Jillian Holloway
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December 19, 2013

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

RE: Well Decommissioning Report
1771 First Street, Livermore, California
Fuel Leak Case No.: RO0000436

Dear Mr. Wickham,

I declare under penalty of perjury that to the best of my knowledge the information and/or recommendations contained in the attached report is/are true and correct. The attached Well Decommissioning Report documents the decommissioning of 15 groundwater monitoring wells and 8 sparge points associated with the site. Destruction of the wells was required as a final condition to receive case closure at the site.

If you have any questions or need additional information, please contact me at (925) 790-3513 or by e-mail at JillianHolloway@chevron.com.

Sincerely,

Jillian Holloway
Union Oil of California – Project Manager

Attachment
Well Decommissioning Report

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

Union Oil Company of California

Well Decommissioning Report

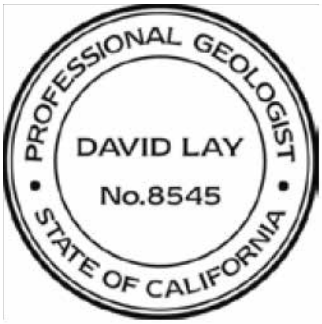
76 Service Station No. 4186
1771 First Street
Livermore, California
Case No. RO0000436

December 19, 2013

ARCADIS

Katherine Brandt
Certified Project Manager

David W. Lay, P.G., C.P.G
Principal Geologist



Well Decommissioning Report

76 Service Station No. 4186
1771 First Street
Livermore, California
Case No. RO0000436

Prepared for:
Union Oil Company of California

Prepared by:
ARCADIS U.S., Inc.
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Tel 510 652 4500
Fax 510 652 4906

Our Ref.:
B0047942.2013.00005

Date:
December 19, 2013

ARCADIS

Table of Contents

Acronyms and Abbreviations

ACDEH	Alameda County Department of Environmental Health
ARCADIS	ARCADIS U.S., Inc.
bgs	below ground surface
CDWR	California Department of Water Resources
Cruz	Cruz Brothers Locators
Delta	Delta Environmental Consultants, Inc.
EM	electromagnetic transmitter and receiver
ft/ft	foot per foot
GPR	ground-penetrating radar
Gregg	Gregg Drilling, Inc.
report	Well Decommissioning Report
site	76 Service Station No. 4186, located at 1771 First Street in Livermore, California
UST	underground storage tank
Zone 7	Zone 7 Water Agency

1. Introduction

ARCADIS U.S. Inc. (ARCADIS), on behalf of Chevron Environmental Management Company's affiliate, Union Oil Company of California (Union Oil) prepared this Well Decommissioning Report (report) for the 76 Service Station No. 4186, located at 1771 First Street in Livermore, California (site; Figure 1). This report documents the decommissioning of 15 groundwater monitoring wells (U-1 through U-15) and eight ozone sparge points (SP-1 through SP-4, SP-5/5S, SP-6S, SP-7S, SP-8/8S) associated with the site. The wells were abandoned in accordance with the Zone 7 Water Agency (Zone 7) requirements. In a letter dated September 23, 2013 the Alameda County Department of Environmental Health (ACDEH) requested well destruction activities (ACDEH 2013). Monitoring well destruction activities were conducted pursuant to California Well Standards Bulletin No. 74-81 and Supplement No. 74-90, under the supervision and signed by an appropriately registered California Professional Geologist. Destruction of the wells was required as a final condition to receive case closure at the site.

2. Site Description

The site is an operating Chevron-branded gas station located at 1771 First Street in Livermore, California (Alameda County Assessor's Parcel # 97-10-1-1; Figure 1). The site currently consists of a station building, four product dispenser islands, and two 10,000-gallon gasoline underground storage tanks. A site plan is presented on Figure 2.

The site is bounded to the northwest by First Street, to the east by South N Street, and to the south and west by commercial property. Commercial and residential properties are located further north and south of the site (ARCADIS 2013a).

2.1 Regional and Site Geology

Onsite soil include Holocene-age alluvial fan deposits, described by the California Department of Water Resources (CDWR) in Bulletin 118-3 as "unconsolidated, moderately sorted, permeable fine sand and silt, with gravel becoming more abundant toward fan heads with canyons" (CDWR 1974). The site is located approximately 1 mile east of the northwest-trending Livermore Fault (Zone 7 2005). Holocene alluvial fan deposits comprise semi-consolidated sand and gravel in a clayey sand matrix (Delta Environmental Consultants, Inc. [Delta] 2006).

The site is underlain by sand and gravel to approximately 20 feet below ground surface (bgs). The sand and gravel layer is underlain by a clay layer from approximately 20 to 35 feet bgs. A sandy layer then extends from approximately 35 to 45 feet bgs, followed by another clay layer from approximately 45 feet bgs (Delta 2010). Copies of available boring logs are provided in Appendix A.

2.2 Regional and Site Hydrogeology

The site is located within the Mocho Sub-basin of the Livermore Valley Groundwater Basin. The Mocho Sub-basin is bounded by the Livermore Fault to the west, exposed Livermore Formation to the east, Tassajara Formation and Parks Boundary to the north, and Livermore Uplands to the south (Zone 7 2005).

Water-bearing zones can be found under the entire Livermore Valley Groundwater Basin and portions of the upland areas. Valley fill, the Livermore Formation, and the Tassajara Formation make up the primary water-bearing zones (CDWR 1974). Multiple aquifers are present in the Livermore Valley Groundwater Basin and include unconfined aquifers in the Upper Aquifer Zone and confined aquifers in the Lower Aquifer Zone. The Upper Aquifer Zone exists between surficial clay (at approximately 20 to 40 feet bgs) to approximately 80 to 150 feet bgs. The Lower Aquifer Zone is located below the up to 50-foot-thick clay aquiclude beneath the center of the Upper Aquifer Zone. Water quality within the Mocho Sub-basin is described as fair to excellent quality, with the presence of sodium bicarbonate and magnesium bicarbonate (Zone 7 2005).

Groundwater was first encountered in borings drilled in 1998 at approximately 23 feet bgs (Gettler-Ryan Inc. 1998). Three hydrologic units were discovered (shallow, intermediate, and deep), separated by approximately 15-foot-thick clayey layers (Delta 2006). The groundwater flow direction on site has varied from the north to the southwest, with dominant flow to the west. The depth to groundwater in on-site wells varies from approximately 21 to 51 feet bgs. Groundwater elevations fluctuate seasonally by approximately 10 feet. The hydraulic gradient during the second semiannual 2012 groundwater monitoring event was approximately 0.004 foot per foot (ft/ft) in the shallow zone, 0.036 ft/ft in the intermediate zone, and 0.014 ft/ft in the deep zone (ARCADIS 2013b).

3. Monitoring Well Decommissioning Activities

Fifteen existing monitoring wells (U-1 through U-15) and eight ozone sparge points (SP-1 through SP-4, SP-5/5S, SP-6S, SP-7S, SP-8/8S) at the site were identified for well destruction. A site plan showing the well locations before destruction is included on Figure 2.

3.1 Pre-Field Activities

Prior to initiating field activities, ARCADIS updated the site-specific Health and Safety Plan in accordance with state and federal requirements for use during the field activities. ARCADIS obtained well destruction permits from Zone 7 prior to initiating the drilling and grouting activities, and an encroachment permit from the City of Livermore Community Development Department to perform well destruction activities at U-4 and U-5, which were located on the City of Livermore right-of-way.

3.2 Underground Utility Locating

On October 11, 2013, ARCADIS contacted Underground Service Alert of Northern California to identify any public utilities near the monitoring well locations. On October 16, 2013, Cruz Brothers Locators (Cruz), a private utility-locating company, conducted a utility mark out under direct supervision by ARCADIS. Cruz conducted the utility mark out using an electromagnetic transmitter and receiver (EM; Fisher TW-6 Pipe & Cable Locator 81.92 kHertz frequency) and ground-penetrating radar (GPR) to depths of approximately 4 to 6 feet, to clear proposed decommissioned monitoring and sparge well locations of conductive and nonconductive underground utilities. Cruz used a traceable rodder to locate the sewer lateral. The site was also inspected for manholes and storm drains. Finally, ARCADIS staff conducted a visual inspection of the site to identify potential utility lines. ARCADIS established three lines of evidence for utility location prior to implementing the planned drilling activities.

No utilities were located within 5 feet of monitoring wells U-1, U-2, U-3, U-9, U-10, U-13, U-14, and SP-5/SP-5S during the public or private utility scans with EM and GPR. Utilities including water (irrigation and domestic), electrical (high voltage electrical, side lighting), sewer, communication, and product lines were encountered within 5 feet of off-site monitoring wells U-4 and U-5, and on-site wells U-6 through U-8, U-11, U-12, SP-1 through SP-4, SP-6, SP-7, and SP-8/SP-8S. A magnetic anomaly was identified around well U-15.

3.3 Monitoring Well Decommissioning by Pressure Grouting

From November 4 through 8, 2013, 13 on-site (U-1 through U-3, and U-6 through U-15) and two off-site (U-4 and U-5) monitoring wells, and eight on-site sparge points (SP-1 through SP-4, SP-5/5S, SP-6/6S, SP-7S, SP-8/8S) were successfully decommissioned by pressure grouting in place. Gregg Drilling, Inc. (Gregg), a California licensed drilling contractor (C-57 License No. 485165) performed the well abandonment in accordance with Zone 7 requirements and the California Well Standards. Available boring logs and well construction diagrams are included as Appendix A.

Prior to well decommissioning, the depth to groundwater and depth to bottom was measured to confirm well construction details (Table 1). The well collar and cover at each well location was removed with a jackhammer, and the wells were pressure grouted at a pressure of approximately 25 pounds per square inch for 5 minutes. The pressure test was completed by connecting the well casing to an air compressor and monitoring the pressure to ensure sufficient setting of the neat cement mixture without any leak or pressure drop. Following the initial pressure test, additional neat cement was pumped into the well casing as necessary to bring the neat cement level back to the top of the casing. Annular materials were removed within the well box to 1 foot bgs and the casing was subsequently cut. The surface at each well location was restored to match pre-existing conditions using concrete, except for SP-3, which was backfilled with garden soil to match the surrounding landscape material.

4. Management of Investigation-Derived Waste

On the final day of work, Gregg removed construction debris including polyvinyl chloride piping, concrete, asphalt, and well monuments from the site and disposed of the debris as municipal waste.

5. Well Completion Reports

As required by Section 13751 of the California Water Code, Well Completion Reports must be filed with the CDWR within 60 days of completion of the well destruction activities. Well Completion Reports were submitted to the CDWR on November 25, 2013.

6. Summary

ARCADIS directed the decommissioning of 15 monitoring and eight sparge wells at the site in November 2013. Wells were decommissioned according to Zone 7 and CDWR Bulletin 74-90 guidelines. ARCADIS has fulfilled all of the requirements for case closure.

7. References

Alameda County Department of Environmental Health. 2013. Well Decommissioning for Fuel Leak Case No. RO0000436 and GeoTracker Global ID T0600101777, Unocal #4186, 1771 First Street, Livermore, CA 94550. September 23.

ARCADIS U.S., Inc. 2013a. Semiannual Monitoring Report – Second Half 2012. Facility No. 4186, 1771 First Street, Livermore, California. January 24.

ARCADIS U.S., Inc. 2013b. Conceptual Site Model and Closure Request. 76 Service Station No. 4186, 1771 First Street, Livermore, California. May 23.

California Department of Water Resources. 1974. California's Groundwater, Bulletin 118, Livermore Valley Groundwater Basin 2-10, Original 1974, Updated January 20, 2006.

Delta Environmental Consultants, Inc. 2006. Soil Boring Assessment, Delta Project No. C104186031, 76 Services Station No. 4186, 1771 First Street, Livermore, California. May 26.

Delta Environmental Consultants, Inc. 2010. Magnesium Sulfate Application Pilot Test Report, 76 Service Station No. 4186, 1771 First Street, Livermore, California. September 15.

Gettler-Ryan Inc. 1998. Well Installation Report at Tosco (Unocal) Service Station No. 4186, 1771 First Street, Livermore, California. November 23.

Zone 7 Water Agency. 2005. Groundwater Management Plan for Livermore-Amador Valley Groundwater Basin. September.

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Table

Table 1
Well Construction Details

Well Decommissioning Report
Union Oil Company of California
76 Service Station No. 4186
1771 First Street, Livermore, California

Monitoring Well ID	Well Installation Date	Well Destruction Date	Borehole Diameter (inches)	PVC diameter (inches)	Well Depth (feet bgs)	Screen Interval (feet bgs)	Depth to Bottom (feet btoc)
Shallow Unit							
U-1	8/15/1998	11/7/2013	8	2	34.5	14 - 34.5	33.8
U-2	8/16/1998	11/7/2013	8	2	34.5	13 - 34.5	32.9
U-3	8/16/1998	11/7/2013	8	2	34	14 - 34	33.5
Intermediate Unit							
U-4	2/21/2001	11/5/2013	8	2	45	35 - 45	44.6
U-5	2/21/2001	11/5/2013	8	2	47	37 - 47	47.8
U-6	12/6/2001	11/6/2013	8	2	45	35 - 45	41.8
U-7	12/6/2001	11/8/2013	8	2	45	35 - 45	44.9
U-8	9/8/2008	11/6/2013	8	2	45	35 -45	45.5
U-9	9/10/2008	11/6/2013	8	2	45	35 -45	44.7
U-10	9/11/2008	11/7/2013	8	2	47	37 - 47	47.9
U-11	9/12/2008	11/8/2013	8	2	45	35 -45	45.6
Deep Unit							
U-12	10/7/2008	11/8/2013	17	4	75	65 - 75	74.8
U-13	10/8/2008	11/6/2013	17	4	72	62 - 72	75.3
U-14	10/1/2008	11/6/2013	17	4	73	65 - 73	72.0
U-15	10/8/2008	11/7/2013	17	4	71	61 - 71	71.5
Sparge Points							
SP-1	12/7/2001	11/6/2013	8	3/4	45	42.5-45	---
SP-2	12/7/2001	11/7/2013	8	3/4	45	42.5-45	---
SP-3	12/6/2001	11/7/2013	8	3/4	45	42.5-45	---
SP-4	12/5/2001	11/7/2013	8	3/4	45	42.5-45	---
SP-5/SP-5S	12/5/2001	11/7/2013	8	3/4	45	42.5-45, 22.5-25	---
SP-6S	12/72001	11/7/2013	8	3/4	25	22.5-25	---
SP-7S	12/6/2001	11/8/2013	8	3/4	25	22.5-25	---
SP-8/SP-8S	12/5/2001	11/8/2013	8	3/4	25	42.5-45, 22.5-25	---

Notes:
bgs = below ground surface
btoc = below top of casing

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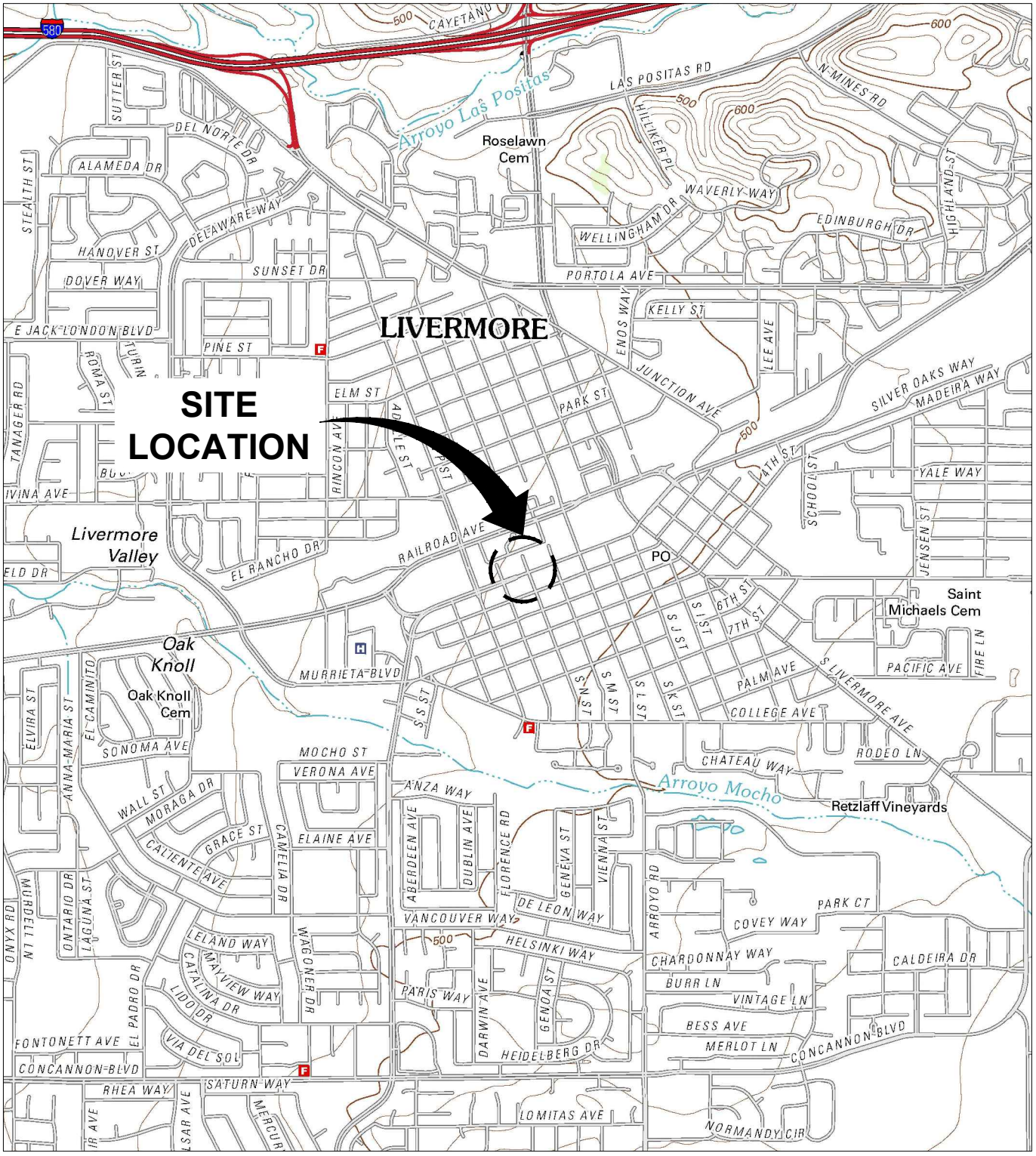
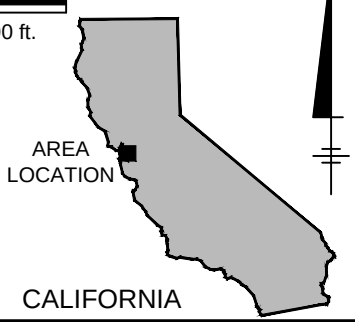
Figures



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., LIVERMORE, CALIFORNIA, 2012.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



UNION OIL COMPANY OF CALIFORNIA
76 SERVICE STATION 4186
1771 FIRST STREET
LIVERMORE, CALIFORNIA

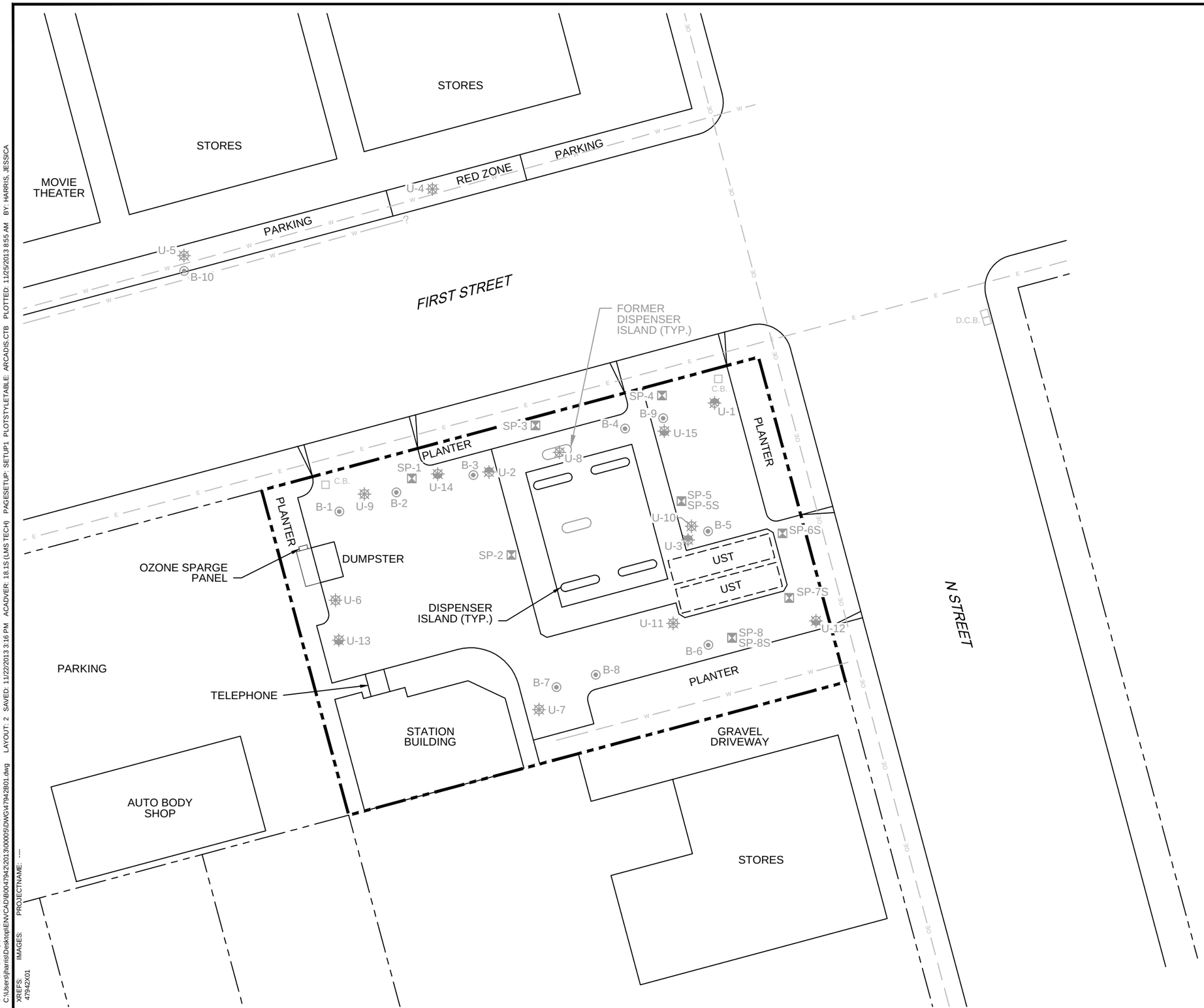
SITE LOCATION MAP

ARCADIS

FIGURE 1

CITY: PETALUMA, CA DIV/GROUP: ENV DB: J. HARRIS
C:\Users\jharris\Desktop\ENVCAD\B0047942\2012\00002\DWG\47942N01.dwg LAYOUT: 1 SAVED: 7/5/2012 6:45 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 7/5/2012 6:45 AM BY: HARRIS, JESSICA

XREFS: IMAGES: PROJECTNAME: ---
Livermore.jpg



LEGEND

- PROPERTY BOUNDARY
- U-1 SHALLOW ZONE MONITORING WELL (ABANDONED NOVEMBER 2013)
- U-6 INTERMEDIATE ZONE MONITORING WELL (ABANDONED NOVEMBER 2013)
- U-15 DEEP ZONE MONITORING WELL (ABANDONED NOVEMBER 2013)
- SP-1 OZONE SPARGE POINT (ABANDONED NOVEMBER 2013)
- B-1 BOREHOLE LOCATION
- C.B. STORM DRAIN
- UNDERGROUND ELECTRIC
- UNDERGROUND WATER
- OVERHEAD ELECTRIC

NOTES:

1. BASE MAP PROVIDED BY CRA, DATED 1/28/2011. BASED ON A MAP PROVIDED BY DELTA ENVIRONMENTAL CONSULTANTS, FIGURE 2, TITLED "SITE MAP", DATED 12/14/2005.
2. ALL SITE FEATURES AND LOCATIONS ARE APPROXIMATE.

0 30' 60'

GRAPHIC SCALE

UNION OIL COMPANY OF CALIFORNIA
76 SERVICE STATION 4186
1771 FIRST STREET
LIVERMORE, CALIFORNIA

SITE PLAN SHOWING ABANDONED WELL LOCATIONS

ARCADIS

FIGURE 2

CITY: PETALUMA, CA DIV/GROUP: ENV DB: J. HARRIS
C:\Users\jharris\Desktop\ENVCAD\B004794\2\2013000005\DWG\47942B01.dwg LAYOUT: 2 SAVED: 11/22/2013 3:16 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 11/25/2013 8:55 AM BY: HARRIS, JESSICA
XREFS: 47942X01 IMAGES: PROJECTNAME: ----

Appendix A

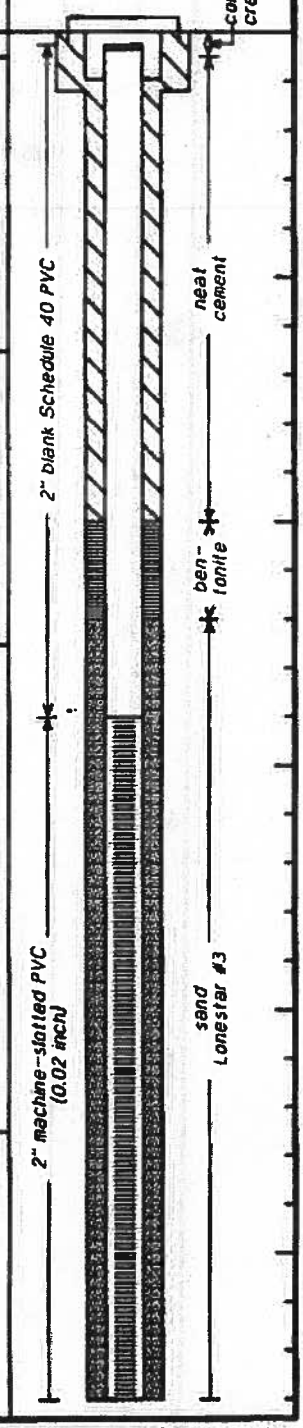
Boring Logs

Gettler-Ryan Inc.

Log of Boring U-1

PROJECT: *Tosco (Unocal) Station No. 4186*	LOCATION: *1771 1st Street, Livermore, CA*
GSI PROJECT NO.: *140175.02*	CASING ELEVATION: *478.27 feet MSL*
DATE STARTED: *06/15/98*	WL (ft. bgs): *24.9* DATE: *06/16/98* TIME: *8:00 am*
DATE FINISHED: *06/15/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8" hollow-stem auger*	TOTAL DEPTH: *34.5 Feet*
DRILLING COMPANY: *Woodward Drilling*	GEOLOGIST: *Clyde Galantine*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							Asphalt and fill gravel.
						ML	GRAVELLY SILT WITH SAND (ML) – dark brown (10YR 3/3), damp, very stiff, non plastic, 80% silt, 20% fine gravel, 15% fine to coarse sand, 5% clay.
5	8	23	U-1-6				
						GW	
10	2	60	U-1-11				GRAVEL WITH SAND (GW) – dark brown (10YR 4/3), damp, very dense, 75% subangular to rounded fine gravel, 20% fine to coarse sand, 5% clay.
						GW GC	
15	3	69	U-1-15.5				GRAVEL WITH CLAY AND SAND (GW-GC) – brown (10YR 5/3), saturated, very dense, 70% subangular to rounded fine gravel, 20% fine to coarse sand, 10% clay.
	–	44	U-1-19				
20	4	78	U-1-21.5				
						CL	
25	2	24	U-1-26.5				CLAY (CL) – yellowish brown (10YR 5/4), damp, very stiff, plastic, 75% clay, 20% silt, 5% fine to medium sand.



JOB NUMBER: *140175.02*

Gettler-Ryan Inc.

Log of Boring U-1

PROJECT: *Tosco (Unocal) Station No. 4186*

LOCATION: *1771 1st Street, Livermore, CA*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
	1	24	U-1-30			CL	Becomes damp to wet.	cap 2" machine-slotted PVC (0.02 inch) sand Lonestar #3
33	2	28	U-1-34.5					
38								
43								
48								
53								
58								

JOB NUMBER: *140175.02*

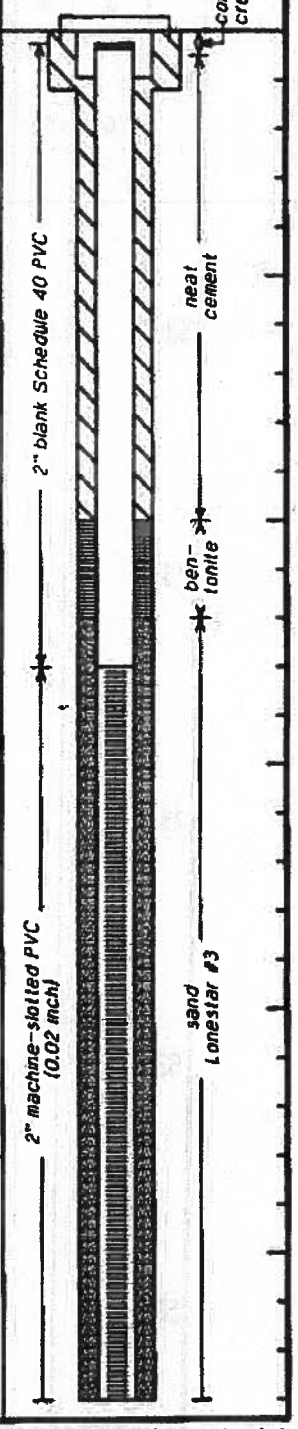
Gettler-Ryan Inc.

Log of Boring U-2

PROJECT: *Tosco (Unocal) Station No. 4188*	LOCATION: *1771 1st Street, Livermore, CA*
GSI PROJECT NO.: *140175.02*	CASING ELEVATION: *477.44 feet MSL*
DATE STARTED: *06/16/98*	WL (ft. bgs): *23.8* DATE: *06/16/98* TIME: *3:00 pm*
DATE FINISHED: *06/16/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8" hollow-stem auger*	TOTAL DEPTH: *34.5 Feet*
DRILLING COMPANY: *Woodward Drilling*	GEOLOGIST: *Clyde Galantine*

DEPTH feet	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						GW GM	Asphalt and fill gravel.
5	-	21	U-2-5.5				GRAVEL WITH SILT AND SAND (GW-GM) - brown (10YR 5/3), damp, medium dense, 75% subangular to rounded fine gravel, 15% fine to coarse sand, 10% silt.
10	3	40	U-2-10.5				
15	-	79	U-2-14				Becomes very dense.
						GW GC	
20	4	51	U-2-21				GRAVEL WITH CLAY AND SAND (GW-GC) - brown (10YR 5/3), saturated, very dense, 70% subangular to rounded fine gravel, 20% fine to coarse sand, 10% clay.
						CL	
25	4	33	U-2-26.5				CLAY (CL) - brown (10YR 5/3) with dark blue gray (5B 4/1) mottling, moist to damp, hard, plastic, 90% clay, 10% silt, trace fine sand.

WELL DIAGRAM



JOB NUMBER: *140175.02*

Gettler-Ryan Inc.

Log of Boring U-2

PROJECT: *Tosco (Unocal) Station No. 4188*

LOCATION: *1771 1st Street, Livermore, CA*

DEPTH feet	PID (ppm)	BLOWS/FT. #	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
						CL	Color change to brown (10YR 5/3), becomes moist to saturated, very stiff.	cap; 2" machine-slotted PVC (0.02 inch); sand Lonestar #3; ben-tonite
	3	18	U-2-31.5					
33							Becomes damp, hard.	
	6	62	U-2-34			GW GC	GRAVEL WITH CLAY AND SAND (GW-GC) - gray (5Y 5/1) to dark yellowish brown (10YR 4/6), saturated, very dense, 75% subangular to rounded fine gravel, 20% fine to coarse sand, 10% clay.	
38								
43								
48								
53								
58								

JOB NUMBER: *140175.02*

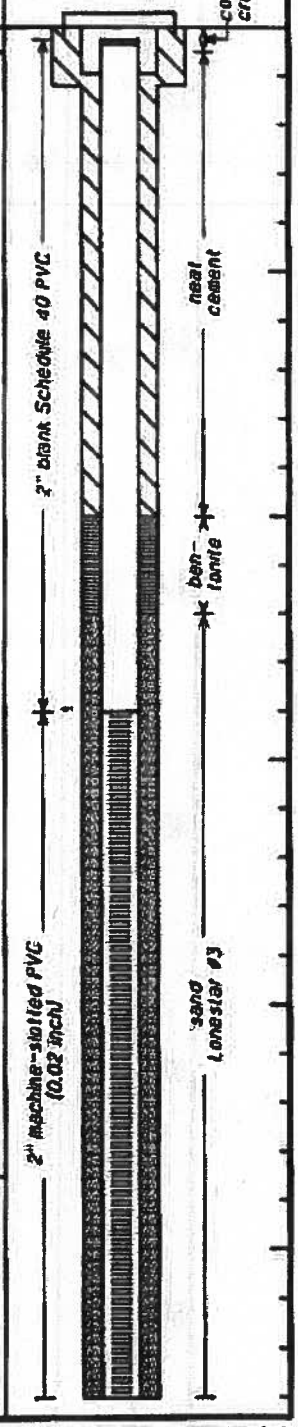
Gettler-Ryan Inc.

Log of Boring U-3

PROJECT: *Tosco (Unocal) Station No. 4186*	LOCATION: *1771 1st Street, Livermore, CA*
GSI PROJECT NO.: *140175.02*	CASING ELEVATION: *454.92 feet MSL*
DATE STARTED: *06/16/98*	WL (ft. bgs): *23.9* DATE: *06/16/98* TIME: *4:45 pm*
DATE FINISHED: *06/16/98*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8" hollow-stem auger*	TOTAL DEPTH: *38.5 Feet*
DRILLING COMPANY: *Woodward Drilling*	GEOLOGIST: *Clyde Galantine*

DEPTH (feet)	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0						GW GC	Asphalt and fill gravel.
5	2	27	U-3-6				GRAVEL WITH CLAY AND SAND (GW-GC) - brown (10YR 5/3), moist, dense, 70% subangular to rounded fine gravel, 20% fine to coarse sand, 10% clay.
10	2	51	U-3-11				Becomes very dense.
15	18	88	U-3-15.5				
20	-	70	U-3-20.5				
25	218	35	U-3-25.5			CL	CLAY (CL) - yellowish brown (10YR 5/4), damp to moist, hard, plastic, 85% clay, 15% silt, trace fine sand.

WELL DIAGRAM



JOB NUMBER: *140175.02*

Gettler-Ryan Inc.

Log of Boring U-3

PROJECT: *Tosco (Unocal) Station No. 4186*

LOCATION: *1771 1st Street, Livermore, CA*

DEPTH feet	PID (ppm)	BLOWS/FT. #	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	WELL DIAGRAM
33	31	14	U-3-31			CL	Color change to olive brown (2.5Y 4/4), becomes saturated.	cap; 2" machine-slotted PVC (0.02 inch); sand Lonestar #3; ben-tonite
	340	30	U-3-34.5				CLAY WITH SAND AND GRAVEL (CL) - olive brown (2.5Y 4/4), 70% clay, 10% silt, 10% fine to coarse sand, 10% fine gravel.	
38	372	44	U-3-38.5			GW	GRAVEL (GW) - brown (10YR 4/3), saturated, very dense, 85% subangular to rounded fine gravel, 10% fine to coarse gravel, 10% clay, abundant water.	
43								
48								
53								
58								

JOB NUMBER: *140175.02*

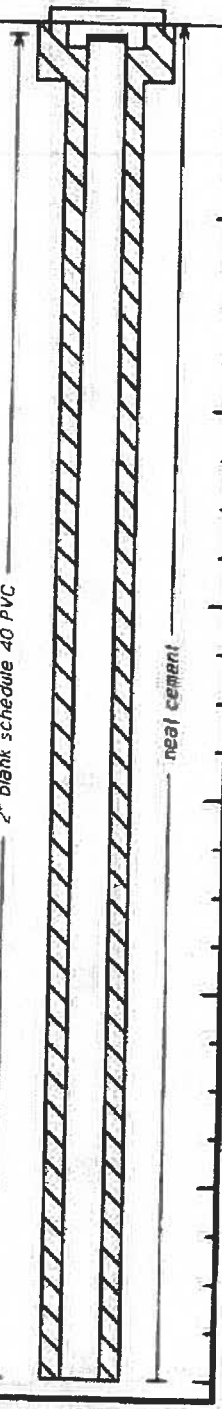
Gettler-Ryan, Inc.

Log of Boring U-4

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO. : *140175.05*	CASING ELEVATION:
DATE STARTED: *02/21/01*	WL (ft. bgs): *29.5* DATE: *02/21/01* TIME: *10:35*
DATE FINISHED: *02/21/01*	WL (ft. bgs): *33.0* DATE: *02/21/01* TIME: *15:00*
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *46.5 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						GW	ASPHALT – 3 inches thick.
							GRAVEL WITH SAND (GW) – dark brown (10YR 3/3), dry, very dense; 60% fine to coarse subangular gravel to 4 cm, 40% fine to coarse sand.
4	0	>100	U-4-5				
8	0	>100					Becomes 50% fine to coarse subangular gravel to 4 cm, 30% fine to coarse sand, 20% silt.
12						SW-SM	SAND WITH SILT AND GRAVEL (SW-SM) – brown (10YR 4/3), dry, very dense; 50% fine to coarse sand, 30% silt, 20% fine gravel.
16	0	>100	U-4-15				
						SW-SC	SAND WITH GRAVEL AND CLAY (SW-SC) – brown (10YR 4/3), dry, very dense; 60% fine to coarse sand, 30% fine to coarse subangular gravel, 20% clay.
20	0	>100	U-4-20				
						CL	CLAY (CL) – yellowish brown (10YR 5/4), dry, hard, medium plasticity; 95% clay, 5% fine sand.
24	0	38	U-4-25				
28							

WELL DIAGRAM



JOB NUMBER: *140175.05*

Gettler-Ryan, Inc.

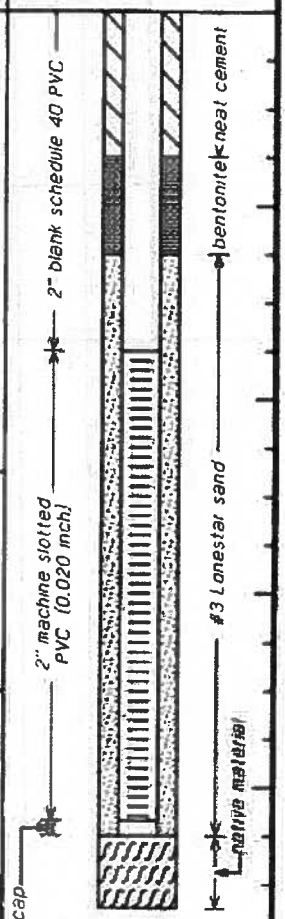
Log of Boring U-4

PROJECT: *Tosco (76) Service Station No. 4186*

LOCATION: *1771 First Street, Livermore, CA*

DEPTH (feet)	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						CL	
	0	19	U-4-30				Becomes saturated, very stiff.
32							
	0	31	U-4-35				
36							
						GW-GM	GRAVEL WITH SAND AND SILT (GW-GM) - dark yellowish brown (10YR 4/4), saturated, very dense; 50% fine to coarse gravel, 30% fine to coarse sand, 20% silt.
40	0	>100					
						CL	CLAY (CL) - yellowish brown (10YR 5/4), saturated, hard; 90% clay, 10% fine sand.
44							
	0	24	U-4-45				
							Bottom of boring at 48.5 feet bgs.
48							(* = Converted to equivalent standard penetration blows/foot.)
52							
56							
60							

WELL DIAGRAM



JOB NUMBER: *140175.05*

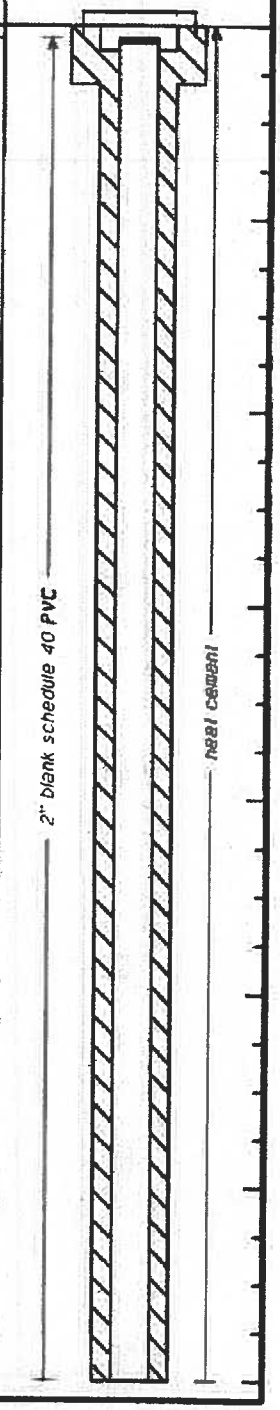
Gettler-Ryan, Inc.

Log of Boring U-5

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO.: *140175.05*	CASING ELEVATION:
DATE STARTED: *02/21/01*	WL (ft. bgs): *29* DATE: *02/21/01* TIME: *14:05*
DATE FINISHED: *02/21/01*	WL (ft. bgs): *33.4* DATE: *02/21/01* TIME: *15:30*
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *47 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SOIL CLASS	GEOLOGIC DESCRIPTION
4				GW-GM	ASPHALT – 3 inches thick. GRAVEL WITH SAND AND SILT (GW-GM) – dark brown (10YR 3/3), dry, very dense; 60% fine to coarse subangular gravel to 4.5 cm, 25% fine to coarse sand, 15% silt.
8					
12	0	>100	U-5-10		
16	0	>100		SW	SAND (SW) – dark yellowish brown (10YR 4/4), wet, very dense; 90% fine to coarse sand, 10% clay. (perched zone ?)
20	0	64	U-5-20		
24	0	44	U-5-25	CL	CLAY (CL) – brown (10YR 4/3), dry, hard, low plasticity; 95% clay, 5% fine sand.
28					

WELL DIAGRAM



JOB NUMBER: *140175.05*

Gettler-Ryan, Inc.

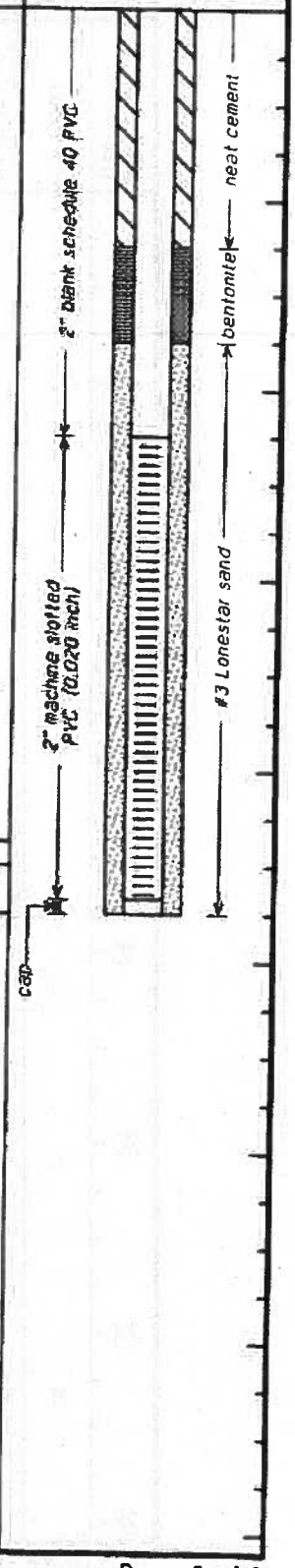
Log of Boring U-5

PROJECT: *Tosco (76) Service Station No. 4186*

LOCATION: *1771 First Street, Livermore, CA*

DEPTH (feet)	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
32	0	18	U-5-30				Becomes saturated, very stiff, medium plasticity.
36	0	29	U-5-35				
40	0	25	U-5-40				
44	0	26				SC	CLAYEY SAND (SC) – brown (10YR 5/3), saturated, medium dense; 75% fine sand, 25% clay.
						CL	CLAY (CL) – brown (10YR 4/3), saturated, very stiff, medium plasticity; 95% clay, 5% fine sand.
48							Bottom of boring at 47 feet bgs.
							(* = Converted to equivalent standard penetration blows/foot.)
52							
56							
60							

WELL DIAGRAM



JOB NUMBER: *140175.05*

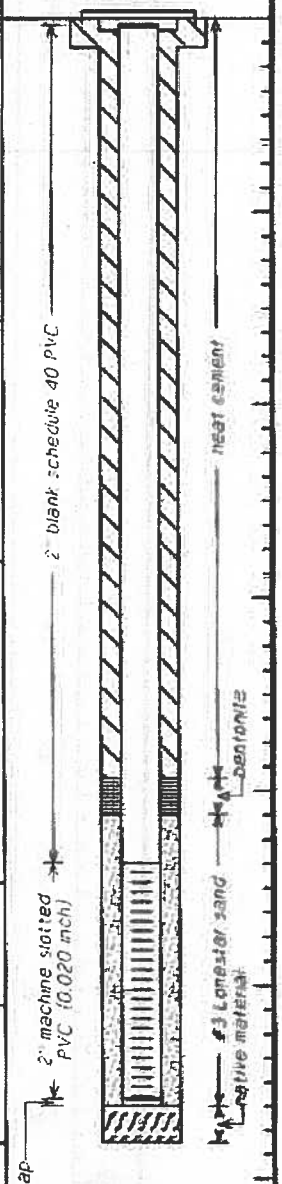
Gettler-Ryan, Inc.

Log of Boring U-6

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO.: *140175.07*	CASING ELEVATION: *478.38 Ft. (MSL)*
DATE STARTED: *12/06/01*	WL (ft. bgs): *31.5* DATE: *12/06/01* TIME: *04:40*
DATE FINISHED: *12/06/01*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *46.5 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SAMPLE INT.	SOIL CLASS	GEOLOGIC DESCRIPTION
					GW	Asphalt and base rock.
	0	>100	U-6-5			WELL-GRADED GRAVEL WITH SAND (GW) – dark brown (10YR 3/3), dry, very dense; 50% fine to coarse subangular to rounded gravel to 3 cm, 50% fine to coarse sand.
8	0	>100	U-6-10			Color changes to brown (10YR 4/3); becomes 70% fine to coarse gravel, 30% fine to coarse sand.
					SW	WELL-GRADED SAND WITH GRAVEL (SW) – brown (10YR 4/3), dry, very dense; 70% fine to coarse sand, 30% fine gravel.
16	0	>100	U-6-15			
	8	48	U-6-20			Color changes to dark yellowish brown (10YR 4/4), becomes moist, dense, 70% fine to coarse sand, 30% fine to coarse gravel to 3 cm.
24					CL	CLAY (CL) – dark yellowish brown (10YR 4/6), moist hard, low plasticity; 80% clay, 20% fine to coarse sand.
	25	39	U-6-25			
	27	57	U-6-30			Becomes saturated, medium plasticity; 90% clay, 10% fine to coarse sand.
32						
	0	54	U-6-35			
					SW-SC	WELL-GRADED SAND WITH GRAVEL AND CLAY (SW-SC) – olive gray (5Y 4/2), saturated, very dense; 50% fine to coarse sand, 40% fine to coarse gravel, 10% clay.
40	199	50			CL	CLAY (CL) – olive brown (2.5Y 4/4), moist, hard, medium plasticity; 80% clay, 20% fine sand.
	54	50				Becomes saturated.
48						Bottom of boring at 46.5 feet bgs.
						(* = Converted to equivalent standard penetration blows/foot.)
56						

WELL DIAGRAM



JOB NUMBER: *140175.07*

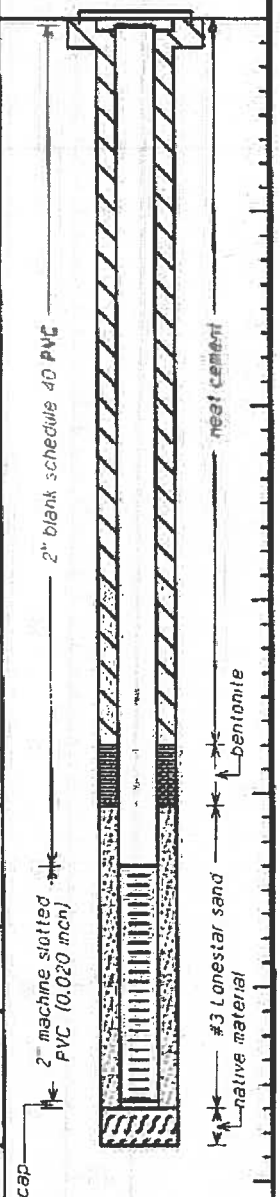
Gettler-Ryan, Inc.

Log of Boring U-7

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO.: *140175.07*	CASING ELEVATION: *478.74 Ft. (MSL)*
DATE STARTED: *12/06/01*	WL (ft. bgs): *20* DATE: *12/06/01* TIME: *13:05*
DATE FINISHED: *12/06/01*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *46.5 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	PID (ppm)	BLOWS/FT. *	SAMPLE NUMBER	SOIL CLASS	GEOLOGIC DESCRIPTION
				GW	Asphalt and base rock.
					WELL-GRADED GRAVEL WITH SAND (GW) - very dark grayish brown (10YR 3/2), dry, very dense; 50% fine to coarse gravel, 50% fine to coarse sand.
		>100			No recovery.
8					
	0	>100	U-7-10		Color changes to brown (10YR 4/3).
				SW	WELL-GRADED SAND WITH GRAVEL (SW) - dark yellowish brown (10YR 4/4), dry, very dense; 70% fine to coarse sand, 30% fine to coarse gravel to 3 cm.
16	0	>100	U-7-15		
	0	>100	U-7-20		Becomes wet; 60% fine to coarse sand, 40% fine to coarse gravel to 4 cm.
24				CL	CLAY (CL) - dark yellowish brown (10YR 4/4), dry, hard, low plasticity; 90% clay, 10% fine sand.
	0	51	U-7-25		
	0	52	U-7-30		Becomes wet, medium plasticity; iron oxide staining.
32				SW	WELL-GRADED SAND WITH GRAVEL (SW) - dark yellowish brown (10YR 4/4), wet, very dense; 70% fine to coarse sand, 30% fine to coarse gravel.
	0	47	U-7-35		
				GW	WELL-GRADED GRAVEL WITH SAND (GW) - dark yellowish brown (10YR 4/6), saturated, very dense; 60% fine to coarse gravel to 4 cm, 40% fine to coarse sand.
40	349	49		CL	CLAY (CL) - light olive brown (2.5Y 5/3), moist, hard, medium plasticity; 90% clay, 10% fine sand.
	558	52			Color changes to light olive brown (2.5Y 5/3) mottled with very dark gray (N3).
48					Bottom of boring at 46.5 feet bgs.
					(* = Converted to equivalent standard penetration blows/foot.)
56					

WELL DIAGRAM



JOB NUMBER: *140175.07*

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-8	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 1 of 2	
Driller:	Gregg Drilling	Date Drilled:	9/4/08, 9/8/08	Location Map	
Drilling Method:	Hollow Stem Auger/Rhino	Hole Diameter:	8 inches		
Sampling Method:	Split Spoon	Hole Depth:	50 feet	Please see site map	
Casing Type:	SCH 40 PVC	Well Diameter:	2 inches		
Slot Size:	0.020	Well Depth:	45 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	

Well Completion (Backfill / Casing / Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
	well box									Concrete
	neat cement				Air Knife	1.0				
						2.0			GM	**Silty Sandy Gravel:** well graded, no odor
	2" PVC casing					3.0				
						4.0				
						5.0			GM	**Silty Sandy Gravel:** dark brown, well graded,
			DRY	0		6.0				30-40% silty sand matrix, loose, no odor, dry
						7.0				
						8.0				
						9.0				
						10.0				
			DRY	0.3	Rhino Rig used- no blow counts collected	11.0				
						12.0				
						13.0				
						14.0				
						15.0				
			DRY	0		16.0				
						17.0				
						18.0			CL	**Gravelly Silty Clay:** brown, medium plasticity,
						19.0				>50% silty clay matrix, soft to firm,
						20.0				(as per driller from augers)
						20.0			CL	**Silty Clay:** brown, medium plasticity, firm, moderate
			WET	146		21.0				hydrocarbon odor, wet
						22.0				
						23.0				
						24.0				
						25.0				
			WET	0.4					CL	**Gravelly Clay:** brown, well graded, >50% clay, no odor

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-8	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 2 of 2	
Driller:	Gregg Drilling	Date Drilled:	9/4/08, 9/8/08	Location Map	
Drilling Method:	Hollow Stem Auger/Rhino	Hole Diameter:	8 inches	Please see site map	
Sampling Method:	Split Spoon	Hole Depth:	50 feet		
Casing Type:	SCH 40 PVC	Well Diameter:	2 inches		
Slot Size:	0.020	Well Depth:	45 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	

Well Completion (Backfill / Casing / Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
	neat cement		WET		Rhino Rig used- no blow counts collected	26.0			CL	**Gravelly Clay:** brown, well graded, >50% clay, no odor wet
	2" PVC casing					27.0				
						28.0				
						29.0				
						30.0			CL	**Silty Clay:** orange-brown, high plasticity, soft, no odor, wet
	bentonite		WET	0.3		31.0				
						32.0				
	#3 sand					33.0				
						34.0				
	well screen		WET	0.4		35.0			GC	**Sandy Clayey Gravel:** orange-brown mottled, low plasticity, soft, no odor, wet
						36.0				
						37.0				As above: grey mottled with moderate to strong hydrocarbon odor
			WET	1338*		38.0				
				165		39.0				* soil sample collected for laboratory analysis
			MOIST	358		40.0			CL	**Silty Clay:** orange-brown, medium-high plasticity, <20% silt, strong hydrocarbon odor, moist
						41.0				
						42.0				
			MOIST	20		43.0				As above: with no odor
			MOIST	57		44.0			CL	**Sandy Clay:** medium brown, medium-high plasticity, <30% sand, well graded, soft, no odor, moist
	# 3 sand		MOIST	56		45.0				
	bentonite		MOIST	238		46.0			CL	**Silty Clay:** grey-brown to orange-brown, medium plasticity, soft, no odor, moist
			MOIST	70		47.0				
			MOIST			48.0				
			MOIST	15		49.0				
						50.0				Boring terminated at 50 feet below ground surface.

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-9	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 1 of 2	
Driller:	Gregg Drilling	Date Drilled:	9/4/08, 9/10/08	Location Map	
Drilling Method:	Hollow Stem Auger	Hole Diameter:	8 inches	Please see site map	
Sampling Method:	Split Spoon	Hole Depth:	45 feet		
Casing Type:	SCH 40 PVC	Well Diameter:	2 inches		
Slot Size:	0.020	Well Depth:	45 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	▼ = Static Groundwater

Well Completion (Backfill / Casing / Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery Interval	Soil Type	LITHOLOGY / DESCRIPTION
	well box					1.0			Asphalt
	neat cement				Air Knife	2.0		GM	**Silty Sandy Gravel:** well graded, no odor
	2" PVC casing					3.0			
						4.0			
						5.0		GM	**Sandy Silty Gravel:** medium to dark brown,
			DRY	0.7	9 54 5	6.0			~30% sandy silt, well graded, no odor, dry
						7.0			
						8.0			
			DRY	0.7	9 18 10	9.0			as above: medium dense
						10.0			
						11.0			
						12.0			
						13.0			
			DRY	0.3	18 25 26	14.0		GM	**Silty Sandy Gravel:** brown, 30-35% silty sand, well graded, no odor, dry
						15.0			
						16.0			
						17.0			
						18.0			
			DRY	0.2	12 50 5	19.0		GC	**Sandy Clayey Gravel:** brown, low plasticity, 20-30% sandy clay, no odor, dry
						20.0			
						21.0			
						22.0			as above: with less gravel (50-60%) (as per driller from augers)
						23.0			
			MOIST	0	8 10 12	24.0		CL	**Silty Clay:** orange-brown, medium plasticity, very stiff, no odor, moist
						25.0			

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: D-9	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 2 of 2	
Driller:	Gregg Drilling	Date Drilled:	9/4/08, 9/10/08	Location Map	
Drilling Method:	Hollow Stem Auger	Hole Diameter:	8 inches		
Sampling Method:	Split Spoon	Hole Depth:	45 feet	Please see site map	
Casing Type:	SCH 40 PVC	Well Diameter:	2 inches		
Slot Size:	0.020	Well Depth:	45 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-	▼ = Static Groundwater	
Elevation		Latitude		Longitude	

Well Completion (Backfill / Casing / Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
	neat cement		MOIST			26.0			CL	**Silty Clay:** orange-brown, medium plasticity, stiff to hard, no odor, moist
	2" PVC casing					27.0				
						28.0				
					6				CL	**Clay:** orange-brown, medium-high plasticity, stiff to very stiff, no odor, moist
			MOIST	0	8	29.0				
					9	30.0				
	bentonite					31.0				
						32.0			GM	**Gravel** (as per driller from augers)
	#3 sand		MOIST	0		33.0				
					18				CL	**Gravelly Sandy Clay:** orange-brown mottled, medium plasticity, 50-60% sandy clay, soft, no odor, moist
					25	34.0				
					34					
	well screen		WET	1	8	35.0				as above: with 50% sandy clay, no odor, wet
					18	36.0				
					25					
					36	37.0			GM	**Sandy Silty Gravel:** green-grey mottled with black staining, hydrocarbon odor, wet
			WET	60	15					
					21	38.0				
					34					
					21	39.0			GC	**Sandy Clayey Gravel:** black-brown mottled in color, low plasticity, dense, strong hydrocarbon odor, wet
			WET	122	24					
					30	40.0				
					9					
			MOIST	647	12	41.0				
					5					
					4	42.0			CL	**Clay:** orange brown, medium-high plasticity, medium stiff, strong hydrocarbon odor, moist
			MOIST	89	2					
					3	43.0			CL	**Silty Clay:** orange brown, medium-high plasticity, medium stiff, hydrocarbon odor, moist
					5					
					1	44.0				as above: becoming wet
		▼	WET	75	4					
					4	45.0				Boring terminated at 45 feet below ground surface.

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA
Driller:	Gregg Drilling	Date Drilled:	9/5/08, 9/11/08
Drilling Method:	Hollow Stem Auger	Hole Diameter:	8 inches
Sampling Method:	Split Spoon	Hole Depth:	48.5 feet
Casing Type:	SCH 40 PVC	Well Diameter:	2 inches
Slot Size:	0.020	Well Depth:	47 feet
Gravel Pack:	#3 Sand	Casing Stickup:	-
Elevation		Latitude	Longitude

Well No: U-10
Page 1 of 2

Location Map

Please see site map

Well Completion: Backfill	Well Completion: Casing	Well Completion: Backfill	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample: Recovery	Sample: Interval	Soil Type	LITHOLOGY / DESCRIPTION
			well box				Air Knife					Asphalt
			neat cement					1.0			GM	**Gravel with Cobbles and Silt:** well graded, no odor
								2.0				
								3.0				
			2" PVC casing					4.0				
								5.0			GM	**Silty Sandy Gravel:** brown, well graded,
					DRY	13	18 21 34	6.0				20-30% silty sand matrix, dense, no odor, dry
								7.0				
								8.0				
					DRY	1	50/5	9.0			GC	**Sandy Clayey Gravel:** brown, well graded, medium-low plasticity, 30-40% sandy clay, very dense, no odor, dry
								10.0				
								11.0				
								12.0				
								13.0				
							27	14.0			GC	**Clayey Sandy Gravel:** brown-orange mottled,
					DRY	2	30 40	15.0				20-30% clayey sand, very dense, no odor, dry
								16.0				
								17.0				
								18.0				
							15	19.0				
					MOIST	1	20 4	20.0			CL	**Silty Clay:** orange-brown, high plasticity, hard, no odor, moist
								21.0				
								22.0				
								23.0				
							16	24.0				as above: with medium plasticity, hard
					MOIST	1	15 25	25.0				

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-10	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 2 of 2	
Driller:	Gregg Drilling	Date Drilled:	9/5/08, 9/11/08	Location Map	
Drilling Method:	Hollow Stem Auger	Hole Diameter:	8 inches	Please see site map	
Sampling Method:	Split Spoon	Hole Depth:	48.5 feet		
Casing Type:	SCH 40 PVC	Well Diameter:	2 inches		
Slot Size:	0.020	Well Depth:	47 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	

Well Completion (Backfill / Casing / Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
	neat cement		MOIST			26.0			CL	**Silty Clay:** orange-brown, medium plasticity, hard, no odor moist
						27.0				
						28.0				
	2" PVC casing				6	29.0				as above: with high plasticity, stiff to very stiff
			MOIST	1	7					
					9	30.0				
						31.0				
						32.0				
						33.0				
	bentonite								CL	**Gravelly Clay:** orange-brown, high plasticity, <20% gravel, stiff to very stiff, no odor, moist
			MOIST	1	5	34.0				
					6					
	#3 sand		WET	2	14	35.0				as above: with sandy clay (<20%) and mottling
					10					
					12	36.0				
					19					
	well screen		WET	4	28	37.0				as above: with black staining and slight hydrocarbon odor, 30-40% sandy clay
					8					
			MOIST	11	27	38.0				
					35					
					18	39.0			CL	**Clay:** orange-brown with grey mottling, medium plasticity, hard, no odor
					21					
			WET	2	23	40.0				
					4				GC	**Silty Clayey Gravel:** orange-brown with ~20% silty clay, black staining, medium plasticity, no odor, wet
					14	41.0				
					28					
			WET	1	39	42.0				
					11					
					14	43.0				
					53					
				3	10	44.0				
					50/5"					as above: turning grey in color with orange mottling and staining, slight hydrocarbon odor
			WET	10	12	45.0				
					20					
			WET		25	46.0				
					30					
	bentonite		MOIST	62	8	47.0			CL	**Sandy Clay:** orange-brown mottled with grey staining, high plasticity, <10% sand, stiff to very stiff, moderate hydrocarbon odor, moist
					7	48.0				
					7					Boring terminated at 48.5 feet below ground surface.

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-11	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 1 of 2	
Driller:	Gregg Drilling	Date Drilled:	9/3/08, 9/12/08	Location Map	
Drilling Method:	Hollow Stem Auger	Hole Diameter:	8 inches	Please see site map	
Sampling Method:	Split Spoon	Hole Depth:	45 feet		
Casing Type:	SCH 40 PVC	Well Diameter:	2 inches		
Slot Size:	0.020	Well Depth:	45 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	

Well Completion (Backfill / Casing / Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
	well box									Asphalt
	neat cement				Air Knife	1.0				
	2" PVC casing					2.0			GM	**Gravel with Cobbles and Silty Sand:** well graded, no odor
						3.0				
						4.0				
						5.0				
					4				SW	**Gravelly Sand:** brown, 1/4 - 3/4" diameter gravel,
			MOIST	0	19	6.0				~75% well graded sand, loose to medium dense,
					19					no odor, moist
						7.0				
						8.0				
						9.0				
						10.0				
					11				GM	**Gravel with Silty Sand:** light brown-brown, 1/2 -1 1/4"
			MOIST	0	14	11.0				diameter gravel, 40% sandy silt, medium dense,
					14					no odor, moist
						12.0				
						13.0				
						14.0				
						15.0				
					23					as above: with 25-30% sandy silt, dense,
			MOIST	0	50/5"	16.0				1/4" - 1" diameter gravel, no odor, moist
					5					
						17.0				
						18.0				
						19.0				
						20.0				
					20					
			MOIST	0	24	21.0				
					29					
						22.0			CL	**Silty Clay:** light brown, medium-high plasticity, stiff,
										no odor, moist (as per driller from augers)
						23.0				
						24.0				
						25.0				**Gravelly Silty Clay:** light brown, medium plasticity
					7				CL	very stiff, 5% gravel, no odor, moist

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-11	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 2 of 2	
Driller:	Gregg Drilling	Date Drilled:	9/3/08, 9/12/08	Location Map	
Drilling Method:	Hollow Stem Auger	Hole Diameter:	8 inches	Please see site map	
Sampling Method:	Split Spoon	Hole Depth:	45 feet		
Casing Type:	SCH 40 PVC	Well Diameter:	2 inches		
Slot Size:	0.020	Well Depth:	45 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	

Well Completion (Backfill / Casing / Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
	neat cement		MOIST	24	13	26.0			CL	**Gravelly Silty Clay:** light brown, medium plasticity, very stiff, 5% gravel, no odor, moist
	2" PVC casing				16	27.0				
						28.0				
						29.0				
						30.0				
					5				CL	**Silty Clay:** light brown, medium-high plasticity, stiff, no odor, moist
			MOIST	33	7	31.0				
	bentonite				9					
						32.0				
	#3 sand					33.0				
						34.0				
	well screen		WET	0	11	35.0			SP	**Gravelly Clayey Sand:** orange-brown to brown mottled, 50% clayey sand, 1/4 - 1/2" gravel, soft-medium stiff, no odor, wet
					16	36.0				
					17					
					4	37.0				
			WET	1.5	13				GC	**Sandy Clayey Gravel:** orange-brown to brown mottled, 30% sandy clay, 1/4 - 1" gravel, soft, slight hydrocarbon odor, wet
					35	38.0				
					36					
					14	39.0				
			MOIST	4.8	29					
					40	40.0				
			DRY	7.1	10				CL	**Sandy Clay:** brown, low-medium plasticity, hard, no odor
					11	41.0				
					15					
					8	42.0				
			MOIST	2.7	4					as above: becoming light brown with high plasticity, soft to medium stiff, moist
					4	43.0				
			MOIST	13.3	6					
					3	44.0				as above: with grey staining, medium-high plasticity, soft to medium stiff, moist
					4					
					4	45.0				

Boring terminated at 45 feet below ground surface.

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-12	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 1 of 3	
Driller:	Gregg Drilling	Date Drilled:	9/2, 9/22-26,10/7/08	Location Map	
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches		
Sampling Method:	Split Spoon Auger	Hole Depth:	75 feet	Please see site map	
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches		
Slot Size:	0.020	Well Depth:	75 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	▼ = Static Groundwater

Well Completion (Backfill / Steel Casing / Steel Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
	well box				Water Knife					Asphalt
	neat cement					1.0				
	12" steel & 4" PVC casings					2.0			GC	**Gravel with Sand, Silt and Clay:** tight sand-clay, no odor
						3.0				
						4.0				
						5.0			GW	**Sandy Gravel:** well graded, no odor (Note: Mud Rotary does not allow for detailed lithology)
					Mud Rotary	6.0				
						7.0				
						8.0				
						9.0				
						10.0				
						11.0				
						12.0				
						13.0				
						14.0				
						15.0				
						16.0				
						17.0			GM	**Sandy Gravel:** smaller coarse grained sand, no odor with < 1 1/2" diameter cobbles, no odor (as per driller)
						18.0				
						19.0				
						20.0			SW	**Gravelly Sand:** no odor (as per driller)
						21.0				
						22.0				as above: with cobbles
						23.0			SP	**Sand:** green-grey, no odor
						24.0				
						25.0			GC	**Clayey Gravel:** orange-brown, no odor

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-12	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 2 of 3	
Driller:	Gregg Drilling	Date Drilled:	9/2, 9/22-26,10/7/08	Location Map	
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches		
Sampling Method:	Split Spoon Auger	Hole Depth:	75 feet	Please see site map	
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches		
Slot Size:	0.020	Well Depth:	75 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	▼ = Static Groundwater

Well Completion	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Backfill / Steel Casing / Steel Backfill	neat cement 12" steel & 4" PVC casings				Mud Rotary	26.0			GC	**Clayey Gravel:** orange-brown, no odor
						27.0				
						28.0			CL	**Clay:** orange-brown, no odor
						29.0				
						30.0			CL	**Sandy Clay:** orange-brown, no odor
						31.0				
						32.0				
						33.0				
						34.0				
						35.0				
						36.0			GW	**Sandy Gravel:** well graded, no odor
						37.0				
						38.0				
						39.0				
						40.0				
						41.0				
						42.0				
						43.0				
						44.0				
						45.0				
						46.0				
						47.0				
						48.0			CL	**Gravelly Clay:** light brown, no odor
						49.0				
						50.0				

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-12
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 3 of 3
Driller:	Gregg Drilling	Date Drilled:	9/2, 9/22-26,10/7/08	Location Map
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches	
Sampling Method:	Split Spoon Auger	Hole Depth:	75 feet	Please see site map
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches	
Slot Size:	0.020	Well Depth:	75 feet	
Gravel Pack:	#3 Sand	Casing Stickup:	-	
Elevation		Latitude		Longitude

▼ = Static Groundwater

Well Completion	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Backfill / Steel Casing / Steel Backfill	neat cement; 12" steel & 4" PVC casings	▼			Mud	51.0			CL	**Gravelly Clay:** light brown, no odor
						52.0				
						53.0				
						54.0				
						55.0				
	4" PVC casings					56.0				
						57.0				**NO RECOVERY**
						58.0				
						59.0				
			MOIST TO WET	0	10	60.0			CL	**Sandy Clay:** light brown, ~10" diameter coarse sand, medium plasticity, firm, no odor, moist to wet
	bentonite					61.0				
			MOIST	0	14	62.0				as above: becoming light brown-orange mottled
	#3 sand		WET	0	16	63.0			CL	**Gravelly Clay:** light brown, ~30-40% gravel, medium-high plasticity, very stiff, no odor, wet
						64.0				
	well screen					65.0				**NO RECOVERY**
			WET	0	18	66.0			CL	**Gravelly Sandy Clay:** light brown, >30% sand, 5-10% gravel, high plasticity, soft, no odor, wet
						67.0				
						68.0				**NO RECOVERY**
						69.0				
						70.0				
						71.0				
			WET	0	10	72.0			GP	**Sandy Gravel:** light brown, <5% sand, loose, no odor, wet
						73.0				
						74.0				**Clayey Gravel:** light brown, <20% clay, soft, wet
			WET	0		75.0			GC	as above: with >40% clay, high plasticity, very firm to hard, no odor, wet

Mud Rotary - 5 - 55' bgs; Hollow Stem Auger 55-75' bgs

Boring terminated at 75 feet below ground surface (bgs).

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-13	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 1 of 3	
Driller:	Gregg Drilling	Date Drilled:	9/2,26,29-30,10/8/08	Location Map	
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches		
Sampling Method:	Split Spoon Auger	Hole Depth:	72 feet	Please see site map	
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches		
Slot Size:	0.020	Well Depth:	72 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	▼ = Static Groundwater

Well Completion	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Backfill / Steel Casing / Steel Backfill	well box; neat cement; 12" steel & 4" PVC casings				Air Knife	1.0				Asphalt
						2.0			GM	**Gravel with Silty Sand and Cobbles:** no odor
						3.0				
						4.0				
						5.0			GW	**Sandy Gravel with Cobbles:** well graded, no odor
						6.0				(Note: Mud Rotary does not allow for detailed lithology)
						7.0				
						8.0				
						9.0				
						10.0				
						11.0				
						12.0				
						13.0				
						14.0				
						15.0				
						16.0				
						17.0				
						18.0				
						19.0				
					Mud Rotary	20.0			SW	**Gravelly Sand:** 1-1.5" diameter gravel, coarse grained sand
						21.0				well graded, no odor
						22.0				
						23.0				
						24.0				
						25.0			GC	**Clayey Gravel:** orange-brown, no odor

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-13	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 2 of 3	
Driller:	Gregg Drilling	Date Drilled:	9/2,26,29-30,10/6/08	Location Map	
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches		
Sampling Method:	Split Spoon Auger	Hole Depth:	72 feet	Please see site map	
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches		
Slot Size:	0.020	Well Depth:	72 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	▼ = Static Groundwater

Well Completion (Backfill / Steel Casing / Steel / Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
	neat cement 12" steel & 4" PVC casings				Mud Rotary	26.0			GC	**Clayey Gravel:** orange-brown, no odor
						27.0				
						28.0			CL	**Clay:** orange-brown, high plasticity, no odor
						29.0				
						30.0			SC	**Sandy Clay:** orange-brown, no odor
						31.0				
						32.0				
						33.0				
						34.0				
						35.0				
						36.0				
						37.0			GP	**Sandy Gravel:** no odor
						38.0				
						39.0				
						40.0				
						41.0				
						42.0				
						43.0				
						44.0				
						45.0				
						46.0				
						47.0				
						48.0			CL	**Gravelly Clay:** no odor
						49.0				
						50.0				

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-13
Logged By:	Joyce Welsh	Location:	1771 First Street, Livemore, CA	Page 3 of 3
Driller:	Gregg Drilling	Date Drilled:	9/2,26,29-30,10/8/08	Location Map
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches	
Sampling Method:	Split Spoon Auger	Hole Depth:	72 feet	Please see site map
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches	
Slot Size:	0.020	Well Depth:	72 feet	
Gravel Pack:	#3 Sand	Casing Stickup:	-	
Elevation		Latitude		Longitude

▼ = Static Groundwater

Well Completion	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Backfill / Steel Casing / Steel Backfill	neat cement 12" steel & 4" PVC casings	▼			Mud	51.0			GC	**Gravelly Clay:** no odor
						52.0			GP	**Gravel:** no odor
						53.0				
	bentonite grout plug					54.0			GC	**Clayey Gravel:** no odor
						55.0			GP	**Gravel:** no odor
	4" PVC casing					56.0				
						57.0				
	bentonite					58.0				
						59.0				NOTE: Drilled to 59' with 10" bit; backfilled to 54' with bentonite quick grout
	#3 sand		WET	0		60.0			GC	**Clayey Gravel:** light brown, 20-30% clay, no odor
			WET	0		61.0			CL	**Gravelly Sandy Clay:** light brown-orange mottled, ~30% gravel, low plasticity, hard, no odor, wet
	well screen		WET	0		62.0				
			WET	0		63.0				
						64.0				
			WET	0		65.0				
			WET	0		66.0				
			WET	0		67.0			GP	**Sandy Gravel:** light brown, ~10% sand, no odor,wet
						68.0			GC	**Sandy Clayey Gravel:** light brown, no odor, wet
			WET	0		69.0			CL	**Sandy Clay:** light brown, 20-30% sand, medium stiff, no odor, wet
						70.0				
						71.0				as above: with <20% sand, low plasticity, soft
			WET	0		72.0				as above: with ~5-10% sand, stiff, no odor, wet

Mud Rotary - 5 - 59' bgs; Hollow Stem Auger 59-72' bgs

Boring terminated at 72 feet below ground surface (bgs).

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA
Driller:	Gregg Drilling	Date Drilled:	9/3,29,30,10/1, 9/08
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches
Sampling Method:	Split Spoon Auger	Hole Depth:	73 feet
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches
Slot Size:	0.020	Well Depth:	73 feet
Gravel Pack:	#3 Sand	Casing Stickup:	-

Well No: U-14

Location Map

Please see site map

Elevation | Latitude | Longitude

▼ = Static Groundwater

Well Completion (Backfill / Steel Casing / Steel Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
	well box									Asphalt
	neat cement				Air Knife	1.0				
	12" steel & 4" PVC casings					2.0			GM	**Gravel with Silty Sand and Cobbles:** well graded, no odor
						3.0				
						4.0				
						5.0			GW	**Sandy Gravel with Cobbles: well graded,** no odor
						6.0				(Note: Mud Rotary does not allow for detailed lithology)
						7.0				
						8.0				
						9.0				
						10.0				
						11.0				
						12.0				
						13.0				
						14.0				
					Mud Rotary	15.0				as above: with fewer larger sized cobbles
						16.0				
						17.0				
						18.0				
						19.0				
						20.0			SW	**Gravelly Sand:** well graded, no odor
						21.0				
						22.0				
						23.0				
						24.0			GC	**Clayey Gravel:** orange-brown, no odor
						25.0			CL	**Sandy Clay:** orange-brown, no odor

Delta
Consultants

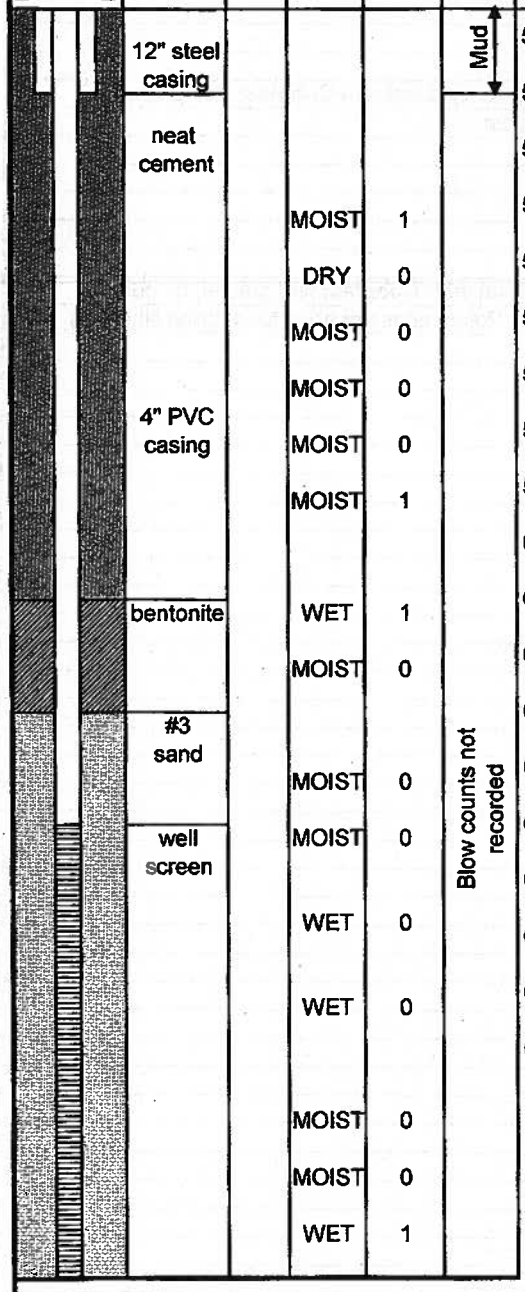
Project No:	C104186	Client:	ConocoPhillips	Well No: U-14	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 2 of 3	
Driller:	Gregg Drilling	Date Drilled:	9/3,29,30,10/1, 9/08	Location Map	
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches		
Sampling Method:	Split Spoon Auger	Hole Depth:	73 feet	Please see site map	
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches		
Slot Size:	0.020	Well Depth:	73 feet		
Gravel Pack:	#3 Sand	Casing Stickup:	-	▼ = Static Groundwater	
Elevation		Latitude		Longitude	

Well Completion (Backfill / Steel Casing / Steel / Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
	neat cement 12" steel & 4" PVC casings				Mud Rotary	26.0			CL	**Sandy Clay:** orange-brown, no odor
						27.0				
						28.0				
						29.0				
						30.0				
						31.0				
						32.0				
						33.0				
						34.0				
						35.0				
						36.0				
						37.0				
						38.0				
						39.0				
						40.0			GM	**Sandy Gravel:** no odor
						41.0				
						42.0			GC	**Clayey Gravel:** no odor
						43.0				
						44.0				
						45.0			CL	**Gravelly Clay:** no odor
						46.0				
						47.0				
						48.0				
						49.0				
			▼			50.0			CL	**Sandy Clay:** no odor

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-14
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 3 of 3
Driller:	Gregg Drilling	Date Drilled:	9/3,29,30,10/1-3/08	Location Map
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches	
Sampling Method:	Split Spoon Auger	Hole Depth:	73 feet	Please see site map
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches	
Slot Size:	0.020	Well Depth:	73 feet	
Gravel Pack:	#3 Sand	Casing Stickup:	-	
Elevation		Latitude		Longitude

▼ = Static Groundwater



Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Recovery Interval	Soil Type	LITHOLOGY / DESCRIPTION
		Mud	51.0		CL	**Sandy Clay:** no odor
			52.0			
			53.0			
MOIST	1		54.0		CL	**Gravelly Clay:** orange-brown-light brown mottled, ~20% gravel, high-medium plasticity, hard, no odor, moist
DRY	0		55.0		CL	**Gravelly Sandy Clay:** orange-brown-light brown, <20% gravel, ~20% sand, low-medium plasticity no odor
MOIST	0		56.0			
MOIST	0		57.0		CL	**Sandy Gravelly Clay:** light brown, <5% gravel, 20-40% sand, high plasticity, firm, no odor, moist
MOIST	0		58.0			as above: turning orange-brown-light brown in color, with <5% gravel and 15-20% sand
MOIST	1		59.0			
			60.0		GC	**Clayey Sandy Gravel:** orange-brown, 20-30% clay, low plasticity, soft, no odor, moist
WET	1		61.0			as above: turning orange-brown-light brown in color with 30-40% clay, 50-60% gravel, soft, wet
MOIST	0		62.0			
			63.0			
MOIST	0	Blow counts not recorded	64.0			as above: turning light brown in color
MOIST	0		65.0			
			66.0			as above: turning orange-brown-light brown in color
WET	0		67.0		CL	**Gravelly Clay:** light brown, ~ 40% gravel, medium-high plasticity, soft-firm, no odor, wet
WET	0		68.0			
			69.0		GM	**Sandy Gravel:** light brown, loose, no odor, wet
MOIST	0		70.0		CL	**Sandy Clay:** orange-brown, high plasticity, hard, no odor, moist
MOIST	0		71.0			
			72.0			
WET	1		73.0		CL	**Gravelly Clay:** orange-brown, 5-10% gravel, high plasticity firm to hard, no odor, wet

Mud Rotary - 5 - 50' bgs; Hollow Stem Auger 50-73' bgs

Boring terminated at 73 feet below ground surface (bgs).

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-15	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 1 of 3	
Driller:	Gregg Drilling	Date Drilled:	9/4-5,23,10/2-3,6,10/08	Location Map	
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches		
Sampling Method:	Split Spoon Auger	Hole Depth:	71.5	Please see site map	
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches		
Slot Size:	0.020	Well Depth:	71		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	▼ = Static Groundwater

Well Completion (Backfill / Steel Casing / Steel Backfill)	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery / Interval	Soil Type	LITHOLOGY / DESCRIPTION
	well box				Air Knife	0			Asphalt
	neat cement					1.0			
	12" steel & 4" PVC casings					2.0		GM	**Gravel with Silty Sand and Cobbles:** well graded, no odor
						3.0			
						4.0			
						5.0		GW	**Sandy Gravel with Cobbles:** well graded, no odor
						6.0			(Note: Mud Rotary does not allow for detailed lithology)
						7.0			
						8.0			
						9.0			
						10.0			
						11.0			
						12.0			
						13.0			
						14.0			
						15.0			
						16.0			
						17.0			
						18.0			
						19.0			
						20.0			
						21.0			
						22.0			
					Mud Rotary	23.0		GC	**Clayey Gravel with Cobbles:** no odor
						24.0			
						25.0			

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-15	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 2 of 3	
Driller:	Gregg Drilling	Date Drilled:	9/4-5,23,10/2-3,6,10/08	Location Map	
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches		
Sampling Method:	Split Spoon Auger	Hole Depth:	71.5	Please see site map	
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches		
Slot Size:	0.020	Well Depth:	71		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	▼ = Static Groundwater

Well Completion	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Backfill / Steel Casing / Steel Backfill	neat cement 12" steel & 4" PVC casings		▼		Mud Rotary	26.0			GC	**Clayey Gravel with Cobbles:** no odor
						27.0				
						28.0				
						29.0				
						30.0			CL	**Clay:** light brown, no odor
						31.0				
						32.0				
						33.0				
						34.0				
						35.0				
						36.0				
						37.0				
						38.0			GC	**Clayey Gravel:** no odor
						39.0				
						40.0			CL	**Gravelly Clay:** light brown, no odor
						41.0				
						42.0				
						43.0				
						44.0				
						45.0				
						46.0				
						47.0			GC	**Clayey Gravel:** no odor
						48.0				
						49.0				
						50.0				

Delta
Consultants

Project No:	C104186	Client:	ConocoPhillips	Well No: U-15	
Logged By:	Joyce Welsh	Location:	1771 First Street, Livermore, CA	Page 3 of 3	
Driller:	Gregg Drilling	Date Drilled:	9/4-5,23,10/2-3,6,10/06	Location Map	
Drilling Method:	Mud Rotary/Hollow Stem	Hole Diameter:	17 inches		
Sampling Method:	Split Spoon Auger	Hole Depth:	71.5	Please see site map	
Casing Type:	12" Steel/ 4" SCH 40 PVC	Well Diameter:	4 inches		
Slot Size:	0.020	Well Depth:	71		
Gravel Pack:	#3 Sand	Casing Stickup:	-		
Elevation		Latitude		Longitude	▼ = Static Groundwater

Well Completion	Well Details	Static Water Level	Moisture Content	PID Reading (ppm)	Penetration (blows/6")	Depth (feet)	Sample Recovery Interval	Soil Type	LITHOLOGY / DESCRIPTION
Backfill / Steel Casing / Steel / Backfill	neat cement; 12" steel casing				Mud	51.0		GC	**Gravelly Clay**: light brown
						52.0			
						53.0			
						54.0			
						55.0		CL	**Gravelly Sandy Clay:** orange-brown-light brown mottled, 10-15% gravel, medium plasticity, hard-firm, no odor
	4" PVC casing		DRY	5		56.0			
			DRY	5		57.0			
	bentonite					58.0		CL	**Sandy Clay:** light brown, <5% gravel, low plasticity, soft-firm, no odor, moist
			MOIST	2		59.0			
	#3 sand		MOIST	1		60.0		GC	**Sandy Clayey Gravel:** light brown, ~30% sandy clay, 1-2" diameter cobbles, soft, loose, no odor, moist
			WET			61.0			
	well screen		WET			62.0			
						63.0			**NO RECOVERY**
			WET	14	Blow counts not recorded	64.0		GC	**Sandy Clayey Gravel:** light brown, 20-30% sandy clay, loose, no odor, wet
			WET	7		65.0			
			WET	0		66.0			
			WET	8		67.0			as above: with 40% sandy clay
						68.0			
						69.0			**NO RECOVERY**
								CL	(as per driller: clay @ 69')
			WET	1		70.0		CL	**Sandy Clay:** light brown, 5-10% sand, high plasticity, soft, no odor, wet
						71.0			

Mud Rotary - 5 - 59' bgs; Hollow Stem Auger 59-71.5' bgs

Boring terminated at 71.5 feet below ground surface (bgs).

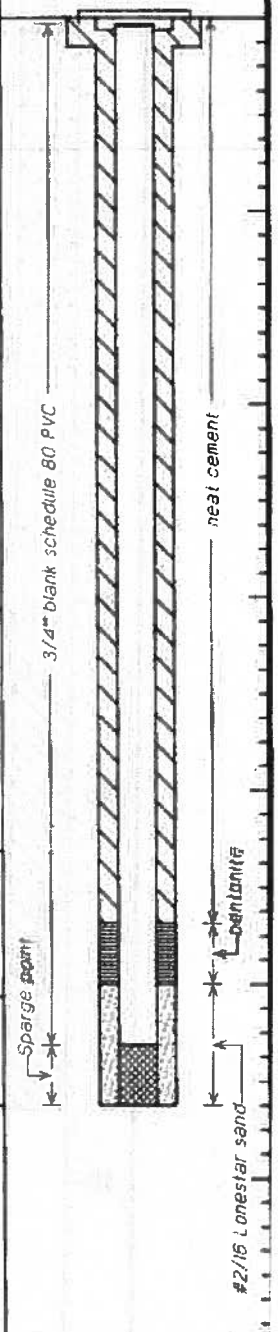
Gettler-Ryan, Inc.

Log of Boring SP-1

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO. : *140175.07*	CASING ELEVATION:
DATE STARTED: *12/07/01*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *12/07/01*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *45 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	SOIL CLASS	GEOLOGIC DESCRIPTION
	GW	Asphalt and base rock.
		WELL-GRADED GRAVEL WITH SAND (GW) - dark brown (10YR 3/2), dry, very dense; 50% fine to coarse subangular to rounded gravel to 3 cm, 50% fine to coarse sand.
8		
	SW	WELL-GRADED SAND WITH GRAVEL (SW) - brown (10YR 4/3), dry, very dense; 70% fine to coarse sand, 30% fine gravel.
16		
24	CL	CLAY (CL) - dark yellowish brown (10YR 4/4), moist hard, low plasticity; 80% clay, 20% fine to coarse sand.
32		
	SW-SC	WELL-GRADED SAND WITH GRAVEL AND CLAY (SW-SC) - brown (10YR 4/3), saturated, very dense; 50% fine to coarse sand, 40% fine to coarse gravel, 10% clay.
40	CL	CLAY (CL) - olive brown (2.5Y 4/4), moist, hard, medium plasticity; 80% clay, 20% fine sand.
		Bottom of boring at 45 feet bgs.
48		
56		

WELL DIAGRAM



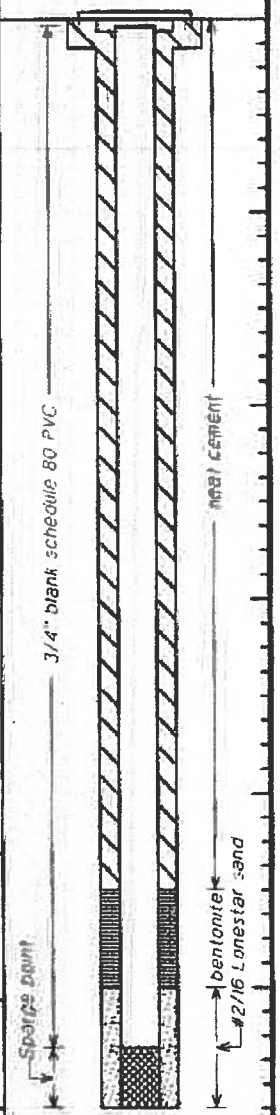
Gettler-Ryan, Inc.

Log of Boring SP-2

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO.: *140175.07*	CASING ELEVATION:
DATE STARTED: *12/07/01*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *12/07/01*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *45 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		GW	Asphalt and base rock. WELL-GRADED GRAVEL WITH SAND (GW) – dark brown (10YR 3/2), dry, very dense; 50% fine to coarse subangular to rounded gravel to 3 cm, 50% fine to coarse sand.
8			
16		SW	WELL-GRADED SAND WITH GRAVEL (SW) – brown (10YR 4/3), dry, very dense; 70% fine to coarse sand, 30% fine gravel.
24		CL	CLAY (CL) – dark yellowish brown (10YR 4/4), moist hard, low plasticity; 80% clay, 20% fine to coarse sand.
32		SW-SC	WELL-GRADED SAND WITH GRAVEL AND CLAY (SW-SC) – brown (10YR 4/3), saturated, very dense; 50% fine to coarse sand, 40% fine to coarse gravel, 10% clay.
40		CL	CLAY (CL) – olive brown (2.5Y 4/4), moist, hard, medium plasticity; 80% clay, 20% fine sand.
48			Bottom of boring at 45 feet bgs.
56			

WELL DIAGRAM



JOB NUMBER: *140175.07*

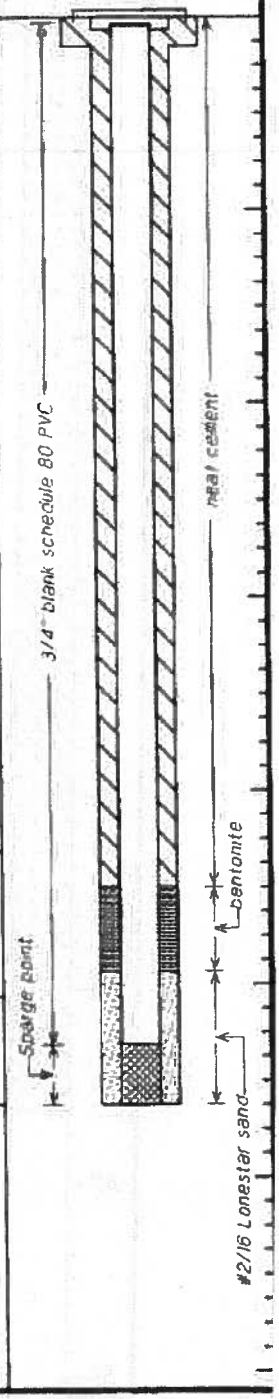
Gettler-Ryan, Inc.

Log of Boring SP-3

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO. : *140175.07*	CASING ELEVATION:
DATE STARTED: *12/06/01*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *12/06/01*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *45 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		GW	Topsoil. WELL-GRADED GRAVEL WITH SAND (GW) – dark brown (10YR 3/2), dry, very dense; 50% fine to coarse subangular to rounded gravel to 3 cm, 50% fine to coarse sand.
8			
		SW	WELL-GRADED SAND WITH GRAVEL (SW) – brown (10YR 4/3), dry, very dense; 70% fine to coarse sand, 30% fine gravel.
16			
24		CL	CLAY (CL) – dark yellowish brown (10YR 4/4), moist hard, low plasticity; 80% clay, 20% fine to coarse sand.
32			
		SW-SC	WELL-GRADED SAND WITH GRAVEL AND CLAY (SW-SC) – brown (10YR 4/3), saturated, very dense; 50% fine to coarse sand, 40% fine to coarse gravel, 10% clay.
40		CL	CLAY (CL) – olive brown (2.5Y 4/4), moist, hard, medium plasticity; 80% clay, 20% fine sand.
			Bottom of boring at 45 feet bgs.
48			
56			

WELL DIAGRAM



JOB NUMBER: *140175.07*

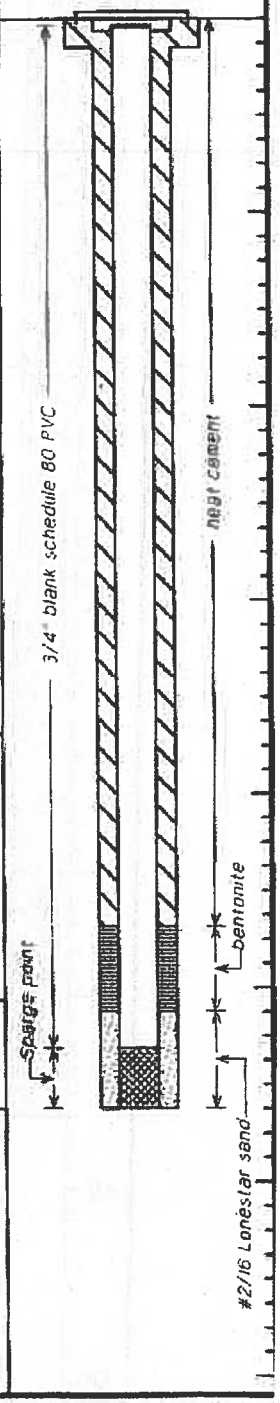
Gettler-Ryan, Inc.

Log of Boring SP-4

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO. : *140175.07*	CASING ELEVATION:
DATE STARTED: *12/05/01*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *12/05/01*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *45 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		GW	Asphalt and base rock. WELL-GRADED GRAVEL WITH SAND (GW) – dark brown (10YR 3/2), dry, very dense; 50% fine to coarse subangular to rounded gravel to 3 cm, 50% fine to coarse sand.
24		CL	CLAY (CL) – dark yellowish brown (10YR 4/4), moist hard, low plasticity; 80% clay, 20% fine to coarse sand.
32		GW	WELL-GRADED GRAVEL WITH SAND (GW) – dark brown (10YR 3/2), dry, very dense; 50% fine to coarse subangular to rounded gravel to 3 cm, 50% fine to coarse sand.
40		CL	CLAY (CL) – olive brown (2.5Y 4/4), moist, hard, medium plasticity; 80% clay, 20% fine sand.
48			Bottom of boring at 45 feet bgs.
56			

WELL DIAGRAM



JOB NUMBER: *140175.07*

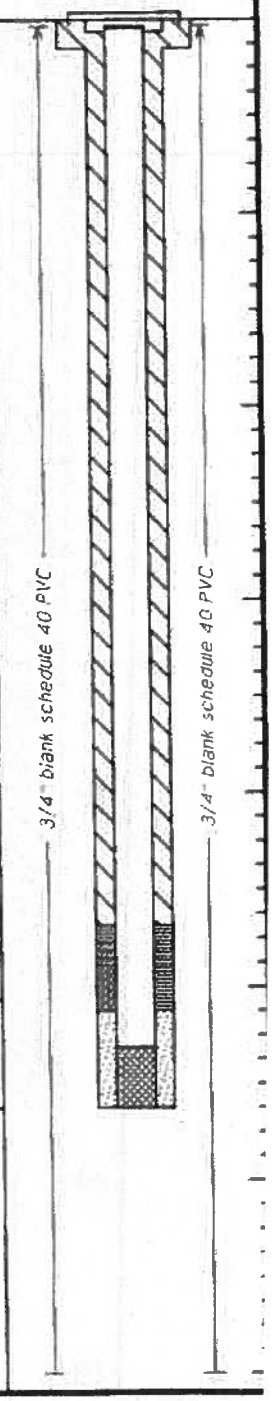
Gettler-Ryan, Inc.

Log of Boring SP-5

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO. : *140175.07*	CASING ELEVATION:
DATE STARTED: *12/05/01*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *12/05/01*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *45 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0		GW-GC	Asphalt and base rock.
			WELL-GRADED GRAVEL WITH SAND AND CLAY (GW-GC) – dark grayish brown (10YR 4/2), dry, very dense; 60% fine to coarse gravel, 30% fine to coarse sand, 10% clay.
8			
16			
24		CL	CLAY (CL) – dark yellowish brown (10YR 4/4), moist hard, low plasticity; 80% clay, 20% fine to coarse sand.
32		GW	WELL-GRADED GRAVEL WITH SAND (GW) – dark brown (10YR 3/2), dry, very dense; 50% fine to coarse subangular to rounded gravel to 3 cm, 50% fine to coarse sand.
40		CL	CLAY (CL) – olive brown (2.5Y 4/4), moist, hard, medium plasticity; 80% clay, 20% fine sand.
48			Bottom of boring at 45 feet bgs.
56			

WELL DIAGRAM



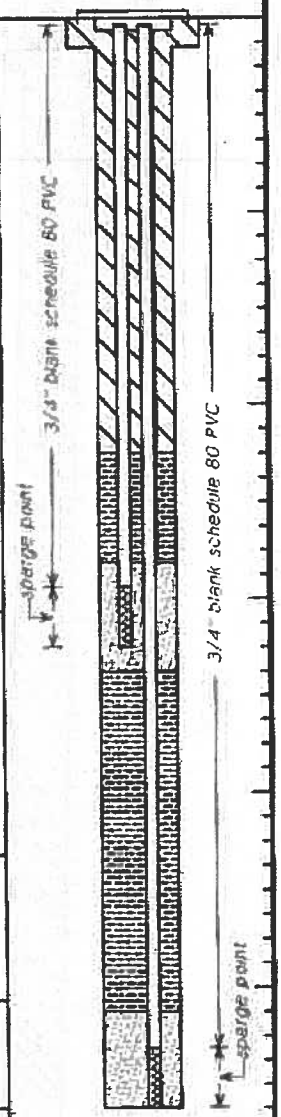
Gettler-Ryan, Inc.

Log of Boring SP-5/SP-5S

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO.: *140175.07*	CASING ELEVATION:
DATE STARTED: *12/05/01*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *12/05/01*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *45 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		GW-GC	Asphalt and base rock. WELL-GRADED GRAVEL WITH SAND AND CLAY (GW-GC) - dark grayish brown (10YR 4/2), dry, very dense; 60% fine to coarse gravel, 30% fine to coarse sand, 10% clay.
24		CL	CLAY (CL) - dark yellowish brown (10YR 4/4), moist hard, low plasticity; 80% clay, 20% fine to coarse sand.
32		GW	WELL-GRADED GRAVEL WITH SAND (GW) - dark brown (10YR 3/2), dry, very dense; 50% fine to coarse subangular to rounded gravel to 3 cm, 50% fine to coarse sand.
40		CL	CLAY (CL) - olive brown (2.5Y 4/4), moist, hard, medium plasticity; 80% clay, 20% fine sand.
48			Bottom of boring at 45 feet bgs.

WELL DIAGRAM



JOB NUMBER: *140175.07*

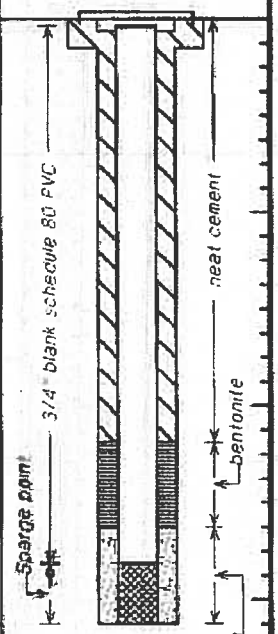
Gettler-Ryan, Inc.

Log of Boring SP-6S

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO.: *140175.07*	CASING ELEVATION:
DATE STARTED: *12/07/01*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *12/07/01*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *25 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0		GW	Asphalt and base rock.
			WELL-GRADED GRAVEL WITH SAND (GW) - dark brown (10YR 3/2), dry, very dense; 50% fine to coarse subangular to rounded gravel to 3 cm, 50% fine to coarse sand.
8			
16		SW	WELL-GRADED SAND WITH GRAVEL (SW) - brown (10YR 4/3), dry, very dense; 70% fine to coarse sand, 30% fine gravel.
24			Bottom of boring at 25 feet bgs.
32			
40			
48			
56			

WELL DIAGRAM



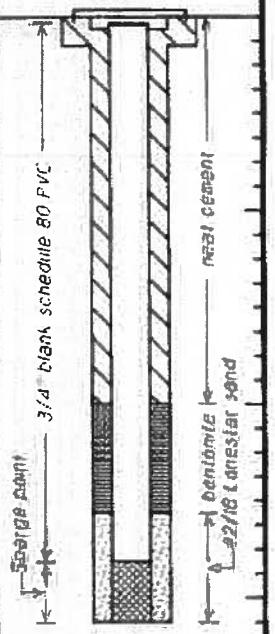
Gettler-Ryan, Inc.

Log of Boring SP-7S

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO.: *140175.07*	CASING ELEVATION:
DATE STARTED: *12/06/01*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *12/06/01*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *25 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		GW	Asphalt and base rock. WELL-GRADED GRAVEL WITH SAND (GW) – dark brown (10YR 3/2), dry, very dense; 50% fine to coarse subangular to rounded gravel to 3 cm, 50% fine to coarse sand.
16		SW	WELL-GRADED SAND WITH GRAVEL (SW) – brown (10YR 4/3), dry, very dense; 70% fine to coarse sand, 30% fine gravel.
24			Bottom of boring at 25 feet bgs.

WELL DIAGRAM



JOB NUMBER: *140175.07*

Gettler-Ryan, Inc.

Log of Boring SP-8/SP-8S

PROJECT: *Tosco (76) Service Station No. 4186*	LOCATION: *1771 First Street, Livermore, CA*
GR PROJECT NO. : *140175.07*	CASING ELEVATION:
DATE STARTED: *12/05/01*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *12/05/01*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *8 in. Hollow Stem Auger*	TOTAL DEPTH: *45 feet*
DRILLING COMPANY: *Cascade Drilling*	GEOLOGIST: *Jed Douglas*

DEPTH (feet)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
0		GW	**Asphalt and base rock.** WELL-GRADED GRAVEL WITH SAND (GW) – dark brown (10YR 3/2), dry, very dense; 50% fine to coarse subangular to rounded gravel to 3 cm, 50% fine to coarse sand.
16		SW	WELL-GRADED SAND WITH GRAVEL (SW) – brown (10YR 4/3), dry, very dense; 70% fine to coarse sand, 30% fine gravel.
24		CL	CLAY (CL) – dark yellowish brown (10YR 4/4), moist hard, low plasticity; 80% clay, 20% fine to coarse sand.
32		SW-SC	WELL-GRADED SAND WITH GRAVEL AND CLAY (SW-SC) – brown (10YR 4/3), saturated, very dense; 50% fine to coarse sand, 40% fine to coarse gravel, 10% clay.
40		CL	CLAY (CL) – olive brown (2.5Y 4/4), moist, hard, medium plasticity; 80% clay, 20% fine sand.
48			Bottom of boring at 45 feet bgs.
56			

WELL DIAGRAM