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May 21, 2014

Ms. Dilan Roe
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Work Plan – Well Destruction and Replacement

76 (Former BP) Station No. 2611117
7210 Bancroft Avenue
Oakland, California
Fuel Leak Case No. RO0000356

Dear Ms. Roe:

I declare under penalty of perjury that to the best of my knowledge the information and/or recommendations contained in the attached report is/are true and correct.

If you have any questions or need additional information, please contact Mr. Dennis Dettloff at (916) 503-1261.

Sincerely,

Edward C. Ralston
Program Manager
Remediation Management

Work Plan - Well Destruction and Replacement

76 (Former BP) Station No. 11117
7210 Bancroft Avenue
Oakland, CA

Alameda County Health Care Services Agency
Fuel Leak Case No. RO0000356

San Francisco Bay, Regional Water Quality Control Board
Case No. 01-0215

GeoTracker Global ID No.T0600100201

Antea Group Project No. I42611117

May 21, 2014

Prepared for:
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Work Plan

Well Destruction and Replacement
76 (Former BP) Station No. 11117

1.0 INTRODUCTION

Antea[TM]Group is pleased to submit this *Work Plan – Well Destruction and Replacement*, for the referenced site in Oakland, California (**Figure 1**). The proposed destruction of seventeen (17) on- and off-site wells is in preparation of the proposed site razing activities as discussed in a conference call with Alameda County Health Care Services Agency (ACHCSA) on May 9, 2014. Several on-site wells have submerged screens and need to be destroyed and replaced with proper screen intervals as discussed in the *Site Conceptual Model*, dated March 14, 2014, submitted to the ACHCSA. The proposed replacement of five (5) on-site monitoring wells is proposed to take place after the proposed site razing is completed.

1.1 Site Description

The site is currently a closed 76 gas station located at 7210 Bancroft Avenue in Oakland, California (**Figure 1**). The site contains three 12,000-gallon gasoline underground storage tanks (USTs), one 10,000-gallon diesel UST, and the associated product piping and dispensers (**Figure 2**). See **Appendix A** for additional site information and for a history of environmental investigations and remedial actions.

2.0 PROPOSED ACTIVITIES

2.1 Health and Safety

Before commencing field activities, Antea Group will prepare a Health and Safety Plan in accordance with state and federal requirements for use during investigation activities. Drilling permits will be obtained for the well destruction and replacement from the Alameda County Public Works Agency (ACPWA). An encroachment permit will be obtained from the City of Oakland for the destruction of monitoring wells, MW-8 and MW-9, in the City right-of-way. Prior to well destruction, Underground Service Alert (USA) will be notified, as required by law, and a private utility locator will be employed to clear the well locations for underground utilities.

2.2 Well Destruction

Antea Group proposes destroying wells DPE-1 through DPE-5, AS-1, SVE-1, EX-1, EX-2, MW-1, MW-3, MW-4, MW-6 through MW-9, and MW-11 in preparation of the proposed site razing and wells with submerged screens. Only monitoring well MW-10, which is located in the adjacent parking lot will remain. Prior to the destruction of each of the wells, the total depth of each well will be measured to assess if any obstruction or sediment is present. Well logs of the seventeen wells are included as **Appendix B**. Subsequent to measuring the depths of the wells, the wells will cleared to 5 feet below ground surface (bgs) using an air-knife. Subsequent to air-knifing, the wells will be destroyed by pressure grouting using neat cement. Pressure grouting will consist of attaching a hose from the cement mixer directly to the top of the well casing and pumping neat cement into the well, under pressure (a minimum of 25 pounds per square inch (psi)) for five minutes or pumping refusal. Subsequent to pressure grouting, the top 5 feet of well casing will be removed and backfilled with the soil removed during air-knifing and capped with concrete.

2.3 Well Replacement

Antea Group proposes replacing monitoring wells MW-3, MW-4, MW-7, MW-11, and EX-1 with MW-3R, MW-4R, MW-7R, MW-11R, and EX-1R. The replacement wells will be installed after the site razing activities have been completed. The borings for the replacement wells will be advanced to a maximum depth of 30 feet bgs using a drill-rig equipped with 8-inch, outside diameter, hollow-stem augers (HSA).

The proposed replacement well locations are shown on **Figure 2**. Each replacement well location will be cleared to 5 feet bgs with an air-knife prior to borehole advancement.

The groundwater monitoring well casing will be installed in the well boring while the augers are in place. The monitoring wells will consist of 2-inch diameter schedule 40 poly vinyl chloride (PVC) well casing with a screen interval to be determined in the field, based on the encountered lithology and groundwater elevation. The screen interval is anticipated to be fifteen feet in length from approximately 15 to 30 feet bgs. The perforation size in the screen interval will be 0.020-inch. A sand pack consisting of RMC Lonestar Sand #3 or equivalent will be installed into the annular space and extend approximately two (2) feet above the top of the screen interval.

A two (2) foot thick bentonite seal will be placed on top of the sand pack. The monitoring wells will be surged prior to the placement of the bentonite seal to promote settling of the sand pack. The remainder of the annular space will be filled with neat cement and the monitoring wells will be fitted with a locking cap and encased in a traffic-rated protective vault placed at existing ground level. Well construction details are shown on **Figure 3**.

2.4 Soil Sampling

During the borehole advancement for each monitoring well, soil samples will be collected beginning at a depth of five feet bgs. Soils will be classified and logged according to the Unified Soil Classification System (USCS). Soil samples will be screened for volatile organic compounds in the field using a calibrated photoionization detector (PID).

Select soil samples will be collected and retained for laboratory analysis using the following criteria:

- A sample will be collected at any change in lithology (if encountered).
- A sample will be collected from the highest PID measurement in each boring.
- A sample will be collected from just above first encountered groundwater.
- A sample will be collected from the bottom of each boring.
- Additional samples may be submitted based on historical occurrences of hydrocarbons, field observations, and/or PID measurements observed in the field.

Soil samples retained for laboratory analysis will be given a unique sample number, placed in an ice-cooled chest, and recorded on the chain of custody. All soil samples collected during borehole

advancement activities will be submitted to Kiff Analytical LLC (Kiff), a state of California Environmental Laboratory Accreditation Program (ELAP) certified laboratory (Certification No. 08263CA), and analyzed for the following constituents:

- Total petroleum hydrocarbons – gasoline range organics (TPHg), carbon chain range C05 – C12, benzene, toluene, ethylbenzene, and total xylenes (collectively BTEX compounds), methyl tert-butyl ether (MTBE), tertiary-butyl alcohol (TBA), di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), 1,2-dibromoethane, 1,2-dichloroethane, and ethanol by Environmental Protection Agency (EPA) Method 8260B; and
- Total petroleum hydrocarbons – diesel range organics (TPHd) [silica gel treated] by EPA Method 8015.

2.5 Well Development, Monitoring, and Sampling

The replacement monitoring wells will be developed, by bailing, surging, and pumping, a minimum of 72 hours after construction. A minimum of 10 casing volumes of groundwater will be removed from each monitoring well, if possible, during the development process.

The monitoring wells will be sampled a minimum of 72 hours after they have been developed, and will be incorporated into a quarterly sampling schedule for the first year.

Groundwater samples collected for analysis from each monitoring well will be analyzed for TPHg, BTEX, MTBE, TBA, DIPE, ETBE, TAME, 1,2-dibromoethane, 1,2-dichloroethane and ethanol by EPA Method 8260B.

2.6 Wellhead Survey

Following the completion of the replacement monitoring wells, a California licensed surveyor will survey the northing and easting of the monitoring wells using datum NAD 83. The monitoring well elevation will be surveyed relative to mean sea level, with an accuracy of +/- 0.01 foot. A global positioning system (GPS) will also be used to survey the latitude and longitude of each well and uploaded to California's Geo Tracker database system. The survey of the well locations will be to sub-meter accuracy.

2.7 Disposal of Drill Cuttings and Waste Water

Drill cuttings and decontamination water generated during well destruction and replacement activities will be placed into properly labeled 55-gallon Department of Transportation (DOT) approved steel drums and temporarily stored on the station property. Samples of the drill cuttings, and decontamination wastewater will be collected, properly labeled and placed on ice for submittal to a California-certified laboratory and will be analyzed for TPHg, BTEX, and MTBE by Environmental Protection Agency (EPA) Method 8260, and lead by EPA Method 6010. A chain-of-custody will accompany the samples during transportation to the laboratory. Subsequent to receiving the laboratory analytical results, the drummed drill cuttings and decontamination wastewater will be profiled, transported, and disposed of at an approved facility.

2.8 Reporting

A summary report, describing the well destruction activities and well replacement activities will be submitted no later than 60 days after the field work has been completed. Required electronic submittals will be uploaded to the State Geotracker database.

3.0 REMARKS

The recommendations contained in this report represent Antea USA, Inc.'s professional opinions based upon the currently available information and are arrived at in accordance with currently accepted professional standards. This report is based upon a specific scope of work requested by the client. The contract between Antea USA, Inc. and its client outlines the scope of work, and only those tasks specifically authorized by that contract or outlined in this report were performed. This report is intended only for the use of Antea USA, Inc.'s client and anyone else specifically identified in writing by Antea USA, Inc. as a user of this report. Antea USA, Inc. will not and cannot be liable for unauthorized reliance by any other third party. Other than as contained in this paragraph, Antea USA, Inc. makes no express or implied warranty as to the contents of this report.

Date: 5/21/14

Edward T. Weyrens, G.I.T.
Project Professional

Reviewed by:

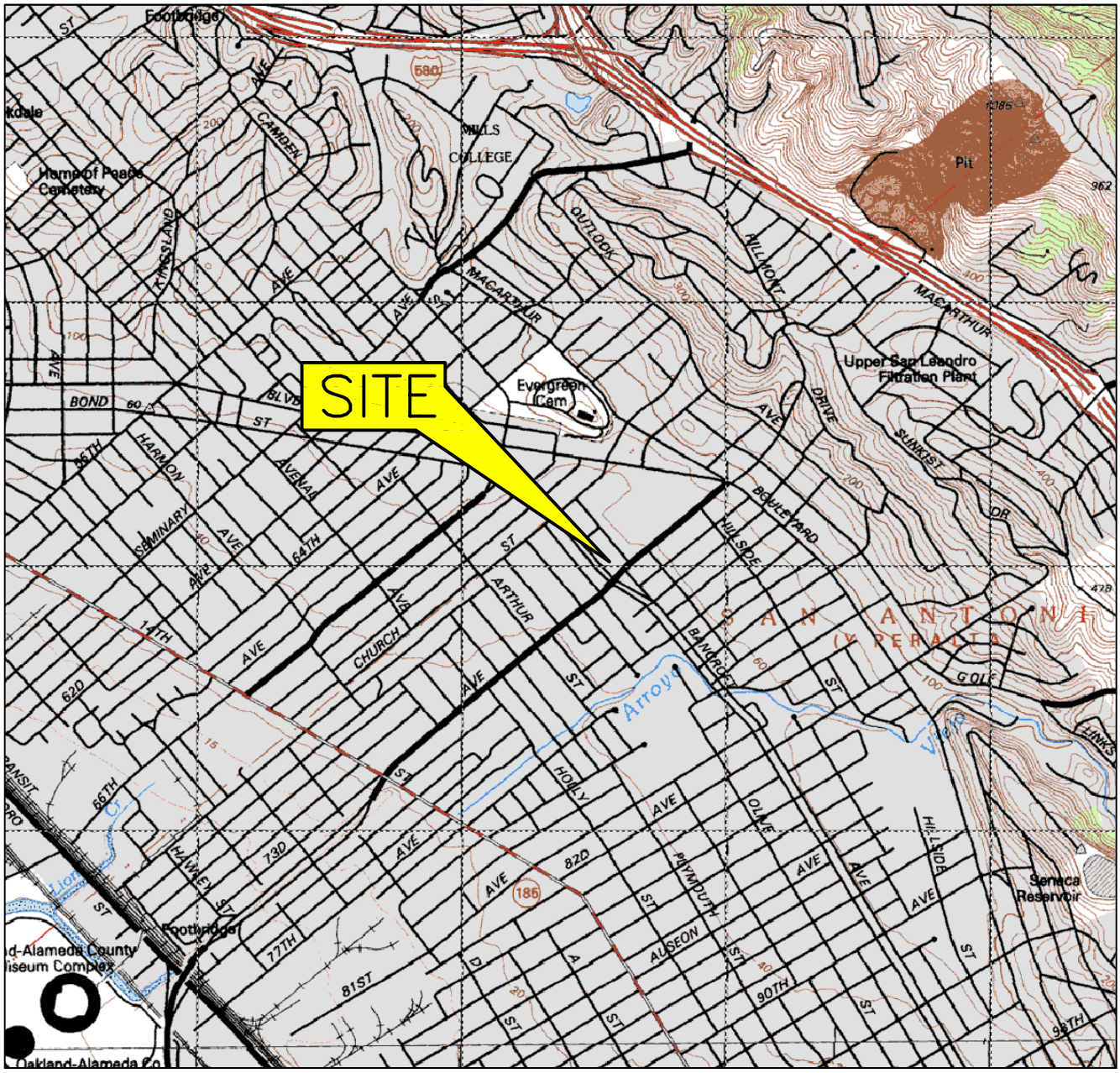
PROFESSIONAL GEOLOGIST
DENNIS SHANNON DETTLOFF
No. 7480
STATE OF CALIFORNIA

Date: 5/21/14

Dennis S. Dettloff, P.G.
Senior Project Manager
California Registered Geologist No. 7480

cc: Ms. Tiffany McClendon, One Eastmont Town Center, 7200 Bancroft Avenue, Oakland, CA 94605
GeoTracker (upload)

Figures



QUADRANGLE LOCATION

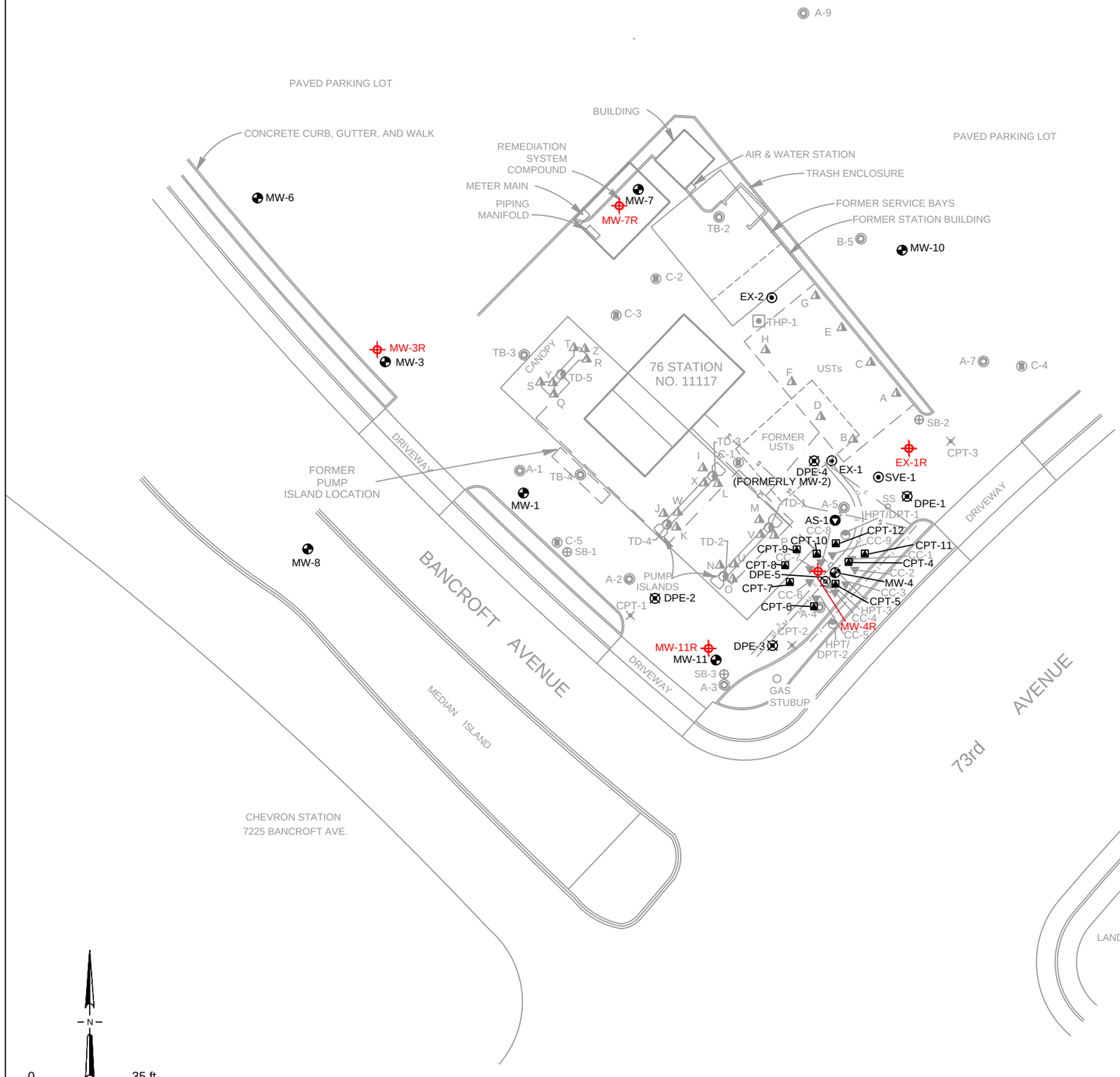
GENERAL NOTES:
BASE MAP FROM USGS, 7.5 MINUTE
TOPOGRAPHIC OAKLAND, CA. PHOTO REVISED 1980

FIGURE 1
SITE LOCATION MAP

76 (FORMER BP) STATION NO 11117
7210 BANCROFT AVENUE
OAKLAND CALIFORNIA

PROJECT NO.	PREPARED BY	DRAWN BY
142611117	DK	JH
DATE	REVIEWED BY	FILE NAME
03/30/11	DU	11117-TOPO

anteagroup



EXPLANATION

- MW-7 — GROUNDWATER MONITORING WELL LOCATION
- EX-1 — SOIL VAPOR EXTRACTION WELL LOCATION
- DPE-2 — GROUNDWATER EXTRACTION WELL LOCATION
- AS-1 — AIR SPARGE WELL LOCATION
- HPT-3 — HPT BORING LOCATION
- CC-1 — INJECTION LOCATION
- SS — SEWER CLEANOUT LOCATION
- SB-2 — FUTURE USE STUB-OUT LOCATION
- CPT-12 — CPT / UVOST BORING (ANTEA GROUP 2013)
- C-1 — SOIL BORING LOCATION (ANTEA GROUP, 2011)
- CPT-1 — CONE PENETROMETER TEST BORINGS BROADBENT & ASSOCIATES, INC. (JUNE, 2007)
- A-1/TB-2 — SOIL BORING LOCATION
  - A BORINGS (URS, NOVEMBER 2005)
  - B BORING (HEDI, 1992)
  - T BORINGS (EMCON, 1994)
- TD-1 — DISPENSER GRAB SAMPLE LOCATION (EMCON, SEPTEMBER 1994)
- THP-1 — HYDROPUNCH BORING LOCATION (EMCON, SEPTEMBER 1994)
- A — SOIL SAMPLES COLLECTED DURING ERI UST, PRODUCT LINE, AND DISPENSER REMOVAL (NOVEMBER, 1998)

- PRODUCT LINES
- C — UNDERGROUND COMMUNICATIONS LINE
- E — UNDERGROUND ELECTRIC LINE
- I — UNDERGROUND IRRIGATION LINE
- M — UNDERGROUND METAL PIPE LINE
- S — UNDERGROUND SEWER LINE
- PROPOSED WELL LOCATION

FIGURE 2
SITE PLAN WITH PROPOSED WELL LOCATIONS

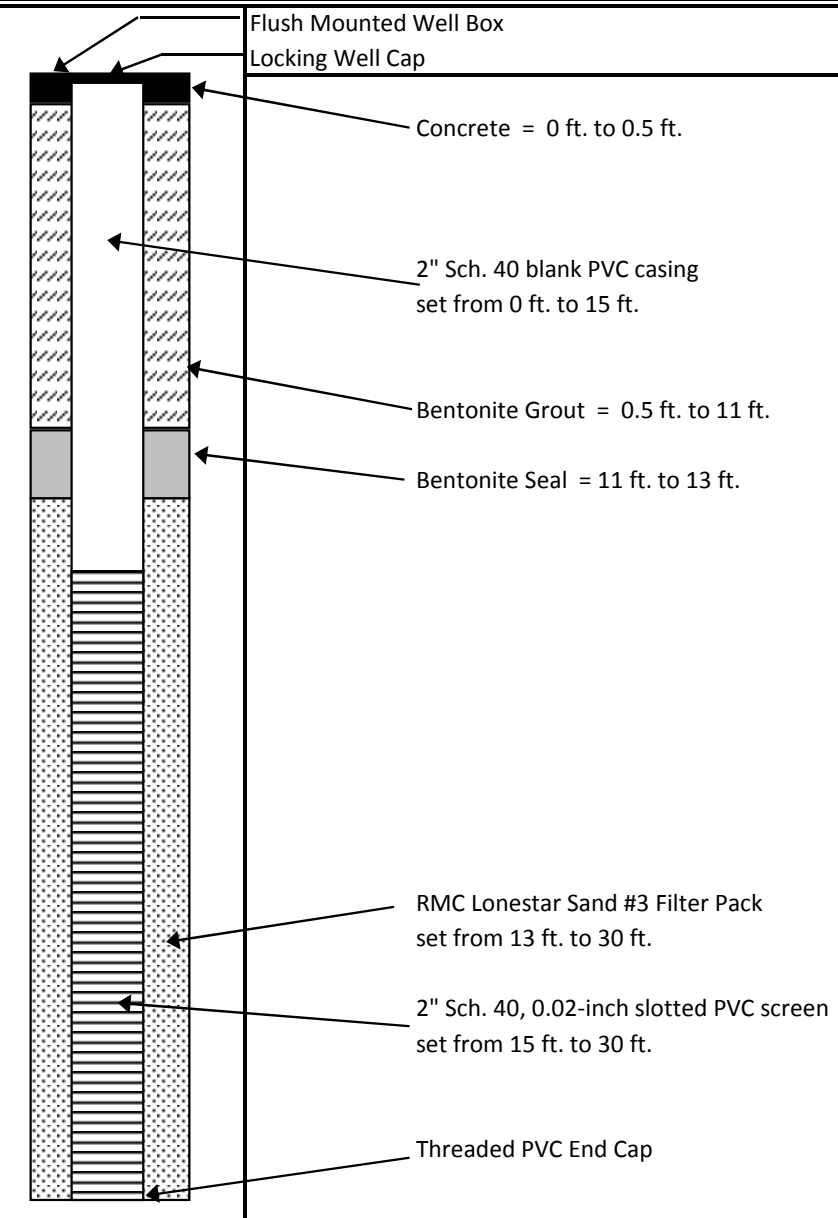
76 (FORMER BP) STATION NO 11117
7210 BANCROFT AVENUE
OAKLAND, CALIFORNIA

PROJECT NO.	PREPARED BY	DRAWN BY
142611117	EW	JH
DATE	REVIEWED BY	FILE NAME
5/21/14	DU	11117-SMS

antea group

Project Name and Location:
76 (Former BP) Station No. 11117
Site Address: 7210 Bancroft Road
City, State: Oakland, California

FIGURE 3
WELL CONSTRUCTION DETAILS



Total Depth of boring at 30 feet below ground surface (bgs)

- Concrete
- Bentonite Grout
- Two inch diameter 0.02-inch Slotted PVC Screen
- Two inch diameter PVC well casing grouted in place
- RMC Lonestar Sand #3 Filter Pack
- Bentonite Chip Seal

Appendix A

Previous Investigation and Site History Summary

SITE LOCATION AND BACKGROUND

The Site is an active 76-brand gasoline retail outlet located on the northern corner of Bancroft Avenue and 73rd Avenue at 7210 Bancroft Avenue in Oakland, Alameda County, California (**Figure 1**). The site consists of a service station building, three 12,000-gallon gasoline underground storage tanks (USTs), and one 10,000-gallon diesel UST with associated piping and dispensers. The site is covered with asphalt or concrete surfacing except for planters along the southeastern and southwestern property boundaries and at the north corner of the property.

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) and has not operated the facility since that time.

SUMMARY OF PREVIOUS ENVIRONMENTAL INVESTIGATIONS

1984 UST Replacement: In 1984, the pre-existing USTs at the site were removed and three single-walled fiberglass gasoline underground storage tanks (USTs) (6,000-gallon, 10,000-gallon, and 12,000-gallon) and one 6,000-gallon diesel UST were installed in a cavity immediately to the northeast of the former USTs. A UST removal/installation report is not on file, and it is unknown if one was ever prepared. No documentation was reportedly found referencing the conditions of the removed USTs or reporting evidence of the hydrocarbon impacts in the soil and groundwater, if any, at the time of the UST removal.

1989 Phase II Environmental Audit: In December 1989, Hunter Environmental Services, Inc. (Hunter) performed a Phase II Environmental Audit on the adjacent Eastmont Town Center site located to the north and northwest of the former BP Site. Part of the Phase II study included the installation monitoring well MW-3 near the western boundary of the former BP Site. Soil samples collected from 10 and 20 feet below ground surface (bgs) from MW-3 were analyzed for total petroleum hydrocarbons (TPH), benzene, toluene, ethyl benzene, and total xylenes (BTEX), and oil and grease. No analytes were reported above their respective laboratory reporting limits (LRLs). A groundwater sample collected from MW-3 was reported to contain TPH and benzene at concentrations of 2,700 micrograms per liter (µg/L) and 530 µg/L, respectively (Hunter, 1989).

1991 Phase I Subsurface Investigation: In December 1991, Hydro Environmental Technologies, Inc. (Hydro) drilled two on-site soil borings (MW-1 and MW-2) to total depths of 40 feet bgs, and soil samples were collected at 10-foot intervals between 5 and 25 feet bgs. First groundwater was encountered at approximately 30 feet bgs. The analytical results of the soil samples from MW-1 and MW-2 reported total petroleum hydrocarbons as gasoline (TPH-g) and BTEX at concentrations below their respective LRLs (Hydro, 1991).

1992 Phase I Subsurface Investigation: In July 1992, Hydro advanced boring MW-4 and MW-6 to total depths of 40 feet bgs, and boring B-5 was advanced to 50 feet bgs, First groundwater was encountered at approximately 30 feet bgs in borings MW-4 and MW-6, and no free water was encountered in boring B-5. The analytical results of soil samples collected at 30 feet bgs from B-5 and MW-6 reported TPH-g and BTEX at concentrations below their respective LRLs. The maximum TPH-g and BTEX concentrations in soil reported in MW-4 were 6,000 milligrams per kilogram (mg/kg) and 34 mg/kg, respectively, from a depth of 20 feet bgs. Borings MW-4 and MW-6 were subsequently converted into monitoring wells (Hydro, 1992).

1994 Baseline Assessment Report: In September 1994, EMCON performed a Supplemental Site Assessment at the site. Four exploratory soil borings (THP-1, TB-2, TB-3, TB-4) were advanced to a maximum depth of 45 feet bgs north of the former and existing UST complexes (THP-1), at the former service bays (TB-2), north of the northern pump island (TB-3), and at a former pump island (TB-4). Additionally, one soil sample was collected from beneath each of the five dispensers (TD-1 through TD-5). Groundwater was encountered in TB-2 and TB-3 at approximately 33 to 36 feet bgs and groundwater samples were collected from TB-2 and TB-3 via temporarily well points. Maximum concentrations of 16 mg/kg TPH-g (TD-3), TPH as diesel (TPH-d) at concentrations ranging from 110 mg/kg to 5,000 mg/kg (TD-1 through TD-5), and benzene at concentrations below LRLs were reported in soil samples. TPHg was not reported above the LRLs and a maximum concentration of 0.7 µg/L benzene (TB-3) was reported in groundwater samples (EMCON, 1994).

1994 Well Installation: In October 1994, Hydro advanced boring MW-7 to a total depth of 45 feet bgs, and borings MW-8 and MW-9 were advanced to total depths of 40 feet bgs. First encountered groundwater was at approximately 27 feet bgs to 32 feet bgs. TPH-g and BTEX were not detected above their respective LRLs in soil samples collected from 25 feet bgs in each boring. The three borings were subsequently converted into monitoring wells MW-7 through MW-9 (Hydro, 1995).

1997 Offsite Well Installation: In July 1997, Pacific Environmental Group (PEG) drilled one boring (MW-10) offsite to a depth of approximately 37.5 feet bgs. Soil samples were collected and the boring was subsequently converted into a monitoring well. First groundwater was encountered at approximately 26 feet bgs. No TPH-g, BTEX or methyl tertiary butyl ether (MTBE) was detected in soil samples at concentrations above their respective LRLs in MW-10. TPH-g and BTEX were not detected in the groundwater sample from MW-10 at concentrations above their respective LRLs. However, MTBE was detected at concentration of 13 µg/L using EPA Method 8020 (PEG, 1997).

1998 UST and Associated Piping and Dispenser Removal: In August 1998, Environmental Resolutions, Inc. (ERI) removed the three gasoline USTs (6,000-gallon, 10,000-gallon, and 12,000-gallon), one 6,000-gallon diesel UST, and associated dispensers and piping from the site. There was no visible evidence of leakage from the USTs removed. A total of eight native soil samples were collected from beneath each end of the removed USTs (denoted as A through H on **Figure 2**) at depths of 14 to 16 feet bgs, and a total of 18 soil samples (denoted as I through Z on **Figure 2**) were collected from the former dispenser locations and from beneath the associated product lines at three feet bgs (ERI, 1998).

TPH-g was reported in five of the eight UST excavation samples at concentrations ranging from 3.7 mg/kg (S-15-T2S) to 5,300 mg/kg (S-15-T1S). TPH-d was detected at 630 mg/kg (S-15-T1N) and 800mg/kg (S-15 T1S) into two samples, benzene concentrations ranged between 0.40 mg/kg (S-15-T1N) to 0.95 mg/kg (S-16-T3N) in three samples, MTBE concentrations ranged between 0.028 mg/kg (S-14-T4S) to 5.3 mg/kg (S-16-T3N) in seven samples, and lead was not reported in the sample analyzed for lead. TPH-g was reported in nine of the eighteen dispenser and product line samples with concentrations ranging between 1.4 mg/kg (S-3-PL12) to 7,200 mg/kg (S-3-D4). TPH-d was detected between 4.8 mg/kg (S-3-PL12) to 190 mg/kg (S-3-PL11) in five samples, benzene was detected between 0.0089 mg/kg (S-3-PL12) to 22 mg/kg (S-3-D4) in three samples and MTBE was detected between 0.048 mg/kg (S-3-PL12) to 15 mg/kg (S-3-PL1) in ten samples (ERI, 1998).

During the 1998 UST replacement activities, approximately 389 tons of soil and backfill were transported off-site disposal. The existing 10,000-gallon diesel and three 12,000-gallon gasoline USTs were installed as replacements (ERI, 1998).

1999 Groundwater Recovery Test: In April 1999, Alisto Engineering Group (Alisto) conducted groundwater recovery tests on wells MW-1 through MW-4, MW-6, MW-7 and MW-10 to assess the spatial variation in hydraulic conductivity in the shallow water-bearing zone across the Site. Testing by the Bouwer-Rice method yielded hydraulic conductivities of 2.46 x 10^{-2} ft/min for MW-1, 2.42 x 10^{-4} ft/min for MW-2, 3.82 x 10^{-4} ft/min for MW-3, 5.75 x 10-4 ft/min for MW-4, 1.99 x 10^{-2} ft/min for MW-6 1.09 x 10^{-4} ft/min for MW-7 and 8.78 x 10^{-5} ft/min for MW-10. The geometric mean of the hydraulic conductivity and flow velocity values were calculated to be 1.37 x 10-5 feet per second and 73.85 feet per year, respectively (Alisto, 1999).

1999 Extraction Well Installation: In November 1999, Cambria Environmental Technology, Inc. (Cambria) installed two 4-inch diameter wells (EX-1 and EX-2) on-site to facilitate potential remedial activities at the site. Well EX-1 was drilled to 39.5 feet bgs and EX-2 was drilled to 36.5 feet bgs. Groundwater was first encountered at 26 feet bgs. No TPH-G or BTEX, and relatively low MTBE concentrations (below 0.012 mg/kg) were reported in soil samples collected from EX-1 and EX-2 (Cambria, 2000).

2000 Interim Remedial Action and Recovery Testing: Between March 16 and April 30, 2000, Cambria conducted interim remedial activities at the site to evaluate the effectiveness of hydrocarbon and MTBE reduction using short-term groundwater extraction. During eight extraction events, approximately 10,900 gallons of groundwater was extracted from wells EX-1, EX-2 and MW-2. During the extraction events, stable to slightly decreasing hydrocarbon and MTBE concentration trends were reported in samples collected from wells MW-2 and EX-1, located immediately southwest of the existing USTs. Samples from well EX-2, located north of the existing USTs, exhibited lower hydrocarbon and MTBE concentrations than MW-2 and EX-1. In April 2000, during the batch extraction events, recovery tests were conducted on wells EX-1, EX-2 and MW-2. Based on the recovery test measurements, the calculated hydraulic conductivity values ranged from 1.85 x 10^{-4} ft/min to 8.33 x 10^4 ft/min with resulting flow velocities of 16 ft/year to 73 ft/year at well MW-2 (Cambria, 2000).

The calculated hydraulic conductivity values ranged from 2.02 x 10^{5} ft/min to 3.85 x 10^{-5} ft/min for well EX-1 with resulting flow velocities of 1.8 to 3.4 Ft/yr. And a well EX-2, the calculated hydraulic conductivity values ranged from 3.04 x 10^{-4} ft/min to 2.13 x 10^{-3} ft/min for resulting flow velocities of 27 ft/year to 187 ft/year. The geometric mean of these values is a hydraulic conductivity of 3.0 x 10^{-4} ft/min and resulting flow velocity of 26 ft/year (Cambria, 2000).

2001 Dual-Phase Extraction Pilot Test: From October 29, through November 2, 2001, Cambia performed a dual phase soil vapor and groundwater extraction (DPE) pilot test on the monitoring wells with the highest historical hydrocarbon concentrations (i.e., MW-2 and MW-4) and the extraction wells (EX-1 and EX-2) at the site. The DPE test results indicated that the vacuum influence was limited to within 18 to 28 feet of the extraction well. Water levels typically decreased several feet in the extraction wells and had a varied response in the observation wells. Estimated vapor-phase removal rates were approximately 200-pounds of hydrocarbon per day in wells MW-4 and EX-1, and less than 5-pounds of hydrocarbon per day in wells MW-2 and EX-2 (Cambria 2002).

Soil vapor concentrations showed a decreasing trend in wells MW-4 and EX-1 during the short-term pilot tests. Grab water samples collected before and after the pilot tests remained the same order of magnitude. A total of 6,500 gallons of water was extracted during the DPE pilot test and appropriately disposed off-site. Overall, the test results indicated that DPE is a feasible remedial alternative for the site (Cambria, 2002). Alameda County Environmental Health (ACEH) approved Cambria's August 8, 2002, *Dual Phase Extraction Pilot Test Report* as a Corrective Action Plan (CAP).

2005 Soil and Water Investigation: In Fall 2005, URS completed nine Geoprobe soil borings with co-located Hydropunch borings. The first phase of work was on-site source area characterization: five boring locations (A-1 through A-5) were advanced in the vicinity of the possible hydrocarbons source areas such as locations of former and current USTs, products dispensers, and in the vicinity of MW-4 to adequately characterize the lateral and vertical extent of petroleum hydrocarbons in soils in the identified source areas. An off-site assessment was completed during the second phase of work (borings A-7 through A-10) to further define the downgradient, cross-gradient, and up-gradient extent of the groundwater plume (soil boring A-6 was unable to be advanced due to close proximity to electric lines and product piping). Maximum concentrations of gasoline range organics (GRO), benzene, and MTBE were detected in soil at concentrations of 490 mg/kg [A-4 (23.5-24')], 0.11 mg/kg [A-5 (35-35.5')], and 0.84 mg/kg [A-1 (46-46.5')], respectively. Maximum concentrations of GRO, benzene, and MTBE were detected in ground water at concentrations of 510,000 µg/L [A-2 (21.3')], 11,000 µg/L [A-4 (34-36')], and 39,000 ug/L [A-4 (34-36')], respectively (URS, 2005).

The cross-gradient and downgradient lateral extents of the dissolved hydrocarbon plume were characterized during the last investigation. However, the vertical extent of the dissolved-phase hydrocarbons on the southern portion of the site was not defined. Specifically, significantly elevated concentrations were detected in Hydropunch groundwater samples collected from the bottom depths of soil borings A-2, A-3 and A-4. The bottom Hydropunch sample from boring A-2 (40-42 ft bgs) contained concentrations of GRO, benzene, and MTBE at 36,000 µg/L. 1,800 µg/L, and 110 µg/L, respectively. The bottom Hydropunch sample from boring A-3 (34-36 ft bgs) contained concentrations of GRO, benzene, and MTBE at 12,000µg/L, 21µg/L, and 8.3µg/L respectively. The bottom Hydropunch sample from boring A-4 (34-36 ft bgs) contained GRO, benzene, and MTBE concentrations of 120,000µg/L, 11,000µg/L and 39,000 µg/L respectively (URS, 2005).

Therefore, the vertical extent of dissolved phase petroleum hydrocarbon contamination remains unknown in this southern area of the site (URS, 2005). A work plan for soil and water investigation to delineate the vertical extent of contamination in the southern portion of the site was submitted to ACEH in October 2006.

2007 Soil and Groundwater Investigation: In April 2007, Stratus Environmental, Inc. (Stratus) advanced cone penetrometer test (CPT) borings in three locations onsite (CPT-1 through CPT-3) to maximum depths of 60 feet bgs. CPT-1 was advanced southwest of the dispenser islands and southeast of monitoring well MW-1; CPT-2 was advanced south of the dispenser islands and southwest of monitoring well MW-4; CPT-3 was advanced in the eastern corner of the side as requested by the ACEH. An Ultraviolet Induced Fluorescence (UVIF) module was used at each CPT boring location, analyzing the vertical extent of petroleum hydrocarbons in additional to providing soil profiling data. Groundwater samples were collected from multiple depths at each boring locations; physical soil samples were not collected during this investigation.

- GRO was detected above laboratory reporting limits in five of the seven groundwater samples, ranging from 170 µg/L (CPT-3-28-32') to 170,000 µg/L (CPT-1-37-41').
- Benzene was detected above laboratory reporting limits in four of the seven groundwater samples, ranging from 0.51 µg/L (CPT-3-23-27') to 7,700 µg/L (CPT-2-37-41').
- Toluene was detected above laboratory reporting limits in three of the seven groundwater samples, ranging from 57 µg/L (CPT-1-30-34') to 670 µg/L (CPT-2-28-32').

- Ethylbenzene was detected above laboratory reporting limits in four of the seven groundwater samples, ranging from 530 µg/L (CPT-2-37-41') to 2,600 µg/L (CPT-1-37-41').
- Total xylenes were detected above laboratory reporting limits in four of the seven groundwater samples, ranging from 290 µg/L (CPT-2-37-41') to 9,600 µg/L (CPT-1-37-41').
- MTBE was detected above laboratory reporting limits in five of the seven groundwater samples, ranging from 4.4 µg/L (CPT-3-56-60') to 6,500 µg/L (CPT-2-37-41').
- TBA was detected above laboratory reporting limits in groundwater sample CPT-2-37-41' at 2,400 µg/L.

2007-2008 DPE System Installation: Construction of the DPE system was started by Broadbent & Associates, Inc (BAI) and Stratus in late 2007. The system consists of a thermal/catalytic oxidizer with a 25 horsepower liquid ring blower designed to extract water and vapor from six on-site extraction wells. Extracted vapor were to be treated by thermal/catalytic oxidation and discharged to the atmosphere under the oversight of the Bay Area Air Quality Management District. Extracted groundwater was to be treated by a sediment filter and three 1,000 pounds carbon vessels before being discharged into the City of Oakland sanitary sewer system. DPE wells DPE-1 through DPE-5 were installed at the site to total depths ranging from 35 feet to 40 feet bgs. Well MW-2 was overdrilled and destroyed to allow DPE-4 to be installed in the same borehole. The system is currently connected to six wells (DPE-1 through DPE-5 and EX-1) (BAI, 2008a).

As of the end of the fourth quarter 2008 the system had not been started. BAI and Stratus were still coordinating with Pacific Gas & Electric (PG&E) to install electrical service to the system. Natural gas was completed to the site and system in third quarter 2008 (BAI, 2008a).

During DPE construction activities, on-site groundwater monitoring well MW-11 was installed to a total depth of 40 feet bgs on the southern corner of the site. Soil samples collected at 20 feet and 30 feet bgs reported maximum concentrations of 1.9 mg/kg GRO and 0.0089 mg/kg benzene. MTBE was not reported above the LRL in either of the soil samples (BAI, 2008a).

2009-2011 DPE System Startup Efforts: In 2009, Antea Group (formerly Delta Consultants) began coordinating with nearby businesses (Eastmont Mall and Burger King) for the 3-phase power source. Due to financial consideration, Antea Group also explored another alternative for the startup of the DPE system, which included reconfiguring the current system for single phase power.

2011-2012 Remedial Action Site Investigation: Antea Group submitted the *Remedial Action Investigation Work Plan*, dated August 03, 2011 to the ACEH. The ACEH approved the proposed scope of work in an agency letter to Antea Group dated September 1, 2011. In October 2011, Antea Group and subcontractors advanced borings C-1 through C-5, and advanced and installed remedial wells SVE-1 and AS-1 per the August 2011 Work Plan. Antea Group submitted a *Remedial Investigation Work Plan Addendum*, dated December 13, 2011 which proposes a postponement of the AS/SVE pilot test described in the August 3, 2011 *Remedial Action Investigation Work Plan* to utilize a new remedial strategy called Plume Stop, a product created by Regenesis. Between March 26 and 30, 2012, Antea Group and Regenesis oversaw subcontractor Vironex inject Plume Stop at nine soil boring locations using direct push technology. Antea Group is currently conducting post injection groundwater monitoring events as outlined in the December 2011 Work Plan Addendum.

2013 Site Investigation: Antea Group conducted a site investigation on October 14 through 18, 2013 including the advancement of nine CPT borings (CPT-4 through CPT-12). The borings were advanced in the vicinity of monitoring well MW-4 in an attempt to evaluate soil contamination in the area in preparation for a feasibility study/corrective action plan. Results of the investigation were reported in the *Site Investigation Report*, dated January 24, 2014.

FREE PRODUCT RECOVERY DURING GROUNDWATER MONITORING EVENTS

Free product was observed in groundwater monitoring well MW-2 between the 1993 and 1998, at thicknesses ranging from 2.60 feet (3/30/1994) to less than 0.01 feet (10/2/1997 to 7/21/1998). When free product was observed in the well, it was removed by bailer. Between 1993 and 1998, a cumulative total of 24.90 gallons of free product had been removed from the well (Alisto, 1998).

Free product was also observed in well MW-4 during the third quarter 2001 (0.03 inches), fourth quarter 2006 (0.11 inches), first quarter 2008 (0.01 inches), and third quarter 2008 (0.05 inches); and in EX-2 during the second quarter 2007 (0.01 inch). With the exception of 1.5 gallons of a free product/water mixture recovered from MW-4 during the third quarter 2008 (BAI, 2008b), free product was not recovered from these wells when observed.

SENSTIVE RECEPTORS

2000 Potential Receptor Survey, Expanded Site Plan and Well Search: In October 2000, Alisto completed a potential receptor survey, prepared an expanded site plan with neighboring property parcel information and underground utilities mapped, and identified wells in the vicinity of the site. A review of the files of the California Department of Water Resources (DWR) was performed to identify all known wells within one-half mile radius of the site. The results of the well search revealed that there were 17 wells other than the on-site monitoring sells. Of these, 11 were offsite monitoring wells; four were cathodic protection wells, one an industrial well, and one an irrigation well for a nearby cemetery. No domestic/municipal water supply wells were identified from review of the DWR files (Alisto, 2000).

2010 Sensitive Receptor Survey: Delta Consultants (Delta) submitted a *Sensitive Receptor Survey* in October 2010. As part of that receptor survey, Delta conducted a records review (environmental database search), a well radius search, and a search for other sensitive receptors which have the potential to be affected by the petroleum hydrocarbon release at the site. Delta's review of the historical aerial photographs indicated that the site in 1939 was primarily used for agricultural purposes with small family residences. In general, the site was developed to the current conditions with the station building in 1974. The historical topographic maps support the indication of residential houses and agriculture in the site region as early as 1915 to 1948. The well search indicated that 10 wells were within a one-mile radius of the site. DWR indicated the presence of 7 wells within a one-mile radius of the site. However, no records were found for the status of these wells as being active or abandoned. The main surface water bodies were Lake Merritt located northwest of the site and San Leandro Bay located west of the site. Several churches, schools and day care centers were located within a one-mile radius of the site. Based on the above identified receptors' distances form the site, directions from the site, and extent of hydrocarbon impact at the site, they were not anticipated to be affected by the petroleum hydrocarbon release at the site.

Appendix B

Well Logs

SITE/LOCATION 7210 Bancroft Avenue, Oakland, CA	BEGUN 12/27/91	BORING DIAMETER 8 Inches	GLE/BEARING 90 Degrees	BORING NO MW-1
DRILLING CONTRACTOR Bayland Drilling	COMPLETED 12/27/91	FIRST ENCOUNTERED WATER DEPTH 28 Feet		
OPERATOR Tom Schmidt	LOGGED BY T. Lane	STATIC WATER DEPTH/DATE 29 Feet		
DRILL MAKE & MODEL CME 75	SAMPLING METHOD California modified split spoon			BOTTOM OF BORING 40 Feet
WELL MATERIAL 2" SCH 40 PVC	SLOT SIZE 0.020"	FILTER PACK #2/16	WELL SEAL Neat cement over bentonite	WELL NO. MW-1

FIELD HEADSPACE *	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
	1					ASPHALT
	2					BASEROCK
	3					Silty CLAY (CL) dark brown, low plasticity, 20-25% silt, trace fine to coarse sand, trace pebble gravel, dry.
	4					
0.0	5					Sandy CLAY (CL) yellow-brown, low plasticity, 30-35% fine sand, trace pebble gravel, trace rootlets, moist.
	6					
	7					Gravelly SAND (SW) med. brown, well graded, medium to coarse grained, 15% sub-rounded pebble gravel, moist.
	8					
	9					Silty CLAY (CL) medium brown, low plasticity, 15-20% silt, trace medium sand, damp.
0.0	10					
	11					
	12					
	13					
	14					Sandy CLAY (CL) medium brown, low plasticity, 35-40% fine sand, trace rounded pebble gravel, wet.
0.0	15					
	16					
	17					Silty CLAY (CL) medium yellow-brown, low plasticity, 15-20% silt, trace angular pebble gravel, trace charcoal fragments, wet.
	18					
	19					
0.0	20					
	21					
	22					
	23					
	24					
0.0	25					Gravelly CLAY (CL) medium brown, low plasticity, 10-15% pebble gravel, damp.
	26					
	27					
	28		▽			
* PID (ppm)	29		▼			
	30					

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE:

APPROVED BY: Frederick G. Moss, PE No. 35162

SOIL BORING LOG MW-1
AND
WELL CONSTRUCTION MW-1

BP Oil Station No. 11117
7210 Bancroft Avenue
Oakland, CA

PLATE
A-2

JOB NO.
9-029

SITE/LOCATION 7210 Bancroft Avenue, Oakland, CA	BEGUN 12/27/91	BORING DIAMETER 8 Inches	ANGLE/BEARING 90 Degrees	BORING NO MW-1
DRILLING CONTRACTOR Bayland Drilling	COMPLETED 12/27/91	FIRST ENCOUNTERED WATER DEPTH 28 Feet		
OPERATOR Tom Schmidt	LOGGED BY T. Lane	STATIC WATER DEPTH/DATE 29 Feet		
DRILL MAKE & MODEL CME 75	SAMPLING METHOD California modified split spoon			BOTTOM OF BORING 40 Feet
WELL MATERIAL 2" SCH 40 PVC	SLOT SIZE 0.020"	FILTER PACK #2/16	WELL SEAL Neat cement over bentonite	WELL NO. MW-1

FIELD HEADSPACE *	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
	31					Gravelly CLAY (CL) medium brown, low plasticity, 20-30% sub-rounded coarse gravel, wet.
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					
	41					
	42					
	43					
	44					
	45					
	46					
	47					
	48					
	49					
	50					
	51					
	52					
	53					
	54					
	55					
	56					
	57					
	58					
*PID (ppm)	59					
	60					

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE:

APPROVED BY: Frederick G. Moss, PE No. 35162

SOIL BORING LOG MW-1
AND
WELL CONSTRUCTION MW-1

BP Oil Station No. 11117
7210 Bancroft Avenue
Oakland, CA

PLATE
A-3

JOB NO. -
9-029

HUNTER
ENVIRONMENTAL SERVICES, INC.

587 Center Avenue, Suite 350
Martinez, California 94553
415-372-3637

LOG OF BORING NO. MW-3

PAGE 1 of 2

PROJECT NO: 02-401-002

DATE: 12/6/89

CLIENT: TOPA

REF. ELEV. --

SITE LOCATION: EASTMONT MALL
OAKLAND, CA.

METHOD: HOLLOW STEM AUGER

BORING LOCATION: SEE FIG 1

HOLE DIA: 8"

DRILLER: GREGG DRILLING & TESTING

LOGGED BY: J. BRYSON

SUPERVISOR: S. WICKHAM Susan Wickham P.G.#3677

DEPTH (FT)	GRAPHIC LOG	BLOW/FT	VAPOR (PPM)	SAMPLE TYPE AND DEPTH	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	WELL CONSTRUCTION
0						3" Asphalt @ Surface	
2					CL	CLAY, black-grey, stiff, slightly moist, some silt, no odor.	
4			ND	RING @ 5'	CL	SILTY CLAY, brown, stiff, slightly moist, trace of gravel, no odor.	
6							
8							
10			ND	RING @ 10'	CL	As above, some medium sand to coarse gravel.	
12							
14			ND	RING @ 15'	SM	SILTY SAND, brown, some clay & gravel, medium to coarse grained, medium dense, slightly moist, no odor.	
16							
18							
20			ND	RING @ 20'	SM	As above.	
22							
24			ND	RING @ 25'	SW	SAND, brown with silt and small gravel, moist, medium dense, no odor.	
26							
28							

Completed By: HUNTER ENVIRONMENTAL SERVICES, INC. December 6, 1989	SOIL BORING LOG MW-3 AND WELL CONSTRUCTION MW-3 BP Oil Station No. 11117 7210 Bancroft Avenue Oakland, CA	PLATE A-6 JOB NO. 9-029

HUNTER
ENVIRONMENTAL SERVICES, INC.
597 Center Avenue, Suite 350
Martinez, California 94553
415-372-3637

LOG OF BORING NO. MW-3 PAGE 2 of 2
PROJECT NO: 02-401-002 DATE: 12/6/89
CLIENT: TOFA REF. ELEV. —
SITE LOCATION: EASTMONT MALL METHOD: HOLLOW STEM AUGER
OAKLAND, CA.
BORING LOCATION: SEE FIG 1 HOLE DIA: 8"
DRILLER: GREGG DRILLING & TESTING
LOGGED BY: J. BRYSON
SUPERVISOR: S. WICKHAM Stuart Wickham RG-3551

DEPTH (FT)	GRAPHIC LOG	BLOW/FT	VAPOR (PPM)	SAMPLE TYPE AND DEPTH	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	WELL CONSTRUCTION
29			ND	RING @ 30'	SW	As above.	
31							
33							
35			ND	RING @ 35'	SW	As above, moist.	
37						▽	
39						As above, saturated.	
41							
43						CLAY, silty, light brown, firm, slightly moist, no odor.	
45						TOTAL DEPTH = 45'	
47						Well Construction: 2" (0.02") slotted PVC 45'-30'; blank 2" PVC 30'-0; #3 lonestar sand 45'-25'; bentonite 25'-3'; cement 3'-0.	
49							
51							
53							
55							
57							

Completed By:

HUNTER
ENVIRONMENTAL SERVICES, INC.

December 6, 1989

SOIL BORING LOG MW-3
AND
WELL CONSTRUCTION MW-3

BP Oil Station No. 11117
7210 Bancroft Avenue
Oakland, CA

PLATE
A-7

JOB NO.
9-029

SITE/LOCATION 7210 Bancroft Avenue, Oakland, CA	BEGUN 7/22/92	BORING DIAMETER 8 Inches	ANGLE/BEARING 90 Degrees	BORING NO MW-4
DRILLING CONTRACTOR Bayland Drilling	COMPLETED 7/22/92	FIRST ENCOUNTERED WATER DEPTH 31 Feet		
OPERATOR Frank Bartolovich	LOGGED BY T. Ramirez	STATIC WATER DEPTH/DATE 32.5 Feet		
DRILL MAKE & MODEL CME 55	SAMPLING METHOD California modified split spoon			BOTTOM OF BORING 40 Feet
WELL MATERIAL 2" SCH 40 PVC	SLOT SIZE 0.020"	FILTER PACK #2/12	WELL SEAL Neat cement with 5% bentonite over hydrated pellets	WELL NO. MW-4

BLOWS/FOOT	FIELD HEAD-SPACE *	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		1					ASPHALT
		2					BASEROCK
		3					CLAY (CL) medium brown, moderate plasticity, 5-10% medium to coarse sand, dry.
7		4					
24	462	5					Sandy CLAY (CL) light brown, low plasticity, 40% fine to medium angular sand, dry.
24		6					
		7					Sandy CLAY (CL) greenish-brown, moderate plasticity, 30% fine sub-angular to sub-rounded sand, 5-10% silt content, dry.
		8					
4		9					
12	106	10					
23		11					
		12					Sandy CLAY (CL) medium brown, low plasticity, 25-30% fine to coarse angular to sub-rounded sand, occasional gravel clast up to 5cm, dry.
		13					
13		14					
14	464	15					
22		16					
		17					
		18					
		19					
6							
10	442	20					Sandy CLAY (CL) interbedded light brown and dark brown layers. Dark brown sandy clay is 30% fine to medium sand, with moderate plasticity. Light brown sandy clay is 20% fine sand, 10% silt content, with low plasticity. Both are damp, with increasing moisture, clay content and plasticity with depth.
13		21					
		22					
		23					
		24					
3							
13	673	25					
21		26					Clayey SAND (SC) medium brown, fine to medium sub-rounded to rounded sand, 5% gravel with clasts up to 3cm, 15% clay content, moist.
		27					
		28					
	*PID (ppm)	29					
		30					

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE:

APPROVED BY: Frederick G. Moss, PE No. 35162

SOIL BORING LOG MW-4
AND
WELL CONSTRUCTION MW-4

BP Oil Station No. 11117
7210 Bancroft Avenue
Oakland, CA

PLATE
A-8

JOB NO.
9-029

SITE/LOCATION: 7210 Bancroft Avenue, Oakland, CA	BEGUN: 7/22/92	BORING DIAMETER: 8 Inches	ANGLE/BEARING: 90 Degrees	BORING NO: MW-4
DRILLING CONTRACTOR: Bayland Drilling	COMPLETED: 7/22/92	FIRST ENCOUNTERED WATER DEPTH: 31 Feet		
OPERATOR: Frank Bartolovich	LOGGED BY: T. Ramirez	STATIC WATER DEPTH/DATE: 32.5 Feet		
DRILL MAKE & MODEL: CME 55	SAMPLING METHOD: California modified split spoon			BOTTOM OF BORING: 40 Feet
WELL MATERIAL: 2" SCH 40 PVC	SLOT SIZE: 0.020"	FILTER PACK: #2/12	WELL SEAL: Neat cement with 5% bentonite over hydrated pellets	WELL NO.: MW-4

BLOWS/FOOT	FIELD HEAD-SPACE *	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
13	691	31		▽			Sandy CLAY (CL) medium brown, low plasticity,
50/6		32					30% fine to coarse, sub-angular to rounded sand,
		33		▼			occasional gravel clast up to 2cm, moist to wet.
6		34					CLAY (CL) dark brown, high plasticity, wet.
8		35					
9		36					Silty SAND (SM) grey to light brown, fine to
		37					medium sand, 10% gravel up to 5cm, sub-rounded
		38					to rounded clasts, 20% silt content, saturated.
3		39					CLAY (CL) med. brown, moderate plasticity, approx.
6		40					5% rounded medium sand, wet.
8		41					
		42					
		43					
		44					
		45					
		46					
		47					
		48					
		49					
		50					
		51					
		52					
		53					
		54					
		55					
		56					
		57					
		58					
	*PID (ppm)	59					
		60					

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE:

APPROVED BY: Frederick G. Moss, PE No. 35162

SOIL BORING LOG MW-4
AND
WELL CONSTRUCTION MW-4

BP Oil Station No. 11117
7210 Bancroft Avenue
Oakland, CA

PLATE
A-9

JOB NO.
9-029

SITE/LOCATION 7210 Bancroft Avenue, Oakland, CA	BEGUN 7/23/92	BORING DIAMETER 8 Inches	ANGLE/BEARING 90 Degrees	BORING NO MW-6
DRILLING CONTRACTOR Bayland Drilling	COMPLETED 7/23/92	FIRST ENCOUNTERED WATER DEPTH 31.5 Feet		
OPERATOR Kurt Voss	LOGGED BY T. Ramirez	STATIC WATER DEPTH/DATE 31.5 Feet		
DRILL MAKE & MODEL CME 75	SAMPLING METHOD California modified split spoon			BOTTOM OF BORING 40 Feet
WELL MATERIAL 2" SCH 40 PVC	SLOT SIZE 0.020"	FILTER PACK #2/12	WELL SEAL Neat cement with 5% bentonite over hydrated pellets	WELL NO. MW-6

BLOWS/FOOT	FIELD HEAD-SPACE *	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
	*PID (ppm)	1					ASPHALT
		2					CLAY (CL) dark brown, high plasticity, 10% sub-angular to sub-rounded fine to medium sand, moist.
4		3					
6		4					Sandy CLAY (CL) dark brown, high plasticity, 25% fine to coarse sand with occasional gravel clasts up to 3cm, dry.
9	0.0	5					
		6					CLAY (CL) light brown, moderate plasticity, 5-10% fine sand, dry.
		7					
		8					
6		9					
9							
15	0.0	10					Sandy CLAY (SC) dark brown, high plasticity, 20% fine to coarse angular to sub-rounded sand, occasional gravel clasts up to 4cm, dry.
		11					
		12					
		13					
5		14					
12							
16	0.0	15					Sandy CLAY (CL) yellow brown, moderate plasticity, 20% fine to medium sand, 10% silt content, occasional gravel clasts up to 8cm, dry.
		16					
		17					
		18					
8		19					
12							
15	0.0	20					Sandy CLAY (CL) light brown, moderate plasticity, 40% fine to coarse sand, occasional angular to sub-rounded gravel clasts up to 10 cm, moist.
		21					
		22					
		23					
10		24					Sandy CLAY (CL) same as above except only 25% sand content.
13							
16	0.0	25					
		26					
		27					
		28					Gravelly CLAY (CL) medium brown, 25% angular to sub-rounded gravel clasts up to 5cm, 20% fine to coarse sand, decrease gravel and sand content with depth, moist.
9		29					
16							
20	0.0	30					

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE:

APPROVED BY: Frederick G. Moss, PE No. 35162

SOIL BORING LOG MW-6
AND
WELL CONSTRUCTION MW-6

BP Oil Station No. 11117
7210 Bancroft Avenue
Oakland, CA

PLATE
A-12

JOB NO.
9-029

SITE/LOCATION	BEGUN	BORING DIAMETER	ANGLE/BEARING	BORING NO
7210 Bancroft Avenue, Oakland, CA	7/23/92	8 Inches	90 Degrees	MW-6
DRILLING CONTRACTOR	COMPLETED	FIRST ENCOUNTERED WATER DEPTH		
Bayland Drilling	7/23/92	31.5 Feet		
OPERATOR	LOGGED BY	STATIC WATER DEPTH/DATE		
Kurt Voss	T. Ramirez	31.5 Feet		
DRILL MAKE & MODEL	SAMPLING METHOD			
CME 75	California modified split spoon			BOTTOM OF BORING 40 Feet
WELL MATERIAL	SLOT SIZE	FILTER PACK	WELL SEAL	WELL NO.
2" SCH 40 PVC	0.020"	#2/12	Neat cement with 5% bentonite over hydrated pellets	MW-6

BLOWS/FOOT	FIELD HEAD-SPACE *	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		31		▼			
		32					Silty CLAY (CL) yellow-brown, 30% silt content, 10% sub-angular to sub-rounded gravel clasts up to 10cm, approx. 5% medium to coarse sand, increase sand content with depth, wet.
4		33					
12		34					
20		35					
		36					
		37					Sandy GRAVEL (GP) light brown, gravel clasts up to 7cm, 30% fine to coarse sand, 10% silt content, saturated.
5		38					
9		39					Silty SAND (SM) light grey, fine to medium sand with <5% coarse sand, 35% silt content, saturated.
15		40					
		41					
		42					
		43					
		44					
		45					
		46					
		47					
		48					
		49					
		50					
		51					
		52					
		53					
		54					
		55					
		56					
		57					
		58					
	*PID (ppm)	59					
		60					

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE:

APPROVED BY: Frederick G. Moss, PE No. 35162

SOIL BORING LOG MW-6
AND
WELL CONSTRUCTION MW-6

BP Oil Station No. 11117
7210 Bancroft Avenue
Oakland, CA

PLATE
A-13

JOB NO.
9-029

SITE/LOCATION: BP/7210 Bancroft Ave, Oakland	GUN: 10/6/94	BORING DIAMETER: 8"	ANGLE: 90	RING	BORING NO: MW-7
DRILLING CONTRACTOR: West Hazmat Drilling Corp.	COMPLETED: 10/6/94	FIRST ENCOUNTERED WATER DEPTH: 31.0' damp			BOTTOM OF BORING: 45.0'
MAKE & MODEL: Mobile B-57	OPERATOR: Eugene Nunes	LOGGED BY: F. Maroni	STATIC WATER DEPTH/DATE: 43.67' 10/10/94		WELL NO.: MW-7
WELL MATERIAL: PVC Sch 40	SLOT SIZE: 0.020"	SAMPLING METHOD: CA Modified Split Spoon			BOTTOM OF WELL: 45.0'
FILTER PACK: #3 Monterey Sand	WELL SEAL: Bentonite				PLANNED USE: Monitoring

BLOWS/FOOT	PID FIELD HEADSPACE (ppm)	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		1–4					3" Asphalt over baserock; Gravel (GP) with some reddish brown clay.
		3–4					Silty CLAY (CL); very dark brown, stiff, dry.
88	0.0	5–9					Sandy CLAY (CL); yellow brown, very stiff; trace very fine grained sand, dry.
65	0.0	10–12					Sandy CLAY (CL); reddish brown, iron oxide deposits, black streaks like coal, well graded coarse grained, subangular to angular sand; few gravel, dry.
		13–14					Clayey SAND (SC); brown, well graded coarse sand, some subangular to angular gravel, some fine-grained sand, moist.
90	0.0	15–19					Gravelly CLAY (CL); brown, iron oxide deposits, some coarse gravel, few coarse sand.
57	0.0	20–24					Sandy CLAY (CL); brown, medium stiff, well graded coarse sand, some angular to subangular gravel, dry.
50 w/ 5" rec.	0.0	25–26					Encountered rock/gravel (GP) at 25.5 feet. Drilled out to 26.5 ft.
50 w/ 10" rec.		MW-7-25' 27–30					Sandy CLAY (CL); brown, stiff, well graded, subangular to angular, coarse grained sand; some fine grained angular gravel; few fine grained sand.

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE: 11/2/94

APPROVED BY: SP

SOIL BORING LOG AND WELL CONSTRUCTION DIAGRAM

MW-7

PLATE C-1

SHEET 1 OF 2

JOB NO. 9-029

SITE/LOCATION BP/7210 Bancroft Ave, Oakland	RUN 10/6/94	BORING DIAMETER 8"	ANGLE/BEARING 90°	BORING NO MW-7
DRILLING CONTRACTOR Hazmat Drilling Corp.	COMPLETED 10/6/94	FIRST ENCOUNTERED WATER DEPTH 31.0' damp		BOTTOM OF BORING 45.0'
RIG MAKE & MODEL Mobile B-57	OPERATOR Eugene Nunes	LOGGED BY F. Maroni	STATIC WATER DEPTH/DATE 43.67' 10/10/94	WELL NO. MW-7
WELL MATERIAL PVC Sch 40	SLOT SIZE 0.020"	SAMPLING METHOD CA Modified Split Spoon		BOTTOM OF WELL 45.0'
FILTER PACK #3 Monterey Sand	WELL SEAL Bentonite			PLANNED USE Monitoring

BLOWS/ FOOT	PID FIELD HEADSPACE (ppm)	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		31					Sandy CLAY (CL); brown, stiff, medium to coarse grained, subangular to subrounded sand; some fine grained to coarse grained, angular to subangular gravel, damp.
		32					
		33					
		34					
50 w/ 6" rec.	0.0	35					CLAY (CL); yellowish brown, very stiff, damp.
		36					
		37					
		38					
		39					
85 w/ 8" rec.	0.0	40					Silty CLAY (CL); yellowish orange, very stiff, moist.
		41					
		42					Gravelly CLAY (CL); yellowish brown, fine to coarse grained angular gravel; some medium to coarse grained sand, moist.
		43		▼			
		44					
82		45					CLAY (CL); yellowish brown, trace fine grained sand.
							T.D. = 45.0"

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE: 11/3/94

APPROVED BY: GP

SOIL BORING LOG AND WELL CONSTRUCTION DIAGRAM

MW-7

PLATE C-1

SHEET 2 OF 2

JOB NO. 9-029

SITE/LOCATION: BP/7210 Bancroft Ave, Oakland	BEGUN: 10/6/94	BORING DIAMETER: 8"	ANGLE BORING: 90°	BORING NO: MW-8
DRILLING CONTRACTOR: West Hazmat Drilling Corp.	COMPLETED: 10/6/94	FIRST ENCOUNTERED WATER DEPTH: 32.0'		BOTTOM OF BORING: 40.0'
DRILL MAKE & MODEL: Mobile B-57	OPERATOR: Eugene Nunes	LOGGED BY: F. Maroni	STATIC WATER DEPTH/DATE: 28.51' 10/10/94	WELL NO.: MW-8
WELL MATERIAL: PVC Sch 40	SLOT SIZE: 0.020"	SAMPLING METHOD: CA Modified Split Spoon		BOTTOM OF WELL: 40.0'
FILTER PACK: #3 Monterey Sand	WELL SEAL: Bentonite			PLANNED USE: Monitoring

BLOWS/FOOT	PID FIELD HEADSPACE (ppm)	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		1					Sandy topsoil (OL/OH); brown.
		2					Silty CLAY (CL); dark gray, very stiff, dry.
		3					
		4					
		5					
		6					Silty CLAY (CL); light brown, stiff; trace fine grained sand, dry.
		7					
		8					
		9					
90	0.0	10					Sandy CLAY (CL); light brown; some fine to coarse grained sand, some fine-grained, angular to subangular gravel, trace coarse grained gravel; trace silt, dry.
		11					
		12					
		13					
		14					
50 w/ 6" rec.	0.0	15					Gravely CLAY (CL); light brown; some fine to coarse grained, well graded, subangular to subrounded gravel, some well graded, medium grained sand, moist.
		16					
		17					
		18					
		19					
80	0.0	20					Sandy CLAY (CL); light brown, some fine-grained sand, moist.
		21					
		22					
		23					
		24					
50 w/ 6" rec.	0.0	MW-8-25' 25					Sandy GRAVEL (GW); fine to coarse grained, well graded gravel; some fine to coarse grained, well-graded sand; trace clay, moist to wet.
		26					
		27					
		28		▼			
		29					
		30					

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

SOIL BORING LOG AND WELL CONSTRUCTION DIAGRAM

MW-8

PLATE C-1

SHEET 1 OF 2

JOB NO. 9-029

DATE: 11/3/94

APPROVED BY: GP

SITE/LOCATION BP/7210 Bancroft Ave		BEGUN 10/6/94	BORING DIAMETER 8"	ANG[illegible]EARING 90°	BORING NO MW-8
DRILLING CONTRACTOR West Hazmat Drilling Corp.		COMPLETED 10/6/94	FIRST ENCOUNTERED WATER DEPTH 32.0'		BOTTOM OF BORING 40.0'
RILL MAKE & MODEL Mobile B-57	OPERATOR Eugene Nunes	LOGGED BY F. Maroni	STATIC WATER DEPTH/DATE 28.51' 10/10/94		WELL NO. MW-8
WELL MATERIAL PVC Sch 40	SLOT SIZE 0.020"	SAMPLING METHOD CA Modified Split Spoon			BOTTOM OF WELL 40.0'
FILTER PACK #3 Monterey Sand	WELL SEAL Bentonite				PLANNED USE Monitoring

BLOWS/FOOT	PID FIELD HEADSPACE (ppm)	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		31		▽			As above.
35 w/ 6" rec.		32 33 34 35 36 37 38 39					Clayey SAND (SC); brown, medium grained, well-graded sand; some clay; few fine grained, subrounded gravel, wet.
40 w/ 6" rec.		40					As above.
							T.D. = 40.0'

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE: 11/2/94

APPROVED BY: CP

SOIL BORING LOG AND WELL CONSTRUCTION DIAGRAM

MW-8

PLATE C-1

SHEET 2 OF 2

JOB NO. 9-029

SITE/LOCATION BP/7210 Bancroft Ave, Oakland	RUN 10/6/94	BORING DIAMETER 8"	ANGLE/B NG 90°	BORING NO MW-9
DRILLING CONTRACTOR W Hazmat Drilling Corp.	COMPLETED 10/6/94	FIRST ENCOUNTERED WATER DEPTH 27.5'		BOTTOM OF BORING 40.0'
DR MAKE & MODEL Mobile B-57	OPERATOR Eugene Nunes	LOGGED BY F. Maroni	STATIC WATER DEPTH/DATE 28.45' 10/10/94	WELL NO. MW-9
WELL MATERIAL PVC Sch 40	SLOT SIZE 0.020"	SAMPLING METHOD CA Modified Split Spoon		BOTTOM OF WELL 40.0'
FILTER PACK #3 Monterey Sand	WELL SEAL Bentonite			PLANNED USE Monitoring

BLOWS/FOOT	PID FIELD HEADSPACE (ppm)	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		1–9					Backfill; GRAVEL (GP); cobble-sized.
		4–9					CLAY (CL); reddish brown, stiff, dry.
80	0.0	10–14					CLAY (CL); light brown, hard, trace fine grained sand, dry.
90	0.0	15–19					Silty CLAY (CL); light brown, hard, dry.
80	0.0	20–24					As above, moist.
70	0.0	25–30	MW-9-25'	▽ 27 ▼			Clayey SAND (SC); brown; fine to medium grained, well graded, rounded to subrounded, moist.

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE: 11/2/94

APPROVED BY: CP

SOIL BORING LOG AND WELL CONSTRUCTION DIAGRAM

MW-9

PLATE C-1

SHEET 1 OF 2

JOB NO. 9-029

SITE/LOCATION	BEGUN	BORING DIAMETER	ANGLE BEARING	BORING NO
BP/7210 Bancroft Ave, Oakland	10/6/94	8"	90	MW-9
DRILLING CONTRACTOR	**COMPLETED**	**FIRST ENCOUNTERED WATER DEPTH**		**BOTTOM OF BORING**
West Hazmat Drilling Corp.	10/6/94	27.5'		40.0'
DRILLING MAKE & MODEL	**OPERATOR**	**LOGGED BY**	**STATIC WATER DEPTH/DATE**	**WELL NO.**
Mobile B-57	Eugene Nunes	F. Maroni	28.45' 10/10/94	MW-9
WELL MATERIAL	**SLOT SIZE**	**SAMPLING METHOD**		**BOTTOM OF WELL**
PVC Sch 40	0.020"	CA Modified Split Spoon		40.0'
FILTER PACK	**WELL SEAL**			**PLANNED USE**
#3 Monterey Sand	Bentonite			Monitoring

BLOWS/FOOT	PID FIELD HEADSPACE (ppm)	DEPTH	SAMPLE	WATER LEVEL	WELL CONSTR.	GRAPHIC LOG	MATERIAL CLASSIFICATION & PHYSICAL DESCRIPTION
		31					Clayey SAND (SC); brown, fine-grained, well-graded, subrounded to rounded sand; few fine to coarse grained, angular to subrounded gravel, wet.
		32					
		33					
		34					Gravelly CLAY (CL); brown, fine grained, well graded, subangular to subrounded gravel; some fine grained sand, wet.
70		35					
		36					
		37					
		38					
		39					
		40					As above.
							T.D. = 40.0'

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

DATE: 11/2/94

APPROVED BY: CP

SOIL BORING LOG AND WELL CONSTRUCTION DIAGRAM

MW-9

PLATE C-1

SHEET 2 OF 2

JOB NO. 9-029

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	EX-1
JOB/SITE NAME	BP-11117	DRILLING STARTED	30-Nov-99
LOCATION	7210 Bancroft Avenue, Oakland, California	DRILLING COMPLETED	30-Nov-99
PROJECT NUMBER	852-1546	WELL DEVELOPMENT DATE (YIELD)	30-Nov-99
DRILLER	V&W Drilling	GROUND SURFACE ELEVATION	Not Surveyed
DRILLING METHOD	Hollow-stem auger	TOP OF CASING ELEVATION	NA
BORING DIAMETER	10"	SCREENED INTERVAL	18 to 38 ft bgs
LOGGED BY	J. Jones	DEPTH TO WATER (First Encountered)	26.0 ft (30-Nov-99)
REVIEWED BY	K. Rahman, RG	DEPTH TO WATER (Static)	20.55 ft (30-Nov-99)
REMARKS	Hand augered to 5' bgs; located 5' from well MW-2.		

TPHg (mg/kg)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
							ASPHALT.		
							Silty GRAVEL; (FILL); light brown; dry; 5% clay, 35% silt, 20% sand, 40% gravel; low plasticity; moderate to high estimated permeability.	1.0	
	4 7 7	EX-1@6'		5			@ 5' - medium dense.		Portland Type I/II
							SAND; (SW); tan; loose; moist; 10% silt, 85% medium grained sand, 5% gravel; high estimated permeability.		
	4 4 5	EX-1@11'		10					
							Sandy Silty GRAVEL; (GM); brown; dense; moist; 5% clay, 35% silt, 15% medium grained sand, 45% angular gravel up to 2"; high estimated permeability.	13.0	4" diam., Schedule 40 PVC
<1.0	20 50	EX-1@15.5'		15	GM				Bentonite Seal
									Lonestar Sand #2/12
	14 17 20	EX-1@21'		20			@ 20' - olive brown; damp; 10% medium grained sand, 50% angular gravel up to 0.5".		
<1.0							Gravelly Silty SAND; (SM); brown; dense; wet; 5% clay, 35% silt, 40% coarse grained sand, 20% gravel; high estimated permeability.	23.0	
	20 50	EX-1@25.5'		25	SM				
							Sandy Silty GRAVEL; (GM); olive; dense; wet; 20% silt, 35% sand, 45% gravel; high estimated permeability.	28.0	4"-diam., 0.010" Slotted Schedule 40 PVC
	20 50	EX-1@30.5'		30	GM				
							Sandy Silty CLAY; (CL); see next page.	33.0	
				35					

11117--1\GINT\BP-11117.GPJ DEFAULT GDT 4/24/00

WELL LOG (TPH-G) H:\BR

Cambria Environmental Technology, Inc.
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BORING/WELL LOG

CLIENT NAME	BP Oil Company	**BORING/WELL NAME**	EX-1
JOB/SITE NAME	BP-11117	**DRILLING STARTED**	30-Nov-99
LOCATION	7210 Bancroft Avenue, Oakland, California	**DRILLING COMPLETED**	30-Nov-99

Continued from Previous Page

TPHg (mg/kg)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
	17 23 33	EX-1@36'			CL		Sandy Silty CLAY: (CL); brown mottled with black; hard; damp; 45% clay, 35% silt, 20% very fine grained sand; low plasticity; low estimated permeability.		
	12 50/6	EX-1@39'						39.5	Bottom of Boring @ 39.5 ft

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BORING/WELL LOG

CLIENT NAME	BP Oil Company	BORING/WELL NAME	EX-2
JOB/SITE NAME	BP-11117	DRILLING STARTED	30-Nov-99
LOCATION	7210 Bancroft Avenue, Oakland, California	DRILLING COMPLETED	30-Nov-99
PROJECT NUMBER	852-1546	WELL DEVELOPMENT DATE (YIELD)	30-Nov-99
DRILLER	V&W Drilling	GROUND SURFACE ELEVATION	Not Surveyed
DRILLING METHOD	Hollow-stem auger	TOP OF CASING ELEVATION	NA
BORING DIAMETER	10"	SCREENED INTERVAL	15 to 35 ft bgs
LOGGED BY	J. Jones	DEPTH TO WATER (First Encountered)	26.0 ft (30-Nov-99)
REVIEWED BY	K. Rahman, RG	DEPTH TO WATER (Static)	22.64 ft (30-Nov-99)

REMARKS: Hand augered to 5' bgs; located between trash enclosure and UST slab.

TPHg (mg/kg)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)
							ASPHALT.	
							Silty Sandy GRAVEL; (FILL); brown; dry; 5% clay, 15% silt, 20% sand, 50% gravel; high estimated permeability.	1.0
	10 12 14	EX-2@6'		5	ML		Sandy SILT; (ML); orange brown; very stiff; dry; 5% clay, 55% silt, 30% sand, 10% gravel; low plasticity; moderate estimated permeability.	4.0
							Sandy Silty GRAVEL; (GM); brown; dense; dry; 5% clay, 20% silt, 25% sand, 50% gravel; high estimated permeability.	8.0
<1.0	13 15 18	EX-2@11'		10	GM			
	20 50	EX-2@15.5'		15				
							Silty SAND; (SM); brown; dense; damp; 25% silt, 70% medium grained sand, 5% gravel; high estimated permeability.	18.0
<1.0	26 55	EX-2@20.5'		20	SM			
							Silty Sandy GRAVEL; (GP); brown; dense; wet; 15% silt, 20% medium to coarse grained sand, 65% gravel; high estimated permeability.	23.0
	18 26 30	EX-2@26'		25	GP			
	10 13 26	EX-2@31'		30				
							Sandy Silty CLAY; (CL); light brown; hard; damp; 45% clay, 35% silt, 20% very fine grained sand; low plasticity; low estimated permeability.	30.5
					CL			
				35				

WELL DIAGRAM: Portland Type I/II; 4" diam., Schedule 40 PVC; Bentonite Seal; Lonestar Sand #2/12; 4"-diam., 0.010" Slotted Schedule 40 PVC

11117--1\GINT\BP-11117.GPJ DEFAULT.GDT 4/24/00

WELL LOG (TPH-G) H:\BR\

Cambria Environmental Technology, Inc.
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BORING/WELL LOG

CLIENT NAME	BP Oil Company	**BORING/WELL NAME**	EX-2
JOB/SITE NAME	BP-11117	**DRILLING STARTED**	30-Nov-99
LOCATION	7210 Bancroft Avenue, Oakland, California	**DRILLING COMPLETED**	30-Nov-99

Continued from Previous Page

TPHg (mg/kg)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
	10 13 32	EX-2@36'						36.5	Bottom of Boring @ 36.5 ft

SOIL BORING LOG **Boring No. MW-11** **Sheet: 1 of 2**

Client	ARCO 11117	Date	November 20, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	
Well Pack	sand: 40 ft. to 13 ft	Well Construction	Casing Material: Schedule 40 PVC Screen Interval: 15 ft. to 40 ft.
	bent.: 13 ft. to 10 ft.		Casing Diameter: 4 in. Screen Slot Size: 0.020-in.
	grout: 10 ft. to 0 ft.	Depth to GW:	▽ first encountered static ▼

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
						1		Cleared to 5' bgs with air knife	
						2			
						3			
						4			
						5	CL		
S	MW-11 5'	13	1000	100				Sandy clay, CL, dark yellowish brown, (10YR 3/4), dry, hard	0
		17				6		low plasticity, 60% clay, 40% medium to coarse sand	
		24				7			
						8			
						9			
						10			
S	MW-11 10'	8	1005	100					
		13				11			
		24				12	SM	Silty sand with clay, SM, olive grey, (5Y 4/3), moist, dense	0
								75% coarse grained sand, 15% silt, 10% clay	
						13			
						14			
						15			
S	MW-11 15'	15	1025	100				Clayey sand, SC, dark olive grey, (5Y 3/2), moist, dense	0
		18				16		80% coarse grained sand, 20% clay	
		28				17	SC		
						18			
						19			
						20	GC		

Recovery

Sample

Comments:

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. MW-11** **Sheet: 2 of 2**

Client	ARCO 11117	Date	November 20, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
S	MW-11 20'	15 19	1035	100		21		Clayey gravel, GC, dark olive grey, (5Y 3/2), wet, dense 80% medium graiend gravel, 15% clay	0
		24				22			
						23			
						24			
						25			
S	MW-11 25'	8 12	1040	0		26		No recovery	0
		24				27			
						28	GC		
						29			
						30			
S	MW-11 30'	8 24	1055	100		31		Clayey gravel, GC, dark olive grey, (5Y 3/2), wet, very dense 85% fine gravel, 15% clay	0
		30				32			
						33			
						34			
						35			
S	MW-11 35'	13 33	1105	100		36		becomes 75% fine to medium graiend gravel, 15% clay, 10% coarse sand	0
		36				37			
						38			
		5				39			
S	MW-11 40'	15 25	1125	100		40		Poorly graded sand, SP, dark olive grey, (5Y 3/2), wet, very dense 100% medium grained sand	

Comments:

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. DPE-1** **Sheet: 1 of 2**

Client	ARCO 11117	Date	November 19, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	
Well Pack	sand: 40 ft. to 13 ft	Well Construction	Casing Material: Schedule 40 PVC Screen Interval: 15 ft. to 40 ft.
	bent.: 13 ft. to 10 ft.		Casing Diameter: 4 in. Screen Slot Size: 0.020-in.
	grout: 10 ft. to 0 ft.	Depth to GW:	▽ first encountered static ▼

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
						1		Cleared to 5' bgs with air knife	
						2			
						3			
						4			
						5	CL		
S	DPE-1 5'	10 20 30	1240	100		6		Clay, CL, dark yellowish brown, (10YR 4/4), dry, hard, medium plasticity 100% clay	0
						7			
						8			
						9			
						10			
S	DPE-1 10'	12 14 16	1245	100		11	GM	Silty Gravel with clay, GM, dark yellowish brown, (10YR 4/6), moist medium dense, 75% medium gravel, 15% silt, 10% clay	0
						12			
						13			
						14			
						15			
S	DPE-1 15'	18 27 27	1250	100		16	GP	Poorly graded gravel with sand, GP, dark grayish brown, (2.5Y 4/2), moist very dense, 80% fine gravel, 20% coarse sand	0
						17			
						18			
						19			
						20	CL		

Recovery

Sample

Comments:

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. DPE-1** **Sheet: 2 of 2**

Client	ARCO 11117	Date	November 19, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
S	DPE-1 20'	7 14 20	1255	100		21 22 23 24 25	CL	Silty clay with sand, CL, dark yellowish brown, (10YR 4/6), moist, hard low plasticity, 60% clay, 30% silt, 10% sand	0
S	DPE-1 25'	10 16 22	1300	100		26 27 28 29 30	GM	Silty gravel with sand, GM, light olive brown, (2.5Y 5/3), wet, dense 70% fine gravel, 20% silt, 10% medium sand same as above	0
S	DPE-1 30'	5 7 12	1305	100		31 32 33 34 35	CL	Clay, CL, light olive brown, (2.5Y 5/2), wet, very stiff, medium plasticity 100% clay	0
S	DPE-1 35'	7 15 22	1310	100		36 37 38 39		becomes yellowish brown, (10YR 5/4)	0
S	DPE-1 40'		1315	100		40		becomes silty clay, CL, 80% clay, 20% silt	

Comments:

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. DPE-2** **Sheet: 1 of 2**

Client	ARCO 11117	Date	November 21, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	
Well Pack	sand: 40 ft. to 13 ft	Well Construction	Casing Material: Schedule 40 PVC Screen Interval: 15 ft. to 40 ft.
	bent.: 13 ft. to 10 ft.		Casing Diameter: 4 in. Screen Slot Size: 0.020-in.
	grout: 10 ft. to 0 ft.	Depth to GW:	▽ first encountered static ▼

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
						1		Cleared to 5' bgs with air knife	
						2			
						3			
						4			
						5			
S	DPE-2 5'	10	0835	100		6		Sandy clay, CL, dark yellowish brown, (10YR 4/6), dry, hard	0
		23						medium plasticity, 65% clay, 35% medium to coarse sand	
		33				7			
						8			
						9			
						10	CL		
S	DPE-2 10'	10	0850	100		11		same as above	0
		10							
		15				12			
						13			
						14			
						15			
S	DPE-2 15'	9	0900	100		16		Sandy clay, CL, dark olive brown, (2.5Y 3/3), moist, hard, low plasticity	0
		15						60% clay, 40% medium sand	
		20				17			
						18			
						19			
						20	SC ▽		

Recovery

Sample

Comments:

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. DPE-2** **Sheet: 2 of 2**

Client	ARCO 11117	Date	November 21, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
S	DPE-2 20'	7 11	910	100		21	SC	Clayey sand with gravel, SC, very dark grey, (5Y 3/1), wet, dense 70% medium grained sand, 20% clay, 10% fine grained gravel	0
		24				22			
						23			
						24			
						25			
S	DPE-2 25'	7 18	915	100		26		Clayey gravel with sand, GC, olive grey, (5Y 4/2), wet, very dense 75% medium grained gravel, 15% clay, 10% coarse grained sand	0
		34				27			
						28			
						29			
						30			
S	DPE-2 30'	10 18	930	100		31	GC	same as above, but with hydrocarbon odor	0
		27				32			
						33			
						34			
						35			
S	DPE-2 35'	14 26	940	100		36		same as above	0
		34				37			
						38			
		14				39			
S	DPE-2 40'	20 32	950	100		40	SM	Silty sand, SM, olive grey, (5Y 4/2), wet, very dense 80% medium grained sand, 20% silt	0

Comments:

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. DPE-3** **Sheet: 1 of 2**

Client	ARCO 11117	Date	November 20, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	
Well Pack	sand: 40 ft. to 11 ft	Well Construction	Casing Material: Schedule 40 PVC Screen Interval: 13 ft. to 38 ft.
	bent.: 11 ft. to 8 ft.		Casing Diameter: 4 in. Screen Slot Size: 0.020-in.
	grout: 8 ft. to 0 ft.	Depth to GW:	▽ first encountered static ▼

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
						1		Cleared to 5' bgs with air knife	
						2			
						3			
						4			
						5			
S	DPE-3 5'	5	1345	100		6		Sandy clay, CL, dark yellowish brown, (10YR 3/6), dry, hard	0
		10						medium plasticity, 75% clay, 25% medium grained sand	
		25				7	CL		
						8			
						9			
						10			
S	DPE-3 10'	8	1350	100		11		becomes, olive brown, (2.5Y 4/4), moist	0
		18							
		18				12			
						13			
						14			
						15			
S	DPE-3 15'	13	1355	100		16		Clayey gravel, GC, dark olive grey, (5Y 3/2), moist, very dense	0
		26						85% medium grained gravel, 15% clay	
		27				17	GC		
						18			
						19			
						20	▽		

Recovery

Sample

Comments:

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. DPE-3** **Sheet: 2 of 2**

Client	ARCO 11117	Date	November 20, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
S	DPE-3 20'	12 20 26	1400	100		21 22 23 24 25		Clayey gravel with sand, GC, dark olive grey, (5Y 3/2), wet, dense 75% medium grained gravel, 15% clay, 10% coarse grained sand	0
S	DPE-3 25'	11 13 23	1410	100		26 27 28 29 30	GC	same as above	0
S	DPE-3 30'	9 14 19	1420	100		31 32 33 34 35	SP	same as above Poorly graded fine sand, SP	0
S	DPE-3 35'	5 6 6	1425	100		36 37 38 39	GP	Poorly graded gravel, GP, dark olive grey, (5Y 3/2), wet, medium dense 100% medium gravel	0
S	DPE-3 40'		1430	100		40		same as above	0

Comments:

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. DPE-4** **Sheet: 1 of 3**

Client	ARCO 11117	Date	November 19, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	
Well Pack	sand: 45 ft. to 13 ft	Well Construction	Casing Material: Schedule 40 PVC Screen Interval: 15 ft. to 40 ft.
	bent.: 13 ft. to 10 ft.		Casing Diameter: 4 in. Screen Slot Size: 0.020-in.
	grout: 10 ft. to 0 ft.	Depth to GW:	▽ first encountered static ▼

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
						1		Cleared to 5' bgs with air knife	
						2			
						3			
						4			
						5			
						6			
						7			
						8			
						9			
						10			
						11			
						12			
						13			
						14			
						15			
						16			
						17			
						18			
						19			
						20			

Recovery

Sample

Comments: Overdrill existing 2" well to 45' bgs
Set new 4" well at 40' bgs

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. DPE-4** **Sheet: 2 of 3**

Client	ARCO 11117	Date	November 19, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
						21			
						22			
						23			
						24			
						25			
						26			
						27			
						28			
						29			
						30			
S						31			
						32			
						33			
						34			
						35			
S						36			
						37			
						38			
						39			
S						40			0

Comments:

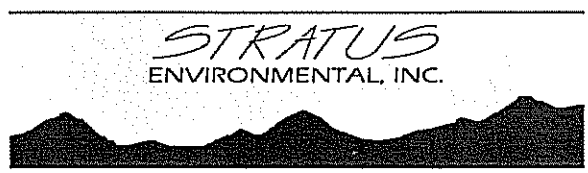
STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. DPE-4** **Sheet: 3 of 3**

Client	ARCO 11117	Date	November 19, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
						41			
						42			
						43			
						44			
						45			
						46			
						47			
						48			
						49			
						50			
S						51			
						52			
						53			
						54			
						55			
S						56			
						57			
						58			
						59			
S						60			0

Comments:



SOIL BORING LOG **Boring No. DPE-5** **Sheet: 1 of 2**

Client	ARCO 11117	Date	November 21, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	
Well Pack	sand: 40 ft. to 13 ft	Well Construction	Casing Material: Schedule 40 PVC Screen Interval: 15 ft. to 40 ft.
	bent.: 13 ft. to 10 ft.		Casing Diameter: 4 in. Screen Slot Size: 0.020-in.
	grout: 10 ft. to 0 ft.	Depth to GW:	▽ first encountered static ▼

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
						1		Cleared to 5' bgs with air knife	
						2			
						3			
						4	CL		
						5			
S	DPE-5 5'	11	1300	100		6		Silty clay, CL, dark yellowish brown, (10YR 3/6), dry, hard, medium plasticity	0
		17						70% clay, 30% silt	
		33				7			
						8			
						9			
						10			
S	DPE-5 10'	8	1305	100		11	SM	Silty sand, SM, olive, (5Y 4/3), dry, medium dense	0
		9						85% medium grained sand, 15% silt	
		13				12			
						13			
						14			
						15			
S	DPE-5 15'	11	1315	100		16		Clayey gravel with sand, GC, dark olive grey, (5Y 3/2), moist, dense	0
		15					GC	75% medium grained gravel, 15% clay, 10% coarse grained sand	
		20				17			
						18			
						19			
						20	SC ▽		

Recovery

Sample

Comments:

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. DPE-5** **Sheet: 2 of 2**

Client	ARCO 11117	Date	November 21, 2007
Address	7210 Bancroft Avenue	Drilling Co.	Woodward Drilling rig type:BK-61
	Oakland, CA	Driller	Norman Hunger
Project No.	E11117-01	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	

Sample Type	Sample No.	Blow Count	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
S	DPE-5 20'	4 7 12	1320	100		21 22 23 24 25	SC	Clayey sand, SC, dark olive grey, (5Y 3/2), wet, medium dense 80% medium grained sand, 20% clay	0
S	DPE-5 25'	7 20 23	1330	100		26 27 28 29 30		Clayey gravel with sand, GC, dark olive grey, (5Y 3/2), wet, dense 75% medium grained gravel, 15% clay, 10% coarse grained sand	0
S	DPE-5 30'	14 27 50/3"	1340	100		31 32 33 34 35	GC	same as above	0
S	DPE-3 35'	15 25 45	1350	100		36 37 38 39		increasing clay content 70% medium grained gravel, 20% clay, 10% coarse grained sand	0
S	DPE-5 40'	17 24 30	1400	100		40		same as above	0

Comments:

STRATUS ENVIRONMENTAL, INC.

Project No:	I42611117	Client:	ELT COP		Well/ Boring ID: SVE-1
Logged By:	Caitlin Morgan	Location:	7210 Bancroft Avenue, Oakland, CA		Page 1 of 1
Driller: Cascade Drilling		Date Drilled:	10/6/2011	Explanation:	
Drilling Method:	GeoProbe w/ Hollow Stem	Hole Diameter:	10"	▼	Static Groundwater Level
Sampling Method:	CA Mod SS	Hole Depth:	22'	▽	First Encountered Water
Casing Type:	Schedule 40 PVC	Well Diameter:	4"		Blank Well Casing
Slot Size:	0.020	Well Depth:	22'		Well Screen
Gravel Pack:	#2/12	Casing Stickup:	NA		Neat Cement Grout
Elevation		Northing		Easting	Bentonite Seal
					Sand Pack

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
									Asphalt to 4"
Neat Cement				Air-knifed to 5 ft	1				
					2				
					3				
					4				
		Moist	1.2		5			CL	**Lean Clay with Sand (CL);** brown
Bentonite					6				
					7				**Sandy Lean Clay (CL);** 60% fines, 40% medium to coarse grained sand
					8				
					9				**As above;** oxidation stains
		Moist	1.6		10				
					11				**Sandy Lean Clay (CL);** medium brown, 70% fines, 30% coarse grained sand
					12				
Sand Pack					13				(Strong odor at 12.5 feet bgs)
		Very Moist							**Sandy Lean Clay (CL);** dark to light brown, 70% fines, 30% fine grained sands, visible contamination
					14				
		Very Moist	4.3		15				**As Above**
					16				
					17				
					18				**As above;** strong odor
	▽				19				
			2497		20				
					21				
					22				
Bentonite					23				
					24				
					26				
					27				
					28				

PROFESSIONAL GEOLOGIST
REGINA M. BUSSARD
No. 8289
EXP. 1/31/14
STATE OF CALIFORNIA

Boring terminated at 28 feet below ground surface (bgs). **Drillers extended to borehole 28 feet bgs by accident.

Project No:	I42611117	Client:	ELT COP	Well/ Boring ID: AS-1	
Logged By:	Caitlin Morgan	Location:	7210 Bancroft Avenue, Oakland, CA	Page 1 of 2	
Driller:	Cascade Drilling	Date Drilled:	10/4/2011	Explanation:	
Drilling Method:	GeoProbe	Hole Diameter:	3 1/4"	▼	Static Groundwater Level
Sampling Method:	Direct Push	Hole Depth:	35'	▽	First Encountered Water
Casing Type:	Teflon/ Stainless Steel	Well Diameter:	0.25"/2"		Blank Well Casing
Slot Size:	0.010"	Well Depth:	34'		Well Screen
Gravel Pack:	#2/12 Sand	Casing Stickup:			Neat Cement Grout
Elevation		Northing		Easting	Bentonite Seal
					Sand Pack

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
				Air Knife to 5 ft	1				Asphalt to 3.5"
					2				
					3				
					4				
Neat Cement		Moist	63.3		5			CL	**Sandy Lean Clay (CL);** medium plasticity, firm
					6				
		Moist	1.3		7				**As Above**
					8				
		Moist	52.5		9				
		Moist	68		10				**Lean Clay (CL);** medium brown,100% fines, low plasticity, trace rounded gravel
					11				
					12				
		Moist	30.8		13				**As Above;** mottled brown, red and green in color
					14				
		Moist	51.2		15				**Sandy Lean Clay (CL);** 60% fines, 40% subangular coarse grained sand
			23.7		16				
					17				
		Very Moist	3.6		18				
	▽				19				
		Sat	73		20				
					21				
			4.6		22				

Project No:	142611117	Client:	ELT COP	Well/ Boring ID: AS-1
Logged By:	Caitlin Morgan	Location:	7210 Bancroft Ave., Oakland, CA	Page 2 of 2
Driller:	Cascade Drilling	Date Drilled:	10/6/2011	
Drilling Method:	GeoProbe	Hole Diameter:	3 1/4"	
Sampling Method:	Direct Push	Hole Depth:	35'	
Casing Type:	Teflon/ Stainless Steel	Well Diameter:	0.25"/2"	
Slot Size:	0.010"	Well Depth:	34'	
Gravel Pack:	#2/12 Sand	Casing Stickup:	NA	
Elevation		Northing		Easting

Explanation:
- Static Groundwater Level
- First Encountered Water
- Teflon Tubing
- Well Screen
- Neat Cement Grout
- Bentonite Seal
- Sand Pack

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Neat Cement / Bentonite / Sand Pack			27.9		23			CL	**Sandy Lean Clay (CL)**
					24				
			57.1		25				As Above
					26				
					27				
					28				
			48.9		29			SP	**Poorly Graded Sand with Gravel (SP)**
					30				
					31				
			1.8		32				
					33			SC	**Clayey Sand (SC);** coarse grained sand

Boring terminated at 35 feet below ground surface (bgs).
2.5 foot rods used due to sticking rods.

PROFESSIONAL GEOLOGIST
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