RO-215 213

CAMBRIA

June 5, 2002

eva chu
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: **Well Installation Work Plan**
Shell-branded Service Station
11989 Dublin Boulevard
Dublin, California
Incident # 98995328
Cambria Project # 244-0548

Dear Ms. chu:

Cambria Environmental Technology, Inc. (Cambria) is submitting this *Well Installation Work Plan* on behalf of Shell Oil Products US. The well installation work plan was recommended in our April 4, 2002 *First Quarter 2002 Monitoring Report*. The purpose of the well is to define the downgradient extent of hydrocarbons and oxygenates in groundwater. Presented below are summaries of the site background and our proposed scope of work.

SITE BACKGROUND

Site Location: This operating Shell-branded service station is located at the intersection of Dublin Boulevard and San Ramon Road in Dublin, California (Figure 1). The surrounding area is primarily commercial with retail businesses adjacent to the site. A Chevron service station is located northeast of the Shell-branded site. Currently, three gasoline underground storage tanks (UST) and one diesel UST are in use onsite.

Soil and Groundwater Investigation Summary

June 1997 Dispenser and Piping Removal and Replacement: In June 1997, soil samples were collected from beneath each of the dispensers and product piping runs at the site during dispenser and piping replacement. Maximum detected concentrations of total petroleum hydrocarbons as gasoline (TPHg) and total petroleum hydrocarbons as diesel (TPHd) were 690 parts per million (ppm) and 12,000 ppm, respectively. The highest detected benzene and methyl tertiary

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butyl ether (MTBE) (by EPA Method 8020) concentrations during the same sampling event were 0.55 ppm and 8.9 ppm, respectively, both from beneath the center dispenser in the northern pump island.

August 1997 Tank Backfill Well Destruction: On August 8, 1997, six tank backfill wells were destroyed in accordance with permit #97433 issued by the Alameda County Flood Control and Water Conservation District Zone 7 (Zone 7). One tank backfill well (BW-7) still exists onsite. Water was not encountered at 12 feet below grade (fbg), the maximum tank backfill well depth.

November 1997 Subsurface Investigation: On November 19, 1997, Cambria advanced four soil borings (SB-1 though SB-4) at the site to define the extent of hydrocarbons in soil and groundwater. The maximum hydrocarbon concentrations in soil were 11 ppm TPHg, 300 ppm TPHd and 0.0051 ppm benzene in sample SB-3 from 25 fbg. The maximum MTBE concentration in soil (by EPA Method 8020) was 0.11 ppm in sample SB-2 at 20 fbg. A grab groundwater sample collected from SB-2 contained 470 parts per billion (ppb) TPHg, 4,900 ppb TPHd, 17 ppb benzene and 110 ppb MTBE. No groundwater was encountered in the other borings to the total explored depth of 41 fbg.

August 1998 Subsurface Investigation: On August 5, 1998, Cambria advanced two soil borings to evaluate soil and groundwater conditions in the assumed downgradient direction of the UST complex. Maximum concentrations detected in soil were 250 ppm TPHg and 2.8 ppm benzene from SB-2 at 30 fbg. Grab groundwater samples collected from borings SB-1 and SB-2 contained maximum TPHg, TPHd and MTBE (by EPA Method 8260) concentrations of 140,000 ppb, 54,000 ppb, 14,000 ppb, respectively. Benzene was below detection limits in grab groundwater samples from both borings.

January 1999 Subsurface Investigation: On June 8 and 9, 1999, Cambria installed three onsite groundwater monitoring wells (MW-1 though MW-3). The maximum TPHg concentration in soil of 4.1 ppm was detected in the sample collected from well MW-3 at a depth of 25.5 fbg. The maximum TPHd and MTBE (by EPA Method 8260) concentrations in soil of 103 ppm and 1.14 ppm, respectively, were detected in MW-2 at a depth of 25.5 fbg. No benzene, toluene, ethylbenzene and xylenes (BTEX), hydrocarbons, or MTBE (by EPA Method 8020) were detected in soil samples collected from monitoring well MW-1 or in vadose zone soil samples collected from wells MW-2 and MW-3.

July 2001 Subsurface Investigation: On July 26, 2001, Cambria installed downgradient monitoring well MW-4 across San Ramon Road from the site. A soil sample collected at the soil-groundwater interface contained no TPHg, BTEX or MTBE.

Groundwater Depth and Flow Direction: The depth to groundwater at the site varies from 5.6 to 6.7 fbg in well MW-1 and from 18.7 to 26.6 fbg in wells MW-2 through MW-4. Groundwater flow direction has been consistently east and a groundwater gradient of 0.125 ft/ft was determined in Cambria's *Second Quarter 2001 Monitoring Report*. Although no apparent explanation for the discrepancy between depths-to-water in the wells at the site has been identified, the steep gradient at the site may be due to lithologic controls, possibly associated with the nearby Calaveras Fault. Topography slopes slightly to the east.

Soil Lithology: The site is underlain by gravelly fill to approximately 2 fbg. The fill is underlain by clayey sands to the maximum explored depth of 35 fbg.

Quarterly Groundwater Monitoring: Quarterly monitoring has been conducted at the site since July 1999. Maximum TPHg, TPHd, benzene and MTBE (by EPA Method 8260) concentrations in groundwater have been reported in well MW-2 at 7,130 ppb, 1,490 ppb, 125 ppb and 28,000 ppb, respectively. Groundwater samples collected from downgradient well MW-4 have contained up to 2,400 ppb TPHg and 8,600 ppb MTBE (by EPA Method 8260). No BTEX has been detected in well MW-4 since installation.

PROPOSED SCOPE OF WORK

Due to the elevated concentrations detected in monitoring well MW-4, Cambria recommended installation of an additional offsite monitoring well in our September 26, 2001 *Offsite Monitoring Well Installation Report and Site Conceptual Model*. To better define the downgradient extent of MTBE, Cambria proposes to advance once soil boring in the general downgradient direction of well MW-4 and to complete the boring as a groundwater monitoring well. The nearest practical location for monitoring well installation is on private property across San Ramon Road from the site. The proposed monitoring well location is shown on Figure 2. Cambria's scope of work for this investigation will include the following tasks:

Right-of-Entry Agreement: Cambria will contact the property owners and obtain a right-of-entry agreement for well installation. Due to the potential for lengthy access agreement negotiations, Cambria will begin this portion of the scope of work immediately.

Utility Location: Cambria will notify Underground Services Alert (USA) of our drilling activities, and USA will identify utilities in the site vicinity.

Site Health and Safety Plan: Cambria will prepare a comprehensive site safety plan to protect site workers. The plan will be reviewed and signed by each site worker and kept onsite during field activities.

Permits: Cambria will obtain the required well installation permit from Zone 7.

Soil Boring: Assuming the absence of subsurface and overhead obstructions, Cambria will use a drill rig equipped with 8-inch diameter hollow-stem augers to advance one soil boring in the approximate location shown on Figure 2. The boring will be advanced to approximately 35 fbg and converted to a 2-inch diameter groundwater monitoring well. Soil samples will be collected at 5-foot intervals in unsaturated soils. All collected soil samples will be transported to a State-approved analytical laboratory. Cambria's standard field procedures are included as Attachment A.

Groundwater Monitoring Well Installation: The groundwater monitoring well will be constructed of PVC and screened with 0.010-inch machined slot. The screened interval will be determined based on field conditions and observations. A traffic-rated vault box will be installed to protect the well. The groundwater monitoring well will be developed by surging and purging at least 10 casing volumes of water. Cambria's standard field procedures for monitoring well installation are included as Attachment A.

Chemical Analysis: Selected soil samples will be analyzed by a State-certified analytical laboratory for TPHg, BTEX, and MTBE.

Reporting: Upon receipt of analytical results, Cambria will prepare a report that, at a minimum, will contain:

- A summary of the site background and history;
- Descriptions of the drilling and sampling methods;
- A boring/well log;
- Tabulated soil analytical results;
- Analytical reports and chain-of-custody forms; and
- Cambria's conclusions and recommendations.

Groundwater Monitoring: Following installation and development, the new monitoring well will be added to the current groundwater monitoring program at the site. Routine groundwater samples will be collected on a quarterly basis and analyzed for TPHg, BTEX and MTBE.

Schedule: Upon receiving written work plan approval, permits will be acquired and the field activities will be scheduled. An investigation report will be submitted approximately 60 days after completing the field activities.

CLOSING

Please call Jacquelyn Jones at (510) 420-3316 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

Jacquelyn L. Jones
Project Geologist

for

Matthew W. Derby, P.E.
Senior Project Engineer

Figures: 1 - Vicinity/Area Well Survey Map
2 - Proposed Monitoring Well Location Map

Attachment: A - Standard Field Procedures for Monitoring Well Installation

cc: Karen Petryna, Shell Oil Products US, P.O. Box 7869, Burbank, CA 91510-7869

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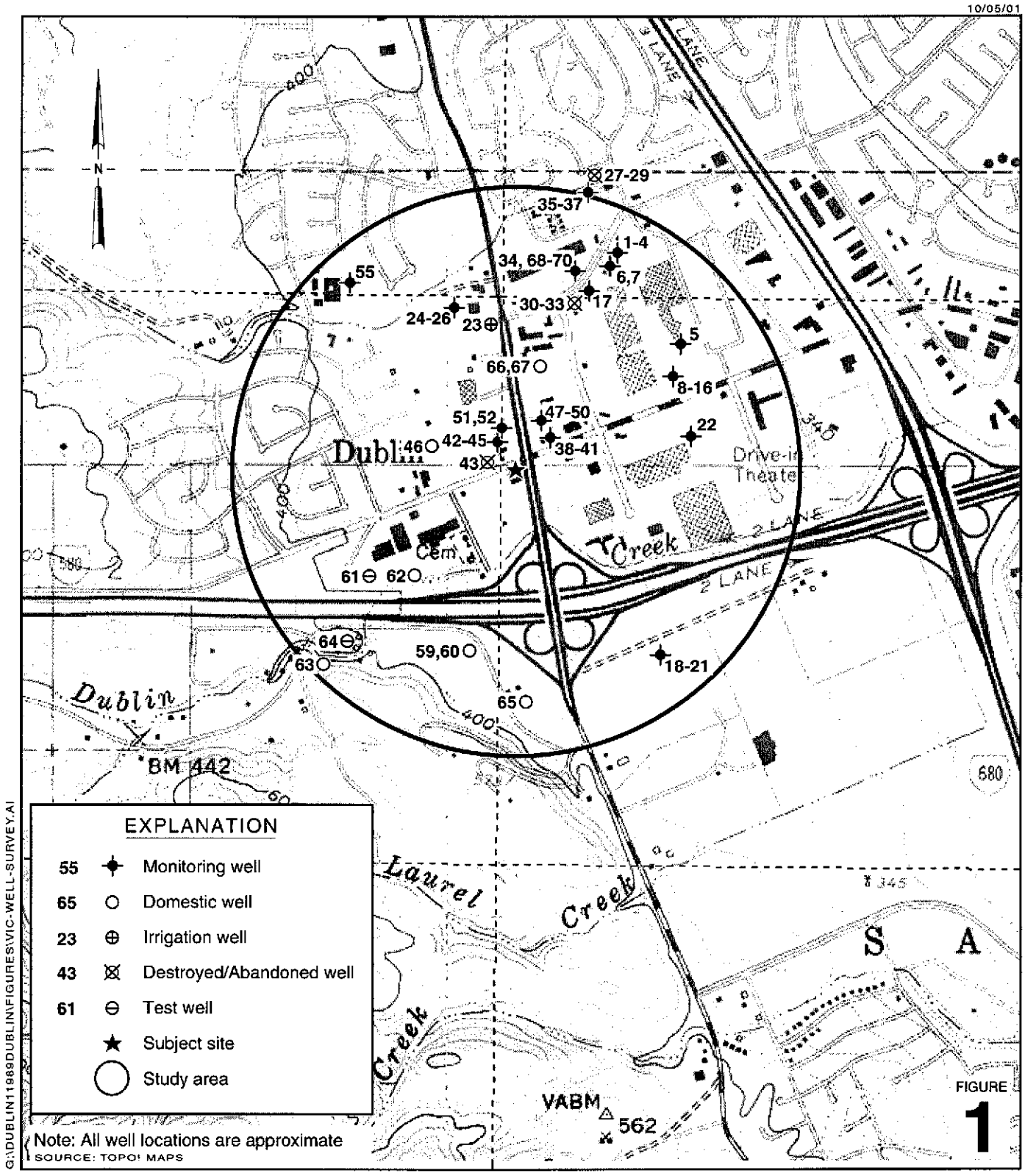

FIGURE **1**

Shell-branded Service Station
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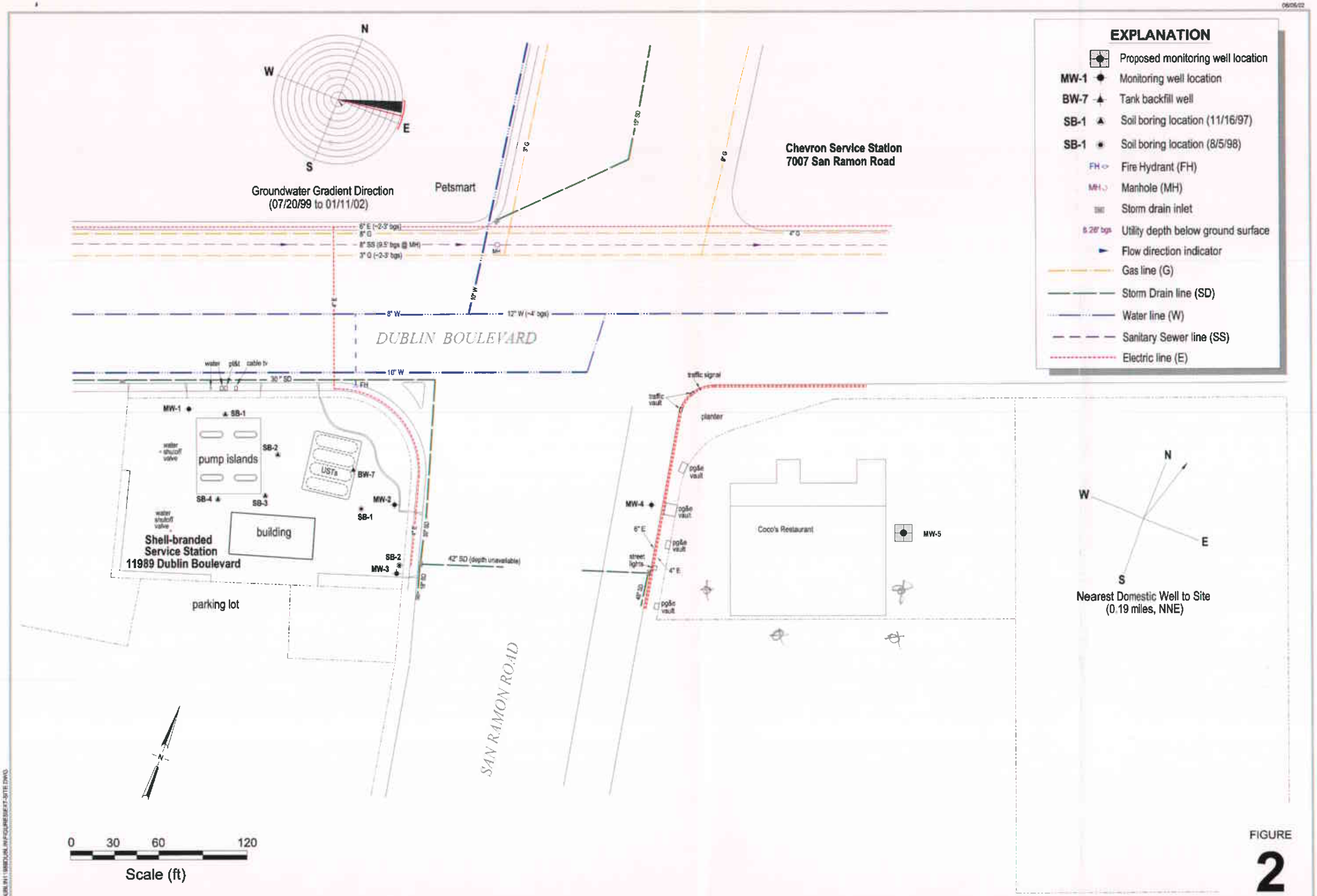
Vicinity / Area Well Survey Map
(1/2 Mile Radius)

Proposed Monitoring Well Location Map



FIGURE

2

Shell-branded Service Station
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ATTACHMENT A

Standard Field Procedures for Monitoring Well Installation

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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 Registered Geologist (RG).

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 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. 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 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 fee 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,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.