

ENVIRONMENTAL
PROTECTION
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SITE CLOSURE REPORT

**KTVU
Two Jack London Square
Oakland, California**

Prepared for

**KTVU
Two Jack London Square
Oakland, California**

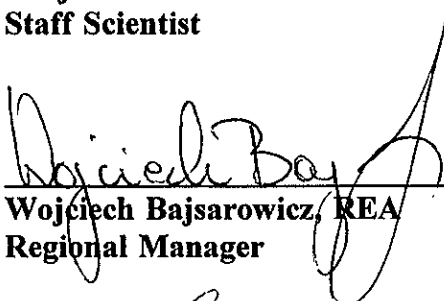
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INTRODUCTION - SITE BACKGROUND

On behalf of KTVU, the property owner, CET Environmental Services, Inc. (CET) is pleased to submit this request for site closure to the Alameda County Health Care Services Agency (ACHCSA) for the property located at Two Jack London Square, Oakland, California (herein known as the subject property or site). A site location map is shown on Plate 1, Appendix A. This document was prepared in accordance with the *Letter of Recommendation for UST (underground storage tank) Case Closure* outline provided by the ACHCSA (Appendix H).

Two USTs and associated product lines, reportedly dating from 1980, were removed from the subject property in August 1993. These included:

- One 10,000 gallon single walled steel UST used for the storage of gasoline until October 1992,
- One 4,000 gallon single walled fiberglass UST used for the storage of diesel fuel until its removal,
- A new double wall steel, fiberglass coated UST and monitoring system was subsequently installed in the over-excavated diesel tank pit.

The original removal of the USTs, initial soil and tank excavation water sampling activities, soil boring and monitoring well installation activities, and initial three quarters of groundwater monitoring were performed by Applied Environmental Solutions (AES) and reports of these activities were supplied to CET by KTVU. These reports were reviewed by CET and the findings have been incorporated in this report. CET performed the most recent groundwater monitoring and sampling activities at the site.



SITE DESCRIPTION

The subject property houses the offices and broadcast studios of the KTVU Television Station located at Two Jack London Square at the western boundary of the City of Oakland, California (see site location map on Plate 1, Appendix A). The site is bordered on the west by vacant lots, by condominiums to the east, by a railway line to the north, and by the Oakland Inner Harbor to the south. A site plan of the subject property is shown on Plate 2, Appendix A.

PREVIOUS INVESTIGATIONS

The following description of previous investigations and site activities was prepared from the following documents compiled by Applied Environmental Solutions, Inc. (AES):

- *Report Of Findings, Underground Storage Tank Removal* (AES, September 1993)
- *Work Plan, Subsurface Petroleum Hydrocarbon Contamination Assessment* (AES, October 1993) (proposed monitoring well installations)
- *Report Of Findings, Soil And Ground Water Investigation* (AES, January 1994) (summary of drilling and monitoring well installation activities)
- *Report Of Findings, Ground Water Investigations* (AES, June 1994) (summary of quarterly groundwater monitoring and sampling activities)
- *Report Of Findings, Ground Water Investigations* (AES, October 1994) (summary of quarterly groundwater monitoring and sampling activities).

One 4,000 gallon diesel UST and one 10,000 gallon gasoline UST were removed from the subject property in August 1993 under the supervision of AES personnel. On August 4, soils were excavated from above and along the sides of the USTs in preparation for their removal.



Approximately 4,000 gallons of product was removed from the diesel UST and approximately 300 gallons of product was removed from the gasoline UST prior to tank removal. On August 5, the tanks and appurtenant piping were removed from the ground, inspected, and disposed off site. The locations of the former tank excavations are shown on the site plan on Plate 2, Appendix A.

The following was observed during the diesel tank removal:

- Floating product on the water in the bottom of the excavation
- Product odor and staining on the walls of the excavation and in excavated soils
- When removal of the diesel tank was attempted, it was discovered that the tank wall had been ruptured during the shoring of the excavation
- Product odor and staining in native soils below the ruptured diesel product lines was observed.

Soil and water samples were subsequently collected from the tank excavations and stockpiled soils. Analytical results detected the presence of diesel petroleum hydrocarbons in the soil in the area of the diesel tank excavation. Contaminated soil in the vicinity of the diesel tank excavation was subsequently over-excavated, and contaminated groundwater in both excavations was removed by pumping, under the supervision of AES personnel during August 1993.

On November 30, 1993, three (3) soil borings were drilled on the subject property and completed as groundwater monitoring wells under the supervision of AES personnel. The monitoring well locations are shown on the site plan on Plate 2, Appendix A. Petroleum hydrocarbon odors and soil staining were not observed during initial drilling and well installation activities. Analytical results from soil samples collected during drilling did not contain total petroleum hydrocarbons



as gasoline or diesel (TPHg, TPHd), or benzene, toluene, ethyl benzene, and total xylenes (BTEX) at or above the test method detection limits.

Groundwater samples were first collected from the newly installed monitoring wells on December 8, 1993 by AES personnel. No floating product, sheen, or odors were observed during monitoring well sampling activities. Laboratory analytical results indicated that the groundwater samples did not contain TPHg, TPHd, or BTEX analytes at or above the test method detection limits.

The groundwater monitoring wells were sampled quarterly on December 8, 1993; March 2, 1994; June 29, 1994; and September 27, 1994 by AES personnel. The groundwater monitoring wells were sampled again on February 8, 1995 by CET personnel. During the five quarters of monitoring, no TPHd, TPHg, benzene, toluene or ethyl benzene were detected in any groundwater sample. Total xylenes were detected in groundwater samples from MW1 only during the first three quarters (12/8/93, 3/2/94 and 6/29/94) at low concentrations (2.7 µg/l, 2.0µg/l and 0.5 µg/l). Xylenes were not detected in the other wells or in MW1 during the last two monitoring events.

It is believed that no other environmental investigative actions regarding the subject property have been initiated since the last groundwater monitoring event and the compilation of this report.

INVESTIGATIVE METHODS

The following descriptions of investigative methods were summarized from the AES Report (AES, January 1994).

Drilling and Soil Borings

On November 30, 1993, AES personnel supervised the drilling of three soil borings at the subject property, which were subsequently completed as groundwater monitoring wells. The drilling (monitoring well) locations are shown on Plate 2, Appendix A. HEW Drilling Company, a C-57



licensed driller located in East Palo Alto, California, provided drilling services. The boreholes were drilled using 8.0 inch outside diameter (OD) hollow stem augers. The boreholes were drilled to a total depth of 15 feet below the ground surface (bgs). All subsurface equipment was steam cleaned before drilling and between each borehole. Copies of AES's borehole logs and well construction diagrams are provided in Appendix C.

Soil Sampling

Soil samples were collected from each borehole at five (5) foot intervals beginning at five feet bgs. A total of six (6) soil samples were collected; one from borehole MW-1 at 5.0 feet bgs (sample SB-1-5A); two from borehole MW-2 at 10 and 15 feet bgs (samples SB-2-10A and SB-2-15A); and three from borehole MW-3 at 5.0, 10, and 15 feet bgs (samples SB-3-5A, SB-3-10A, and SB-3-15A).

Soil samples were collected using a California modified split-spoon sampler. Before each sample drive, the sampler was lined with three, laboratory pre-cleaned, brass tubes (each tube six inches long by two inches in diameter). The sampler was advanced through the hollow stem auger using a 140 pound drop hammer. The sampler was cleaned before and between each sample drive by washing it in a solution of non-phosphate detergent and tap water followed by one tap water rinse and then one deionized water rinse.

After removal from the sampler, the ends of the soil-filled brass tubes were sealed with aluminum foil, plastic caps, and aluminized tape. Each sample was labeled with the date, sample identification number, project name and number, and sampler's name. Under chain of custody protocol, each sample was placed on ice inside of a thermally insulated cooler and maintained at four degrees centigrade for transport to Superior Precision Analytical, Inc., a state certified analytical testing laboratory in San Francisco, California. Copies of the chain of custody documentation are provided in Appendix D.



Monitoring Well Construction

Pre-cleaned, two-inch diameter PVC well casing and screen was used to construct the three monitoring wells (designated as MW-1, MW-2, and MW-3). Each well was screened from 5.0 to 15 feet bgs using 0.010 inch slot well screen. A pre-washed, No. 2/16 sand was used as the filter pack material opposite the well screens to one foot above the screens. A one foot bentonite seal was then placed above the sand filter pack for each well. A neat cement sanitary seal was then placed above the bentonite to within approximately 0.5 foot of the surface. An at-grade steel casing box was installed above each well.

Monitoring Well Development

The three monitoring wells were developed by AES personnel on December 3, 1993, by surging and then purging water using a hand bailer. Approximately eight (8) well volumes of water were bailed from each well. The development equipment was cleaned before and between each monitoring well using the methods described above.

Groundwater Sample Collection

The groundwater monitoring wells were sampled quarterly on December 8, 1993; March 2, 1994; June 29, 1994; and September 27, 1994 by AES personnel. The groundwater monitoring wells were sampled again on February 8, 1995 by CET personnel. Copies of the sample collection records and chain of custody documents are provided in Appendix D.

The following groundwater sampling procedures were used by AES personnel (AES, January 1994):

Prior to groundwater sampling, the depth to groundwater in each well was measured. Water in each well was then observed for floating product or sheen. During well purging field notes were maintained for pH, electrical conductivity, turbidity, temperature, and



time elapsed during purging. If product odor or sheen were present in the purged water, a field notation was made. After the field parameters stabilized and/or an appropriate volume of water had been purged from each well, the wells were allowed to recover to a minimum of 80% before a sample was collected.

The groundwater samples were collected using a transparent, 1.66-inch diameter, two foot long PVC bailer. A clear bailer will provide an indication of the presence or absence of free product or sheen. Dedicated nylon rope was used to lower the bailer into each well. The groundwater sample was then poured into appropriate laboratory supplied and preserved glassware and capped with Teflon lined plastic screw caps.

Upon collection of a groundwater sample, the bottles were labeled. The label information included the date and time of sampling, the project name and number, and the sample identification number. Under Chain of Custody procedures, the samples were placed on ice inside of a thermally-insulated cooler for transport to a State-certified laboratory.

During the February 8, 1995 groundwater monitoring and sampling event, CET personnel collected the well samples in accordance with the sampling protocol presented in Appendix E.

Laboratory Analytical Methods

Soil Samples

Soil samples, from the boreholes drilled under the supervision of AES personnel, were analyzed for Total Petroleum Hydrocarbons as diesel and gasoline (TPHd/TPHg), and for benzene, toluene, ethyl benzene, and total xylenes (BTEX) using U.S. Environmental Protection Agency (EPA) test method numbers 3550/8015, 5030/8015, and 8020, respectively.



Groundwater Samples

The groundwater samples, collected from the monitoring wells by AES personnel, were analyzed for TPHd, TPHg, and BTEX using EPA test methods 3550/8015, 5030/8015, and 8020. The groundwater samples, collected from the monitoring wells by CET personnel, were analyzed for TPHd, TPHg, and BTEX using EPA test methods 3510/8015, 5030/8015, and 8020, respectively.

EXTENT OF HYDROCARBONS IN SOIL AND GROUNDWATER

Petroleum Hydrocarbons in Soil

The soil samples collected from the boreholes did not contain TPHd, TPHg, or BTEX analytes at or above the test method detection limits.

A number of soil samples (a total of 11) were collected from the tank excavations and stockpiled soil by AES personnel. The soil sampling locations in the tank excavations and confirmation samples from the over excavations, along with the sample analytical results, are shown on Plates 3 (diesel tank excavation) and 4 (gasoline tank excavation), Appendix A.

The following description of the soil sample collection activities during tank removal and soil excavation work, was summarized from the AES report (AES, September 1993).

On August 5, 1993, under the supervision of Senior Hazardous Materials Specialist Susan Hugo of the Alameda County Department of Environmental Health, AES personnel collected soil samples T1-A and T1-B in the soil from the diesel tank excavation at five feet bgs from the north and south walls, respectively, and samples T2-A, T2-B, and T2-C in the soil from the gasoline tank excavation at four feet bgs from the north, south and east walls, respectively.



On August 10, 1993, AES personnel collected two soil samples: sample T1-C in the soil of the diesel tank excavation at five feet bgs from the west wall directly below the ruptured diesel product lines; and sample D-1 from the soil below the former location of the gasoline dispenser at three feet bgs.

On August 30, 1993, AES personnel collected three soil samples: sample T1-D in the soil of the diesel tank excavation at five feet bgs from the east wall; sample T1-E in the soil under the building directly below the ruptured diesel product lines and sample T2-D from the soil of the gasoline tank excavation at four feet bgs from the west wall.

On September 2, 1993, AES personnel collected one soil sample: sample T1-F from the east wall of the diesel tank excavation at five feet bgs.

The soil samples were collected by hand by driving a clean 2-inch outside diameter, 6-inch long brass sampling tube into the excavated soils in the bucket of a backhoe. Upon recovery of the sample, the ends of the brass tube were sealed with aluminum foil, capped with polyethylene end caps, secured with aluminized tape, and properly labeled. The label information included the date, identification number, and project name and number. Under property Chain-of-Custody procedures, the samples were placed on ice inside a thermally-insulated cooler for transport to a state-certified analytical laboratory.

The samples were submitted to Priority Environmental Labs, of Milpitas, California (state-certification #1708). Samples from the diesel excavation were analyzed for Total Petroleum Hydrocarbons as diesel (TPHd) using EPA Method 3550/8015 for soil and Benzene, Toluene, Ethyl benzene, and Total Xylenes (BTEX) using EPA Method 8020 for soil. Samples from the gasoline excavation were analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg) using EPA method 5030/8015 and BTEX using EPA Method 8020 for soil.



Copies of the Chain of custody documents and laboratory analytical reports are provided in Appendix D. A description of over excavation activities is summarized below under the section heading *Remediation Activities and Effectiveness*.

Petroleum Hydrocarbons in Groundwater

Floating Product

On August 4, 1993, during soil excavation in preparation for the tank removals, floating product was observed by AES personnel on the water at the bottom of the diesel tank excavation.

When removal of the diesel tank was attempted, it was discovered that the tank wall had been ruptured during the shoring of the excavation and that the diesel tank contained water and pea gravel from the pit. The water was subsequently pumped from the diesel tank by a vacuum truck from Erickson, Inc. (EPA# CAD0094666392), a licensed hazardous waste hauler, and transported under manifest to the Gibson recycling facility (EPA# CAD043260702) in Redwood City, California for disposal. A copy of the transport manifest is provided in Appendix F. Due to the weight of the pea gravel and the rupture on the side of the tank, the diesel tank was subsequently removed in three sections.

Dissolved Hydrocarbons

The following water samples were collected by AES personnel from the bottom of the tank excavations during tank removal and soil excavation activities. On August 5, 1993, water sample T1-H2O was collected from the bottom of the diesel tank excavation, and water sample T2-H2O was collected from the bottom of the gasoline tank excavation. The tank excavation water sample analytical results are summarized in Table 1, Appendix B. Three additional sets of water samples were collected from the tank excavations after pumping and removal of contaminated water (see section below, Remediation Activities and Effectiveness).



The groundwater monitoring wells were sampled quarterly on December 8, 1993; March 2, 1994; June 29, 1994; and September 27, 1994 by AES personnel. The groundwater monitoring wells were sampled again on February 8, 1995 by CET personnel. The cumulative groundwater sample analytical results from the monitoring wells are summarized in Table 2, Appendix B.

During the five quarters of monitoring, no TPHd, TPHg, benzene, toluene or ethyl benzene were detected in any groundwater sample. Total xylenes were detected in groundwater samples from MW1 only during the first three quarters (12/8/93, 3/2/94 and 6/29/94) at low concentrations (2.7 µg/l, 2.0µg/l and 0.5 µg/l). Xylenes were not detected in the other wells or in MW1 during the last two monitoring events.

HYDROLOGY

Regional Hydrology

The vicinity of the site represents the meeting of two hydrologic regimes, the shoreline tidelands of San Francisco Bay and the east bay plain [Alameda County Flood Control and Water Conservation District (ACFCWCD) report: *Geohydrology and Groundwater - Quality Overview, East Bay Plain Area, Alameda County, California*, report 205J dated 1988]. The east bay plain typically consists of alluvial fan deposits of clay, silt, and sand interbedded with gravel. The regional direction of groundwater flow in the plain is westward towards San Francisco Bay. The regional flow direction is modified near the bay (and estuary) by tidal influences and shore geometry. The shoreline region consists of filled tidelands (tidal deposits in the shallow aquifer) adjacent to the east bay plain, where the generally westward regional flow is strongly modified by tidal influences, resulting in a lower gradient and gradient reversal.

Local Hydrology

The following information was summarized from the AES report (AES, September 1993).



On August 4/5, 1993 the depth to groundwater in the diesel tank excavation was measured at approximately seven (7) feet below the ground surface (bgs). The soil encountered along the walls of the diesel tank excavation was typically a dark gray silty clay from approximately one foot to 13 feet bgs. In the gasoline tank excavation, groundwater was measured at approximately six (6) feet bgs during tank removal and soil excavation activities. The soil encountered along the walls of the gasoline tank excavation was typically a poorly sorted, light brown sand from approximately one foot to 11 feet bgs.

The following information was summarized from the AES report (AES, January 1994).

The site is a relatively flat parcel of land bordered to the south by The Oakland Inner Harbor. Elevation is approximately seven (7) to 10 feet above sea level. Previous work indicated that the site is underlain by silty clay ("Bay Mud") deposits in the area of the diesel tank, and by well-sorted, fine to medium-grained sands in the former gasoline tank location. According to geologic maps the area was formally tidal flats ("Bay Mud") and artificial fill (sand).

Ground water was encountered at approximately five to six feet below surface grade (bgs). Direction of groundwater flow is assumed to be towards the Bay (west to south west), however it is probably highly variable due to tidal influences.

The following geologic information was summarized from AES's soil borehole logs (AES, January 1994). In the vicinity of borehole MW-1: below the asphalt surface; gravel, well sorted, 1/4-inch diameter, light gray, backfill for diesel tank excavation to 14 feet bgs; grey clay from 14 to 15 feet bgs (borehole terminated at 15 feet bgs). In the vicinity of borehole MW-2: below the asphalt surface; dark brown silt with gravel from 0.5 to 2.0 feet bgs; grey clay with fine sand from 2.0 to 4.0 feet bgs; grey medium grained sand with clay from 4.0 to 9.5 feet bgs; and grey clay from 9.5 to 15 feet bgs (borehole terminated at 15 feet bgs). In the vicinity of borehole MW-3: below the asphalt surface; dark brown silt with gravel from 0.5 to 3.5 feet bgs; yellow, medium to coarse grained sand from 3.5 to 4.5 feet bgs; grey clay from 4.5 to 5.0 feet



bgs; light grey, well sorted, medium grained sand from 5.0 to 9.0 feet bgs; and grey clay from 9.0 to 15 feet bgs (borehole terminated at 15 feet bgs). Copies of the soil borehole logs are provided in Appendix C.

Groundwater Gradient

The following groundwater gradients and flow directions were calculated from groundwater elevations obtained from AES reports (the information from the last monitoring event was provided by CET).

Date	Direction	Gradient
12/08/93	Northwest	0.0079 ft/ft
03/02/94	Northwest	0.0077 ft/ft
06/29/94	Northeast	0.0011 ft/ft
09/27/94	East	0.0039 ft/ft
02/08/95	Northwest	0.0034 ft/ft

Groundwater measurement data, including depth to water and groundwater elevation relative to mean sea level (msl), are summarized in Table 3, Appendix B. Groundwater contours and flow directions, for measurements recorded during the quarterly monitoring events, are shown on Plates 5 through 9, Appendix A.

Groundwater Variations

The depth to groundwater is strongly influenced by tidal fluctuations (the subject property is immediately adjacent to the bay waters of the Oakland Inner Harbor). The tidally-influenced water table could easily account for the 1.5 foot variations in groundwater depths. Based on the measurements, the predominant direction of groundwater flow appears to be more towards the land than towards the Inner Harbor. However, this may be the result of tide/water table interactions.



Aquifer Characteristics

The following information was summarized from the AES report (AES, January 1994).

Ground water was first encountered at the top of the sand layer in MW-2 and MW-3, indicating that the sand is acting as an aquifer. The clay layers above and below the sand layer were moist but not saturated, indicating that the clays may be acting as confining or semiconfining layers.

CET has no information indicating that aquifer testing was ever performed at the subject property.

BENEFICIAL USES OF GROUNDWATER

Well Inventory

A well inventory or survey was not deemed necessary for the following reasons:

- The subject property is located immediately adjacent to the Oakland Inner Harbor, and therefore the shallow groundwater is of poor quality due to its high TDS concentration. Conductivity has often been measured at levels far in excess of 5,000 $\mu\text{S}/\text{cm}$, which classifies the groundwater at the subject property as unusable for drinking water in accordance with State regulatory criteria.
- The subject property lies in an historically industrial - commercial area, therefore the shallow groundwater in the area has been historically degraded by industry (it is assumed that the general background groundwater quality is poor)
- The subject property is believed to lie on bay fill material, historically areas utilized for agriculture and residential have been located much further east towards the East Bay hills,



therefore it is extremely unlikely that water supply wells for agriculture or domestic use would be located in the vicinity of the subject property

- The subject property lies immediately adjacent to the Bay and the predominant local and regional groundwater flow direction is towards the Bay, therefore, there is virtually no possibility of off site water supply wells down-gradient of the subject property.

Due to the reasons listed above, it is believed that the possibility of off site water supply wells being impacted by potential contaminants originating from the subject property, is extremely remote (only very low concentrations of xylene were detected in the onsite wells).

Contaminant Fate and Transport

The results of quarterly groundwater monitoring (see section above, *Petroleum Hydrocarbons in Groundwater, Dissolved Hydrocarbons*) indicated that the groundwater samples collected during the last two quarterly monitoring events (September 1994 and February 1995) did not contain any analytes at or above the test method detection limits. With the exception of low concentrations of total xylenes (just above the method detection limit, and well below 1,750 ppb, which is the MCL) found in groundwater samples from monitoring well MW1 on three occasions, no TPHg, TPHd, or BTEX analytes were detected in the groundwater samples at or above the test method detection methods from the previous three quarterly monitoring events. Therefore, it is assumed that the source has been removed by the excavation of soil and pumping of water from the excavations.

CET has no information indicating that aquifer testing and/or fate and transport modeling was ever performed for the subject property.



Drinking Water Policy Determination

The California Regional Water Quality Control Board - San Francisco Bay Region (RWQCB) has identified shallow groundwater as having a beneficial use as a domestic water supply source. In view of this determination, the type of relevant criteria are water quality standards and drinking water standards. The following information was obtained from the *Basin Plan* (State Water Resources Control Board) and has been adopted by the RWQCB (*Water Quality Control Plan San Francisco Bay Region*, Section II, Beneficial Uses, Ground Waters, December 1986, Final Adopted August 17, 1994).

Unless otherwise designated by the Regional Water Board, all ground waters are considered as suitable, or potentially suitable, for municipal or domestic water supply (MUN). In making any exceptions, the Regional Water Board will consider the criteria referenced in Regional Water Board Resolution No. 89-39, "Sources of Drinking Water", where:

- The total dissolved solids (TDS) exceed 3,000 mg/L (5,000 $\mu\text{s}/\text{cm}$, electrical conductivity) and it is not reasonably expected by the Regional Water Board (for the groundwater) to supply a public water system, or
- There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or
- The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day, or



- The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR Section 261.3.

REMEDIATION ACTIVITIES AND EFFECTIVENESS

Soil Remediation

Contaminated soil was subsequently over-excavated, where accessible, under the supervision of AES personnel. A total of 317 tons of petroleum hydrocarbon contaminated soil was removed from the diesel site. There is no evidence in the AES documentation that additional soil was over-excavated from the gasoline tank excavation. The soil was transported by Bauerle Trucking (EPA #CAD980585780) to the Gibson Oil and Refining Co. (EPA #CAD980883177) facility in Bakersfield, California for disposal. Copies of the transport manifests are provided in Appendix F.

Some contaminated soil was left in-place in the vicinity of the diesel tank excavation due to inaccessibility caused by buildings and structures, and the presence of groundwater at the bottom of the excavations. In addition, a concrete pad was encountered at the bottom of the diesel tank excavation which blocked additional soil removal at the bottom of the excavation. The AES report (AES, September 1993) indicated that the area in the vicinity of sample T1-E (collected from underneath the existing building. diesel tank excavation), which contained 94 parts per million (ppm) TPHd, was not over excavated due to inaccessibility. Soil sample T2-D from the gasoline tank excavation contained 9.4 parts per billion (ppb) total xylenes, no other analytes were detected at or above the test method detection limits in the soil samples from the gasoline tank excavation.



Groundwater Remediation

The following description of the pumping and removal of contaminated groundwater from the tank excavations, was summarized from the AES report (AES, September 1993).

Due to the elevated levels of petroleum hydrocarbons detected in the water samples from the tank excavations, AES began a water pumping program. The excavated pits were pumped dry to remove any free product in the water and soil in the pit. After each pit was pumped, it was allowed to recharge before a sample was collected.

On August 10, 1993, approximately 2,500 gallons of water was pumped from the diesel tank excavation and approximately 6,000 gallons of water was pumped from the gasoline tank excavation.

On August 10, 1993, AES personnel collected one water sample, labeled T1-H2OA, from the diesel tank excavation. The sample was submitted to Priority Environmental Labs and analyzed for TPHd and BTEX.

On August 11, 1993, an Evergreen Environmental Services vacuum truck pumped approximately 2,000 gallons of water from the diesel tank excavation.

On August 11, 1993, AES personnel collected one water sample, labeled T2-H2OA, from the gasoline tank excavation. The sample was submitted to Priority Environmental labs and analyzed for TPHg and BTEX.

On August 13, 1993, an Evergreen Environmental Services vacuum truck pumped approximately 2,000 gallons of water from the diesel tank excavation and approximately 3,000 gallons of water from the gasoline tank excavation. On August 16, 1993, an Evergreen Environmental Services vacuum truck pumped approximately 8945 gallons of water from the diesel tank excavation. On August 17, 1993, AES personnel collected one



water sample, labeled T2-H2OB, from the gasoline tank excavation and the sample was submitted to Priority Environmental Labs and analyzed for TPHg and BTEX.

On August 17, 1993, an Evergreen Environmental Services vacuum truck pumped approximately 4,500 gallons of water from the gasoline tank excavation. On August 18, 1993, AES personnel collected one water sample, labeled T1-H2OB, from the diesel tank excavation. The sample was submitted to Priority Environmental Labs and analyzed for TPHd.

On August 25, 1993, AES personnel collected one water sample from the diesel tank excavation, labeled T1-H2OC and one water sample from the gasoline tank excavation, labeled T2-H2OC. The samples were submitted to Priority Environmental Labs. Sample T1-H2OC was analyzed for TPHd; sample T2-H2OC was analyzed for TPHG and BTEX. Analytical results indicated sample T1-H2OC did not contain TPHd at or above method detection limits; sample T2-H2OC did not contain TPHg or BTEX at or above method detection limits.

Copies of the chain of custody documents and laboratory analytical reports are provided in Appendix F. The groundwater was pumped and transported, under manifest, by vacuum trucks from Evergreen Environmental Services (EPA #CAD980695761). The pumped groundwater was transported to the Evergreen Oil Inc. recycling facility (EPA #CAD980887418), in Newark, California for disposal. Copies of the transport manifests are provided in Appendix F.

Impact of Residual Hydrocarbons on Beneficial Uses

The quarterly groundwater sampling analytical results indicate that residual hydrocarbons have not adversely impacted beneficial uses of the groundwater at the subject property (see section above, *Petroleum Hydrocarbons in Groundwater, Dissolved Hydrocarbons*).



SUMMARY AND CONCLUSIONS

The information contained herein supports the following summary and conclusions:

- The subject property is located in an historically industrial area immediately adjacent to the Oakland Inner Harbor (San Francisco Bay).
- One 10,000 gallon gasoline UST and one 4,000 gallon diesel UST were removed from the subject property during August 1993.
- Contaminated soil was excavated, and contaminated water was pumped from the tank excavations and removed from the subject property during August 1993.
- A total of 317 tons of petroleum hydrocarbon contaminated soil was excavated, and approximately 29,000 gallons of petroleum contaminated water was pumped from the tank excavations and removed from the subject property during August 1993.
- The final grab groundwater samples from the tank excavations, collected after all pumping had been completed and the groundwater in the excavations had equilibrated, did not contain any TPHd, TPHg, or BTEX analytes at or above the test method detection limits.
- Three groundwater monitoring wells were installed at the subject property on November 30, 1993.
- Soil samples collected from the boreholes (which were subsequently completed as monitoring wells) did not contain TPHd, TPHg, or BTEX analytes at or above the test method detection limits.
- Groundwater samples were collected from the monitoring wells on five (5) separate occasions during quarterly monitoring events.



- With three minor exceptions, no TPHd, TPHg, or BTEX analytes were detected in the quarterly groundwater samples at or above the test method detection limits. The exceptions were the groundwater samples collected from monitoring well MW-1, on three separate occasions, which contained very low concentrations of total xylenes just above the test method detection limits and well below the MCL.
- Groundwater samples collected during the last two monitoring events (September 1994 and February 1995) did not contain any analytes at or above the test method detection limits.

RECOMMENDATIONS

The information presented in this report supports CET's recommendation for no further action at the subject property. Based on the information presented herein, and on behalf of our client and owner of the subject property, CET formally requests site closure from the ACHCSA.

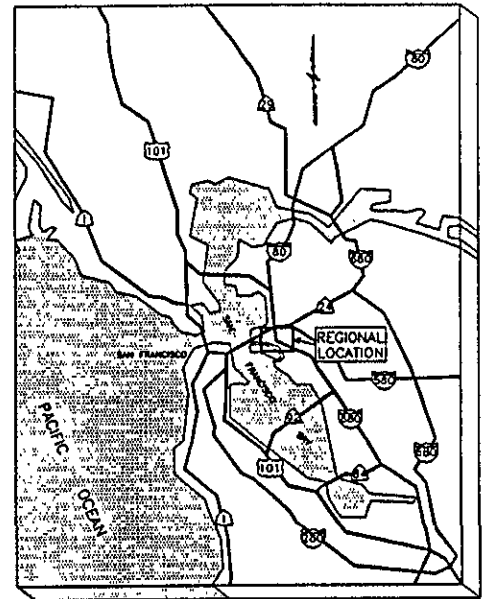
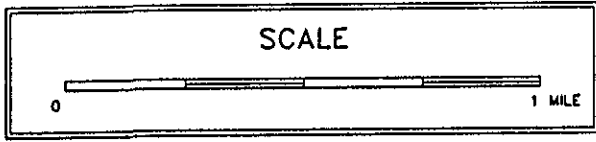
Limitations and Uncertainties for this report are presented in Appendix G.



**Table 1 - Analytical Results
Grab Groundwater Samples from Tank Excavations
2 Jack London Square - Oakland, California**

Sample ID	Sample Collection Date	Tank Excavation	Concentration/Analyte ($\mu\text{g/L}$) ¹					
			TPHg ²	TPHd ³	B ⁴	T ⁴	E ⁴	X ⁴
T1-H20	8/5/93	Diesel	NA ⁵	1,000	<0.5	<0.5	<0.5	<0.5
T2-H20	8/5/93	Gasoline	1,600	NA	1.2	1.4	1.8	5.9
T1-H20A	8/10/93	Diesel	NA	4,600	<0.5	<0.5	<0.5	<0.5
T2-H20A	8/11/93	Gasoline	2,800	NA	<0.5	<0.5	0.5	1.7
T1-H20B	8/18/93	Diesel	NA	320	NA	NA	NA	NA
T2-H20B	8/17/93	Gasoline	63	NA	0.6	0.8	1	4.8
T1-H20C	8/25/93	Diesel	NA	<50	NA	NA	NA	NA
T2-H20C	8/25/93	Gasoline	<50	NA	<0.5	<0.5	<0.5	<0.5

1. $\mu\text{g/L}$ = micrograms per liter, equivalent to parts per billion (ppb)
2. TPHg = Total Petroleum Hydrocarbons as gasoline
3. TPHd = Total Petroleum Hydrocarbons as diesel
4. BTEX = benzene, toluene, ethyl benzene, total xylenes
5. NA = not analyzed



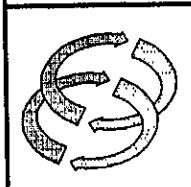
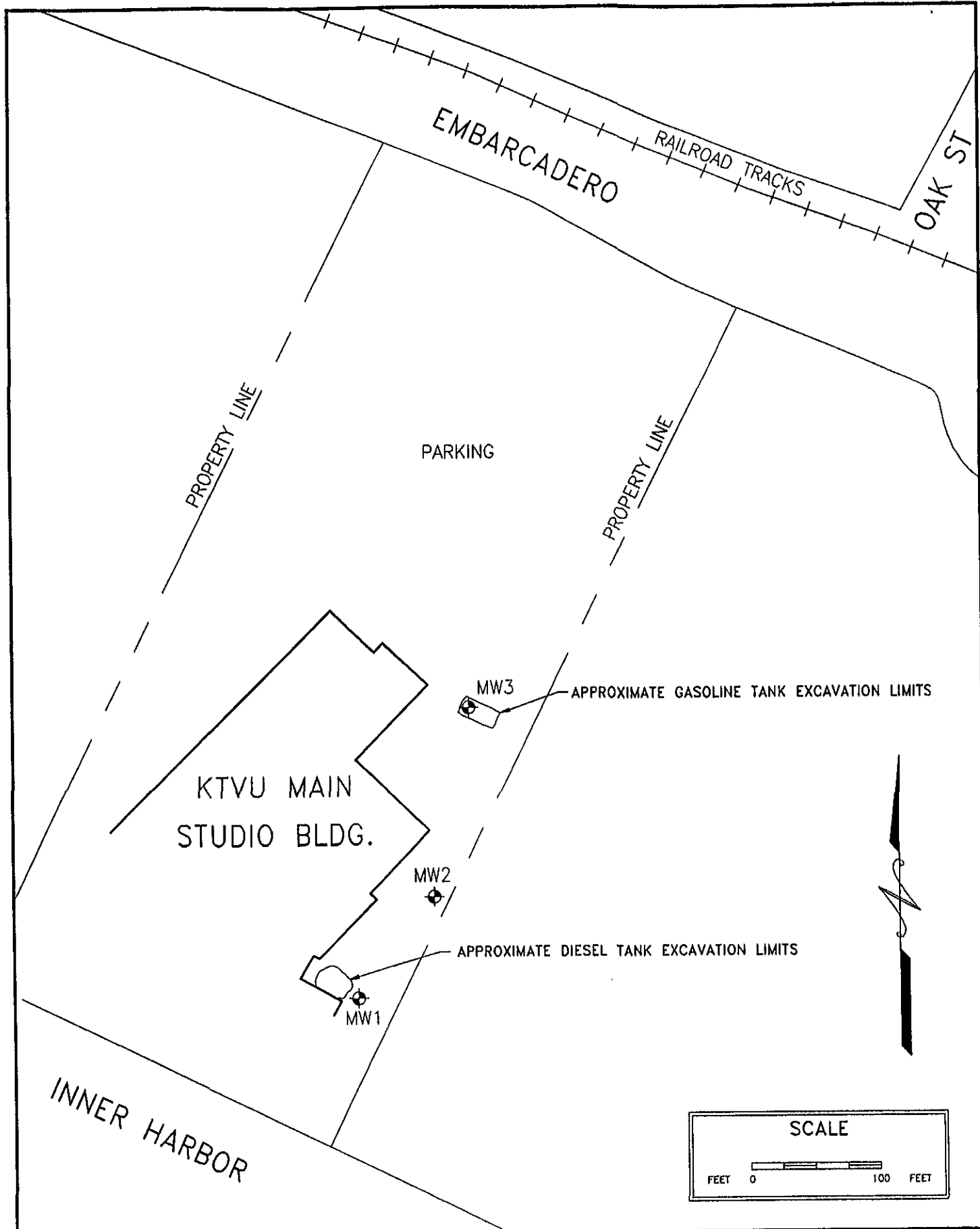
CET Environmental Services, Inc.

SITE LOCATION MAP

KTVU, INC.
2 JACK LONDON SQUARE
OAKLAND, CALIFORNIA

JOB NUMBER	DATE	DRAWING	BY	REVISED
3668	03/95	3668LOC	RASCHKE	03/23

PLATE



CET Environmental Services, Inc.

SITE PLAN KTVU, INC. 2 JACK LONDON SQUARE OAKLAND, CALIFORNIA					PLATE 2
JOB NUMBER	DATE	DRAWING	BY	REVISED	
3668	03/95	3668PLAN	RASCHKE	03/21	

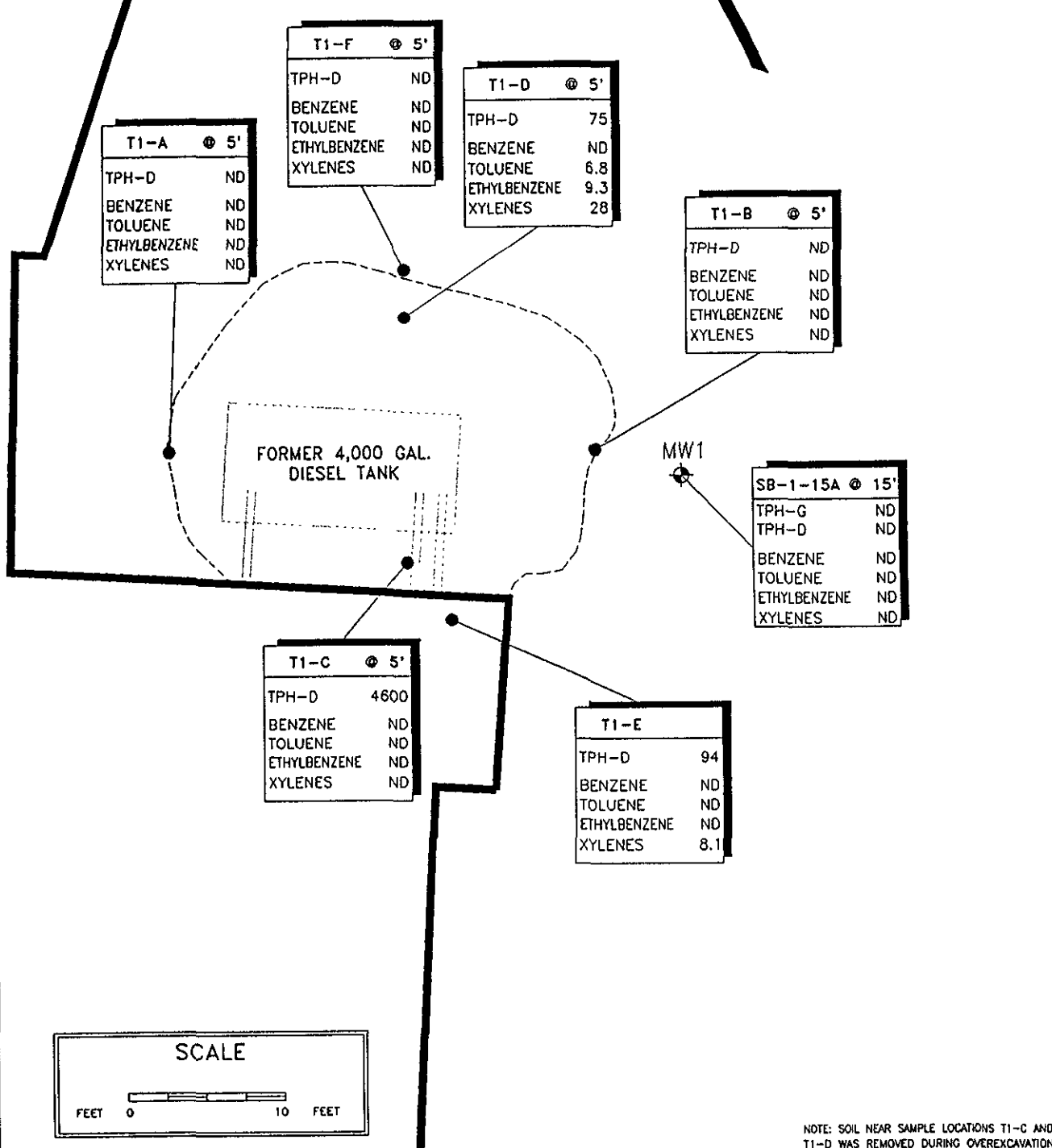
KTVU MAIN
STUDIO BLDG.

LEGEND

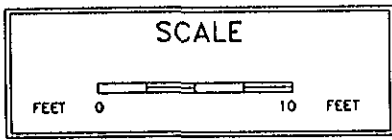
- APPROXIMATE FINAL LIMITS OF EXCAVATION
- APPROXIMATE TANK LOCATION
- ⊕ APPROXIMATE MONITORING WELL LOCATION
- EXCAVATION SAMPLE LOCATION

TPH-D: TOTAL PETROLEUM HYDROCARBONS AS DIESEL
 TPH-G: TOTAL PETROLEUM HYDROCARBONS AS GAS

TPH CONCENTRATIONS ARE IN mg/Kg OR ppm
 BTEX CONCENTRATIONS ARE IN ug/Kg OR ppb
 ND: NOT DETECTED AT OR ABOVE THE TEST MOL



PROPERTY LINE



NOTE: SOIL NEAR SAMPLE LOCATIONS T1-C AND T1-D WAS REMOVED DURING OVEREXCAVATION.

	CET Environmental Services, Inc.	DIESEL TANK EXCAVATION AND SOIL SAMPLE LOCATIONS KTVU, INC. 2 JACK LONDON SQUARE OAKLAND, CALIFORNIA			PLATE 3
		JOB NUMBER 3668	DATE 03/95	DRAWING 3668DSEL	

LEGEND

- APPROXIMATE FINAL LIMITS OF EXCAVATION
 - APPROXIMATE TANK LOCATION
 - ⊕ APPROXIMATE MONITORING WELL LOCATION
 - EXCAVATION SAMPLE LOCATION
- TPH-D: TOTAL PETROLEUM HYDROCARBONS AS DIESEL
 TPH-G: TOTAL PETROLEUM HYDROCARBONS AS GAS
- TPH CONCENTRATIONS ARE IN mg/Kg OR ppm
 BTEX CONCENTRATIONS ARE IN ug/Kg OR ppb
 ND: NOT DETECTED AT OR ABOVE THE TEST MDL

T2-A	
TPH-G	ND
BENZENE	ND
TOLUENE	ND
ETHYLBENZENE	ND
XYLENES	ND

T2-C	
TPH-G	ND
BENZENE	ND
TOLUENE	ND
ETHYLBENZENE	ND
XYLENES	ND

D-1	
TPH-G	ND
BENZENE	ND
TOLUENE	ND
ETHYLBENZENE	ND
XYLENES	ND

SB-3	⊕	5'	10'	15'
TPH-G		ND	ND	ND
TPH-D		ND	ND	ND
BENZENE		ND	ND	ND
TOLUENE		ND	ND	ND
ETHYLBENZENE		ND	ND	ND
XYLENES		ND	ND	ND

T2-D	
TPH-G	ND
BENZENE	ND
TOLUENE	ND
ETHYLBENZENE	ND
XYLENES	9.4

T2-B	
TPH-G	ND
BENZENE	ND
TOLUENE	ND
ETHYLBENZENE	ND
XYLENES	ND

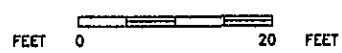
SB-3	⊕	5'	10'
TPH-G		ND	ND
TPH-D		ND	ND
BENZENE		ND	ND
TOLUENE		ND	ND
ETHYLBENZENE		ND	ND
XYLENES		ND	ND

KTVU MAIN
STUDIO BLDG.

PROPERTY LINE

MW2

SCALE



CET Environmental Services, Inc.

GASOLINE TANK EXCAVATION
AND SOIL SAMPLE LOCATIONS
KTVU, INC.
2 JACK LONDON SQUARE
OAKLAND, CALIFORNIA

PLATE

4

JOB NUMBER	DATE	DRAWING	BY	REVISED
3668	03/95	3668GAS	RASCHKE	03/23

LEGEND

MW3
MONITORING WELL LOCATION AND GROUNDWATER ELEVATION

0.80
LINE OF EQUAL GROUNDWATER ELEVATION (INTERVAL = 0.20 FT) ELEVATIONS RELATIVE TO MSL

APPROX. DIRECTION OF GROUNDWATER FLOW GRADIENT = 0.0079 FT/FT N48°W

EMBARCADERO RAILROAD TRACKS

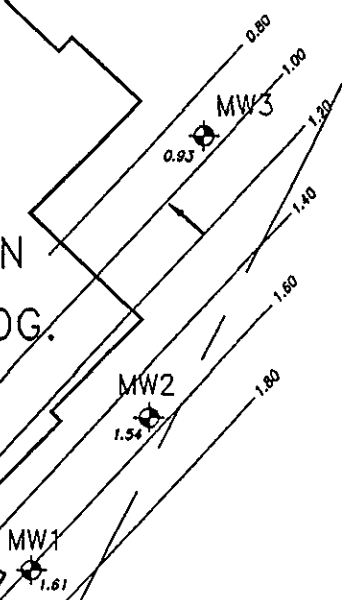
OAK ST

PROPERTY LINE

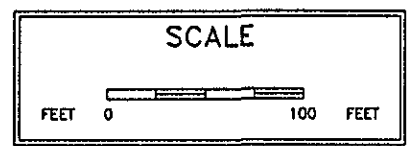
PARKING

PROPERTY LINE

KTVU MAIN STUDIO BLDG.



INNER HARBOR



CET Environmental Services, Inc.

GROUNDWATER ELEVATIONS AND CONTOURS

12/08/93

KTVU, INC.

2 JACK LONDON SQUARE
OAKLAND, CALIFORNIA

PLATE

5

JOB NUMBER	DATE	DRAWING	BY	REVISED
3668	03/95	GWL12-93	LONG	03/29

LEGEND

- MW3
MONITORING WELL LOCATION AND GROUNDWATER ELEVATION
- 1.20
1.00
LINE OF EQUAL GROUNDWATER ELEVATION (INTERVAL = 0.20 FT) ELEVATIONS RELATIVE TO MSL
- APPROX. DIRECTION OF GROUNDWATER FLOW GRADIENT = 0.0077 FT/FT N45°W

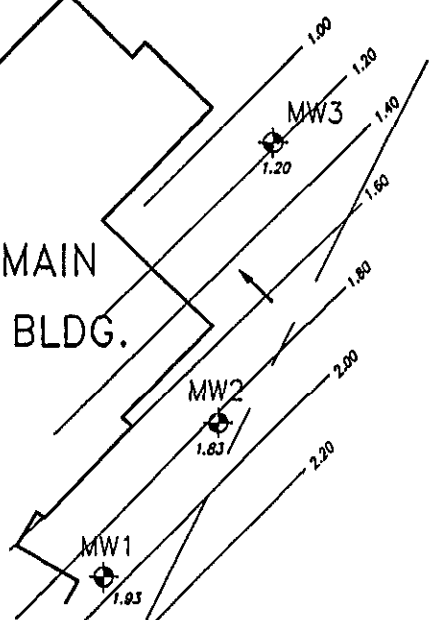
EMBARCADERO RAILROAD TRACKS
OAK ST

PROPERTY LINE

PARKING

PROPERTY LINE

KTVU MAIN STUDIO BLDG.



INNER HARBOR

SCALE


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CET Environmental Services, Inc.

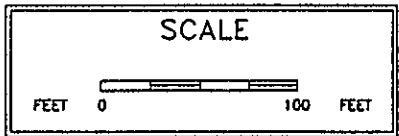
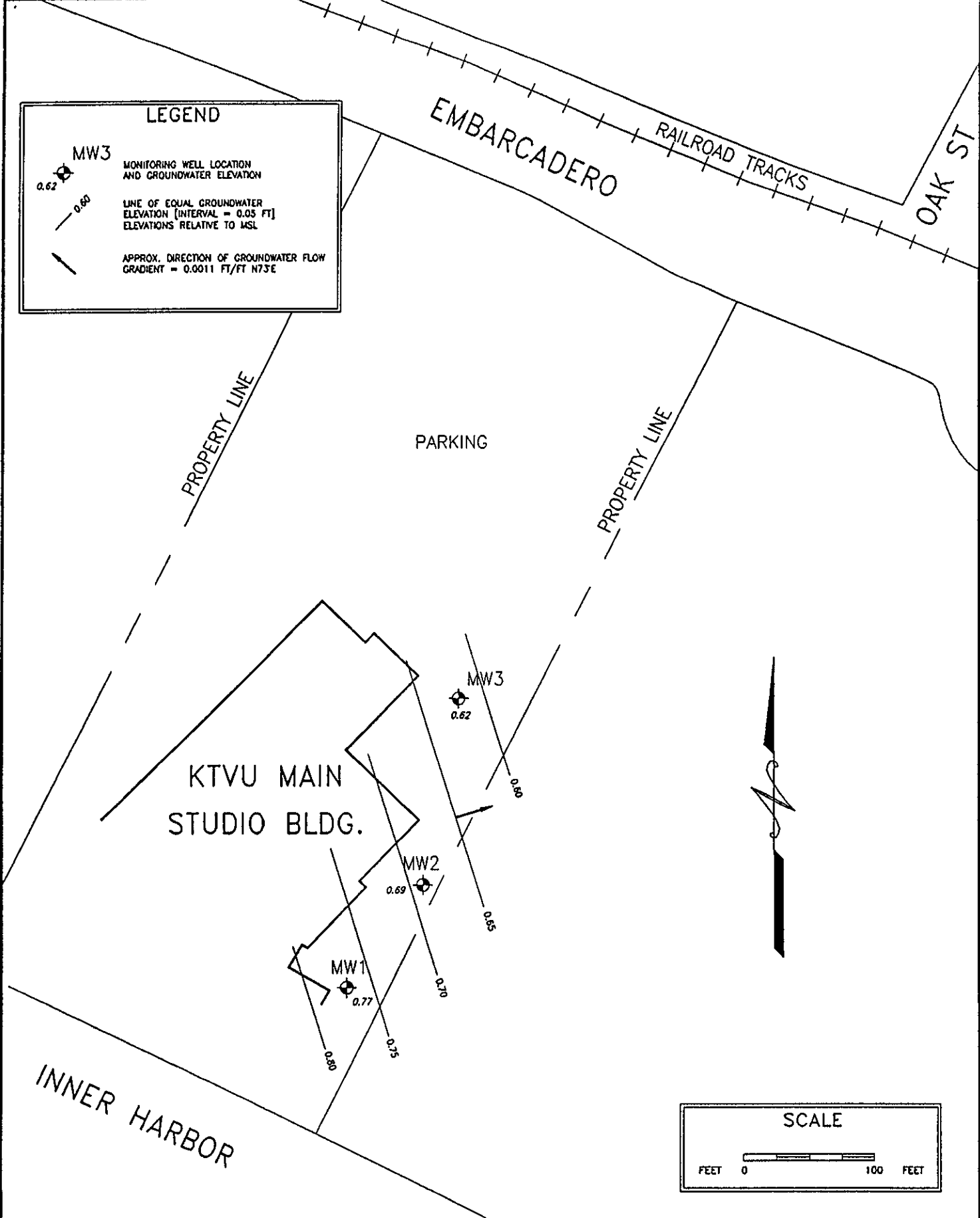
GROUNDWATER ELEVATIONS AND CONTOURS					PLATE 6
03/02/94					
KTVU, INC.					
2 JACK LONDON SQUARE					
OAKLAND, CALIFORNIA					
JOB NUMBER	DATE	DRAWING	BY	REVISED	
3668	03/95	GWL03-94	LONG	03/29	


LEGEND

MW3
 MONITORING WELL LOCATION AND GROUNDWATER ELEVATION
 0.62


0.60
 LINE OF EQUAL GROUNDWATER ELEVATION (INTERVAL = 0.05 FT) ELEVATIONS RELATIVE TO MSL

 APPROX. DIRECTION OF GROUNDWATER FLOW GRADIENT = 0.0011 FT/FT N73E



	CET Environmental Services, Inc.				GROUNDWATER ELEVATIONS AND CONTOURS 06/29/94 KTVU, INC. 2 JACK LONDON SQUARE OAKLAND, CALIFORNIA				PLATE 7
	JOB NUMBER	DATE	DRAWING	BY	REVISED				
	3668	03/95	GWL06-94	LONG	03/29				

LEGEND

MW3
 MONITORING WELL LOCATION AND GROUNDWATER ELEVATION
 0.62
 0.60

LINE OF EQUAL GROUNDWATER ELEVATION [INTERVAL = 0.10 FT] ELEVATIONS RELATIVE TO MSL

APPROX. DIRECTION OF GROUNDWATER FLOW
 GRADIENT = 0.0039 FT/FT 58°E

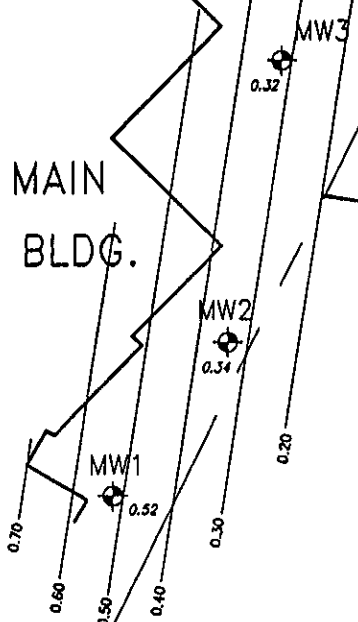
EMBARCADERO RAILROAD TRACKS
 OAK ST

PROPERTY LINE

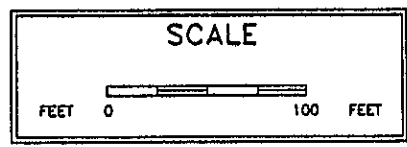
PARKING

PROPERTY LINE

KTVU MAIN STUDIO BLDG.



INNER HARBOR



CET Environmental Services, Inc.

GROUNDWATER ELEVATIONS AND CONTOURS
 09/27/94
 KTVU, INC.
 2 JACK LONDON SQUARE
 OAKLAND, CALIFORNIA

PLATE

8

JOB NUMBER	DATE	DRAWING	BY	REVISED
3668	03/95	GWL09-94	LONG	03/29

LEGEND

- MW3
MONITORING WELL LOCATION AND GROUNDWATER ELEVATION
- LINE OF EQUAL GROUNDWATER ELEVATION (INTERVAL = 0.10 FT) ELEVATIONS RELATIVE TO MSL
- APPROX. DIRECTION OF GROUNDWATER FLOW
GRADIENT = 0.0034 FT/FT N30°W

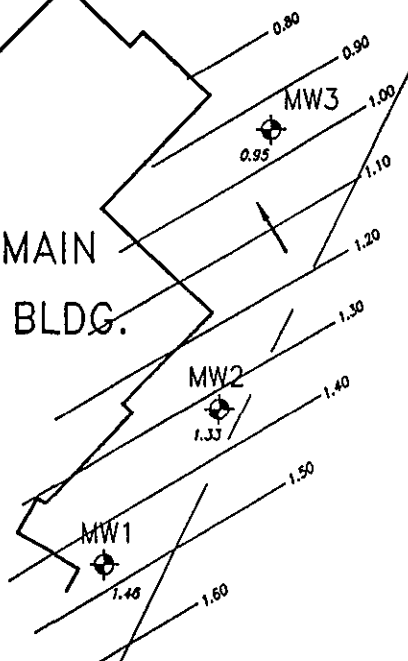
EMBARCADERO RAILROAD TRACKS
OAK ST

PROPERTY LINE

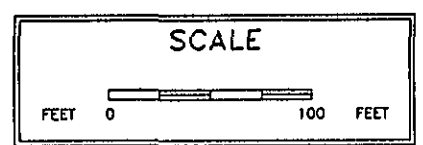
PARKING

PROPERTY LINE

KTVU MAIN STUDIO BLDG.



INNER HARBOR



	CET Environmental Services, Inc.				GROUNDWATER ELEVATIONS AND CONTOURS 02/08/95 KTVU, INC. 2 JACK LONDON SQUARE OAKLAND, CALIFORNIA		PLATE 9
	JOB NUMBER 3668	DATE 03/95	DRAWING GWL02-95	BY LONG	REVISED 03/29		



**Table 2 - Analytical Results - Quarterly Groundwater Samples
Monitoring Wells MW-1, MW-2, and MW-3
2 Jack London Square - Oakland, California**

Sample ID	Sample Collection Date	Concentration/Analyte (µg/L) ¹					
		TPHg ²	TPHd ³	B ⁴	T ⁴	E ⁴	X ⁴
MW-1	12/8/93	<50	<50	<0.5	<0.5	<0.5	2.7
MW-2		<50	<50	<0.5	<0.5	<0.5	<0.5
MW-3		<50	<50	<0.5	<0.5	<0.5	<0.5
MW-1	3/2/94	<50	<50	<0.5	<0.5	<0.5	2
MW-2		<50	<50	<0.5	<0.5	<0.5	<0.5
MW-3		<50	<50	<0.5	<0.5	<0.5	<0.5
MW-1	6/29/94	<50	<50	<0.5	<0.5	<0.5	0.5
MW-2		<50	<50	<0.5	<0.5	<0.5	<0.5
MW-3		<50	<50	<0.5	<0.5	<0.5	<0.5
MW-1	9/27/94	<50	<50	<0.5	<0.5	<0.5	<0.5
MW-2		<50	<50	<0.5	<0.5	<0.5	<0.5
MW-3		<50	<50	<0.5	<0.5	<0.5	<0.5
MW-1	2/8/95	<50	<50	<0.5	<0.5	<0.5	<0.5
MW-2		<50	<50	<0.5	<0.5	<0.5	<0.5
MW-3		<50	<50	<0.5	<0.5	<0.5	<0.5

1. µg/L = micrograms per liter, equivalent to parts per billion (ppb)
2. TPHg = Total Petroleum Hydrocarbons as gasoline
3. TPHd = Total Petroleum Hydrocarbons as diesel
4. BTEX = benzene, toluene, ethyl benzene, total xylenes
5. NA = not analyzed



**Table 3 - Groundwater Elevation Data
Monitoring Wells MW-1, MW-2, and MW-3
2 Jack London Square - Oakland, California**

Sample ID	Top of Casing Elevation ¹ (ft.)	Groundwater Measurement Date	Depth to Water (ft.)	Groundwater Elevation (ft.)
MW-1	4.76	12/8/93	3.15	1.61
		3/2/93	2.83	1.93
		6/29/94	3.99	0.77
		9/27/94	4.24	0.52
		2/8/95	3.3	1.46
MW-2	4.19	12/8/93	2.65	1.54
		3/2/93	2.36	1.83
		6/29/94	3.5	0.69
		9/27/94	3.85	0.34
		2/8/95	2.86	1.33
MW-3	4.35	12/8/93	3.42	0.93
		3/2/93	3.15	1.2
		6/29/94	3.73	0.62
		9/27/94	4.03	0.32
		2/8/95	3.4	0.95

1. Elevation was determined relative to mean seal level (msl), by a California licensed surveyor.

Project: KTVU Inc.	Applied Environmental Solutions	Page: 1 of 2
Location: Oakland, CA	Well Construction Data:	Well Number: MW-1
Driller: HEW Drilling Company, Inc.	Grout: 0.5 ft to 3 ft	Date: November 30, 1993
Method: Hollow Stem Auger	Seal Plug: 3 ft to 4 ft	Logged By: Mark L. Wuest
Sampling Method: Split Spoon	Sand Pack: 4 ft to 15 ft	Weather: Clear
Casing Type: PVC	Screen: 5 ft to 15 ft	Boring Dia: 8 Inch
Casing Dis.: 2 Inch	Grout Type: Portland I/II	Boring Depth: 15 Feet
Screen Type: PVC	Seal Type: Bentonite	Completion Depth: 15 Feet
Screen Slot: 0.010 Inch	Sand Type: #2-16	Depth to Groundwater: Approx. 5 Feet

Lithology	S A M P #	D E P T H	Well Completion	B L O W S	M O I S T	Remarks
Asphalt w/ grading material		0				Backfill pea gravel was not sampled
Gravel, well sorted, 1/4 inch, light grey, backfill for diesel tank pit		1	G R O U T		D R Y	
		2				
		3	S E A L			
		4	S A N D			
		5			S A T U R A T E D	
		6				
		7				
		8				
		9				
		10				
	11					


Project: KTVU Inc.	Applied Environmental Solutions		Page: 2 of 2				
Location: Oakland, CA	Logged By: Mark L. Wuest		Well Number: MW-1				
Driller: HEW Drilling Company, Inc.	Weather: Clear		Date: November 30, 1993				
Lithology	S A M P #	D E P T H	Well Completion	B L O W S	M O I S T	Remarks	
Gravel, well sorted, 1/4 inch, light grey, backfill for diesel tank pit		12	S A N D		V E R Y M O I S T		
		13					
	A	14				3	
Clay, grey	B			1			
	C	15		1			
Boring terminated at 15 feet bsg		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					
		26					

Project: KTVU Inc.	Applied Environmental Solutions	Page: 1 of 2
Location: Oakland, CA	Well Construction Data:	Well Number: MW-2
Driller: HEW Drilling Company, Inc.	Grout: 0.5 ft to 3 ft	Date: November 30, 1993
Method: Hollow Stem Auger	Seal Plug: 3 ft to 4 ft	Logged By: Mark L. Wuest
Sampling Method: Split Spoon	Sand Pack: 4 ft to 15 ft	Weather: Clear
Casing Type: PVC	Screen: 5 ft to 15 ft	Boring Dia: 8 Inch
Casing Dia.: 2 Inch	Grout Type: Portland I/II	Boring Depth: 15 Feet
Screen Type: PVC	Seal Type: Bentonite	Completion Depth: 15 Feet
Screen Slot: 0.010 Inch	Sand Type: #2-16	Depth to Groundwater: Approx. 4 Feet

Lithology	S A M P #	D E P T H	Well Completion	B L O W S	M O I S T	Remarks
Asphalt w/grading material		0				
Silt w/gravel, dark brown		1	G R O U T		M O I S T	
Clay w/fine sand, grey		2				
		3				
	C	4		2		
Sand w/clay, medium grained, grey	B	5	S A N D	2	S A T U R A T E D	Sample SB-2-5 disturbed, too wet
	A	6				
		7				
		8				
	C	9		0		
	B	10		0		
Clay, grey	A	11	S A N D	0	V E R Y M O I S T	

Project: KTVU Inc.		Applied Environmental Solutions			Page: 2 of 2	
Location: Oakland, CA		Logged By: Mark L. Wuest			Well Number: MW-2	
Driller: HEW Drilling Company, Inc.		Weather: Clear			Date: November 30, 1993	
Lithology	S A H P #	D E P T H	Well Completion	B L O W S	M O I S T	Remarks
Clay, grey	A B C	12	S A N D		V E R Y M O I S T	
		13				
		14				
		15				
		16				
		17				
		18				
		19				
		20				
		21				
		22				
		23				
		24				
		25				
		26				
Boring terminated at 15 feet bsg						

Project: KTVU Inc.	Applied Environmental Solutions		Page: 1 of 2			
Location: Oakland, CA	Well Construction Data:		Well Number: MW-3			
Driller: HEW Drilling Company, Inc.	Grout:	0.5 ft to 3 ft	Date: November 30, 1993			
Method: Hollow Stem Auger	Seal Plug:	3 ft to 4 ft	Logged By: Mark L. Wuest			
Sampling Method: Split Spoon	Sand Pack:	4 ft to 15 ft	Weather: Clear			
Casing Type: PVC	Screen:	5 ft to 15 ft	Boring Dia: 8 Inch			
Casing Dia.: 2 Inch	Grout Type: Portland I/II	Boring Depth: 15 Feet				
Screen Type: PVC	Seal Type: Bentonite	Completion Depth: 15 Feet				
Screen Slot: 0.010 Inch	Sand Type: #2-16	Depth to Groundwater: Approx. 5 Feet				
Lithology	S A M P #	D E P T H	Well Completion	B L O W S	M O I S T	Remarks
Asphalt w/grading		0				
Silt w/gravel, dark brown		1	G R O U T			
		2				
		3	S E A L			
Sand, medium to coarse grained, yellow	C	4		2		
Clay, grey	B		S A N D	3		
Sand, medium grained, well sorted, light grey	A	5		1		
		6				
		7				
		8				
		9		0		
Clay, grey	C			0		
	B			0		
	A	10		2		
		11				

Project: KTVU Inc.		Applied Environmental Solutions			Page: 2 of 2		
Location: Oakland, CA		Logged By: Mark L. Wuest			Well Number: MW-3		
Driller: HEW Drilling Company, Inc.		Weather: Clear			Date: November 30, 1993		
Lithology	S A M P #	D E P T H	Well Completion	B L O W S	H O I S T	Remarks	
Clay, grey		12	 S A N D		V E R Y H O I S T		
		13					
	A	14				0	
	B	14				0	
	C	15				1	
Boring terminated at 15 feet bsg		15					
		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					
		26					