CONESTOGA-ROVERS
& ASSOCIATES

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March 17, 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**
Shell-branded Service Station
1784 150th Avenue
San Leandro, California
SAP Code 136019
Incident No. 98996068
ACHCSA Case No. 0367
CRA Project No. 240612-2008.7

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 December 19, 2008 *Supplemental Subsurface Investigation Report* recommended properly destroying wells MW-1 and MW-2, installing two replacement wells near MW-1 (one shallow, one deep), and installing a groundwater monitoring well near boring B-1. Alameda County Health Care Services Agency's (ACHCSA's) January 18, 2008 letter requested this work plan.

Site Location and Description

The site is an operating Shell-branded service station located at the southern corner of the 150th Avenue and Freedom Avenue intersection in San Leandro, California (Figure 1). The area surrounding the site is mixed commercial and residential. The site layout (Figure 2) includes a station building, two dispenser islands, and three fuel underground storage tanks (USTs). One waste oil UST was removed from the site on May 25, 2006.

A summary of previous work performed at the site and additional background information was submitted in CRA's December 19, 2007 *Supplemental Subsurface Investigation Report*, and is not repeated herein.

Technical Rationale for Proposed Scope of Work

- Wells MW-1 and MW-2 will be properly destroyed because they are screened below first-encountered groundwater and may be acting as conduits for vertical migration.

- CRA proposes two wells (MW-1A and MW-1B) to replace MW-1. Well MW-1A will be a 4-inch diameter well screened in the shallow water-bearing zone approximately 17 to 27 feet below grade (fbg). Well MW-1B will be a 2-inch diameter well screened within the deeper sandy unit encountered below 40 fbg.
- CRA proposes one 4-inch diameter well (MW-14) at the location of soil boring B-1. The well will be screened in the shallow water-bearing zone approximately 17 to 27 fbg.
- No replacement is needed for MW-2 since MW-11 is located approximately 10 feet to the southwest and is screened in the shallow water-bearing zone.

Work Tasks – Well Destruction

Permit: CRA will obtain the required drilling permit from ACHCSA 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 two monitoring wells (MW-1 and MW-2). 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-landscaped to match surrounding plantings. CRA's standard field procedures are included as Attachment A, and the available well logs are included in Attachment B. The proposed scope of work described will be performed under the supervision of a professional geologist or engineer.

Report Preparation: Following completion 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 an appropriate permit for drilling from ACHCSA.

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: Three monitoring wells (MW-1A, MW-1B, and MW-14) 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-1A and MW-14 are proposed in the shallow water-bearing zone. Well MW-1B is proposed in the deeper sandy unit encountered below 40 fbg. CRA's standard field procedures are included as Attachment A.

A CRA geologist will supervise the drilling and describe encountered soils using the Unified Soil Classification System. CRA will collect soil samples from the borings at 5-foot intervals for soil description (continuously below 15 fbg in MW-1A and MW-14, and continuously below 35 fbg in MW-1B), 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-1A and MW-14 will be drilled to approximately 27 to 30 fbg. Based on fourth quarter 2007 data, first-encountered groundwater is approximately 22 fbg in MW-1. These wells will target the shallow water-bearing zone. Both wells will be constructed using 4-inch diameter Schedule 40 PVC casing. The well screen interval will be from approximately 17 to 27 fbg.

The boring for MW-1B will be drilled to approximately 45 to 50 fbg. Based on the boring log for CPT-1, a sand layer is approximately 40 to 47 fbg. MW-1B will target this sand layer. This well will be constructed using 2-inch diameter Schedule 40 PVC casing. The well screen interval will be from approximately 41 to 46 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 engineer.

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 wells MW-1A, MW-1B, and MW-14 will be analyzed for total petroleum hydrocarbons as gasoline, benzene, toluene, ethyl benzene, xylenes, and fuel oxygenates by EPA Method 8260B. Groundwater samples from the other wells (MW-3 through MW-13) 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 the receipt of analytical results from the laboratory, CRA will prepare a written report, which will include field procedures, laboratory results, boring logs, and conclusions.

Schedule

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

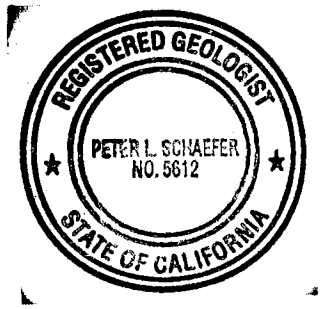
Closing

If you have any questions regarding the scope of work outlined in this work plan, please call Peter Schaefer at (510) 420-3319 or Ana Friel at (707) 268-3812.

Sincerely,
Conestoga-Rovers & Associates

Peter Schaefer, CEG, CHG
Acting Project Manager

P. Schaefer for Aubrey Cool
Aubrey K. Cool, PG
Professional Geologist



Figures: 1 - Vicinity Map
2 - Site Plan

Attachments: A - Standard Field Procedures
B - Well Logs

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

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05/17/07

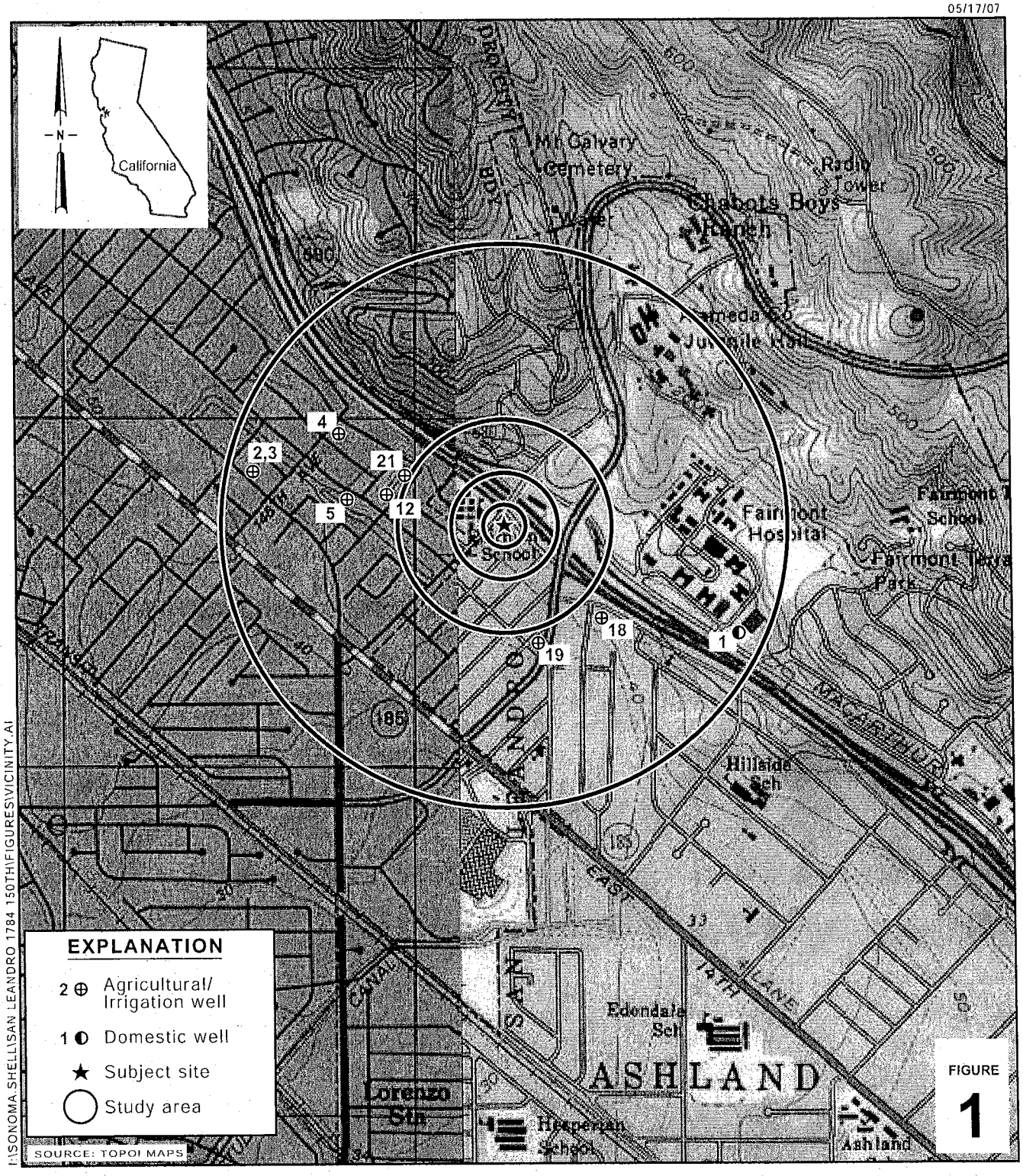

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FIGURE 1

Shell-branded Service Station

1784 150th Avenue

San Leandro, California

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Vicinity Map

03/13/08

Site Plan

EXPLANATION

- MW-1B — Proposed deeper groundwater monitoring well
- MW-1A — Proposed groundwater monitoring well
- MW-1 — Well proposed for destruction
- CPT-1 — CPT location (CRA, 8/29-30/07)
- B-1 — Soil boring location (CRA, 9/14/07)
- SVP-1 — Soil vapor probe location (CRA, 8/28/07)
- WO-1-6.5 — Soil sample location (Cambria, 5/25/06)
- S-19 — Soil boring location (Cambria, 5/23-25/06)
- MW-4 — Monitoring well location
- MW-6 — Monitoring well location
- D-1-5.0 — Soil sample location (Cambria, 04/05/05)
- D-1-3.5 — Soil sample location (Cambria, 03/22/05)
- SB-17 — Soil boring location (Cambria, 9/04)
- SB-10 — Soil boring location (Cambria, 6/03)
- SB-9 — Soil boring location (Cambria, 10/02)
- SVS-11 — Soil boring location (Cambria, 11/98)
- SVS-1 — Soil boring location (Cambria, 7/96)
- BH-7 — Soil boring location (Weiss, 3/95)
- A — Dispenser soil sample location (Weiss, 3/95)
- BH-1 — Soil boring location (Weiss, 6/94)
- Dispenser number
- Product piping

I-580

I-580 OFF-RAMP

BH-4

brick sound wall

PORTOFINO CIRCLE

SB-12

BH-5

SB-13

SB-14

MW-9

SB-25/ MW-13

SVS-9

SB-11

MW-7

SVS-8

SVP-5

SB-24/MW-12

SB-9

SVS-7

MW-8

Residential

SB-10

MH

MW-4

BH-9

SB-16

PORTOFINO DRIVE

SVS-6

BH-7

Residential

150TH AVENUE

BH-8

BH-1 located 215' SE

BH-6 located 360' SE

FREEDOM AVENUE

BH-2

Former Dispenser Island

MW-3

MW-10

Shell Station

1784 150th Ave.

CPT-3

SB-15

P-2-3.5, P-2-5.0

D-2-3.5

D-2-5.0

P-1-2.5, P-1-5.0

D-4-3.5

D-4-5.0

Station Building

SB-21

MW-14

D-3-3.5

B-1

SVP-4

W

P-3-3.0

D-1-3.5

D-1-5.0

P-4-2.5, P-4-5.0

SB-23

air comp

SB-20

SVS-1

WO-1-6.5

Former W/O UST

CPT-5

MW-2

USTs

SB-19

SVS-10

SVP-3

SVS-5

CPT-1

SB-17

CPT-2

SB-22

MW-1

MW-11

SVS-12

SVS-13

SVS-3

SVS-2

SVP-1

SVP-2

MW-1A

MW-1B

SVS-4

SVS-11

SB-18

parking lot

Denny's Restaurant *15015 Freedom Ave.*

Residential (Townhouses)

Residential (Townhouses)

BH-3

MH

SVS-14

SVS-15

CPT-6

MW-6

SVS-16

Private (Gated Driveway)

MW-5

MH

Residential (Townhouses)

0 20 40 80

Scale (ft)

FIGURE

2

Shell-branded Service Station

1784 150th Avenue

San Leandro, California

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Attachment A
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 I/II 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.

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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.

DRILLING AND SAMPLING

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 (PG).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe®. Prior to drilling, the first 8 ft of the boring are cleared using an air or water knife and vacuum extraction. This minimizes the potential for impacting utilities.

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 EPA-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 from 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.

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. Equipment blanks may be analyzed if non-dedicated sampling equipment is used.

MONITORING WELL INSTALLATION, 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. Rinsed and graded sand corresponding to the slot size 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, II 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 cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

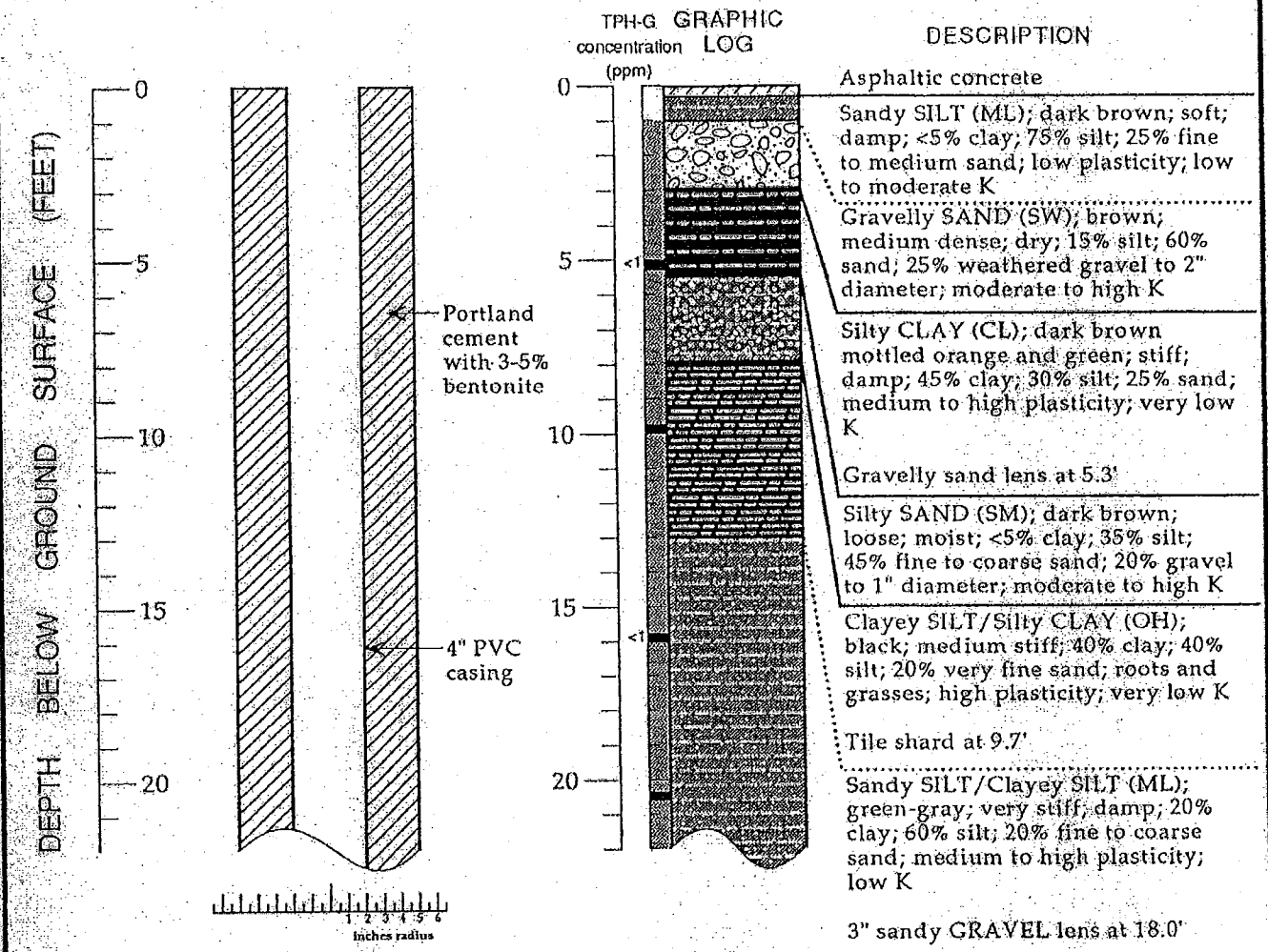
Waste Handling and Disposal

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.

Attachment B
Well Logs

WELL MW-1 (BH-A)



EXPLANATION

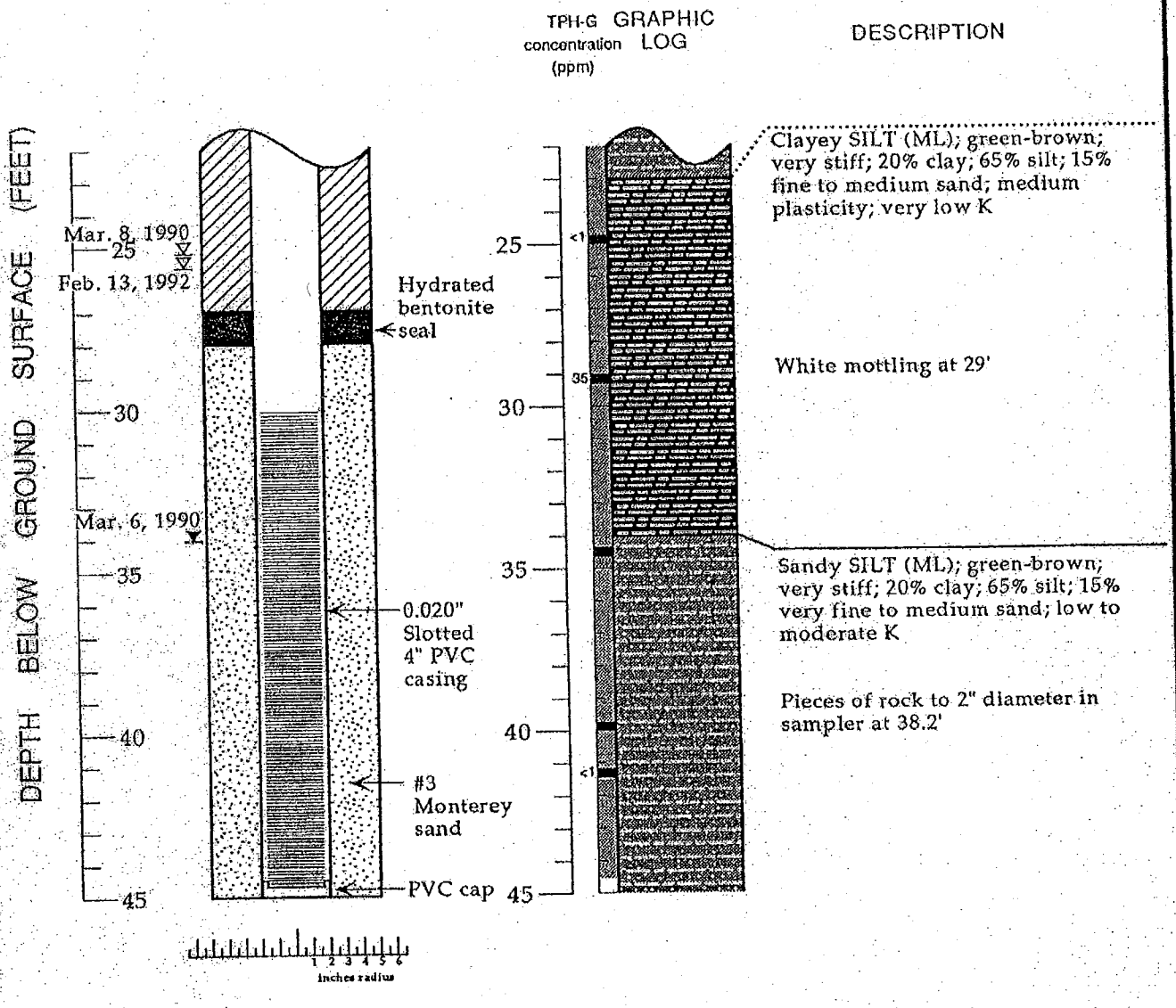
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approximate)
- Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Karen Sixt
Supervisor: Richard Weiss; CEG 1112
Drilling Company: HEW Drilling, East Palo Alto, CA
License Number: Lic. #C57-61384167
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 (2" ID)
Ground Surface Elevation: 49.48 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-1 (BH-A) - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

2/26/92

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



Boring Log and Well Construction Details - Well MW-1 (BH-A) - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

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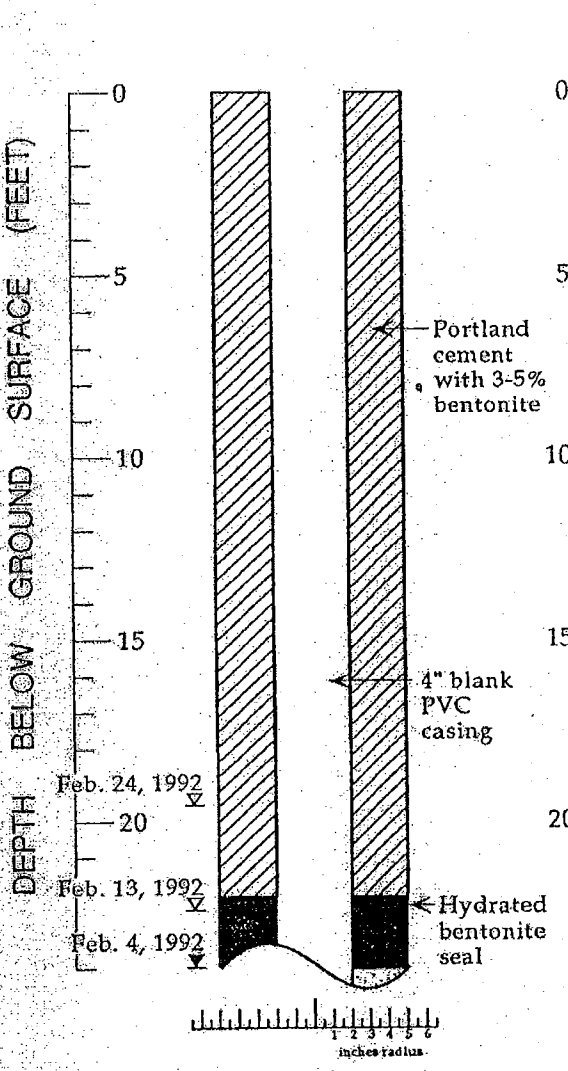
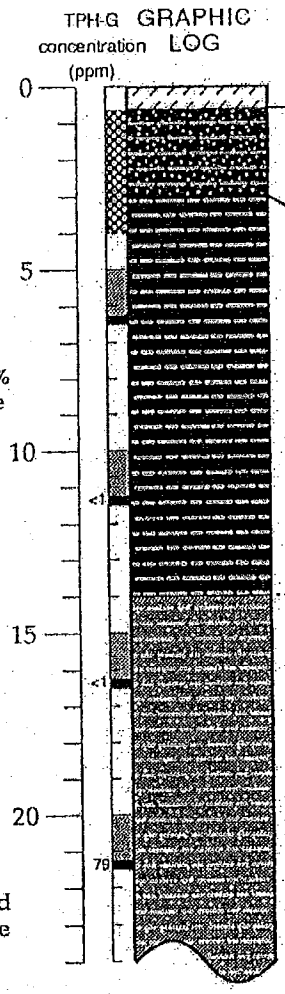
WELL MW-2 (BH-B)





DESCRIPTION

Asphaltic concrete

Sandy CLAY (CL); dark brown; soft; damp; 45% clay; 20% silt; 30% sand; 5% gravel to 0.25" diameter; low plasticity; low K

Silty CLAY (CH); black; soft; damp; 60% clay; 35% silt; 5% fine sand; high plasticity; very low K

1.5" diameter gravel at 6'

gray from 10'

Sandy SILT (ML); green-gray; very stiff; damp; 10% clay; 70% silt; 20% sand; low plasticity; low K

10% clay; 60% silt; 30% fine to coarse sand from 20.0'

EXPLANATION

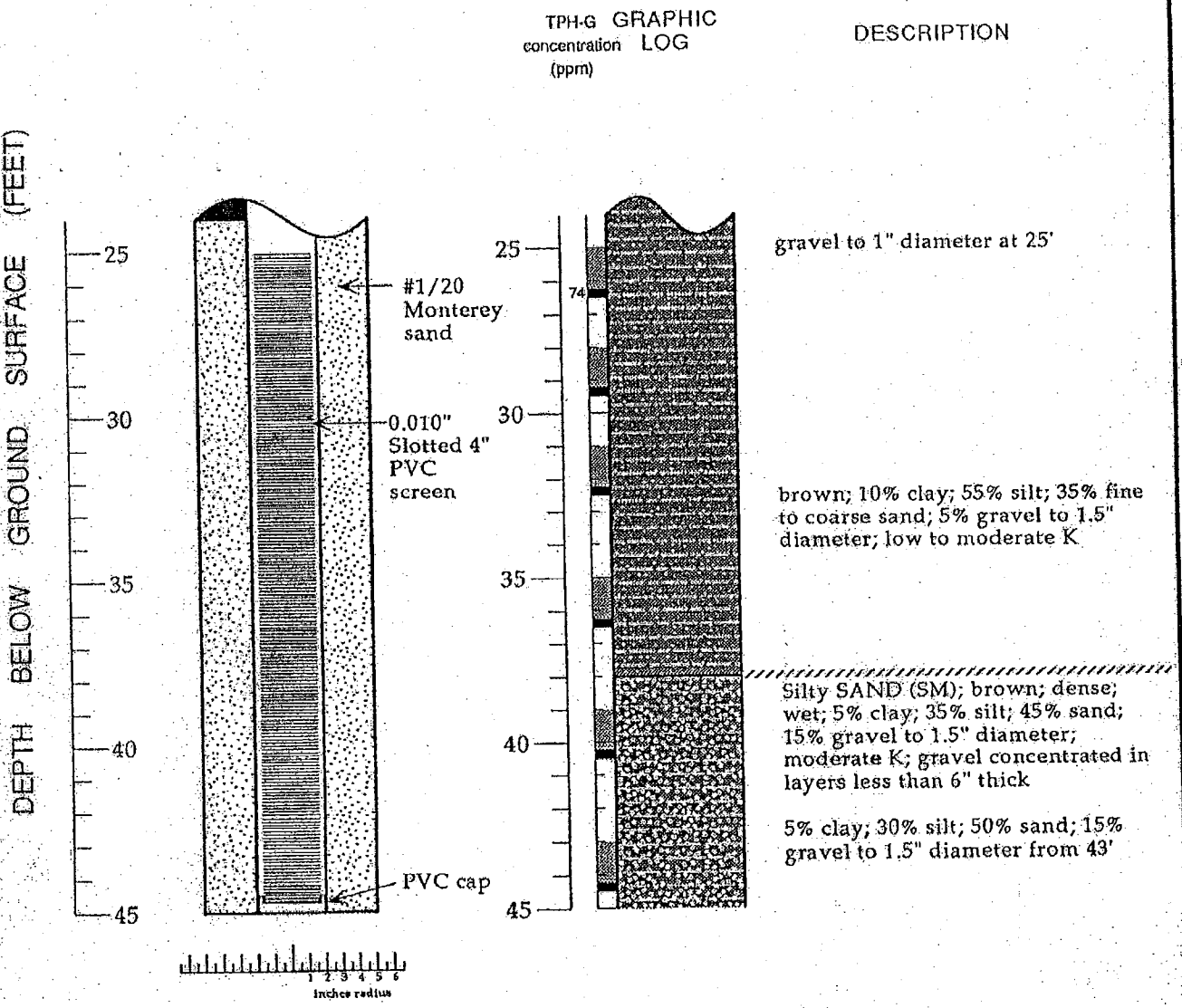
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approximate)
- —?—?— Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Tom Fojut
Supervisor: Joseph P. Theisen; CEG 1645
Drilling Company: Soils Exploration Services, Benicia, CA
License Number: Lic. #C57-582696
Driller: Courtney Mossman
Drilling Method: Hollow-stem auger
Date Drilled: February 4 , 1992
Well Head Completion: 4" locking well-plug, traffic-rated vault
Type of Sampler: Split barrel (2" ID)
Ground Surface Elevation: 46.18 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 #204-6852-1404 - 1784 150th Avenue, San Leandro, California

2/26/92

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



Boring Log and Well Construction Details - Well MW-2 (BH-B) - Shell Servie Station WIC #204-6852-1404 - 1784 150th Avenue, San Leandro, California

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