	<1.0	34	4.3	SPL	--	
	11/30/1998	--	39.08	19.25	--	19.83	--	--	--	--	--	--	--	---	--	
	1/21/1999	--	39.08	18.94	--	20.14	3,700	830	93	200	360	30	--	---	--	
	4/30/1999	--	39.08	19.10	--	19.98	--	--	--	--	--	--	--	---	--	
	7/9/1999	--	39.08	18.93	--	20.15	76,000	12,000	6,600	2,000	8,700	320	--	SPL	--	
	11/3/1999	--	39.08	20.65	--	18.43	--	--	--	--	--	--	--	---	--	
	1/12/2000	--	39.08	21.21	--	17.87	67,000	12,000	3,500	2,900	15,000	280	--	PACE	--	
	4/13/2000	--	39.08	21.33	--	17.75	--	--	--	--	--	--	--	---	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-4	5/24/2000	--	39.08	19.84	--	19.24	--	--	--	--	--	--	--	--	--	
	6/1/2000	--	39.08	19.04	--	20.04	--	--	--	--	--	--	--	--	--	
	6/8/2000	--	39.08	18.32	--	20.76	--	--	--	--	--	--	--	--	--	
	6/15/2000	--	39.08	16.70	--	22.38	--	--	--	--	--	--	--	--	--	
	7/26/2000	--	39.08	21.50	--	17.58	910	<0.5	<0.5	<0.5	<0.5	3,500	--	PACE	--	
	10/24/2000	--	39.08	22.00	--	17.08	--	--	--	--	--	--	--	--	--	
	1/19/2001	--	39.08	18.97	--	20.11	6,600	2,460	24	497	534	267	--	PACE	--	
	7/24/2001	--	39.08	18.55	--	20.53	5,100	1,080	143	409	827	115	--	PACE	--	
	1/18/2002	--	39.08	17.22	--	21.86	3,900	442	241	157	681	85.3	--	PACE	--	
	8/1/2002*	--	39.08		--		--	--	--	--	--	--	--	--	--	f
	1/16/2003	--	39.08	16.85	--	22.23	2,900	260	160	120	590	<120	--	SEQ	--	p
	7/7/2003	--	39.08	17.94	--	21.14	600	90	7.9	18	36	--	--	SEQ	--	q
	02/05/2004	--	39.08	16.94	--	22.14	420	40	3.1	15	27	40	--	SEQM	6.8	odor
	07/01/2004	**P**	**39.08**	**18.24**	**--**	**20.84**	**6,000**	**970**	**200**	**310**	**1,500**	**64**	**--**	**SEQM**	**6.7**	
AW-5	4/5/1991	--	38.51	25.48	--	13.03	420	31	7.5	20	68	--	--	SUP	--	
	4/1/1992	--	38.51	23.95	--	14.56	--	--	--	--	--	--	--	--	--	
	4/2/1992	--	38.51		--		4,000	270	63	190	290	--	--	APP	--	
	7/6/1992	--	38.51	26.48	--	12.03	1,400	160	<2.5	250	58	--	--	ANA	--	
	10/7/1992	--	38.51	28.18	--	10.33	360	12	0.6	8.7	5	--	--	ANA	--	
	1/14/1993	--	38.51	24.15	--	14.36	1,700	270	7.5	130	62	--	--	PACE	--	m
	4/22/1993	--	38.51	--	--	--	3,500	780	29	240	210	--	--	PACE	--	QC-1, e, m
	4/22/1993	--	38.51	22.43	--	16.08	2,700	780	30	220	180	--	--	PACE	--	m
	7/15/1993	--	38.51	--	--	--	1,300	68	8.3	64	99	<50	--	PACE	--	QC-1, e, m
	7/15/1993	--	38.51	24.31	--	14.20	1,300	69	16	67	120	<50	--	PACE	--	m
	10/21/1993	--	38.51	26.05	--	12.46	510	9.6	1.5	17	45	75	--	PACE	--	c, m
	1/27/1994	--	38.51	26.42	--	12.09	420	3.3	<0.5	1	0.9	48.9	--	PACE	--	m
	4/21/1994	--	38.51	24.36	--	14.15	1,000	110	25	56	27	75	1.3	PACE	--	c, m
	9/9/1994	--	38.51	24.55	--	13.96	210	<0.5	<0.5	0.5	0.9	--	2.7	PACE	--	m
	12/21/1994	--	38.51	--	--	--	340	<0.5	15	3.3	1.4	104	--	PACE	--	QC-1, e, m
	12/21/1994	--	38.51	22.30	--	16.21	410	<0.5	20	4.3	1.4	114	1.1	PACE	--	m
	1/30/1995	--	38.51	18.88	--	19.63	210	0.6	11	8.8	2	--	1.5	ATI	--	
	4/10/1995	--	38.51	18.44	--	20.07	500	1.4	0.59	6.5	4.3	--	8.3	ATI	--	
	6/29/1995	--	38.51	19.92	--	18.59	490	1.2	0.58	7.3	2.2	--	6.9	ATI	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-5	9/18/1995	--	38.51	22.15	--	16.36	--	--	--	--	--	--	--	---	--	
	9/19/1995	--	38.51		--		260	0.62	<0.50	3.1	1.1	110	8.2	ATI	--	
	12/7/1995	--	38.51	23.75	--	14.76	60	<0.50	<0.50	<0.50	<1.0	210	4.3	ATI	--	
	3/28/1996	--	38.51	17.76	--	20.75	<50	<0.5	<1	<1	<1	63	3	SPL	--	
	6/20/1996	--	38.51	18.46	--	20.05	<50	<0.5	<1	<1	<1	<10	3.6	SPL	--	
	10/11/1996	--	38.51	21.84	--	16.67	<50	<0.5	<1.0	<1.0	<1.0	<10	4.5	SPL	--	
	1/2/1997	--	38.51	18.01	--	20.50	<50	<0.5	<1.0	<1.0	<1.0	<10	4.6	SPL	--	
	4/14/1997	--	38.51	19.35	--	19.16	<50	<0.5	<1.0	<1.0	<1.0	<10	5.1	SPL	--	
	7/2/1997	--	38.51	20.29	--	18.22	<50	<0.5	<1.0	<1.0	<1.0	<10	4	SPL	--	
	9/30/1997	--	38.51	23.15	--	15.36	<250	<2.5	<5.0	<5.0	<5.0	1,300	6.3	SPL	--	
	1/21/1998	--	38.51	17.33	--	21.18	6,100	<0.5	2.1	<1.0	<1.0	3,700	4.5	SPL	--	
	4/9/1998	--	38.51	15.25	--	23.26	--	--	--	--	--	--	--	---	--	
	4/10/1998	--	38.51		--		3,500	<0.5	<1.0	<1.0	<1.0	3,000	5.4	SPL	--	
	6/19/1998	--	38.51	17.39	--	21.12	3,300	<0.5	<1.0	<1.0	<1.0	2,500	5.2	SPL	--	
	11/30/1998	--	38.51		--		--	--	--	--	--	--	--	---	--	f
	1/21/1999	--	38.51	21.22	--	17.29	2,800	<1.0	<1.0	<1.0	<1.0	1,800	--	SPL	--	
	4/30/1999	--	38.51	21.50	--	17.01	--	--	--	--	--	--	--	---	--	
	7/9/1999	--	38.51	20.15	--	18.36	4,000	<1.0	<1.0	<1.0	<1.0	3400/3500	--	SPL	--	g
	11/3/1999	--	38.51	22.04	--	16.47	--	--	--	--	--	--	--	---	--	
	1/12/2000	--	38.51	22.59	--	15.92	1,000	7.3	30	6.7	40	4,600	--	PACE	--	
	4/13/2000	--	38.51	23.11	--	15.40	--	--	--	--	--	--	--	---	--	
	7/26/2000	--	38.51	22.72	--	15.79	1,800	94	35	5.9	27	16,000	--	PACE	--	
	10/24/2000	--	38.51	20.15	--	18.36	--	--	--	--	--	--	--	---	--	
	1/19/2001	--	38.51	19.79	--	18.72	2,600	<0.5	<0.5	<0.5	<0.5	4,580	--	PACE	--	
	7/24/2001	--	38.51	20.17	--	18.34	5,400	18.4	17.2	<12.5	40.8	5,170	--	PACE	--	
	1/18/2002	--	38.51	17.34	--	21.17	3,800	343	0.738	<0.5	<1.0	3,750	--	PACE	--	
	8/1/2002*	--	38.51	19.49	--	19.02	5,300	<12.5	<12.5	<12.5	<25	3,470	--	PACE	--	
	1/16/2003	--	38.51	17.30	--	21.21	1,400	140	<10	<10	<10	1,600	--	SEQ	--	p
	7/7/2003	--	38.51	18.43	--	20.08	1,400	<10	<10	<10	<10	--	--	SEQ	--	q
	02/05/2004	--	38.51	17.24	--	21.27	1,800	<10	<10	<10	<10	810	--	SEQM	6.7	
	07/01/2004	**P**	**38.51**	**19.43**	**--**	**19.08**	**1,100**	**<5.0**	**<5.0**	**<5.0**	**<5.0**	**550**	**--**	**SEQM**	**6.6**	
AW-6	4/5/1991	--	37.08	22.48	--	14.60	1,100	80	19	1.4	230	--	--	SUP	--	
	4/1/1992	--	37.08	22.50	--	14.58	--	--	--	--	--	--	--	---	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-6	4/2/1992	--	37.08		--		<50	<0.5	<0.5	<0.5	<0.5	--	--	APP	--	
	7/6/1992	--	37.08	22.74	--	14.34	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	10/7/1992	--	37.08	24.64	--	12.44	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	1/14/1993	--	37.08	22.36	--	14.72	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	4/22/1993	--	37.08	22.82	--	14.26	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	7/15/1993	--	37.08	20.49	--	16.59	<50	<0.5	<0.5	<0.5	0.8	<5.0	--	PACE	--	m
	10/21/1993	--	37.08	22.84	--	14.24	<50	0.5	0.6	<0.5	0.7	<5.0	--	PACE	--	m
	1/27/1994	--	37.08	22.33	--	14.75	<50	<0.5	0.9	3.1	12	<5.0	--	PACE	--	m
	4/21/1994	--	37.08	20.66	--	16.42	<50	<0.5	<0.5	<0.5	<0.5	<5.0	1.7	PACE	--	m
	9/9/1994	--	37.08	21.57	--	15.51	<50	0.9	<0.5	<0.5	0.5	--	2.9	PACE	--	m
	12/21/1994	--	37.08	19.40	--	17.68	<50	1.8	0.8	0.8	3.2	5.19	1.1	PACE	--	m
	1/30/1995	--	37.08	--	--	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	ATI	--	QC-1, e
	4/10/1995	--	37.08	16.74	--	20.34	<50	<0.50	<0.50	<0.50	<1.0	--	2.2	ATI	--	
	6/29/1995	--	37.08	16.01	--	21.07	<50	<0.50	<0.50	<0.50	<1.0	--	8.6	ATI	--	
	9/18/1995	--	37.08	17.54	--	19.54	<50	<0.50	<0.50	<0.50	<1.0	--	6.3	ATI	--	
	9/19/1995	--	37.08	19.65	--	17.43	--	--	--	--	--	--	--	--	--	
	12/7/1995	--	37.08		--		<50	<0.50	<0.50	<0.50	<1.0	25	8.3	ATI	--	
	3/28/1996	--	37.08	20.35	--	16.73	<50	<0.50	<0.50	<0.50	<1.0	16	4.7	ATI	--	
	6/20/1996	--	37.08	14.99	--	22.09	<50	<0.5	<1	<1	<1	<10	4	SPL	--	
	10/11/1996	--	37.08	15.59	--	21.49	<50	<0.5	<1	<1	<1	<10	4.6	SPL	--	
	1/2/1997	--	37.08	19.09	--	17.99	<50	<0.5	<1.0	<1.0	<1.0	<10	5.3	SPL	--	
	4/14/1997	--	37.08	15.11	--	21.97	<50	<0.5	<1.0	<1.0	<1.0	<10	5.5	SPL	--	
	7/2/1997	--	37.08	16.25	--	20.83	<50	<0.5	<1.0	<1.0	<1.0	<10	3.9	SPL	--	
	9/30/1997	--	37.08	17.99	--	19.09	<50	<0.5	<1.0	<1.0	<1.0	<10	5.2	SPL	--	
	1/21/1998	--	37.08	20.50	--	16.58	<50	<0.5	<1.0	<1.0	<1.0	<10	6	SPL	--	
	4/9/1998	--	37.08	15.72	--	21.36	160	<0.5	<1.0	<1.0	<1.0	110	5	SPL	--	
	4/10/1998	--	37.08	13.31	--	23.77	--	--	--	--	--	--	--	--	--	
	6/19/1998	--	37.08		--		370	<0.5	<1.0	<1.0	<1.0	300	4.3	SPL	--	
	11/30/1998	--	37.08	15.18	--	21.90	830	2	<1.0	<1.0	<1.0	690	4	SPL	--	
	1/21/1999	--	37.08		--		--	--	--	--	--	--	--	--	--	f
	4/30/1999	--	37.08	15.78	--	21.30	2,300	<1.0	<1.0	<1.0	<1.0	1,900	--	SPL	--	
	7/9/1999	--	37.08	16.01	--	21.07	--	--	--	--	--	--	--	--	--	
	11/3/1999	--	37.08	17.63	--	19.45	--	--	--	--	--	--	--	--	--	
				18.42	--	18.66	--	--	--	--	--	--	--	--	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-6	1/12/2000	--	37.08	19.92	--	17.16	<50	<0.5	<0.5	<0.5	<0.5	2,700	--	PACE	--	
	4/13/2000	--	37.08	19.87	--	17.21	--	--	--	--	--	--	--	---	--	
	7/26/2000	--	37.08	19.99	--	17.09	--	--	--	--	--	--	--	---	--	
	10/24/2000	--	37.08	18.12	--	18.96	--	--	--	--	--	--	--	---	--	
	1/19/2001	--	37.08	17.04	--	20.04	2,700	<0.5	<0.5	<0.5	<0.5	4,850	--	PACE	--	
	7/24/2001	--	37.08	17.83	--	19.25	--	--	--	--	--	--	--	---	--	
	1/18/2002	--	37.08	15.54	--	21.54	5,500	614	<0.5	<0.5	<1.0	5,390	--	PACE	--	
	8/1/2002*	--	37.08	16.98	--	20.10	--	--	--	--	--	--	--	---	--	
	1/16/2003	--	37.08	15.05	--	22.03	2,900	<20	<20	<20	63	2,500	--	SEQ	--	p
	7/7/2003	--	37.08	16.58	--	20.50	--	--	--	--	--	--	--	---	--	
	02/05/2004	--	37.08	15.84	--	21.24	7,000	<50	<50	<50	<50	5,400	--	SEQM	6.7	
	07/01/2004	**P**	**37.08**	**17.91**	**--**	**19.17**	**9,600**	**<50**	**<50**	**<50**	**<50**	**4,600**	**--**	**SEQM**	**6.5**	
AW-7	4/5/1991	--	37.6	23.38	--	14.22	<50	0.4	0.7	<0.3	<0.3	--	--	SUP	--	
	4/1/1992	--	37.6	21.92	--	15.68	--	--	--	--	--	--	--	---	--	
	4/2/1992	--	37.6		--		<50	<0.5	3.2	1	5.4	--	--	APP	--	
	7/6/1992	--	37.6	24.50	--	13.10	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	10/7/1992	--	37.6	26.18	--	11.42	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	1/14/1993	--	37.6	22.03	--	15.57	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	4/22/1993	--	37.6	21.18	--	16.42	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	7/15/1993	--	37.6	22.09	--	15.51	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--	PACE	--	m
	10/21/1993	--	37.6	24.05	--	13.55	51	5	4.2	3.5	8.2	<5.0	--	PACE	--	m
	1/27/1994	--	37.6	23.40	--	14.20	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--	PACE	--	m
	4/21/1994	--	37.6	22.24	--	15.36	<50	<0.5	<0.5	<0.5	<0.5	<5.0	2.5	PACE	--	m
	9/9/1994	--	37.6	22.94	--	14.66	<50	<0.5	<0.5	<0.5	0.5	--	4.3	PACE	--	m
	12/21/1994	--	37.6	20.86	--	16.74	<50	<0.5	<0.5	<0.5	<0.5	<5.0	2.2	PACE	--	m
	1/30/1995	--	37.6	17.51	--	20.09	<50	<0.50	<0.50	<0.50	<1.0	--	2.7	ATI	--	
	4/10/1995	--	37.6	16.69	--	20.91	<50	<0.50	<0.50	<0.50	<1.0	--	4.8	ATI	--	
	6/29/1995	--	37.6	18.33	--	19.27	<50	<0.50	<0.50	<0.50	<1.0	--	7.6	ATI	--	
	9/18/1995	--	37.6	20.68	--	16.92	--	--	--	--	--	--	--	---	--	
	9/19/1995	--	37.6		--		<50	<0.50	<0.50	<0.50	<1.0	<5.0	5.1	ATI	--	
	12/7/1995	--	37.6	22.15	--	15.45	<50	<0.50	<0.50	<0.50	<1.0	<5.0	5.2	ATI	--	
	3/28/1996	--	37.6	16.38	--	21.22	<50	<0.5	<1	<1	<1	<10	3.9	SPL	--	
	6/20/1996	--	37.6	17.02	--	20.58	<50	<0.5	<1	<1	<1	<10	5	SPL	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-7	10/11/1996	--	37.6	20.47	--	17.13	<50	<0.5	<1.0	<1.0	<1.0	<10	6.3	SPL	--	
	1/2/1997	--	37.6	16.70	--	20.90	<50	<0.5	<1.0	<1.0	<1.0	<10	6.2	SPL	--	
	4/14/1997	--	37.6	17.96	--	19.64	<50	<0.5	<1.0	<1.0	<1.0	<10	5	SPL	--	
	7/2/1997	--	37.6	19.11	--	18.49	<50	<0.5	<1.0	<1.0	<1.0	<10	5.4	SPL	--	
	9/30/1997	--	37.6	22.97	--	14.63	<250	<2.5	<5.0	<5.0	<5.0	1,100	6.5	SPL	--	
	1/21/1998	--	37.6	16.50	--	21.10	<50	<0.5	<1.0	<1.0	<1.0	<10	4.9	SPL	--	
	4/9/1998	--	37.6	13.56	--	24.04	<50	<0.5	<1.0	<1.0	<1.0	<10	4.9	SPL	--	
	6/19/1998	--	37.6	15.41	--	22.19	<50	<0.5	<1.0	<1.0	<1.0	<10	4.4	SPL	--	
	11/30/1998	--	37.6	18.90	--	18.70	--	--	--	--	--	--	--	--	--	
	1/21/1999	--	37.6	18.39	--	19.21	--	--	--	--	--	--	--	--	--	
	4/30/1999	--	37.6	18.54	--	19.06	--	--	--	--	--	--	--	--	--	
	7/9/1999	--	37.6	17.98	--	19.62	--	--	--	--	--	--	--	--	--	
	11/3/1999	--	37.6	20.22	--	17.38	--	--	--	--	--	--	--	--	--	
	1/12/2000	--	37.6	19.46	--	18.14	--	--	--	--	--	--	--	--	--	
	4/13/2000	--	37.6	19.59	--	18.01	--	--	--	--	--	--	--	--	--	
	7/26/2000	--	37.6	19.69	--	17.91	--	--	--	--	--	--	--	--	--	
	10/24/2000	--	37.6	18.78	--	18.82	--	--	--	--	--	--	--	--	--	
	1/19/2001	--	37.6		--		--	--	--	--	--	--	--	--	--	
	7/25/2001	--	37.6		--		--	--	--	--	--	--	--	--	--	f
	1/18/2002	--	37.6		--		--	--	--	--	--	--	--	--	--	f
	8/1/2002*	--	37.6		--		--	--	--	--	--	--	--	--	--	o
	1/16/2003	--	37.6		--		--	--	--	--	--	--	--	--	--	o
	7/7/2003	--	37.6		--		--	--	--	--	--	--	--	--	--	o
	07/01/2004	--	37.60	--	--	--	--	--	--	--	--	--	--	--	--	o
AW-8	4/5/1991	--	40.86	26.68	--	14.18	80	1.9	2.2	0.5	1.3	--	--	SUP	--	Well inaccessible
	4/1/1992	--	40.86	25.11	--	15.75	73	<0.5	0.7	<0.5	0.6	--	--	APP	--	
	7/6/1992	--	40.86	26.43	--	14.43	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	10/7/1992	--	40.86	28.59	--	12.27	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	1/14/1993	--	40.86	25.55	--	15.31	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	4/22/1993	--	40.86	22.29	--	18.57	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	7/15/1993	--	40.86	23.42	--	17.44	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	10/21/1993	--	40.86	25.15	--	15.71	<50	1.9	1.8	1.3	3.3	<5.0	--	PACE	--	m

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-8	1/27/1994	--	40.86	25.42	--	15.44	<50	<0.5	0.5	0.6	8.5	<5.0	--	PACE	--	m
	4/21/1994	--	40.86	24.14	--	16.72	<50	<0.5	<0.5	<0.5	<0.5	<5.0	1.5	PACE	--	m
	9/9/1994	--	40.86	24.55	--	16.31	<50	<0.5	<0.5	<0.5	<0.5	--	2.4	PACE	--	m
	12/21/1994	--	40.86	22.72	--	18.14	<50	<0.5	<0.5	<0.5	<0.5	<5.0	1.1	PACE	--	m
	1/30/1995	--	40.86	19.75	--	21.11	<50	<0.50	1	<0.50	1	--	0.8	ATI	--	
	4/10/1995	--	40.86	17.78	--	23.08	<50	<0.50	<0.50	<0.50	<1.0	--	8.3	ATI	--	
	6/29/1995	--	40.86	18.18	--	22.68	<50	<0.50	<0.50	<0.50	<1.0	--	8.3	ATI	--	
	9/18/1995	--	40.86	20.20	--	20.66	--	--	--	--	--	--	--	--	--	
	9/19/1995	--	40.86		--		<50	<0.50	<0.50	<0.50	<1.0	<5.0	7.7	ATI	--	
	12/7/1995	--	40.86	21.54	--	19.32	<50	<0.50	<0.50	<0.50	<1.0	<5.0	4.4	ATI	--	
	3/28/1996	--	40.86	15.77	--	25.09	<50	<0.5	<1	<1	<1	<10	3.8	SPL	--	
	6/20/1996	--	40.86	16.41	--	24.45	<50	<0.5	<1	<1	<1	<10	3.6	SPL	--	
	10/11/1996	--	40.86	19.90	--	20.96	<50	<0.5	<1.0	<1.0	<1.0	<10	6.4	SPL	--	
	1/2/1997	--	40.86	15.89	--	24.97	<50	<0.5	<1.0	<1.0	<1.0	<10	5.9	SPL	--	
	4/14/1997	--	40.86	17.07	--	23.79	<50	<0.5	<1.0	<1.0	<1.0	<10	4.6	SPL	--	
	7/2/1997	--	40.86	18.67	--	22.19	<50	<0.5	<1.0	<1.0	<1.0	<10	5.6	SPL	--	
	9/30/1997	--	40.86	22.52	--	18.34	<50	<5	<10	<10	<10	820	6.7	SPL	--	
	1/21/1998	--	40.86	16.01	--	24.85	<50	<0.5	<1.0	<1.0	<1.0	<10	5.2	SPL	--	
	4/9/1998	--	40.86	11.18	--	29.68	<50	<0.5	<1.0	<1.0	<1.0	<10	4.4	SPL	--	
	6/19/1998	--	40.86	13.01	--	27.85	<50	<0.5	<1.0	<1.0	<1.0	<10	4.1	SPL	--	
	11/30/1998	--	40.86	17.46	--	23.40	--	--	--	--	--	--	--	--	--	
	1/21/1999	--	40.86	17.47	--	23.39	--	--	--	--	--	--	--	--	--	
	4/30/1999	--	40.86	17.60	--	23.26	--	--	--	--	--	--	--	--	--	
	7/9/1999	--	40.86	16.50	--	24.36	--	--	--	--	--	--	--	--	--	
	11/3/1999	--	40.86	19.29	--	21.57	--	--	--	--	--	--	--	--	--	
	1/12/2000	--	40.86	21.49	--	19.37	--	--	--	--	--	--	--	--	--	
	4/13/2000	--	40.86	21.60	--	19.26	--	--	--	--	--	--	--	--	--	
	7/26/2000	--	40.86	21.53	--	19.33	--	--	--	--	--	--	--	--	--	
	10/24/2000	--	40.86	19.37	--	21.49	--	--	--	--	--	--	--	--	--	
	1/19/2001	--	40.86	18.60	--	22.26	--	--	--	--	--	--	--	--	--	
	7/24/2001	--	40.86	18.22	--	22.64	--	--	--	--	--	--	--	--	--	
	1/18/2002	--	40.86	16.29	--	24.57	--	--	--	--	--	--	--	--	--	
	8/1/2002*	--	40.86	17.25	--	23.61	--	--	--	--	--	--	--	--	--	
	1/16/2003	--	40.86	15.82	--	25.04	--	--	--	--	--	--	--	--	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
AW-8	7/7/2003	--	40.86	18.55	--	22.31	--	--	--	--	--	--	--	--	--	
	07/01/2004	--	40.86	18.25	--	22.61	--	--	--	--	--	--	--	--	--	
AW-9	1/2/1997	--	37.78	10.00	--	27.78	<50	<0.5	<1.0	<1.0	<1.0	<10	6.7	SPL	--	
	4/14/1997	--	37.78		--		--	--	--	--	--	--	--	--	--	f
	7/2/1997	--	37.78	12.71	--	25.07	<50	<0.5	<1.0	<1.0	<1.0	<10	6	SPL	--	
	9/30/1997	--	37.78	21.22	--	16.56	<50	<0.5	<1.0	<1.0	<1.0	<10	6.8	SPL	--	
	1/21/1998	--	37.78	10.26	--	27.52	<50	<0.5	<1.0	<1.0	<1.0	<10	5.3	SPL	--	
	4/9/1998	--	37.78	6.77	--	31.01	<50	<0.5	<1.0	<1.0	<1.0	<10	5.6	SPL	--	
	6/19/1998	--	37.78	8.96	--	28.82	<50	<0.5	<1.0	<1.0	<1.0	<10	4.8	SPL	--	
MW-1	4/5/1991	--	34.46		--		--	--	--	--	--	--	--	--	--	
	4/1/1992	--	34.46	11.25	0.01	23.20	--	--	--	--	--	--	--	--	--	
	7/6/1992	--	34.46	13.61	0.02	20.83	--	--	--	--	--	--	--	--	--	
	10/7/1992	--	34.46	15.15	0.09	19.22	--	--	--	--	--	--	--	--	--	
	1/14/1993	--	34.46	10.73	0.01	23.72	--	--	--	--	--	--	--	--	--	
	4/22/1993	--	34.46	11.64	0.16	22.66	--	--	--	--	--	--	--	--	--	
	7/15/1993	--	34.46	13.50	1.11	19.85	--	--	--	--	--	--	--	--	--	
	10/21/1993	--	34.46	15.21	1.00	18.25	--	--	--	--	--	--	--	--	--	
	1/27/1994	--	34.46	17.48	0.81	16.17	--	--	--	--	--	--	--	--	--	
	4/21/1994	--	34.46	10.94	--	23.52	110,000	1,400	9,100	3,400	30,000	11,000	1.6	PACE	--	
	9/9/1994	--	34.46	13.80	--	20.66	--	--	--	--	--	--	--	--	--	
	12/21/1994	--	34.46	12.60	0.02	21.84	--	--	--	--	--	--	--	--	--	
	1/30/1995	--	34.46		--		--	--	--	--	--	--	--	--	--	
	4/10/1995	--	34.46	10.62	--	23.84	--	--	--	--	--	--	--	--	--	
	6/29/1995	--	34.46	18.72	--	15.74	--	--	--	--	--	--	--	--	--	
	9/18/1995	--	34.46	12.92	--	21.54	--	--	--	--	--	--	--	--	--	
	12/7/1995	--	34.46	13.82	--	20.64	--	--	--	--	--	--	--	--	--	
	3/28/1996	--	34.46	10.03	0.01	24.42	--	--	--	--	--	--	--	--	--	
	6/20/1996	--	34.46	11.29	0.02	23.15	--	--	--	--	--	--	--	--	--	
	10/11/1996	--	34.46	14.86	0.01	19.59	--	--	--	--	--	--	--	--	--	
	1/2/1997	--	34.46	11.03	0.01	23.42	--	--	--	--	--	--	--	--	--	
	4/14/1997	--	34.46	12.25	0.01	22.20	--	--	--	--	--	--	--	--	--	
	4/15/1997	--	34.46		--		35,000	130	650	1,700	8,200	4,800	--	SPL	--	
	7/2/1997	--	34.46	14.11	--	20.35	42,000	<250	<500	2,000	9,600	<5000	5.5	SPL	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
MW-1	9/30/1997	--	34.46	14.40	--	20.06	61,000	130	1,100	2,700	14,600	2,000	6.7	SPL	--	
	1/21/1998	--	34.46	7.99	0.01	26.46	14,000	11	60	310	1,790	1,300	4.5	SPL	--	
	4/9/1998	--	34.46	7.89	--	26.57	--	--	--	--	--	--	--	---	--	
	4/10/1998	--	34.46		--		45,000	380	520	2,100	6,800	9,300	5.3	SPL	--	
	6/19/1998	--	34.46	10.31	--	24.15	35,000	170	100	1,100	3,590	5,000	4.9	SPL	--	
	11/30/1998	--	34.46	11.16	--	23.30	10,000	100	24	350	1,040	1800/2800	--	SPL	--	
	1/21/1999	--	34.46	10.76	--	23.70	18,000	120	37	590	1,800	2,700	--	SPL	--	
	4/30/1999	--	34.46	10.78	--	23.68	17,000	240	89	1,100	1,900	1,600	--	SPL	--	
	7/9/1999	--	34.46	12.62	--	21.84	58,000	140	100	1,800	6,900	1,200	--	SPL	--	
	11/3/1999	--	34.46	14.00	--	20.46	20,000	62	42	620	2,100	630	--	PACE	--	
	1/12/2000	--	34.46	15.25	--	19.21	72,000	110	120	2,400	8,200	630	--	PACE	--	
	4/13/2000	--	34.46	15.57	--	18.89	37,000	300	32	1,000	1,700	810	--	PACE	--	
	5/24/2000	--	34.46	11.75	--	22.71	--	--	--	--	--	--	--	---	--	
	6/1/2000	--	34.46	11.41	--	23.05	--	--	--	--	--	--	--	---	--	
	6/8/2000	--	34.46	11.68	--	22.78	--	--	--	--	--	--	--	---	--	
	6/15/2000	--	34.46	11.85	--	22.61	--	--	--	--	--	--	--	---	--	
	7/26/2000	--	34.46	16.19	--	18.27	10,000	480	210	470	710	1,100	--	PACE	--	
	10/24/2000	--	34.46	13.89	--	20.57	9,900	31	7.2	550	1,200	4,400	--	PACE	--	
	1/19/2001	--	34.46	12.90	--	21.56	57,000	199	7.66	1,170	3,260	514	--	PACE	--	
	7/24/2001	--	34.46	13.55	--	20.91	27,000	96.7	<5.0	548	1,460	285	--	PACE	--	
	1/18/2002	--	34.46	10.91	--	23.55	25,000	150	31.5	597	1,040	138	--	PACE	--	
	8/1/2002*	--	34.46	12.97	--	21.49	25,000	80.2	17.7	714	1,280	489	--	PACE	--	
	1/16/2003	--	34.46	10.45	--	24.01	22,000	170	110	630	670	<500	--	SEQ	--	p
	7/7/2003	--	34.46	12.40	SHEEN	22.06	9,900	42	<5.0	160	150	24	--	SEQ	--	q
	02/05/2004	--	34.46	10.26	--	24.20	6,200	56	11	250	210	9.2	--	SEQM	6.9	
	07/01/2004	--	**34.46**	**13.20**	--	**21.26**	**18,000**	**<50**	**<50**	**210**	**300**	**<50**	--	**SEQM**	--	**Sheen**
MW-2	4/5/1991	--	35.5	16.62	--	18.88	<50	0.6	0.9	<0.3	<0.3	--	--	SUP	--	
	4/1/1992	--	35.5	11.25	--	24.25	--	--	--	--	--	--	--	---	--	
	4/2/1992	--	35.5		--		<50	<0.5	<0.5	<0.5	<0.5	--	--	APP	--	
	7/6/1992	--	35.5	12.72	--	22.78	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	10/7/1992	--	35.5	15.08	--	20.42	<50	<0.5	1.8	<0.5	2.3	--	--	ANA	--	
	1/14/1993	--	35.5	9.69	--	25.81	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	4/22/1993	--	35.5	10.46	--	25.04	<50	<0.5	<0.5	<0.5	<0.5	30	--	PACE	--	c

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
MW-2	7/15/1993	--	35.5	12.02	--	23.48	<50	<0.5	<0.5	<0.5	<0.5	21.7	--	PACE	--	c, m
	10/21/1993	--	35.5	13.12	--	22.38	<50	0.7	0.9	<0.5	0.9	14.9	--	PACE	--	m
	1/27/1994	--	35.5	12.01	--	23.49	<50	0.6	<0.5	<0.5	<0.5	11.5	--	PACE	--	m
	4/21/1994	--	35.5	10.60	--	24.90	<50	<0.5	<0.5	<0.5	<0.5	11.4	1.1	PACE	--	m
	9/9/1994	--	35.5	12.42	--	23.08	<50	<0.5	<0.5	<0.5	0.6	--	2.2	PACE	--	m
	12/21/1994	--	35.5	10.85	--	24.65	<50	<0.5	<0.5	<0.5	<0.5	<5.0	1.2	PACE	--	m
	1/30/1995	--	35.5	8.38	--	27.12	<50	<0.50	<0.50	<0.50	<1.0	--	1.7	ATI	--	
	4/10/1995	--	35.5	9.00	--	26.50	<50	<0.50	<0.50	<0.50	<1.0	--	7.8	ATI	--	
	6/29/1995	--	35.5	9.91	--	25.59	<50	<0.50	<0.50	<0.50	<1.0	--	9.1	ATI	--	
	9/18/1995	--	35.5	10.98	--	24.52	--	--	--	--	--	--	--	--	--	
	9/19/1995	--	35.5		--		<50	<0.50	<0.50	<0.50	<1.0	<5.0	7.2	ATI	--	
	12/7/1995	--	35.5	12.30	--	23.20	<50	<0.50	<0.50	<0.50	<1.0	<5.0	2.4	ATI	--	
	3/28/1996	--	35.5	8.57	--	26.93	<50	<0.5	<1	<1	<1	<10	3.2	SPL	--	
	6/20/1996	--	35.5	9.77	--	25.73	<50	<0.5	<1	<1	<1	<10	4.2	SPL	--	
	10/11/1996	--	35.5	13.32	--	22.18	<50	<0.5	<1.0	<1.0	<1.0	<10	6.3	SPL	--	
	1/2/1997	--	35.5	9.60	--	25.90	<50	<0.5	<1.0	<1.0	<1.0	<10	6.7	SPL	--	
	4/14/1997	--	35.5	10.93	--	24.57	<50	<0.5	<1.0	<1.0	<1.0	<10	5.7	SPL	--	
	7/2/1997	--	35.5	12.57	--	22.93	<50	<0.5	<1.0	<1.0	<1.0	<10	5.9	SPL	--	
	9/30/1997	--	35.5	12.91	--	22.59	<50	<0.5	<1.0	<1.0	<1.0	<10	6.3	SPL	--	
	1/21/1998	--	35.5	10.12	--	25.38	160	<0.5	<1.0	<1.0	<1.0	100	5.4	SPL	--	
	4/9/1998	--	35.5	6.82	--	28.68	--	--	--	--	--	--	--	--	--	
	4/10/1998	--	35.5		--		<50	1	<1.0	<1.0	<1.0	23	5	SPL	--	
	6/19/1998	--	35.5	9.00	--	26.50	<50	<0.5	<1.0	<1.0	<1.0	<10	4.9	SPL	--	
	11/30/1998	--	35.5	9.44	--	26.06	--	--	--	--	--	--	--	--	--	
	1/21/1999	--	35.5	8.96	--	26.54	<50	<1.0	<1.0	<.1.0	<1.0	1.9	--	SPL	--	
	4/30/1999	--	35.5	9.15	--	26.35	--	--	--	--	--	--	--	--	--	
	7/9/1999	--	35.5	10.82	--	24.68	--	--	--	--	--	--	--	--	--	
	11/3/1999	--	35.5	11.86	--	23.64	--	--	--	--	--	--	--	--	--	
	1/12/2000	--	35.5	12.35	--	23.15	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	PACE	--	
	4/13/2000	--	35.5	13.01	--	22.49	--	--	--	--	--	--	--	--	--	
	7/26/2000	--	35.5	13.01	--	22.49	--	--	--	--	--	--	--	--	--	
	10/24/2000	--	35.5	11.57	--	23.93	--	--	--	--	--	--	--	--	--	
	1/19/2001	--	35.5	10.52	--	24.98	--	--	--	--	--	--	--	--	--	
	7/24/2001	--	35.5	11.13	--	24.37	--	--	--	--	--	--	--	--	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
MW-2	1/18/2002	--	35.5	8.85	--	26.65	--	--	--	--	--	--	--	--	--	
	8/1/2002*	--	35.5	10.47	--	25.03	--	--	--	--	--	--	--	--	--	
	1/14/2003	--	35.5	8.49	--	27.01	--	--	--	--	--	--	--	--	--	
	7/7/2003	--	35.5	9.63	--	25.87	--	--	--	--	--	--	--	--	--	
	02/05/2004	--	35.50	8.40	--	27.10	--	--	--	--	--	--	--	--	--	
	07/01/2004	**NP**	**35.50**	**9.94**	--	**25.56**	--	--	--	--	--	--	--	--	--	
MW-3	4/5/1991	--	36.53	17.84	--	18.69	<50	<0.3	<0.3	<0.3	<0.3	--	--	SUP	--	
	4/1/1992	--	36.53	15.64	--	20.89	--	--	--	--	--	--	--	--	--	
	4/2/1992	--	36.53		--		<50	1.4	<0.5	<0.5	<0.5	--	--	APP	--	
	7/6/1992	--	36.53	19.03	--	17.50	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	10/7/1992	--	36.53	21.83	--	14.70	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	1/14/1993	--	36.53	15.96	--	20.57	350	<0.5	<0.5	<0.5	<0.5	714	--	PACE	--	c, m
	4/22/1993	--	36.53	16.20	--	20.33	2,800	<0.5	<0.5	<0.5	<0.5	3,600	--	PACE	--	c, m
	7/15/1993	--	36.53	16.82	--	19.71	1,400	1.2	<0.5	2	3.5	2,204	--	PACE	--	c, m
	10/21/1993	--	36.53	18.84	--	17.69	370	2.1	2.3	2.3	6	847	--	PACE	--	c, m
	1/27/1994	--	36.53	18.00	--	18.53	1,300	6.3	<0.5	<0.5	<0.5	3,892	--	PACE	--	c, m
	4/21/1994	--	36.53	16.62	--	19.91	2,000	<0.5	<0.5	<0.5	<0.5	3,864	1.4	PACE	--	c, m
	9/9/1994	--	36.53	18.38	--	18.15	1,300	<0.5	<0.5	0.5	1.2	--	3	PACE	--	m
	12/21/1994	--	36.53	15.28	--	21.25	420	16	0.7	3.5	5.9	800	1.9	PACE	--	m
	1/30/1995	--	36.53	12.62	--	23.91	<50	<0.50	<0.50	<0.50	<1.0	--	2.5	ATI	--	
	4/10/1995	--	36.53	12.41	--	24.12	150	<0.50	<0.50	<0.50	<1.0	--	6.9	ATI	--	
	6/29/1995	--	36.53	14.95	--	21.58	100	<0.50	<0.50	<0.50	<1.0	--	6.4	ATI	--	
	9/18/1995	--	36.53	15.82	--	20.71	--	--	--	--	--	--	--	--	--	
	9/19/1995	--	36.53		--		82	<0.50	<0.50	<0.50	<1.0	260	7	ATI	--	
	12/7/1995	--	36.53	17.09	--	19.44	<50	<0.50	<0.50	<0.50	<1.0	91	4.5	ATI	--	
	3/28/1996	--	36.53	11.90	--	24.63	<50	<0.5	<1	<1	<1	230	4.2	SPL	--	
	6/20/1996	--	36.53	12.66	--	23.87	260	<0.5	<1	<1	<1	370	4.4	SPL	--	
	10/11/1996	--	36.53	16.23	--	20.30	330	<0.5	<1.0	<1.0	<1.0	440	5.8	SPL	--	
	1/2/1997	--	36.53	12.17	--	24.36	<50	<0.5	<1.0	<1.0	<1.0	140	6	SPL	--	
	4/14/1997	--	36.53	13.45	--	23.08	--	--	--	--	--	--	--	--	--	
	4/15/1997	--	36.53		--		1,500	<0.5	<1.0	<1.0	<1.0	1,800	5.6	SPL	--	
	7/2/1997	--	36.53	15.60	--	20.93	880	<0.5	<1.0	<1.0	<1.0	940	5.3	SPL	--	
	9/30/1997	--	36.53	17.16	--	19.37	40,000	13,000	2,400	870	3,100	510	6.6	SPL	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
MW-3	1/21/1998	--	36.53	11.77	--	24.76	120	<0.5	<1.0	<1.0	<1.0	98	4.7	SPL	--	
	4/9/1998	--	36.53	9.42	--	27.11	950	<0.5	<1.0	<1.0	<1.0	890	5.7	SPL	--	
	6/19/1998	--	36.53	12.09	--	24.44	1,800	<0.5	<1.0	<1.0	<1.0	1,900	4.7	SPL	--	
	6/19/1998	--	36.53	15.28	--	21.25	1,800	<0.5	<1.0	<1.0	<1.0	1,900	4.7	SPL	--	
	1/21/1999	--	36.53	14.67	--	21.86	1,100	<1.0	<1.0	<1.0	<1.0	1,200	--	SPL	--	
	4/30/1999	--	36.53	16.00	--	20.53	--	--	--	--	--	--	--	--	--	
	7/9/1999	--	36.53	14.64	--	21.89	470	<1.0	<1.0	<1.0	<1.0	460/470	--	SPL	--	g
	11/3/1999	--	36.53	16.39	--	20.14	--	--	--	--	--	--	--	--	--	
	1/12/2000	--	36.53	16.80	--	19.73	<50	<0.5	<0.5	<0.5	<0.5	34	--	PACE	--	
	4/13/2000	--	36.53	16.43	--	20.10	--	--	--	--	--	--	--	--	--	
	7/26/2000	--	36.53	16.93	--	19.60	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	PACE	--	
	10/24/2000	--	36.53	15.69	--	20.84	--	--	--	--	--	--	--	--	--	
	1/19/2001	--	36.53	14.84	--	21.69	<50	<0.5	<0.5	<0.5	1	25.9	--	PACE	--	
	7/23/2001	--	36.53	15.11	--	21.42	62	<0.5	<0.5	<0.5	<1.5	28.7	--	PACE	--	
	1/18/2002	--	36.53	12.37	--	24.16	<50	<0.5	<0.5	<0.5	<1.0	17.8	--	PACE	--	
	8/1/2002*	--	36.53	14.44	--	22.09	66	<0.5	<0.5	<0.5	<1.0	<0.5	--	PACE	--	
	1/16/2003	--	36.53	12.07	--	24.46	<50	<0.50	<0.50	<0.50	<0.50	20	--	SEQ	--	p
	7/7/2003	--	36.53	13.90	--	22.63	<50	<0.50	<0.50	<0.50	<0.50	--	--	SEQ	--	q
	02/05/2004	--	36.53	12.60	--	23.93	<50	<0.50	<0.50	<0.50	<0.50	4.6	--	SEQM	7.0	
	07/01/2004	**--**	**36.53**	**14.57**	**--**	**21.96**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**3.3**	**--**	**SEQM**	**--**	
QC-2	10/7/1992	--	37.73	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	ANA	--	
	1/14/1993	--	37.73	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	4/22/1993	--	37.73	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	m
	7/15/1993	--	37.73	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<5.0	--	PACE	--	m
	10/21/1993	--	37.73	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	
	1/27/1994	--	37.73	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	
	4/21/1994	--	37.73	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	
	9/9/1994	--	37.73	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	
	12/21/1994	--	37.73	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	PACE	--	
	1/30/1995	--	37.73	--	--	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	ATI	--	
	4/10/1995	--	37.73	--	--	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	ATI	--	
	6/27/1995	--	37.73	--	--	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	ATI	--	
	9/19/1995	--	37.73	--	--	--	<50	<0.50	<0.50	<0.50	<1.0	<5.0	--	ATI	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
QC-2	12/7/1995	--	37.73	--	--	--	<50	<0.50	<0.50	<0.50	<1.0	<5.0	--	ATI	--	
	3/28/1996	--	37.73	--	--	--	<50	<0.5	<1	<1	<1	<10	--	SPL	--	
	6/20/1996	--	37.73	--	--	--	<50	<0.5	<1	<1	<1	<10	--	SPL	--	
RW-1	4/5/1991	--	37.73		--		--	--	--	--	--	--	--	--	--	
	4/1/1992	--	37.73	22.81	0.30	14.62	--	--	--	--	--	--	--	--	--	
	7/6/1992	--	37.73	26.92	0.41	10.40	--	--	--	--	--	--	--	--	--	
	10/7/1992	--	37.73	28.51	1.26	7.96	--	--	--	--	--	--	--	--	--	
	1/14/1993	--	37.73	23.75	0.25	13.73	--	--	--	--	--	--	--	--	--	
	4/22/1993	--	37.73	22.70	1.38	13.65	--	--	--	--	--	--	--	--	--	
	7/15/1993	--	37.73	26.10	0.81	10.82	--	--	--	--	--	--	--	--	--	
	10/21/1993	--	37.73	25.40	0.49	11.84	--	--	--	--	--	--	--	--	--	
	1/27/1994	--	37.73	28.02	0.37	9.34	--	--	--	--	--	--	--	--	--	
	4/21/1994	--	37.73	23.10	0.91	13.72	--	--	--	--	--	--	--	--	--	
	9/9/1994	--	37.73	24.39	1.04	12.30	--	--	--	--	--	--	--	--	--	
	12/21/1994	--	37.73		--		--	--	--	--	--	--	--	--	--	
	12/7/1995	--	37.73	25.71	1.04	10.98	150,000	34,000	35,000	4,300	21,000	2,700	--	ATI	--	h
	3/28/1996	--	37.73	16.75	0.18	20.80	--	--	--	--	--	--	--	--	--	
	6/20/1996	--	37.73	25.10	0.02	12.61	--	--	--	--	--	--	--	--	--	
	10/11/1996	--	37.73	25.51	0.00	12.22	130,000	20,000	32,000	2,800	20,700	1400/1200	7.4	SPL	--	h
	1/2/1997	--	37.73	24.49	0.01	13.23	--	--	--	--	--	--	--	--	--	g
	4/14/1997	--	37.73	23.99	0.04	13.70	--	--	--	--	--	--	--	--	--	
	4/15/1997	--	37.73		--		1,800,000	38,000	190,000	48,000	281,000	<25000	--	SPL	--	
	7/2/1997	--	37.73	--	--	--	130,000	19,000	54,000	4,700	33,400	<10000	--	SPL	--	QC-1, e
	7/2/1997	--	37.73	16.40	0.20	21.13	140,000	19,000	55,000	4,400	32,400	<10000	5.7	SPL	--	
	9/30/1997	--	37.73	--	--	--	140,000	17,000	29,000	2,500	15,900	1,200	--	SPL	--	QC-1, e
	9/30/1997	--	37.73	27.97	0.02	9.74	110,000	13,000	22,000	2,000	12,500	1,100	7	SPL	--	
	1/21/1998	--	37.73	14.14	0.44	23.15	270,000	21,000	48,000	3,500	25,000	1,100	4.8	SPL	--	
	4/9/1998	--	37.73	25.01	0.05	12.67	--	--	--	--	--	--	--	--	--	
	4/10/1998	--	37.73		--		220,000	26,000	46,000	4,400	24,500	<2500	5.1	SPL	--	
	6/19/1998	--	37.73	11.43	--	26.30	180,000	19,000	32,000	3,000	17,400	<2500	4.6	SPL	--	
	11/30/1998	--	37.73	7.87	--	29.86	--	--	--	--	--	--	--	--	--	
	1/21/1999	--	37.73	18.90	0.03	18.80	260,000	24,000	46,000	5,100	30,000	1,700	--	SPL	--	
	7/9/1999	--	37.73	18.58	0.26	18.89	--	--	--	--	--	--	--	--	--	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well No.	Date	P/ NP	Well Elevation/ TOC (feet)	DTW (feet)	Product Thickness (feet)	GWE (feet)	GRO/ TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	DO (mg/L)	Lab	pH	Comments
RW-1	11/3/1999	--	37.73	20.85	0.60	16.28	160,000	19,000	37,000	3,800	25,000	1,500	--	PACE	--	
	1/12/2000	--	37.73	21.20	0.23	16.30	240,000	18,000	46,000	5,800	26,000	2,100	--	PACE	--	
	4/13/2000	--	37.73	21.71	0.11	15.91	120,000	2,100	33,000	2,800	28,000	1,500	--	PACE	--	
	5/24/2000	--	37.73	21.89	0.24	15.60	--	--	--	--	--	--	--	--	--	
	6/1/2000	--	37.73	16.30	0.01	21.42	--	--	--	--	--	--	--	--	--	
	6/8/2000	--	37.73	17.88	0.20	19.65	--	--	--	--	--	--	--	--	--	
	6/15/2000	--	37.73	16.72	0.04	20.97	--	--	--	--	--	--	--	--	--	
	6/20/2000	--	37.73	21.04	0.20	16.49	--	--	--	--	--	--	--	--	--	
	7/7/2000	--	37.73	17.21	0.01	20.51	--	--	--	--	--	--	--	--	--	
	7/20/2000	--	37.73	21.87	0.18	15.68	--	--	--	--	--	--	--	--	--	
	7/26/2000	--	37.73	21.45	0.13	16.15	67,000	160	5,300	2,100	18,000	1,100	--	PACE	--	
	7/31/2000	--	37.73	22.11	--	15.62	--	--	--	--	--	--	--	--	--	
	8/8/2000	--	37.73	17.80	0.01	19.92	--	--	--	--	--	--	--	--	--	
	8/16/2000	--	37.73	17.92	--	19.81	--	--	--	--	--	--	--	--	--	
	8/23/2000	--	37.73	18.11	0.02	19.60	--	--	--	--	--	--	--	--	--	
	10/24/2000	--	37.73	18.93	--	18.80	--	--	--	--	--	--	--	--	--	
	10/25/2000	--	37.73	19.04	--	18.69	360,000	18,000	78,000	34,000	180,000	2,100	--	PACE	--	k
	1/19/2001	--	37.73	18.19	0.05	19.49	110,000	9,450	19,600	3,510	21,100	1,270	--	PACE	--	
	7/24/2001	--	37.73	17.93	--	19.80	--	--	--	--	--	--	--	--	--	l
	1/18/2002	--	37.73	14.87	--	22.86	63,000	2,060	4,370	1,770	13,900	491	--	PACE	--	
	8/1/2002*	--	37.73	16.84	--	20.89	60,000	1,210	2,200	1,520	10,600	390	--	PACE	--	
	1/16/2003	--	37.73	14.42	--	23.31	34,000	2,500	2,700	780	5,300	680	--	SEQ	--	p
	7/7/2003	--	37.73	16.11	SHEEN	21.62	50,000	640	280	1,600	10,000	--	--	SEQ	--	q
	07/01/2004	P	37.73	16.75	--	20.98	47,000	320	87	1,900	7,500	72	--	SEQM	6.7	

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

ABBREVIATIONS:
TOC - top of casing
DTW - depth to water
GWE - groundwater elevation
TPH-G - total petroleum hydrocarbons as gasoline
B - benzene
T - toluene
E- ethyl benzene
X - total xylenes
MTBE - methyl tert butyl ether
DO - dissolved oxygen
ug/L - micrograms per liter
ppm - parts per million
— - not sampled
< - not detected at or above the lab reporting limit
PACE - PACE, Inc.
SUP - Superior Analytical Laboratories, Inc.
APP - Applied Analytical Laboratory
ANA - Anametrix, Inc.
ATI - Analytical Technologies, Inc.
SPL - Southern Petroleum Laboratories
SEQ - Sequoia Analytical
NOTES:
(a) Top of casing elevations surveyed to the nearest 0.01 foot above mean sea level.
(b) Groundwater elevations adjusted assuming a specific gravity of 0.75 for free product.
(c) A copy of the documentation for this data is included in Appendix C of Alistoreport 10-025-13-003.
(d) MTBE peak. See documentation in Appendix C of Alisto report 10-025-13-003.
(e) Blind duplicate.
(f) Well inaccessible.
(g) EPA Methods 8020/8260 used.
(h) Well not monitored and/or sampled due to vapor extraction system.
(i) Travel blank.
(j) This gasoline does not include MTBE.
(k) Well was sampled on a different date from the other wells due to lack of proper equipment.
(l) Unable to sample due to nature of product.
(m) A copy of the documentation for this data is included in Blaine Tech Services, Inc., Report 010724-B-2.The data for sampling events January 14, 1993 and April 22, 1993 has been destroyed.No chromatograms could be located for samples AW-2 on January 27, 1994, and for samples AW-1, AW-2, AW-3, AW-4, AW-5, AW-6, AW-7, AW-8, MW-2 and MW-3 on September 9, 1994.
(n) On June 1, 2001, after reviewing chromatograms, Sequoia reported the value as <5.0.
(o) Unable to locate well.
(p) TPH-g data analyzed by EPA Method 8015B modified; BTEX and MTBE by EPA Method 8021B
(q) TPH-g, BTEX, and MTBE analyzed by EPA method 8260B beginning on the third quarter 2003 sampling event (07/07/03)
(r) Discrete peak at C5
(s) Please note that beginning in the Fourth Quarter 2003, the laboratory modified the reported analyte list. Total Petroleum Hydrocarbons as Gasoline (TPHg) has been changed to Gasoline Range Organics (GRO). The resulting data may be impacted by the potential inclusion of non-TPHg analytes within the requested fuel range resulting in a higher concentration being reported. Also, beginnig the second quarter 2004, the carbon range for GRO has been changed from C-6-C10 to C4-C12.
(t) Well was not gauged during the quarter due to an oversite by the technician.

Table 1

Groundwater Elevation and Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

* During the second quarter of 2002, URS Corporation assumed groundwater monitoring activities for BP.
Source: The data within this tables collected prior to June 2002 was provided to URS by Atlantic Richfield Company and their previous consultants. URS has not verified the accuracy of this information.

Table 2

Fuel Additives Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Well Number	Date Sampled	Ethanol (µg/L)	TBA (µg/L)	MtBE (µg/L)	DIPE (µg/L)	EtBE (µg/L)	TAME (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
AW-1	7/7/2003	<5,000	<1,000	--	<25	<25	190	--	--
	02/05/2004	<10,000	<2,000	930	<50	<50	160	<50	<50
	07/01/2004	**<5,000**	**<1,000**	**1,100**	**<25**	**<25**	**170**	**<25**	**<25**
AW-2	02/05/2004	<100	<20	5.1	<0.50	<0.50	<0.50	<0.50	<0.50
AW-4	7/7/2003	<1,000	<200	--	<5.0	<5.0	<5.0	--	--
	02/05/2004	<200	<40	40	<1.0	<1.0	3.7	<1.0	<1.0
	07/01/2004	**<1,000**	**<200**	**64**	**<5.0**	**<5.0**	**9.6**	**<5.0**	**<5.0**
AW-5	7/7/2003	<2,000	1,200	--	<10	<10	210	--	--
	02/05/2004	<2,000	1,200	810	<10	<10	160	<10	<10
	07/01/2004	**<1,000**	**1,600**	**550**	**<5.0**	**<5.0**	**94**	**<5.0**	**<5.0**
AW-6	02/05/2004	<10,000	<2,000	5,400	<50	<50	1,800	<50	<50
	07/01/2004	**<10,000**	**<2,000**	**4,600**	**<50**	**<50**	**1,600**	**<50**	**<50**
MW-1	7/7/2003	<1,000	<200	24	<5.0	<5.0	<5.0	--	--
	02/05/2004	<1,000	<200	9.2	<5.0	<5.0	<5.0	<5.0	<5.0
	07/01/2004	**<10,000**	**<2,000**	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**
MW-3	7/7/2003	<100	<20	--	<0.50	<0.50	0.65	--	--
	02/05/2004	<100	<20	4.6	<0.50	<0.50	<0.50	<0.50	<0.50
	07/01/2004	**<100**	**<20**	**3.3**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**
RW-1	7/7/2003	<50,000	<10,000	--	<250	<250	<250	--	--
	07/01/2004	**<10,000**	**<2,000**	**72**	**<50**	**<50**	**<50**	**<50**	**<50**

Table 2

Fuel Additives Analytical Data

Former BP Station No. 11133
2220 98th Ave., Oakland, CA

Note: All fuel oxygenate compounds analyzed using EPA Method 8260B.
TBA = tert-butyl alcohol
MTBE = methyl tert-butyl ether
DIPE = di-isopropyl ether
ETBE = ethyl tert butyl ether
TAME = tert-Amyl methyl ether
1, 2-DCA = 1,2-dichloroethane
EDB = 1,2-dibromoethane
ug/L = micrograms per liter
< = less than or equal to the laboratory reporting limit

TABLE 2

RESULTS OF ANALYSIS
GROUND WATER SAMPLES

Well	TPH (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)
MW-1	FP	---	---	---	---
MW-2	ND <50	ND <0.5	ND <0.5	ND <0.5	ND <0.5
MW-3	ND <50	ND <0.5	ND <0.5	ND <0.5	ND <0.5
TW-1	77,000	6,600	5,500	2,900	1,500
TW-2	ND <50	1.4	1.4	0.6	5.0
TW-3	72,000	0.80	2.3	1.4	11
TW-4	FP	---	---	---	---
TW-5	66,000	19,000	15,000	1,800	8,600
TW-6	170,000	32,000	41,000	4,500	24,000
TW-7	470,000	11,000	29,000	9,700	48,000
TW-8	720,000	4,200	38,000	12,000	71,000

ND = Nondetectable
FP = Free Product
ppb = parts per billion
MW = Monitoring Well
TW = Temporary Well

CAMBRIA

Table 3. **Water Analytical Data -** BP Oil Site No. 11133, 2220 98th Avenue, Oakland, California

Well ID (Sample ID)	Date Sampled	TPHg (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Xylenes (ug/l)	MTBE (ug/l)
Analytical Method:		**8015m**	**8260**	**8260**	**8260**	**8260**	**8260**
B-1-W1	10/22/01	<50	<2.0	**2.29**	<2.0	<2.0	**71.6**
B-2-W1	10/22/01	**15,000**	**3,610**	**1,120**	**383**	**1,330**	**1,500**
B-3-W1	10/22/01	**4,600**	**1,410**	**171**	**1,010**	**1,290**	**1,420**
B-4-W1	10/23/01	**71,000**	**7,300**	**10,800**	**7,060**	**36,600**	**177**
DUP	10/23/01	**52,000**	**7,600**	**9,650**	**4,230**	**21,600**	<200
B-5-W1	10/23/01	**100,000**	**16,800**	**42,100**	**6,720**	**33,300**	**244**
B-6-W1	10/23/01	**110,000**	**30,600**	**36,800**	**5,410**	**26,900**	**1,010**

Abbreviations and Notes:

ug/l = micrograms per liter
TPHg = Total petroleum hydrocarbons as gasoline
MTBE = Methyl tert-butyl ether
<n = Below detection limit of n ug/L

Table
Historical Groundwater Flow Direction and Gradient
Former BP Site 11133
2220 98th Ave., Oakland, CA

Date Measured	Flow Direction	Hydraulic Gradient (Feet/foot)
07/06/92	South	0.04
07/06/92	Northwest	0.04
07/06/92	East	0.04
10/07/92	Southeast	0.13
01/14/93	East-northeast	0.20
01/14/93	East	0.30
04/22/93	Northeast	0.20
04/22/93	Southeast	0.20
07/15/93	East	0.10
07/15/93	Southeast	0.20
10/21/93	Northeast	0.13
10/21/93	Southeast	0.15
01/27/94	East-southeast	0.13
01/27/94	East	0.20
04/21/94	East-southeast	0.14
09/09/94	Southeast	0.10
12/21/94	East	0.07
01/30/95	South-southeast	0.06
04/10/95	East	0.07
06/29/95	South-southeast	0.14
09/18/95	Southeast	0.07
12/07/95	Southeast	0.11
03/28/96	East	0.05
06/20/96	East	0.07
06/20/96	West	0.04
10/11/96	East	0.06
01/02/97	East	0.15
04/14/97	East	0.08
07/02/97	East-northeast	0.05
01/21/98	Southwest	0.04
01/12/00	East	0.07
01/12/00	West	0.07
04/13/00	East	0.05
04/13/00	Southwest	0.05
07/26/00	Southwest	0.03
10/24/00	Southeast	0.04
01/19/01	East-southeast	0.04
07/24/01	East	0.08
07/24/01	West	0.03
01/18/02	West	0.04
08/01/02	East	0.05
08/01/02	South-southwest	0.04
01/16/03	East-southeast	0.06
01/16/03	West	0.02
03/14/03	East	0.06
03/14/03	West	0.02
02/05/04	Southwest	0.03
02/05/04	Northeast	0.06
07/07/03	Southwest	0.03
07/07/03	East	0.08
07/01/04	**Southwest**	**0.03**
07/01/04	**East**	**0.08**

ATTACHMENT D

Remediation System Operation Data and Product Removal Program Summary

TABLE 1 - SUMMARY OF RESULTS OF VAPOR EXTRACTION TREATMENT SYSTEM OPERATION
BP OIL COMPANY SERVICE STATION NO. 11133
2220 98TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-025

Monitoring Point	Date of Monitoring	Hydrocarbons Detected (ppmv)	Influent Flow Rate (scfm)	Exhaust Temperature (degrees F)	Effluent Flow Rate (acfm)	Destruction Efficiency (%)	Hydrocarbon Discharge (lbs/day)	Period Hydrocarbons Proccessed (lbs)	Total Hydrocarbons Removed (lbs)	Additional Analytical Data					LAB/ FIELD EQUIPMENT
										TPH-G (ppm)	B (ppm)	T (ppm)	E (ppm)	X (ppm)	
I-1	12/21/94	162	400	194	503	---	---	NC	NC	121	13	14.0	2.4	12.0	ATox
I-1	12/29/94	180	450	190	563	---	---	241.7	241.7	---	---	---	---	---	HORIBA
I-1	01/03/95	80	450	190	563	---	---	67.1	308.8	---	---	---	---	---	HORIBA
I-1	01/12/95	60	425	256	585	---	---	85.6	394.4	---	---	---	---	---	HORIBA
I-1	01/26/95	10	550	196	694	---	---	28.7	423.2	---	---	---	---	---	HORIBA
I-1	01/30/95	10	525	200	666	---	---	7.8	431.0	---	---	---	---	---	HORIBA
I-1	02/16/95	460	550	200	698	---	---	1604.3	2035.3	---	---	---	---	---	HORIBA
I-1	03/02/95	ND<10	650	200	825	---	---	NC	2035.3	---	---	---	---	---	HORIBA
I-1	03/27/95	360	525	254	721	---	---	1762.4	3797.7	---	---	---	---	---	HORIBA
I-1	04/03/95	30	450	221	589	---	---	35.2	3832.9	---	---	---	---	---	HORIBA
I-1	05/04/95	ND<10	475	185	589	---	---	NC	3832.9	---	---	---	---	---	HORIBA
I-1	05/23/95	110	525	176	642	---	---	409.3	4242.2	---	---	---	---	---	HORIBA
I-1	06/01/95	20	425	172	517	---	---	28.5	4270.8	---	---	---	---	---	HORIBA
I-1	06/28/95	80	500	285	716	---	---	402.8	4673.6	---	---	---	---	---	HORIBA
I-1	07/31/95	90	500	189	624	---	---	553.9	5227.5	---	---	---	---	---	HORIBA
I-1	08/23/95	9.8	425	186	528	---	---	35.7	5263.2	---	---	---	---	---	MINIRAE
I-1	09/28/95	86.8	530	183	655	---	---	617.7	5881.0	---	---	---	---	---	MINIRAE
I-1	10/31/95	93.5	450	186	559	---	---	517.9	6398.9	---	---	---	---	---	MINIRAE
I-1	11/14/95	86.6	450	201	572	---	---	203.5	6602.4	---	---	---	---	---	MINIRAE
I-1	12/05/95	196.6	475	209	611	---	---	738.9	7341.3	---	---	---	---	---	MINIRAE
I-1	12/27/95	2000.0	375	200	476	---	---	6154.5	13495.8	---	---	---	---	---	MINIRAE
E-1	12/21/94	4	400	194	503	97.53%	0.8	---	---	4	0.028	0.032	0.004	0.026	ATox
E-1	12/29/94	10	450	190	563	94.44%	2.1	---	---	---	---	---	---	---	HORIBA
E-1	01/03/95	ND<10	450	190	563	>87.50%	<2.1	---	---	---	---	---	---	---	HORIBA
E-1	01/12/95	ND<10	425	256	585	>83.33%	<2.2	---	---	---	---	---	---	---	HORIBA
E-1	01/26/95	ND<10	550	196	694	---	<2.6	---	---	---	---	---	---	---	HORIBA
E-1	01/30/95	ND<10	525	200	666	---	<2.5	---	---	---	---	---	---	---	HORIBA
E-1	02/16/95	60	550	200	698	86.96%	15.6	---	---	---	---	---	---	---	HORIBA
E-1	03/02/95	ND<10	650	200	825	---	<3.1	---	---	---	---	---	---	---	HORIBA
E-1	03/27/95	10	525	254	721	97.22%	2.7	---	---	---	---	---	---	---	HORIBA
E-1	04/03/95	ND<10	450	221	589	>66.67%	<2.2	---	---	---	---	---	---	---	HORIBA
E-1	05/04/95	ND<10	475	185	589	---	<2.2	---	---	---	---	---	---	---	HORIBA
E-1	05/23/95	20	525	176	642	81.82%	4.8	---	---	---	---	---	---	---	HORIBA
E-1	06/01/95	ND<10	425	172	517	>50.00%	<1.9	---	---	---	---	---	---	---	HORIBA
E-1	06/28/95	ND<10	500	285	716	>87.50%	<2.7	---	---	---	---	---	---	---	HORIBA
E-1	07/31/95	ND<10	500	189	624	>88.89%	<2.3	---	---	---	---	---	---	---	HORIBA
E-1	08/23/95	1.6	425	186	528	83.67%	<2.0	---	---	---	---	---	---	---	MINIRAE
E-1	09/28/95	3.6	530	183	655	95.85%	<2.4	---	---	---	---	---	---	---	MINIRAE
E-1	10/31/95	8.8	450	186	559	90.60%	<2.1	---	---	---	---	---	---	---	MINIRAE
E-1	11/14/95	7.1	450	201	572	91.80%	<2.1	---	---	---	---	---	---	---	MINIRAE
E-1	12/05/95	8.9	475	209	611	95.50%	<2.3	---	---	---	---	---	---	---	MINIRAE
E-1	12/27/95	1.4	375	200	476	99.93%	<1.8	---	---	---	---	---	---	---	MINIRAE

TABLE 1 - SUMMARY OF RESULTS OF VAPOR EXTRACTION TREATMENT SYSTEM OPERATION
BP OIL COMPANY SERVICE STATION NO. 11133
2220 98TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-025

Monitoring Point	Date of Monitoring	Hydrocarbons Detected (ppmv)	Influent Flow Rate (scfm)	Exhaust Temperature (degrees F)	Effluent Flow Rate (acfm)	Destruction Efficiency (%)	Hydrocarbon Discharge (lbs/day)	Period Hydrocarbons Proccessed (lbs)	Total Hydrocarbons Removed (lbs)	Additional Analytical Data					LAB/ FIELD EQUIPMENT
										TPH-G (ppm)	B (ppm)	T (ppm)	E (ppm)	X (ppm)	

ABBREVIATIONS:

ppmv	Parts per million volume
scfm	Standard cubic feet per minute
acfm	Actual cubic feet per minute
ppm	Parts per million
I-1	System influent
E-1	System effluent
ND	Not detected above reported detection limit
NC	Not calculated
TPH-G	Total petroleum hydrocarbons as gasoline

B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
---	Not analyzed/applicable
ATox	Air Toxics, Ltd.
HORIBA	HORIBA Meter
MINIRAE	MINIRAE PID Meter

TABLE 1 - FLOW DATA FOR GROUNDWATER REMEDIATION SYSTEM
BP OIL COMPANY SERVICE STATION NO. 11133
2220 98TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-025

Date		Flow Meter Reading (gallons)	Effluent Discharged (gallons)	Total Effluent Discharged (gallons)	Average Flow Rate (gpd)	Average Flow Rate (gpm)	Influent TPH-G Concentration (ug/l)	Period Hydrocarbons Removed (lb)	Cumulative Hydrocarbons Removed (lb)
03/21/95		0	0	0	---	---	299,100	NC	NC
03/27/95		3,069	3,069	3,069	512	0.71	350,600	9.0	9.0
05/02/95		4,280	1,211	4,280	34	0.05	245,400	2.5	11.5
06/01/95		5,390	1,110	5,390	37	0.05	460,600	4.3	15.7
06/28/95		7,634	2,244	7,634	83	0.12	301,300	5.6	21.4
07/31/95		9,480	1,846	9,480	56	0.08	301,300	4.6	26.0
08/30/95		11,869	2,389	11,869	80	0.11	276,700	5.5	31.5
09/28/95		19,572	7,703	19,572	266	0.37	322,800	20.7	52.3
10/18/95		21,266	1,694	21,266	85	0.12	396,200	5.6	57.9
11/14/95		28,880	7,614	28,880	282	0.39	238,100	15.1	73.0
12/27/95		39,395	10,515	39,395	245	0.34	165,100	14.5	87.5
01/22/96		42,994	3,599	42,994	138	0.19	236,400	7.1	94.6
02/27/96		53,058	10,064	53,058	280	0.39	380,000	31.9	126.5
03/01/96		55,609	2,551	55,609	850	1.18	380,000	8.1	134.6
03/25/96		59,409	3,800	59,409	158	0.22	266,300	8.4	143.0
04/30/96		65,132	5,723	65,132	159	0.22	189,000	9.0	152.1
05/30/96		82,551	17,419	82,551	581	0.81	276,200	40.1	192.2
07/01/96	(a)	83,210	659	83,210	21	0.03	151,000	0.8	193.0
07/31/96	(b)	84,444	1,234	84,444	41	0.06	151,000	1.6	194.6
08/27/96		98,824	14,380	98,824	533	0.74	124,500	14.9	209.5
09/30/96		107,482	8,658	107,482	255	0.35	306,100	22.1	231.6
10/29/96		114,368	6,886	114,368	237	0.33	1,930	0.1	231.7
11/25/96		122,583	8,215	122,583	304	0.42	154,500	10.6	242.3
12/31/96	(a)	131,256	8,673	131,256	241	0.33	59,740	4.3	246.7
02/24/97	(b)	132,257	1,001	132,257	250	0.35	308,300	2.6	249.2
03/25/97		138,149	5,892	138,149	1,403	1.95	340,400	16.7	266.0
04/14/97	(a)	138,290	141	138,290	30	0.04	278,500	0.3	266.3
05/20/97	(c)	138,372	82	138,372	36	0.05	465,600	0.3	266.6
05/26/98	(b)	138,967	595	138,967	259	0.36	294,400	1.5	268.1
06/25/98		143,256	4,289	143,256	143	0.20	287,300	10.3	278.4
07/07/98	(d)	149,459	6,203	149,459	517	0.72	287,300	14.9	293.2
09/26/98	(b)	150,311	852	150,311	11	0.01	230,200	1.6	294.9
09/30/98		151,021	710	151,021	178	0.25	230,200	1.4	296.2
10/28/98		160,715	9,694	160,715	346	0.48	441,300	35.7	331.9
11/24/98		162,237	1,522	162,237	56	0.08	441,300	5.6	337.5
12/14/98	(e)	166,358	4,121	166,358	206	0.29	196,300	6.8	344.4

TABLE 1 - FLOW DATA FOR GROUNDWATER REMEDIATION SYSTEM
BP OIL COMPANY SERVICE STATION NO. 11133
2220 98TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-025

Date	Flow Meter Reading (gallons)	Effluent Discharged (gallons)	Total Effluent Discharged (gallons)	Average Flow Rate (gpd)	Average Flow Rate (gpm)	Influent TPH-G Concentration (ug/l)	Period Hydrocarbons Removed (lb)	Cumulative Hydrocarbons Removed (lb)

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline	ug/l	Micrograms per liter
gpd	Gallons per day	lb	Pounds
gpm	Gallons per minute	NC	Not calculated

NOTES:

*	Hydrocarbon removal is calculated by: Effluent discharged (gallons) x TPH-G concentration (ug/l) x 3.785 (liters/gallon) x 1 (lb) / 453.6E6 (ug).
(a)	System shut down due to equipment failure.
(b)	Operation of system resumed.
(c)	System shut down pending approval from East Bay Municipal Utility District to resume operation.
(d)	System shut down for carbon changeout.
(e)	System shut down at the request of BP Oil.

TABLE 2 - SUMMARY OF RESULTS OF GROUNDWATER REMEDIATION SYSTEM SAMPLE ANALYSIS
BP OIL COMPANY SERVICE STATION NO. 11133
2220 98TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-025

Sample ID	Date	TPH-G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	DCA (ug/l)	Lead (mg/l)	Lab
I-1	03/21/95	180,000	32,000	55,000	5,100	27,000	---	---	---	ATI
I-1	04/03/95	210,000	31,000	68,000	6,600	35,000	---	---	---	ATI
I-1	05/23/95	160,000	17,000	38,000	4,400	26,000	---	---	0.006	ATI
I-1	06/20/95	330,000	27,000	55,000	7,600	41,000	---	---	---	ATI
QC-1	06/20/95	200,000	21,000	45,000	5,300	30,000	---	---	---	ATI
I-1	08/29/95	160,000	34,000	54,000	4,700	24,000	7,600	ND<500	---	ATI
I-1	09/19/95	230,000	28,000	40,000	3,800	21,000	---	440	---	ATI
I-1	10/18/95	280,000	38,000	51,000	4,200	23,000	3,000	580	---	ATI
I-1	11/14/95	150,000	32,000	33,000	4,100	19,000	---	560	---	ATI
I-1	12/11/95	99,000	24,000	26,000	2,100	14,000	1,000	420	---	ATI
I-1	01/09/96	150,000	28,000	37,000	3,400	18,000	2,000	720	---	ATI
I-1	02/21/96	230,000	22,000	57,000	10,000	61,000	---	ND<5	---	SPL
I-1	03/13/96	180,000	29,000	35,000	3,300	19,000	---	ND<5	---	SPL
I-1	04/18/96	95,000	37,000	34,000	4,000	19,000	---	ND<5	---	SPL
I-1	05/14/96	170,000	28,000	43,000	5,200	30,000	---	ND<5	---	SPL
I-1	06/13/96	96,000	16,000	23,000	2,200	13,800	ND<10,000	---	---	SPL
I-1	08/08/96	75,000	23,000	13,000	2,500	11,000	2,300	---	---	SPL
I-1	09/17/96	210,000	23,000	33,000	5,100	35,000	ND<10,000	---	---	SPL
I-1	10/24/96	1,600	140	190	ND<1.0	ND<1.0	160	---	---	SPL
I-1	11/14/96	100,000	23,000	20,000	2,600	8,900	ND<2,500	---	---	SPL
I-1	12/11/96	39,000	6,800	8,300	740	4,900	ND<2,500	---	---	SPL
I-1	02/24/97	220,000	27,000	34,000	4,400	22,900	ND<10,000	---	---	SPL
I-1	03/12/97	230,000	24,000	48,000	5,400	33,000	ND<10,000	---	---	SPL
I-1	04/08/97	150,000	26,000	61,000	6,500	35,000	ND<25,000	---	---	SPL
I-1	05/15/97	330,000	24,000	54,000	7,600	50,000	ND<10,000	---	---	SPL
I-1	05/22/98	210,000	20,000	36,000	3,600	24,800	ND<2,500	---	---	SPL
I-1	06/17/98	230,000	6,000	26,000	2,300	23,000	ND<250	---	---	SPL
I-1	09/26/98	150,000	20,000	35,000	3,900	21,300	1,200	---	---	SPL
I-1	10/26/98	320,000	30,000	47,000	6,300	38,000	2,400	---	---	SPL
I-1	12/07/98	130,000	19,000	26,000	3,200	20,100	1,503	---	---	SPL
PS-1	03/21/95	47,000	690	4,200	1,400	8,400	---	---	---	ATI
PS-1	04/03/95	150,000	26,000	42,000	3,500	18,000	---	---	---	ATI
PS-1	05/23/95	35,000	1,400	4,900	1,100	6,800	---	---	---	ATI
PS-1	06/20/95	60,000	5,200	11,000	1,400	9,000	---	---	---	ATI
PS-1	08/29/95	25,000	150	1,000	500	3,300	ND<250	---	---	ATI
PS-1	09/19/95	55,000	---	---	---	---	---	---	---	ATI
PS-1	10/18/95	12,000	86	660	190	1,400	---	ND<10		ATI
PS-1	11/14/95	630	9	11	3	20	---	ND<1	---	ATI

TABLE 2 - SUMMARY OF RESULTS OF GROUNDWATER REMEDIATION SYSTEM SAMPLE ANALYSIS
BP OIL COMPANY SERVICE STATION NO. 11133
2220 98TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-025

Sample ID	Date	TPH-G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	DCA (ug/l)	Lead (mg/l)	Lab
PS-1	12/11/95	470	34	52	8	81	---	ND<1	---	ATI
PS-1	01/09/96	110	ND<1	ND<2	ND<1	1	---	ND<1	---	ATI
PS-1	02/21/96	75,000	4,100	12,000	3,000	20,000	---	ND<5	---	SPL
PS-1	03/13/96	71,000	1,200	5,700	2,300	14,000	---	ND<5	---	SPL
PS-1	04/18/96	190	ND<5	ND<5	ND<5	5	---	ND<5	---	SPL
PS-1	05/14/96	15,000	11	360	600	3,700	---	ND<5	---	SPL
PS-1	06/13/96	18,000	2,000	3,300	460	3,060	ND<1,000	---	---	SPL
PS-1	08/08/96	180	3.2	6.6	1.6	21.2	37	---	---	SPL
PS-1	09/17/96	600	5.8	7.7	1.9	18.7	39	---	---	SPL
PS-1	10/24/96	35,000	3,900	4,700	ND<50	ND<50	570	---	---	SPL
PS-1	11/14/96	12,000	2,300	2,200	270	1,100	420	---	---	SPL
PS-1	12/11/96	17,000	2,900	3,200	330	1,400	640	---	---	SPL
PS-1	02/24/97	280,000	12,000	29,000	6,000	37,000	ND<10,000	---	---	SPL
PS-1	03/12/97	93,000	4,900	11,000	1,600	16,000	ND<5,000	---	---	SPL
PS-1	04/08/97	130,000	10,000	31,000	5,900	30,800	ND<25,000	---	---	SPL
PS-1	05/15/97	230,000	11,000	35,000	6,900	46,000	ND<5,000	---	---	SPL
PS-1	05/22/98	58,000	5,400	11,000	1,200	7,200	ND<500	---	---	SPL
PS-1	06/17/98	96,000	4,200	14,000	2,200	13,900	330	---	---	SPL
PS-1	09/26/98	79,000	11,000	19,000	1,900	11,800	ND<1,000	---	---	SPL
PS-1	10/28/98	120,000	13,000	15,000	1,700	15,100	ND<2,500	---	---	SPL
PS-1	12/07/98	27,000	4,100	3,000	290	4,700	750	---	---	SPL
A-1	03/21/95	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	---	ATI
A-1	04/03/95	ND<50	ND<0.50	0.50	ND<0.50	ND<1.0	---	---	---	ATI
A-1	05/23/95	1,200	ND<1.0	2.2	3.4	22	---	---	---	ATI
A-1	06/20/95	88	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	---	ATI
A-1	08/29/95	340	7.1	68	5.3	92	5.2	---	---	ATI
A-1	09/19/95	ND<500	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
A-1	10/18/95	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
A-1	11/14/95	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
A-1	12/11/95	1,200	4	5	3	82	---	ND<1	---	ATI
A-1	01/09/96	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
A-1	02/21/96	4,100	20	90	87	580	---	ND<5	---	SPL
A-1	03/13/96	11,000	50	860	650	4,100	---	ND<5	---	SPL
A-1	04/18/96	60	ND<5	ND<5	ND<5	ND<5	---	ND<5	---	SPL
A-1	05/14/96	60	ND<5	ND<5	ND<5	10	---	ND<5	---	SPL
A-1	06/13/96	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<10	---	---	SPL
A-1	08/08/96	60	16	12	1.8	10.9	61	---	---	SPL
A-1	09/17/96	140	1.4	1.6	ND<1.0	7.5	ND<10	---	---	SPL

TABLE 2 - SUMMARY OF RESULTS OF GROUNDWATER REMEDIATION SYSTEM SAMPLE ANALYSIS
BP OIL COMPANY SERVICE STATION NO. 11133
2220 98TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-025

Sample ID	Date	TPH-G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	DCA (ug/l)	Lead (mg/l)	Lab
A-1	10/24/96	80	24	15	1.0	8.1	37	---	---	SPL
A-1	11/14/96	370	83	51	5.3	21	92	---	---	SPL
A-1	12/11/96	2,400	490	410	39	249	320	---	---	SPL
A-1	02/24/97	350	1.4	8.4	5.7	55	ND<10	---	---	SPL
A-1	03/12/97	90	0.53	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
A-1	04/08/97	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
A-1	05/15/97	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
A-1	05/22/98	120	ND<0.5	ND<1.0	ND<1.0	1.8	ND<10	---	---	SPL
A-1	06/17/98	1,400	ND<0.5	7.7	24	132	ND<10	---	---	SPL
A-1	09/26/98	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
A-1	10/28/98	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
A-1	12/07/98	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
B-1	03/21/95	88	ND<0.50	2	ND<0.50	2	---	---	---	ATI
B-1	04/03/95	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	---	ATI
B-1	05/23/95	240	ND<0.50	0.68	0.93	7.2	---	---	---	ATI
B-1	06/20/95	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	---	ATI
B-1	08/29/95	37,000	54	420	600	3500	260	---	---	ATI
B-1	09/19/95	550	ND<1	ND<2	ND<1	9	---	ND<1	---	ATI
B-1	10/18/95	---	---	---	---	---	---	---	---	ATI
B-1	11/14/95	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
B-1	12/11/95	270	ND<1	ND<2	ND<1	1	---	ND<1	---	ATI
B-1	01/09/96	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
B-1	02/21/96	ND<50	ND<5	ND<5	ND<5	ND<5	---	ND<5	---	SPL
B-1	03/13/96	ND<50	ND<5	ND<5	ND<5	14	---	ND<5	---	SPL
B-1	04/18/96	ND<50	ND<5	ND<5	ND<5	ND<5	---	ND<5	---	SPL
B-1	05/14/96	ND<50	ND<5	8	ND<5	11	---	ND<5	---	SPL
B-1	06/13/96	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<10	---	---	SPL
B-1	08/08/96	ND<50	2.3	1.2	ND<1.0	1.3	48	---	---	SPL
B-1	09/17/96	52	0.78	1.6	ND<1.0	ND<1.0	14	---	---	SPL
B-1	10/24/96	70	1.4	ND<1.0	ND<1.0	ND<1.0	13	---	---	SPL
B-1	11/14/96	100	19	9.3	1.1	3.9	24	---	---	SPL
B-1	12/11/96	80	26	7.1	ND<1.0	2.6	110	---	---	SPL
B-1	02/24/97	600	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
B-1	03/12/97	730	5.3	8.1	2.5	51	17	---	---	SPL
B-1	04/08/97	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
B-1	05/15/97	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
B-1	05/22/98	230	2.4	2.7	2.2	15.8	ND<10	---	---	SPL
B-1	06/17/98	1,000	0.85	10	15	90	ND<10	---	---	SPL

TABLE 2 - SUMMARY OF RESULTS OF GROUNDWATER REMEDIATION SYSTEM SAMPLE ANALYSIS
BP OIL COMPANY SERVICE STATION NO. 11133
2220 98TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-025

Sample ID	Date	TPH-G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	DCA (ug/l)	Lead (mg/l)	Lab
B-1	09/26/98	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
B-1	10/28/98	ND<50	0.9	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
B-1	12/07/98	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
E-1	03/21/95	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	ND<0.002	ATI
E-1	04/03/95	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.0	---	---	0.007	ATI
E-1	05/23/95	140	ND<0.50	ND<0.50	ND<0.50	2.3	---	---	---	ATI
QC-1	05/23/95	250	ND<0.50	ND<0.50	1.0	7.5	---	---	---	ATI
E-1	06/20/95	ND<50	ND<0.50	ND<0.50	ND<0.50	1.1	---	---	---	ATI
E-1	08/29/95	200	ND<1	ND<2	ND<1	ND<1	ND<5	---	---	ATI
E-1	09/19/95	ND<500	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
QC-1	09/19/95	ND<500	---	---	---	---	---	---	---	ATI
E-1	10/18/95	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
QC-1	10/18/95	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
E-1	11/14/95	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
QC-1	11/14/95	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
E-1	12/11/95	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
E-1	01/09/96	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
QC-1	01/09/96	ND<50	ND<1	ND<2	ND<1	ND<1	---	ND<1	---	ATI
E-1	02/21/96	ND<50	ND<5	ND<5	ND<5	ND<5	---	ND<5	---	SPL
E-1	03/13/96	2,600	ND<5	19	49	320	---	ND<5	---	SPL
E-1	04/18/96	ND<50	ND<5	ND<5	ND<5	ND<5	---	ND<5	---	SPL
E-1	05/14/96	ND<50	ND<5	ND<5	ND<5	ND<5	---	ND<5	---	SPL
E-1	06/13/96	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<10	---	---	SPL
E-1	08/08/96	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	55	---	---	SPL
E-1	09/17/96	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
E-1	10/24/96	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
E-1	11/14/96	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
E-1	12/11/96	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
E-1	02/24/97	ND<50	0.76	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
E-1	03/12/97	1,800	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	---	---	SPL
E-1	04/08/97	ND<50	ND<1.0	ND<1.0	ND<1.0	1.3	ND<1.0	---	---	SPL
E-1	05/15/97	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
E-1	05/22/98	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
E-1	06/17/98	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
E-1	09/26/98	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
E-1	10/28/98	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL
E-1	12/07/98	ND<50	ND<0.5	ND<1.0	ND<1.0	ND<1.0	ND<10	---	---	SPL

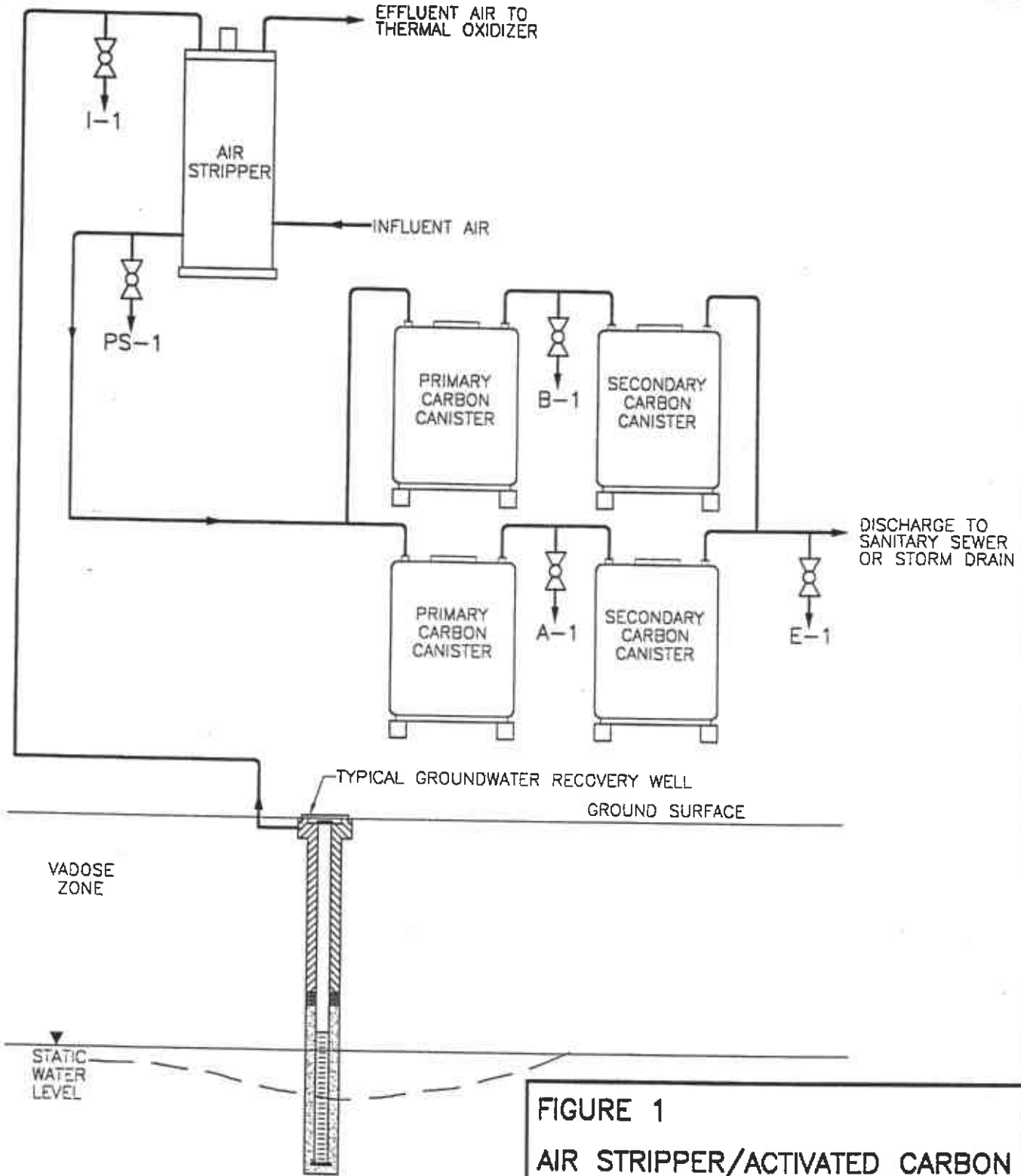
TABLE 2 - SUMMARY OF RESULTS OF GROUNDWATER REMEDIATION SYSTEM SAMPLE ANALYSIS
BP OIL COMPANY SERVICE STATION NO. 11133
2220 98TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-025

Sample ID	Date	TPH-G (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	MTBE (ug/l)	DCA (ug/l)	Lead (mg/l)	Lab

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
MTBE	Methyl tert butyl ether
DCA	1,2-Dichloroethane
ug/l	Micrograms per liter
mg/l	Milligrams per liter
I-1	Sample collected from influent sampling port
PS-1	Sample collected from post air stripper sampling port
A-1	Sample collected from intermediate sampling port
B-1	Sample collected from intermediate sampling port
E-1	Sample collected from effluent sampling port
QC-1	Blind duplicate sample
ND	Not detected above reported detection limit
---	Not analyzed
ATI	Analytical Technologies, Inc.
SPL	Southern Petroleum Laboratories



LEGEND

I = INFLUENT
A&B = INTERMEDIATE
E = EFFLUENT
SAMPLE PORT

FIGURE 1

AIR STRIPPER/ACTIVATED CARBON TREATMENT SYSTEM SAMPLING LOCATIONS

BP OIL SERVICE STATION NO. 11133
2220 98TH AVENUE
OAKLAND, CALIFORNIA

PROJECT NO. 10–025

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

TABLE
PRODUCT REMOVAL STATUS

WELL ID	DATE OF MONITORING	PRODUCT REMOVED (Gallons)	PRODUCT REMOVED CUMULATIVE (Gallons)
RW-1	10/6/1993	1.00	1.00
	10/14/1994	1.00	2.00
	10/20/1994	18.00	20.00
	10/26/1994	3.00	23.00
	11/2/1993	5.00	28.00
	11/10/1994	6.00	34.00
	11/16/1994	2.50	36.50
	11/23/1994	5.00	41.50
	11/30/1993	2.00	43.50
	12/7/1993	4.00	47.50
	12/17/1993	1.50	49.00
	1/4/1994	5.00	54.00
	1/12/1994	3.50	57.50
	1/20/1994	2.50	60.00
	2/11/1994	4.00	64.00
	2/18/1993	3.50	67.50
	2/25/1994	3.00	70.50
	3/4/1994	3.50	74.00
	3/18/1994	5.50	79.50
	3/30/1994	4.00	83.50
	4/13/1994	4.60	88.10
	4/21/1994	4.20	92.30
	4/29/1994	4.50	96.80
	5/6/1994	5.50	102.30
	5/13/1994	3.50	105.80
	5/20/1994	3.50	109.30
	5/26/1994	4.50	113.80
	6/2/1994	3.50	117.30
	6/9/1994	2.50	119.80
	6/16/1994	3.50	123.30
	6/23/1994	4.00	127.30
	6/29/1994	2.50	129.80
	7/7/1994	2.00	131.80
	7/12/1994	3.00	134.80
	7/20/1994	1.50	136.30
	7/29/1994	3.50	139.80
	8/5/1994	1.50	141.30
	8/12/1994	2.00	143.30
	8/18/1994	2.50	145.80
	9/9/1994	3.50	149.30
	9/16/1994	4.00	153.30

TABLE
PRODUCT REMOVAL STATUS

WELL ID	DATE OF MONITORING	PRODUCT REMOVED (Gallons)	PRODUCT REMOVED CUMULATIVE (Gallons)
RW-1	9/23/1994	2.00	155.30
	12/7/1995	0.00	155.30
	3/28/1996	0.01	155.31
	06/20/96	0.00	155.31
	4/14/1997	<0.05	155.31
	7/2/1997	0.25	155.56
	9/30/1997	<0.01	155.56
	1/21/1998	0.5	156.06
	4/10/1998	0.09	156.15
	6/19/1998	<0.01	156.15
	11/30/1998	0.00	156.15
	1/21/1999	0.00	156.15
	4/30/1999	0.11	156.26
	7/9/1999	0.00	156.26
	11/3/1999	1.06	157.32
	1/12/2000	0.53	157.85
	4/13/2000	0.26	158.11
	5/24/2000	0.53	158.64
	6/1/2000	0.00	158.64
	6/8/2000	0.26	158.90
	6/15/2000	0.13	159.03
	6/20/2000	0.53	159.56
	7/7/2000	0.01	159.57
	7/20/2000	0.11	159.68
	7/26/2000	0.13	159.81
	7/31/2000	0.00	159.81
	8/8/2000	0.01	159.82
	8/16/2000	0.00	159.82
	8/23/2000	0.13	159.95
	8/31/2000	0.40	160.35
	9/8/2000	0.53	160.88
	9/25/2000	0.01	160.89
	10/24/2000	0.00	160.89
	2/14/2000	0.01	160.90
	3/20/2000	0.13	161.03
	4/26/2000	0.00	161.03
	5/17/2000	0.00	161.03
	6/28/2000	0.00	161.03
	1/19/2001	0.11	161.14
	2/14/2001	0.01	161.15
	3/20/2001	0.13	161.28
	4/26/2001	0.00	161.28
	5/17/2001	0.00	161.28

TABLE
PRODUCT REMOVAL STATUS

WELL ID	DATE OF MONITORING	PRODUCT REMOVED (Gallons)	PRODUCT REMOVED CUMULATIVE (Gallons)
	6/28/2001	0.00	161.28
	7/24/2001	0.00	161.28
	9/21/2001	0.01	161.29
	10/23/2001	0.00	161.29
	11/30/2001	0.00	161.29
	1/18/2002	0.00	161.29
	2/7/2002	0.00	161.29
MW-1	10/20/1993	0.10	0.10
	11/10/1993	0.10	0.20
	9/9/1994	SHEEN	0.20
	10/26/1994	SHEEN	0.20
	11/16/1994	SHEEN	0.20
	12/21/1994	0.25	0.45
	2/8/1995	0.00	0.45
	4/10/1995	0.25	0.70
	6/29/1995	SHEEN	0.70
	9/18/1995	SHEEN	0.70
	12/7/1995	SHEEN	0.70
	3/28/1996	<.001	0.70
	06/20/96	0.002	0.70
	10/11/1996	<0.001	0.70
	1/2/1997	<0.01	0.70
	4/14/1997	<0.01	0.70
	7/2/1997	<0.01	0.70
	1/21/1998	<0.01	0.70
	6/19/1998	<0.01	0.70
	11/30/1998	0.00	0.70
	1/21/1999	SHEEN	0.70
	4/30/1999	SHEEN	0.70
	7/9/1999	SHEEN	0.70
	11/3/1999	0.00	0.70
	1/12/2000	0.00	0.70
	4/13/2000	0.00	0.70
	5/24/2000	0.00	0.70
	6/1/2000	0.00	0.70
	6/8/2000	0.00	0.70
	6/15/2000	0.00	0.70

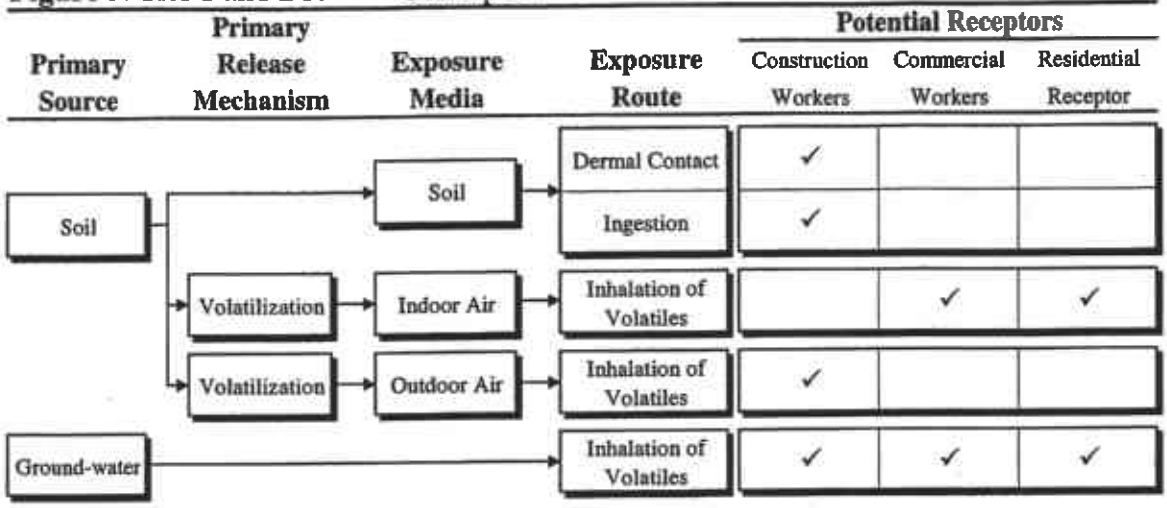
NOTE: Groundwater and soil vapor extraction equipment installed in RW-1 in October 1994.

ATTACHMENT E

RBCA Exposure Evaluation Flow Charts, Tier 1, 2 and 3 evaluations, and Statistical analysis Results

Source: MWH 2002. Risk-Based Corrective Action (RBCA) Evaluation For BP Oil Facility No. 11133, 2220 98th Avenue, Oakland, California. March.

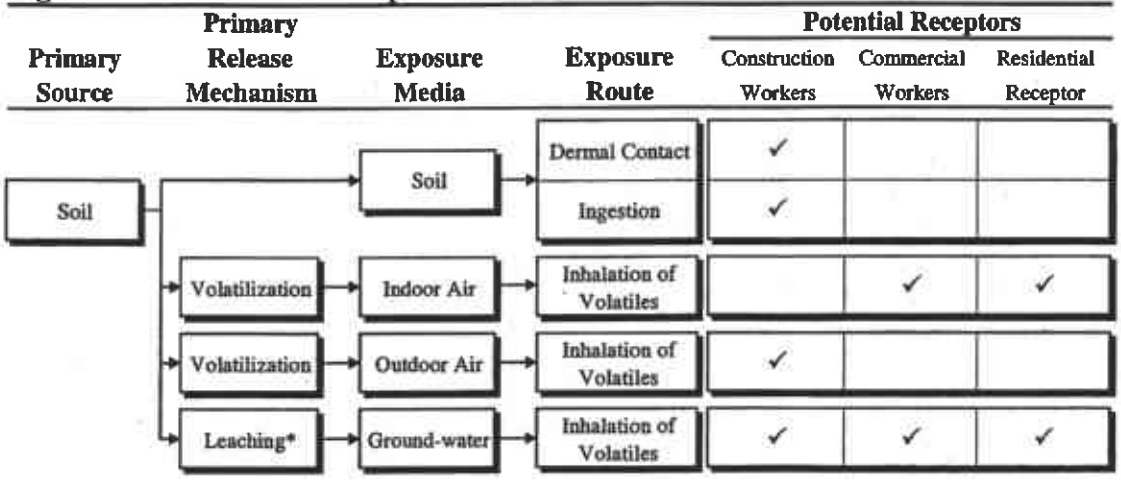
Figure 5. Tier 1 and 2 RBCA Conceptual Site Model



✓ Potentially complete exposure pathway.

Risk-Based Corrective Action (RBCA) Evaluation

Figure 6. Tier 3 RBCA Conceptual Site Model



✓ Potentially complete exposure pathway.

* Evaluated using the RBCA equations.

Table 1. Soil RBCA Tier 1 Analysis

	Soil Concentration (mg/kg)[a]						
	Benzene	**Toluene**	**Ethyl-benzene**	**Xylenes**	**MTBE**	**TPH-G**	**TPH-D**
Minimum	0.01	0.01	0.003	0.01	0.10	1.00	3,900
Mean	0.08	0.04	0.025	0.14	0.5	3.0	--
Maximum	1.0	0.71	0.520	3.0	4.0	33.0	3,900
Location of Maximum	RW-1@25[c]	RW-1@25[c]	P3@2.5[d]	P3@2.5[d]	P3@3.5[d]	RW-1@25[c]	TD-5-0.5[e]
Soil Direct Contact-Construction							
Tier 1 level (Oakland-RBCA)[b]	195.0	5,833	3,438	31,250	177	NA	NA
Proceed to Tier 2?	No	No	No	No	No	**Yes**	**Yes**
Soil to Outdoor Air-Construction							
Tier 1 level (Oakland-RBCA)[b]	18.3	SAT	SAT	SAT	SAT	NA	NA
Proceed to Tier 2?	No	No	No	No	No	**Yes**	**Yes**
Soil to Enclosed Space Air-Workers							
Tier 1 level (Oakland-RBCA)	1.1	SAT	SAT	SAT	SAT	NA	NA
Proceed to Tier 2?	No	No	No	No	No	**Yes**	**Yes**
Soil to Enclosed Space Air-Residents							
Tier 1 level (Oakland-RBCA)	0.069	SAT	SAT	SAT	SAT	NA	NA
Proceed to Tier 2?	**Yes**	No	No	No	No	**Yes**	**Yes**

[a]From soil sampling for the site

[b]Construction benzene Tier 1 level was calculated using construction worker exposure parameters (480 mg/day ingestion, exposure duration of one year).

[c]Alton Geoscience (1990b).

[d]Gettler-Ryan Inc (1999).

[e]EMCON (1994).

SAT = soil saturation concentration

Table 3. Soil RBCA Tier 2 Analysis

	Concentration (mg/kg)[a]		
	Benzene	**TPH-G**	**TPH-D**
Minimum	0.01	1.00	3,900
Mean	0.08	3.0	--
Maximum	1.00	33.0	3,900
Location of Maximum	RW-1@25[d]	RW-1@25[d]	TD-5-0.5[e]
Soil Direct Contact-Construction			
Tier 2 level (Oakland-RBCA-Sandy Silts)[b,c]	NA	NA	NA
Proceed to Tier 3	NA	**Yes**	**Yes**
Soil to Outdoor Air-Construction			
Tier 2 level (Oakland-RBCA-Sandy Silts)[b,c]	NA	NA	NA
Tier 2 level (Cal-EPA adjusted)[f]	NA	--	--
Proceed to Tier 3	NA	**Yes**	**Yes**
Soil to Enclosed Space Air-Workers			
Tier 2 level (Oakland-RBCA-Sandy Silts)[g]	NA	NA	NA
Proceed to Tier 3	NA	**Yes**	**Yes**
Soil to Enclosed Space Air-Residents			
Tier 2 level (Oakland-RBCA-Sandy Silts)[g]	1.1	NA	NA
Proceed to Tier 3	No	**Yes**	**Yes**

[a]From soil sampling for the site.

[b]Construction benzene Tier 1 level was adjusted to reflect the difference between the construction worker exposure duration (1 year) versus the commercial worker exposure duration (assumed to be 25 years).

[c]Sandy Silts Tier 2 values are used because they are considered the most appropriate based on the soil types beneath the site.

[d]Alton Geoscience (1990b).

[e]EMCON (1994).

SAT = soil saturation concentration

Table 5. Soil Statistical Analysis

	Soil Concentration (mg/kg)[a]						
	Benzene	Toluene	Ethyl-benzene	Xylenes	MTBE	TPH-G	TPH-D
Soil (all depths)							
Samples	58	58	58	58	16	58	2
Detections	29	19	19	22	5	11	1
Detection Frequency	50%	33%	33%	38%	31%	19%	50%
Minimum Detectior	0.01	0.01	0.030	0.01	0.10	1.00	3,900
Mean	0.14	0.10	0.061	0.29	0.5	9.20	NA
Maximum Detection	1.0	0.71	0.520	3.0	4.0	33	3,900
Standard Deviation	0.28	0.18	0.12	0.73	1.59	8.79	NA
Distribution	Lognormal	Lognormal	Lognormal	Lognormal	Normal	NP	NA
95% UCL	0.41	0.42	0.18	1.2	3.0	8.7*	3,900
Soil (0-10 feet)							
Samples						23	2
Detections						8	1
Detection Frequency						35%	50%
Minimum Detectior						1.20	3,900
Mean-Detects						8.3	NA
Mean						8.3	NA
Maximum Detection						23.0	3,900
Standard Deviation						7.46	NA
Distribution						Normal	NA
95% UCL						13.2	3,900

* Determined assuming the underlying distribution of the data is normal. See text

[a]Half the detection limit was used for non-detect values

NP = Non-parametric

NA= not applicable

Table 7. Soil Vapor Statistical Analysis

	Soil Concentration (ppmv)[a]					
	Southeastern[b]					
	Benzene	**Toluene**	**Ethyl-benzene**	**Xylenes**	**MTBE**	**TPH-G**
Soil Vapor						
Samples	9	9	9	9	9	9
Detections	8	9	1	8	4	9
Detection Frequency	89%	100%	11%	89%	44%	100%
Minimum Detectior	0.0014	0.0033	0.0010	0.0013	0.0013	1.6
Mean	0.0082	0.0079	0.0015	0.0048	0.0027	5.2
Maximum Detection	0.026	0.019	0.0027	0.0098	0.0050	11
Standard Deviation	0.0070	0.0045	0.00051	0.0025	0.0016	3.6
Distribution	Lognormal	Lognormal	NP	Normal	NP	Normal
95% UCL	0.018	0.012	0.0018*	0.0064	0.0037*	7.4
	Eastern[c]					
	Benzene	**Toluene**	**Ethyl-benzene**	**Xylenes**	**MTBE**	**TPH-G**
Soil Vapor						
Samples	9	9	9	9	9	9
Detections	8	9	4	8	6	8
Detection Frequency	89%	100%	44%	89%	67%	89%
Minimum Detection	0.0021	0.0055	0.0012	0.0021	0.0013	1.3
Mean	0.05	0.041	0.020	0.085	0.01	2.6
Maximum Detection	0.34	0.23	0.15	0.59	0.062	6.2
Standard Deviation	0.11	0.073	0.049	0.19	0.019	1.6
Distribution	Lognormal	Lognormal	NP	Lognormal	Lognormal	Lognormal
95% UCL	0.34	0.19	0.050*	0.59	0.041	4.0

* Determined assuming the underlying distribution of the data is normal. See text.

[a]Half the detection limit was used for non-detect values.

[b]Located near southeastern property line, adjacent to a 2-story apartment building; borings B-1, B-2, and B-3.

[c]Located near eastern property line, adjacent to a single-story residence; borings B-4, B-5, and B-6.

NP = Non-parametric

Table 8. On-Site Vapor Diffusion Model - Subsurface Soil to Ambient and Indoor Air[a]

			TPH-D			
			C9-C18 aliphatics		C9-C22 aromatics	
Parameter	**Abbrev.**	**Units**	Outdoor	Indoor Commercial	Outdoor	Indoor Commercial
Henry's law constant[b]	H	unitless	250.51	250.51	0.17	0.17
Volumetric air content in vadose zone soils[b]	θ_{as}	cm^3/cm^3	0.13	0.13	0.13	0.13
Volumetric water content in vadose zone soils[b]	θ_{ws}	cm^3/cm^3	0.35	0.35	0.35	0.35
Volumetric air content in crack[b]	θ_{acrack}	cm^3/cm^3	0.26	0.26	0.26	0.26
Volumetric water content in crack[b]	θ_{wcrack}	cm^3/cm^3	0.12	0.12	0.12	0.12
Total soil porosity[b]	θ_T	cm^3/cm^3	0.45	0.45	0.45	0.45
Diffusion coefficient in water[b]	D^{wat}	cm^2/s	1.0 E-5	1.0 E-5	1.0 E-5	1.0 E-5
Vapor phase diffusion coefficient in air[b]	D^{air}	cm^2/s	0.100	0.100	0.100	0.100
Effective diffusion coefficient-soil[c]	$D^{eff}{}_s$	cm^2/s	4.6 E-4	4.9 E-4	4.6 E-4	4.9 E-4
Effective diffusion coefficient-crack[c]	$D^{eff}{}_{crack}$		5.2 E-3	5.2 E-3	5.2 E-3	5.2 E-3
Wind speed[d]	U_{air}	cm/s	322.0	--	322.0	--
Mixing zone height[b]	δ_{air}	cm	200	--	200	--
Partition coefficient for organic carbon[e]	k_{oc}	cm^3/g	341,455	341,455	4,217	4,217
Organic carbon content of soil[b]	f_{oc}	--	1.8%	1.8%	1.8%	1.8%
Sorption coefficient[f]	k_s	cm^3/g	5975.46	5975.46	73.80	73.80
Soil bulk density[b]	ρ_s	g/cm^3	1.5	1.5	1.5	1.5
Depth to subsurface soil sources[d]	L_S	cm	15.2	15.2	15.2	15.2
Width of source area parallel to wind[d]	W	cm	305	--	305	--
Enclosed space air exchange rate[b]	ER	sec^{-1}	--	1.4 E-3	--	1.4 E-3
Enclosed space volume/infiltration area ratio[g]	L_B	cm	--	9.4 E+3	--	9.4 E+3
Enclosed space or wall thickness[b]	L_{crack}	cm	--	15	--	15
Areal fraction of cracks in foundations/walls[b]	η	cm^2/cm^2	--	0.001	--	0.001
Soil to ambient air volatilization factor[h]	VF	(mg/m^3) / (mg/kg)	6.0 E-6	1.0 E-7	3.4 E-7	5.9 E-9
Concentration in soil[d]	C_s	mg/kg	2,535	2,535	1,365	1,365
Ambient air concentration[i]	C_{air}	mg/m^3	1.5 E-2	2.6 E-4	4.6 E-4	8.0 E-6

Table 9. On-Site Vapor Diffusion Model - Groundwater to Indoor Air[a]

Parameter	Abbrev.	Units	TPH-G		
			C5-C8 aliphatics	C9-C18 aliphatics	C9-C22 aromatics
Henry's law constant[b]	H	unitless	42.64	250.51	0.17
Volumetric air content in vadose zone soils[b]	θ_{as}	cm^3/cm^3	0.13	0.13	0.13
Volumetric air content in capillary fringe soils[b]	$\theta_{a,cap}$	cm^3/cm^3	0.015	0.015	0.015
Volumetric water content in vadose zone soils[b]	θ_{ws}	cm^3/cm^3	0.33	0.33	0.33
Volumetric water content in capillary fringe soils[b]	$\theta_{w,cap}$	cm^3/cm^3	0.44	0.44	0.44
Volumetric air content in foundation/wall cracks[b]	θ_{acrack}	cm^3/cm^3	0.26	0.26	0.26
Volumetric water content in foundation/wall cracks[b]	θ_{wcrack}	cm^3/cm^3	0.12	0.12	0.12
Effective diffusion coefficient through capillary fringe[c]	$D_{eff,cap}$	cm^2/s	5.0 E-7	4.3 E-7	2.0 E-5
Effective diffusion coefficient in soil[d]	$D_{eff,s}$	cm^2/s	4.9 E-4	4.9 E-4	4.9 E-4
Effective diffusion coefficient between groundwater and soil[e]	$D_{eff,ws}$	cm^2/s	2.5 E-6	2.2 E-6	8.6 E-5
Effective diffusion coefficient through cracks[f]	$D_{eff,crack}$	cm^2/s	5.6 E-3	5.6 E-3	5.6 E-3
Thickness of capillary fringe[b]	h_{cap}	cm	106	106	106
Thickness of vadose zone[g]	h_v	cm	427	427	427
Total soil porosity[b]	θ_T	cm^3/cm^3	0.45	0.45	0.45
Diffusion coefficient in water[b]	D_w	cm^2/s	1.1 E-5	1.1 E-5	1.1 E-5
Vapor phase diffusion coefficient in air[b]	D_{air}	cm^2/s	0.100	0.100	0.100
Soil bulk density[b]	ρ_s	g/cm^3	1.5	1.5	1.5
Depth to groundwater[g]	L_{GW}	cm	533.4	533.4	533.4
Enclosed-space volume/infiltration ratio[b]	L_B	cm	305	305	305
Enclosed-space foundation or wall thickness[b]	L_{crack}	cm	1	1	1
Areal fraction of cracks in foundations/walls[b]	η	cm^2/cm^2	0.001	0.001	0.001
Enclosed space air exchange rate[b]	ER	L/s	1.4 E-3	1.4 E-3	1.4 E-3
Groundwater to indoor air volatilization factor[h]	VF_{es}	$(mg/m^3)/(mg/L)$	4.7 E-4	2.4 E-3	6.4 E-5
Concentration in groundwater[g]	C_{gw}	mg/L	12.8	9.1	14.6
Enclosed-space air concentration[i]	C_{es}	mg/m^3	5.9 E-3	2.2 E-2	9.3 E-4

Table 10. On-Site Vapor Diffusion Model - Groundwater to Ambient Air[a]

Parameter	Abbrev.	Units	TPH-G C5-C8 aliphatics	TPH-G C9-C18 aliphatics	TPH-G C9-C22 aromatics
Henry's law constan[b]	H	unitless	42.64	250.51	0.17
Volumetric air content in vadose zone soils[b]	θ_{as}	cm^3/cm^3	0.13	0.13	0.13
Volumetric air content in capillary fringe soils[b]	$\theta_{a,cap}$	cm^3/cm^3	0.015	0.015	0.015
Volumetric water content in vadose zone soils[b]	θ_{ws}	cm^3/cm^3	0.33	0.33	0.33
Volumetric water content in capillary fringe soils[b]	$\theta_{w,cap}$	cm^3/cm^3	0.44	0.44	0.44
Effective diffusion coefficient through capillary fringe[c]	$D_{eff,cap}$	cm^2/s	4.9 E-7	4.3 E-7	1.8 E-5
Effective diffusion coefficient in soil[d]	$D_{eff,s}$	cm^2/s	4.9 E-4	4.9 E-4	4.9 E-4
Groundwater/soil effective diffusion coefficient[e]	$D_{eff,ws}$	cm^2/s	2.5 E-6	2.2 E-6	7.9 E-5
Thickness of capillary fringe[b]	h_{cap}	cm	106	106	106
Thickness of vadose zone[f]	h_v	cm	427	427	427
Total soil porosity[b]	θ_T	cm^3/cm^3	0.45	0.45	0.45
Diffusion coefficient in water[b]	D_w	cm^2/s	1.0 E-5	1.0 E-5	1.0 E-5
Vapor phase diffusion coefficient in air[b]	D_{air}	cm^2/s	0.100	0.100	0.100
Wind speed above source parallel to groundwater flow[b]	U_{air}	cm/s	322	322	322
Ambient air mixing zone height[b]	δ_{air}	cm	200	200	200
Width of source area parallel to groundwater flow[f]	W	cm	2,286	2,286	2,286
Soil bulk density[b]	ρ_s	g/cm^3	1.5	1.5	1.5
Depth to groundwater[f]	L_{GW}	cm	533.4	533.4	533.4
Groundwater to ambient air volatilization factor[g]	VF_{am}	$(mg/m^3)/(mg/kg)$	7.0 E-6	3.6 E-5	9.2 E-7
Concentration in groundwater[f]	C_{gw}	mg/L	12.8	9.1	14.6
Ambient air concentration[h]	C_{am}	mg/m^3	8.9 E-5	3.3 E-4	1.3 E-5

[a]ASTM, 1999, Oakland RBCA (2000a).

[b]Oakland RBCA (2000a) default value. The soils beneath the site are predominantly silty clay; therefore, soil parameters are the average of the sandy silt and clayey silt parameters.

[c]$D_a \times (\theta_{a,cap}^{3.33}/\theta_T^2) + D_w \times (1/H) \times (\theta_{w,cap}^{3.33}/\theta_T^2)$.

[d]$D_a \times (\theta_{as}^{3.33}/\theta_T^2) + D_w \times (1/H) \times (\theta_{ws}^{3.33}/\theta_T^2)$.

[e]$(h_{cap} + h_v)/[(h_{cap}/D_{eff,cap}) + (h_v/D_{s,eff})]$.

[f]Based on site data.

[g]$1000\ L/m^3 \times H/[1 + (U_{air} \times \delta_{air} \times L_{GW})/(W \times D_{eff,ws})]$.

[h]$C_{gw} \times VF_{am}$.

Table 12. Leaching Model - Soil to Groundwater[a]

Parameter	Abbrev.	Units	Benzene	Toluene	Ethyl-benzene	Xylene	MTBE
Henry's law constant[b]	H	unitless	0.22	0.22	0.22	0.22	0.22
Volumetric air content in vadose zone soils[b]	θ_{as}	cm^3/cm^3	0.13	0.13	0.13	0.13	0.13
Volumetric water content in vadose zone soils[b]	θ_{ws}	cm^3/cm^3	0.33	0.33	0.33	0.33	0.33
Groundwater darcy velocity[b]	U_{air}	cm/s	33.0	33.0	33.0	33.0	33.0
Groundwater mixing zone thickness[b]	δ_{gw}	cm	1143	1143	1143	1143	1143
Partition coefficient for organic carbon[b]	k_{oc}	cm^3/g	83	83	83	83	83
Organic carbon content of soil[b]	f_{oc}	--	1.8%	1.8%	1.8%	1.8%	1.8%
Sorption coefficient[d]	k_s	cm^3/g	1.45	1.45	1.45	1.45	1.45
Soil bulk density[b]	ρ_s	g/cm^3	1.72	1.72	1.72	1.72	1.72
Infiltration rate[b]	I	cm/yr	4.5	4.5	4.5	4.5	4.5
Width of source area[e]	W	cm	2286.0	2286.0	2286.0	2286.0	2286.0
Soil to ambient air volatilization factor[f]	LF	(mg/L) / (mg/kg)	1.3 E-1	1.3 E-1	1.3 E-1	1.3 E-1	1.3 E-1
Concentration in soil[e]	C_s	mg/kg	0.41	0.42	0.18	1.23	2.97
Predicted groundwater concentration[g]	C_{gw}	mg/L	0.053	0.054	0.023	0.159	0.384
Current average groundwater concentration[c]	C_{gw}	mg/L	2.81	6.27	1.33	5.91	2.78
Predicted concentration>current concentration?			NO	NO	NO	NO	NO

* This model assumes that the asphalt is removed from the site. If the asphalt remains it will act as an effective barrier to infiltration. If infiltration is impeded, it is considered likely that there will no driving force for this COPC to move through the vadose zone, and if it does reach water it is unlikely to be in detectable amounts.

[a]ASTM, 1999, Oakland RBCA (2000a).

[b]Oakland RBCA (2000a) default value. The soils beneath the site are predominantly silty clay; therefore, soil parameters are the average of the sandy silt and clayey silt parameters.

[c]Based on available scientific literature.

[d]$f_{oc} \times k_{oc}$.

[e]Based on site data.

[f]$\rho_s/[\theta_{as}+ks\times\rho s+\theta as\times H]\times (1+((U_{gwr}\times\delta_{gw}/(I\times W))$ cm^3-kg/l-g.

[g]$C_s \times LF$.

Table 13. Exposure Parameters

Parameter	Abbrev.	Units	Value[a] Commercial Worker	Construction Worker	Resident Child	Resident Adult
Dermal absorption factor	ABS	--	0.1	0.1	NA	NA
Averaging time for carcinogens	AT_c	days	25,550	25,550	25,550	25,550
Averaging time for non-carcinogens	AT_{nc}	days	9,125	365	2,190	8,760
Body weight	BW	kg	70	70	15	70
Exposure frequency	EF	d/yr	250	183	350	350
Exposure duration	ED	years	25	1	6	24
Skin surface area exposed to soil	SA	cm^2	5,000	5,000	NA	NA
Soil adherence factor	AF	mg/cm^2	0.5	0.5	NA	NA
Soil ingestion rate	SI	mg/d	50	480	NA	NA
Exposure time to indoor air	ET_{ia}	hr/d	9	--	24	24
Exposure time to outdoor air	ET_{oa}	hr/d	--	9	--	--
Outdoor air inhalation rate	IR_{am}	m^3/d	--	20	--	--
Indoor air inhalation rate	IR_{es}	m^3/d	20	--	10	15

[a]Oakland RBCA (2000a) unless otherwise noted.

Table 15. RBCA Tier 3 Evaluation for Soil - On-Site Construction Worker

Chemical	Exposure Pathway	RfD[a] (mg/kg-d)	CSF[a] $(mg/kg-d)^{-1}$	Conc.[b]	LADD[c] (mg/kg-d)	ILCR[d]	ADD[c] (mg/kg-d)	Hazard Index[d]	Odor Threshold[b]	Nuisance Index[g]
Soil										
TPH-G				13.20						
C5-C8 aliphatics	Ingestion	0.06	---	4.62	2.3 E-7	---	1.6 E-5	**0.0003**		
C9-C18 aliphatics	Ingestion	0.6	---	3.30	1.6 E-7	---	1.1 E-5	**0.00002**		
C9-C22 aromatics	Ingestion	0.03	---	5.28	2.6 E-7	---	1.8 E-5	**0.0006**		
TPH-D				3,900						
C9-C18 aliphatics	Ingestion	0.06	---	2,535	1.2 E-4	---	8.7 E-3	**0.15**		
C9-C22 aromatics	Ingestion	0.03	---	1,365	6.7 E-5	---	4.7 E-3	**0.16**		
TPH-G				13.20						
C5-C8 aliphatics	Dermal	0.06	---	4.62	1.2 E-7	---	8.3 E-6	**0.0001**		
C9-C18 aliphatics	Dermal	0.6	---	3.30	8.4 E-8	---	5.9 E-6	**0.000010**		
C9-C22 aromatics	Dermal	0.03	---	5.28	1.4 E-7	---	9.5 E-6	**0.0003**		
TPH-D				3,900						
C9-C18 aliphatics	Dermal	0.06	---	2,535	6.5 E-5	---	4.5 E-3	**0.076**		
C9-C22 aromatics	Dermal	0.03	---	1,365	3.5 E-5	---	2.4 E-3	**0.081**		
Outdoor Air										
TPH-G				2.6 E-4					281	9.3 E-7
C5-C8 aliphatics	Inhalation	0.06	---	2.5 E-4	1.9 E-7	---	1.4 E-5	**0.0002**		
C9-C18 aliphatics	Inhalation	0.6	---	6.2 E-6	4.8 E-9	---	3.3 E-7	**0.0000006**		
C9-C22 aromatics	Inhalation	0.03	---	5.6 E-7	4.3 E-10	---	3.0 E-8	**0.0000010**		
TPH-D				1.6 E-2					888	1.8 E-5
C9-C18 aliphatics	Inhalation	0.06	---	1.5 E-2	1.2 E-5	---	8.1 E-4	**0.014**		
C9-C22 aromatics	Inhalation	0.057	---	4.6 E-4	3.5 E-7	---	2.5 E-5	**0.0004**		

Table 16. RBCA Tier 3 Evaluation for Groundwater - On-Site Commercial Worker

Chemical	Exposure Pathway	RfD[a] (mg/kg-d)	CSF[a] $(mg/kg-d)^{-1}$	Conc.[b]	LADD[c] (mg/kg-d)	ILCR[d]	ADD[c] (mg/kg-d)	Hazard Index[d]	Odor Threshold[b]	Nuisance Index[h]
Indoor Air										
TPH-G				2.9 E-2					281	1.0 E-4
C5-C8 aliphatics	Inhalation	0.06	---	5.9 E-3	1.6 E-4	---	4.4 E-4	**0.0073**		
C9-C18 aliphatics	Inhalation	0.6	---	2.2 E-2	5.7 E-4	---	1.6 E-3	**0.0026**		
C9-C22 aromatics	Inhalation	0.03	---	9.3 E-4	2.5 E-5	---	6.9 E-5	**0.0023**		
Total Risk/HI Across Pathways[e]						---		**0.012**		
Site-Specific Target Level (SSTL, in mg/L)[f]-TPG-G						---		**2,991**		
SSTL Exceeded?						---		**NO**		
Target Risk						**1 E-5**		**1.0**		

[a]From OEHHA (2002), EPA (2002).

[b]For air, concentration is in mg/m^3.

[c]Air: LADD/ADD = $(C_{air} \times IR \times ED \times EF \times AF_i) / (AT \times BW)$.

[d]ILCR = LADD × CSF; HI = ADD × RfD.

[e]Assumes either an indoor or outdoor occupational worker.

[f]SSTL = $(C \times (1 \times 10^{-5})) / ILCR$ or $(C \times 1.0) / HI$.

[g]The most conservative odor thresholds from ATSDR Toxicological Profiles.

[h]Nuisance index = air concentration/odor threshold.

Table 18. RBCA Tier 3 Evaluation for Off-Site Residential (Eastern Samples-Adjacent to Single-Story Residence)

Chemical	Exposure Pathway	RfD[a] (mg/kg-d)	CSF[a] $(mg/kg-d)^{-1}$	Conc.[b]	LADD[c] (mg/kg-d)	ILCR[d]	ADD[c] (mg/kg-d)	Hazard Index[d]	Odor Threshold[b]	Nuisance Index[g]
Indoor Air										
Benzene	Inhalation	0.0017	0.1	1.9 E-9	2.4 E-10	**2 E-11**	1.6 E-9	**9.5 E-7**	5	3.8 E-10
Toluene	Inhalation	0.11	---	9.8 E-10	1.2 E-10	---	8.3 E-10	**7.6 E-9**	10	9.7 E-11
Ethylbenzene	Inhalation	0.29	---	2.4 E-10	3.0 E-11	---	2.0 E-10	**6.9 E-10**	31	7.7 E-12
Xylenes	Inhalation	0.2	---	2.8 E-9	3.5 E-10	---	2.4 E-9	**1.2 E-8**	0	8.0 E-9
MTBE	Inhalation	---	---	NA	---	---	---	---	15.8	---
TPH-G				1.3 E-4					281	4.6 E-7
C5-C8 aliphatics	Inhalation	0.06	---	2.3 E-5	2.9 E-6	---	1.9 E-5	**0.00032**		
C9-C18 aliphatics	Inhalation	0.6	---	3.2 E-5	4.0 E-6	---	2.7 E-5	**0.000045**		
C9-C22 aromatics	Inhalation	0.03	---	7.4 E-5	9.3 E-6	---	6.3 E-5	**0.0021**		
Total Risk/HI Across Pathways						**2 E-11**		**0.0025**		
SSTL Exceeded by Exposure Concentration?						**NO**		**NO**		
Target Risk/HI						**1 E-5**		**1.0**		

[a]From OEHHA (2002), EPA (2002).

[b]For air, concentration is in mg/m^3. Based on average soil vapor concentrations (See Table 11).

[c]Air: LADD/ADD = $(C_{air} \times IR \times ED \times EF \times AF_i) / (AT \times BW)$.

[d]ILCR = LADD × CSF; HI = ADD × RfD.

[f]The most conservative odor thresholds from ATSDR Toxicological Profiles.

[g]Nuisance index = air concentration/odor threshold.

Table 20. Product-Specific Fractions, Fraction Composition, and Toxicity Criteria[a]

Product	Fractions	Composition	Toxicity Criteria
Benzene			CSF = 0.1 (mg/kg-d)$^{-1}$[b]
TPH as gasoline (TPH-g)			
	C5-C8 aliphatics	35%	RfD = 0.06 mg/kg-d (n-hexane)
	C9-C18 aliphatics	25%	RfD = 0.6 mg/kg-d (n-nonane)
	C9-C22 aromatics	40%	RfD = 0.03 mg/kg-d (pyrene)
TPH as diesel (TPH-d)			
	C9-C18 aliphatics	65%	RfD = 0.6 mg/kg-d (n-nonane)
	C9-C22 aromatics	35%	RfD = 0.03 mg/kg-d oral (pyrene)
			RfD = 0.057 mg/kg-d inhalation (pyrene)[c]

[a]From MaDEP, 1997.

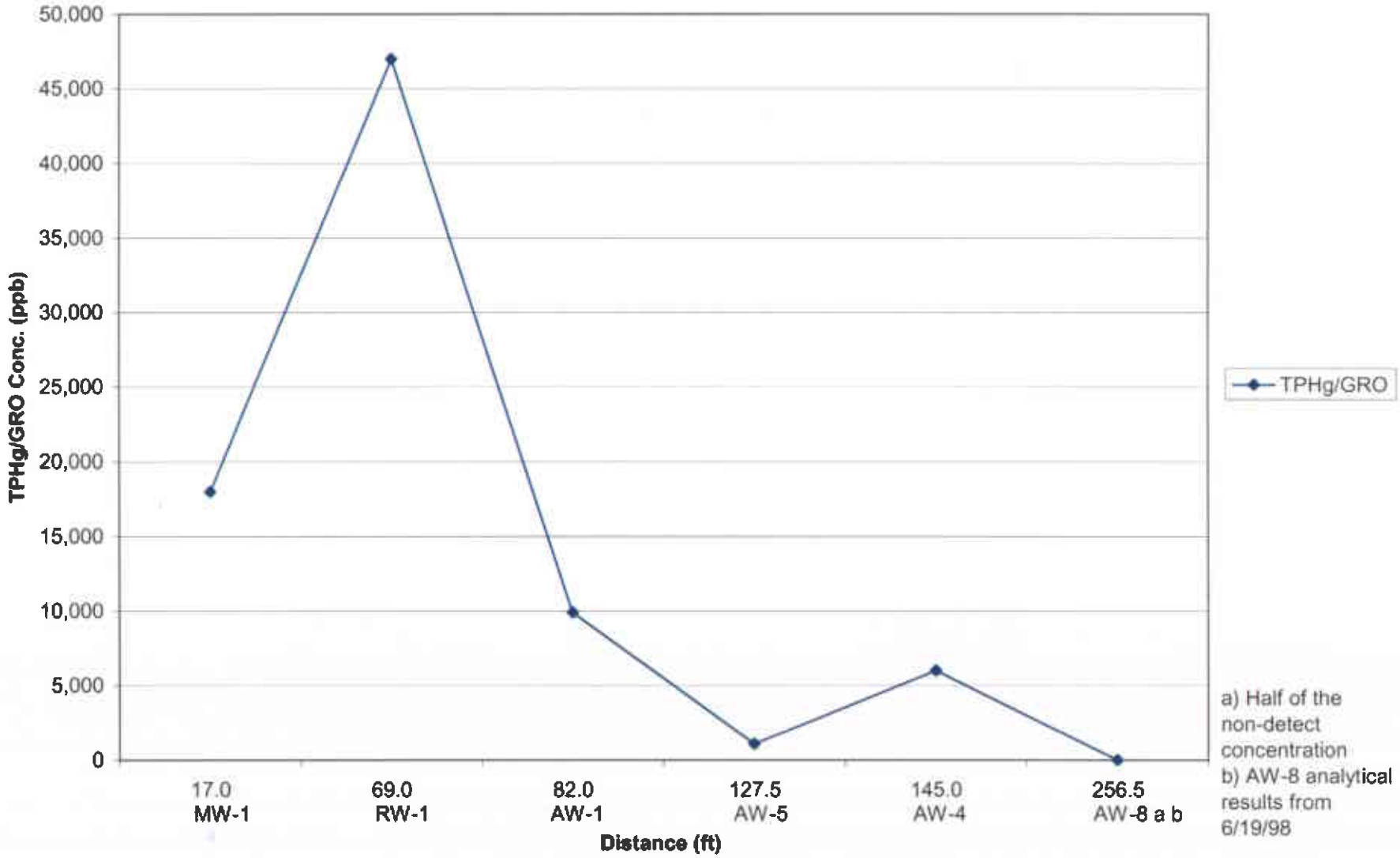
[b]From OEHHA, 2002.

[c]From TPHCWG, 1996.

ATTACHMENT F

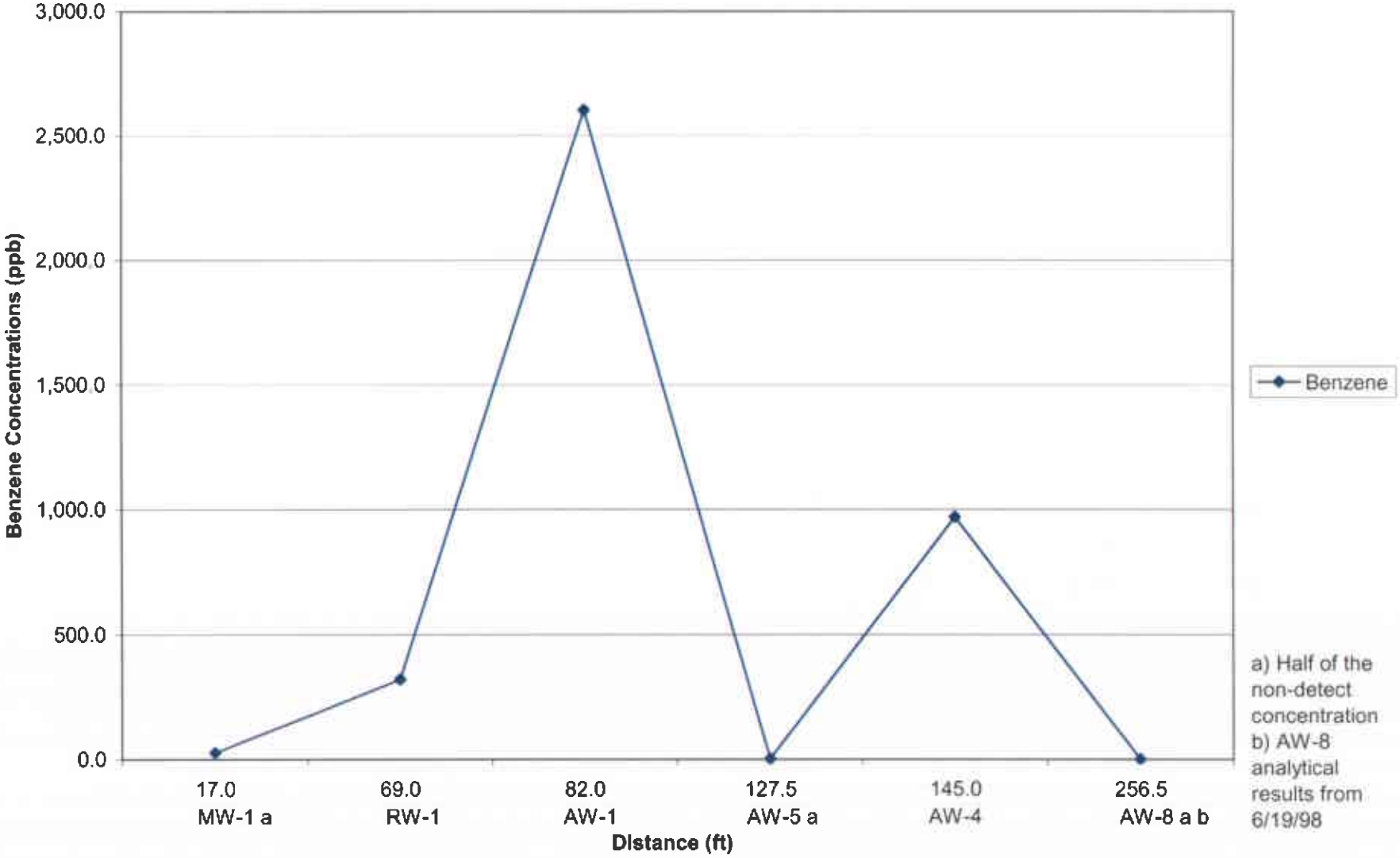
Plots of Chemical Concentrations Vs. Time and Distance

TPHg/GRO Concentrations vs. Distance from USTs



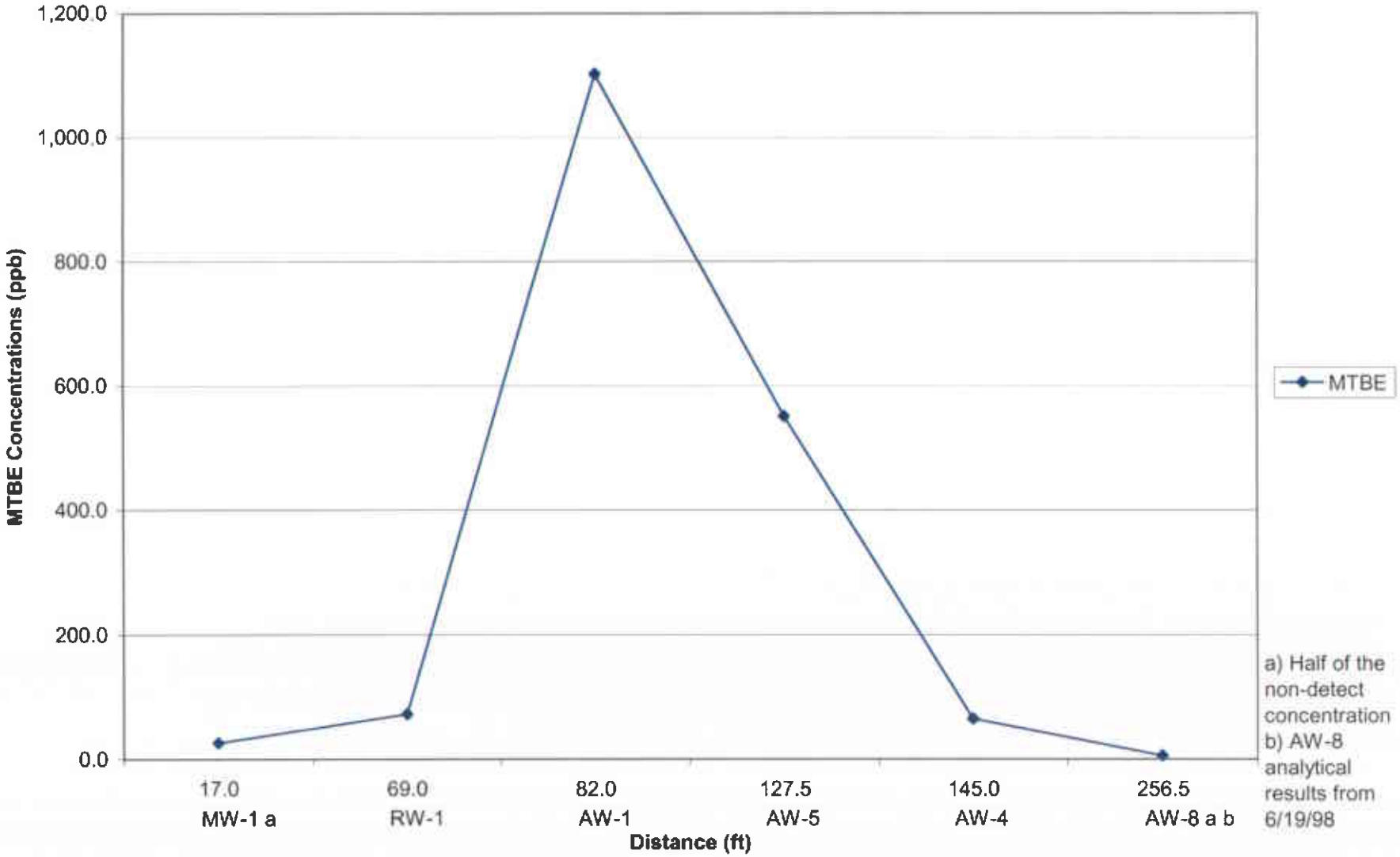
a) Half of the non-detect concentration
b) AW-8 analytical results from 6/19/98

Benzene Concentrations vs. Distance from USTs

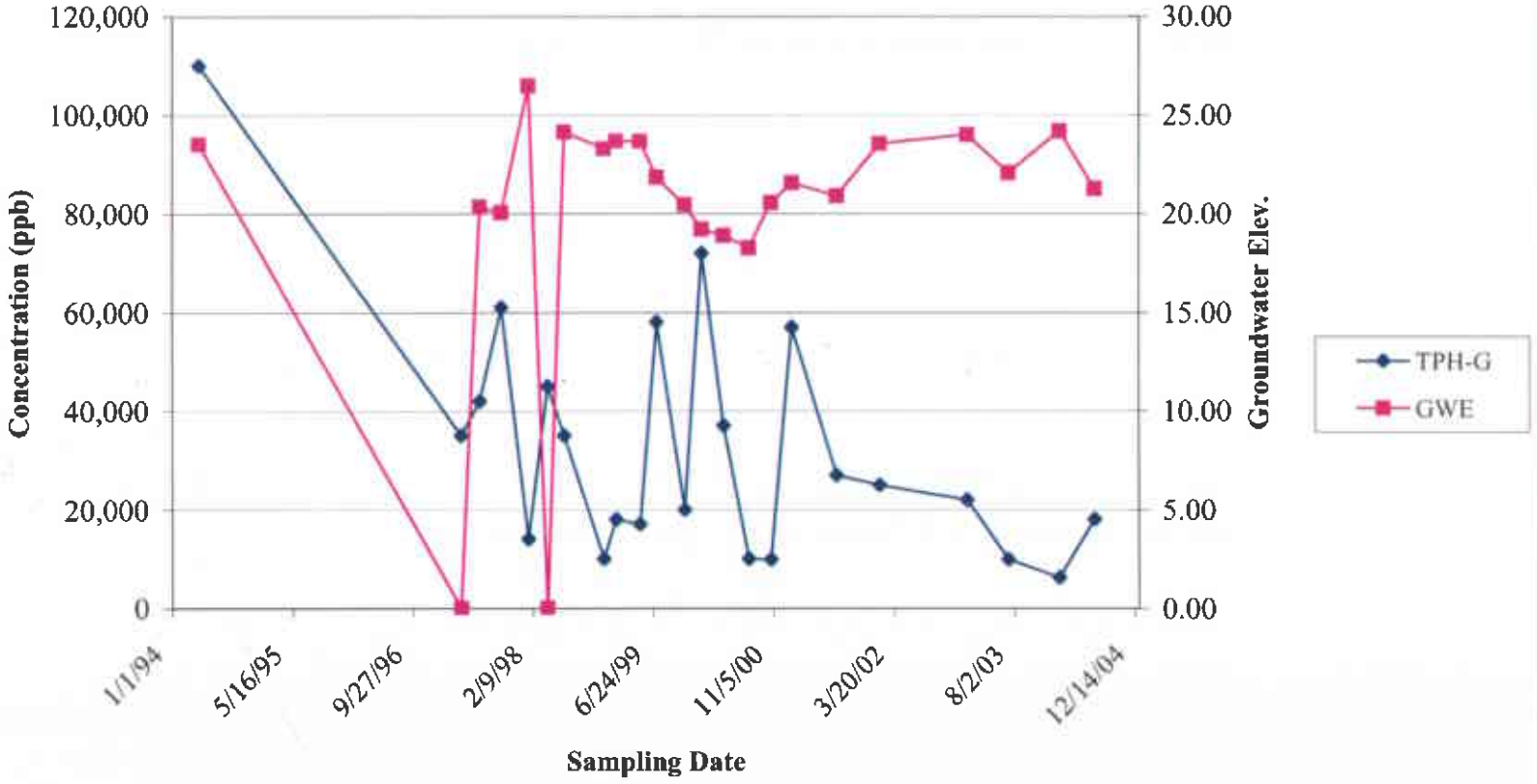


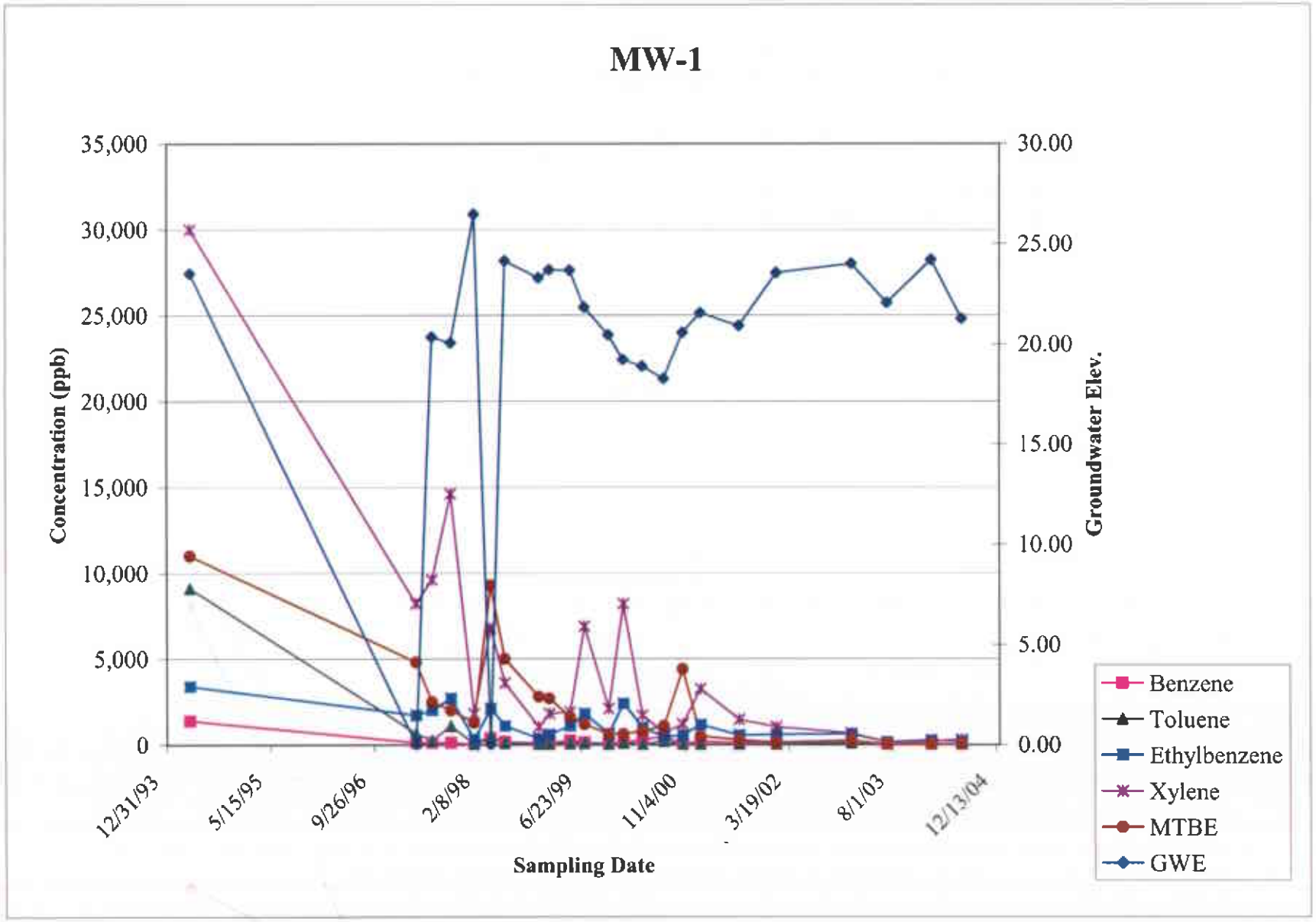
a) Half of the non-detect concentration
b) AW-8 analytical results from 6/19/98

Concentrations vs. Distance from USTs



MW-1


120,000
100,000
80,000
60,000
40,000
20,000
0
Concentration (ppb)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
1/1/94
5/16/95
9/27/96
2/9/98
6/24/99
11/5/00
3/20/02
8/2/03
12/14/04
Sampling Date
TPH-G
GWE


MW-1
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Concentration (ppb)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
12/31/93
5/15/95
9/26/96
2/8/98
6/23/99
11/4/00
3/19/02
8/1/03
12/13/04
Sampling Date
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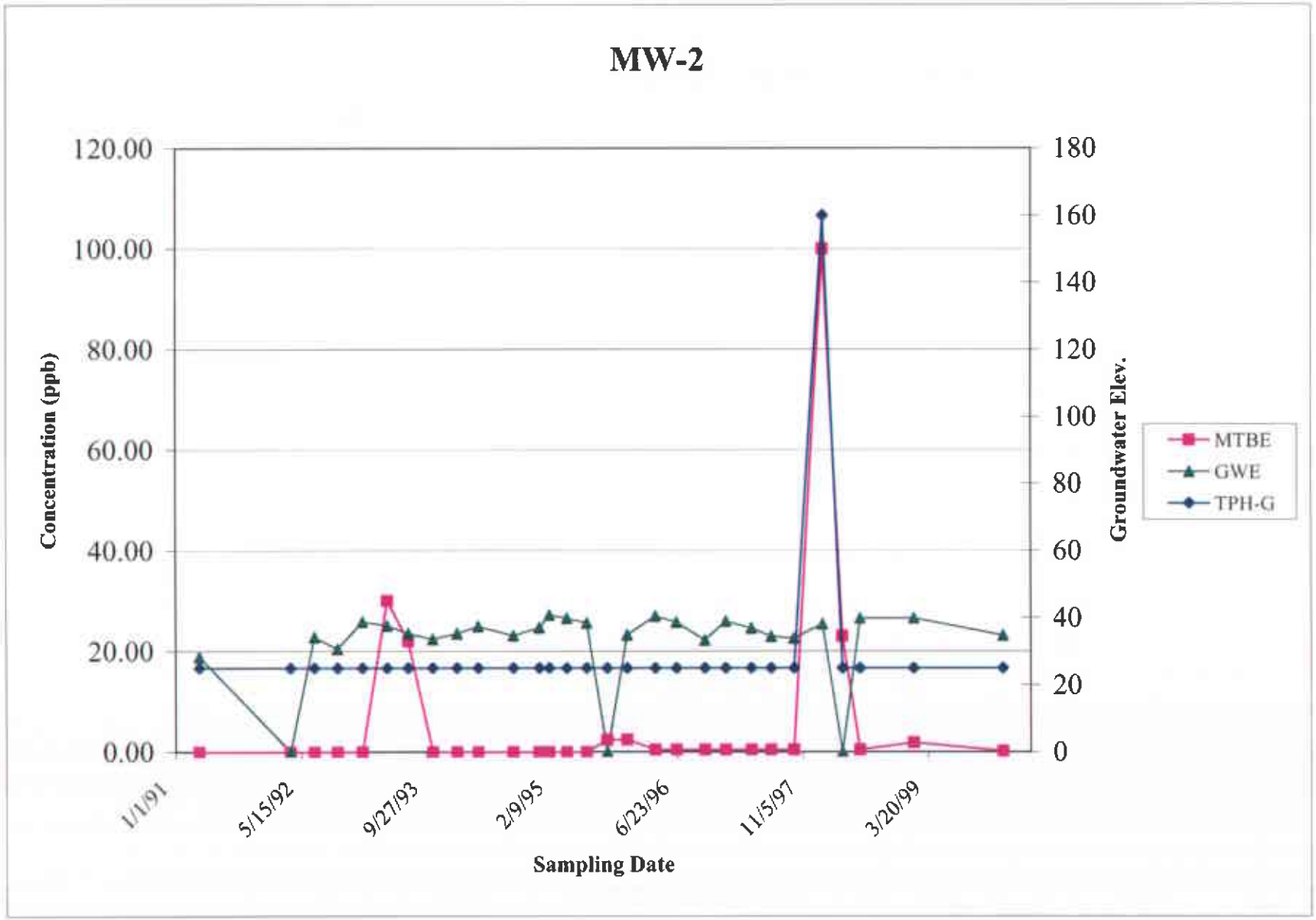
Toluene
Ethylbenzene
Xylene
MTBE
GWE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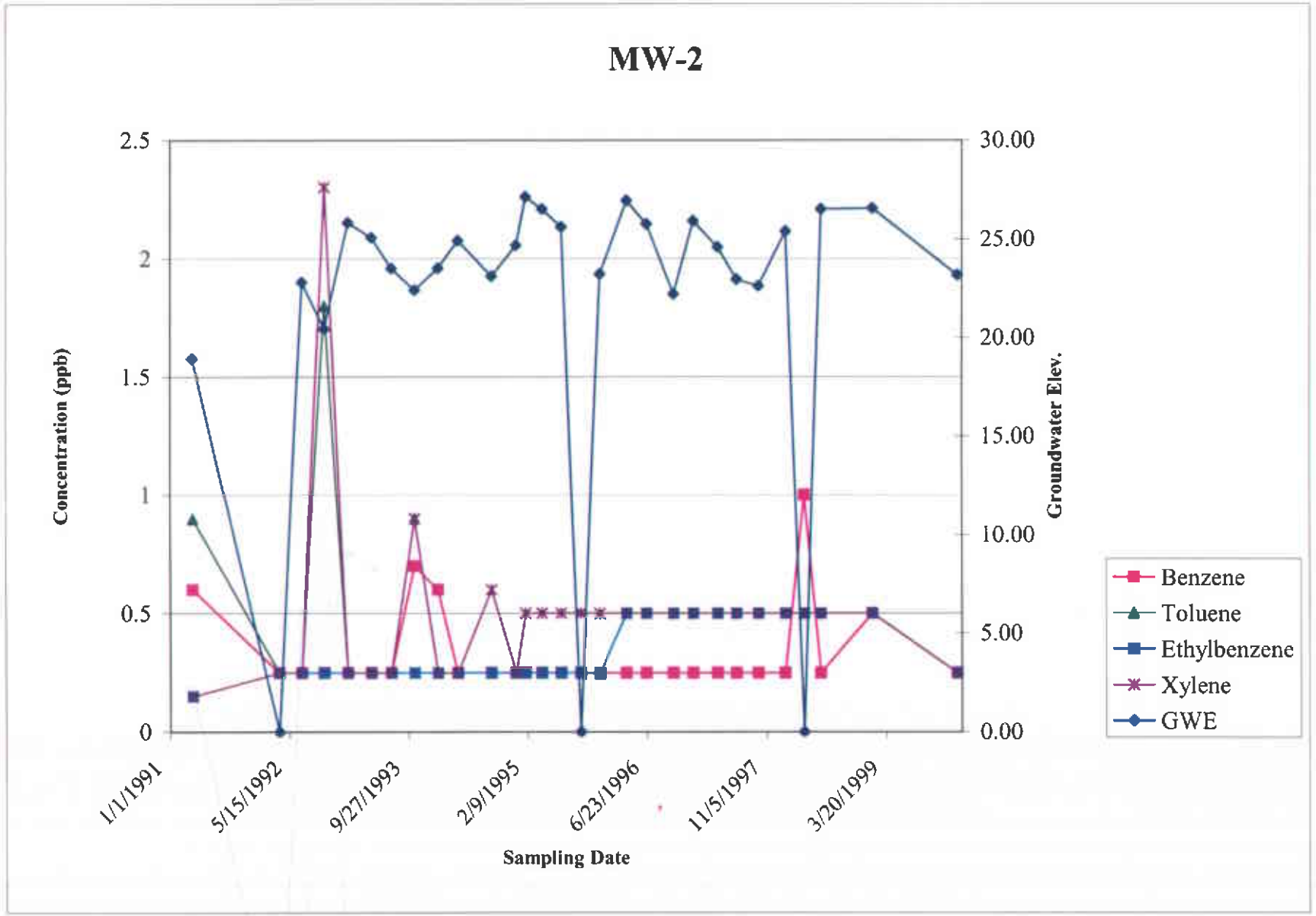
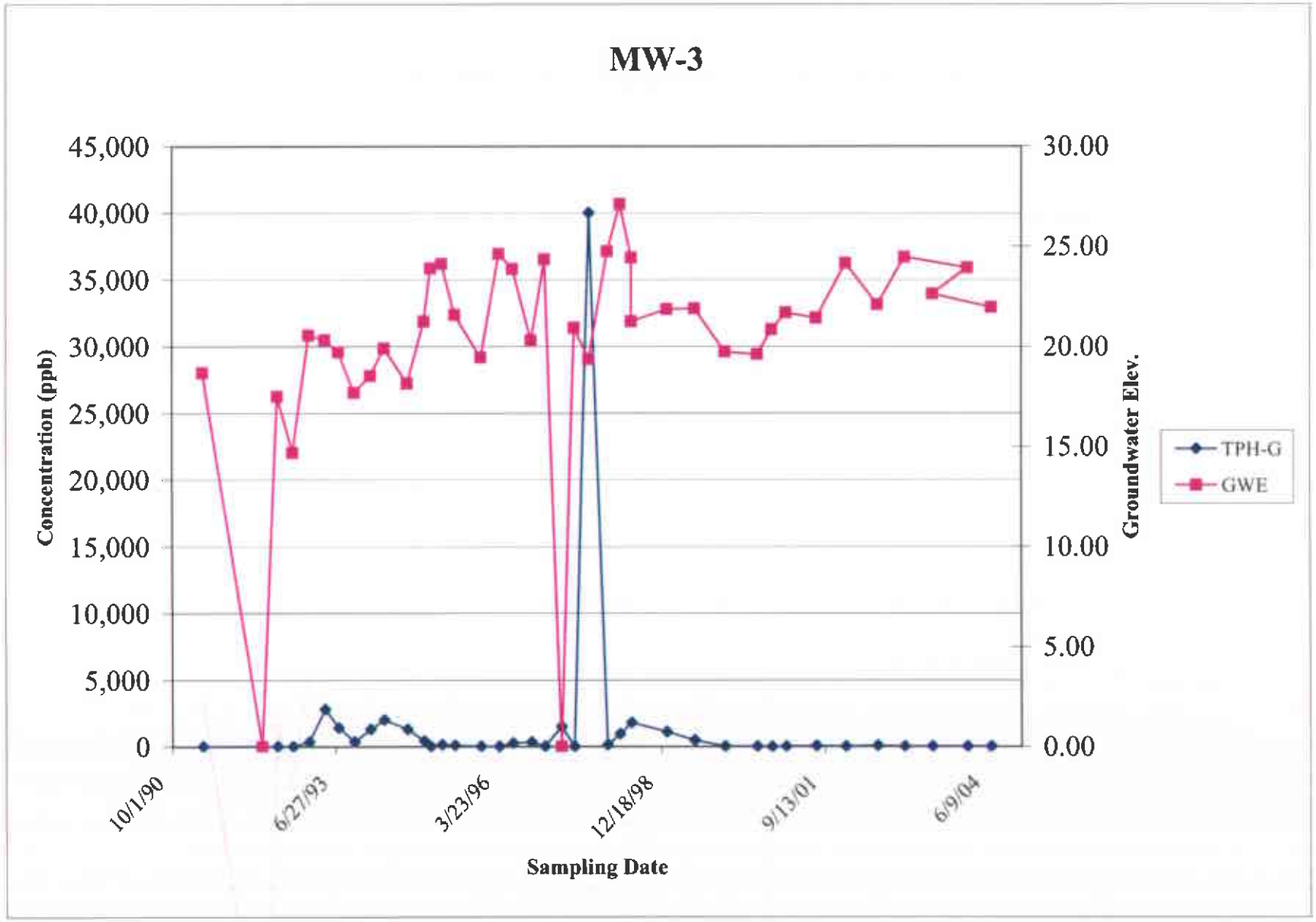
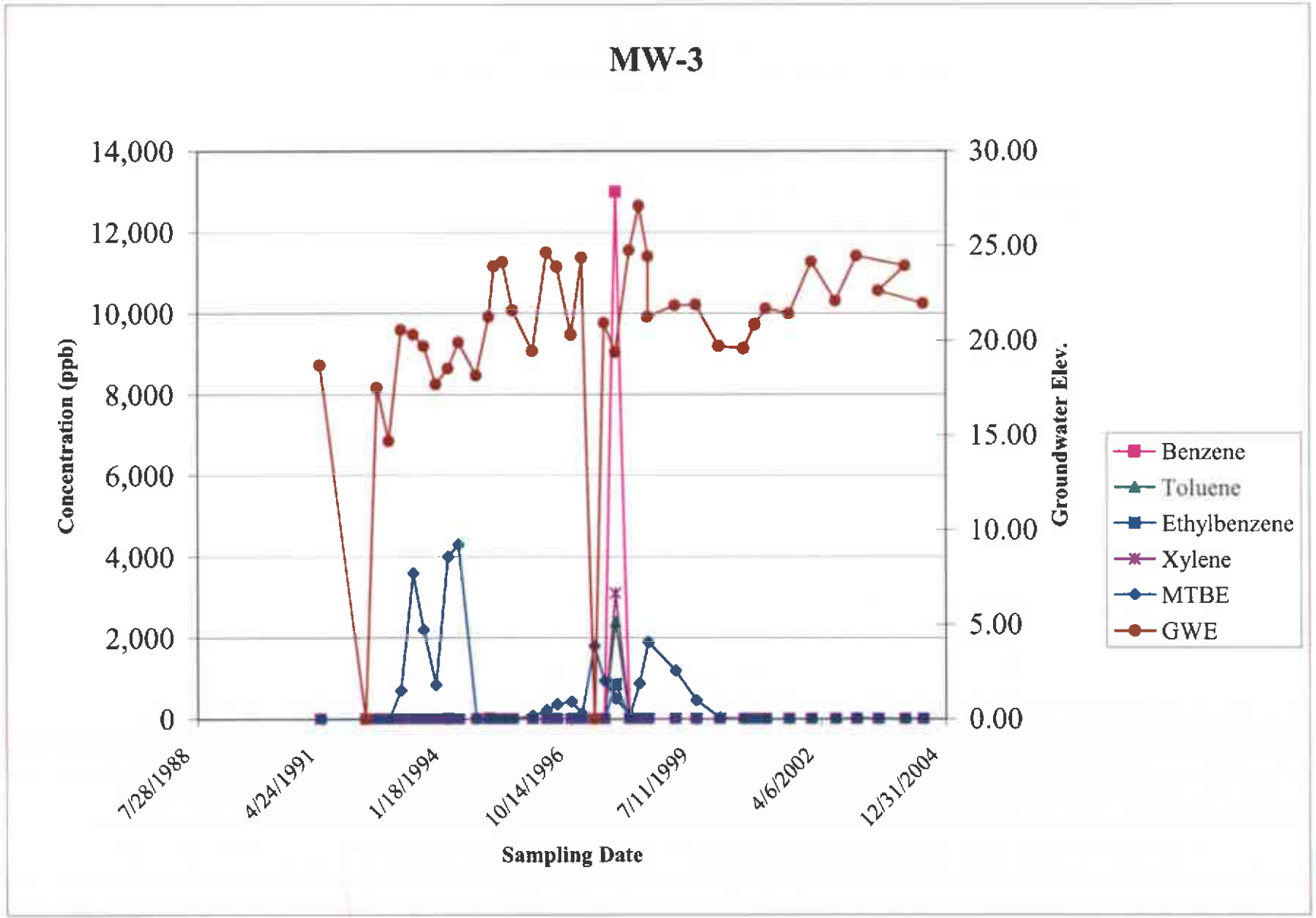
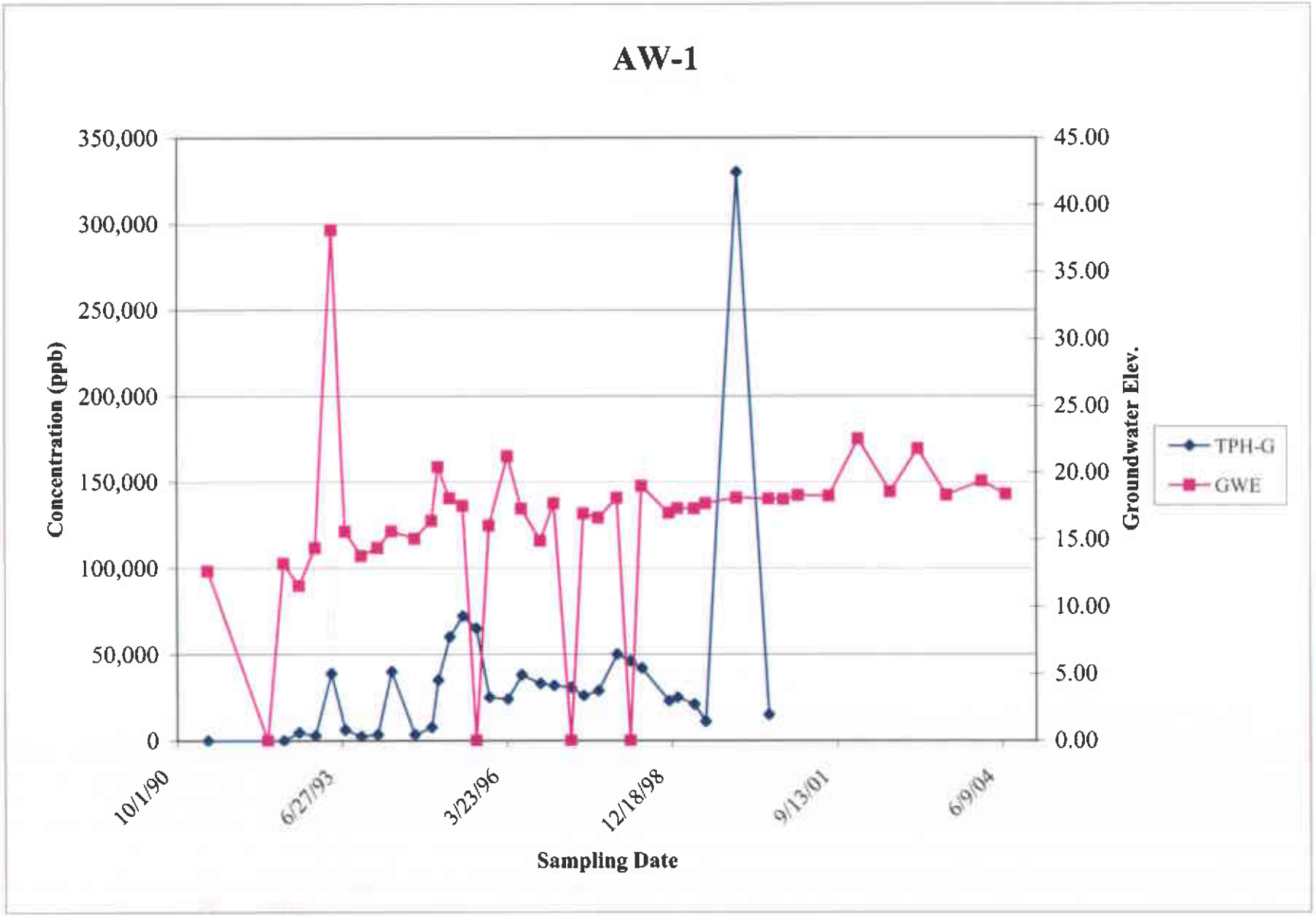
100.00
80.00
60.00
40.00
20.00
0.00
Concentration (ppb)
180
160
140
120
100
80
60
40
20
0
Groundwater Elev.
MTBE
GWE
TPH-G
1/1/91
5/15/92
9/27/93
2/9/95
6/23/96
11/5/97
3/20/99
Sampling Date


MW-2
Concentration (ppb)
Groundwater Elev.
Sampling Date
2.5
2
1.5
1
0.5
0
30.00
25.00
20.00
15.00
10.00
5.00
0.00
1/1/1991
5/15/1992
9/27/1993
2/9/1995
6/23/1996
11/5/1997
3/20/1999
Benzene
Toluene
Ethylbenzene
Xylene
GWE


MW-3
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Concentration (ppb)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
TPH-G
GWE
10/1/90
6/27/93
3/23/96
12/18/98
9/13/01
6/9/04
Sampling Date


MW-3
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Concentration (ppb)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
7/28/1988
4/24/1991
1/18/1994
10/14/1996
7/11/1999
4/6/2002
12/31/2004
Sampling Date
Benzene
Toluene
Ethylbenzene
Xylene
MTBE
GWE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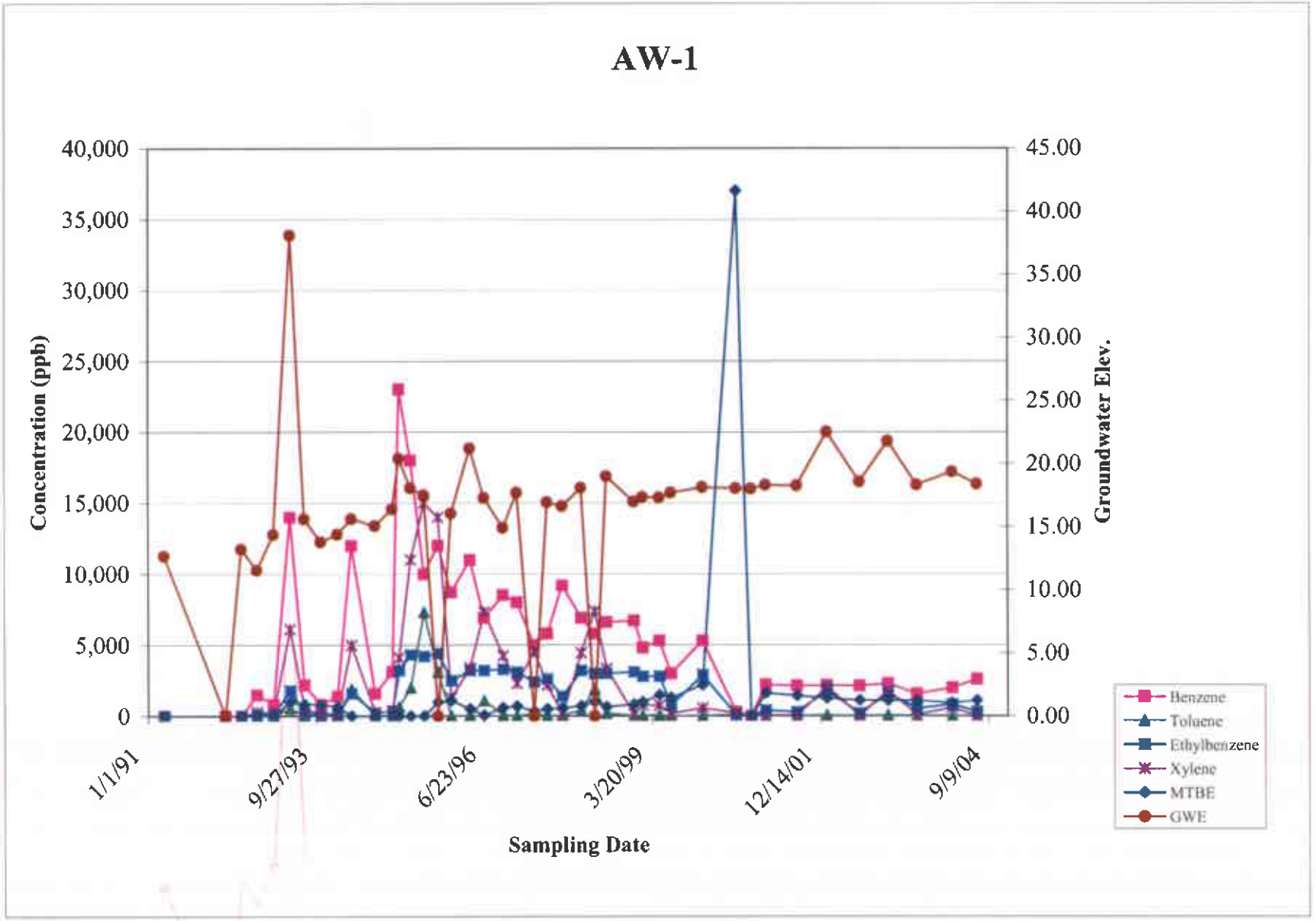
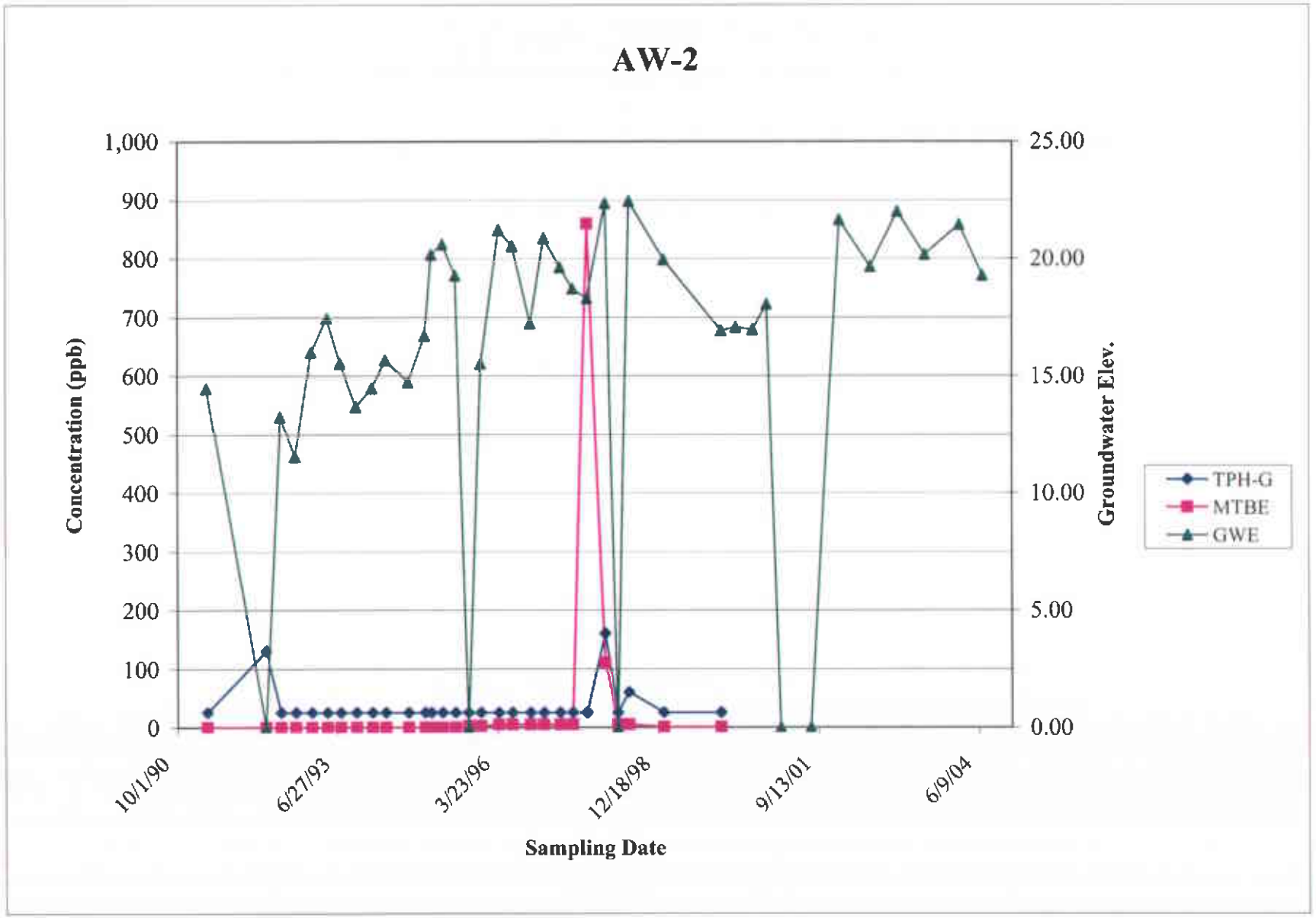
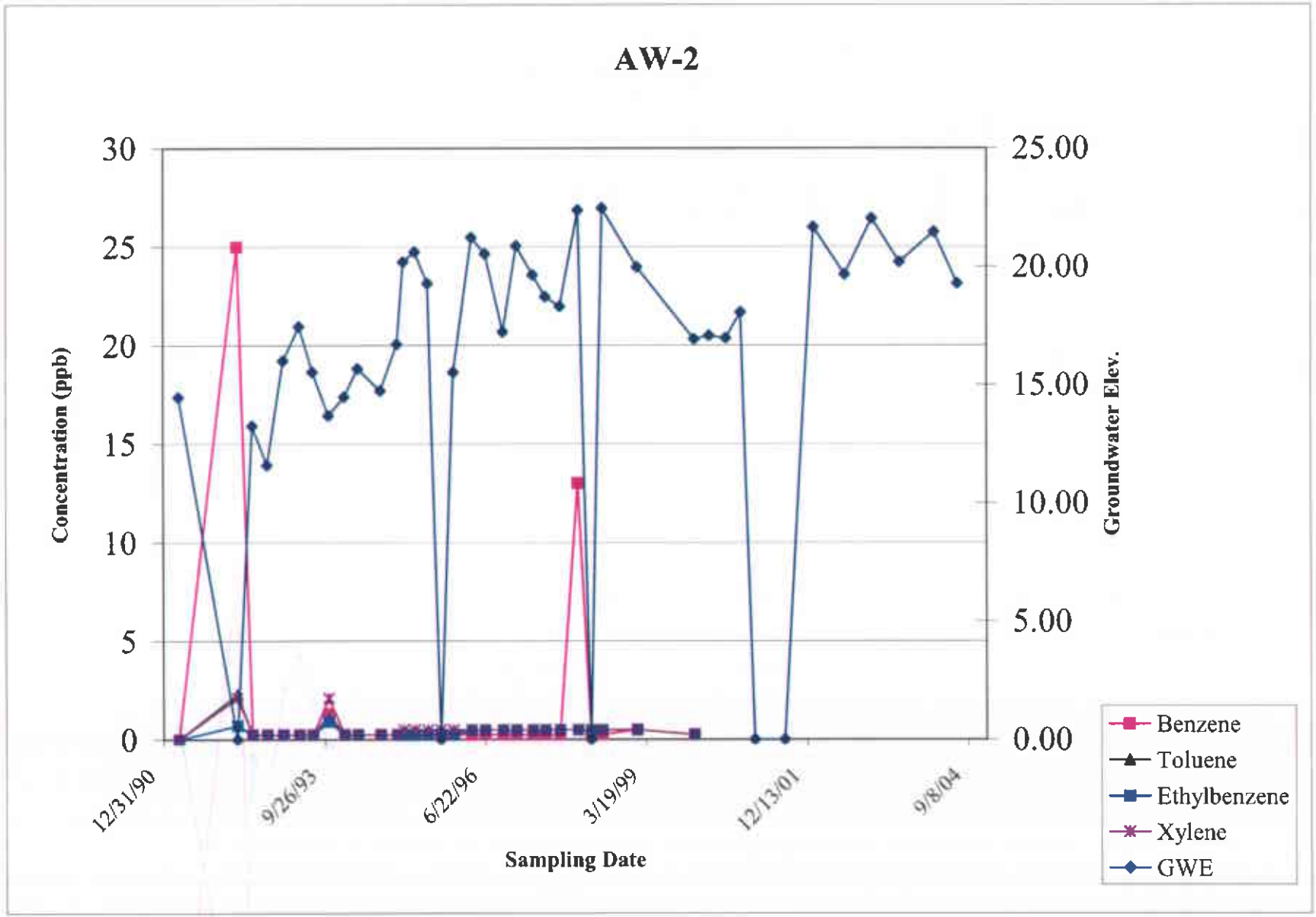
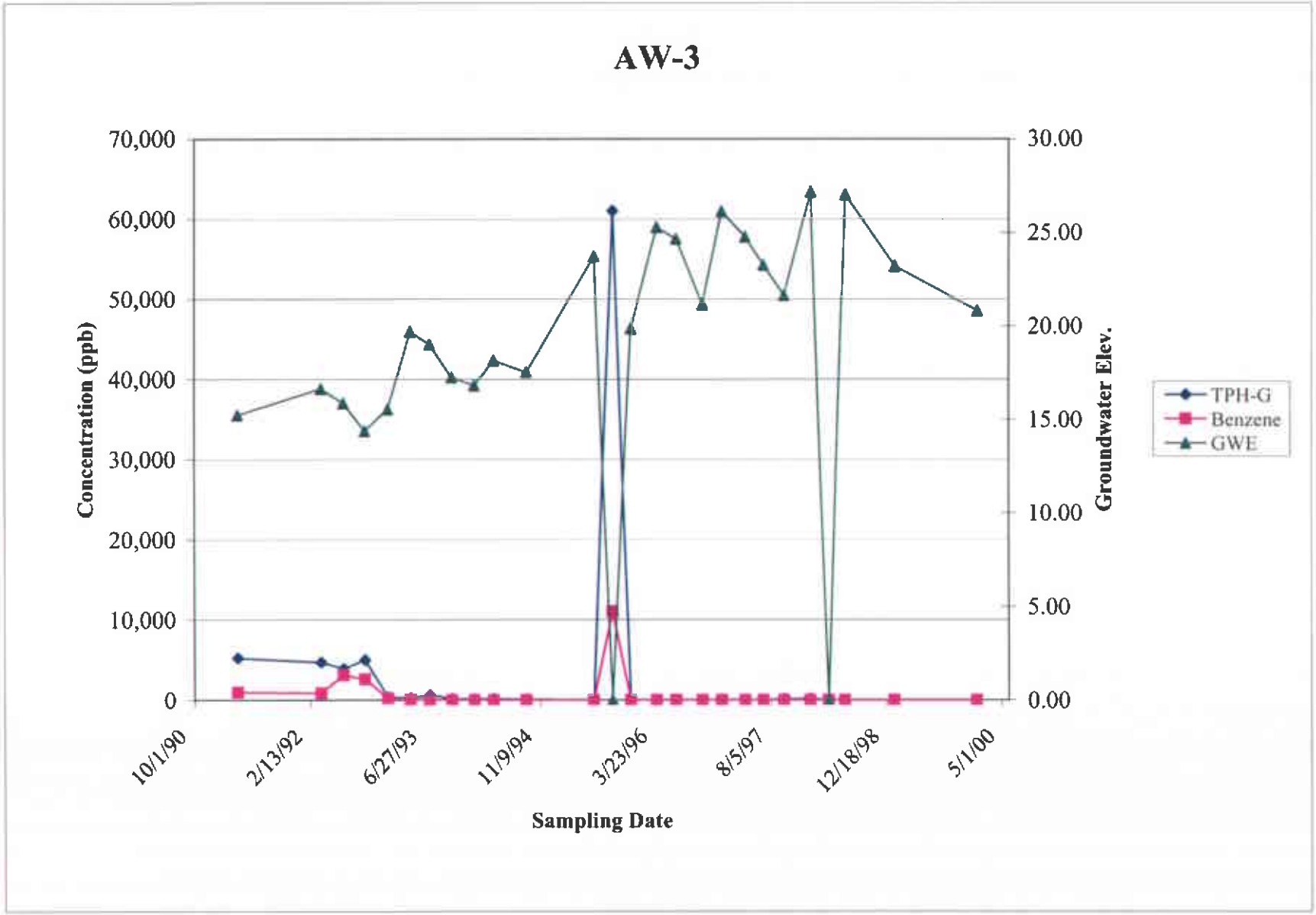
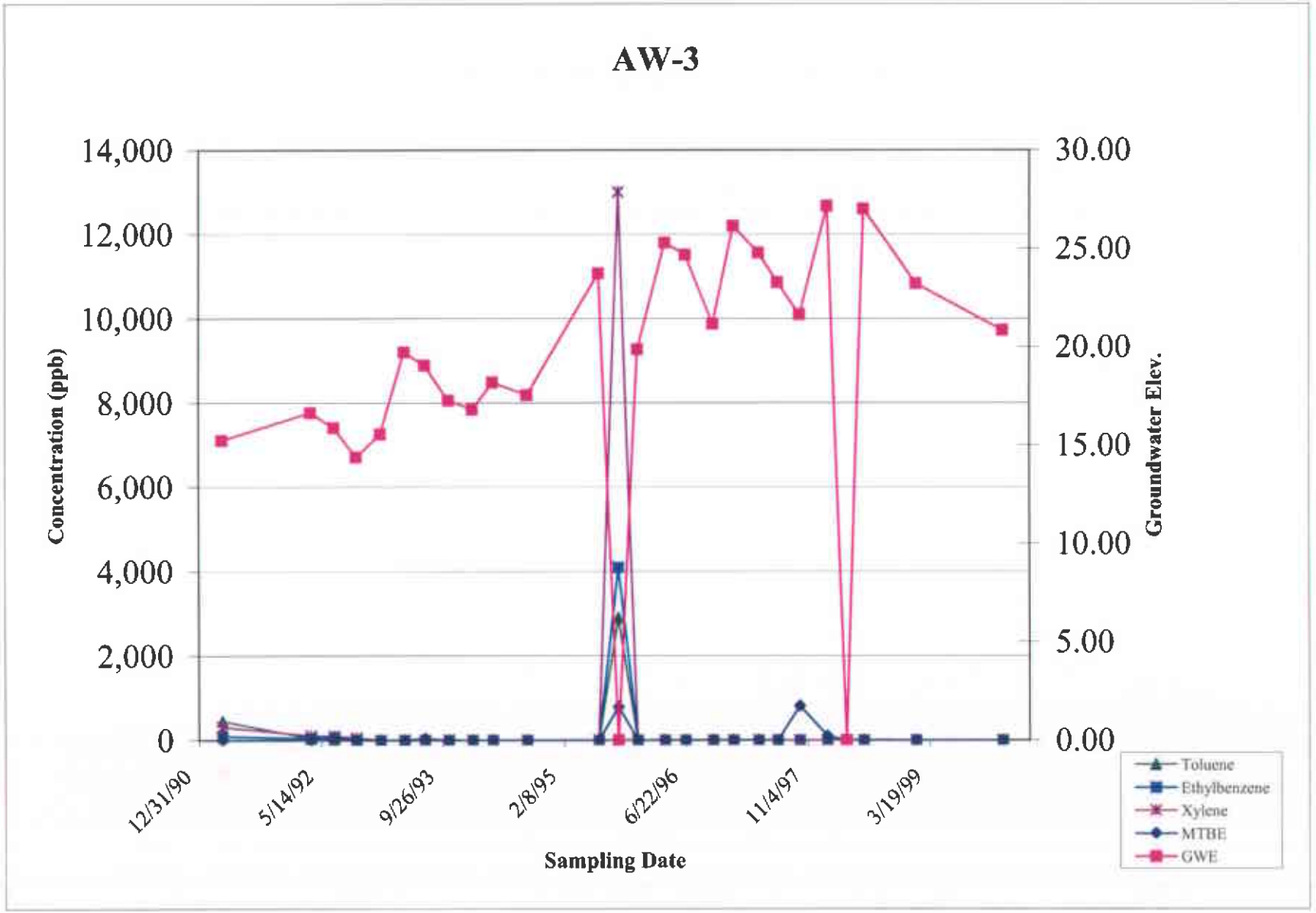
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Concentration (ppb)
Groundwater Elev.
TPH-G
GWE
10/1/90
6/27/93
3/23/96
12/18/98
9/13/01
6/9/04
Sampling Date

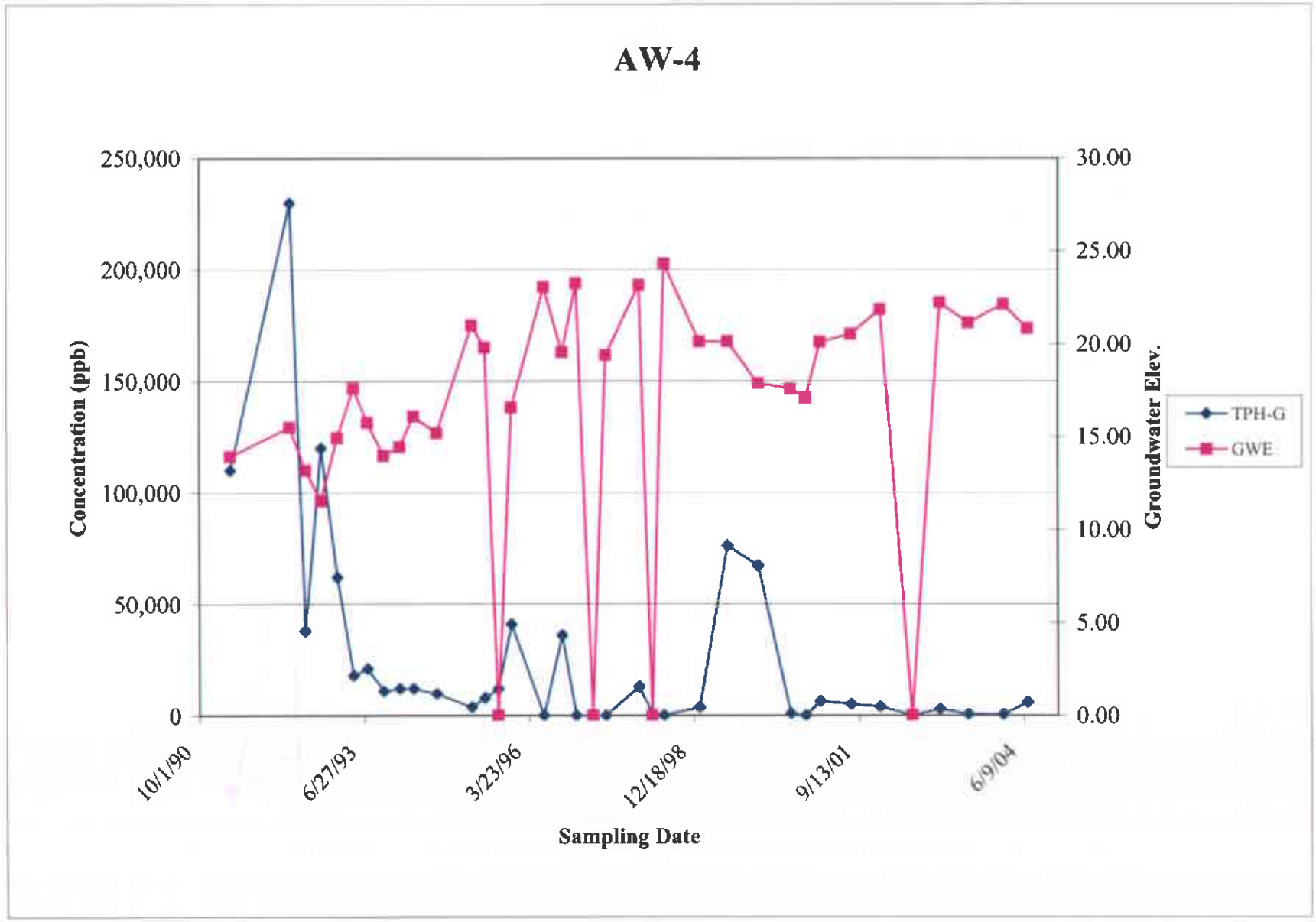

AW-1
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Concentration (ppb)
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
1/1/91
9/27/93
6/23/96
3/20/99
12/14/01
9/9/04
Sampling Date
Benzene
Toluene
Ethylbenzene
Xylene
MTBE
GWE

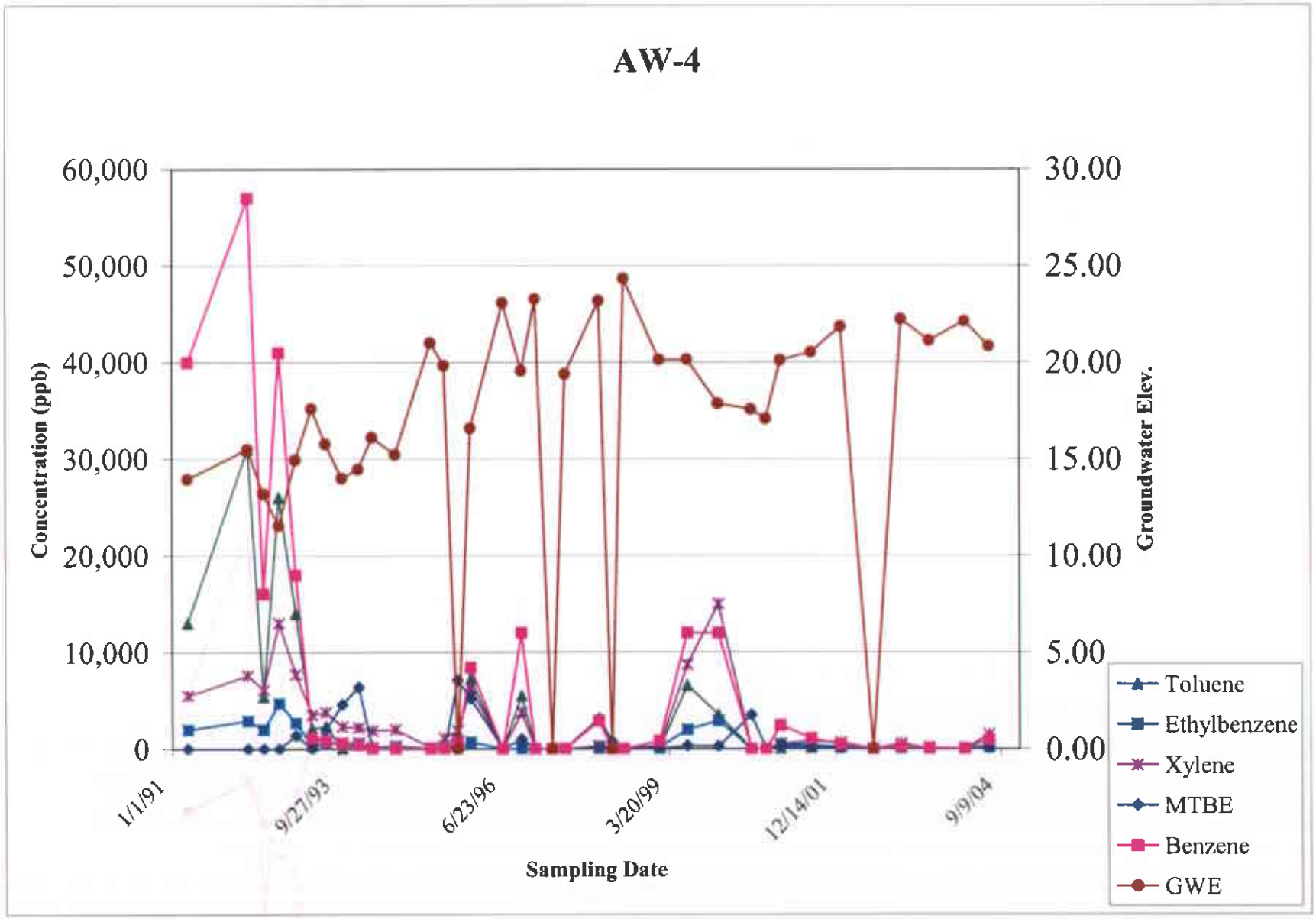

AW-2
1,000
900
800
700
600
500
400
300
200
100
0
25.00
20.00
15.00
10.00
5.00
0.00
Concentration (ppb)
Groundwater Elev.
10/1/90
6/27/93
3/23/96
12/18/98
9/13/01
6/9/04
Sampling Date
TPH-G
MTBE
GWE


AW-2
30
25
20
15
10
5
0
Concentration (ppb)
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
12/31/90
9/26/93
6/22/96
3/19/99
12/13/01
9/8/04
Sampling Date
Benzene
Toluene
Ethylbenzene
Xylene
GWE


AW-3
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Concentration (ppb)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
TPH-G
Benzene
GWE
10/1/90
2/13/92
6/27/93
11/9/94
3/23/96
8/5/97
12/18/98
5/1/00
Sampling Date


AW-3
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Concentration (ppb)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
12/31/90
5/14/92
9/26/93
2/8/95
6/22/96
11/4/97
3/19/99
Sampling Date
Toluene
Ethylbenzene
Xylene
MTBE
GWE


AW-4
250,000
200,000
150,000
100,000
50,000
0
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Concentration (ppb)
Groundwater Elev.
TPH-G
GWE
10/1/90
6/27/93
3/23/96
12/18/98
9/13/01
6/9/04
Sampling Date


AW-4
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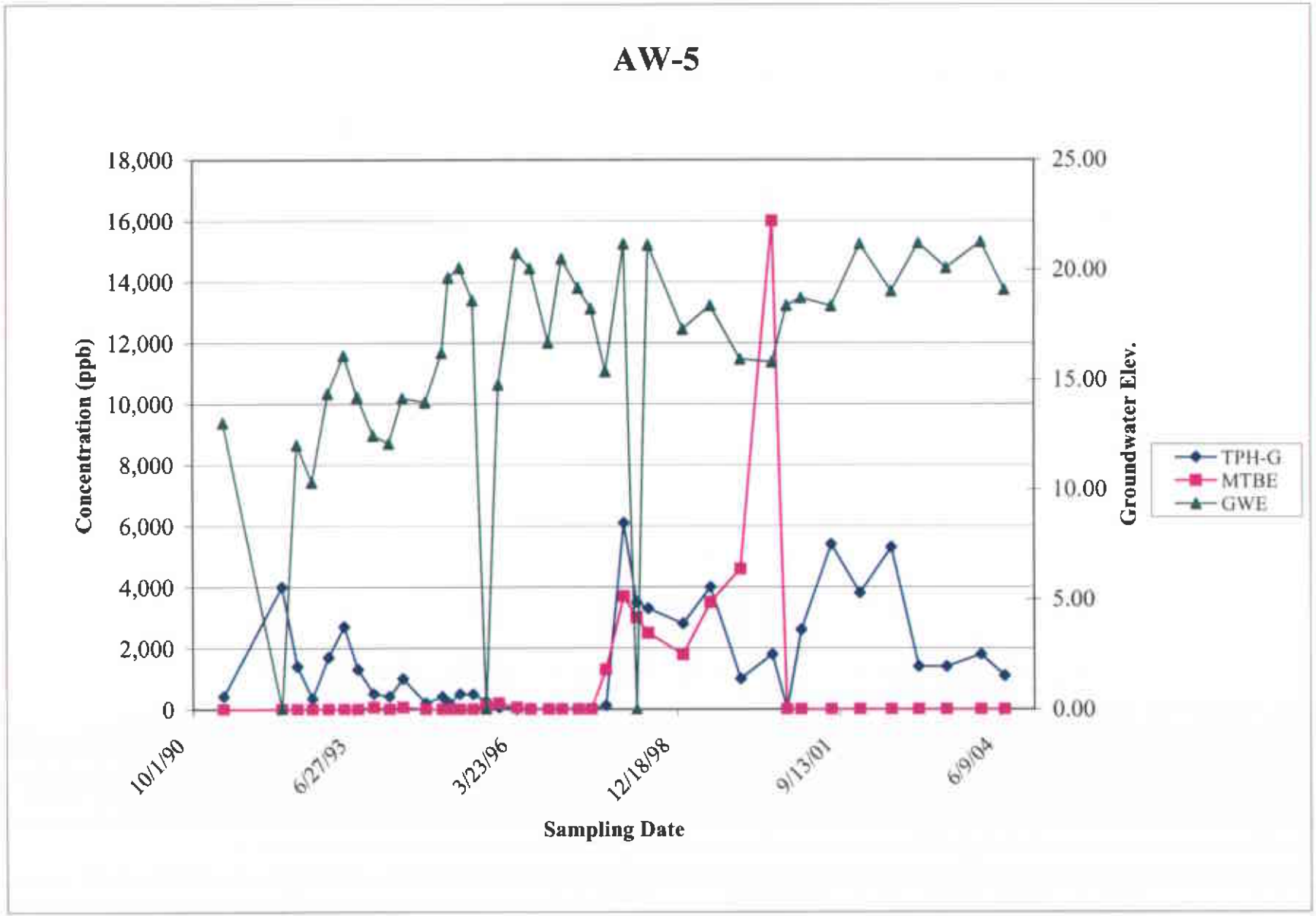
50,000
40,000
30,000
20,000
10,000
0
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Concentration (ppb)
Groundwater Elev.
1/1/91
9/27/93
6/23/96
3/20/99
12/14/01
9/9/04
Sampling Date
Toluene
Ethylbenzene
Xylene
MTBE
Benzene
GWE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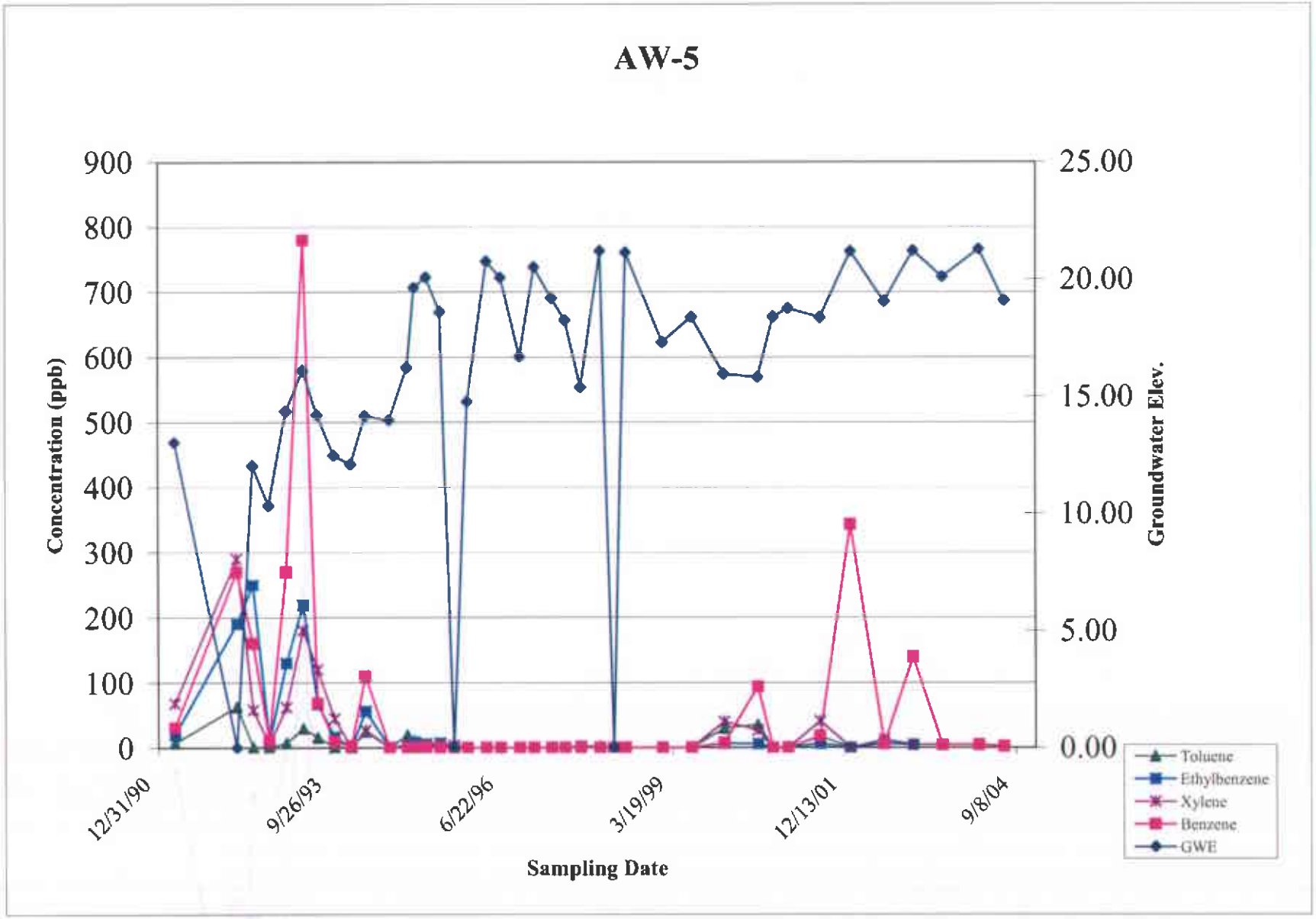
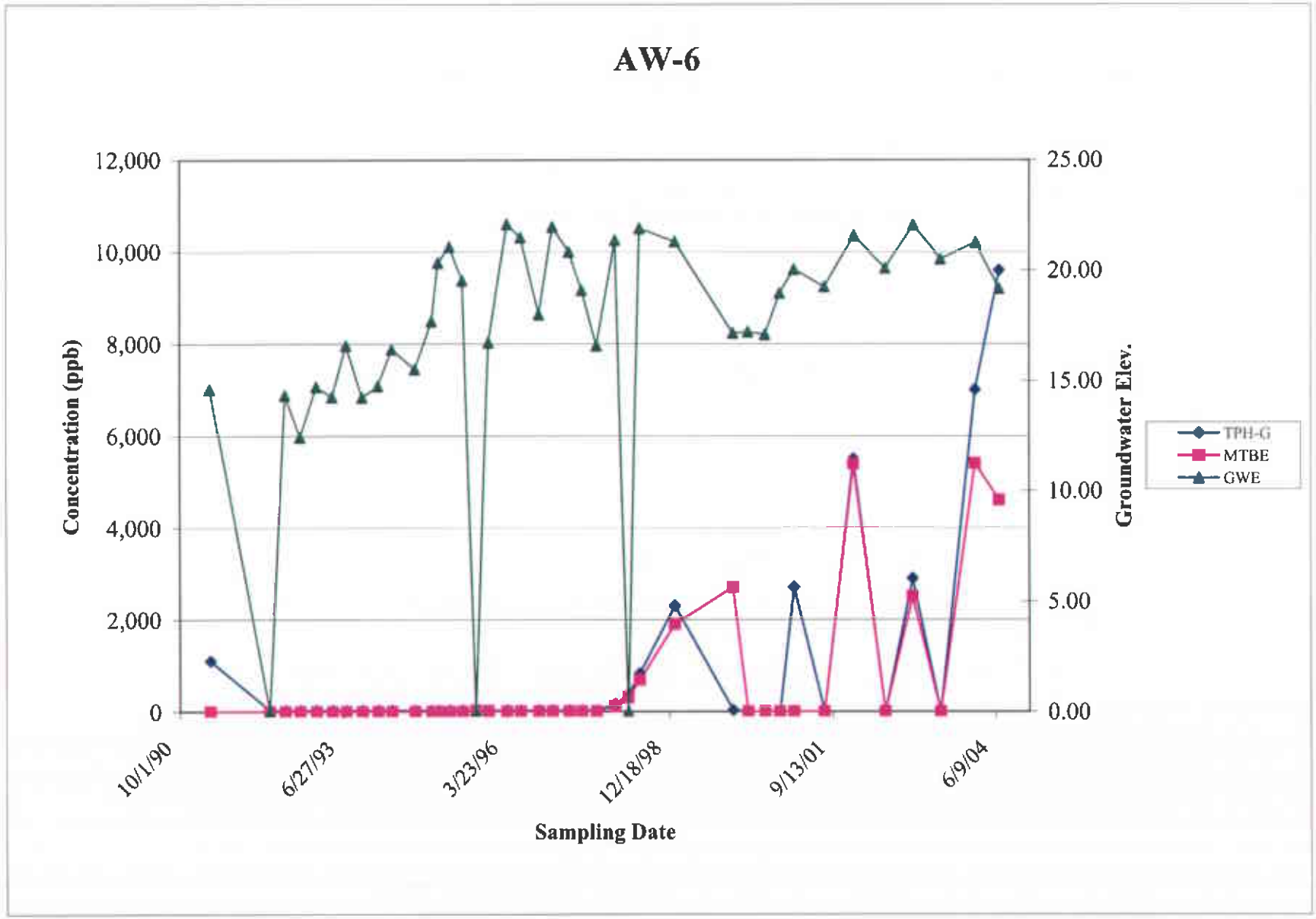
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
Concentration (ppb)
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
TPH-G
MTBE
GWE
10/1/90
6/27/93
3/23/96
12/18/98
9/13/01
6/9/04
Sampling Date


AW-5
900
800
700
600
500
400
300
200
100
0
Concentration (ppb)
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
12/31/90
9/26/93
6/22/96
3/19/99
12/13/01
9/8/04
Sampling Date
Toluene
Ethylbenzene
Xylene
Benzene
GWE


AW-6
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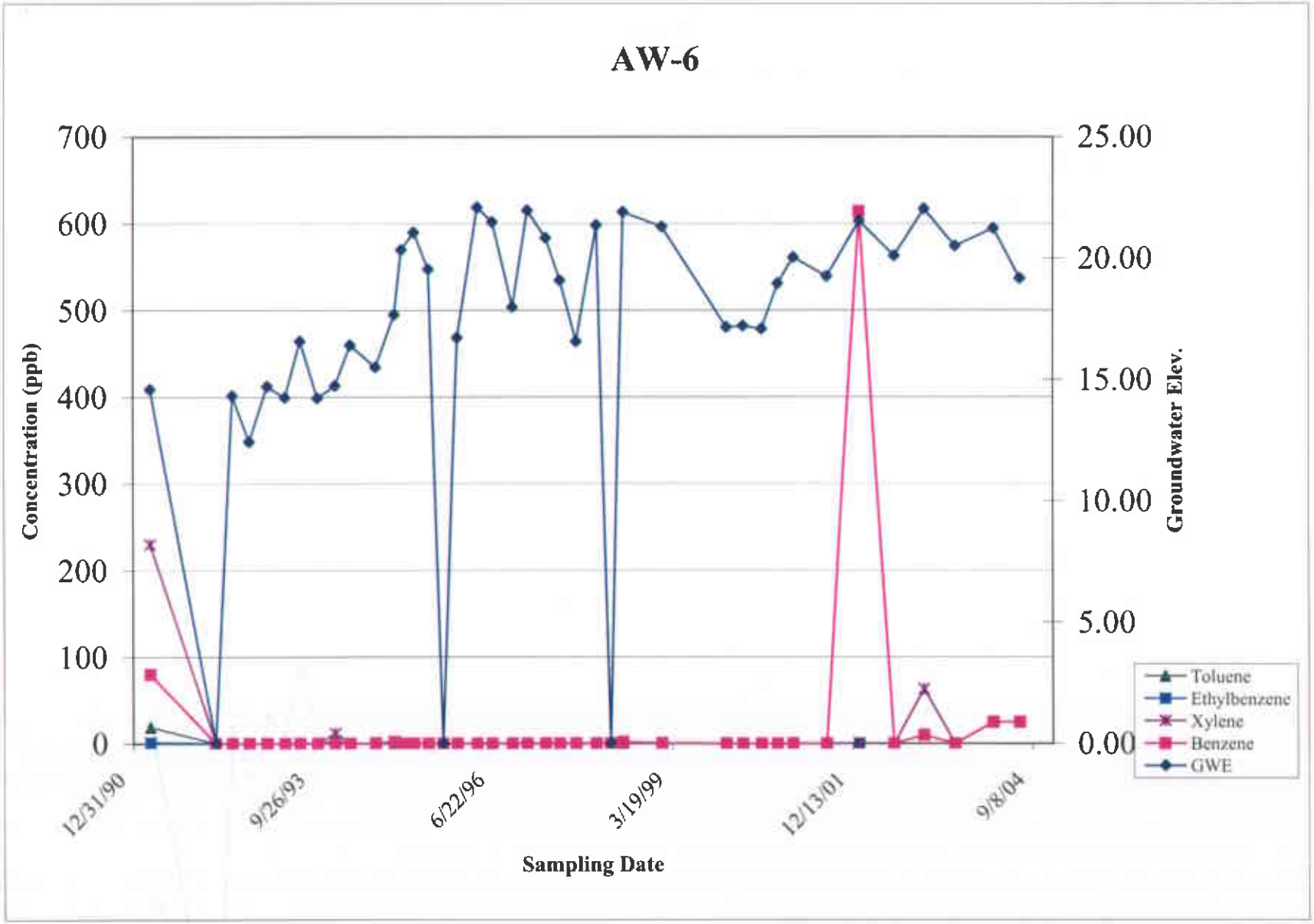
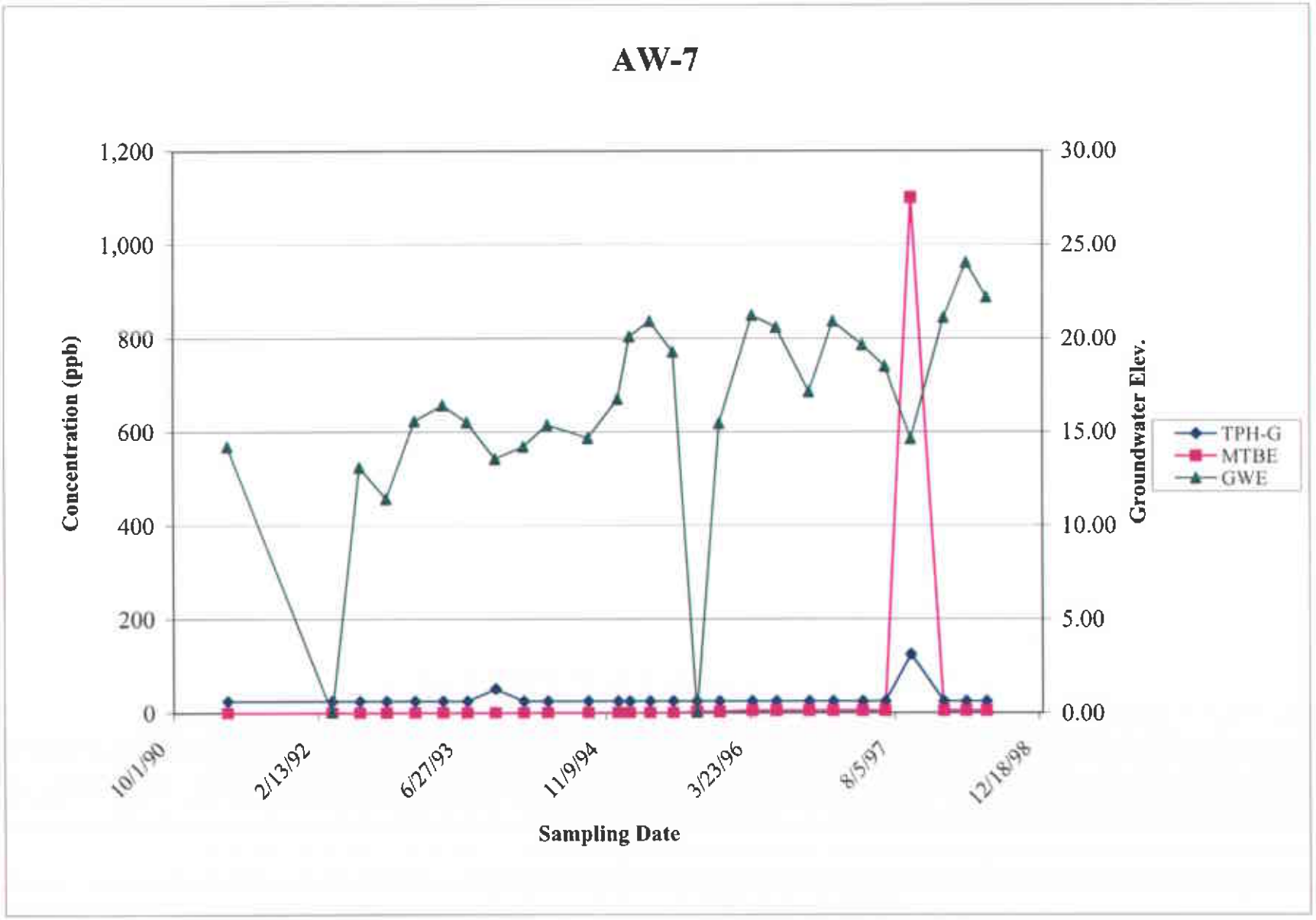
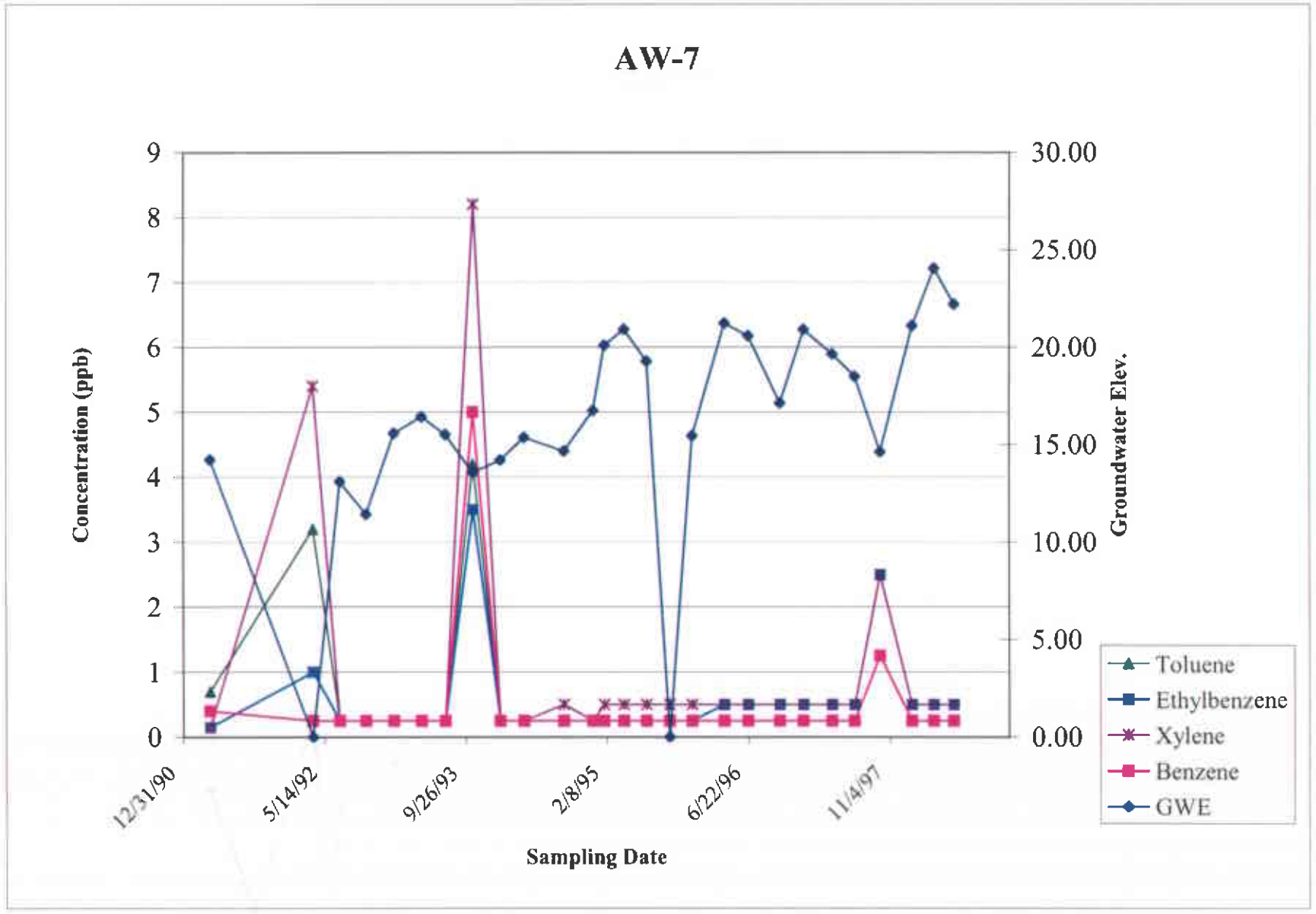
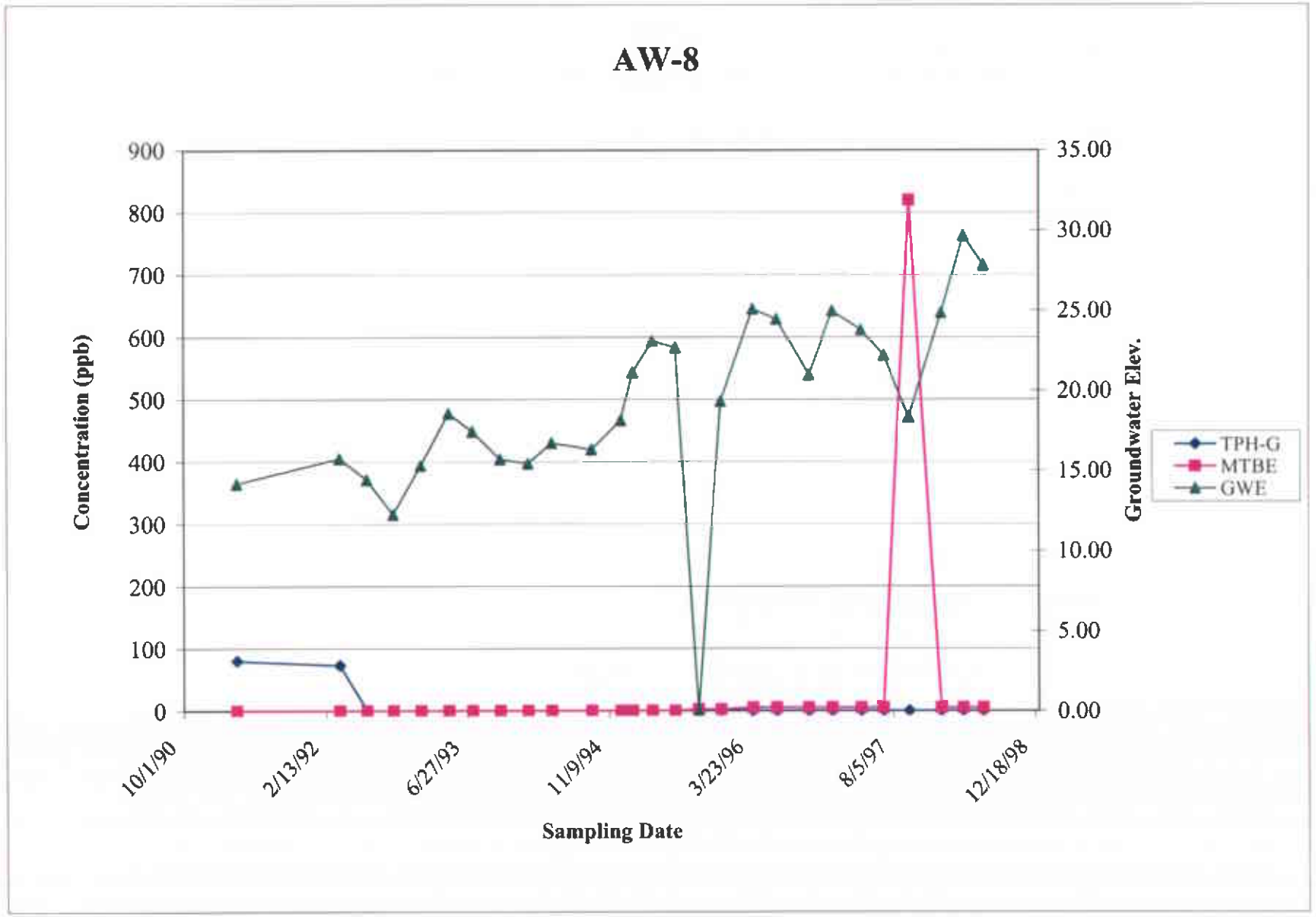
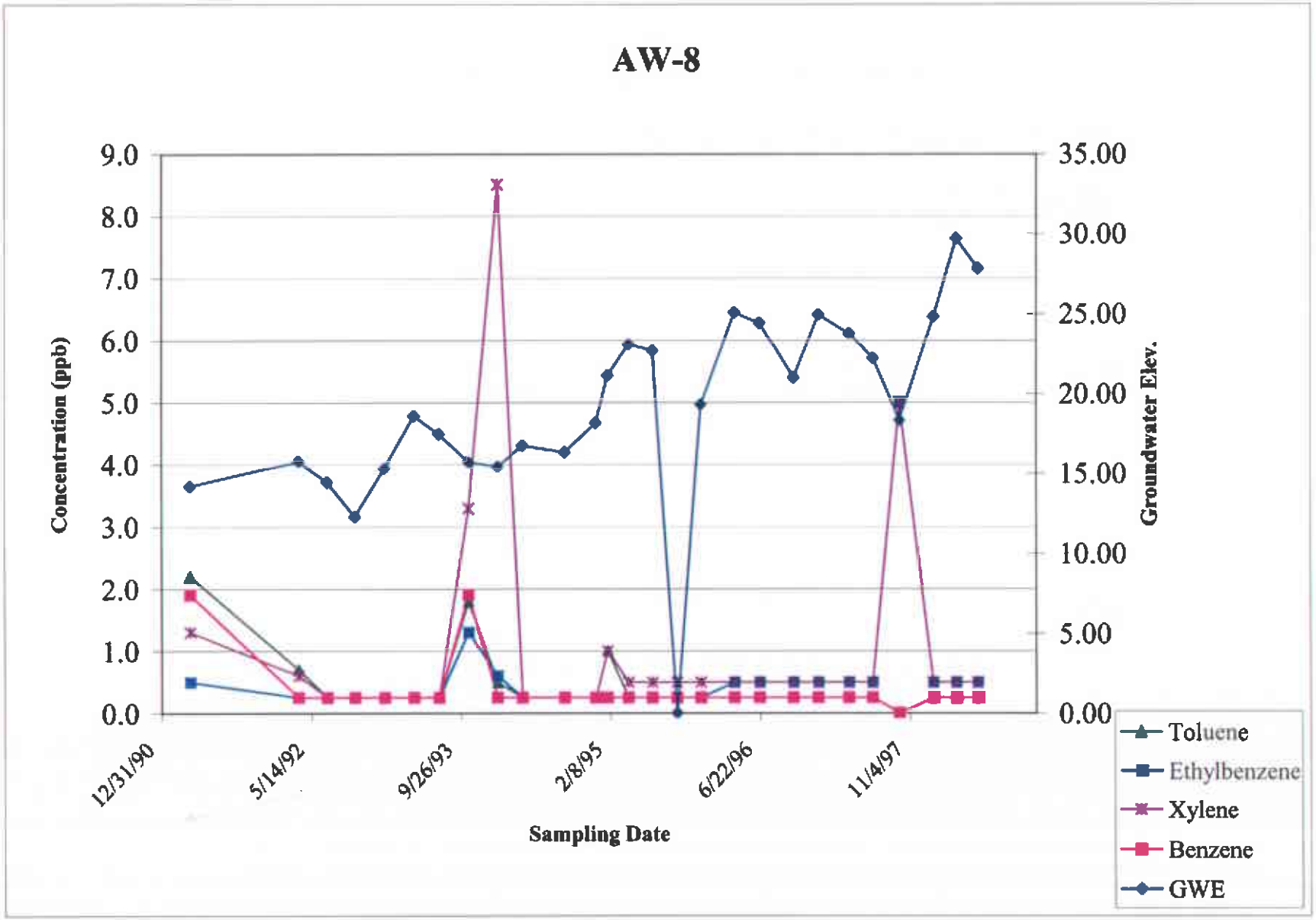
10,000
8,000
6,000
4,000
2,000
0
Concentration (ppb)
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
TPH-G
MTBE
GWE
10/1/90
6/27/93
3/23/96
12/18/98
9/13/01
6/9/04
Sampling Date


AW-6
700
600
500
400
300
200
100
0
Concentration (ppb)
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
12/31/90
9/26/93
6/22/96
3/19/99
12/13/01
9/8/04
Sampling Date
Toluene
Ethylbenzene
Xylene
Benzene
GWE


AW-7
1,200
1,000
800
600
400
200
0
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Concentration (ppb)
Groundwater Elev.
TPH-G
MTBE
GWE
10/1/90
2/13/92
6/27/93
11/9/94
3/23/96
8/5/97
12/18/98
Sampling Date


AW-7
Concentration (ppb)
Groundwater Elev.
Sampling Date
0
1
2
3
4
5
6
7
8
9
0.00
5.00
10.00
15.00
20.00
25.00
30.00
12/31/90
5/14/92
9/26/93
2/8/95
6/22/96
11/4/97
Toluene
Ethylbenzene
Xylene
Benzene
GWE


AW-8
900
800
700
600
500
400
300
200
100
0
Concentration (ppb)
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
TPH-G
MTBE
GWE
10/1/90
2/13/92
6/27/93
11/9/94
3/23/96
8/5/97
12/18/98
Sampling Date


AW-8
Concentration (ppb)
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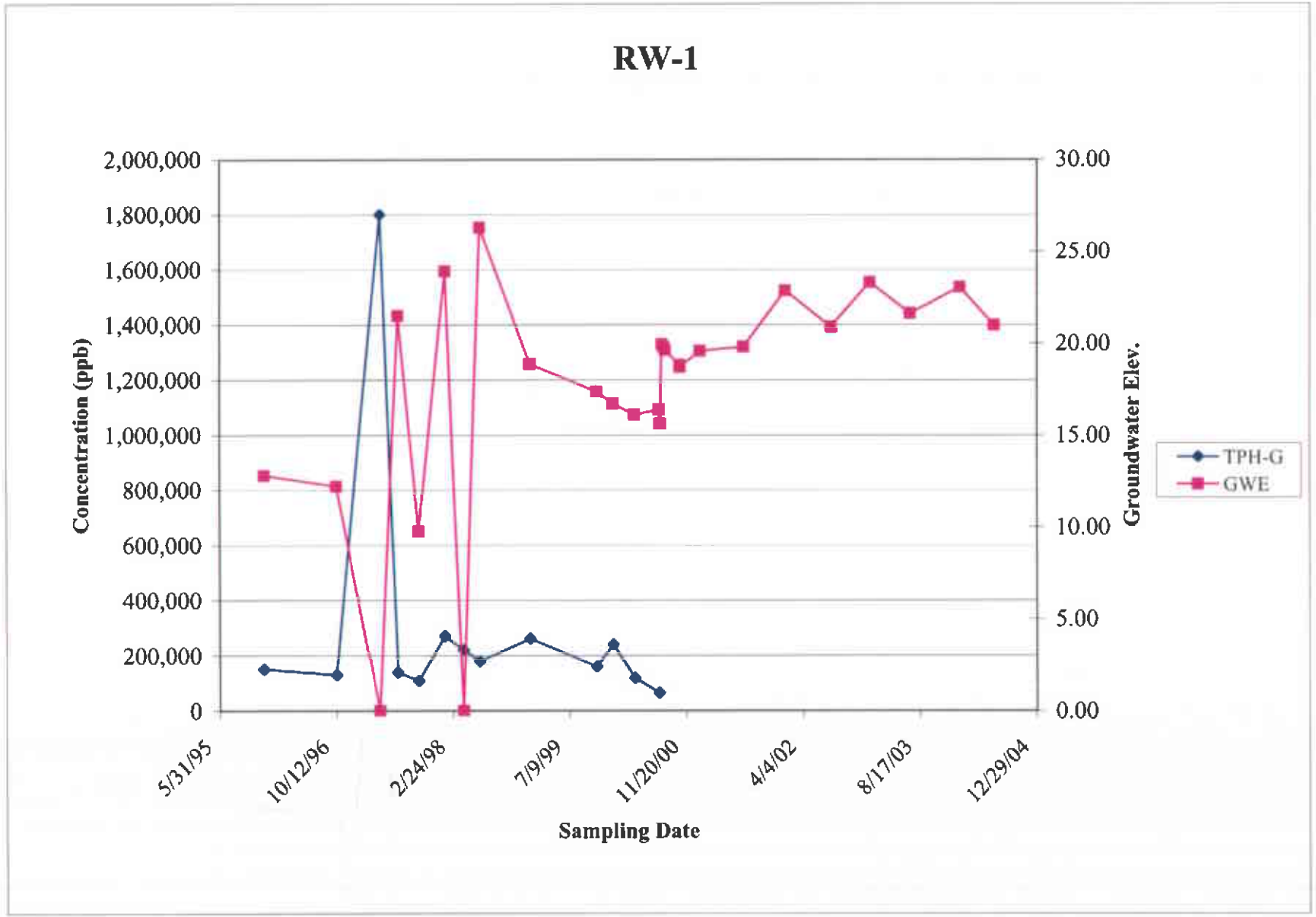
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
12/31/90
5/14/92
9/26/93
2/8/95
6/22/96
11/4/97
Sampling Date
Toluene
Ethylbenzene
Xylene
Benzene
GWE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Concentration (ppb)
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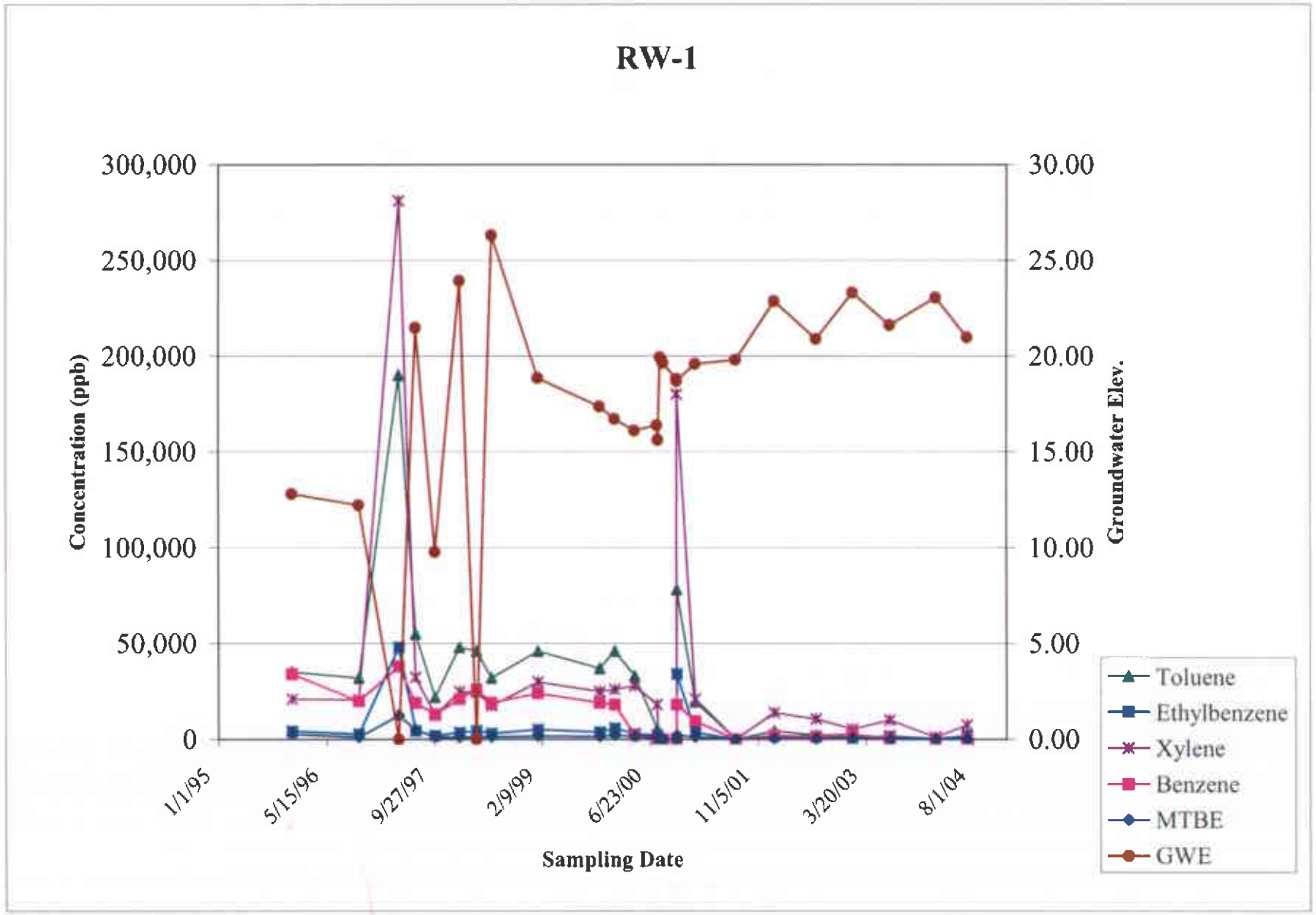
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Groundwater Elev.
TPH-G
GWE
5/31/95
10/12/96
2/24/98
7/9/99
11/20/00
4/4/02
8/17/03
12/29/04
Sampling Date


RW-1
300,000
250,000
200,000
150,000
100,000
50,000
0
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Concentration (ppb)
Groundwater Elev.
1/1/95
5/15/96
9/27/97
2/9/99
6/23/00
11/5/01
3/20/03
8/1/04
Sampling Date
Toluene
Ethylbenzene
Xylene
Benzene
MTBE
GWE

ATTACHMENT G

Sensitive Receptor Survey and Well Survey Results

SENSITIVE RECEPTORS SURVEY
SITE SURVEY AND LITERATURE SEARCH

Client: BP Oil Company Project No.: 30-080-01

Station No.: 11133

Location: 2220 98TH AVE

City/State: Oakland CA

I. Provide answers to the following questions:

A. Is there a public water supply well within 2500 feet? Y/N No
If Yes, Distance — ft.

B. Is there a private water supply well within 1000 feet? Y/N No
If Yes, Distance — ft.

C. Is there a subway within 1000 feet? Y/N NO
If Yes, Distance — ft.

D. Is there a basement within 1000 feet? Y/N NO
If Yes, Distance — ft.

E. Is there a school within 1000 feet? Y/N Yes
If Yes, Distance ____ ft.

F. Is there a surface body of water within 1000 feet? Y/N NO
If Yes, Distance — ft.
Name ____

II. Describe type of local water supply.

Public: X

- Suppliers Name: East Bay Municipal Water District
- Suppliers Source: Sierra Snow Melt, Pardee Dam
- Distance to Site: ____

Private: ____

SENSITIVE RECEPTORS SURVEY
SITE SURVEY AND LITERATURE SEARCH

III. Distance to Nearest Adjacent Properties:

Residential	~50 ft.
Commercial	— ft.
Industrial	— ft.
Hospital	13,200 ft.
School (E. Morris Cox Elementary)	~1000 ft.
Name	

IV. Aquifer Classification, if available.

Class I - Special Ground Waters	
- Irreplaceable Drinking Water Source	
- Ecologically Vital	
Class II - Current and Potential Drinking Water Sources	
Class III - Not Potential Source of Drinking Water	X

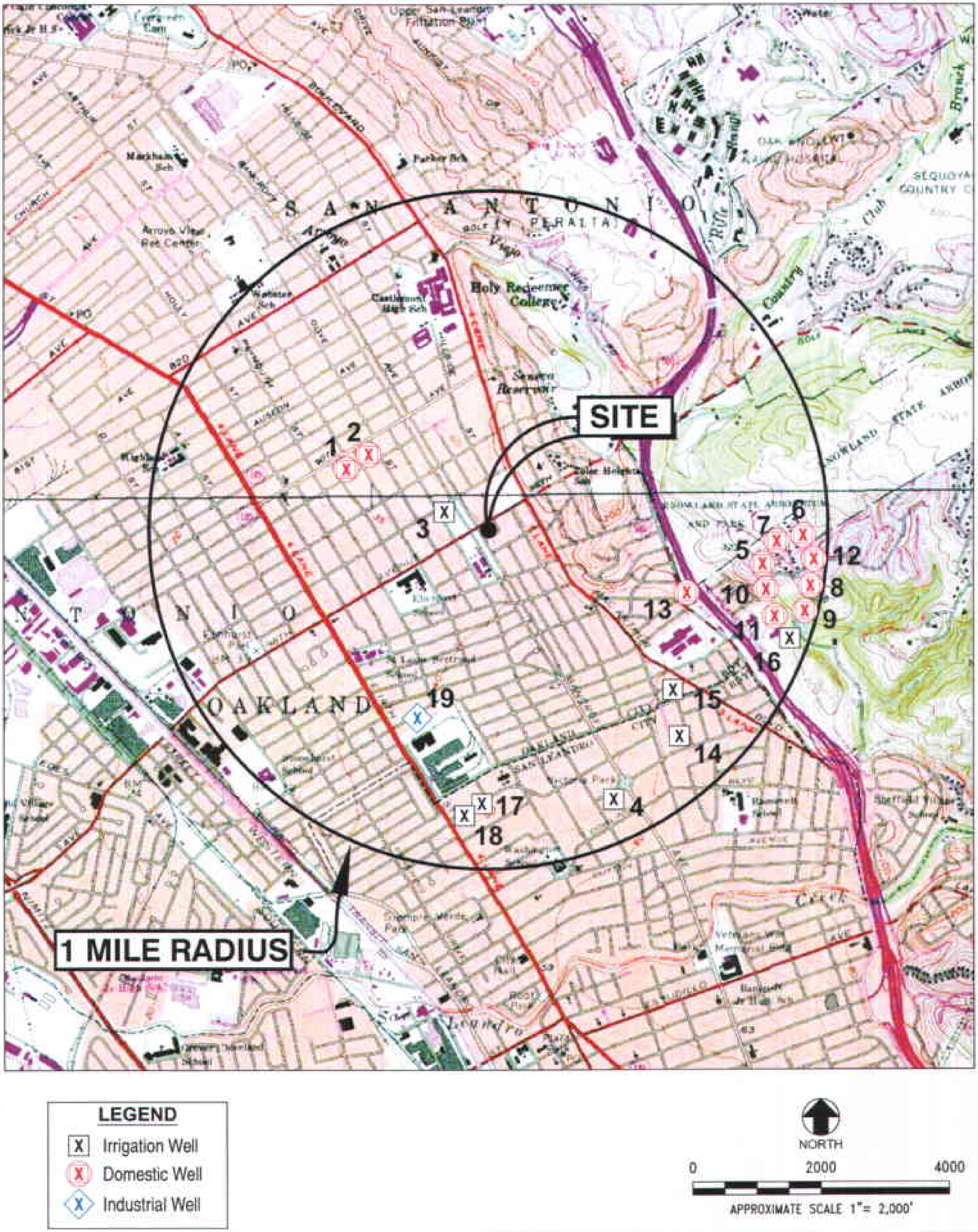
V. Describe observation wells, if any.

Number	11
Free Product? Y/N	Yes

VI. Signature of Preparer: Matthew A. Taylor

Date: 2-20-91

VII. Sketch of Site



URS	Project No. 38486823 Former BP Service Station #11133 2220 98th Avenue Oakland, California	WELL SURVEY RESULTS	FIGURE G-1

Sensitive Receptor Well Survey

Map Location #	Well Type	Installation Date	Total Depth (ft)	Screened Interval (ft)	Current Status	Well Address (If Available)
1	Domestic	6/1/1977	60	20-50	Unknown	1840 90th Avenue, Oakland, CA
2	Domestic	10/5/1977	62	20-60	Unknown	1910 90th Avenue, Oakland, CA
3	Irrigation	8/1/1977	260	60-180/ 200-240	Unknown	9600 Sunnyside Drive, Oakland, CA
4	Irrigation	10/30/1977	80	40-80	Unknown	533 Victoria Court, San Leandro,CA
5	Domestic	1951	Unknown	Unknown	Unknown	10550 Mark Street, Oakland, CA
6	Domestic	1951	190	Unknown	Unknown	10520 Stella Street, Oakland, CA
7	Domestic	1951	Unknown	Unknown	Unknown	10521 Stella Street, Oakland, CA
8	Domestic	1951	98	Unknown	Unknown	10600 Stella Street, Oakland, CA
9	Domestic	1951	55	Unknown	Unknown	10700 Stella Street, Oakland, CA
10	Domestic	1951	102	Unknown	Unknown	10731 Mark Street, Oakland, CA
11	Domestic	Unknown	100	41-76	Unknown	
12	Domestic	Unknown	97	42-92	Unknown	10544 Stella Street, Oakland, CA
13	Domestic	4/19/1951	100	28-85	Unknown	
14	Irrigation	3/17/1977	79	35-75	Unknown	377 Hollister Court, San Leandro, CA
15	Irrigation	9/25/1977	58	38-58	Unknown	2544 109th Avenue, Oakland, CA
16	Irrigation	8/9/1954	125	40-100	Unknown	
17	Irrigation	8/15/1982	100	68-96	Unknown	93 Broadmore Boulevard, San Leandro, CA
18	Irrigation	5/6/1977	32	None	Unknown	91 Broadmore Boulevard, San Leandro, CA
19	Industial	6/27/1977	77	34-74	Unknown	1500 105th Avenue, Oakland, CA

Note: 15 DWR records did not specify an address. Well potentially could be located within 1-mile radius.

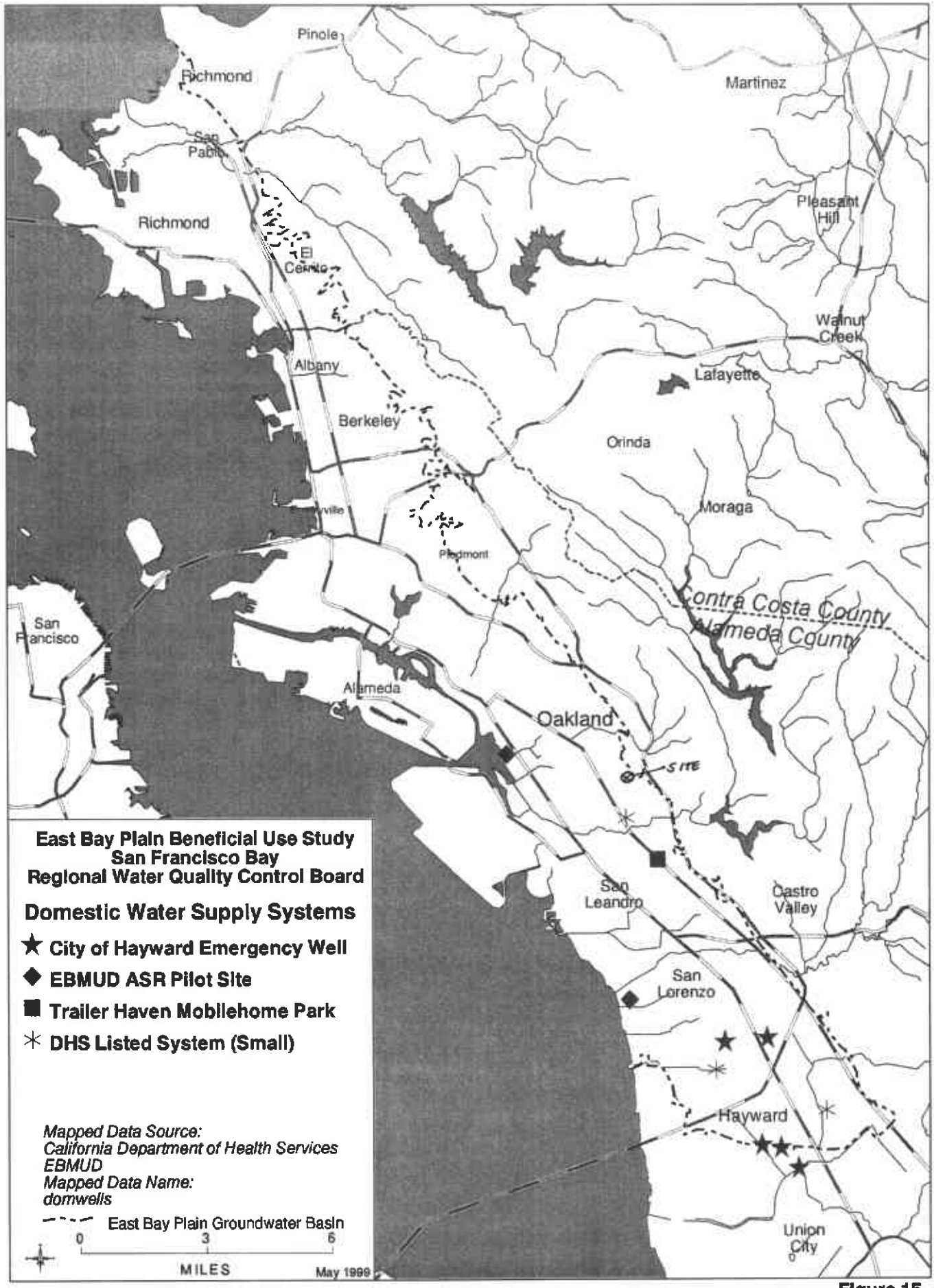

Pinole
Richmond
Martinez
San Pablo
Richmond
Pleasant Hill
El Cerrito
Walnut Creek
Albany
Lafayette
Berkeley
Orinda
Moraga
Piedmont
Contra Costa County
Alameda County
San Francisco
Alameda
Oakland
SITE
San Leandro
Castro Valley
San Lorenzo
Hayward
Union City
East Bay Plain Beneficial Use Study
San Francisco Bay
Regional Water Quality Control Board
Domestic Water Supply Systems
City of Hayward Emergency Well
EBMUD ASR Pilot Site
Trailer Haven Mobilehome Park
DHS Listed System (Small)
Mapped Data Source:
California Department of Health Services
EBMUD
Mapped Data Name:
domwells
East Bay Plain Groundwater Basin
0
3
6
MILES
May 1999

Figure 15

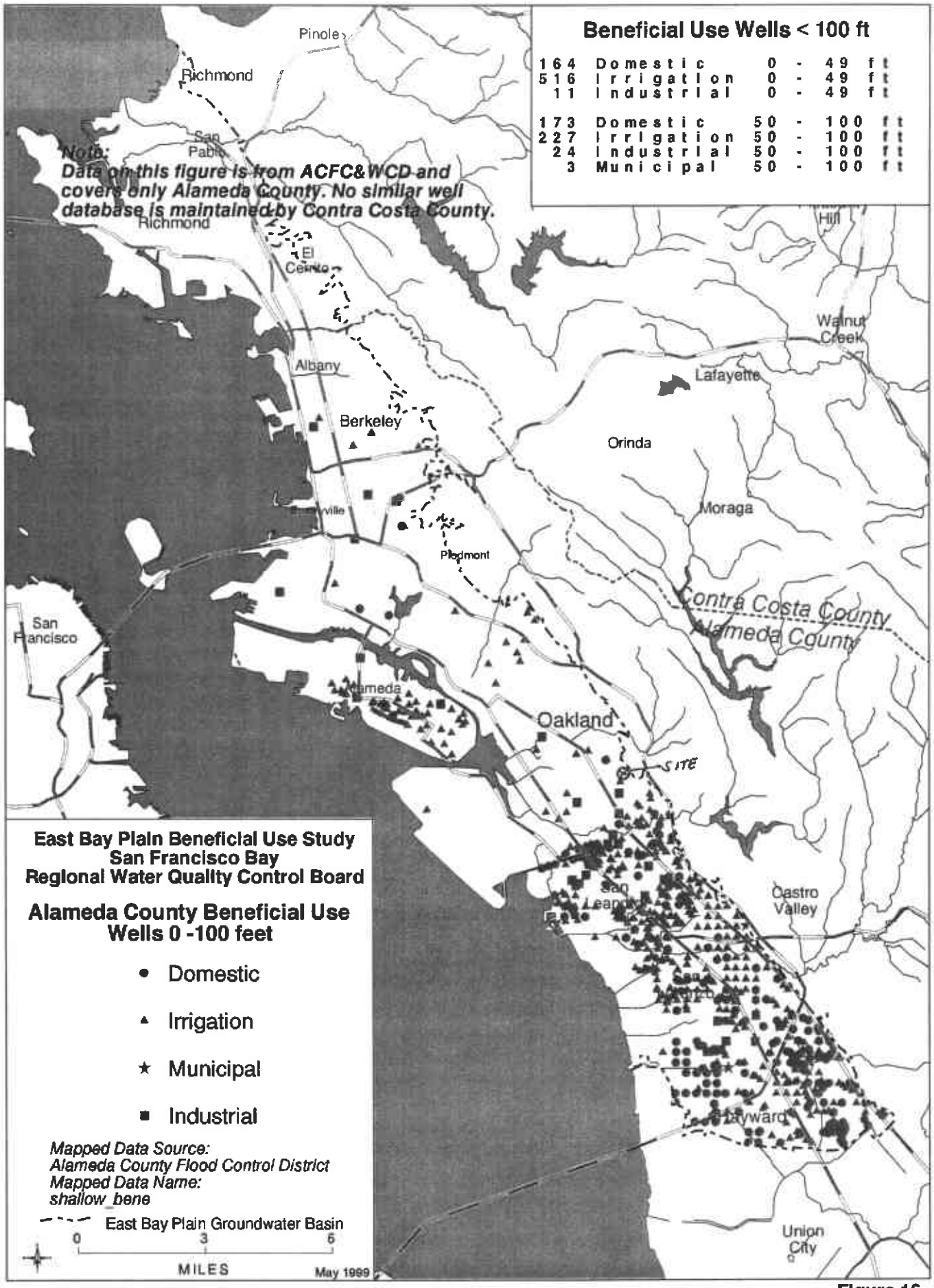

Beneficial Use Wells < 100 ft
164 Domestic 0 - 49 ft
516 Irrigation 0 - 49 ft
11 Industrial 0 - 49 ft
173 Domestic 50 - 100 ft
227 Irrigation 50 - 100 ft
24 Industrial 50 - 100 ft
3 Municipal 50 - 100 ft
Note:
Data on this figure is from ACFC&WCD and covers only Alameda County. No similar well database is maintained by Contra Costa County.
Pinole
Richmond
San Pablo
El Cerrito
Albany
Berkeley
Hill
Walnut Creek
Lafayette
Orinda
Moraga
Piedmont
Contra Costa County
Alameda County
San Francisco
Alameda
Oakland
SITE
San Leandro
Castro Valley
Hayward
Union City
East Bay Plain Beneficial Use Study
San Francisco Bay
Regional Water Quality Control Board
Alameda County Beneficial Use Wells 0 -100 feet
Domestic
Irrigation
Municipal
Industrial
Mapped Data Source:
Alameda County Flood Control District
Mapped Data Name:
shallow_bene
East Bay Plain Groundwater Basin
0 3 6
MILES
May 1999

Figure 16

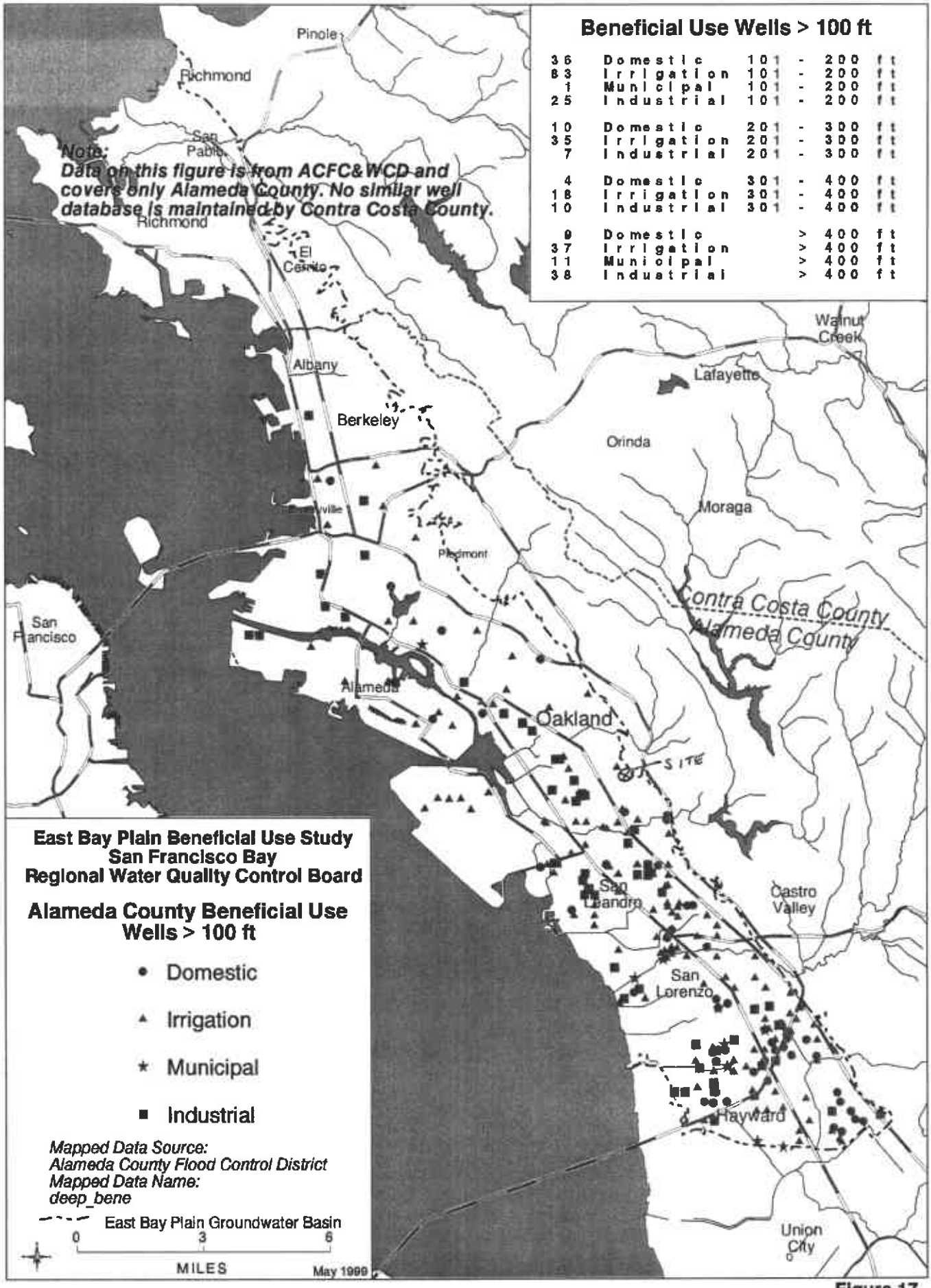

Beneficial Use Wells > 100 ft
36 Domestic 101 - 200 ft
83 Irrigation 101 - 200 ft
1 Municipal 101 - 200 ft
25 Industrial 101 - 200 ft
10 Domestic 201 - 300 ft
35 Irrigation 201 - 300 ft
7 Industrial 201 - 300 ft
4 Domestic 301 - 400 ft
18 Irrigation 301 - 400 ft
10 Industrial 301 - 400 ft
9 Domestic > 400 ft
37 Irrigation > 400 ft
11 Municipal > 400 ft
38 Industrial > 400 ft
Note:
Data on this figure is from ACFC&WCD and covers only Alameda County. No similar well database is maintained by Contra Costa County.
Pinole
Richmond
San Pablo
Richmond
El Cerrito
Albany
Berkeley
Walnut Creek
Lafayette
Orinda
Moraga
Piedmont
Contra Costa County
Alameda County
San Francisco
Alameda
Oakland
SITE
San Leandro
Castro Valley
San Lorenzo
Hayward
Union City
East Bay Plain Beneficial Use Study
San Francisco Bay
Regional Water Quality Control Board
Alameda County Beneficial Use Wells > 100 ft
Domestic
Irrigation
Municipal
Industrial
Mapped Data Source:
Alameda County Flood Control District
Mapped Data Name:
deep_bene
East Bay Plain Groundwater Basin
0 3 6
MILES
May 1999

Figure 17

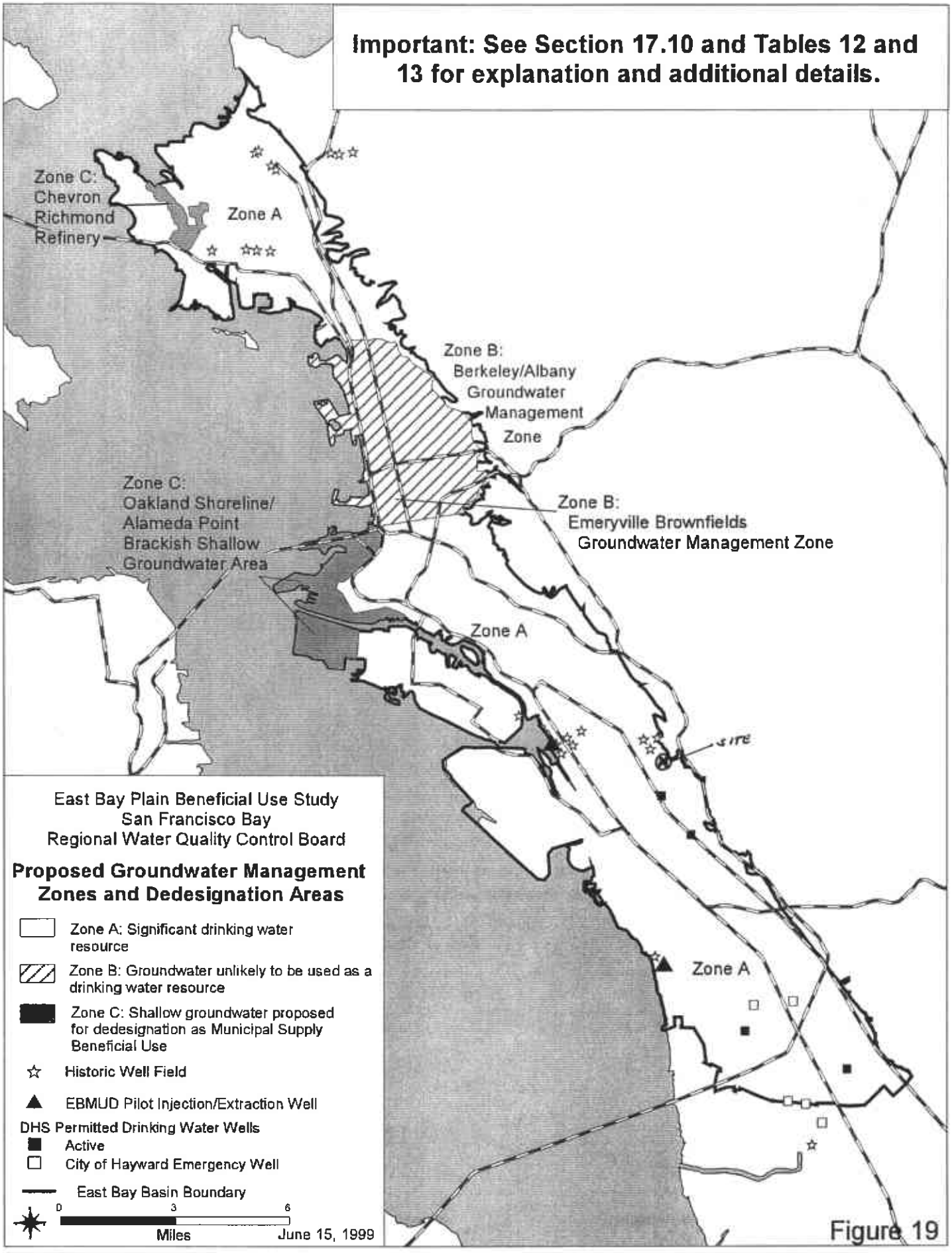

Important: See Section 17.10 and Tables 12 and 13 for explanation and additional details.
Zone C: Chevron Richmond Refinery
Zone A
Zone B: Berkeley/Albany Groundwater Management Zone
Zone C: Oakland Shoreline/ Alameda Point Brackish Shallow Groundwater Area
Zone B: Emeryville Brownfields Groundwater Management Zone
Zone A
Zone A
East Bay Plain Beneficial Use Study
San Francisco Bay
Regional Water Quality Control Board
Proposed Groundwater Management Zones and Dedesignation Areas
Zone A: Significant drinking water resource
Zone B: Groundwater unlikely to be used as a drinking water resource
Zone C: Shallow groundwater proposed for dedesignation as Municipal Supply Beneficial Use
Historic Well Field
EBMUD Pilot Injection/Extraction Well
DHS Permitted Drinking Water Wells
Active
City of Hayward Emergency Well
East Bay Basin Boundary
0 3 6
Miles
June 15, 1999

Figure 19

Table 12. Summary of Proposed East Bay Plain Groundwater Management Zones

Zone		Historical Public Water Supply	Historical Domestic Water Supply	Existing, Probable or Potential Drinking Water Source	Remediation Strategy	Location
A – Areas of Basin that have moderate to significant deep drinking watert resource	Shallow	Yes, but limited	Yes	Potential	For shallow pollution, goal is to maintain and restore drinking water quailty and actively prevent migration into deeper zones. Target areas of Special Concern shown on Table 13.	All of San Leandro and San Lorenzo Subareas; Bulk of Cen Oakland and Richmond Sub A
	Deep	Yes	Yes	Existing or Probable	For deeper aquifers require active remediation and hydraulic control to maintain and restore drinking water quality.	
B – Areas of basin that are unlikely to be used as a drinking water resource		No	Yes	Potential	Passive Remediation to restore drinking water quality as a long-term strategy while actively protecting private irrigation wells, human health and ecological receptors. Utilize risk based corrective action in establishing groundwater cleanup standards.	Berkeley Sub Area and Emery
C - Not a drinking water resource		No	No	Neither Existing, Probable or Potential	Protect human health and ecological receptors. Dedesignate MUN in Zone C. Utilize risk based corrective action in establishing groundwater cleanup standards. Locate and seal vertical conduits that extend into deeper portions of Zone B.	Shallow high TDS aquifers alo Oakland and Alameda Shorelin and at Chevron Refinery.

MUN - Municipal and Domestic Supply Beneficial Use
Shallow Zone - Groundwater within shallow deposits above the Yerba Buena Mud or its lateral equivalent.
Deep Zone - Groundwater below the Yerba Buena Mud or its lateral equivalent within the Alameda Formation or Santa Clara Formation as defined by Figuers (1998).

Table 13. Proposed Strategy by Sub-Area for Addressing Groundwater Contamination in the East Bay Plain

Sub-Area	Vertical Subdivisions	Areas of special concern	Areas proposed for less aggressive or passive remediation.	Areas proposed for dedesignation
RICHMOND	*None*	Areas with a have high density of back yard irrigation wells in east central Richmond and western San Pablo (See Figure 17). North-central portion is deepest and potentially most productive (See Figure 10).	None defined, however, portions of Richmond Inner Harbor / South Shore Area may qualify. Bedrock is less than 200 feet deep in this area (See Figure 10).	Chevron Richmond Refinery
CENTRAL	*Shallow*	Area on Alameda Island with a high density of existing back yard irrigation wells pumping from Merritt Formation (See Figure 17). Bay front groundwater with potential to impact San Francisco Bay.	Shallow brackish artificial fill areas on a case-by-case basis (See Figure 17).	Portion of Alameda Point and Oakland Shorline
	Deep	Area south of the Bay Bridge where basin is deepest and potentially most productive (See Figure 10). High density of deep historic wells in City of Alameda (See Fig. 2 and Table 4).	None	None
BERKELEY	*None*	Areas with moderate density of back yard irrigation wells (see Figure 17).	Berkeley/ Albany Groundwater Management Zone. Emeryville Brownfields Groundwater Management Zone (see Figure 19).	None
OAKLAND	*Shallow*	Areas with moderate density of back yard irrigation wells (See Figure 17).	Regional Board will consider applicability of City of Oakland's Urban Land Redevelopment Protocol once it is finalized (see Section 14.1).	None
	Deep	Area south of Lake Merritt is deepest and historically most productive portion of the Oakland Sub-Area (See Figure 3). SWPZ for EBMUD aquifer storage and recovery test well near Oakland Coliseum (See Figure 14). High density of deep historic wells in City of Oakland (See Fig. 2 and Table 4).	None	None
SAN LEANDRO	*Shallow*	Areas with a high density of back yard irrigation wells (See Figure 17).	Shallow groundwater pollution sites that meet remediation and investigation criteria on a case-by-case basis (See Section 17.11).	None
	Deep	SWPZ for 2 small DHS Permitted Drinking Water Systems (See Figure 14).	None	None
SAN LORENZO	*Shallow*	Areas with a high density of back yard irrigation wells (Figure 17).	Shallow groundwater pollution sites that meet remediation and investigation criteria on a case-by-case basis (See Section 17.11).	None
	Deep	SWPZ for 2 small DHS Permitted Drinking Water Systems, 5 City of Hayward Emergency Supply Wells, and EBMUD aquifer storage and recovery test well near Ora Loma Waste Water Treatment Plant.	None	None

SWPZ – Source Water Protection Zone

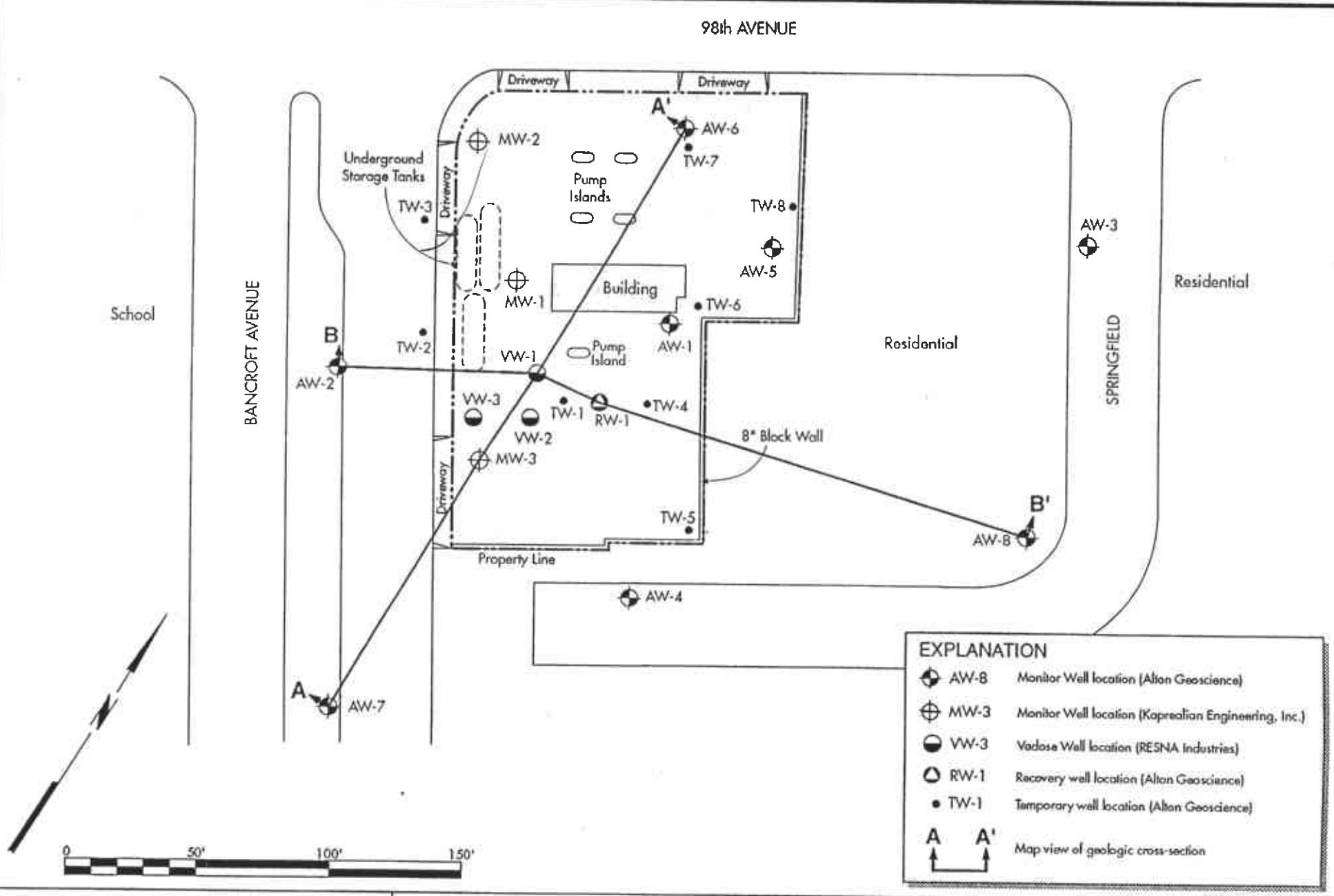
ATTACHMENT H

Well Construction Details, Historic Hydrogeologic Cross-sections and Boring Logs

Well Construction Table

Former BP 11133: 2220 98th Avenue, Oakland, California

Well ID	Install Date	Total Well Depth (ft)	Total Boring Depth (ft)	Boring Diameter (inches)	Well Diameter (inches)	Screened Interval (ft)	Sreen Slot Size (inches)	Bentonite Seal (ft)	Sand Pack Interval (ft)	Sand Pack Type
MW-1	5/6/1988	29.0	29.0	8.0	2.0	10-29	0.020	8-9	9-29	No.3
MW-2	5/6/1988	32.0	32.0	8.0	2.0	12-32	0.020	9-10	10-32	No.3
MW-3	5/6/1988	34.0	34.0	8.0	2.0	14-34	0.020	10.5-11.5	11.5-34	No.3
AW-1	6/5/1990	35.0	35.0	10.0	2.0	15-35	0.020	16-18	18-35	No.3
AW-2	6/5/1990	35.0	35.0	10.0	2.0	20-35	0.020	16-18	18-35	No.3
AW-3	6/6/1990	35.0	35.0	10.0	2.0	15-35	0.020	16-18	18-35	No.3
AW-4	6/6/1990	35.0	35.0	10.0	2.0	15-35	0.020	16-18	18-35	No.3
AW-5	2/27/1991	45.0	46.5	10.0	4.0	20-45	0.020	17-18	18-45	No.3
AW-6	2/28/1991	35.0	36.5	10.0	4.0	20-35	0.020	17-18	18-35	No.3
AW-7	3/1/1991	35.0	36.5	8.0	2.0	20-35	0.020	17-18	18-35	No.3
AW-8	2/28/1991	40.0	41.5	8.0	2.0	20-40	0.020	17-18	18-40	No.3
AW-9	12/3/1996	40.0	33.0	8.0	2.0	12.5-27.5	0.010	9-11	11-28	No.12
RW-1	6/5/1990	40.0	40.0	10.0	6.0	15-40	0.020	11-13	13-40	No.3
VEW-9	5/9/1996	20.0	21.5	12.0	4.0	6-20	0.010	4-5	5-20	No.3
VW-1	3/26/1992	16.5	16.6	12.0	4.0	9-16.5	0.10	6-8	8-16.5	No.3
VW-2	3/26/1992	16.5	16.5	12.0	4.0	9-16.5	0.10	6-8	8-16.5	No.3
VW-3	3/26/1992	16.5	16.5	12.0	4.0	9-16.5	0.10	6-8	8-16.5	No.3



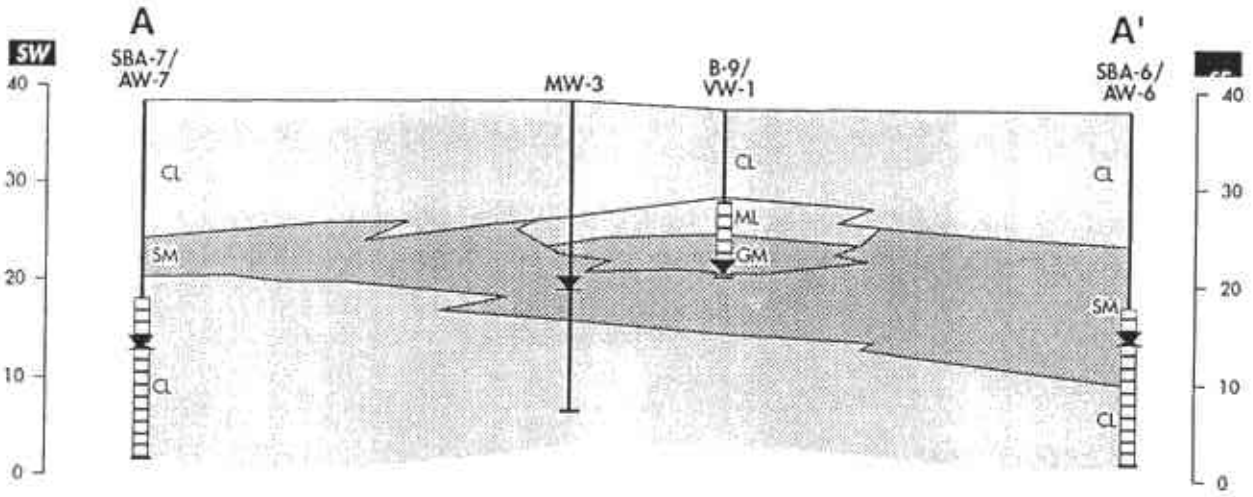
RESNA

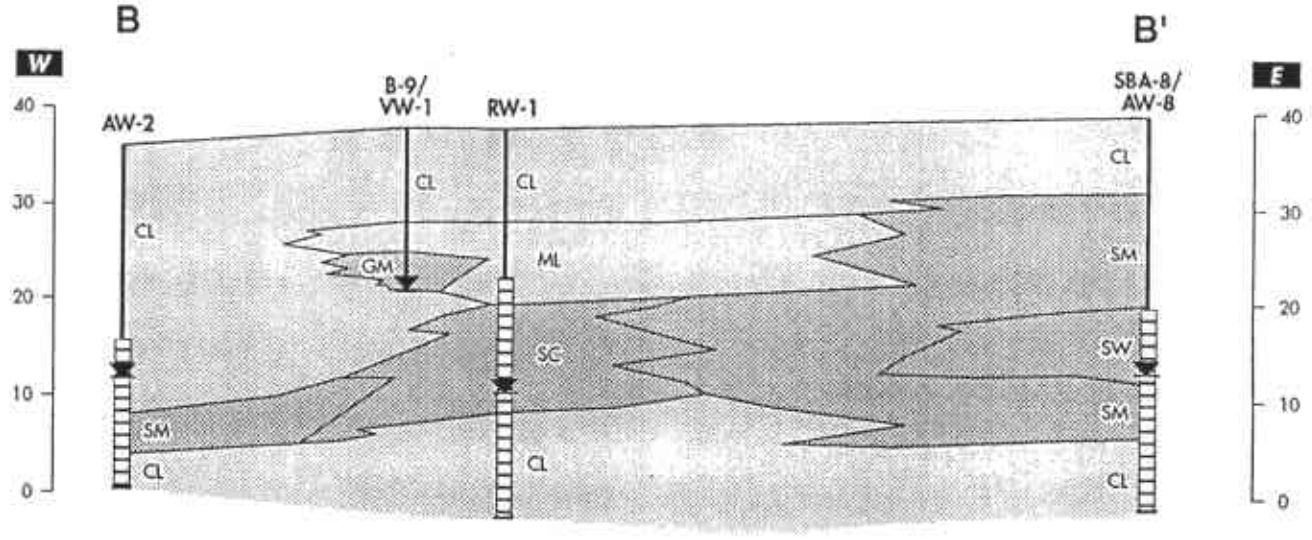
PROJECT NO. 32006.03 | 12/92

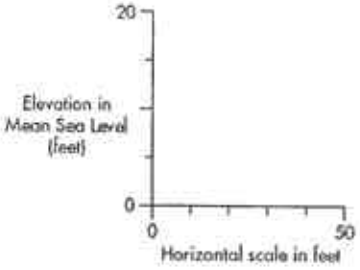
GENERALIZED SITE PLAN

BP Facility No. 11133
2220 98th Avenue
Oakland, California

PLATE
2







EXPLANATION

- Silty CLAY (CL); SILT (ML)
- Silty SAND (SM); SAND (SW); Clayey Sand/Sandy Clay (SC); Silty GRAVEL (GM)

- SBA-7/ AM-7 — Boring/Monitor Well location (Alton Geoscience)
- B-9/ VW-1 — Boring/Vadose Well location (RESNA Industries, Inc.)
- MW-3 — Monitor Well location (Kaprealian Engineering, Inc.)
- Boring
- Screen interval
- Static water level on July 6, 1992

RESNA

PROJECT NO. 32006.03 | 12/92

CROSS-SECTIONS A-A' & B-B'

BP Facility No. 11133
2220 98th Avenue
Oakland, California

PLATE 3

Exploratory Boring Log

Project No.	Boring & Casing Diameter	Logged By
KEI-P87-064A-1	8 in. 2 in. csg.	JS
Project Name	**Casing Elevation**	**Date Drilled**
Mobil #10-MGV		5-6-88
Boring No.	**Hollow-stem Flight Auger**	**Depth to Groundwater**
MW-1		20.5 ft.

Penetration blows/ft	G. W. level	Depth (ft) Samples	Lithography USCS	Description
		0	CH	ASPHALT & BASEROCK CLAY: dark greyish brown 10YR 3/2 to black N2/, highly plastic, stiff, dry
		5		
31		10		
			CL	SANDY CLAY: dark greenish grey 5GY 4/1 moderately to highly plastic, very fine grained sand, well sorted Faint odor at 15 ft.
15		15		
		20		

Exploratory Boring Log

Project No. KEI-P87-064A-1	Boring & Casing Diameter .	Logged By
Project Name Mobil #10-MGV	Casing Elevation	Date Drilled 5-6-88
Boring No. MW-1	Hollow-stem Flight Auger	Depth to Groundwater

Penetration blows/ft	G. W. level	Depth (ft) Samples	Lithography USCS	Description
25	▼	20		SANDY CLAY: as above
		25	CH	CLAY: moderately plastic, dry
		30		TOTAL DEPTH 29 FEET
		35		
		40		

WELL DETAILS

PROJECT NAME: Mobil #10-MGV 2220 98th Ave. Oakland, CA

BORING/WELL NO. MW-1

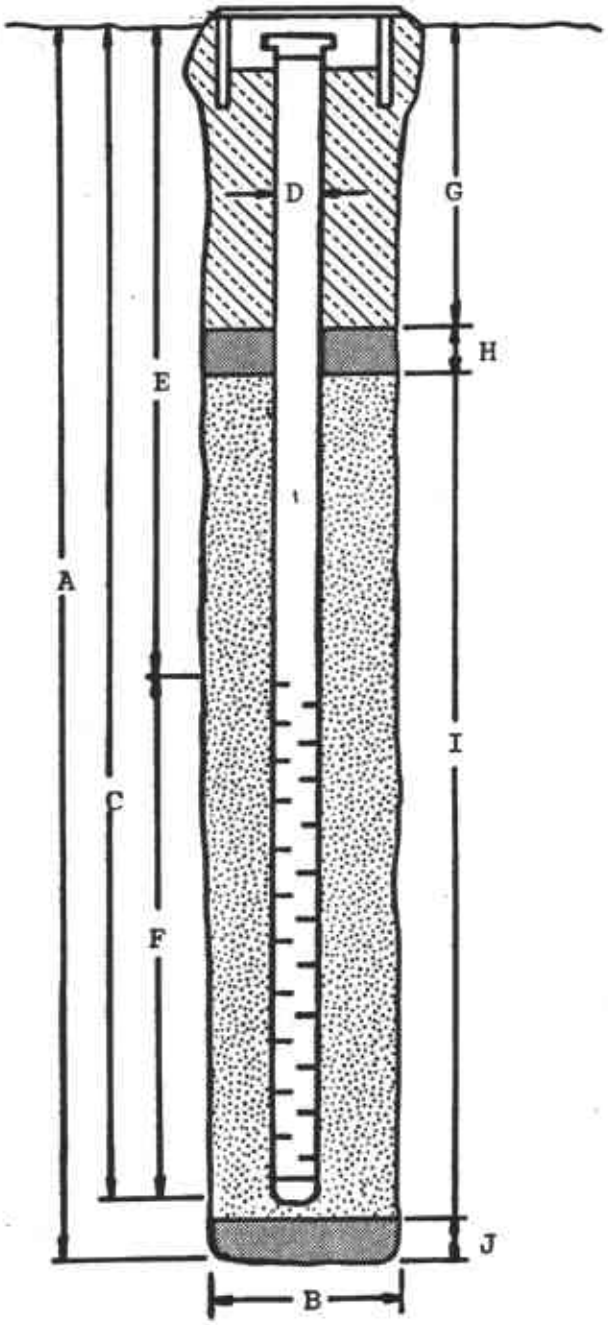
PROJECT NUMBER: KEI-P87-064A-1

CASING ELEVATION:

WELL PERMIT NO.: 88-156 Alameda Co. Flood Control

SURFACE ELEVATION:

G-5 Vault Box



A. Total Depth: 29 ft.

B. Boring Diameter: 8 in.

Drilling method: Hollow stem

C. Casing Length: 29 ft.

Material: Schedule 40 PVC

D. Casing Diameter: 2 in.

E. Depth to Perforations: 10 ft.

F. Perforated Length: 19 ft.

Perforated Interval: 29 to 10 ft.

Perforation Type: slot

Perforation Size: 0.02 in.

G. Surface Seal: 8 to 0 ft.

Seal Material: concrete

H. Seal: 9 to 8 ft.

Seal Material: bentonite

I. Gravel Pack: 29 to 9 ft.

Pack Material: Monterey sand

Size: No. 3

J. Bottom Seal: none

Seal Material:

Exploratory Boring Log

Project No.	Boring & Casing Diameter	Logged By
KEI-P87-064A-1	8 in. 2 in. csg.	JS
Project Name	**Casing Elevation**	**Date Drilled**
Mobil #10-MGV		5-6-88
Boring No.	**Hollow-stem Flight Auger**	**Depth to Groundwater**
MW-2		24 ft.

Penetration blows/ft	G. W. level	Depth (ft) Samples	Lithography USCS	Description
		0		ASPHALT & BASEROCK FILL
			CH	CLAY: very dark greyish brown 10YR 3/2 highly plastic, stiff, dry
		5		
			CL	SANDY CLAY: very dark greyigh brown 10YR 3/2, very fine grained sand highly plastic clay, 5% fine gravel
27		10		
19		15		brown 10YR 5/3
21		20		

Exploratory Boring Log

Project No. KEI-P87-064A-1	Boring & Casing Diameter	Logged By
Project Name Mobil #10-MGV	Casing Elevation	Date Drilled 5-6-88
Boring No. MW-2	Hollow-stem Flight Auger	Depth to Groundwater

Penetration blows/ft	G. W. level	Depth (ft) Samples	Lithography USCS	Description
		20		SANDY CLAY: as above moist
	▼		SC	CLAYEY SAND: yellowish brown 10YR 5/4 fine grained well sorted sand, low plastic fines
		25		
		30	CH	CLAY: dark brown 10YR 4/3, stiff to hard, plastic, dry
				TOTAL DEPTH 32 FEET
		35		
		40		

WELL DETAILS

PROJECT NAME: Mobil #10-MGV 2220 98th Ave. Oakland, CA

BORING/WELL NO. MW-2

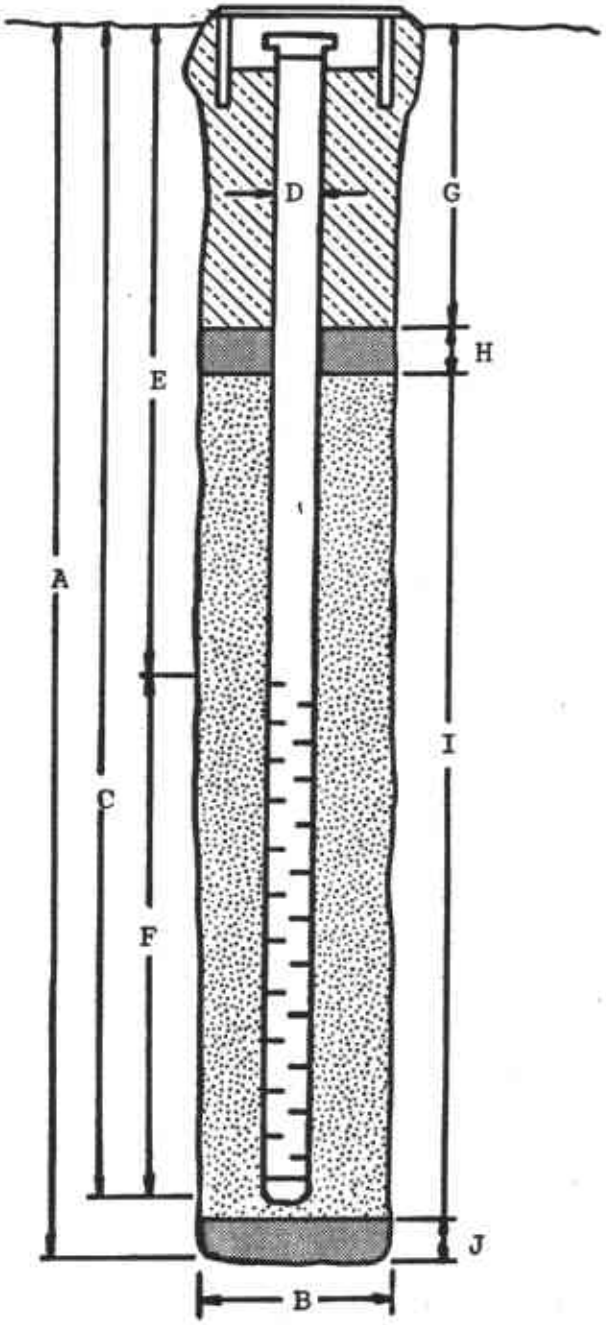
PROJECT NUMBER: KEI-P87-064A-1

CASING ELEVATION:

WELL PERMIT NO.: 88-156 Alameda Co. Flood Control

SURFACE ELEVATION:

G-5 Vault Box



A. Total Depth: 32 ft.

B. Boring Diameter: 8 in.

Drilling method: Hollow stem

C. Casing Length: 32 ft.

Material: Schedule 40 PVC

D. Casing Diameter: 2 in.

E. Depth to Perforations: 12 ft.

F. Perforated Length: 20 ft.

Perforated Interval: 32 to 12 ft.

Perforation Type: slot

Perforation Size: 0.02 in.

G. Surface Seal: 9 to 0 ft.

Seal Material: concrete

H. Seal: 10 to 9 ft.

Seal Material: bentonite

I. Gravel Pack: 32 to 10 ft.

Pack Material: Monterey sand

Size: NO. 3

J. Bottom Seal: none

Seal Material:

Exploratory Boring Log

Project No.	Boring & Casing Diameter	Logged By
KEI-P87-064A-1	8 in. 2 in. csg.	JS
Project Name	**Casing Elevation**	**Date Drilled**
Mobil #10-MGV		5-6-88
Boring No.	**Hollow-stem Flight Auger**	**Depth to Groundwater**
MW-3		29.5 ft.

Penetration blows/ft	G. W. level	Depth (ft) Samples	Lithography USCS	Description
		0		ASPHALT & BASEROCK FILL
			CL	SANDY CLAY: brown 10YR 4/3, very fine grained sand, well sorted, low plasticity clay
		5		
			ML	SILTY CLAY: brown 10YR 4/3, very well sorted, moderatley plastic, stiff, dry
33		10		
			SC	CLAYEY SAND: dark yellowish brown very fine grained well sorted sand, low to mod. plastic fines, soft, damp
13		15		coarser sand with depth
				gravel lens 18 to 19 ft.
		20		

Exploratory Boring Log

Project No. KEI-P87-064A-1	Boring & Casing Diameter	Logged By
Project Name Mobil #10-MGV	Casing Elevation	Date Drilled 5-6-88
Boring No. MW-3	Hollow-stem Flight Auger	Depth to Groundwater

Penetration blows/ft	G. W. level	Depth (ft) Samples	Lithography USCS	Description
22		20		CLAYEY SAND: as above
12		25		very fine grained sand, damp
	▼	30	CL	SANDY CLAY: brown 10YR 4/3, hard, dry, fine grained sand and mod. plastic clay
		35		TOTAL DEPTH 34 FEET
		40		

WELL DETAILS

PROJECT NAME: Mobil #10-MGV 2220 98th AVe. Oakland, CA

BORING/WELL NO. MW-3

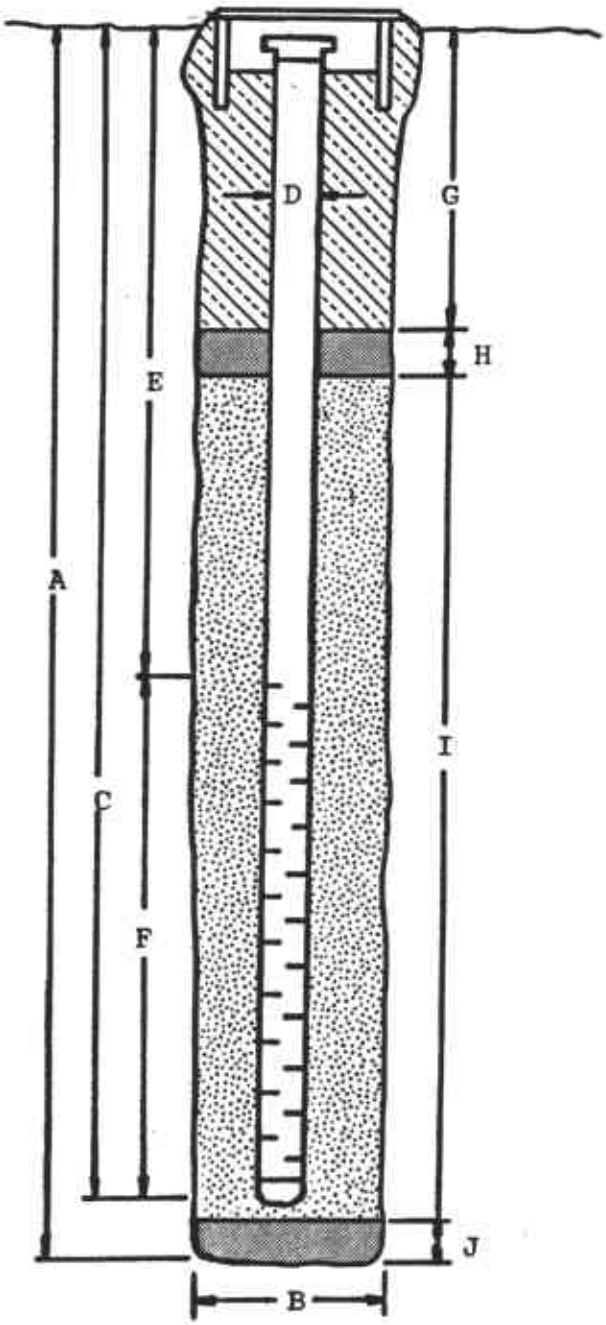
PROJECT NUMBER: KEI-P87-064A-1

CASING ELEVATION:

WELL PERMIT NO.: 88-156 Alameda Co. Flood Control

SURFACE ELEVATION:

G-5 Vault Box



A. Total Depth: 34 ft.

B. Boring Diameter: 8 in.

Drilling method: Hollow stem

C. Casing Length: 34 ft.

Material: Schedule 40 PVC

D. Casing Diameter: 2 in.

E. Depth to Perforations: 14 ft.

F. Perforated Length: 20 ft.

Perforated Interval: 34 to 14 ft.

Perforation Type: slot

Perforation Size: 0.02 in.

G. Surface Seal: 10.5 to 0 ft.

Seal Material: concrete

H. Seal: 11.5 to 10.5 ft.

Seal Material: bentonite

I. Gravel Pack: 34 to 11.5 ft.

Pack Material: Monterey sand

Size: No. 3

J. Bottom Seal: none

Seal Material:

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080 DATE DRILLED 6/5/90
CLIENT BP OIL COMPANY
LOCATION 2201 98TH AVENUE, OAKLAND, CA
LOGGED BY M. TAYLOR APPROVED BY

BORING NO.
WELL NO. AW-1

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 98.99

DRILLING METHOD HOLLOW-STEM AUGER HOLE DIAM. 10 inch
SAMPLER TYPE SEE MONITORING WELL CONSTRUCTION DETAIL
CASING DATA
DRILLER WEST HAZMAT

WATER LEVEL: 26.87
DATE: JULY, 1990
TIME:

BLOWS PER FOOT(N)	CGI(PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
			0	Christy Box			ASPHALT
			2				SILTY CLAY; moderately stiff, damp, light gray
			4	2" sch. 40 PVC Casing			
5,12,20			6		CL		SILTY CLAY; moderately stiff, damp, brown, some organic material
7,17,31			8				As above
8,23,45			10				As above
8,21,29			12				SILTY CLAY; brown, damp
11,17,28			14				As above, increasing sand
			16				
8,12,30	75		18				CLAYEY SILT; moderately stiff, damp
8,13,24	ND		20		ML		
			22	2" sch. 40 PVC .020 Slot			As above, softer, very moist
4,6,11	25		24				
			26		SC		CLAYEY SAND; very fine grained, saturated, moderately loose, tan
4,6,10			28				SILTY CLAY; w/ sand, saturated, moderately stiff, brown w/ gray motlling
15,20,34			30				

CONTINUED ON NEXT PAGE

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080 DATE DRILLED 5/17/90
CLIENT BP OIL COMPANY
LOCATION 2201 98TH AVENUE, OAKLAND, CA
LOGGED BY M. TAYLOR APPROVED BY

BORING NO.
WELL NO. AW-1

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION

DRILLING METHOD HOLLOW-STEM AUGER HOLE DIAM. 10 INCH
SAMPLER TYPE
CASING DATA SEE MONITORING WELL CONSTRUCTION DETAIL
DRILLER WEST HAZMAT

WATER LEVEL
DATE
TIME

BLOWS PER FOOT(N)	CGI(PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
11,23, 35			30		SC		CLAYEY SAND; very fine grained, very moist, moderately dense, tan to light brown
			32				
8,25, 33			34				As above, some coarse sand
			36	End Cap			BOREHOLE TERMINATED AT 35 FEET
			38				
			40				
			42				
			44				
			46				
			48				
			50				

Portland Cement
Sand #3 Lonestar
Bentonite Pellets
Sample
Driven interval

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080 DATE DRILLED 6/5/90
CLIENT BP OIL COMPANY
LOCATION 2201 98TH AVENUE, OAKLAND, CA
LOGGED BY M. TAYLOR APPROVED BY

BORING NO.
WELL NO. AW-2

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 97.69

DRILLING METHOD HOLLOW-STEM AUGER HOLE DIAM. 10 inch
SAMPLER TYPE SEE MONITORING WELL CONSTRUCTION DETAIL
CASING DATA
DRILLER WEST HAZMAT

WATER LEVEL: 24.88
DATE : JULY, 1990
TIME:

BLOWS PER FOOT(N)	CGI (PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
			0	Christy Box			Native soil
			2				SILTY CLAY; dark brown, damp, medium plasticity
			4	2" sch. 40 PVC Casing			
16, 20, 26			6				SILTY CLAY; brown, dry to damp, medium plasticity, hard
			8				
7, 7, 8			10				SILTY CLAY; w/ fine sand, reddish brown, damp, medium platicity, stiff
			12				
			14				
7, 10, 21			16		CL		SILTY CLAY; w/ slight gravels, brown, damp, high platicity, very stiff
			18				
			20				SILTY CLAY; brown, damp, low platicity, hard
9, 15, 23			22	2" sch. 40 PVC .020 Slot			
			24				▼ SILTY CLAY; sandy brown, moist, medium plasticity, very stiff
7, 10 20			26				
			28				
			30				

CONTINUED ON NEXT PAGE

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080 DATE DRILLED 6/5/90
CLIENT BP OIL COMPANY
LOCATION 2201 98TH AVENUE, OAKLAND, CA
LOGGED BY M. TAYLOR APPROVED BY _____

BORING NO.
WELL NO. AW-2

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION _____

DRILLING METHOD HOLLOW-STEM AUGER HOLE DIAM. 10 inch
SAMPLER TYPE SEE MONITORING WELL CONSTRUCTION DETAIL
CASING DATA _____
DRILLER WEST HAZMAT

WATER LEVEL
DATE
TIME

BLOWS PER FOOT(N)	CGI (PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
9, 17, 25			30		SC		SILTY SAND; brown, saturated, hard
			32				
17, 23 50/5			34	2" sch. 40 PVC .020 Slot	CL		SILTY CLAY; w/ fine sand, brown, dry to damp, low plasticity, hard
			36				
27, 39, 50/5			38				SILTY CLAY; brown, damp, low plasticity, hard
			40	End Cap			BOREHOLE TERMINATED AT 35 FEET
			42				
			44				
			46				
			48				
			50				

Portland Cement
Sand #3 Lonestar
Bentonite Pellets
Sample
Driven interval

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080 DATE DRILLED 6/6/90
CLIENT BP OIL COMPANY
LOCATION 2201 98TH AVENUE, OAKLAND, CA
LOGGED BY M. TAYLOR APPROVED BY

BORING NO.
WELL NO. AW-3

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 100.00

DRILLING METHOD HOLLOW-STEM AUGER HOLE DIAM. 10 inch
SAMPLER TYPE
CASING DATA SEE MONITORING WELL CONSTRUCTION DETAIL
DRILLER WEST HAZMAT

WATER LEVEL: 24.75
DATE : JULY, 1990
TIME:

BLOWS PER FOOT(N)	CGI(PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
			0	Christy Box			ASPHALT
9, 9, 12			2				
			4	2" sch. 40 PVC Casing			SILTY CLAY; brown, damp, medium plasticity
			6				
			8				
11, 15, 21			10				SILTY CLAY; brown, damp, low plasticity, very stiff
			12				
			14				
9, 17, 32			16		CL		SILTY CLAY; brown, damp, low to medium plasticity, hard
			18				
27, 50/5			20				SILTY CLAY; gravelly, medium size gravel, moist, hard
			22	2" sch. 40 PVC .020 Slot			
			24				
21, 29, 39			26				SILTY CLAY; gravelly, reddish brown, saturated, hard
			28				
			30				

CONTINUED ON NEXT PAGE

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080 DATE DRILLED 6/6/90
CLIENT BP OIL COMPANY
LOCATION 2201 98TH AVENUE, OAKLAND, CA
LOGGED BY M. TAYLOR APPROVED BY

BORING NO.
WELL NO. AW-3

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION

DRILLING METHOD HOLLOW-STEM AUGER HOLE DIAM. 10 inch
SAMPLER TYPE
CASING DATA SEE MONITORING WELL CONSTRUCTION DETAIL
DRILLER WEST HAZMAT

WATER LEVEL
DATE
TIME

BLOWS PER FOOT(N)	CGI(PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
21, 25, 37			30				SILTY CLAY; greyish brown, damp, medium plasticity, hard
			32		CL		
			34				SILTY CLAY; brown, damp, medium to high plasticity, "very tight"
21, 37, 41			36	End Cap			BOREHOLE TERMINATED AT 35 FEET.
			38				
			40				
			42				
			44				
			46				
			48				
			50				

Portland Cement
Sand #3 Lonestar
Bentonite Pellets
Sample
Driven interval

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080 DATE DRILLED 6/6/90
CLIENT BP OIL COMPANY
LOCATION 2201 98TH AVENUE, OAKLAND, CA
LOGGED BY M. TAYLOR APPROVED BY

BORING NO.
WELL NO. AW-4

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 99.96

DRILLING METHOD HOLLOW-STEM AUGER HOLE DIAM. 10 inch
SAMPLER TYPE
CASING DATA SEE MONITORING WELL CONSTRUCTION DETAIL
DRILLER WEST HAZMAT

WATER LEVEL: 27.29
DATE : JULY, 1990
TIME:

BLOWS PER FOOT(N)	CGI(PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
			0	Christy Box			ASPHALT
			2				
8, 12, 16			4	2" sch. 40 PVC Casing			CLAY w/ roots, dark brown, organic, damp, high plasticity
			6				SILTY clay w/ root fragments, greyish brown, damp, medium plasticitity, no odor,very stiff
			8				
23, 50/5			10				SILTY CLAY; brown, damp, medium plasticity,no odor, hard
			12				
			14				
28, 36, 41			16		CL		SILTY CLAY; brown, moist, medium to high plasticity, no odor, hard
			18				
9, 17, 32			20				SILTY CLAY; brown, moist, low to medium plasticity, gas odor, hard
			22	2" sch. 40 PVC .020 Slot			
			24				
11, 15, 22			26				SILTY CLAY; brown, moist, medium plasticity, gas odor, hard
			28				
			30				

CONTINUED ON NEXT PAGE

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080 DATE DRILLED 6/6/90
CLIENT BP OIL COMPANY
LOCATION 2201 98TH AVENUE, OAKLAND, CA
LOGGED BY M. TAYLOR APPROVED BY

BORING NO.
WELL NO. AW-4

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION

DRILLING METHOD HOLLOW-STEM AUGER HOLE DIAM. 10 inch
SAMPLER TYPE
CASING DATA SEE MONITORING WELL CONSTRUCTION DETAIL
DRILLER WEST HAZMAT

WATER LEVEL
DATE
TIME

BLOWS PER FOOT(N)	CGI(PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
15, 19, 23			30				SILTY CLAY; brown, moist, low plasticity, gas odor, hard
			32		CL		
6,23,31			34				SILTY CLAY; brown, damp, high platicity, no odor, hard
			36	End Cap			BOREHOLE TERMINATED AT 35 FEET
			38				
			40				
			42				
			44				
			46				
			48				
			50				

Portland Cement
Sand #3 Lonestar
Bentonite Pellets
sample
Driven interval

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080-01 DATE DRILLED 2-27-91
CLIENT BP Oil Company
LOCATION 2201 98th Ave, Oakland
LOGGED BY M. Taylor APPROVED BY M. Hopwood

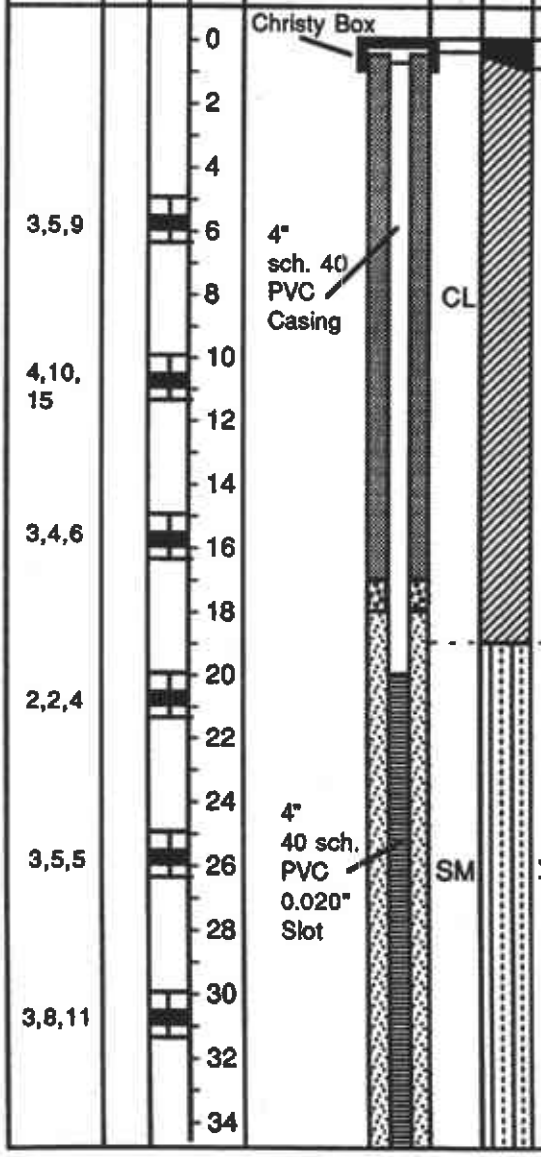
BORING NO. SBA-5
WELL NO. AW-5

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 39.35'

DRILLING METHOD Hollow stem auger HOLE DIAM. 10"
SAMPLER TYPE Modified split spoon
CASING DATA See well construction details
DRILLER Soils Exploration Services, Inc.

WATER LEVEL	26.00'	25.48'	
DATE	2/27/91	4/5/91	
TIME	2:00 pm	1:00 pm	



DESCRIPTION
1" Asphalt
SILTY CLAY: brown, damp, stiff, medium plasticity
Same, becomes very stiff
Same, becomes moist, stiff
SILTY SAND: black to brownish green, moist, firm, low plasticity
Same, becomes brownish green, wet, stiff
▽ 26'
Same, becomes very stiff, low to medium plasticity

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080-01 DATE DRILLED 2/27/91
CLIENT BP Oil Company
LOCATION 2201 98th Ave., Oakland
LOGGED BY M. Taylor APPROVED BY M. Hopwood

BORING NO. SBA-5
WELL NO. AW-5

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 39.35'

DRILLING METHOD Hollow stem auger HOLE DIAM. 10"
SAMPLER TYPE Modified split spoon
CASING DATA See well construction detail
DRILLER Soils Explorations Services, Inc.

WATER LEVEL	26.00'	25.48'	
DATE	2/27/91	4/5/91	
TIME	2:00 pm	1:00 pm	

BLOWS PER FOOT(N)	OVA (PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
4,7,12			36		SM		SILTY SAND: brown, wet, very stiff, medium plasticity
			38				
			40				
3,4,8			42		CL		SILTY CLAY: light brown, wet to moist, stiff, medium to high plasticity
			44				
4,7,9			46	End Cap			Same, becomes moist, very stiff
			48				BORING TERMINATED AT 46.5 FEET BELOW GRADE
			50				
			52				
			54				
			56				
			58				
			60				

Portland Cement
Sand #3 Lonestar
Bentonite Pellets
Sample
Driven Interval
Water level encountered during drilling

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080-01 DATE DRILLED 2-28-91
CLIENT BP Oil Company
LOCATION 2201 98th Ave, Oakland
LOGGED BY M. Taylor APPROVED BY M. Hopwood

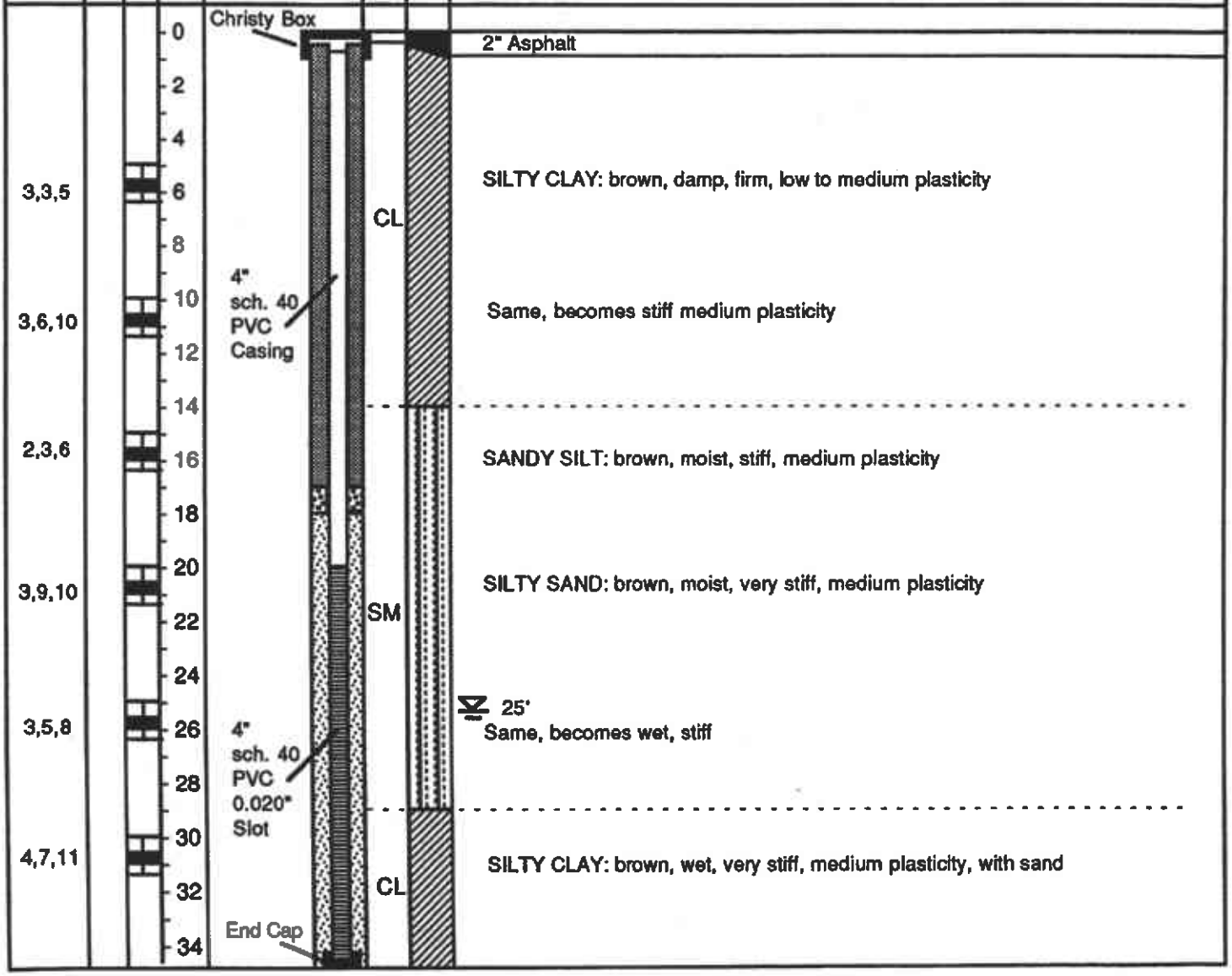
BORING NO. SBA-6
WELL NO. AW-6

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 37.95'

DRILLING METHOD Hollow stem auger HOLE DIAM. 10"
SAMPLER TYPE Modified split spoon
CASING DATA See well construction details
DRILLER Soils Exploration Services, Inc.

WATER LEVEL	25.00'	22.48'	
DATE	2/28/91	4/5/91	
TIME	10:00 am	1:10 pm	



ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080-01 DATE DRILLED 2/28/91
CLIENT BP Oil Company
LOCATION 2201 98th Ave., Oakland
LOGGED BY M. Taylor APPROVED BY M. Hopwood

BORING NO. SBA-6
WELL NO. AW-6

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 37.95'

DRILLING METHOD Hollow stem auger HOLE DIAM. 10"
SAMPLER TYPE Modified split spoon
CASING DATA See well construction detail
DRILLER Soils Explorations Services, Inc.

WATER LEVEL	25.00'	22.48'
DATE	2/28/91	4/5/91
TIME	10:00 am	1:10 pm

BLOWS PER FOOT(N)	CGI (PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
4,7,12			36		CL		SILTY CLAY: brown, wet, very stiff, medium plasticity, with some sand
							BORING TERMINATED AT 36.5 FEET BELOW GRADE
			38				
			40				
			42				
			44				
			46				
			48				
			50				
			52				
			54				
			56				
			58				
			60				

Portland Cement
Sand #3 Lonestar
Bentonite Pellets
Sample
Driven interval
Water level encountered during drilling

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080-01 DATE DRILLED 3-1-91
CLIENT BP Oil Company
LOCATION 2201 98th Ave, Oakland
LOGGED BY M. Taylor APPROVED BY M. Hopwood

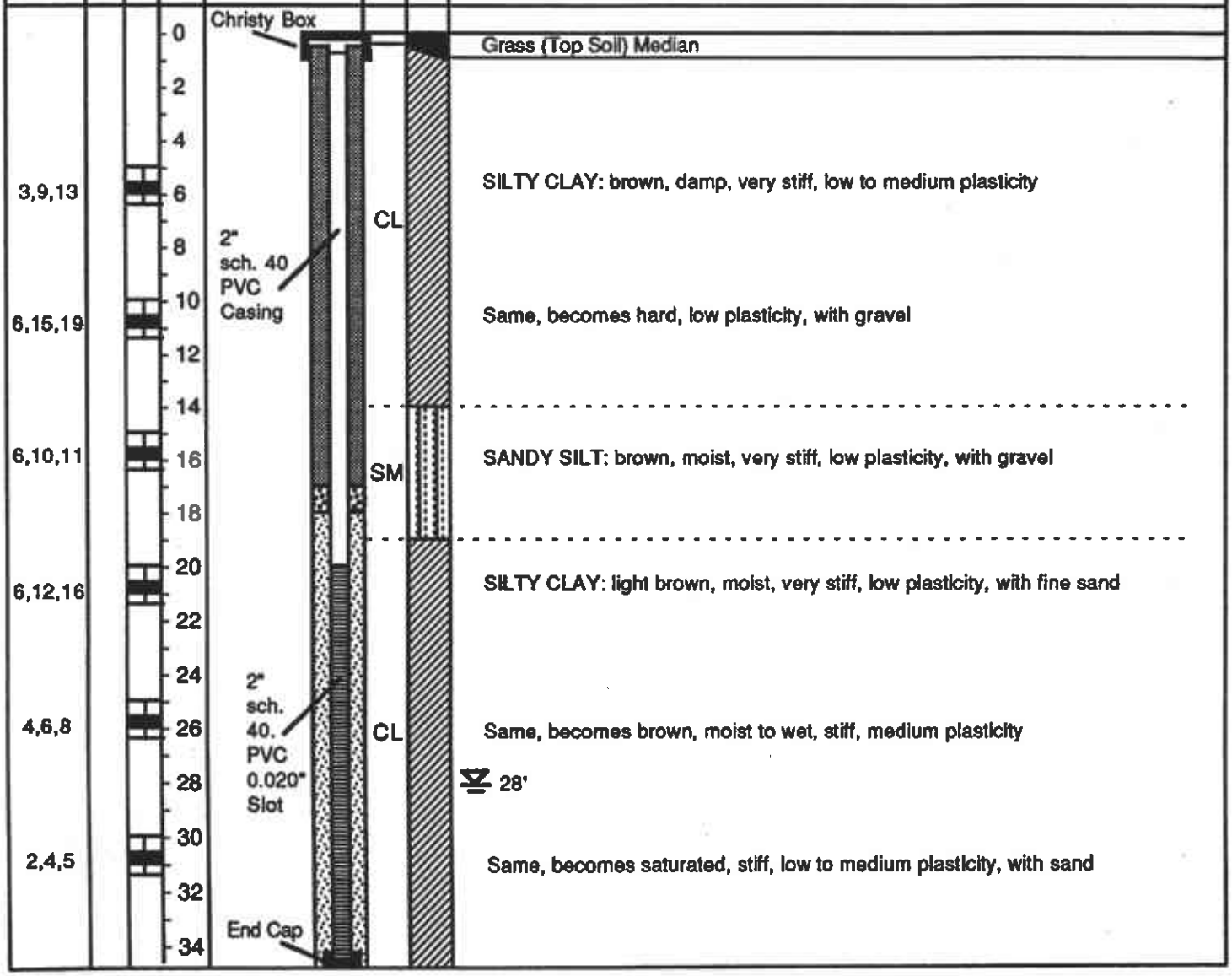
BORING NO. SBA-7
WELL NO. AW-7

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 38.17'

DRILLING METHOD Hollow stem auger HOLE DIAM. 8"
SAMPLER TYPE Modified split spoon
CASING DATA See well construction details
DRILLER Soils Exploration Services , Inc.

WATER LEVEL	28.00'	23.38'	
DATE	3/1/91	4/5/91	
TIME	11:00 am	1:20 pm	



ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080-01 DATE DRILLED 3/1/91
CLIENT BP Oil Company
LOCATION 2201 98th Ave., Oakland
LOGGED BY M. Taylor APPROVED BY M. Hopwood

BORING NO. SBA-7
WELL NO. AW-7

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 38.17'

DRILLING METHOD Hollow stem auger HOLE DIAM. 8"
SAMPLER TYPE Modified split spoon
CASING DATA See well construction detail
DRILLER Soils Explorations Services, Inc.

WATER LEVEL	28.00'	23.38'
DATE	3/1/91	4/5/91
TIME	11:00 am	1:20 pm

BLOWS PER FOOT(IN)	CGI (PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
2,4,6			36		CL		SILTY CLAY: brown, saturated, stiff, medium plasticity, with some sand
							BORING TERMINATED AT 36.5 FEET BELOW GRADE

38
40
42
44
46
48
50
52
54
56
58
60

Portland Cement
Sand #3 Lonestar
Bentonite Pellets
Sample
Driven interval
Water level encountered during drilling

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080-01 DATE DRILLED 2-28-91
CLIENT BP Oil Company
LOCATION 2201 98th Ave, Oakland
LOGGED BY M. Taylor APPROVED BY M. Hopwood

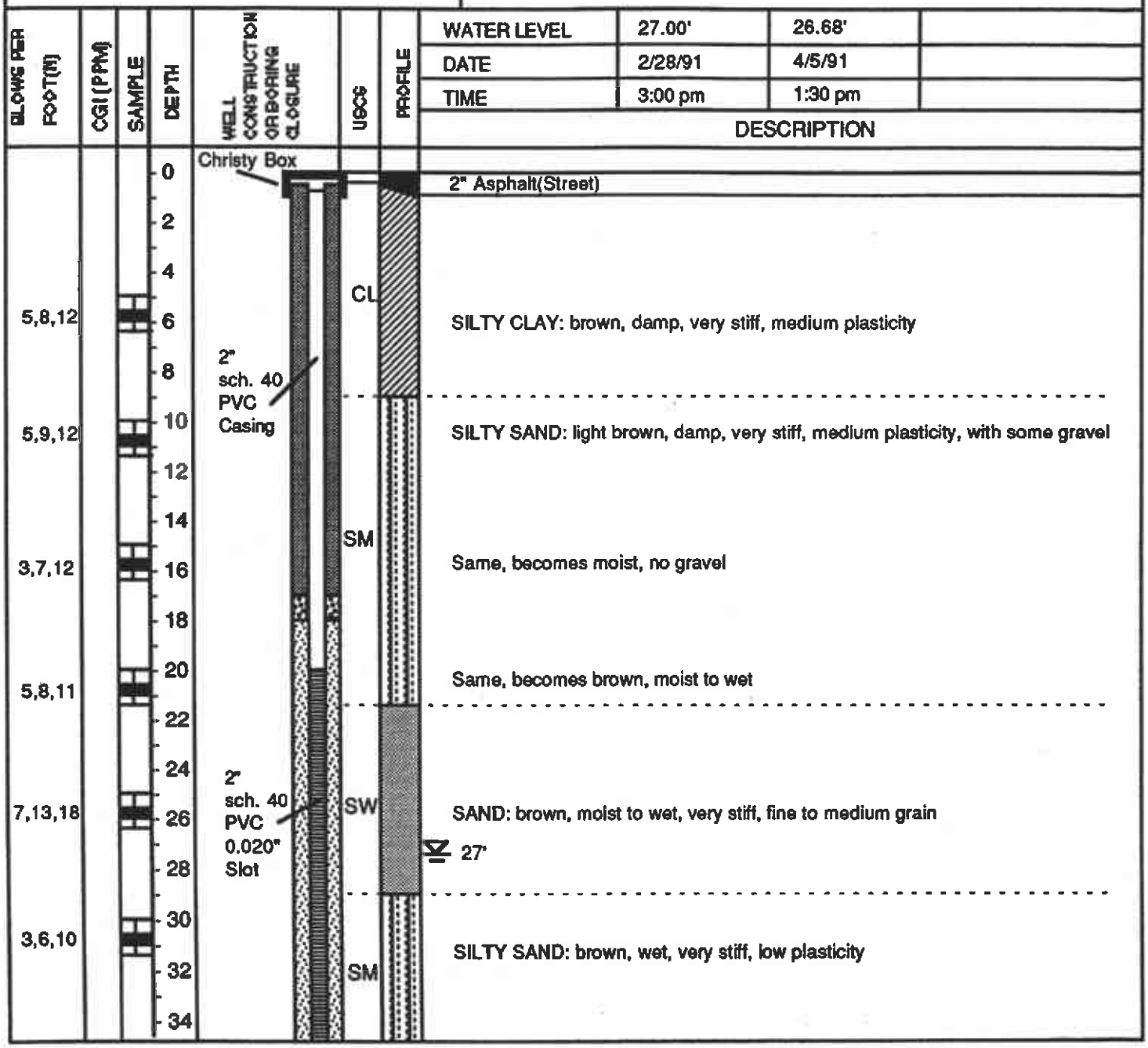
BORING NO. SBA-8
WELL NO. AW-8

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 41.74'

DRILLING METHOD Hollow stem auger HOLE DIAM. 8"
SAMPLER TYPE Modified split spoon
CASING DATA See well construction details
DRILLER Soils Exploration Services , Inc.

WATER LEVEL	27.00'	26.68'	
DATE	2/28/91	4/5/91	
TIME	3:00 pm	1:30 pm	



ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080-01 DATE DRILLED 2/28/91
CLIENT BP Oil Company
LOCATION 2201 98th Ave., Oakland
LOGGED BY M. Taylor APPROVED BY M. Hopwood

BORING NO. SBA-8
WELL NO. AW-8

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 41.74'

DRILLING METHOD Hollow stem auger HOLE DIAM. 8"
SAMPLER TYPE Modified split spoon
CASING DATA See well construction detail
DRILLER Soils Explorations Services, Inc.

WATER LEVEL	27.00'	26.68'	
DATE	2/28/91	4/5/91	
TIME	3:00 pm	1:30 pm	

BLOWS PER FOOT(N)	PID (PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
5,8,11			36				SILTY CLAY: brown, wet, very stiff, medium plasticity
			38		CL		
4,8,9			40	End Cap			Same, becomes saturated, low plasticity, with some fine sand
			42				BORING TERMINATED AT 41.5 FEET BELOW GRADE
			44				
			46				
			48				
			50				
			52				
			54				
			56				
			58				
			60				

Portland Cement
Sand #3 Lonestar
Bentonite Pellets
Sample
Driven interval
Water level encountered during drilling

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING AW-9

SEE SITE PLAN

ALISTO PROJECT NO: 10-025-12 DATE DRILLED: 12/03/98

CLIENT: BP Oil Company

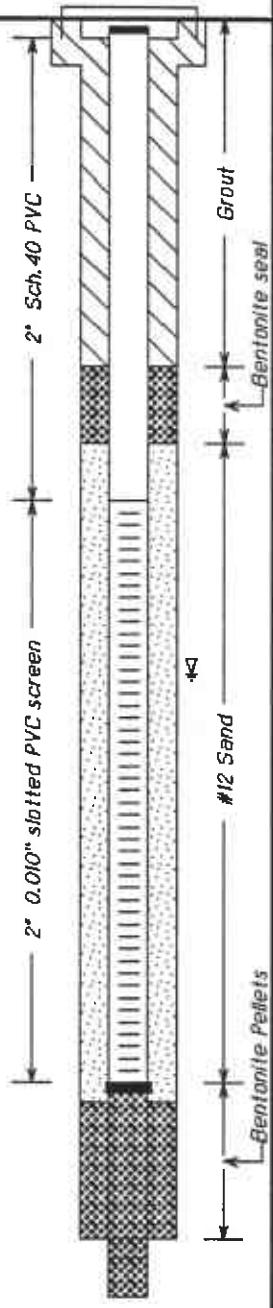
LOCATION: 2231 Warner Avenue, Oakland, California

DRILLING METHOD: Hollow-stem Auger (8")

DRILLING COMPANY: V & W Drilling Inc. CASING ELEVATION: 'MSL

LOGGED BY: Chris Reinheimer APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	DEPTH feet	SOIL CLASS	GEOLOGIC DESCRIPTION
			GC	4" asphalt; 8" concrete.
				Fill: Clayey to sandy GRAVEL; gray-green; damp.
17,20,21	0	5	ML	silty CLAY: medium red-brown, damp, medium-grained sand to 5%, root traces and organics to 5%, hard.
17,20,25	0	10		Same: damp to moist, sand <2%, organics <2%, hard.
20,21,23	0	15	SM	clayey to silty SAND: medium red-brown, moist to wet, sand med-coarse, gravel to 1.5 cm 10%, dense.
13,14,14	0	20		Same
17,11,21	0	25	GM GC	clayey to silty GRAVEL: medium red-brown, wet, gravel to 1.5 cm 80%, fines to 20%, medium to coarse grained sand to 20%, dense.
17,19,31	NM			Same, very dense.
18,18,28	NM	30	CL	CLAY: medium red-brown, wet, coarse-grained sand <5%, hard.
11,18,24	NM			Same
				Boring terminated at 33 feet. Stabilized water level measured on .



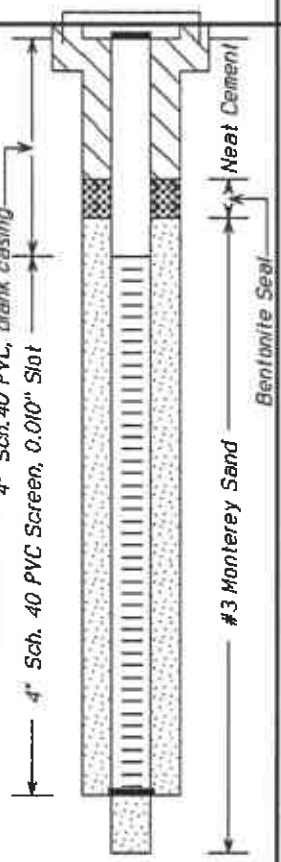
ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

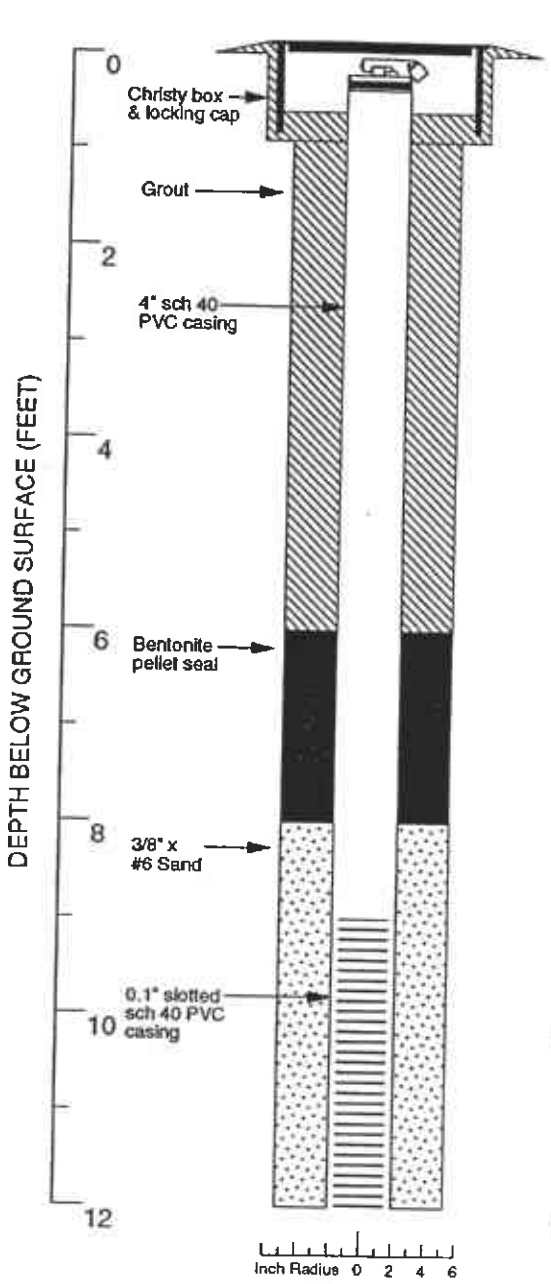
LOG OF BORING VEW-9

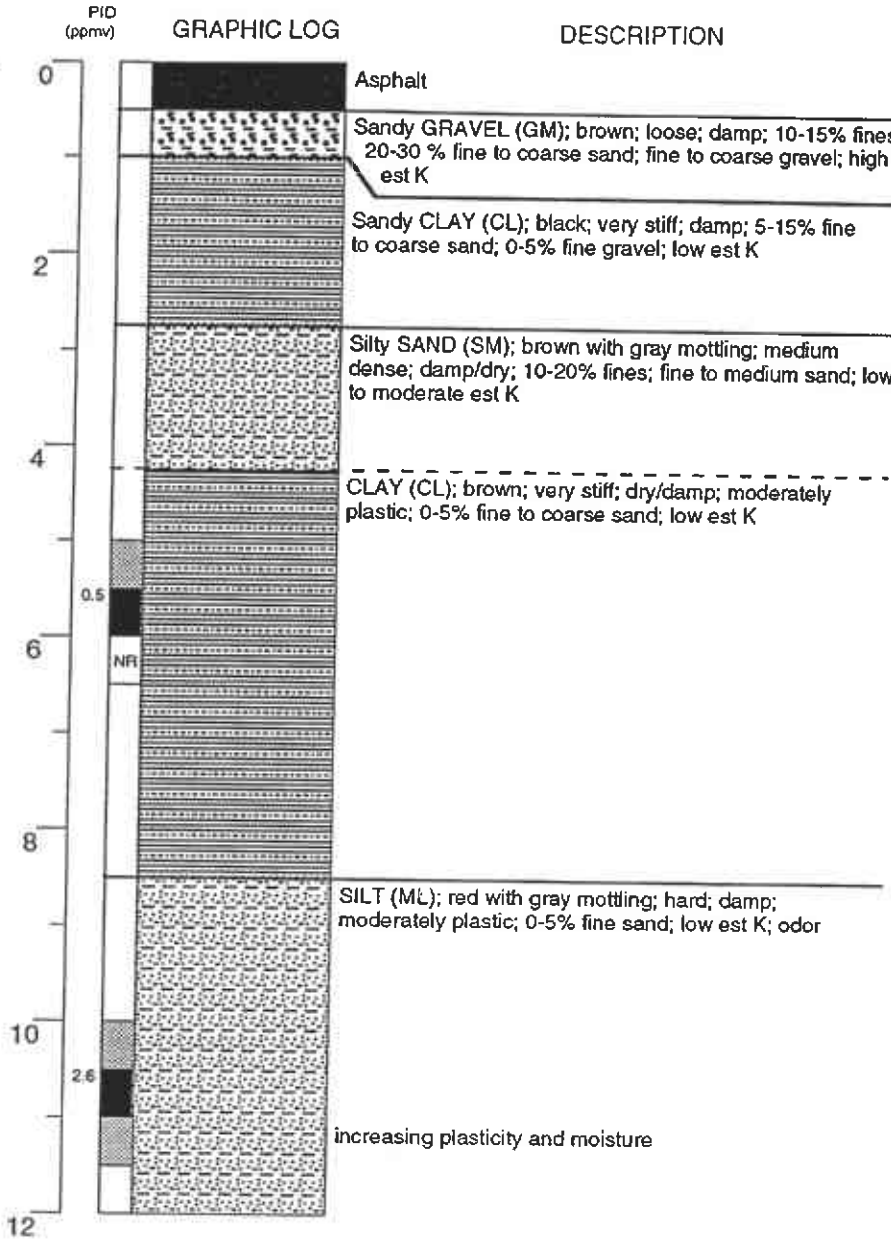
SEE SITE PLAN

ALISTO PROJECT NO: 10-025-06 DATE DRILLED: 05/09/96
CLIENT: BP Oil Company
LOCATION: 98th Avenue, Oakland, CA
DRILLING METHOD: Hollow-stem Auger (12")
DRILLING COMPANY: V&W Drilling Inc. CASING ELEVATION: N/A
LOGGED BY: Chris Reinhelmer APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	WELL DIAGRAN	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							6" asphalt
	3.2					ML	
4,5,9	0.8		5				clayey SILT: medium orange brown, damp, stiff; gravel to 1 centimeter to approximately 5%; organics to 2%.
7,11,18	0.2		10				Same: medium brown, very stiff.
5,12,21	4.3		15			CL	silty CLAY: orange tan, damp to moist, hard; organics < 2%.
4,8,11	NM		20			SC	clayey SAND: medium orange brown, wet, medium dense; fine-grained sand; Fe oxide to 5%; organics < 2%.
			25				
			30				







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Logged by:	Justin Power	Drilling Company:	Kvilhaug	Well Head Completion:	Christy box & locking cap
Project Mgr:	Keith Romstad	Drilling Method:	11" Hollow stem auger	Type of Sampler:	2.5" split barrel
Dates Drilled:	3/26/92	Driller:	Rod	TD (Total Depth):	16.6 ft.

EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

All symbols and definitions may not be applicable

- Contacts: Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational
- est K: Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR: No recovery

Boring Log and Well Completion Details
VW-1 (Boring B-9)

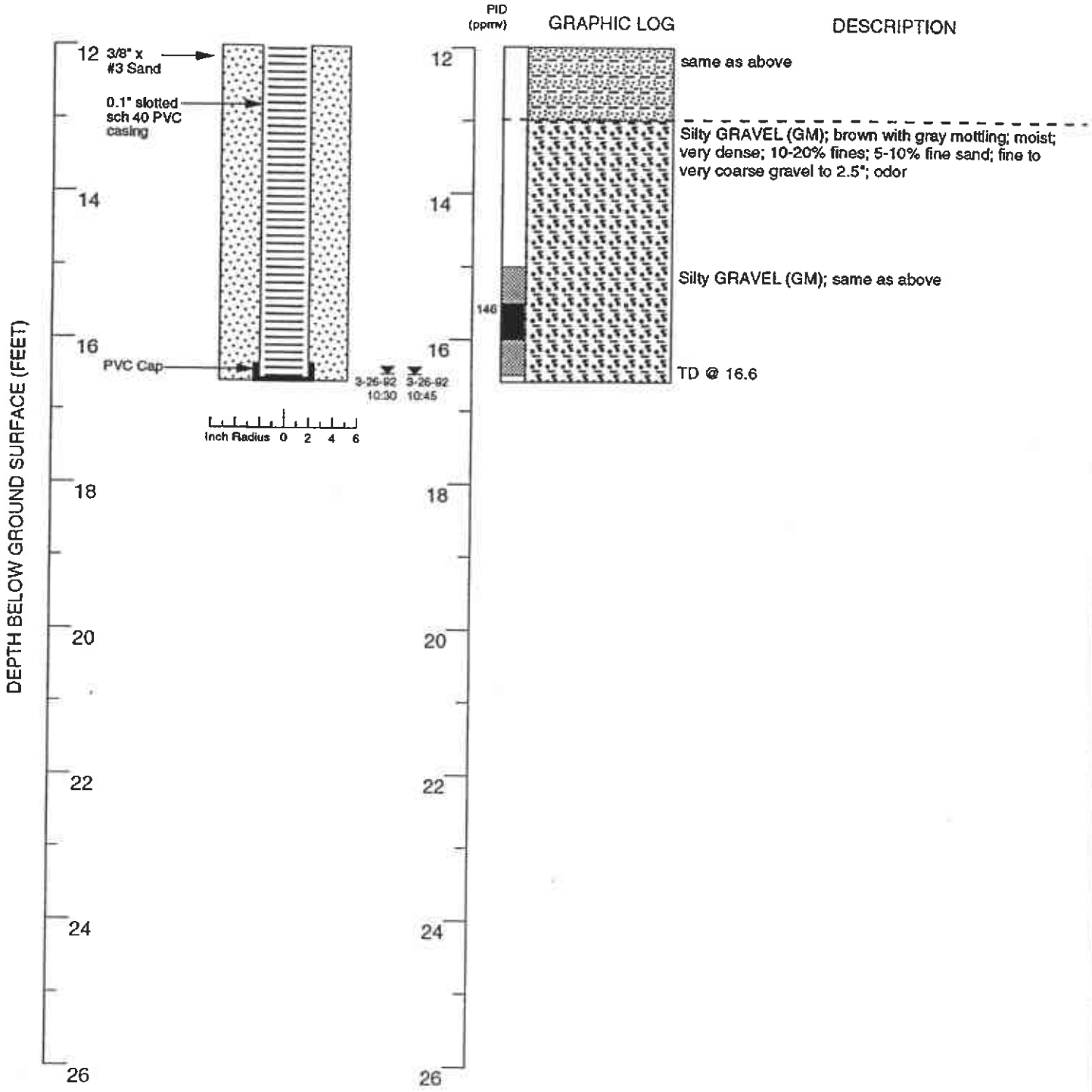
BP Service Station #11133
2220 98th Avenue
Oakland, California

VADOSE WELL

1

RESNA

32006.01



EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

All symbols and definitions may not be applicable

- Contacts: Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational
- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

Boring Log and Well Completion Details
VW-1 (Boring B-9)

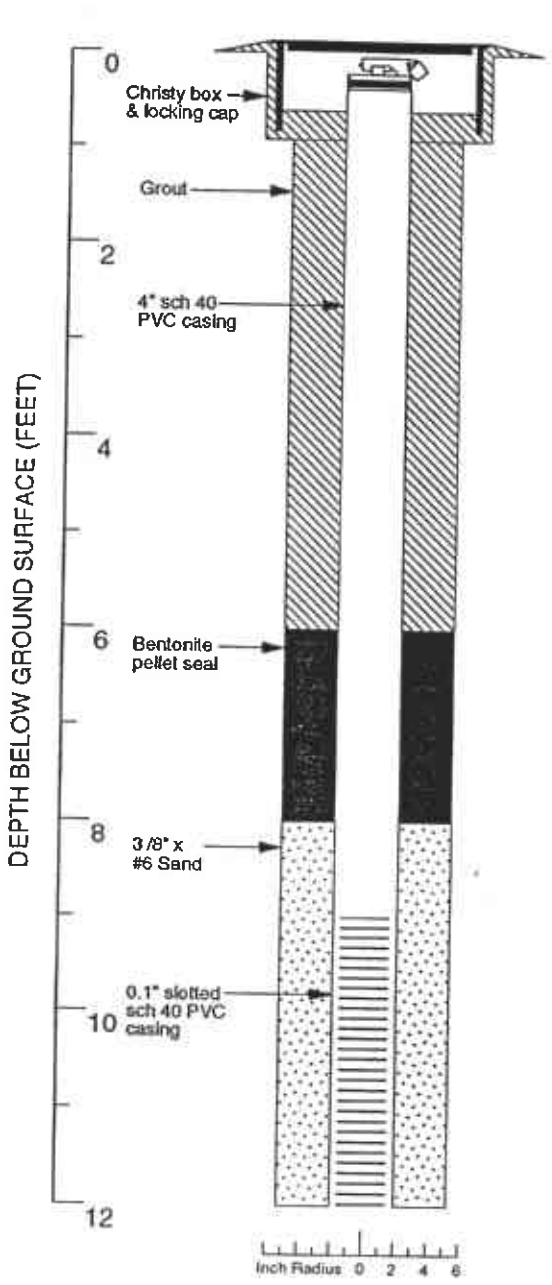
BP Service Station #11133
2220 98th Avenue
Oakland, California

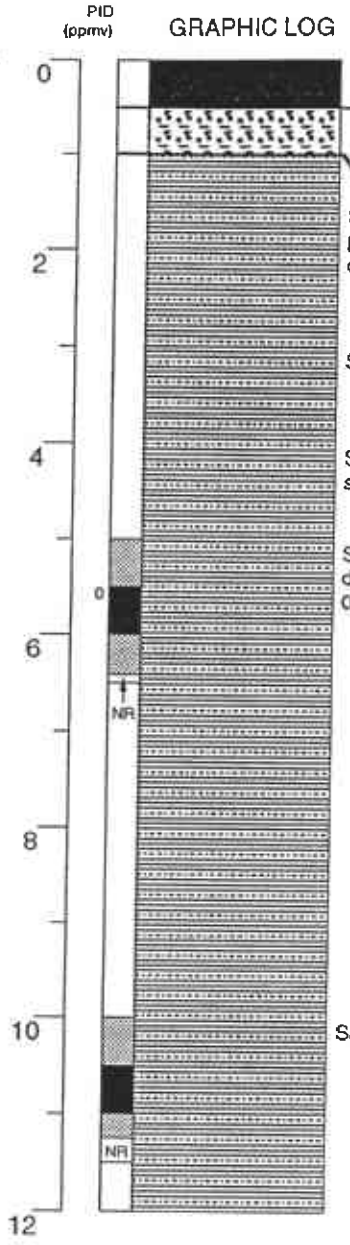
VADOSE WELL

1

RESNA

32006.01





DESCRIPTION

Asphalt

Sandy GRAVEL (GM); brown; medium dense; dry/damp; 5-15% fines; 25-30% fine to coarse sand; fine to coarse gravel; high est K

Sandy CLAY (CL); black; stiff; dry/damp; moderately plastic; 15-25% fine to coarse sand; 0-5% fine to coarse gravel; low est K

Same as above; brown (cuttings)

Same as above; brown with black mottling; medium stiff; very plastic (cuttings)

Sandy CLAY (CL); brown with black mottling; hard; dry/damp; slightly plastic; 5-15% fine to coarse sand; 0-5% fine to medium gravel; low est K

Same as above

Continues

Logged by:	Justin Power	Drilling Company:	Kvilhaug	Well Head Completion:	Christy box & locking cap
Project Mgr:	Keith Romstad	Drilling Method:	11" Hollow stem auger	Type of Sampler:	2.5" split barrel
Dates Drilled:	3/26/92	Driller:	Rod	TD (Total Depth):	16.5 ft.

EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

All symbols and definitions may not be applicable

Contacts:
- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary

NR — No recovery

Boring Log and Well Completion Details
VW-2 (Boring B-11)

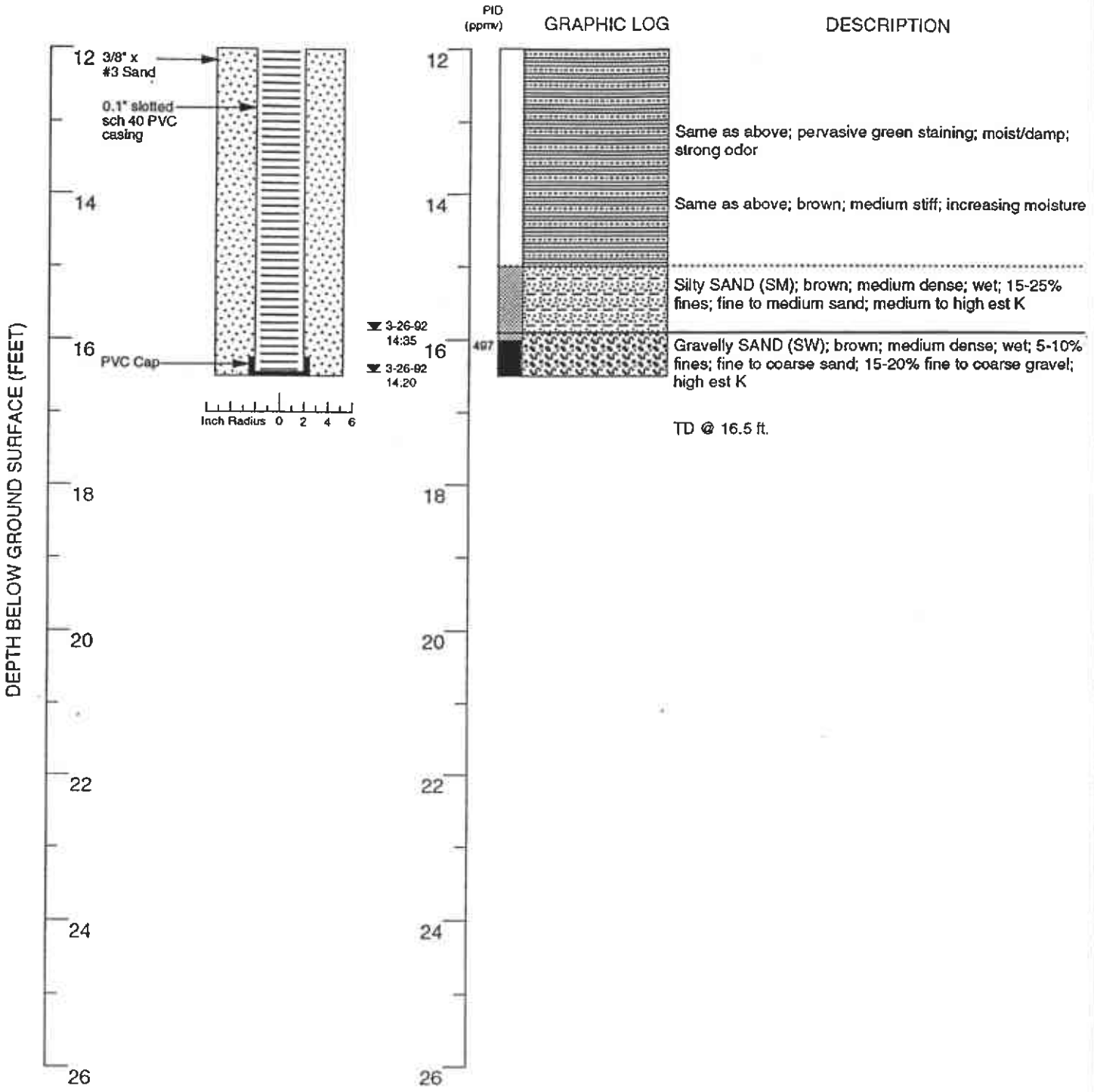
BP Service Station #11133
2220 98th Avenue
Oakland, California

VADOSE WELL

2

RESNA

32006.01



EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

All symbols and definitions may not be applicable

- Contacts: Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational
- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

Boring Log and Well Completion Details
VW-2 (Boring B-11)

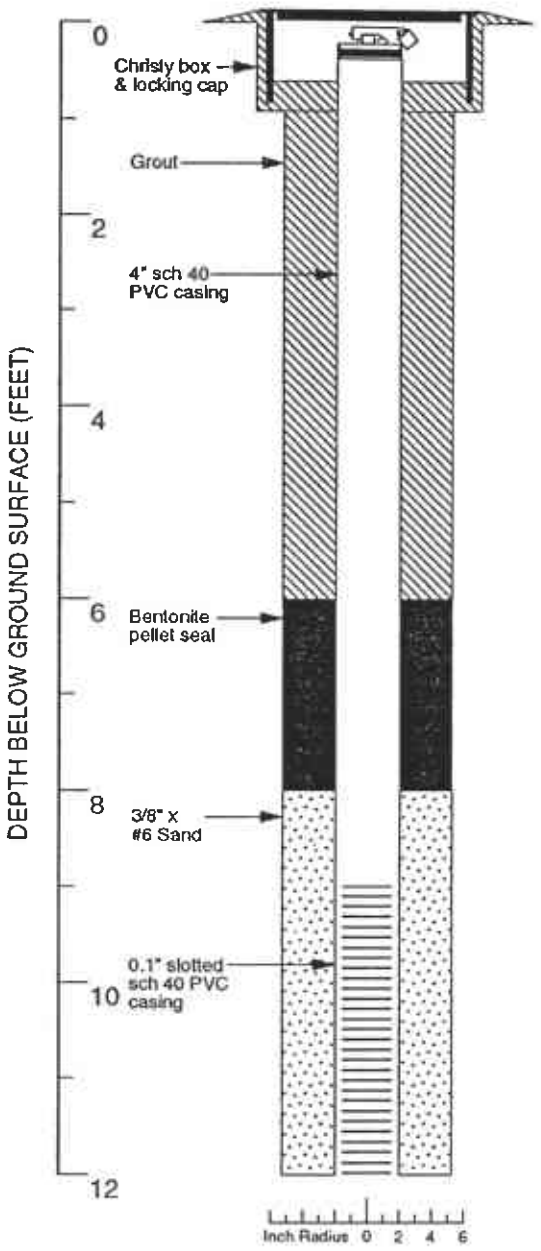
BP Service Station #11133
2220 98th Avenue
Oakland, California

VADOSE WELL

2

RESNA

32006.01



PID (ppmv)	GRAPHIC LOG	DESCRIPTION
0		Asphalt
		Sandy GRAVEL (GM); brown; loose; damp; 10-15% fines; 20-25 % fine to coarse sand; fine to coarse gravel; high est K
2		Sandy CLAY (CL); brown with black mottling; very stiff; dry/damp; slightly plastic; 5-15% fine to coarse sand; 0-5% fine gravel; low est K
4		Sandy SILT (ML); brown with local gray mottling; medium stiff; damp; 10-40% fine to coarse sand; 0-5% fine gravel; low to moderate est K
4.7		Sandy CLAY (CL); brown; very stiff; damp; slightly plastic; 5-10% fine sand; 0-5% fine gravel; low est K
6		
8		
10		Sandy CLAY (CL); brown; hard; damp; slightly plastic; 10-25% fine to coarse sand; low est K
3.1		
12		

Continues

Logged by:	Justin Power	Drilling Company:	Kvilhaug	Well Head Completion:	Christy box & locking cap
Project Mgr:	Keith Romstad	Drilling Method:	11" Hollow stem auger	Type of Sampler:	2.5" split barrel
Dates Drilled:	3/26/92	Driller:	Rod	TD (Total Depth):	16.5 ft.

EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

All symbols and definitions may not be applicable

Contacts:
- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

- est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary
- NR — No recovery

Boring Log and Well Completion Details
VW-3 (Boring B-10)

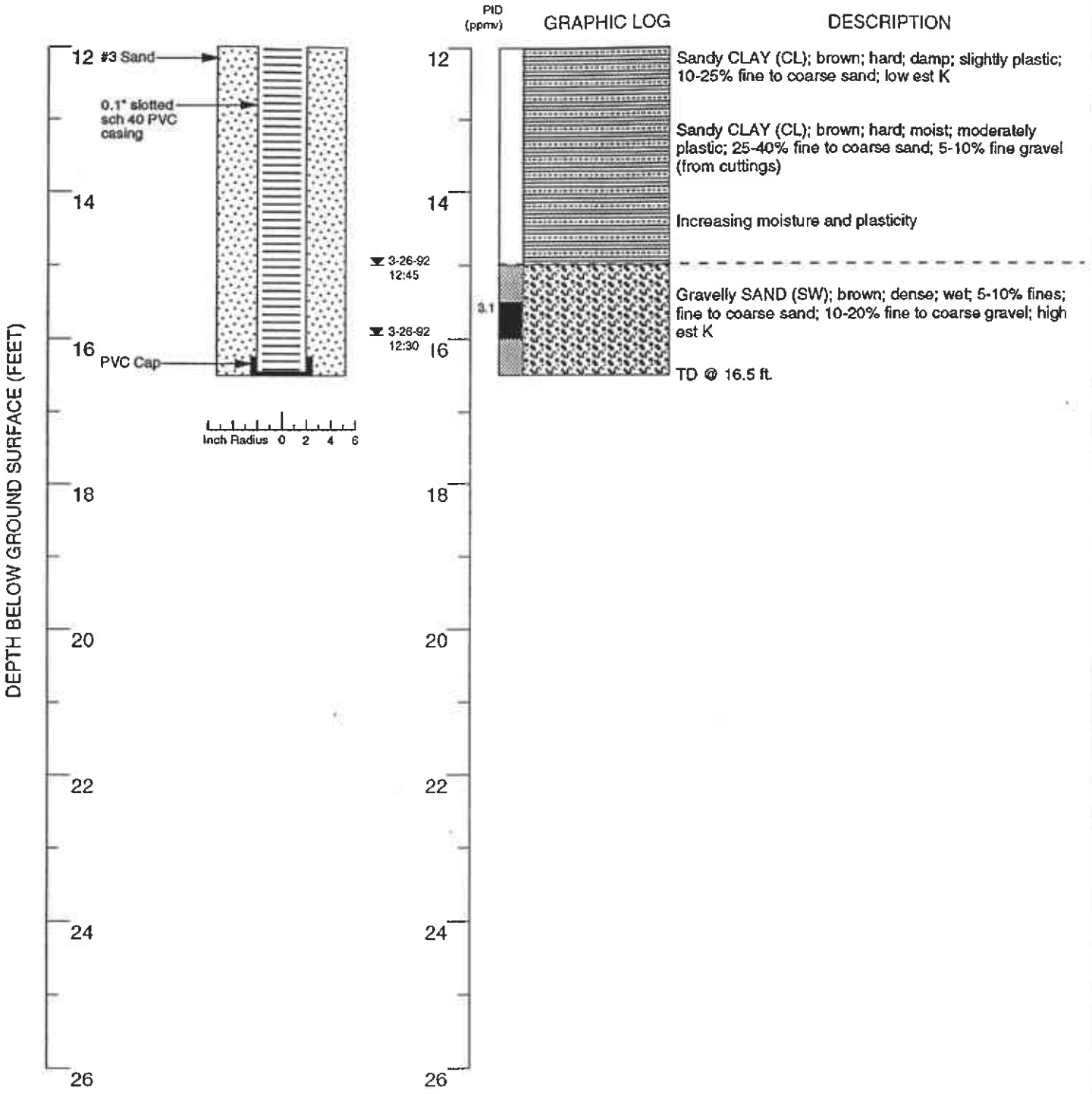
BP Service Station #11133
2220 98th Avenue
Oakland, California

VADOSE WELL

3

RESNA

32006.01



EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered drill sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample

All symbols and definitions may not be applicable

Contacts:
- Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational

est K — Estimated permeability (hydraulic conductivity) 1K = primary 2K = secondary

NR — No recovery

Boring Log and Well Completion Details
VW-3 (Boring B-10)

BP Service Station #11133
2220 98th Avenue
Oakland, California

VADOSE WELL

3

RESNA

32006.01

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080 DATE DRILLED 6/5/90
CLIENT BP OIL COMPANY
LOCATION 2201 98TH AVENUE, OAKLAND, CA
LOGGED BY M. TAYLOR APPROVED BY

BORING NO.
WELL NO. RW-1

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION 98.60

DRILLING METHOD HOLLOW-STEM AUGER HOLE DIAM. 10 inch
SAMPLER TYPE
CASING DATA SEE MONITORING WELL CONSTRUCTION DETAIL
DRILLER WEST HAZMAT

WATER LEVEL: 27.93
DATE : JULY, 1990
TIME:

BLOWS PER FOOT(N)	CGI (PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
			0	Christy Box			ASPHALT
			2				
			4	6" sch. 40 PVC Casing	CL		
4,6,11	ND		6				SILTY CLAY; w/ sand, damp, moderately stiff, tan w/ grey mottling
			8				
11, 23, 31	ND		10		ML		CLAYEY SILT; w/ slight sand, damp, moderately stiff,tan
			12				
			14				
7,11, 24	ND		16				As above, sand grains larger
			18	6" sch. 40 PVC .020 Slot			
7,16, 21	ND		20		SC		CLAYEY SAND; moderately dense, very moist, fine grained
			22				
			24				As above, less clayey , i.e., sand w/ slight clay
7, 11, 25	>500		26				
			28		SC		SANDY CLAY; stiff, damp tan to light brown, sand clasts to 3 mm, some dark organic matter
7, 13, 29			30				

CONTINUED ON NEXT PAGE

ALTON GEOSCIENCE, Inc.
LOG OF EXPLORATORY BORING

PROJECT NO. 30-080 DATE DRILLED 6/5/90
CLIENT BP OIL COMPANY
LOCATION 2201 98TH AVENUE, OAKLAND, CA
LOGGED BY M. TAYLOR APPROVED BY _____

BORING NO.
WELL NO. RW-1

FIELD SKETCH OF BORING LOCATION

TOP OF CASING ELEVATION _____

DRILLING METHOD HOLLOW-STEM AUGER HOLE DIAM. 10 INCH
SAMPLER TYPE _____
CASING DATA SEE MONITORING WELL CONSTRUCTION DETAIL
DRILLER WEST HAZMAT

WATER LEVEL
DATE
TIME

BLOWS PER FOOT(N)	CGI (PPM)	SAMPLE	DEPTH	WELL CONSTRUCTION OR BORING CLOSURE	USCS	PROFILE	DESCRIPTION
7, 13, 29			30				
			32				
			34	6" sch. 40 PVC .020 Slot			
7, 11, 23			36		CL		As above, more sand, strong TPH odor
			38				
			40				As above, some coarse sand
5, 11, 26				End Cap			
			42				BOREHOLE TERMINATED AT 40 FEET
			44				
			46				
			48				
			50				

Portland Cement
Sand #3 Lonestar
Bentonite Pellets
Sample
Driven interval

Cambria Environmental Technology, Inc.
1144 - 65th St.
Oakland, CA 94608
Telephone: (510) 420-0700
Fax: (510) 420-9170

BORING/WELL LOG

CLIENT NAME	BP Oil Company	**BORING/WELL NAME**	B-1
JOB/SITE NAME	BP-11133	**DRILLING STARTED**	22-Oct-01
LOCATION	2220 98th Avenue, Oakland, California	**DRILLING COMPLETED**	23-Oct-01
PROJECT NUMBER	852-1692	**WELL DEVELOPMENT DATE (YIELD)**	22-Oct-01 (0.87 gal purge volume)
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	2"	**SCREENED INTERVAL**	18 to 28 ft bgs
LOGGED BY	S. Dwight	**DEPTH TO WATER (First Encountered)**	19.5 ft (22-Oct-01)
REVIEWED BY	K. Rahman, RG	**DEPTH TO WATER (Static)**	18.5 ft (22-Oct-01)
REMARKS	Hand augered to 5 feet. Located on southern property boundary adjacent to apartment complex.		

PID (ppm)	Vapor THC (ppmv)	Soil TPHg (ppm)	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	BORING BACKFILL
						ML		SILT (ML); brown; dry; 90% silt, 10% fine grained sand; no plasticity; moderate to high estimated permeability.		
0.4	6.6	0.49	B-1-4 .5 B-1-V 1		5			@4': very stiff; 10% clay, 85% silt, 5% fine grained sand; low plasticity; low estimated permeability.	8.0	3/4" diam., Schedule 40 PVC
						ML		SANDY SILT (ML); brown; dry; medium stiff; 5% clay, 80% silt, 15% fine grained sand; no plasticity; low to moderate estimated permeability.	10.0	Open Borehole
0.4	9.9		B-1-9 .5 B-1-V 2		10	ML		SILT (ML); brown; dry; very stiff; 10% clay, 85% silt, 5% fine grained sand; no plasticity; low estimated permeability; some roots.	12.0	
0.4		<0.050	B-1-1 3.5			ML		CLAYEY SILT (ML); brown; dry; soft; 15% clay, 75% silt, 10% fine grained sand; low to medium plasticity; low to moderate estimated permeability.		
	1.8		B-1-V 3		15				17.0	
0.4						ML		SANDY SILT (ML); brown; damp; 15% clay, 65% silt, 20% fine grained sand; low to medium plasticity; low to moderate estimated permeability.	19.0	
			B-1-1 9.5		20	SM		SILTY SAND (SM); brown; wet; 20% silt, 60% fine to coarse grained sand, 20% fine gravel; no plasticity; high estimated permeability.		Monterey Sand #2/12
			B-1-2 3.5		25	SP		GRAVELLY SAND (SP); brown; wet; 15% silt, 45% medium to coarse grained sand, 40% fine gravel; no plasticity; high estimated permeability.	23.0	3/4"-diam., 0.010" Slotted Schedule 40 PVC
								Total depth = 28'. Temporary well casing installed. Well purged and grab water sample collected using baller. Casing removed and sealed with grout after sampling.	28.0	Bottom of Boring @ 28 ft

WELL LOG (PID/VP/SOIL) H:\BRITIS-1\11133--1\BP-11133.GPJ DEFAULT.GDT 2/19/02

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BORING/WELL LOG

CLIENT NAME	BP Oil Company	**BORING/WELL NAME**	B-2
JOB/SITE NAME	BP-11133	**DRILLING STARTED**	22-Oct-01
LOCATION	2220 98th Avenue, Oakland, California	**DRILLING COMPLETED**	23-Oct-01
PROJECT NUMBER	852-1692	**WELL DEVELOPMENT DATE (YIELD)**	22-Oct-01 (0.93 gal purge volume)
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	2"	**SCREENED INTERVAL**	18 to 28 ft bgs
LOGGED BY	S. Dwight	**DEPTH TO WATER (First Encountered)**	18.0 ft (22-Oct-01)
REVIEWED BY	K. Rahman, RG	**DEPTH TO WATER (Static)**	18.0 ft (22-Oct-01)
REMARKS	Hand augered to 5 feet. Located on southern property boundary adjacent to apartment complex.		

PID (ppm)	Vapor THC (ppmv)	Soil TPHg (ppm)	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	BORING BACKFILL
						ML		SANDY SILT (ML); dark brown; dry; 5% clay, 80% silt, 15% fine grained sand; no plasticity; low estimated permeability.	4.0	
7.0	2.4	1.6	B-2-V 1, B-2-5		5	ML		SILT (ML); brown; dry; very stiff; 5% clay, 85% silt, 10% fine grained sand; no plasticity; low estimated permeability.	8.0	3/4" diam., Schedule 40 PVC
			B-2-9 .5			ML		SANDY SILT (ML); dark brown; dry; 5% clay, 80% silt, 15% fine grained sand; no plasticity; low to moderate estimated permeability, some roots.	10.0	Open Borehole
20	11		B-2-V 2		10	ML		SILT (ML); brown; dry; very stiff; 5% clay, 85% silt, 10% fine grained sand; no plasticity; low estimated permeability.	12.0	
6.0		<0.050	B-2-1 3.5			ML		SANDY SILT (ML); brown; dry; medium stiff; 10% clay, 70% silt, 20% fine grained sand; no plasticity; low estimated permeability.		
	4.5		B-2-V 3		15	ML		@16': damp; 15% clay, 60% silt, 25% fine grained sand; low to medium plasticity; low to moderate estimated permeability.	18.0	
						SP		GRAVELLY SAND (SP); brown; wet; 10% silt, 50% medium to coarse grained sand; 40% fine to coarse gravel; no plasticity; high estimated permeability.	19.0	
						SM		SILTY SAND (SM); brown; wet; 15% silt, 85% fine grained sand; no plasticity; high estimated permeability.	20.0	
6.0			B-2-1 9.5		20	ML		SANDY SILT (ML); brown; wet; 15% clay, 60% silt, 25% fine grained sand; low to medium plasticity; moderate estimated permeability.	21.0	Monterey Sand #2/12
						SM		SILTY SAND (SM); brown; wet; 15% silt, 85% fine grained sand; no plasticity; high estimated permeability.	22.0	
			B-2-2 3.5			SP		GRAVELLY SAND (SP); brown; wet; 10% silt, 50% medium to coarse grained sand; 40% fine to coarse gravel; no plasticity; high estimated permeability.	24.0	3/4"-diam., 0.010" Slotted Schedule 40 PVC
5.0					25	SM		SILTY SAND (SM); brown; wet; 15% silt, 85% fine grained sand; no plasticity; high estimated permeability.	25.0	
						SP		GRAVELLY SAND (SP); brown; wet; 10% silt, 50% medium to coarse grained sand; 40% fine to coarse gravel; no plasticity; high estimated permeability.	27.0	
			B-2-2 7.5			ML		CLAYEY SILT (ML); brown; damp; 15% clay, 75% silt, 10% fine grained sand; low to medium plasticity; low to moderate estimated permeability.	28.0	Bottom of Boring @ 28 ft
								Total depth = 28'. Temporary well casing installed. Well purged and grab water sample collected using bailer. Casing removed and sealed with grout after sampling.		

WELL LOG (PID/VP/SOIL) H:\BRITIS~1\11133~1\BP-11133.GPJ DEFAULT.GDT 2/19/02

Cambria Environmental Technology, Inc.
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Oakland, CA 94608
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BORING/WELL LOG

CLIENT NAME	BP Oil Company	**BORING/WELL NAME**	B-3
JOB/SITE NAME	BP-11133	**DRILLING STARTED**	22-Oct-01
LOCATION	2220 98th Avenue, Oakland, California	**DRILLING COMPLETED**	23-Oct-01
PROJECT NUMBER	852-1692	**WELL DEVELOPMENT DATE (YIELD)**	22-Oct-01 (0.58 gal purge volume)
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	2"	**SCREENED INTERVAL**	20 to 30 ft bgs
LOGGED BY	S. Dwight	**DEPTH TO WATER (First Encountered)**	21.0 ft (22-Oct-01)
REVIEWED BY	K. Rahman, RG	**DEPTH TO WATER (Static)**	21.0 ft (22-Oct-01)

REMARKS Hand augered to 5 feet. Located on southern property boundary adjacent to apartment complex.

PID (ppm)	Vapor THC (ppmv)	Soil TPHg (ppm)	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	BORING BACKFILL
						ML		SANDY SILT (ML); brown; dry; 70% silt, 30% fine to coarse grained sand; no plasticity; high estimated permeability.	4.0	
6.0	7.0	<0.050	B-3-4 .5 B-3-V 1		5	ML		SILT (ML); brown; dry; very stiff; 5% clay, 85% silt, 10% fine grained sand; no plasticity; low estimated permeability.		3/4" diam., Schedule 40 PVC
4.0	2.2		B-3-9 .5 B-3-V 2		10				12.0	Open Borehole
5.0		<0.050	B-3-1 3.5			ML		SANDY SILT (ML); brown; dry; stiff; 10% clay, 75% silt, 15% fine grained sand; low plasticity; low estimated permeability.	15.0	
	1.6		B-3-V 3		15	ML		SILT (ML); brown; dry; 10% clay, 80% silt, 10% fine grained sand; low plasticity; low estimated permeability.	17.0	
4.0			B-3-1 9.5		20	ML		SANDY SILT (ML); brown; damp; 15% clay, 65% silt, 20% fine grained sand; low to medium plasticity; low estimated permeability.	21.0	
						SM		SILTY SAND (SM); brown; wet; 25% silt, 75% fine grained sand; no plasticity; high estimated permeability.	23.0	Monterey Sand #2/12
3.0			B-3-2 3.5			ML		CLAYEY SILT (ML); brown; damp; stiff; 20% clay, 75% silt, 5% fine grained sand; medium plasticity; low to moderate estimated permeability.	25.0	
					25	SM		SILTY SAND (SM); brown; wet; 25% silt, 75% fine grained sand; no plasticity; high estimated permeability.	26.0	3/4"-diam., 0.010" Slotted Schedule 40 PVC
3.0			B-3-2 7.5			ML		CLAYEY SILT (ML); brown; wet; 20% clay, 70% silt, 5% fine grained sand, 5% fine gravel; medium plasticity; low to moderate estimated permeability. @27': 30% clay, 65% silt, 5% fine grained sand.	30.0	
					30			Total depth = 30'. Temporary well casing installed. Well purged and grab water sample collected using baller. Casing removed and sealed with grout after sampling.		Bottom of Boring @ 30 ft

WELL LOG (PID/VP/SOIL) H:\BP\TIS-1\11133--1\BP-11133.GPJ DEFAULT.GDT 2/19/02

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BORING/WELL LOG

CLIENT NAME	BP Oil Company	**BORING/WELL NAME**	B-4
JOB/SITE NAME	BP-11133	**DRILLING STARTED**	22-Oct-01
LOCATION	2220 98th Avenue, Oakland, California	**DRILLING COMPLETED**	23-Oct-01
PROJECT NUMBER	852-1692	**WELL DEVELOPMENT DATE (YIELD)**	23-Oct-01 (0.66 gal purge volume)
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	2"	**SCREENED INTERVAL**	18 to 28 ft bgs
LOGGED BY	S. Dwight	**DEPTH TO WATER (First Encountered)**	21.0 ft (22-Oct-01)
REVIEWED BY	K. Rahman, RG	**DEPTH TO WATER (Static)**	21.0 ft (23-Oct-01)

REMARKS Hand augered to 5 feet. Located on eastern property boundary adjacent to single story residence.

PID (ppm)	Vapor THC (ppmv)	Soil TPHg (ppm)	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	BORING BACKFILL
						ML		SANDY SILT (ML); brown; dry; 75% silt, 25% fine grained sand; no plasticity; moderate estimated permeability.	4.0	
4.0	1.3	<0.050	B-4-4 .5 B-4-V 1		5	ML		SILT (ML); brown; dry; very stiff; 5% clay, 85% silt, 10% fine grained sand; no plasticity; low estimated permeability.		3/4" diam., Schedule 40 PVC Open Borehole
5.0	1.3		B-4-9.5 B-4-V 2		10			@10': 10% clay, 80% silt; low plasticity.	12.0	
5.0		<0.050 <0.050	DUP B-4-1 3.5			ML		SANDY SILT (ML); brown; dry; medium stiff; 5% clay, 80% silt, 15% fine grained sand; no plasticity; low estimated permeability.		
	2.1		B-4-V 3		15				16.0	
						ML		SILT (ML); brown; dry; 5% clay, 85% silt, 10% fine grained sand; low plasticity; low estimated permeability.		
3.0		<0.050	B-4-1 9.5		20				20.0	Monterey Sand #2/12
						ML		CLAYEY SILT (ML); brown; damp; 15% clay, 75% silt, 10% fine grained sand; low to medium plasticity; low to moderate estimated permeability.	21.0	
1162								SILTY SAND (SM); brown with grey; wet; 15% silt, 55% medium to coarse grained sand, 30% fine gravel; no plasticity; high estimated permeability.		3/4"-diam., 0.010" Slotted Schedule 40 PVC
			B-4-2 3.5			SM		@23': 25% silt, 75% fine grained sand. @24': 45% medium to coarse grained sand, 30% fine gravel.		
1730					25			@25': 25% silt, 75% fine grained sand.	26.0	
						ML		CLAYEY SILT (ML); brown; damp; 15% clay, 75% silt, 10% fine grained sand; low to medium plasticity; low to moderate estimated permeability.	28.0	Bottom of Boring @ 28 ft
			B-4-2 7.5					Total depth = 28'.		

Temporary well casing installed. Well purged and grab water sample collected using bailer. Casing removed and sealed with grout after sampling.

WELL LOG (PID/VP/SOIL) H:\BRITS--1111133--1BP-11133.GPJ DEFAULT.GDT 2/19/02

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BORING/WELL LOG

CLIENT NAME	BP Oil Company	**BORING/WELL NAME**	B-5
JOB/SITE NAME	BP-11133	**DRILLING STARTED**	23-Oct-01
LOCATION	2220 98th Avenue, Oakland, California	**DRILLING COMPLETED**	23-Oct-01
PROJECT NUMBER	852-1692	**WELL DEVELOPMENT DATE (YIELD)**	23-Oct-01 (0.44 gal purge volume)
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	2"	**SCREENED INTERVAL**	15 to 25 ft bgs
LOGGED BY	S. Dwight	**DEPTH TO WATER (First Encountered)**	24.0 ft (23-Oct-01)
REVIEWED BY	K. Rahman, RG	**DEPTH TO WATER (Static)**	18.0 ft (23-Oct-01)

REMARKS Hand augered to 5 feet. Located on eastern property boundary adjacent to single story residence.

PID (ppm)	Vapor THC (ppmv)	Soil TPHg (ppm)	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	BORING BACKFILL
								SANDY SILT (ML); dark brown; dry; 70% silt, 15% medium to coarse grained sand; 15% fine gravel; no plasticity; moderate estimated permeability.		
0	6.2	0.084	B-5-V 1 B-5-5 .5		5	ML		@5': brown; hard; 80% silt, 20% medium grained sand; low estimated permeability.		◄ 3/4" diam., Schedule 40 PVC
								@8': very stiff; 5% clay, 75% silt, 15% medium grained sand, 5% fine gravel; low plasticity.		◄ Open Borehole
0.5	2.0		B-5-9 .5 B-5-V 2		10			@10': 65% silt, 25% medium grained sand, 10% fine gravel; no plasticity.		
									12.0	
0.5						SM		SILTY SAND (SM); brown; dry; 40% silt, 60% fine to medium grained sand; no plasticity; moderate estimated pearmeability.	13.0	
			B-5-1 3.5			ML		SANDY SILT (ML); brown; dry; 5% clay, 55% silt, 40% fine grained sand; low plasticity; low estimated permeability.		
	1.7		B-5-V 3		15				16.0	
						ML		SILT (ML); brown; dry; very stiff; 5% clay, 85% silt, 10% fine grained sand; low plasticity; low estimated permeability.	17.0	
						ML		CLAYEY SILT (ML); brown; damp; stiff; 20% clay, 70% silt, 10% fine grained sand; low plasticity; low estimated permeability.	19.0	◄ Monterey Sand #2/12
5.0		<0.050	B-5-1 9.5		20	ML		SANDY SILT (ML); brown; damp; 5% clay, 65% silt, 25% fine grained sand; low plasticity; low to moderate estimated permeability. @20': medium stiff; 15% clay, 55% silt, 30% fine grained sand; low to medium plasticity. @22': stiff; 65% silt, 20% fine grained sand.		◄ 3/4"-diam., 0.010" Slotted Schedule 40 PVC
3.5			B-5-2 3.5					SILTY SAND (SM); brown; wet; 30% silt, 50% fine to coarse grained sand, 20% fine gravel; no plasticity; high estimated permeability.	23.0	
					25	SM		@24': 5% clay, 30% silt, 65% fine grained sand; low plasticity.		
2.5			B-5-2 7.5					@26': 20% silt, 60% fine to coarse grained sand, 20% fine gravel; no plasticity; moderate estimated permeability.	27.0	◄ Slough
						ML		SANDY SILT (ML); brown; wet; medium stiff; 20% clay, 65% silt, 15% fine grained sand; moderate plasticity; low estimated permeability.		
					30				30.0	
								Total depth = 30'. Temporary well casing installed. Well purged and grab water sample collected using bailer. Casing removed and sealed with grout after sampling.		Bottom of Boring @ 30 ft

WELL LOG (PID/VP/SOIL) H:\BRITIS~1\11133~1\BP-11133.GPJ DEFAULT.GDT 2/19/02

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BORING/WELL LOG

CLIENT NAME	BP Oil Company	**BORING/WELL NAME**	B-6
JOB/SITE NAME	BP-11133	**DRILLING STARTED**	23-Oct-01
LOCATION	2220 98th Avenue, Oakland, California	**DRILLING COMPLETED**	23-Oct-01
PROJECT NUMBER	852-1692	**WELL DEVELOPMENT DATE (YIELD)**	23-Oct-01 (0.38 gal purge volume)
DRILLER	Gregg Drilling	**GROUND SURFACE ELEVATION**	
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	2"	**SCREENED INTERVAL**	20 to 30 ft bgs
LOGGED BY	S. Dwight	**DEPTH TO WATER (First Encountered)**	23.0 ft (23-Oct-01)
REVIEWED BY	K. Rahman, RG	**DEPTH TO WATER (Static)**	24.0 ft (23-Oct-01)

REMARKS Hand augered to 5 feet. Located on eastern property boundary adjacent to single story residence.

PID (ppm)	Vapor THC (ppmv)	Soil TPHg (ppm)	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	BORING BACKFILL
						ML		GRAVELLY SILT (ML); dark brown; dry; 70% silt, 15% medium to coarse grained sand, 15% fine gravel; no plasticity; moderate estimated permeability.	5.0	
5	4.2	<0.250	B-6-V 1 B-6-5 .5		5	ML		SILT (ML); brown; dry; very stiff; 5% clay, 85% silt, 10% fine to medium grained sand; no plasticity; low estimated permeability.	9.0	3/4" diam., Schedule 40 PVC
3.7	2.3		B-6-9 .5 B-6-V 2		10	ML		SANDY SILT (ML); brown; dry; 5% clay, 80% silt, 15% fine to coarse grained sand; no plasticity; low to moderate estimated permeability. @10': brown mottled with white; 65% silt, 35% fine to medium grained sand; moderate estimated permeability. @12': 60% silt, 5% fine gravel.		Open Borehole
			B-6-1 3.5						15.0	
	2.4		B-6-V 3		15	ML		SILT (ML); brown; dry; 5% clay, 85% silt, 10% fine grained sand; low plasticity; low estimated permeability.	18.0	
		<0.050	B-6-1 9.5		20	ML		SANDY SILT (ML); brown; dry; 5% clay, 80% silt, 15% fine grained sand; low plasticity; low to moderate estimated permeability.	20.0	
						ML		CLAYEY SILT (ML); brown; damp; 30% clay, 60% silt, 10% fine grained sand; moderate plasticity; low to moderate estimated permeability.	22.0	Monterey Sand #2/12
			B-6-2 3.5			ML		SANDY SILT (ML); brown; wet; 20% clay, 50% silt, 30% fine grained sand; moderate plasticity; moderate estimated permeability.		
					25					3/4"-diam., 0.010" Slotted Schedule 40 PVC
						SM		SILTY SAND (SM); brown with grey; wet; 10% clay, 25% silt; 65% fine grained sand; low plasticity; high estimated permeability.	26.0 27.0	
			B-6-2 7.5			ML		SILT (ML); brown; damp; 10% clay, 80% silt, 10% fine grained sand; low plasticity; low to moderate estimated permeability.	30.0	
					30			Total depth = 30'. Temporary well casing installed. Well purged and grab water sample collected using bailer. Casing removed and sealed with grout after sampling.		Bottom of Boring @ 30 ft

WELL LOG (PID/VP/SOIL) H:\BRTIS-1\11133--1\BP-11133.GPJ DEFAULT.GDT 2/19/02