CONESTOGA-ROVERS & ASSOCIATES

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June 13, 2008

Mr. Jerry Wickham
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250 Alameda,
California 94502-6577

Re: **Well Destruction and Installation Work Plan, Soil Vapor Sampling Work Plan and Hydrographs**
Shell-branded Service Station
1285 Bancroft Avenue
San Leandro, California
SAP Code 136017
Incident No. 98996067
ACHCSA file No. ROOOOO 156

Dear Mr. Wickham:

Conestoga-Rovers & Associates (CRA) prepared this work plan on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell). CRA's February 6, 2008 *Subsurface Investigation Report* recommended properly destroying well MW -3 and installing two replacement wells near MW-3 (one shallow, one deep). Alameda County Health Care Services Agency's (ACHCSA's) April 2, 2008 letter requested this work plan and additionally requested that the work plan cover destruction of wells MW-l, MW-2, and MW-4, installation of replacement wells, a soil vapor sampling proposal, and hydro graphs of existing water level data.

SITE DESCRIPTION AND BACKGROUND

Site Location: The operating Shell-branded service station is located at the northwest comer of Bancroft and Estudillo Avenues in. San Leandro, California (Figures 1 and 2). There are three underground storage tanks (USTs) on site, two dispenser islands, and one station building with three automobile service bays.

Project History: A detailed chronologie description of historical investigative and remedial activities at this site is provided in Attachment A.

Surrounding Land Use: The area surrounding the site is primarily residential.

Local Topography: The site is approximately 65 feet above mean sea level and slopes very gently to the west, toward San Francisco Bay. San Leandro Creek is located approximately 500 feet northwest of the site.

Local Geology: Sediments beneath the site are Quaternary alluvial deposits derived from sedimentary and igneous rocks of the Diablo Range from the Holocene formation. The Hayward Fault Zone lies approximately one mile east of the site. The site is underlain by low estimated permeability sediments (clay and silt) with interspersed moderate estimated permeability sediments.

Groundwater: Groundwater beneath the site typically flows in a south-southwesterly direction with seasonal variations to both the southwest and northwest. Depth to water beneath the site has historically ranged between 23 and 46 fbg.

Technical Rationale for Proposed Scope of Work

- Wells MW-l through MW-4 will be properly destroyed because they are screened over two or more coarse-grained zones and could act as conduits for vertical migration.
- Install two wells (MW-3A and MW-3B) to replace MW-3. Well MW-3A will be a 4-inch diameter well screened in the shallow water-bearing zone approximately 35 to 45 feet below grade (fbg). Well MW-3B will be a 4-inch diameter well screened within the deeper sandy unit encountered below 50 fbg. Proposed well locations are presented on Figure 2.
- Install two 4-inch diameter wells (MW-lA and MW-2A) at the locations of MW-l and MW-2. These wells will be screened in the shallow water-bearing zone approximately 35 to 45 fbg. Proposed well locations are presented on Figure 2.
- No replacement is needed for MW -4 since MW -7 is located approximately 30 feet to the northeast and is screened in the shallow water-bearing zone.
- Install soil vapor probes SVP-l through SVP-4 along the southwestern property boundary and near the onsite commercial building to determine the potential vapor intrusion risk to human health on and offsite. Proposed soil vapor probe boring locations are presented on Figure 2.
- Hydrographs of adjacent shallow and deeper screened wells (MW-3 and MW-5; MW-l and MW -6; MW -4 and MW -7) generally show a neutral to slightly upward groundwater gradient at the site. The hydrographs are presented in Figures 3 through 5.

Work Tasks - Well Destruction

Permit: CRA will obtain the required drilling permits from Alameda County Public Works Agency (ACPW A) for the well destructions.

Health and Safety Plan: CRA will prepare a health and safety plan (HASP) for field work.

Utility Clearance: CRA will mark proposed drilling locations, and the locations will be cleared through Underground Service Alert (USA) prior to drilling.

Monitoring Well Destruction: CRA proposes to properly destroy four monitoring wells (MW-l through MW-4). The wells will be destroyed by backfilling with neat cement under pressure (pressure grouting). The upper 5 feet of each well will then be drilled out. The well vaults will be removed, and the surface pavement will be patched with concrete to match the surrounding grade or re-Iandscaped to match surrounding plantings. CRA's standard field procedures are included as Attachment B, and the available well logs are included in Attachment C. The proposed scope of work described will be performed under the supervision of a professional geologist or engineer.

Report Preparation: Following cqmpletion of the well destructions, CRA will submit a brief report documenting the activities. A Department, of Water Resources (DWR) Well Completion Report form will be completed for each of the destroyed wells and will be submitted to DWR under separate cover.

Work Tasks - Well Installation

Permit: CRA will obtain appropriate permits for drilling from ACPW A.

HASP: CRA will prepare a HASP for field work.

Utility Clearance: CRA will mark the proposed drilling locations, and the locations will be cleared through USA prior to drilling.

Site Investigation: Four monitoring wells (MW-IA, MW-2A, MW-3A and MW-3B) are proposed at the locations shown on Figure 2. The exploratory borings will be drilled using hollow-stem auger equipment and will be converted to groundwater monitoring wells. As discussed above, wells MW-IA, MW-2A, and MW-3A are proposed in the shallow waterbearing zone. Well MW-3B is proposed in the deeper sandy unit encountered below 5G fbg. CRA's standard field procedures are included as Attachment B.

A CRA geologist will supervise the drilling and describe encountered soils using the Unifie,d Soil Classification System. CRA will collect soil samples from the borings at 5-foot intervals for soil description (continuously below 25 fbg in MW-IA, MW-2A, and MW-3A, and continuously below 40 fbg in MW-lB), possible chemical analyses, and organic vapor screening with a photo-ionization detector (PID). CRA will prepare an exploratory boring log for each well and will record PID measurements on the boring logs.

CRA will retain soil samples designated for chemical analyses in stainless steel or brass sample tubes. CRA will cover the tubes on both ends with Teflon sheets and plastic end caps, label the soil samples, enter them onto a chain-of-custody record, and place them into a cooler with ice for transport to a State of California certified laboratory for analyses. We will request a standard 2-week turn-around time for laboratory results.

Monitoring Well Installation: Borings for wells MW-IA, MW-2A, and MW-3A will be drilled to approximately 45 fbg. Based on first quarter 2008 data, first-encountered groundwater is approximately 38 fbg. These wells will target the shallow water-bearing zone. The wells will be constructed using 4-inch diameter Schedule 40 PVC casing. The well screen interval will be from approximately 35 to 45 fbg.

The boring for MW -3B w~ll be drilled to approximately 60 fbg. Based on the boring log for CPT-2 and CPT-3, a sand layer begins app.roximately 50 fbg. MW-3B will target this sand layer. This well will be constructed using 4-inch diameter Schedule 40 PVC casing. The well screen interval will be from approximately 50 to 60 fbg.

The sand-pack in each well will be placed from the bottom of the well screen up to 2 feet above the top of the well screen followed by a 2-foot thick bentonite seal and cement grout to grade. Actual well construction details will be based on soil types and field conditions during drilling. Each well will be secured with a locking cap under a traffic-rated well box. CRA will perform the scope of work described in this work plan under the supervision of a professional geologist or engmeer.

Well Development and Sampling: Blaine Tech Services, Inc. (Blaine) of San Jose, California will develop the new groundwater monitoring wells prior to sampling. After well development, Blaine will sample the site's groundwater monitoring wells according to the existing sampling schedule and submit the samples to a State of California certified laboratory for chemical analyses.

Chemical Analyses: Selected soil samples and groundwater samples from w~lls MW -1 A, MW-2A, MW-3A, and MW-3B will be analyzed for total petroleum hydrocarbons as gasoline, benzene, toluene, ethyl benzene, xylenes, and fuel oxygenates by EP A Method 8260B. Groundwater samples from the other wells (MW-5 through MW-12) will be analyzed per the existing protocol.

Wellhead Survey: Following monitoring well installation, a licensed surveyor will survey wellhead elevations relative to mean sea level and the wells' latitude and longitude.

Report Preparation: Following tht> receipt of soil analytical results from the laboratory, CRA will prepare a written report, which will include field procedures, laboratory results, boring logs, and conclusions. Groundwater sampling will be conducted and reported along with the other site wells during the next quarterly groundwater monitoring event.

Work tasks - Soil Vapor Probe Installation and Sampling

Soil Vapor Probe Installation: Assuming the absence of subsurface obstructions, CRA will advance 4 soil borings (SVP-I through SVP-4) to 5 fbg using an air-knife in the approximate locations shown on Figure 2. After the borings are advanced, fixed vapor-sampling points will be installed in each boring using ~-inch diameter Teflon tubing. Each point will use a 3-inch screen interval manufactured by Geoprobe attached to the Teflon tubing. To ensure the tubing does not curl or kink during installation, CRA will first straighten out each length of tubing priorto installation, and then use a smaH-diameter PVC guide pipe to hold the tubing in place within the boring while packing the annulus with sand. A clean, fine-grained silica sand filter pack will be installed approximately 3 inches below and above the screened interval, and the guide pipe will be lifted as the sand pack is installed to ensure the pack stabilizes the tubing within each boring. The annulus will then be sealed to the surface using bentonite slurry, set atop a two-inch base of bentonite pellets. Each soil probe will be completed at the surface using a traffic-rated well box at grade. At least two weeks following probe installation, soil vapor samples will be collected from each sampling point in summa canisters according to CRA's vapor sampling protocol (Attachment B). Installation and sampling is effected by rain. It is CRA standard procedure to allow 2 days or more after a heavy rain event prior to collecting soil vapor samples.

Chemical Analyses: The soil gas samples will be analyzed by Modified EP A Methods TO-I5 for BTEX, MTBE, TO-3 for TPHg, and leak test compounds isobutane, butane, and propane.

Report Preparation: Following the receipt of analytical results from the laboratory, CRA will prepare a written report for the soil vapor investigation, which will include field procedures, laboratory results, boring logs, and conclusions.

Hydrographs

Hydrographs of adjacent shallow and deeper screened wells are presented in Figures 3 through 5. The hydro graphs present pairs' of wells which are 20 to 30 feet apart (Figure 2). The screened intervals of deeper wells MW-I, MW-3 and MW-4 are 38 to 60, 39 to 59, and 35 to 55 feet, respectively. The screened intervals for shallower wells MW-5, MW-6, and MW-7 are 25 to 50 fbg. The water levels of the. shallower wells are generally at or below those of the deeper wells indicating a neutral to slightly upward vertical gradient.

Schedule

CRA is prepared to implement this work plan upon receiving written approval from ACHCSA.

Closing

If you have any questions regarding the scope of work outlined in this work plan, please call Peter Schaefer at (510) 420-3319.

Sincerely,

Conestoga-Rovers & Associates

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Peter Schaefer, CE
Project Manager

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Figures: 1 - Vicinity Map
2 - Site Plan
3 - Hydrographs of MW -3 and MW-
5 4 - Hydrographs ofMW-l and MW-
6 5 - Hydrographs ofMW-l and MW-
6

Attachments: A - Site History
B - Standard Field Procedures
C - Well Logs

cc: Denis Brown, Shell Oil Products US, 20945 S. Wilmington Ave., Carson, CA 90810

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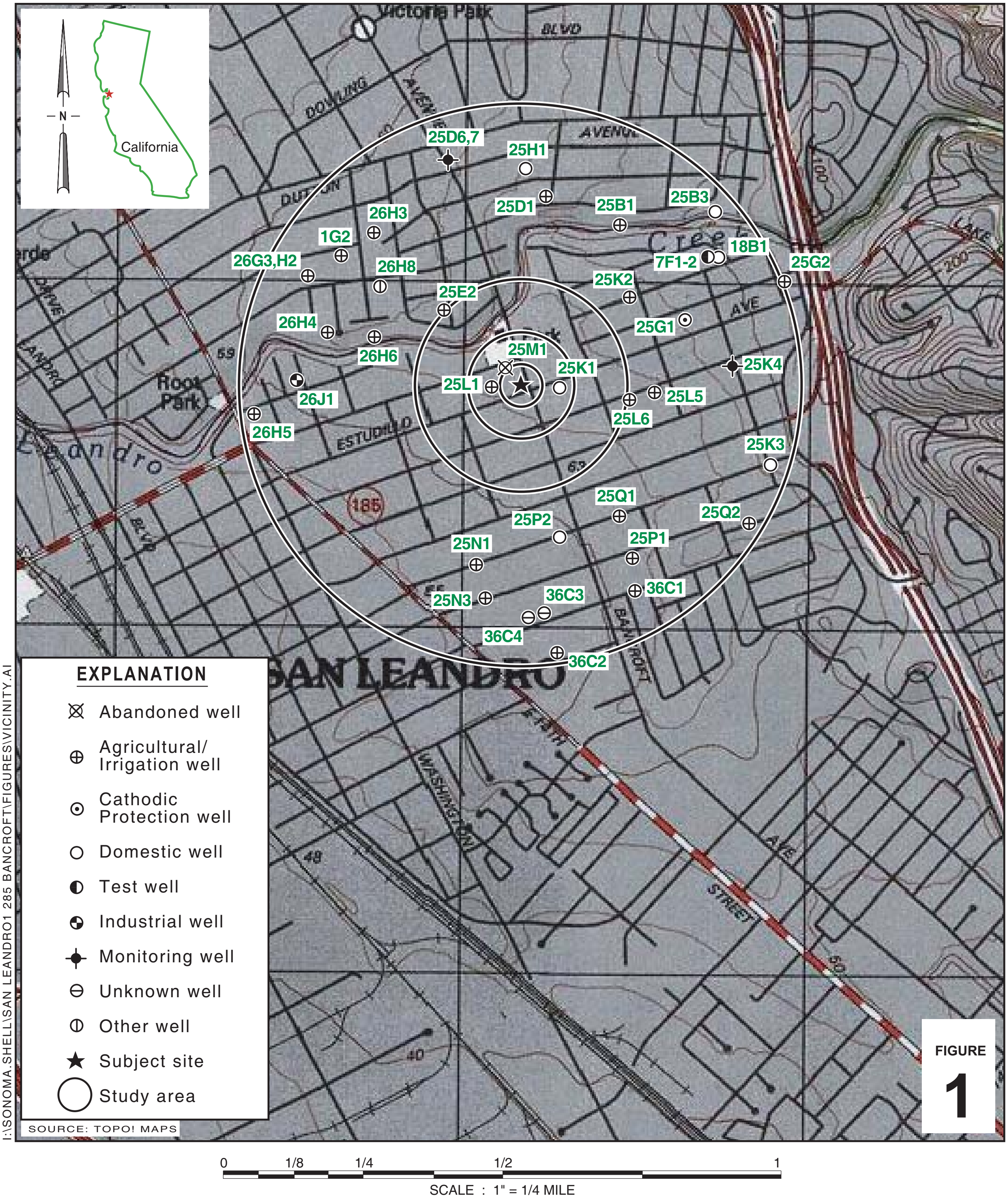

Shell-branded Service Station

1285 Bancroft Avenue

San Leandro, California

Vicinity Map

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FIGURE 2

Site Plan

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Shell-branded Service Station
1285 Bancroft Avenue
San Leandro, California

Figure 3: Shell-Branded Service Station, 1285 Bancroft Ave., San Leandro, CA - Hydrographs of MW-3 and MW-5

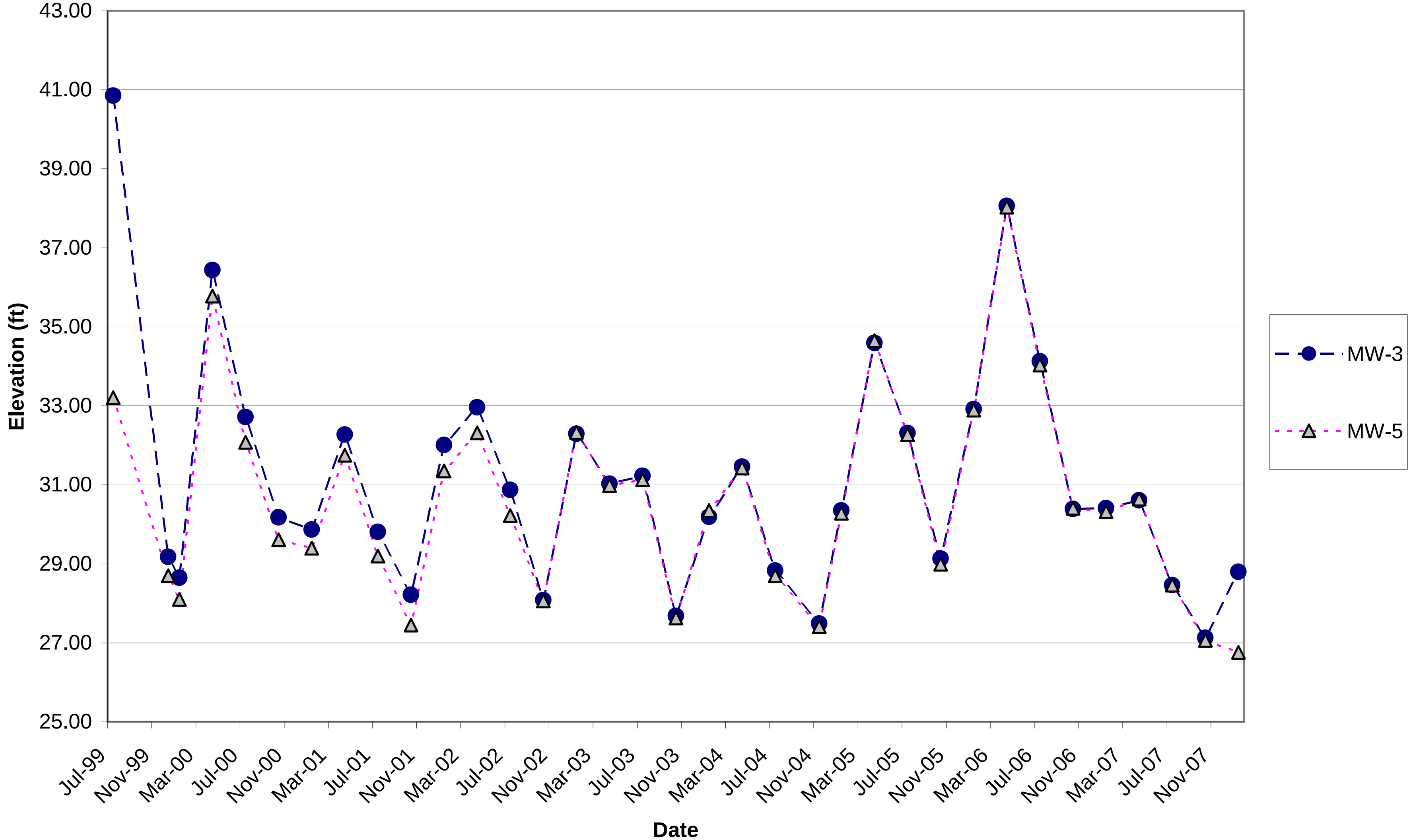
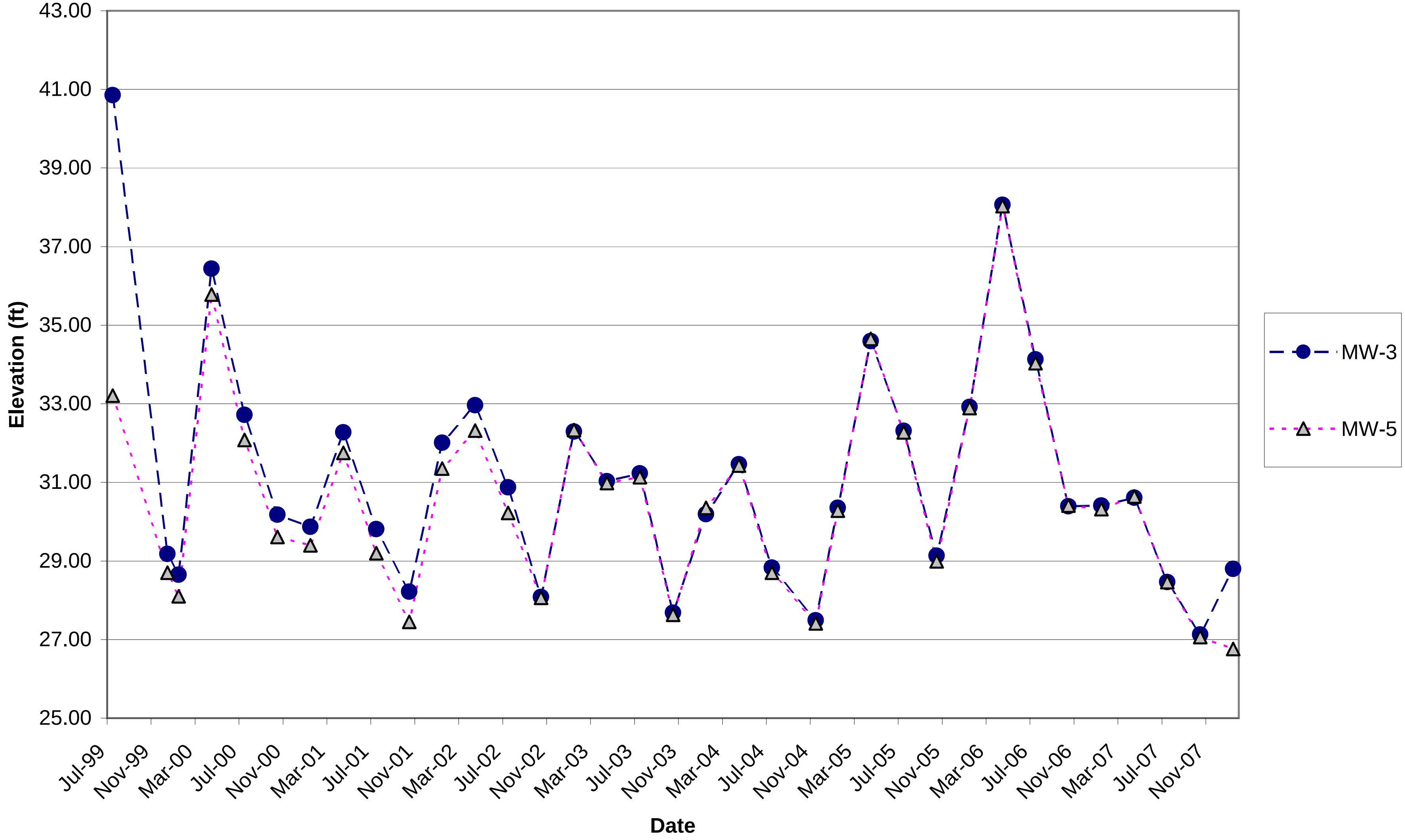


Figure 3: Shell-Branded Service Station, 1285 Bancroft Ave., San Leandro, CA - Hydrographs of MW-3 and MW-5



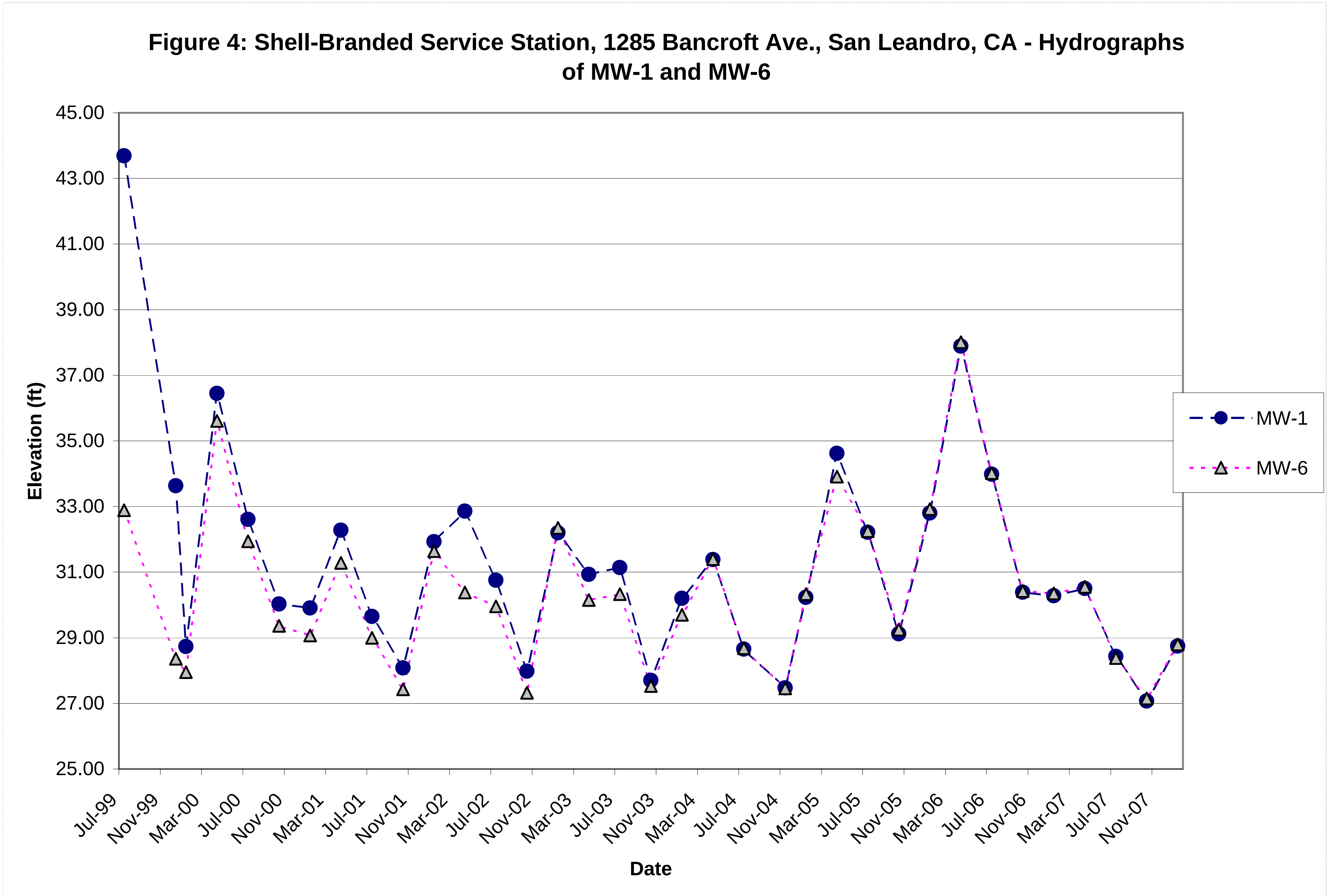


Figure 4: Shell-Branded Service Station, 1285 Bancroft Ave., San Leandro, CA - Hydrographs of MW-1 and MW-6
Elevation (ft)
45.00
43.00
41.00
39.00
37.00
35.00
33.00
31.00
29.00
27.00
25.00
Jul-99
Nov-99
Mar-00
Jul-00
Nov-00
Mar-01
Jul-01
Nov-01
Mar-02
Jul-02
Nov-02
Mar-03
Jul-03
Nov-03
Mar-04
Jul-04
Nov-04
Mar-05
Jul-05
Nov-05
Mar-06
Jul-06
Nov-06
Mar-07
Jul-07
Nov-07
Date
MW-1
MW-6

Attachment A
Site History

1285 BANCROFT, SAN LEANDRO, CA SITE HISTORY

November 1986 Waste-Oil Tank Removal: In November 1986, Petroleum Engineering of Santa Rosa, California removed a 550-gallon waste-oil tank and installed a new 550-gallon fiberglass tank in the former tank pit. Immediately following the tank removal, Blaine Tech Services (Blaine) of San Jose, California collected soil samples beneath the former tank location at 8.75 and 9 fbg. The soil samples contained maximum concentrations of 83 parts per million (ppm) petroleum oil and grease and 583 ppm total oil and grease (TOG). After additional excavation, Blaine collected another soil sample at 9.5 fbg, which contained 89.3 ppm TOG. No groundwater was encountered in the tank pit. No report documenting these activities could be located.

March 1990 Well Installation: In March 1990, Weiss Associates (Weiss) of Emeryville, California advanced a soil boring (BH-A) and converted it to groundwater monitoring well MW-1 adjacent to the waste-oil tank. No petroleum constituents were detected in soil samples analyzed from boring BH-A. Tetrachloroethene (PCE) was detected at 35 parts per billion (ppb). The maximum total petroleum hydrocarbons as gasoline (TPHg) concentration in groundwater from well MW-1 was 510 ppb. Weiss' July 31, 1990 *Second Quarter 2005* letter report documents these activities.

February 1992 Subsurface Investigation: In February 1992, Weiss advanced two soil borings (BH-B and BH-C) upgradient and downgradient of the existing underground storage tanks (USTs) and converted them into monitoring wells MW-2 and MW-3. A maximum TPHg concentration of 8,800 ppm was detected in boring BH-B, which was converted into monitoring well MW-2. No benzene was detected in this investigation. Weiss' April 27, 1992 *Subsurface Investigation* letter report documents these activities.

1992 Well Survey: Weiss included a ½-mile radius well survey with the report of the February 1992 subsurface investigation. A total of 21 wells were identified within ½ mile of the site. One domestic supply well was identified approximately ½ mile northeast (cross gradient) of the site. One domestic or irrigation supply well was also identified within 500 feet west (cross and down gradient) and another within 500 feet east (cross and up gradient) of the site. Weiss' April 27, 1992 *Subsurface Investigation* letter report documents these activities.

February 1994 Subsurface Investigation: In February 1994, Weiss advanced three soil borings (BH-D, BH-E, and BH-F) up gradient and down gradient of the existing USTs. Boring BH-F was converted into monitoring well MW-4. No TPHg was detected in this investigation. A maximum benzene concentration of 0.015 ppm was detected in boring BH-E No report documenting these activities or logs of borings BH-D and BH-E could be located.

October 1995 Dispenser Replacement Sampling: In October 1995, Weiss collected soil samples from beneath the former dispensers. A maximum TPHg concentration of 130 ppm was detected in soil sample D-2A, located 2 fbg beneath the northern dispenser-island. A maximum benzene concentration of 0.31 ppm was detected in soil sample L-1, located 2 fbg beneath the product piping lines on the south end of the site. Weiss' March 5, 1996 *Replacement Sampling Report* documents these activities.

September 1998 and July 1999 through September 1999 Mobile Groundwater Extraction: Mobile groundwater extraction (GWE) was performed at the site on September 2, 1998, and weekly GWE events were performed from July 30, 1999 through September 9, 1999, using wells MW-1, MW-3, and MW-5. Approximately 17.9 pounds of liquid-phase TPHg and 0.77 pounds of methyl tertiary-butyl ether (MTBE) were removed during these activities. No report documenting the mobile groundwater extraction events could be located.

May 1999 Well Installation: In May 1999, Cambria Environmental Technology, Inc. (Cambria) installed groundwater monitoring wells MW-5, MW-6, MW-7, and MW-8. Soil samples collected from boring MW-5 contained maximum concentrations of 10.5 ppm TPHg at 40.5 fbg, 0.0475 ppm benzene at 35.5 fbg, and 2.25 ppm MTBE at 35.5 fbg. Cambria's August 29, 1999 *Well Installation Report* documents these activities.

June 2000 Site Investigation and Risk Based Corrective Action (RBCA) Evaluation: In June 2000, Cambria collected *in-situ* vapor and physical soil property samples and prepared a RBCA analysis of the potential risk to off-site receptors posed by hydrocarbons originating from the site. Six soil borings (B-1 through B-6) were drilled, and soil, soil vapor, and groundwater samples were collected. Soil sample were collected for physical parameter analysis including organic carbon content, moisture content, bulk density, and porosity**.** The risk evaluation showed that the calculated excess cancer risk posed by the site was below the target risk level of 1×10^{-6} and that off-site conditions at the time did not pose a significant risk to off-site occupants directly adjacent to the site. Water was not detected in B-5 and B-6 and groundwater samples could not be collected from B-3 and B-4. Groundwater samples were collected from B-1 and B-2. No TPHg, benzene, or MTBE was detected in the collected groundwater samples. Cambria's June 27, 2001 *Investigation Report and Risk-Based Corrective Action Analysis* documents these findings.

November 2000 through January 2005 Mobile Dual-Phase Vapor Extraction (DVE): In November 2000, Cambria initiated monthly mobile DVE on wells MW-5 and MW-6 to facilitate hydrocarbon and oxygenate removal from groundwater and the vadose zones. Approximately 131.47 pounds of vapor-phase TPHg and 1.23 pounds of vapor-phase MTBE were removed during these activities. Since UST enhanced-vapor-recovery upgrades occurred in January 2005 and because of the lack of marked effect on concentrations in MW-5 and MW-6, mobile DVE was put on hold following the January 17, 2005 event pending an overall evaluation of the site.

April 2002 Enhanced UST Testing: On April 2 and 3, 2002, Shell voluntarily conducted enhanced testing on the USTs at this site. Enhanced testing included a VacuTect Tank Test of tanks under vacuum conditions. When the VacuTect test indicated a problem with the plus tank, the product was immediately transferred out of tank for investigation, which included tank entry for visual inspections and further tank tests. No visible cracks were found, but additional layers of fiberglass were added to suspected problem areas. A passing VacuTect test was conducted. Cambria's October 15, 2002 *Subsurface Investigation Work Plan* indicated that the crack was detected in the secondary containment of the tank, but the tank was actually a single-wall vessel and, as previously mentioned, no crack was detected. A problem with the tank was only found during the VacuTect test, which does not necessarily indicate a leak condition.

August 2003 Soil and Water Investigation and Site Conceptual Model: From August 4 through August 7, 2003, Cambria supervised the advancement of six soil borings (SB-1 through SB-4 offsite and SB-6 and SB-7 onsite). The borings were advanced to a total depth of between 48 and 52.5 fbg to define vertical and lateral migration of the contaminate plume and to determine downgradient monitoring well locations. Soil sample results from the investigation indicated neither hydrocarbons nor MTBE impacts to unsaturated soil in the boring locations. However, the groundwater sample results indicated hydrocarbons and MTBE impacts to groundwater, primarily onsite. The site conceptual model was updated and identified one potential downgradient receptor, irrigation well 2S/3W-25L1 located at 566 Estudillo Avenue, which is discussed below. Cambria’s November 3, 2003 *Soil and Water Investigation Report, Work Plan, and Site Conceptual Model* documents these activities.

October 2003 Sensitive Receptor Survey (SRS): In October 2003, Cambria completed a SRS at Shell’s request. The SRS targeted the following as potential sensitive receptors: basements within 200 feet, surface water, and sensitive habitats within 500 feet, hospitals, residential care and childcare facilities within 1,000 feet, and water wells within ½ mile. No basements were observed within 200 feet, nor was any surface water or sensitive habitats observed within 500 feet. Hospitals, and educational, childcare and residential care facilities were identified at approximately 140, 345, 650, and 670 feet from the site. Bancroft Middle School (1250 Bancroft Avenue) is located approximately 140 feet from the site. The Shelter for Women and Children (1395 Bancroft Avenue) is located approximately 345 feet from the site. Bancroft Convalescent Hospital (1475 Bancroft Avenue) is located approximately 650 feet from the site. Jones Convalescent Hospital (524 Callan Avenue) is located approximately 670 feet from the site.

To update the 1992 well survey performed by Weiss and updated by Cambria in 1998 and 1999, Cambria researched Department of Water Resources (DWR) records in September 2003, and located no additional well records for locations within ½ mile of the site. In addition to numerous wells listed as “irrigation” wells, a number of DWR records identified wells at residential addresses for which no use was listed. The 1992 WA well survey also reviewed Alameda County Public Works well database records, which also listed many of the wells identified in the DWR records search with unknown uses. In the Alameda County listing, several of the wells were listed as “domestic” type wells. Because “domestic” usage may include drinking-water uses, Cambria investigated all three identified downgradient wells within ½ mile with “domestic” usage noted in the Alameda County Public Works database report to clarify their actual use and current status.

The closest identified “domestic” water well (25L1) is an 88-foot deep well installed in 1952, approximately 150 feet southwest of the site. This well is the active irrigation well identified at the adjacent property, 560 Estudillo Avenue. Cambria confirmed that the well is used only for landscape irrigation by interviewing the property manager and by inspecting the well. The next nearest “domestic” well is located approximately 390 feet east of the site (25K1). Cambria interviewed the property owner‘s custodian, who verified the well’s presence, but also verified that the well is not used. The next nearest “domestic” well is located approximately 1,425 feet south of the site (25P2). Cambria met the property owner who verified that the well had not been used since the early 1980’s when the well pump failed.

February 2004 Investigations: Four monitoring wells (MW-9, MW-10, MW-11, and MW-12) and four borings (SB-9, SB-10, SB-11, and SB-12) were installed in February 2004 to define the lateral and vertical extent of MTBE in groundwater and to provide for ongoing groundwater monitoring downgradient of the site. MTBE, TPHg, and benzene, toluene, ethylbenzene, and xylenes (BTEX) were not detected in any soil samples collected during the current investigation with the exception of samples from well locations MW-9 and MW-10. TPHg and benzene were detected only in the soil sample from on-site well MW-9 from a depth of 35 fbg at concentrations of 820 ppm and 1.0 ppm, respectively. MTBE was detected in the MW-9 soil samples at depths of 25 fbg, 30 fbg, and 35 fbg at concentrations of 0.071 ppm, 0.093 ppm, and 1.0 ppm, respectively. MTBE was also detected at a concentration of 0.017 ppm in a soil sample from off-site well MW-10 at a depth of 39.5 fbg. Since groundwater was encountered at approximately 35 fbg during the current investigation, all the hydrocarbon and/or MTBE impacted samples were from saturated soils or from within the capillary fringe, so the results may be more indicative of chemical concentrations in groundwater.

TPHg was detected only in the on-site grab groundwater samples SB-10-W and SB-11-W at concentrations of 1,100 and 2,600 ppb, respectively. Benzene and MTBE were detected only in the on-site grab groundwater sample SB-11-W at concentrations of 9.1 and 76 ppb, respectively. No toluene, ethylbenzene, or xylenes were detected in any of the grab groundwater samples. No groundwater was encountered in SB-12.

Additionally, an inspection of the off-site irrigation well (25L2) located downgradient of the site at 566 Estudillo Avenue was to be conducted by video inspection to evaluate total depth and screen intervals. The inside of the casing was heavily coated with fine-grained material, making it impossible to determine the top of the screen interval. No screen perforations were visible at or above the 31-fbg level of the water. Occasional circular depressions, which could be screen perforations, were observed at approximately 64 fbg. Due to fine-grained debris in the bottom of the well casing, the maximum explorable depth of the well was 79 fbg. The results of this investigation are presented in Cambria's April 29, 2004 *Soil and Water Investigation, Monitoring Well Installation, and Irrigation Well Video Inspection Report.*

2005 Dispenser Upgrade Sampling: During January and February of 2005, Armer/Norman & Associates. Inc. of Pacheco, California upgraded the station's fuel system, including the UST sumps and fuel dispensers. Cambria collected four soil samples beneath the replaced dispensers at depths from 4 to 4.5 fbg. TPHg and BTEX concentrations were below the laboratory detection limits in all dispenser soil samples. MTBE was detected in one soil sample (D-3-4.5) at a concentration of 0.0088 ppm. No other analytes were detected in excess of their laboratory detection limit. The results of this investigation are presented in Cambria's March 23, 2005 *Dispenser Upgrade Sampling Report.*

2006 Waste Oil Tank Removal Sampling: In July 2006, Wayne Perry, Inc. (Wayne Perry) of Sacramento, California removed one 550-gallon, single-wall, fiberglass waste oil UST. Cambria observed no cracks, holes, or corrosion in the UST upon removal. Cambria collected one soil sample (WO-1-11) from the bottom of the UST excavation at a depth of 11 feet below grade using an excavator. Soil sample WO-1-11 contained 64 parts per million (ppm) oil and grease, 1.5 ppm TPHd, 0.075 ppm methylene chloride, 29.6 ppm chromium, 8.18 ppm lead, 40.0 ppm nickel, and 75.4 ppm zinc. Based on these concentrations, Shell submitted an Underground Storage Tank Unauthorized Release (Leak)/Site Contamination Report (Unauthorized Release Report) on July 28, 2006.

2007 Subsurface Investigation: During November and December of 2007 Conestoga-Rovers & Associates, Inc. (CRA) drilled 1 soil boring (SB-16) and 4 cone penetrometer test (CPT) borings (CPT-1 through CPT-4) to define the vertical extent of gasoline compounds and fuel oxygenates in soil and groundwater. Soil samples from soil boring SB-16 contained TPHg, ethylbenzene, xylenes and MTBE at concentrations below SF-RWQCB ESLs. Groundwater grab sampling attempts from the shallow interval (less than 50 fbg) resulted in sample recovery after waiting up to 60 minutes for recharge. The single concentration above non-drinking water SF-RWQCB ESLs was TPHg in on-site boring CPT-2.

Groundwater Monitoring Program: There are six groundwater monitoring wells (MW-1 through MW-5 and MW-9) on site, six groundwater monitoring wells (MW-6, MW-7, MW-8, MW-10, MW-11, and MW-12) off site, and one monitored irrigation well (IW-1) off site. All 13 wells are sampled quarterly for TPHg, MTBE, and BTEX. During the second quarter 2008 sampling event:

- The depth to groundwater measured in the monitoring wells ranged from 30.32 to 37.48 feet below top of well casing. The depth to water in irrigation well IW-1 was measured at 30.32 feet below grade. The groundwater elevations ranged from 29.75 to 30.23 feet above mean sea level.

- Groundwater flows to the southwest at a fairly flat hydraulic gradient of 0.001. This is consistent with previous events for this site.
- TPHg was detected in wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, and MW-9. The maximum concentration observed was 93,000 micrograms per liter (µg/l) in MW-5.
- Benzene was detected in wells MW-2, MW-5, MW-6, and MW-9, at concentrations up to 110 µg/l in well MW-5.
- MTBE was detected in wells MW-4, MW-6, MW-8, MW-9, and MW-10 at concentrations up to 300 µg/l in well MW-6.
- Irrigation well IW-1 did not contain any constituents of concern.

Attachment B
Standard Field Procedures

Conestoga-Rovers & Associates

STANDARD FIELD PROCEDURES FOR MONITORING WELL DESTRUCTION

This document presents standard field methods for properly destroying groundwater monitoring wells. The objective of well destruction is to destroy wells in a manner that is protective of potential water resources. The two procedures most commonly used are pressure grouting and drilling out the well. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Pressure Grouting

Pressure grouting consists of injecting neat Portland cement through a tremie pipe under pressure to the bottom of the well. The cement is composed of about five gallons of water to a 94 pound. sack of Portland VII Cement. Once the well casing is full of grout, it is pressurized for five minutes by applying a pressure of 25 pounds per square inch (psi) with a grout pump. The well casing can also be pressurized by extending the well casing to the appropriate height and filling it with grout. In either case, the additional pressure allows the grout to be forced into the sand pack. After grouting the sand pack and casing, the well vault is removed and the area resurfaced or backfilled as required.

Well Drill Out

When well drill out is required, the well location is cleared for subsurface utilities and a hollow-stem auger (or other appropriate) drilling rig is used to drill out the well casing and filter pack materials. First, drill rods are placed down the well and used to guide the augers as they drill out the well. A guide auger is used in place of the drill rods if feasible. Once the well is drilled out, the boring is filled with Portland cement injected through the augers or a tremie pipe under pressure to the bottom of the boring. The well vault is removed and the area resurfaced or backfilled as required.

1:\misc\Templates\SOPs\ WelI Destruction SOP.doc

Conestoga-Rovers & Associates

STANDARD FIELD PROCEDURES FOR MONITORING WEll INSTAllATION

This document presents standard field methods for drilling and sampling soil borings and installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOil BORINGS

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Professional Geologist (P.G.) or Professional Engineer (P.E.).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe@. Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments at the bottom of the borehole.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent **EP** A-approved detergent.

Sample Analysis

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4° C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory **.**

Field Screening

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize ITom the soil. After ten to fifteen minutes, a portable volatile vapor analyzer measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer measurements are used along with the field observations, odors, stratigraphy and groundwater depth to select soil samples for analysis.

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Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch@ type sampler or are collected from the open borehole using bailers. The groundwater samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

MONITORING WEll INSTAIlATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying

Groundwater monitoring wells are installed to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two feet above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type **I,ll** cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security.

The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for crosscontamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite and covered by plastic sheeting. At least three individual soil samples are collected from the stockpiles and composited at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples in addition to any analytes required by the receiving disposal facility. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Groundwater removed during development and sampling is typically stored onsite in sealed 55-gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Upon receipt of analytic results, the water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

1:\misc\Templates\SOPs\GW well Installation. doc

STANDARD FIELD PROCEDURES FOR SOil VAPOR PROBE INSTAllATION AND SAMPLING

DIRECT PUSH AND VAPOR POINT METHODS

This document describes Conestoga-Rovers & Associates' standard field methods for soil vapor sampling. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil vapor samples are collected and analyzed to assess whether vapor-phase subsurface contaminants pose a threat to human health or the environment.

Direct Push Method for Soil Vapor Sampling

The direct push method for soil vapor sampling uses a hollow vapor probe, which is pushed into the ground, rather than augured, and the stratigraphy forms a vapor seal between the surface and subsurface environments ensuring that the surface and subsurface gases do not mix. Once the desired soil vapor sampling depth has been reached, the field technician installs disposable polyethylene tubing with a threaded adapter that screw into the bottom of the rods. The screw adapter ensures that the vapor sample comes directly from the bottom of the drill rods and does not mix with other vapor from inside the rod or from the ground surface. In addition, hydrated bentonite is placed around the sampling rod and the annulus of the boring to prevent ambient air from entering the boring. The operator then pulls up on the rods and exposes the desired stratigraphy by leaving an expendable drive point at the maximum depth. The required volume of soil vapor is then purged through the polyethylene tubing using a standard vacuum pump. The soil vapor can be sampled for direct injection into a field gas chromatograph, pumped into inert tedlar bags using a "bell jar" sampling device, or allowed to enter a Summa vacuum canister. Once collected, the vapor sample is transported under chain-of-custody to a state-certified laboratory. The ground surface immediately adjacent to the boring is used as a datum to measure sample depth. The horizontal location of each boring is measured in the field relative to a permanent on-site reference using a measuring wheel or tape measure. Drilling and sampling equipment is washed between samples with trisodium phosphate or an equivalent EP A-approved detergent. Once the sampling is completed, the borings are filled to the ground surface with neat cement.

Shallow Soil Vapor Point Method for Soil Vapor Sampling

The shallow soil vapor point method for soil vapor sampling utilizes a hand auger or drill rig to advance a boring for the installation of a soil vapor sampling point. Once the boring is hand augered to the final depth, a 6-inch slotted probe, capped on either end with brass or Swagelok fittings, is placed within 12-inches of number 2/16 filter sand (Figure A). Nylon tubing of \A-inch innerdiameter of known length is attached to the probe. A 2-inch to 12-inch layer of unhydrated bentonite chips is placed on top of the filter pack. Next pre-hydrated granular bentonite is then poured into the hole to approximately and topped with another 2-inch layer of unhydrated bentonite chips or concrete, depending if the boring will hold one probe or multiple probes. The tube is coiled and placed within a wellbox finished flush to the surface. Soil vapor samples will be collected no sooner than one week after installation of the soil-vapor points to allow adequate time for representative soil vapors to accumulate. Soil vapor sample collection will not be scheduled until after a minimum of three consecutive precipitation-free days and irrigation onsite has ceased. Figure B shows the soil vapor sampling apparatus. A measured volume of air will be purged from the tubing using a vacuum pump and a tedlar bag. Immediately after purging, soil-vapor samples will be collected using the appropriate size Summa canister with attached flow regulator and sediment filter. The soil-vapor points will be preserved until they are no longer needed for risk evaluation purposes. At that time, they will be destroyed by extracting the tubing, hand augering to remove the sand and bentonite, and backfilling the boring with neat cement. The boring will be patched with asphalt or concrete, as appropriate.

Vapor Sample Storage, Handling, and Transport

Samples are stored and transported under chain-of-custody to a state-certified analytic laboratory. Samples should never be cooled due to the possibility of condensation within the canister.

Attachment C
Well Logs

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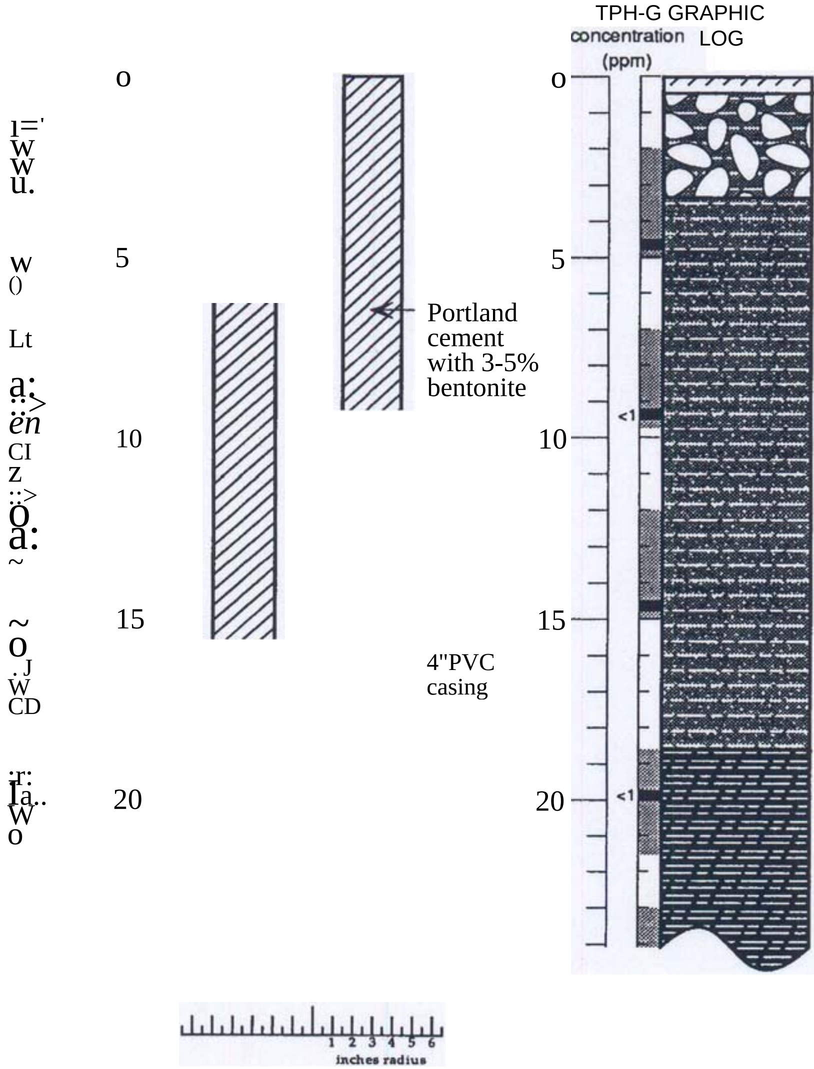
WEISS ASSOCIATES

WELL MW-1 (BH-A)



DESCRIPTION

Asphaltic concrete

Silty GRAVEL (GM); red-brown; loose; damp; 30% silt; 25% fine to coarse sand; 45% gravel to I" diameter; low to moderate K [fill]

Sandy SILT (ML); dark brown; medium stiff; damp; 80% silt; 20% fine to medium sand; low plasticity; moderate K; rootlets and grasses

Clayey SILT (ML); medium brown; stiff; damp; 15% clay; 70% silt; 15% fine to medium sand; low plasticity; low to moderate K

EXPLANATION

X Water level during drilling (date) ~ Water level (date)

................Contact (dotted where approximate)

-?-?- Uncertain contact

/////// Gradational contact

Location of recovered drive sample

Location of drive sample sealed for chemical analysis

Cutting sample

K = Estimated hydraulic conductivity

Logged By: Karin Sixt
Supervisor: Richard B. Weiss; CEG 1112
Drilling Company: HEW Drilling, East Palo Alto, CA
License Number: C57-384167
Driller: Casto Pineda
Drilling Method: Hollow-stem auger
Date Drilled: March 6, 1990
Well Head Completion: 4" locking well-plug, traffic-rated vault
Type of Sampler: Split barrel (1.5", 2"10)
Ground Surface Elevation: 66.60 feet above mean sea level
TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Well MW-l (BH-A) - Shell Service Station WIC #204-6852-0703, 1285 Bancroft Avenue, San Leandro, California

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WEISS ASSOCIATES

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WELL MW-1 (BH-A) (cont.)

	Portland cement with 3-5% bentonite	TPH-G concentra~on (ppm)	GRAPHIC LOG	DESCRIPTION

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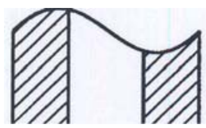

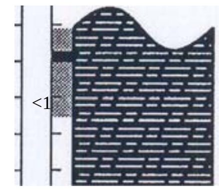

30 30 <1

Silty SAND / Sandy SILT (SM/ML); medium brown; loose; moist; SO% silt; 50% fine to medium sand; moderate to high K; root in sample

6"-thick Clayey SILT lens at 30'

4"-thick medium to coarse SAND lens at 30.S'

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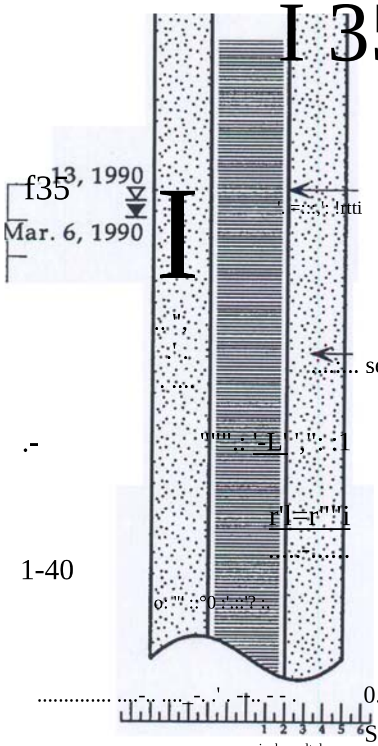
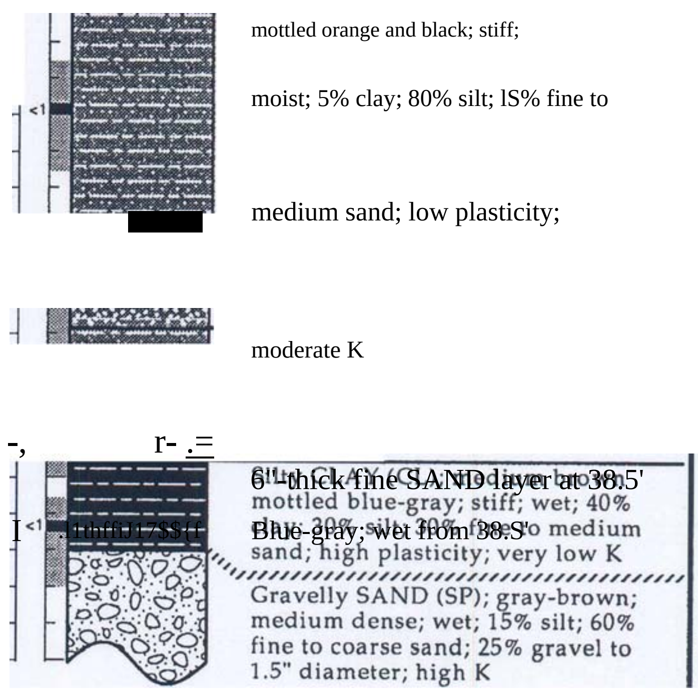
mottled orange and black; stiff; moist; 5% clay; 80% silt; lS% fine to medium sand; low plasticity; moderate K





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seal

1-40 40 <1

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0.020" Slotted 4" PVC casing

#2/12 Monterey sand

6"-thick fine SAND layer at 38.5'

Blue-gray; wet from 38.5'

mottled blue-gray; stiff; wet; 40% clay; 30% silt; 30% fine to medium sand; high plasticity; very low K

Gravelly SAND (SP); gray-brown; medium dense; wet; 15% silt; 60% fine to coarse sand; 25% gravel to 1.5" diameter; high K

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.... (SM/ML); dark green-gray; loose; wet; SO% silt; SO% fine to medium sand; moderate K

Sandy SILT (ML); dark green-gray; medium stiff; wet; <S% clay; 60-6S% silt; 35% fine to medium sand; moderate K

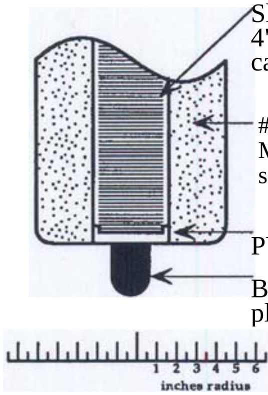
45

Boring Log and Well Construction Details - Well MW-l (BH-A) - Shell Service Station WIC #204-6852-0703, 1285 Bancroft Avenue, San Leandro, California

4/1 0/92

WELL MW-1 (BH-A) (cont.)

L 55

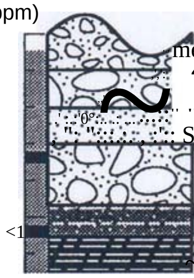


60

TPH-G concentration (ppm)

<1

GRAPHIC LOG



DESCRIPTION

Sandy GRAVEL (GP); gray-brown; medium dense to dense; wet; 10% silt; 40% fine to coarse sand; 50% gravel to 1.5" diameter; high K

SAND (SP); gray-brown; loose; wet; 10% silt; 85% fine to medium sand; 5% coarse sand; high K

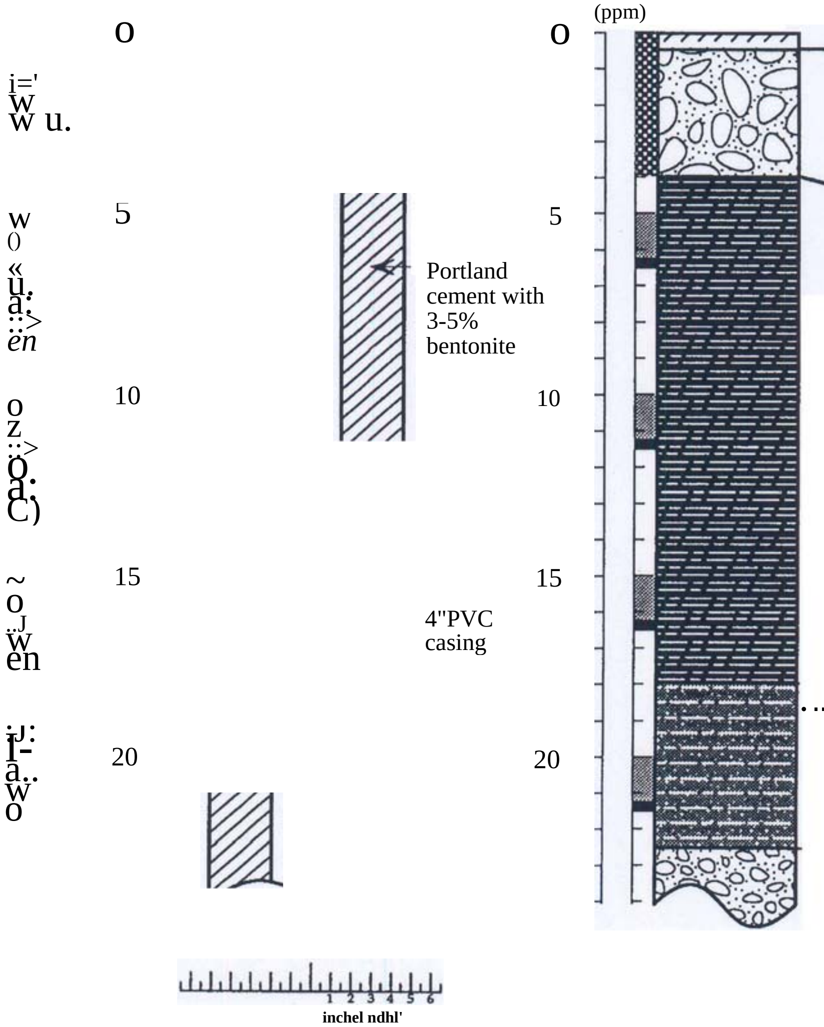
Sandy GRAVEL (GP); gray-brown; medium dense to dense; wet; 10% silt; 40% sand; 50% gravel to 1.5" diameter; high K

~ 6"-thick SAND lens at 58.5'

Sandy SILT (ML); light brown; soft; wet; 5% clay; 65% silt; 30% fine to coarse sand; low plasticity; low to moderate K

Clayey SILT (ML); orange-brown; stiff; wet; 20% clay; 65% silt; 15% fine to medium sand; medium plasticity; very low K

WELL MW-2 (BH-B)



DESCRIPTION

Asphaltic concrete

Sandy GRAVEL (GW); brown; medium dense; damp; 5% clay; 20% silt; 35% fine to coarse sand; 40% concrete gravel to 4" diameter; high K [fill]

Clayey SILT (ML); dark brown; soft; damp; 25% clay; 65% silt; 10% fine sand; low plasticity; low K

Brown; firm from 10'

Sandy SILT (ML); [illegible] soft; damp; 5% clay; 80% silt; 15% fine sand; low plasticity; moderate K

(contact-driller)

Gravelly SAND (GW); dark gray; loose; moist; 5% clay; 15% silt; 55% sand; 25% gravel to 0.5" diameter; high K

EXPLANATION

- Water level during drilling (date) Water level (date)
- ········· Contact (dotted where approximate)
- -?-? Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Tom Fojut
Supervisor: Joseph P. Theisen; CEG 1645
Drilling Company: Soils Exploration Services, Benicia, CA
License Number: C57-582696
Driller: Courtney Mossman
Drilling Method: Hollow-stem auger
Date Drilled: February 6, 1992
Well Head Completion: 4" locking well-plug, traffic-rated vault
Type of Sampler: Split barrel (2" 10)
Ground Surface Elevation: 67.37 feet above mean sea level
TPH-G: Total petroleum hydrocarbon as gasoline in soil by modified EPA Method 8015

Boring Log and Well Construction Details - Well MW-2 (BH-B) - Shell Service Station WIC #204-6852-0703. 1285 Bancroft Avenue, San Leandro, California

2/29/92

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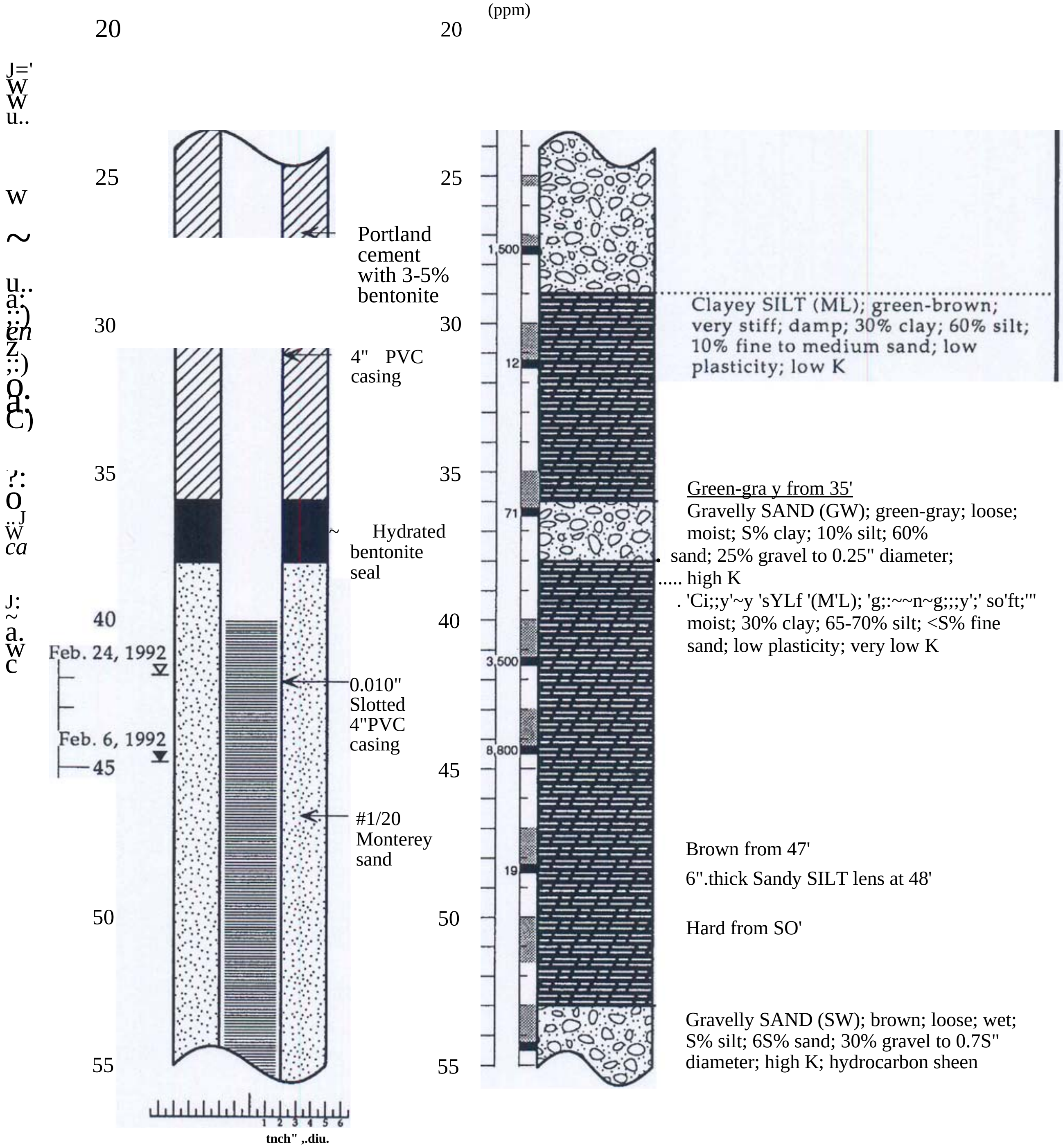
WELL MW-2 (BH-B) (cont.)



Boring Log and Well Construction Details - Well MW-2 (BH-B) - Shell Service Station WIC #204-6852-0703, 1285 Bancroft Avenue, San Leandro, California

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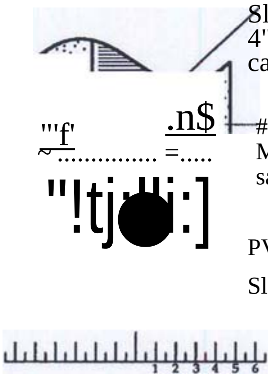
WEISS ASSOCIATES JIM

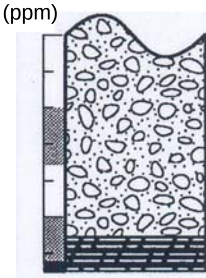
WELL MW-2 (BH-B) (cont.)



60

TPH-G concentration (ppm)

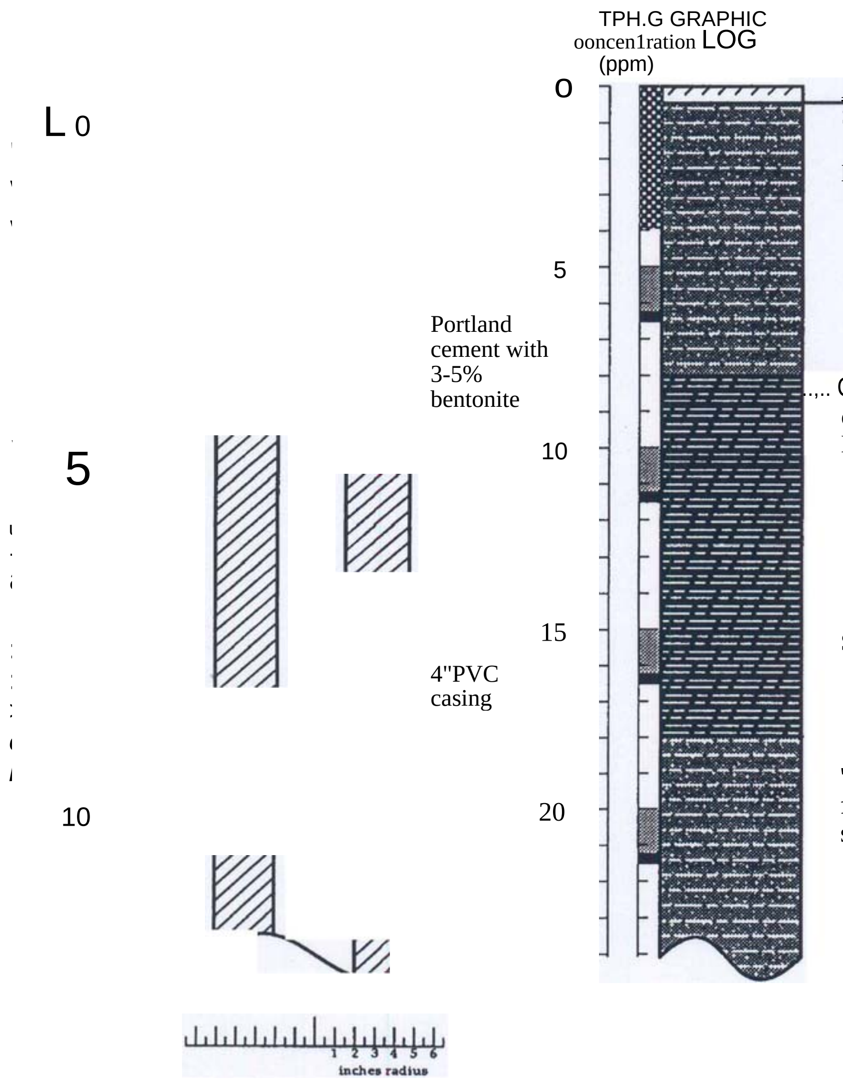
GRAPHIC LOG



DESCRIPTION

Clayey SILT (ML); brown; firm; 35% clay; 60% silt; 5% fine to medium sand; low plasticity; low K

WELL MW-3 (BH-C)



DESCRIPTION

Asphaltic concrete

Sandy SILT (ML); brown; soft; damp; 10% clay; 75% silt; 15% fine sand; low plasticity; low to moderate K

..,.. CYayey'SiL 1" (ML);' b~owii;..iirm;'........ damp; 15% clay; 75% silt; 10% fine sand; low plasticity; low K

Stiff from IS'

Sandy' siFf(ML); '(;riii"ge~brow'i";""" firm; damp; 5% clay; 70% silt; 25% fine sand; low plasticity; moderate K

EXPLANATION

15 Water level during drilling (date) Water level (date)

-.....-. Contact (dotted where approximate)

-?-? Uncertain contact Gradational-contact

Location of recovered drive sample

IJ'If8 Location of drive sample sealed for chemical analysis

Cutting sample

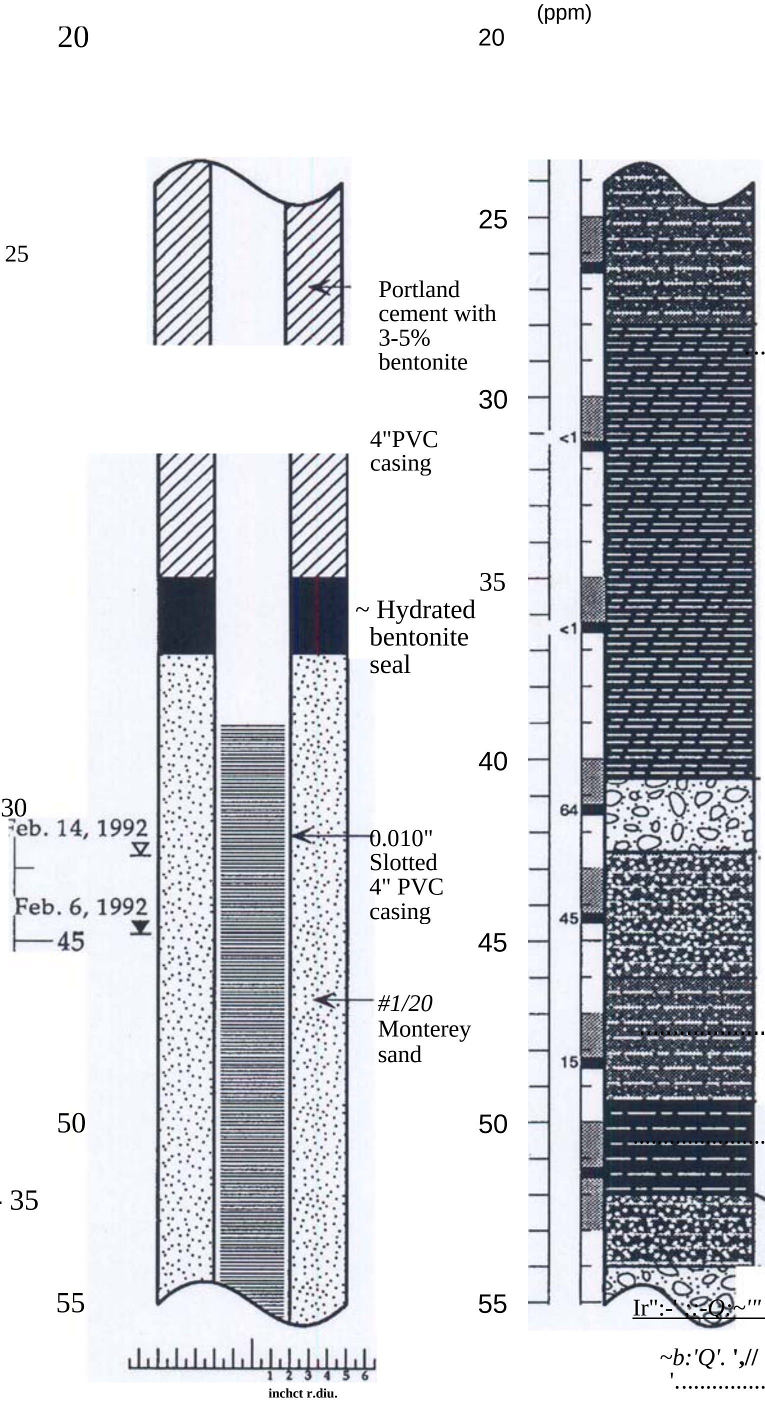
18 Estimated hydraulic conductivity

Logged By: Tom Fojut
Supervisor: Joseph P. Theisen; CEG 1645
Drilling Company: Soils Exploration Services, Benicia, CA
License Number: C57-582696
Driller: Courtney Mossman
Drilling Method: Hollow-stem auger
Date Drilled: February 7, 1992
Well Head Completion: 4" locking well-plug, traffic-rated vault
Type of Sampler: Split barrel (1.5", 2" 10)
Ground Surface Elevation: 66.31 feet above mean sea level
TPH-G: Total petroleum hydrocarbon as gasoline in soil bv modified EP A Method 8015

Boring Log and Well Construction Details - Well MW-3 (BH-C) - Shell Service Station WIC #204-6852-0703, 1285 Bancroft Avenue, San Leandro, California

2/28/92

WELL MW-3 (BH-C) (cont.)



DESCRIPTION

Stiff from 15'

Clayey SILT (ML); brown; soft; moist; 20% clay; 75% silt; 5% fine sand; low plasticity; low K

Very stiff; rootholes from 35'

Gravelly SAND (GW); green-gray; loose; damp; 5% silt; 60% sand; 35% gravel to 1" diameter; high K

Silty SAND (SP/SM); green-gray; loose; moist to wet; 15% silt; 85% fine sand; high K

Sandy SILT (ML); green-brown; soft; moist to wet; 15% clay; 60% silt; 25% fine sand; low plasticity; moderate K

Silty CLAY (CL); brown; hard; damp; 50% clay; 40% silt; 10% fine to medium sand; low plasticity; very low K

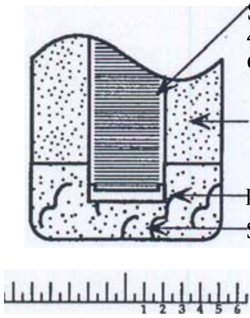
Silty SAND (SP/SM); brown; medium dense; moist to wet; 15% silt; 85% fine to medium sand; high K

Gravelly SAND (SP); brown; loose; wet; 5% silt; 60% sand; 35% gravel to 1.5" diameter; high K

Boring Log and Well Construction Details - Well MW-3 (BH-C) - Shell Service Station WIC #204-6852-0703. 1285 Bancroft Avenue. San Leandro, California

WELL MW-3 (BH-C) (cont.)

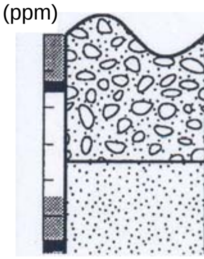
L 55



55

TPH-G concentration (ppm)

GRAPHIG LOG



DESGRIPTION

SAND (SW); brown; loose; wet; <5% silt; 90% sand; 5-10% gravel to 1" diameter; very high K

60

60