



R02440

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April 14, 2006

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

Subject: **Workplan for Monitoring Well Installation Addendum**  
Bernard's Gas  
1051 Airway Blvd  
Livermore, California  
Apex Project No. NWP01.001

Dear Mr. Wickham,

Apex Envirotech, Inc. (Apex) has been authorized by New West Stations (New West) to provide this workplan addendum to the *Workplan for Monitoring Well Installation and Letter Response*, dated October 7, 2005, for the revision of proposed monitoring well installation locations at the subject site (Figure 1) and to address items requested in a Alameda County Environmental Health (ACEH) letter dated November 18, 2005 (Appendix A). The site is located along the eastern side of Airway Boulevard, in Livermore, California and is an active retail fuel station and mini market that retails all three grades of unleaded gasoline and diesel fuel (Figure 2).

This report is based, in part, on information obtained from New West and Grayland Environmental (Grayland) and is subject to modification as newly acquired information may warrant.

## BACKGROUND

June 2001 - Six fuel dispensers and associated product lines were removed by Walton Engineering, Inc. of West Sacramento, California. Soil samples were collected beneath of the former dispensers and product lines. Laboratory results indicated detectable concentrations of total petroleum hydrocarbons as gas (TPHg), TPH as diesel (TPHd), benzene, toluene, ethylbenzene and total xylenes (BTEX) and methyl tertiary butyl ether (MTBE) compounds.

January 18, 2002 - Grayland Environmental submitted the *Site Contamination Work Plan* to evaluate the spatial extent of soil contamination beneath the site and to determine if groundwater had been impacted by residual hydrocarbons.

June 12, 2002 – Apex supervised the installation of four soil boring at the subject site. Soil results showed contamination from 3 to 5 feet below ground surface (bgs) and no contamination at 24 feet bgs. Groundwater results showed detections of MTBE only in low to moderate concentrations. Results were documented in the report, *Soil Boring and Groundwater Sample Collection Results Report*, dated August 6, 2002.

August 30, 2002 - The ACEH issued a letter requesting a site conceptual model (SCM) for the site.

December 19, 2002 – Apex submitted a *Site Conceptual Model*. Although no recommendations were made in the SCM, no response was made by the ACEH.

March through June 2005 – Apex made several attempts to contact ACEH to respond to the SCM but no response was made.

June 14, 2005 – The ACEH issued a letter requesting a workplan to vertically and horizontally define the plume and address technical comments. Apex submitted *Workplan for Monitoring Well Installation and Letter Response*, dated October 7, 2005.

November 18, 2005-The ACEH issued a letter requesting additional information about past investigations at the site and a revision of well placement (Appendix A).

## **ADDITIONAL INFORMATION**

Apex attempted to obtain information regarding the extent of excavated soil removed, the volume of soil removed, and the disposal facility during the June 2001 dispenser and product line removal. Apex could not obtain information to this request.

## **GROUNDWATER MONITORING WELL INSTALLATION ADDENDUM**

Apex proposes modifying the proposed shallow groundwater monitoring wells and one deep monitoring well to the locations as requested by the AECH and shown on Figure 3. The AECH requested one additional shallow well to be located next to the deep well. Depth to groundwater is approximately 27 feet-bgs. The proposed wells will be installed utilizing a hollow stem auger drill rig and completed as 2-inch diameter monitoring wells using Schedule 40 PVC and screened with 0.020-inch slotted screen. Shallow zone wells MW-1, MW-2, MW-3, MW-4, MW-5s, MW-6, and MW-7 will be completed to 35-feet bgs and screened from 20 to 35 feet bgs. The location of off site wells MW-1 and MW-4 is proposed in the center divide non-traffic area of Airway Boulevard as shown on Figure 3. Well MW-5d will be installed as a deep well to an unknown depth to be determined in the field, pending subsurface conditions. Well MW-5d will utilize a 5-foot screened interval and the bentonite seal will be placed between the first and second zone as to prevent cross contamination. Subsurface conditions will be determined by continuously coring the bore hole from 35-feet until a viable second aquifer zone is determined.

All wells annular space will be backfilled with #3 Monterey sand pack from total depth to 2-feet above the screened interval, followed by 2-feet of hydrated bentonite and Portland cement to the surface. The well casings will be protected with locking expansion caps and traffic-rated vault boxes. Offsite wells MW-1 and MW-4 will require an encroachment permit which will be obtained from public works.

Monitoring well installation permits and encroachment permits will be obtained prior to the well installations. A California-licensed drilling contractor will perform the monitoring well installations. All work will be conducted in accordance with the Apex standard operating procedures (SOP) included in Appendix B. Underground Services Alert will be contacted at least 48-hours before drilling to locate underground utilities in the vicinity and adjacent public right-of-ways. As a further precaution, the first five feet of each boring will be hand-augured to avoid striking underground utilities.

### Soil Sampling

Soils will be continuously sampled for logging purposes and the sample collected at the 24-foot interval and at obvious lithologic changes above first groundwater will be submitted for chemical analysis. All soil samples will be screened in the field with the use of a photo ionization detector (PID). Soil samples will be analyzed for the following analysis:

Analysis	Abbreviation	Designation	USEPA Method No.
Total Petroleum Hydrocarbons as Gasoline	TPHg	Gas/Diesel Range Hydrocarbons	8015 Modified
Total Petroleum Hydrocarbons as Diesel	TPHd		
Benzene	BTEX	Aromatic Volatile Organics	8260B
Toluene			
Ethylbenzene			
Xylenes (Total)			
Tertiary Butyl Alcohol	TBA	Fuel Oxygenates	
Methyl Tertiary Butyl Ether	MTBE		
Di-isopropyl Ether	DIPE		
Ethyl Tertiary Butyl Ether	ETBE		
Tertiary Amyl Methyl Ether	TAME		
Ethanol			
1,2-Dichloroethane	1,2-DCA	Lead Scavengers	
Ethylene Dibromide	EDB		

Historical soil and groundwater analytical results are summarized in Tables 1 and 2, respectively. All drill cuttings will be temporarily stored on and under visqueen, pending receipt of the analytical results. A stockpile sample will also be collected for disposal purposes and analyzed for total lead by EPA Method 6010 in addition to the above constituents.

## **Groundwater Sampling**

The proposed groundwater monitoring wells will be developed according to the Apex SOP included in Appendix B. The top of casing elevation will be surveyed and referenced to mean sea level.

All groundwater samples will be submitted under chain-of-custody documentation to a state-certified laboratory for analysis as listed above. Once the laboratory analytical data from the groundwater sampling have been received, a results report will be prepared.

## **Site Specific Health and Safety Plan**

A site specific Health and Safety Plan (HASP) will be prepared and will be on site during all field activities. All on-site work will be conducted according to the HASP. The HASP will contain information on the properties of the hazardous materials known to be on the site. This information is equivalent to that contained within Material Safety Data Sheets.

## **Well Survey**

Apex contacted the Zone 7 Water Agency and included in Appendix C is the results of the well search with wells located within 2,000-feet of the site. Identified are three monitoring wells associated with the golf course southwest of the site.

## **Electronic Submittal of Reports**

Reports after July 1, 2005 have been uploaded into the Geotracker database.

## **SCHEDULE**

Upon approval of this workplan addendum by the ACEH, well installation permitting with the ACEH and an encroachment permit with the City of Livermore will be obtained for the installation of the proposed monitoring wells. Once the permits are approved, drilling activities will be scheduled.

## REPORT DISTRIBUTION

A copy of this report was submitted to:

Regulatory Agency: Mr. Jerry Wickham  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6700  
(510) 567-6791

Responsible Party: Mr. Gil Moore  
New West Stations.

## REMARKS/SIGNATURES

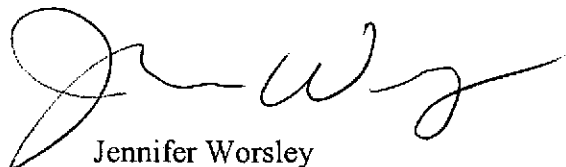
The information contained within this report reflects our professional opinions and was developed in accordance with currently available information, and accepted hydrogeologic and engineering practices.

The work described above was performed under the direct supervision of the professional geologists, registered with the State of California, whose signatures appear below.

We appreciate the opportunity to provide you geologic, engineering and environmental consulting services, and trust this report meets your needs. If you have any questions or comments, please call us at (916) 851-0174.

Sincerely,

**APEX ENVIROTECH INC.**



Jennifer Worsley  
Project Manager



Michael S. Sgourakis, R.G.  
Senior Geologist  
CRG No. 7194



**FIGURES:**

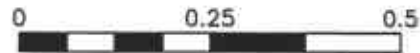
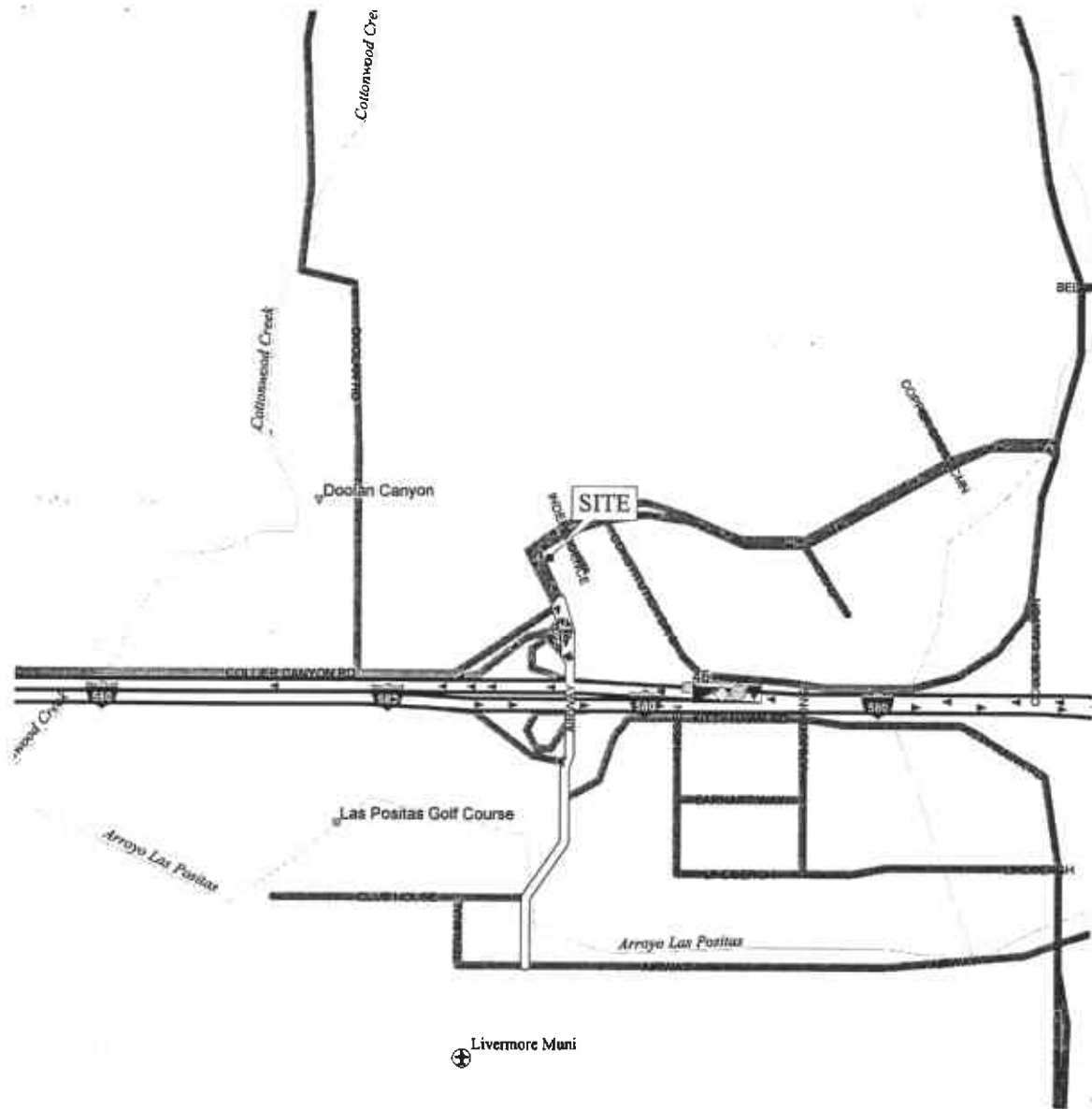
FIGURE 1 .....SITE VICINITY MAP  
FIGURE 2 ..... SITE PLAN MAP  
FIGURE 3 .....PROPOSED MONITORING WELL LOCATION MAP

**TABLES:**

TABLE 1 ..... SOIL ANALYTICAL DATA  
TABLE 2.....GROUNDWATER ANALYTICAL DATA

**APPENDICES:**

APPENDIX A .....ACEH LETTER  
APPENDIX B .....APEX STANDARD OPERATING PROCEDURES  
APPENDIX C .....ZONE 7 AGENCY WELL SEARCH



Approximate Scale  
1 inch = 0.25 miles



**N**



DRAWN BY: D. Alston  
DATE: 07/17/02

REVISIONS

**SITE VICINITY MAP**

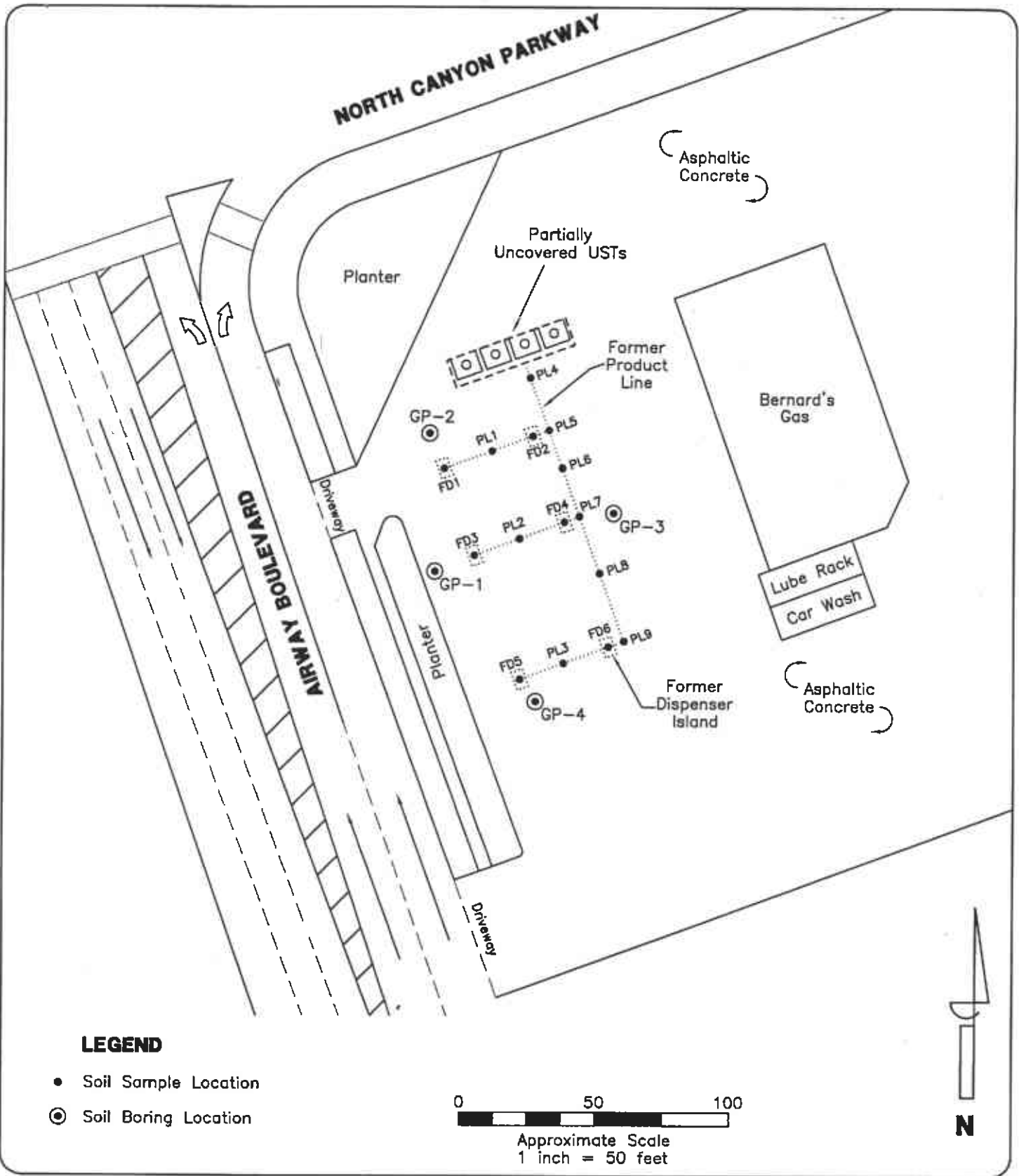
Bernard's Gas  
1051 Airway Boulevard  
Livermore, California


FIGURE

**1**

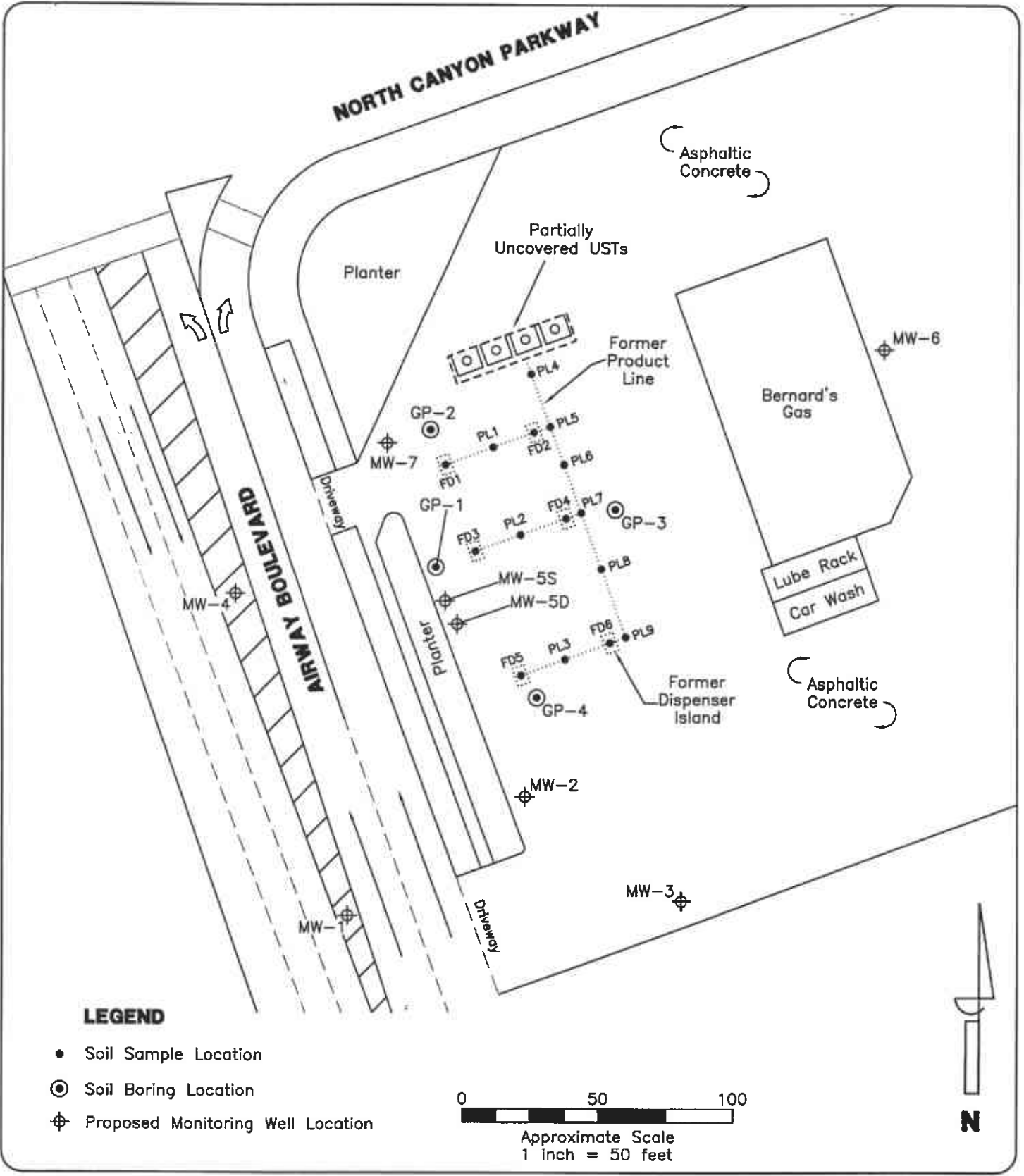
PROJECT NUMBER:

NWPO1.001



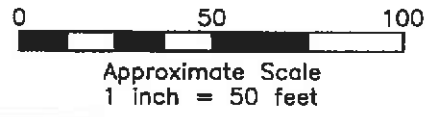
	DRAWN BY: J. Curry DATE: 11/29/05	<b>SITE PLAN MAP</b>  Bernard's Gas 1051 Airway Boulevard Livermore, California	FIGURE <b>2</b>
	REVISIONS		PROJECT NUMBER: NWP01.001
	(Empty table for revisions)		





**LEGEND**

- Soil Sample Location
- ⊙ Soil Boring Location
- ⊕ Proposed Monitoring Well Location



	DRAWN BY: J. Curry DATE: 4/12/06	<b>PROPOSED MONITORING WELL LOCATION MAP</b>	<b>FIGURE 3</b>
	REVISIONS		
	Bernard's Gas 1051 Airway Boulevard Livermore, California		

**TABLE 1**  
**SOIL ANALYTICAL DATA**  
 New West Petroleum  
 1051 Airway Blvd  
 Livermore, California

Sample ID	Date	Sample Depth (feet bgs)	TPH as Gasoline (mg/kg)	TPH as Diesel (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl benzene (mg/kg)	Total Xylenes (mg/kg)	EPA Method 8260					Total Lead (mg/kg)
									DIPE (ug/kg)	ETBE (ug/kg)	MTBE (ug/kg)	TAME (ug/kg)	TBA (ug/kg)	
S-3-FD1	6/19/2001	3	760	830	0.13	<0.10	3.9	28	---	---	5,600	---	---	
S-4-FD2	6/19/2001	4	890	6,800	<0.25	<0.25	2.9	4.0	---	---	1,800	---	---	
S-3-FD3	6/19/2001	3	28	---	<0.050	0.36	0.24	2.7	---	---	970	---	---	
S-3-FD4	6/19/2001	3	3.5	---	0.0061	<0.0050	0.032	0.11	---	---	810	---	---	
S-1-FD5	6/19/2001	1	2,800	---	0.59	29	32	190	---	---	3,600	---	---	
S-2-FD6	6/19/2001	2	29	---	<0.010	<0.010	0.11	0.021	---	---	0.066	---	---	
S-4-PL1	6/19/2001	4	<5.0	10	<0.050	<0.050	<0.050	<0.10	---	---	7,500	---	---	
S-3-PL2	6/19/2001	3	2.9	---	<0.0050	0.052	0.036	0.40	---	---	2,700	---	---	
S-3-PL3	6/19/2001	3	<1.0	---	<0.0050	0.016	0.014	0.10	---	---	92	---	---	
S-5-PL4	6/19/2001	5	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	---	---	7.6	---	---	
S-5-PL5	6/19/2001	5	270	9,500	<0.25	0.31	0.80	4.1	---	---	<250	---	---	
S-4-PL6	6/19/2001	4	<1.0	---	<0.0050	<0.0050	<0.0050	0.024	---	---	140	---	---	
S-3-PL7	6/19/2001	3	1,100	---	<0.10	<0.10	7.8	44	---	---	1,400	---	---	
S-3-PL8	6/19/2001	3	<1.0	---	<0.0050	<0.0050	<0.0050	<0.0050	---	---	17	---	---	
S-3-PL9	6/19/2001	3	<1.0	---	<0.0050	<0.0050	<0.0050	0.0083	---	---	390	---	---	
GP-1	6/12/2002	24	<1.0	<1.0	<0.005	<0.005	<0.005	<0.01	<5.0	<5.0	<5.0	<5.0	<50	---
GP-2	6/12/2002	24	<1.0	<1.0	<0.005	<0.005	<0.005	<0.01	<5.0	<5.0	<5.0	<5.0	<50	---
GP-3	6/12/2002	24	<1.0	<1.0	<0.005	<0.005	<0.005	<0.01	<5.0	<5.0	<5.0	<5.0	<50	---
GP-4	6/12/2002	24	<1.0	<1.0	<0.005	<0.005	<0.005	<0.01	<5.0	<5.0	<5.0	<5.0	<50	---

NOTES:

TPH - Total Petroleum Hydrocarbons  
 DIPE - Di-isopropyl ether  
 ETBE - Ethyl Tertiary Butyl Ether  
 MTBE - Methyl Tertiary Butyl Ether

TAME - Tertiary Amyl Methyl Ether  
 TBA - Tertiary Butyl Alcohol  
 ug/kg - micrograms per kilogram  
 --- - Not Analyzed

**TABLE 2**  
**GROUNDWATER ANALYTICAL DATA**  
**New West Petroleum**  
**1051 Airway Blvd**  
**Livermore, California**

Sample ID	Date	TPH as Gasoline (ug/L)	TPH as Diesel (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl benzene (ug/L)	Total Xylenes (ug/L)	EPA Method 8260					
								DIPE (ug/L)	ETBE (ug/L)	MTBE (ug/L)	TAME (ug/L)	TBA (ug/L)	1,2 DCA (ug/L)
GP-1	6/12/2002	<50	<50	<0.50	<0.50	<0.50	<1.0	<5.0	<5.0	110	<5.0	<50	<5.0
GP-2	6/12/2002	<50	<50	<0.50	<0.50	<0.50	<1.0	<5.0	<5.0	100	<5.0	<50	<5.0
GP-3	6/12/2002	<50	NA	<0.50	<0.50	<0.50	<1.0	<5.0	<5.0	280	6.5	<50	<5.0
GP-4	6/12/2002	<50	NA	<0.50	<0.50	<0.50	<1.0	<2.0	<2.0	4.3	<2.0	<30	<2.0

NOTES:

TPH - Total Petroleum Hydrocarbons  
 DIPE - Di-isopropyl ether  
 ETBE - Ethyl Tertiary Butyl Ether  
 MTBE - Methyl Tertiary Butyl Ether

TAME - Tertiary Amyl Methyl Ether  
 TBA - Tertiary Butyl Alcohol  
 1,2 DCA 1,2 -Dichloroethane  
 ug/L - micrograms per kilogram

**APPENDIX A**

**ACEH LETTER**

ALAMEDA COUNTY  
HEALTH CARE SERVICES

AGENCY  
DAVID J. KEARS, Agency Director



NWPOI.001  
JW

NOV 28 2005

ENVIRONMENTAL HEALTH SERVICES  
ENVIRONMENTAL PROTECTION  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577  
(510) 567-6700  
FAX (510) 337-9335

November 18, 2005

Mr. Gil Moore  
New West Stations, Inc.  
1831 16<sup>th</sup> Street  
Sacramento, CA 95814

COPY

Subject: Fuel Leak Case No. RO0002440, Bernard's Gas, 1051 Airway Blvd., Livermore, CA -  
Work Plan Approval

Dear Mr. Moore:

Alameda County Environmental Health (ACEH) staff has reviewed the fuel leak case file for the above-referenced site and the document entitled, "Workplan for Monitoring Well Installation and Letter Response," dated October 7, 2005 and prepared on your behalf by Apex Envirotech, Inc. The work plan proposes the installation of six shallow and one deep monitoring well to investigate the extent of contamination at the site.

This site is located within the Livermore-Amador Basin where groundwater is extracted for drinking water use. Methyl tert-butyl ether (MTBE) was detected in 14 of the 15 soil samples collected during fuel line and dispenser renovation in 2001 at concentrations up to 7,500 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ). MTBE was also detected in each of the four grab groundwater samples collected at the site in 2002 at concentrations up to 280 micrograms per liter.

Based on our review of the case file and work plan, we request some revisions to the work plan, which are described in the technical comments below. Therefore, we request that you address the technical comments below and submit a revised work plan or work plan addendum to ACEH by **January 10, 2006**.

**TECHNICAL COMMENTS**

1. **Dispenser and Product Line Removal.** ACEH case files contain only the document entitled, "Fuel Dispenser and Line Removal Report," dated August 21, 2001 that describes the dispenser and product line renovation that took place in 2001. The "Fuel Dispenser and Line Removal Report," presents analytical results for soil samples collected beneath the fuel dispensers and product lines and provides field observations of contamination observed at various locations beneath the dispensers and lines. However, the report does not describe the extent of soil excavation during or following the renovation or the disposition of excavated soils. Please submit a description or map to show the extent of excavation of contaminated soil during or subsequent to the 2001 dispenser and line removal and provide documentation to show the volume of soil removed and the facility where the soil was disposed off-site. IN particular, please describe whether the observed contamination beneath the lines and dispensers was excavated. Please present this information in the revised Work Plan requested below.

2. **Lateral and Vertical Extent of Soil Contamination.** As discussed in our June 14, 2005 correspondence, the lateral and vertical extent of soil contamination has not been defined at the site. Total petroleum hydrocarbons as gasoline (TPHg) were detected in soil samples collected beneath the product lines and dispensers at concentrations up to 2,800 milligrams per kilogram (mg/kg). TPH as diesel was detected in the soil samples at concentrations up to 9,500 mg/kg and MTBE was detected at concentrations up to 7,500 µg/kg. The "Fuel Dispenser and Line Removal Report," does not describe overexcavation of these contaminated soil or confirmation sampling to delineate the extent of contaminated soil. The current work plan proposes six soil monitoring wells around the perimeter of the site or off-site and one monitoring well approximately 15 to 20 feet east of the nearest product line. Four previous borings at the site (GP-1 through GP-4) were located approximately 10 to 15 feet from the nearest dispensers and product lines but included only one soil sample. In addition, no logs are available for two of the four borings (GP-3 and GP-4) to describe encountered conditions. The lateral and vertical extent of soil contamination in the source area are to be defined or interim soil remediation is to be conducted. Please describe the approach that will be implemented for the source area in the revised Work Plan requested below.
3. **Proposed Well Locations.** On the attached figure, please see the suggested revisions to the proposed monitoring well locations. ACEH also requests that an additional shallow monitoring well be installed adjacent to the proposed deep monitoring well, MW-5.
4. **Soil Samples.** The Work Plan proposes to collect soil samples at five-foot intervals for logging purposes. ACEH requests that soils be continuously sampled for logging purposes. ACEH concurs with the submittal of the sample collected at the 24-foot depth interval and at obvious lithologic changes for chemical analyses. In addition, the soil samples are to be screened in the field to select samples for chemical analyses. Soil samples are to be submitted for analyses for all depth intervals where staining, odor, or elevated PID readings are observed. If staining, odor, or elevated PID readings are observed over an interval of several feet, a sufficient number of soil samples from this interval should be submitted for laboratory analyses to characterize the fuel hydrocarbon concentrations within this interval. Please include these plans in the revised work plan requested below.
5. **Laboratory Analyses.** ACEH concurs with the proposed analyses for soil and groundwater samples but requests that ethanol also be included as an analyte. Please include this modification in the revised work plan requested below.
6. **Detailed Well Survey.** Please review the results of the well survey previously completed for the site ("Sensitive Survey Results and Site Conceptual Model," dated December 19, 2002), which indicates that no wells are located within ½ mile of the site. A cursory review of the map entitled "Groundwater Program Wells," which is included as Attachment 2, shows wells in close proximity to the site. We recommend that you obtain well information from the Zone 7 Water Agency in addition to information you may have previously reviewed from the State of California Department of Water Resources. Please present the revised well survey results in the revised work plan requested below.
7. **Geotracker EDF Submittals.** A review of the case file and the State Water Resources Control Board's (SWRCB) Geotracker website indicate that electronic copies of analytical

data have not been submitted for your site. Pursuant to CCR Sections 2729 and 2729.1, beginning September 1, 2001, all analytical data, including monitoring well samples, submitted in a report to a regulatory agency as part of the LUFT program, must be transmitted electronically to the SWRCB Geotracker website via the internet. Additionally, beginning January 1, 2002, all permanent monitoring points utilized to collect groundwater samples (i.e. monitoring wells) and submitted in a report to a regulatory agency, must be surveyed (top of casing) to mean sea level and latitude and longitude accurate to within 1-meter accuracy, using NAD 83, and transmitted electronically to the SWRCB Geotracker website. Beginning July 1, 2005, electronic submittal of a complete copy of all reports is required in Geotracker (in PDF format). In order to remain in regulatory compliance, please upload all analytical data (collected on or after September 1, 2001), to the SWRCB's Geotracker database website in accordance with the above-cited regulation. Please perform the electronic submittals for applicable data and submit verification to this Agency by **January 10, 2006**.

#### **TECHNICAL REPORT REQUEST**

Please submit technical reports to Alameda County Environmental Health (Attention: Jerry Wickham), according to the following schedule:

- **January 10, 2006** – Revised Work Plan or Work Plan Addendum

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

#### **ELECTRONIC SUBMITTAL OF REPORTS**

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) now request submission of reports in electronic form. The electronic copy is intended to replace the need for a paper copy and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) Geotracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the Geotracker database over the Internet. Beginning July 1, 2005, electronic submittal of a complete copy of all reports is required in Geotracker (in PDF format). Please visit the State Water Resources Control Board for more information on these requirements ([http://www.swrcb.ca.gov/ust/cleanup/electronic reporting](http://www.swrcb.ca.gov/ust/cleanup/electronic_reporting)).

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

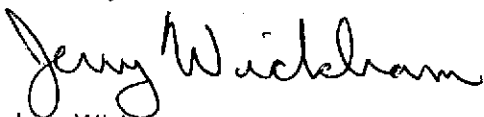
Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to \$10,000 per day for each day of violation.

If you have any questions, please call me at (510) 567-6791.

Sincerely,



Jerry Wickham

Hazardous Materials Specialist



Mr. Gil Moore  
November 18, 2005  
Page 5

Attachment 1: Revised Figure 2 – Site Plan Map  
Attachment 2: Groundwater Program Wells, Figure 4-11, Zone 7 Water Agency

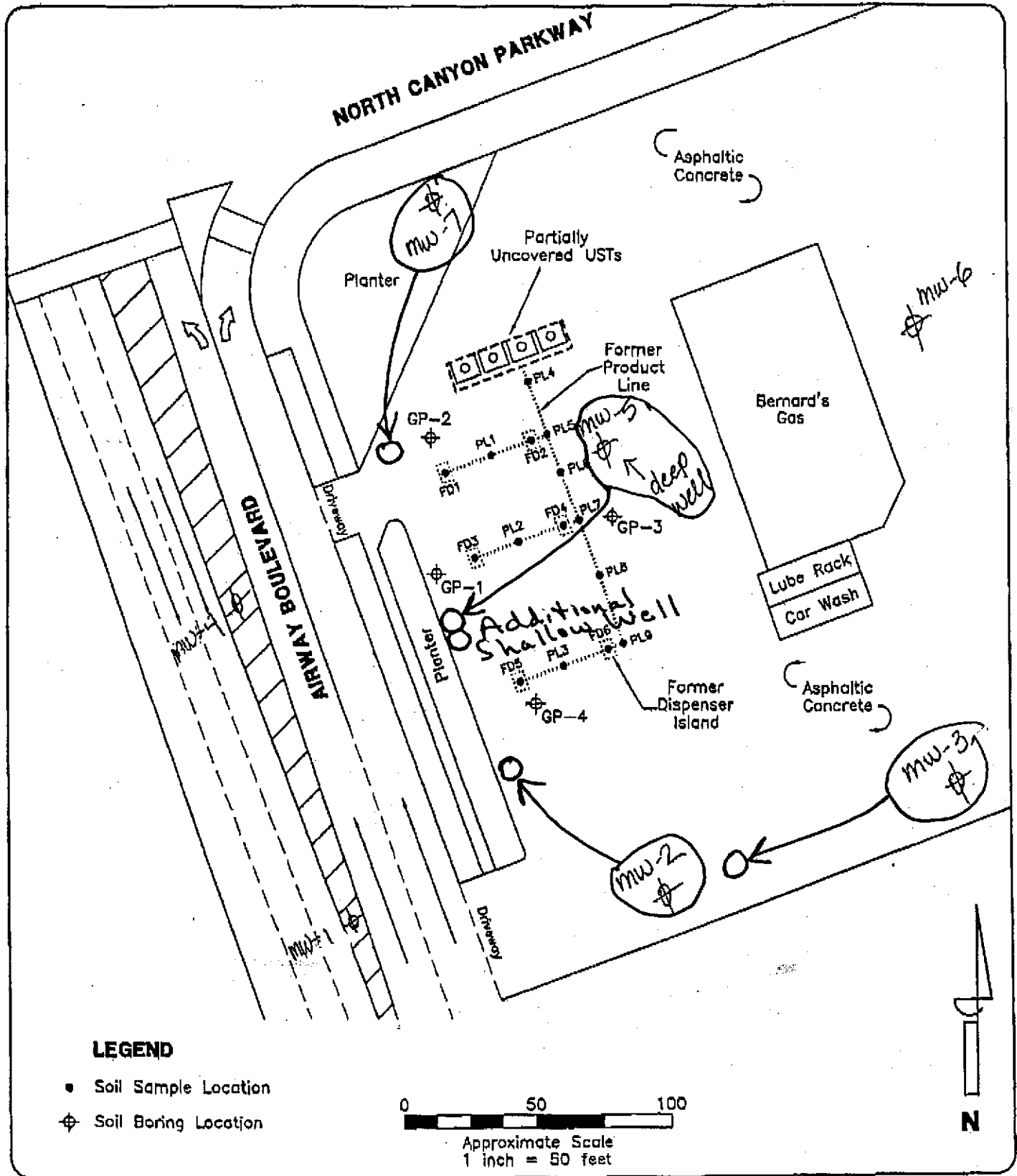
Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Colleen Winey, QIC 80201  
Zone 7 Water Agency  
100 North Canyons Parkway  
Livermore, CA 94551

Danielle Stefani  
Livermore-Pleasanton Fire Department  
3560 Nevada Street  
Pleasanton, CA 94566

Jennifer Worsley ✓  
Apex Envirotech, Inc.  
11244 Pyrites Way  
Gold River, CA 95670

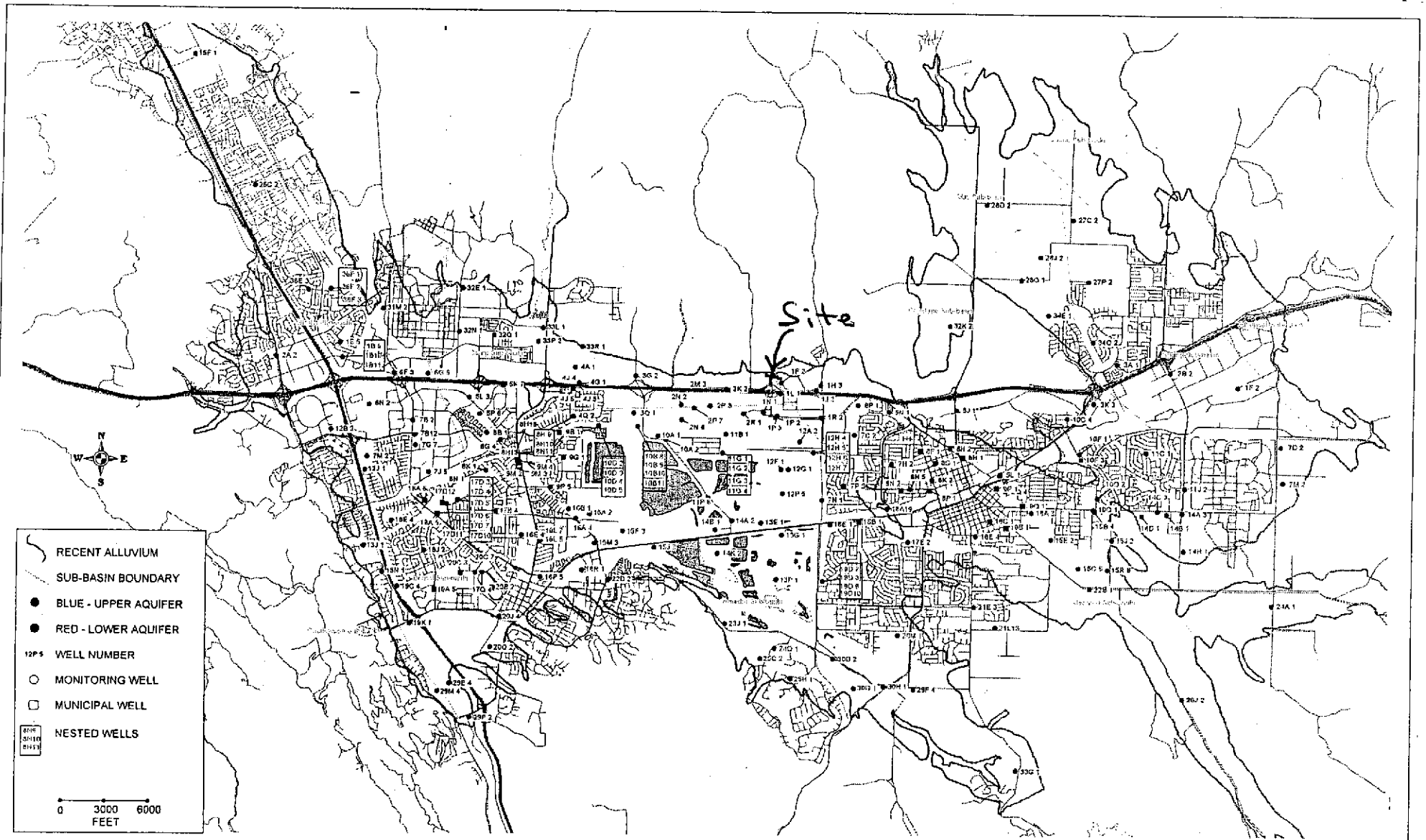
Donna Drogos, ACEH  
Jerry Wickham, ACEH  
File



	DRAWN BY: J. Curry DATE: 10/04/05	<b>SITE PLAN MAP</b>	FIGURE <b>2</b>
	REVISIONS		
	(Empty table for revisions)	(Empty table for project number)	

Attachment 1

# Attachment 2



## ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE, PLEASANTON CA 94588

DRAWN BY: G GATES/T ROOZE

DESIGNED BY: GERALD GATES

FILE NO.: \\Zone7-66\swy\MONITOR\GM\2003\w\Annual\Figures\Fig3ProgramWells.WDR

## WATER RESOURCES GROUNDWATER PROGRAM WELLS 2003 WATER YEAR

SCALE: 1" = 6000'

DATE: August 9, 2004

FIGURE 4-1

**Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC)**  
**Electronic Report Upload (ftp) Instructions**

The Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC) now request submission of reports in electronic form. This e-government initiative is aimed at making our programs more effective and efficient. The electronic copy is intended to replace the need for a paper copy and is expected to be relied upon for all public information requests, regulatory review, and compliance/enforcement activities.

**REQUIREMENTS**

- Entire report including cover letter must be submitted as a **single portable document format (PDF) with no password protection**. (If you cannot submit in PDF format, please check with us to see if we can accommodate your report format).
- It is **preferable** that reports be converted to PDF format from their original format, (E.g., Microsoft Word) rather than scanned.
- Signature pages and perjury statements **should** be included and **must** have either original or electronic signature. Alternatively, the paper copy of the signature page and perjury statement can be mailed separately.
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**. If you cannot comply with this you may continue to submit paper documents.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:  
RO#\_Report Name\_Year-Month-Date  
(e.g., RO#5555\_WorkPlan\_2005-06-14)

**Additional Recommendations**

- A separate copy of the tables in the document should be submitted by e-mail to your Caseworker in **Excel** format. These are for use by assigned Caseworker only.

**Submission Instructions**

1. Obtain User Name and Password:
  - Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
    - a) Send an e-mail to [dehloptoxic@acgov.org](mailto:dehloptoxic@acgov.org)  
or
    - b) Send a fax on company letterhead to (510) 337-9335, to the attention of Alicia Lam-Finneke.
  - In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses, and the Case Numbers (RO# available in Geotracker) you will be posting for**.
  - Note: Both the User Name and Password are Case Sensitive.
2. Upload Files to the ftp Site
  - a) Using Internet Explorer (IE4+) or equivalent browser, go to <ftp://alcoftp1.acgov.org>
  - b) Click on File, then on Login As.
  - c) Enter your User Name and Password.  
Note: Both are Case Sensitive.
  - d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
  - e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.
3. Send E-mail Notifications to the Environmental Cleanup Oversight Programs
  - a) Send email to [dehloptoxic@acgov.org](mailto:dehloptoxic@acgov.org) notify us that you have placed a report on our ftp site.
  - b) Copy your Caseworker on the e-mail
    - Your Caseworker's e-mail address is the entire first name then a period and entire last name at acgov.org  
(e.g., [firstname.lastname@acgov.org](mailto:firstname.lastname@acgov.org))
  - c) The subject line of the e-mail must start with the RO# followed by Report Upload.  
(e.g., Subject: RO1234 Report Upload)

**APPENDIX B**

**APEX STANDARD OPERATING PROCEDURES**

# APEX ENVIROTECH, INC.

## STANDARD OPERATING PROCEDURE

### Monitoring Wells

#### SOP - 1 SOIL BORING SAMPLING

During drilling, soil samples for chemical analysis are collected in thin-walled brass tubes, of varying diameters and lengths (e.g., 4 or 6 inches long by 2 inches outside diameter). Three or four of the selected tubes, plus a spacer tube, are set in an 18-inch long split-barrel sampler of the appropriate inside-diameter.

Where possible, the split-barrel sampler is driven its entire length either hydraulically or using a 140-pound drop hammer. The sampler is extracted from the borehole and the brass tubes, containing the soil samples, are removed. Upon removal from the sampler, the selected brass tubes are either immediately trimmed and capped with aluminum foil or "Teflon" sheets and plastic caps or the samples are extruded from the tubes and sealed within other appropriate, cleaned sample containers. The samples are then hermetically sealed, labeled, and refrigerated for delivery, under strict chain-of-custody, to the analytical laboratory. These procedures minimize the potential for cross-contamination and volatilization of volatile organic compounds (VOC) prior to chemical analysis.

One soil sample collected at each sampling interval is analyzed in the field using either a portable photoionization detector (PID), flame ionization detector, organic vapor analyzer, catalytic gas detector, or an explosimeter. The purpose of this field analysis is to qualitatively determine the presence or absence of hydrocarbons, and the samples to be analyzed at the laboratory. The soil sample is sealed in either a brass tube, glass jar, or plastic bag to allow for some volatilization of VOC. The PID is then used to measure the concentrations of hydrocarbons within the containers' headspace. The data is recorded on both field notes and the boring logs at the depth corresponding to the sampling point.

Other soil samples are collected to document the soil and/or stratigraphic profile beneath the project site, and estimate the relative permeability of the subsurface materials. All drilling and sampling equipment are either steam cleaned or washed in solution and doubly rinsed in deionized water prior to use at each site and between boreholes to minimize the potential for cross-contamination.

In the event the soil samples cannot be submitted to the analytical laboratory on the same day they are collected (e.g., due to weekends or holidays), the samples are temporarily stored until the first opportunity for submittal either on ice in a cooler, such as when in the field, or in a refrigerator at Apex's office.

#### SOP - 3 SOIL CLASSIFICATION

Soil samples are classified according to the Unified Soil Classification System. Representative portions of the samples may be submitted, under strict chain-of-custody, to an analytical laboratory for further examination and verification of the in-field classification and analysis of soil mechanical and/or petrophysical properties. The soil types are indicated on logs of either excavations or borings together with depths corresponding to the sampling points and other pertinent information.

#### SOP - 4 SAMPLE IDENTIFICATION AND CHAIN-OF-CUSTODY PROCEDURES

Sample identification and chain-of-custody procedures ensure sample integrity as well as document sample possession from the time of collection to ultimate disposal. Each sample container submitted for analysis is labeled to identify the job number, date, time of sample collection, a sample number unique to the sample, any in-field measurements made, sampling methodology, name(s) of on-site personnel, and any other pertinent field observations also recorded on the field excavation or boring log.

Chain-of-custody forms are used to record possession of the sample from time of collection to arrival at the laboratory. During shipment, the person with custody of the samples will relinquish them to the next person by signing the chain-of-custody form(s) and noting the date and time. The sample-control officer at the laboratory will verify sample integrity, correct preservation, confirm collection in the proper container(s), and ensure adequate volume for analysis.

If these conditions are met, the samples will be assigned unique laboratory log numbers for identification throughout analysis and reporting. The log numbers will be recorded on the chain-of-custody forms and in the legally-required log book maintained in the laboratory. The sample description, data received, client's name, and any other relevant information will also be recorded.

#### SOP - 5 LABORATORY ANALYTICAL QUALITY ASSURANCE AND CONTROL

In addition to routine instrument calibration, replicates, spikes, blanks, spiked blanks, and certified reference materials are routinely analyzed at method-specific frequencies to monitor precision and bias. Additional components of the laboratory Quality Assurance/Quality Control program include:

1. Participation in state and federal laboratory accreditation/certification programs;
2. Participation in both U.S. EPA Performance Evaluation studies (WS and WP studies) and inter-laboratory performance evaluation programs;
3. Standard operating procedures describing routine and periodic instrument maintenance;
4. "Out-of-Control"/Corrective Action documentation procedures; and,
5. Multi-level review of raw data and client reports.

#### SOP - 6 HOLLOW-STEM AUGER MONITORING WELL INSTALLATION AND DEVELOPMENT

Boreholes for monitoring wells are drilled using a truck-mounted, hollow-stem auger drill rig. The borehole diameter will be a minimum of 4 inches larger than the outside diameter of the casing when installing well screen. The hollow-stem auger provides minimal interruption of drilling while permitting

soil sampling at desired intervals. Soil samples are collected by either hammering (with a 140-pound drop hammer) or hydraulically pushing a conventional split-barrel sampler containing pre-cleaned 2-inch-diameter brass tubes. A geologist or engineer from Apex Envirotech, Inc., continuously logs each borehole during drilling and constantly checks drill cuttings for indications of both the first recognizable occurrence of groundwater and volatile hydrocarbons using either a portable photoionization detector, flame ionization detector, or an explosimeter. The sampler is rinsed between samples and either steam cleaned or washed with all other drilling equipment between borings to minimize the potential for cross-contamination.

Monitoring wells are cased with threaded, factory-perforated and blank Schedule 40 PVC. The perforated interval consists of slotted casing, generally with 0.020-inch wide by 1.5-inch long slots, with 42 slots per foot. A PVC cap may be secured to the bottom of the casing with stainless steel screws; no solvents or cements are used. Centering devices may be fastened to the casing to ensure even distribution of filter material and grout within the borehole annulus. The well casing is thoroughly washed and/or steam cleaned, or may be purchased as pre-cleaned, prior to installation.

After setting the casing inside the hollow-stem auger, sand or gravel filter material is poured into the annular space to fill from boring bottom to generally 1 foot above the perforated interval. A 1- to 2-foot thick bentonite plug is set above this filter material to prevent grout from infiltrating the filter pack. Either neat cement, containing about 5 percent bentonite, or sand-cement grout is then tremied into the annular space from the top of the bentonite plug to near surface. A traffic-rated vault is installed around each wellhead for wells located in parking lots or driveways, while steel "stovepipes" are usually set over wellheads in landscaped areas.

After installation, the wells are thoroughly developed to remove residual drilling materials from the wellbore, and to improve well performance by removing fine material from the filter pack that may pass into the well. Well development techniques used may include pumping, surging, bailing, swabbing, jetting, flushing, and air-lifting. All development water is collected either in drums or tanks for temporary storage, and properly disposed of depending on laboratory analytical results. To minimize the potential for cross-contamination between wells, all development equipment is either steam cleaned or properly washed prior to use. Following development, the well is allowed to stand undisturbed for a minimum of 24 hours before its first sampling.

#### **SOP - 7 GROUNDWATER PURGING AND SAMPLING**

Prior to water sampling, each well is purged by evacuating a minimum of three wetted well-casing volumes of groundwater. When required, purging will continue until either the discharge water temperature, conductivity, or pH stabilize, a maximum of ten wetted-casing volumes of groundwater have been recovered, or the well is bailed dry. When practical, the groundwater sample should be collected when the water level in the well recovers to at least 80 percent of its static level.

The sampling equipment consists of either a "Teflon" bailer, PVC bailer, or stainless steel bladder pump with a "Teflon" bladder. If the sampling system is dedicated to the well, then the bailer is usually "Teflon," but the bladder pump is PVC with a polypropylene bladder. In general and depending on the intended laboratory analysis, 40-milliliter glass, volatile organic

analysis (VOA) vials, with "Teflon" septa, are used as sample containers.

The groundwater sample is decanted into each VOA vial in such a manner that there is no meniscus at the top of the vial. A cap is quickly secured to the top of the vial. The vial is then inverted and gently tapped to see if air bubbles are present. If none are present, the vial is labeled and refrigerated for delivery, under strict chain-of-custody, to the analytical laboratory. Label information should include a unique sample identification number, job identification number, date, time, type of analysis requested, and the sampler's name.

For quality control purposes, a duplicate water sample is collected from each well. This sample may also be analyzed or put on hold at the laboratory. When required, a trip blank, prepared at the laboratory, is placed in the transport cooler. It is labeled similar to the well samples, remains in the cooler during transport, and is analyzed by the laboratory along with the groundwater samples. In addition, a field blank may be prepared in the field when sampling equipment is not dedicated. The field blank is prepared after a pump or bailer has been either steam cleaned or properly washed, prior to use in the next well, and is analyzed along with the other samples. The field blank analysis demonstrates the effectiveness of the in-field cleaning procedures to prevent cross-contamination.

To minimize the potential for cross-contamination between wells, all well development and water sampling equipment not dedicated to a well is either steam cleaned or properly washed between use. As a secondary precautionary measure, wells are sampled in order of least to highest concentrations as established by available previous analytical data.

In the event the water samples cannot be submitted to the analytical laboratory on the same day they are collected (e.g., due to weekends or holidays), the samples are temporarily stored until the first opportunity for submittal either on water ice in a cooler, such as when in the field, or in refrigerator at Apex's office.

#### **SOP - 12 MEASURING LIQUID LEVELS USING WATER LEVEL METER OR INTERFACE PROBE**

Field equipment used for liquid-level gauging typically includes the measuring instrument (water-level meter or interface probe) and product bailer(s). The field kit also includes cleaning supplies (buckets, solution, spray bottles, and deionized water) to be used in cleaning the equipment between wells.

Prior to measurement, the instrument tip is lowered into the well until it touches bottom. Using the previously established top-of-casing or top-of-box (i.e., wellhead vault) point, the probe cord (or halyard) is marked and a measuring tape (graduated in hundredths of a foot) is used to determine the distance between the probe end and the marking on the cord. This measurement is then recorded on the liquid-level data sheet as the "Measured Total Depth" of the well.

When necessary in using the interface probe to measure liquid levels, the probe is first electrically grounded to either the metal stove pipe or another metal object nearby. When no ground is available, reproducible measurements can be obtained by clipping the ground lead to the handle of the interface probe case.

The probe tip is then lowered into the well and submerged in the groundwater. An oscillating (beeping) tone indicates the probe is in water. The probe is slowly raised until either the oscillating tone ceases or becomes a steady tone. In either case, this is the depth-to-water (DTW) indication and the DTW measurement is made accordingly. The steady tone indicates floating liquid hydrocarbons (FLH). In this case, the probe is slowly raised until the steady tone ceases. This is the depth-to-product (DTP) indication and the DTP measurement is made accordingly.

The process of lowering and raising the probe must be repeated several times to ensure accurate measurements. The DTW and DTP measurements are recorded on the liquid-level data sheet. When FLH are indicated by the probe's response, a product bailer is lowered partially through the FLH-water interface to confirm the FLH on the water surface and as further indication of the FLH thickness, particularly in cases where the FLH layer is quite thin. This measurement is recorded on the data sheet as "FLH thickness."

In order to avoid cross-contamination of wells during the liquid-level measurement process, wells are measured in the order of "clean" to "dirty" (where such information is available). In addition, all measurement equipment is cleaned with solution and thoroughly rinsed with deionized water before use, between measurements in respective wells, and at the completion of the day's use.



**APPENDIX C**

**ZONE 7 WATER AGENCY WELL SEARCH**



**ZONE 7 WATER AGENCY**  
**100 NORTH CANYONS PARKWAY**  
**LIVERMORE, CA 94551**

**WELL LOCATION MAP**

**SCALE: 1"= 800 ft**

**DATE: 2/23/06**

**1051 Airway Blvd**  
 H:\FLOOD\REFERALLS\REFERALLS.WOR



Permit Date: 12/18/00	Site Id: 3S-1E_01FD2
Permit No.: 20231	Location: CONSTITUTION DRIVE
Contractor: WOODWARD DRILLING	Elevation: 420.00'
Consulting Firm:	Datum: Mean Sea Level
Logged By: Carol Mahoney	Date(s): 12/18/00 - 12/18/00
Certified By:	

Purpose: Monitoring Well, Shallow	Conductor Casing: type: dia: 6.00in fm: 0.00' to: 2.00'
Drilling Method: HOLLOW STEM	Blank Casing: type: PVC dia: 2.00in fm: 0.0' to: 25.00'
Remarks: SMP MONITORING WELL - CONSTITUTION	Screens: type: Slotted size: 0.010in dia: 2.00in fm: 25.00' to: 40.00'
	Annular Fill: type: Grout fm: 2.00' to: 17.00' type: Bentonite fm: 17.00' to: 21.00' type: Sand Pack (generic) fm: 21.00' to: 40.00'

Elevation (ft)	Depth (ft)	Recovery	Sample No.	Blow Count	Graphic Log	Material Description	Well Construction
420							MP. EL. 0.00
410	10					LL Brownish-grey fine sandy, slightly silty clay, slightly moist Becomes sandier with depth	
						Some as above w/ a few very fine gravel pieces ~1% LL Brownish-grey, w/some iron staining, clayey, fine sand, moist	
						LL Brownish-grey fine sandy, silty clay LL Brownish-grey clayey, fine sand, very moist	
400	20					LL Brownish-grey silty clay, stiff, moist, w/ some fine to med sand at end, wet	
						LL Brownish-grey, very fine sandy, silty clay, plastic to med stiff Sand increases at end (fine to coarse), wet	
390	30					LL Brownish-grey, 2' of gravelly clay then 14' of med to coarse, slightly clayey sand, wet; then another 2' of gravelly clay	
						LL Brownish-grey, clayey, fine sand, med	
						Note: Flowing clayey sand at surface as we drill down.	
380	40					LL Brownish-grey, silty clay, stiff, moist	
370	50						

35/E/L1



Permit Date: 12/18/00	Site Id: 35-1E_01L01
Permit No.: 20230	Location: KITTY HAWK AT MISSEN
Contractor: WOODWARD DRILLING	Elevation: 400.00'
Consulting Firm:	Datum: Mean Sea Level
Logged By: Carol Mahoney	Date(s): 12/18/00 - 12/13/00
Certified By:	Conductor Casing: type: dia: 6.00in fm: 0.00' to: 2.00'

Purpose: Monitoring Well, Shallow	Stank Casing: type: PVC dia: 2.00in fm: 0.0' to: 60.00'
Drilling Method: HOLLOW STEM	Screens: type: Slotted size: 0.010in dia: 2.00in fm: 60.00' to: 70.00'
Remarks: SMP MONITORING WELL - KITTY HAWK	Annular Fill: type: Grout fm: 2.00' to: 51.00'
	type: Bentonite fm: 51.00' to: 55.00'
	type: Sand Pack (generic) fm: 55.00' to: 70.00'

Elevation (ft)	Depth (ft)	Recovery	Sample No.	Blow Count	Graphic Log	Material Description	Well Construction
400					FI (A)		MP. EL. 0.00
					[Cross-hatched pattern]	Anaerobic dark greyish black clay	
90	10				[Diagonal lines pattern]	Yellowish-orange brown to LL Brownish-grey clayey silt, stiff but friable, slightly moist, few coarse sand pieces	
					[Vertical lines pattern]	LL Brownish-grey fine sandy, very silty clay, moist	
380	20				[Diagonal lines pattern]	Some as above LL Brownish-grey to greyish-brown clayey, fine sand, moist	
					[Dotted pattern]	LL Brownish-grey (fine sandy, very silty clay, stiff, moist (sampler bottom wet)	
370	30				[Diagonal lines pattern]	Some as above LL Brownish-grey to very LL brown mottled, very fine to fine sandy, very silty clay, moist	
					[Diagonal lines pattern]	Some as above, mottled, w/ occasional coarse sand pieces	
360	40				[Diagonal lines pattern]	Some as above, but increasing in clay content w/ depth, slightly more moist	
					[Diagonal lines pattern]	Some as above LL Brownish-grey, fine sand, dry	
350	50				[Dotted pattern]	LL Brownish-grey, mottled, fine sandy, silty clay, moist to wet-but just barely	
					[Diagonal lines pattern]	Some as above, but very stiff, moist	
					[Diagonal lines pattern]	LL Brownish-grey, slightly silty, sticky clay, increasing content with depth of minor amounts of fine sand, moist to wet	

3S/E 1L1



Permit Date: 12/18/00	Site Id: 3S-1E_01L01
Permit No.: 20230	Location: KITTY HAWK AT NISSEN
Contractor: WOODWARD DRILLING	Elevation: 400.00'
Consulting Firm:	Datum: Mean Sea Level
Logged By: Carol Mahoney	Date(s): 12/18/00 - 12/19/00
Certified By:	

Purpose: Monitoring Well, Shallow	Conductor Casing: type: dia: 8.00in fm: 0.00' to: 2.00'
Drilling Method: HOLLOW STEM	Blank Casing: type: PVC dia: 2.00in fm: 0.0' to: 60.00'
Remarks: SMP MONITORING WELL - KITTY HAWK	Screens: type: Slotted size: 0.010in dia: 2.00in fm: 60.00' to: 70.00'
	Annular Fill: type: Grout fm: 2.00' to: 51.00'
	type: Bentonite fm: 51.00' to: 55.00'
	type: Sand Pack (generic) fm: 55.00' to: 70.00'

Elevation (ft)	Depth (ft)	Recovery	Sample No.	Blow Count	Graphic Log	Material Description	Well Construction
340						U. Brownish-grey, mottled, very silty, slightly fine sandy clay, wet increasing sand content w/ depth	
330	70					U. Brownish-grey, fine, very sandy clay, sticky, wet L. Brownish-grey, mottled, very silty, slightly fine sandy clay, very stiff, moist.	
320	80						
310	90						
300	100						
290	110						



Permit Date: 07/15/03

Site Id: 3S-1E\_02J03

3S/1E 2J3

Permit No.: 23087

Location:

Contractor: WOODWARD DRILLING

Elevation: 0.00'

Consulting Firm:

Datum:

Logged By: Jen Gelmini

Date(s): 07/16/03 - 07/16/03

Certified By: Colleen Winey

Conductor Casing:  
type:

dia: 0.00in fm: 0.00' to: 0.00'

Blank Casing:  
type: PVC

dia: 2.00in fm: -0.5' to: 55.00'

Screens:

type: Slotted size: 0.010in dia: 2.00in fm: 55.00' to: 65.00'

Annular Fill:

type: Grout fm: 0.50' to: 51.00'

type: Bentonite fm: 51.00' to: 53.00'

type: No. 2/12 clean sand

fm: 53.00' to: 65.00'

Purpose:

Drilling Method: HOLLOW STEM

Remarks: Northern most well in Golf Course Transect part of SMP monitoring well program.

Elevation (ft)	Depth (ft)	Recovery	Sample No.	Elow Count	Graphic Log	Material Description	Well Construction
						SURFACE, asphalt.	
			1	6 7 6 9 6 14		ML, light brown clayey silt trace fine and medium sand, slightly moist, very stiff.	
	10		2	6 7 6 7 6 10		CL, light brown silty clay, moist, stiff, some white mottling.	
			3	6 9 6 9 6 12		CL, light brown clay some silt, slightly moist, stiff, some white mottling.	
	20		4	6 8 6 10 6 20		CL, light brown clay some silt, moist, very stiff, some white mottling.	
			5	6 11 6 11 6 18		CL, as above.	
	30		6	6 7 6 11 6 19		CL, light brown clay some silt, moist, very stiff. SP, greyish-brown medium and fine sand some clay.	
			7	6 11 6 16 6 18		ML, light brown clayey silt some fine sand, moist, very stiff. grading into CL, light brown clay some silt, moist, very stiff, trace white mottling.	
	40		8	6 8 6 9 6 13		CL, light brown clay with silt, moist, very stiff, trace white mottling.	
			9	6 9 6 12 6 17		CL, clay as above.	
	50		10	6 10 6 16 6 22		ML, light brown clayey silt with fine sand, moist, very stiff.	
			11	6 7 6 10 6 12		ML, light brown silt with clay trace fine and medium sand, wet, very stiff.	



Permit Date: 07/15/03	Site Id: 3S-1E_02J03
Permit No.: 23087	Location:
Contractor: WOODWARD DRILLING	Elevation: 0.00'
Consulting Firm:	Datum:
Logged By: Jen Celmini	Date(s): 07/16/03 - 07/16/03
Certified By: Colleen Winey	Conductor Casing:

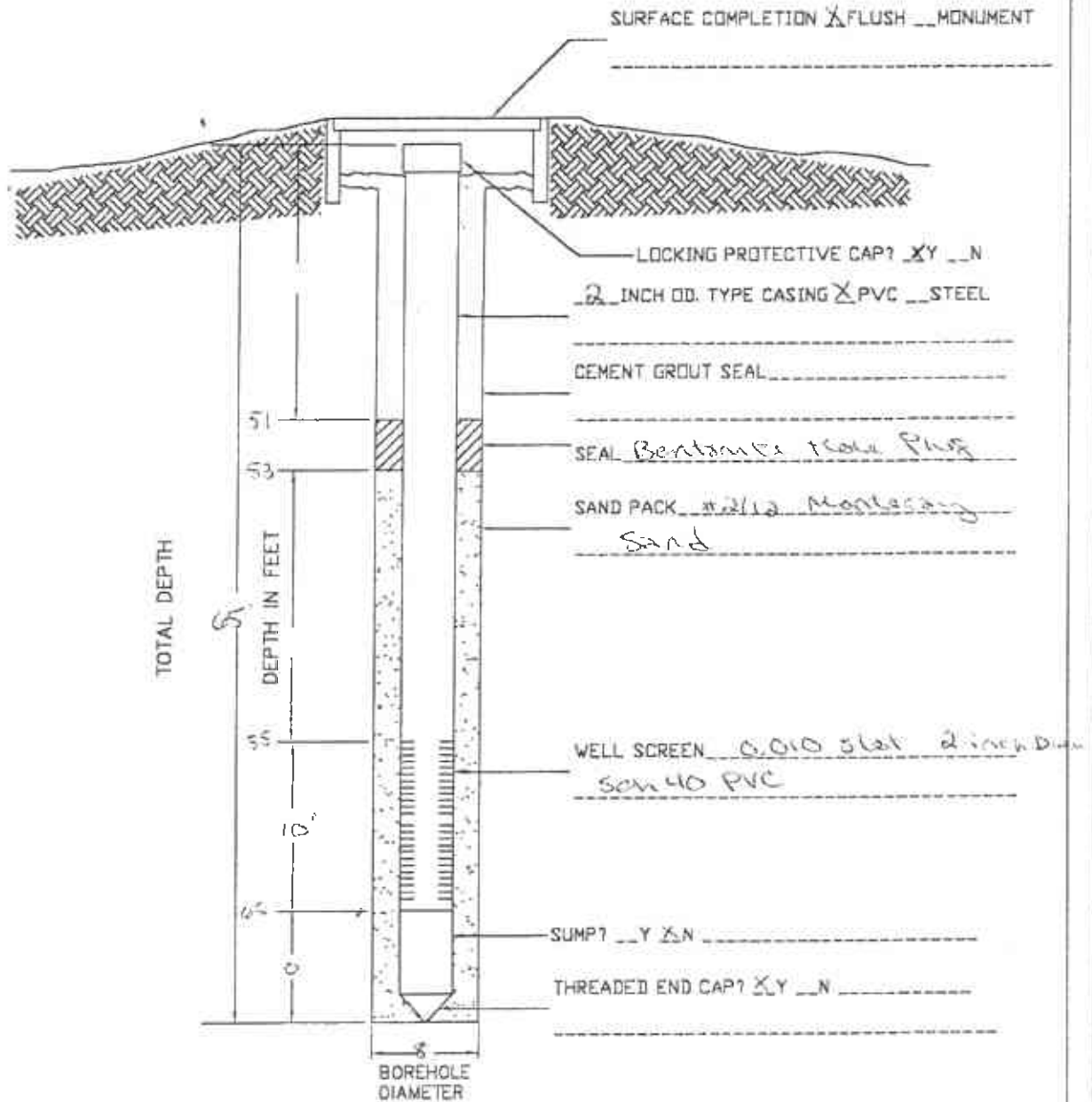
Purpose:	type:	dia: 0.00in	fm: 0.00'	to: 0.00'	
Drilling Method: HOLLOW STEM	Blank Casing:	type: PVC	dia: 2.00in	fm: -0.5'	to: 55.00'
Remarks: Northern most well in Golf Course Transect part of SMP monitoring well program.	Screens:	type: Slotted	size: 0.010in dia; 2.00in	fm: 55.00'	to: 65.00'
	Annular Fill:	type: Grout	fm: 0.50'	to: 51.00'	
	type: Bentonite	fm: 51.00'	to: 53.00'		
	type: No. 2/12 clean sand	fm: 53.00'	to: 65.00'		

Elevation (ft)	Depth (ft)	Recovery	Sample No	Blow Count	Graphic Log	Material Description	Well Construction
			12	6 12 6 18 6 19		CL, light brown clay trace fine sand some silt, wet, hard. SC, light brown clayey sand, saturated, dense. ML, light brown silt with some sand.	
			13	6 17 6 21 6 26		CL, light brown clay trace fine sand some silt, wet, hard, some white mottling.	
-70	70						
-80	80						
-90	90						
-100	100						
-110	110						

HOLE SIZE	

CASING RECORD		
0	SS	2-in diam Saw 40 PVC
55	CS	2-in PVC C. Closure

ANNULAR FILL MATERIALS		



WELL ID: 35116 253

DATE: 7-16-03

DRILLED BY: C. Winey / J. Belmont

INSTALLER: (Signature)

Drilling - Frank

WELL INFORMATION



ZONE 7

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

DRAWN: (MODIFIED) C. MAHONEY

DESIGNED: G. GATES

CHECKED: G. GATES

APPROVED:

DATE: 12/12/2001

SCALE: NONE

FILE NAME: E:\ACAD WORK\WELL\_CONSTRUCT.DWG

WELL CONSTRUCTION DIAGRAM