

**EVALUATION OF THE
ENHANCED BIOATTENUATION PILOT
STUDY**

Pacific Coast Pipeline (PCPL) Superfund Site
Fillmore, California

May 26, 2005

PREPARED FOR SUBMITTAL TO:

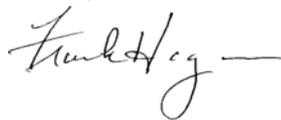
Ms. Holly Hadlock (H-7-2)
U. S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105-3901

PREPARED FOR:

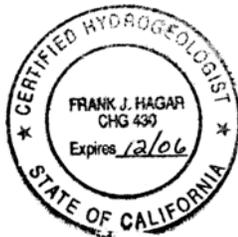
Chevron Environmental Management Company
9525 Camino Media, Room B 1047
Bakersfield, California 93311

PREPARED BY:

England Geosystem, Inc.
15375 Barranca Parkway, Suite F-106
Irvine, California 92618-2



Frank J. Hagar, P.G., C.Hg
Senior Hydrogeologist



Project No. 225.005.130



Leslie A. Klinchuch
PG, CHg, CGWP

Chevron Environmental
Management Company
P.O. Box 1392
Bakersfield, CA 93302
Tel 661-654-7269
Fax 661-654-7431
leslieklinchuch@chevron.com

May 26, 2005

Ms. Holly Hadlock
U.S. Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105-3901

Evaluation of the Enhanced Bioattenuation Pilot Study
Pacific Coast Pipeline (PCPL) Superfund Site – Fillmore, California

Dear Ms. Hadlock,

Enclosed are two copies of the *Evaluation of the Enhanced Bioattenuation Pilot Study* for the subject Site.

Analytical results and field measurements indicate that ORC[®] injection was ineffective in reducing benzene concentrations within the dissolved plumes. During the two-year pilot study, benzene concentrations remained relatively stable, fluctuating within historically observed values. It is likely that subsurface oxygen demand is significant at this groundwater depth, consuming the oxygen released by the ORC[®] slurry without effectively increasing dissolved oxygen and biological activity.

The bioattenuation pilot study will continue with the Soil Vapor Characteristics work plan submitted concurrently with this report.

Respectfully submitted,

A handwritten signature in black ink that reads "Leslie A. Klinchuch".

Leslie A. Klinchuch

cc: David Brod, URS Corporation
Tim Buscheck, Chevron Energy Technology Company
Jessy Fierro, Department of Toxic Substances Control
Joni Fisher, England Geosystem, Inc.
Frank Hagar, England Geosystem, Inc.
Herbert Levine, U.S. Environmental Protection Agency
Eve Wilkerson-Barron, Chevron Legal

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**B-1 CALIFORNIA REGIONAL WATER QUALITY CONTROL
BOARD – LOS ANGELES REGION**

- 1 ORIGINAL WASTE DISCHARGE REQUIREMENT
PERMIT (FEBRUARY 6, 2003)
- 2 AMENDED MONITORING AND REPORTING
PROGRAM (SEPTEMBER 26, 2003)
- 3 TERMINATION OF COVERAGE UNDER GENERAL
WASTE DISCHARGE REQUIREMENTS (JUNE 25, 2004)

**B-2 VENTURA COUNTY WATER RESOURCES DIVISION
(AMMENDED PERMIT ONLY)**

**B-3 VENTURA COUNTY FLOOD CONTROL DISTRICT (NOW
CHANGED TO VENTURA COUNTY WATERSHED
PROTECTION DISTRICT)**

- 1 ORIGINAL PERMIT
- 2 AMENDED PERMIT

B-4 CITY OF FILLMORE ENCROACHMENT PERMIT

**APPENDIX C: SLURRY INJECTION BORING COMPLETION AND
ABANDONMENT INFORMATION**

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LIST OF ABBREVIATIONS AND ACRONYMS

bgs	below ground surface
BTEX	benzene, toluene, ethyl benzene, and total xylenes
Chevron	Chevron Environmental Management Company
DO	dissolved oxygen
England Geosystem	England Geosystem, Inc.
EPA	Environmental Protection Agency
Equilon	Equilon Pipeline LLC
GAC	granulated activated carbon
GWTS	groundwater treatment system
LARWQCB	California Regional Water Quality Control Board – Los Angeles Region
MCL	maximum contaminant level
MDL	method detection limit
mg/L	milligrams per liter
NAPL	non-aqueous phase liquid
ORC®	Oxygen Release Compound®
ORP	oxidation reduction potential
PCPL	Pacific Coast Pipeline
ppb	parts per billion
QSR	Quarterly Status Report
ROD	record of decision
RPM	regional project manager
Site	Pacific Coast Pipeline Superfund Site
TPHG	total petroleum hydrocarbons as gasoline
TTTI	Texaco Trading and Transportation Inc.
µg/L	micrograms per liter
USEPA	United States Environmental Protection Agency
VCFCDD	Ventura County Flood Control District
VCWPD	Ventura County Watershed Protection District
WDR	waste discharge requirement

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

1.0 INTRODUCTION

England Geosystem, Inc. (England Geosystem) has prepared this document on behalf of Chevron Environmental Management Company (Chevron) (formerly ChevronTexaco).

1.1 PROJECT AUTHORIZATION

The purpose of this document is to describe the results of a Pilot Study conducted at the Pacific Coast Pipeline Site (Environmental Protection Agency [EPA] identification number CAD980636781) located at 67 E. Telegraph Road in Fillmore, California (Site). See Figure 1 for Site location and Figure 2 for Site plan, groundwater monitoring wells, and ORC[®] injection areas. The Pilot Study was described in three documents:

- *Technical Memorandum – Proposal for Groundwater Treatment System Operational Modifications and Pilot Study for Enhanced Bioattenuation, Pacific Coast Pipeline (PCPL) Superfund Site, Fillmore, California* (Technical Memorandum) dated October 16, 2002 (England Geosystem, 2002a).
- *Work Plan for Implementation of Enhanced Bioattenuation Pilot Study, Pacific Coast Pipeline (PCPL) Superfund Site, Fillmore, California* dated November 5, 2002 (England Geosystem, 2002b).
- *Addendum To Work Plan for Implementation of Enhanced Bioattenuation Pilot Study* dated December 4, 2002 (England Geosystem, 2002c).

The EPA Remedial Project Manager (RPM) provided final written approval of the pilot study work plan and addendum on January 31, 2003.

1.2 PURPOSE

Long-term groundwater monitoring information collected since 1994 has shown that natural attenuation of hydrocarbons in ground water is occurring within the dissolved phase hydrocarbon plumes beneath the Site.

Figure 3 shows the current dissolved-phase benzene distribution from the Fall 2004 monitoring event. The most recent groundwater data (March 2005) is posted for reference purposes and ground water flow direction is shown by the arrows. There are two separate dissolved-phase benzene plumes at the Site. For ease of reference they will be referred to as the southern and the northern plume based on their relative locations beneath the Site. The *southern plume* is centered in the vicinity of EW-4 and MW-39S. The *northern plume* is centered near EW-P2 and extends westward toward Pole Creek and MW-42S and MW-6S.

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

This pilot study was developed to assess the effectiveness of injecting Oxygen Release Compound[®] (ORC[®]) into the Aquifer I saturated zone beneath and adjacent to the PCPL Site to determine if it would enhance the documented natural biodegradation of benzene in the ground water that is occurring beneath the Site. Aquifer I is the uppermost, continuous saturated zone beneath the Site.

The pilot study was implemented to evaluate if ORC[®] placed into the saturated zone of Aquifer I at selected locations would increase the concentration of dissolved oxygen in the ground water thereby enhancing the biodegradation of hydrocarbons, including benzene which would be manifested by observable decreasing concentrations of hydrocarbons in the ground water in the vicinity of the ORC[®] injection locations.

The pilot study included evaluation of three scenarios:

- ORC[®] slurry injected in a series of boreholes in the southern plume in a grid pattern in the vicinity of MW-39S to evaluate the remedial impact in an elevated concentration area with an apparent saturated smeared zone acting as a source for the contaminants. This is referred to as the *source control scenario*.
- ORC[®] slurry injected in a series of boreholes in the northern plume upgradient of MW-6S and MW-42S to evaluate the effectiveness of a cut-off wall in controlling off-site plume migration. This is referred to as the *cut-off wall scenario*.
- Permeable fiber socks containing ORC[®] were installed in two existing wells MW-22S and MW-32S to evaluate the potential for biofouling (iron bacteria production has been encountered in several groundwater wells at the Site) and to evaluate localized dissolved-oxygen concentrations within the well and at nearby wells after sock emplacement. This is referred to as the *biofouling/localized oxygen delivery scenario*.

The Pilot Study began in November of 2002 with the installation of MW-50S. The ORC[®] injection points, slurry and socks were installed in February of 2003. Figure 4 shows the location of the injection points in the southern plume (*source control scenario*) and new well MW-50S. Figure 5 show the general location and orientation of injection points in the northern plume (*cut-off wall scenario*). The wells with the permeable fiber socks containing ORC[®] (*biofouling/localized oxygen delivery scenario*), MW-22S and MW-32S, are located in the northern plume (Figure 2). These two wells were chosen because they are not used for routine monitoring (since their well screens are submerged below the water table). Therefore, if biofouling was found to occur due to the emplacement of the ORC[®] socks, it would not be detrimental to the routine monitoring program. A secondary factor in choosing these wells was their close proximity to other downgradient monitoring wells. MW-22S is located 15 feet northwest of MW-49S and MW-32S is located 19 feet north-northwest of MW-42S.

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

1.3 PILOT STUDY EVALUATION CRITERIA

The clearest direct evidence of the success of ORC[®] injection in enhancing the natural attenuation of dissolved phase benzene in the ground water would be any significant, sustainable (within the life-cycle of the ORC[®]) decline in the benzene concentration at nearby wells (MW-39S and MW-50S in the southern plume and MW-42S and MW-6S in the northern plume) would be interpreted as demonstrative success. In addition, any increase in dissolved oxygen concentrations in ground water whether sustainable or just observable would confirm that ORC[®] has delivered oxygen.

The wells containing the permeable fiber socks containing ORC[®] were visually inspected for potential biofouling and/or iron bacterial production and the dissolved oxygen was measured (downhole) in the wells to determine if oxygen was being delivered. Hydrocarbon concentrations and dissolved oxygen in nearby wells (MW-49S and MW-42S) were also measured.

1.4 REPORT ORGANIZATION

The report that follows is designed to provide documentation of the implementation of the pilot study and subsequent evaluation of the results of the pilot study. It consists of the following sections.

- Section 1.0 – Introduction
- Section 2.0 – Background Information
- Section 3.0 – Pilot Study Implementation
- Section 4.0 – Monitoring and Reporting
- Section 5.0 – Evaluation of Results
- Section 6.0 – Summary

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2.0 BACKGROUND INFORMATION

2.1 SITE DESCRIPTION AND HISTORY

The PCPL Site is located north of State Highway 126 at 67 East Telegraph Road on the eastern edge of the City of Fillmore, California (Figure 1). The Site, which covers approximately 55 acres, was formerly an oil refinery. In 1928, Texaco purchased the existing refinery and operated it until the early 1950s, when it was shutdown and dismantled except for several tanks and buildings. Following dismantling in 1951, Texaco Trading and Transportation, Inc. (TTTI) operated a crude oil pump station at the Site. In 1998, TTTI became Equilon Pipeline LLC (Equilon). Equilon was formed as a joint venture between Texaco and Shell. After Chevron and Texaco merged in 2001 to form ChevronTexaco, Equilon became a Shell entity. Shell discontinued pumping station operations in late 2002 when the last crude oil tank was cleaned and degassed. The last remaining crude oil tank was dismantled and removed in August 2004. In May 2005 ChevronTexaco was formally renamed to Chevron.

The majority of the above ground facilities were removed in early 2005. The above ground facilities remaining at the Site include:

- A deep water well on the Site and an associated water storage tank (Tank 5028) that historically have been used by the owners of the avocado groves on the hill east of the Site.
- Groundwater pump and treat remediation compound including granulated activated carbon (GAC) vessels and associated piping, manifolds and pre and post treatment machinery.
- A remedial contractor field office trailer and storage shed.

Groundwater monitoring has been ongoing at the PCPL Site for the past twenty years. The result is that there is a significant foundation of data for evaluation on the impact of injection of ORC[®] into the system. For the Pilot Study evaluation, only the results of groundwater monitoring since the Site Consent Decree in 1993 (USEPA, 1993) (validated data) have been considered. This data has been documented in Quarterly Monitoring and Status Reports submitted to the EPA under the terms of the Consent Decree.

2.2 DISTRIBUTION OF HYDROCARBONS PRIOR TO PILOT STUDY

The following sections provide a general basis for evaluation of the results of the Pilot Study by describing the concentrations of dissolved phase hydrocarbons in the ground water based on groundwater monitoring that has been performed at the Site.

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2.2.1 Dissolved-Phase TPHG Distribution

Dissolved-phase total petroleum hydrocarbons as gasoline (TPHG) concentrations are regularly detected in groundwater samples collected across the Site. The TPHG occurrences are generally approximately coincident with benzene occurrences. The highest concentration of TPHG from samples collected from wells without non-aqueous phase liquids (NAPL) are frequently encountered in the southern plume area.

2.2.2 Dissolved-Phase Benzene

Figure 6 is a contour map of benzene concentrations constructed from the dissolved-phase plume analytical data monitored in December 2002. This data was used as the baseline information for the Pilot Study evaluation.

The southern dissolved-phase benzene plume when projected to the surface is larger in area than the northern plume. Historically, the highest benzene concentration detected in the southern plume generally occurs at MW-39S. The southern plume formed by the commingling of contamination from several sources. The location of these sources appears to be below the southern portion of the Site and an adjacent gasoline service station site. The service station had an underground fuel tank leak that was discovered in the 1980s with hydrocarbons detected in soil and ground water below the site. The California Regional Water Quality Board – Los Angeles Region (LARWQCB) closed the service station site in July of 1996 with low levels of benzene and hydrocarbon still in place in the ground water. The service station wells were subsequently abandoned.

The northern benzene plume is located near the former main waste pit, with benzene concentrations generally at a maximum at the location of EW-P2 on the Chevron property. The plume extends westward toward Pole Creek with measurable concentrations of benzene occurring west of Pole Creek. Groundwater samples collected from EW-P2 generally have the highest benzene concentration in the northern plume. Dissolved phase benzene concentrations in groundwater samples collected from EW-P2 declined significantly after groundwater and vapor extraction began in early 1997 (from an initial concentration of 2,400 to 430 micrograms per liter ($\mu\text{g/L}$) in December 2002 just prior to the Pilot Study).

The following table shows the semi-annual benzene concentrations for the two years prior to implementing the Pilot Study.

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**Table 2-1
Semi-Annual Benzene Concentrations in Ground Water
Spring 2001 – Fall 2002 (Concentrations in µg/L)**

Well	Spring 2001	Fall 2001	Spring 2002	Fall 2002
MW-1S	-	<0.30	-	<0.30 J
MW-2S	2.8	130	<0.30	0.32 J
MW-3S	6.0 J	0.51	<0.30	0.32
MW-6S	0.34	65	150 J	18 J
MW-8S	40 J	15	16	34
MW-9S	24 J	<0.30	40	5.0 J
MW-11S	-	-	-	0.50 J
MW-14S	1.4 J	1.2	3.9	<0.30 J
MW-17S	34	5.8	16	35 J
MW-18S	0.49	3.8	<0.30	<0.30 J
MW-19S	<0.30	29	<0.30	26
MW-20S	22	110 J	92	110
MW-25S	-	<0.30	-	9.1 J
MW-28S	<0.30	<0.30	<0.30	0.46 J
MW-29S	-	<0.30	-	<0.30 J
MW-30S	<0.30	<0.30	<0.30	10
MW-35S	-	<0.30	-	<0.30
MW-37S	0.58	<0.30	<0.30	5.8 J
MW-38S	-	<0.30	-	<0.30
MW-39S	480	610	690	390 J
MW-40S	12*	16	96	20
MW-41S	10	32 J	35	19 J
MW-42S	140 J	220	15	140
MW-43S	<0.30	<0.30	<0.30	<0.30 J
MW-44S	<0.30	<0.30	<0.30	0.72 J
MW-45S	<0.30	0.51	<0.30	<0.30 J
MW-48S	<0.30	0.57	<0.30	0.41 J
MW-49S	1.6	0.37	2	<0.30 J
MW-50S	-	-	-	510*
EW-P2	570 J	700	520	430
EW-1	150	140	82	39 J
EW-2	<0.30	<0.30	<0.30	6.4
EW-4	52	96	86	61
EW-5	67	50	85	4.3

J = Estimated

Analyses by EPA Method 8020 and 8021B

* Analyzed by EPA Method 8260B

2.2.3 Dissolved-Phase Toluene, Ethyl Benzene and Xylenes

Dissolved-phase toluene is significantly less abundant in ground water beneath the PCPL Site than benzene. In the few wells where the toluene concentration exceeds the record of decision (ROD) (USEPA, 1992) cleanup goal of 100 µg/L, benzene concentrations are also above the

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

ROD cleanup goal. Toluene concentrations at EW-P2 in the northern plume are generally the highest measured during Site monitoring events. Dissolved-phase toluene concentrations in the southern plume are generally highest in groundwater samples collected at MW-39S and MW-50S.

Dissolved-phase ethyl benzene concentrations measured in ground water since 1990 have never exceeded the ROD stated cleanup goal of 680 µg/L. Similarly, dissolved-phase xylenes concentrations measured in ground water since 1990 are well below the maximum contaminant level (MCL) of 1,750 µg/L.

2.3 BIOATTENUATION MONITORING

Bioattenuation monitoring at the PCPL Site was first conducted in the fourth quarter 1995. The initial program included field monitoring for oxidation-reduction potential (ORP), dissolved oxygen (DO), temperature, pH, conductivity, and ferrous iron in selected wells. In the first quarter 1996, field bioattenuation monitoring continued with the addition of laboratory analyses for nitrate, soluble manganese, sulfate, sulfide, and carbon dioxide. In the fourth quarter 1996, the soluble metals, nitrate, and carbon dioxide were dropped from the program and bioattenuation monitoring was continued on an annual basis. Sulfide was dropped from the program in 1997.

The following conclusions were drawn from past bioattenuation monitoring results.

- *DO* concentration in ground water have been depleted across the Site. *DO* falls in the hypoxic to anaerobic range.
- *Nitrate* concentrations in ground water have also been depleted across the Site. Nitrate concentrations are relatively high in ground water throughout the Fillmore area, but nitrate is absent in Site wells. Nitrate was detected in only one Site well and this well (MW-11S) is upgradient of the contaminant plume.
- Soluble metals (*manganese* and *ferric iron*) concentrations in ground water are not useful as indicators of biodegradation at this Site. Because of the highly variable configuration of subsurface materials across the Site due to the active depositional environment (fault zone, landsliding, channel deposits), deposits of manganese and iron are not continuous across the Site; therefore, areas with elevated concentrations may reflect local manganese or iron content of the subsurface soil more than bio-activity. Also, products from other reduction processes (such as sulfide) can react with iron and manganese altering the concentration.
- *Sulfate* and *sulfide* are good indicators of biodegradation at the Site. Sulfate levels in groundwater wells in the Fillmore area are typically over 500 milligrams per liter (mg/L). Within the benzene plume area, sulfate has been significantly

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reduced by biodegradation. In several wells within the plume, it is non-detectable. Upgradient and downgradient of the plume, sulfate concentrations range from 750 to 1,000 mg/L. Historically, sulfide, a product of sulfate reduction, had been found within the plume area and had been non-detected elsewhere. Sulfide sampling was discontinued in November 1997 when all sampled sulfide concentrations were below detection limits. The absence of sulfide does not indicate that sulfide was no longer being produced. Sulfide is reactive with metals and other constituents so it can be produced and then change to another form. *Hydrogen sulfide* odor has been frequently noted at the wellhead of MW-45S and MW-18S.

- *Carbon dioxide* concentrations in ground water were elevated in the southern portion of the southern plume; however, overall the results of carbon dioxide sampling were inconclusive relative to assessing biodegradation at this Site.
- *Temperature* of ground water across the Site has varied by up to 7 degrees during a sampling event. Temperatures are generally lowest in the southern portion of the Site. The highest temperatures coincide with the northern plume that had the highest methane concentrations in the soil gas. The area with elevated temperature cannot be attributed to biodegradation because, given the low DO concentrations in the ground water, the reactions would be anaerobic, and anaerobic reactions are endothermic, meaning they tend to absorb heat and would cool the water slightly. The higher temperatures could be the result of emissions of deep earth methane and other hydrocarbons from the hot oil and gas reservoirs below the Site. Such emissions would heat the ground water.
- *pH* of the ground water has not varied greatly.
- *Conductivity* values for groundwater samples are generally higher in those wells containing higher sulfate, soluble manganese, and ferrous iron.
- *ORP* of a groundwater sample (when reviewed with other indicators) is a good indicator of biodegradation. ORP is highly negative in the benzene plume area, while less negative and/or positive ORP values are measured upstream, downstream, and across gradient.

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3.0 PILOT STUDY ACTIVITIES

The Pilot Study included:

- Installation of monitoring well MW-50S (Figure 2).
- A baseline groundwater sampling event prior to ORC[®] injection.
- Installation of ORC[®] injection points and ORC[®] slurry injection.
- Installation of ORC[®] socks.
- Implementation of monitoring program to evaluate injection effectiveness and to meet requirements of the LARWQCB Waste Discharge Requirements (WDR) Permit.

3.1 MONITORING WELL INSTALLATION

One new monitoring well, MW-50S, was installed in the vicinity of the southern benzene plume in November 2002. The location of MW-50S was selected to allow the evaluation of benzene concentrations downgradient from the southern plume benzene “hot spot” located in the vicinity of MW-39S. Well MW-50S was bored to a total depth of 80 feet below ground surface (bgs) and screened from 55 to 75 feet bgs. The well construction of MW-50S is similar to MW-39S, which is screened from 53 to 73 feet.

Drilling and soil sampling activities were performed November 21 and 22, 2002. Drilling was performed by West Hazmat Drilling Corporation, of San Diego, California (C-57 license No. 554979). One groundwater monitoring well was drilled using a CME-85 drill rig equipped with 10-inch diameter hollow-stem augers. Prior to drilling, the boring location was cleared for subsurface utilities to a depth of 5 feet bgs by hand-augering and then enlarged to the diameter of the augers using a posthole digger. During drilling, ground water was encountered at a depth of approximately 60 feet bgs.

Complete details of the installation were documented in Appendix B of the *Fourth Quarter 2002 Quarterly Status Report and Semi-Annual (Fall 2002) Ground Water Monitoring Report* Appendix E (England Geosystem, 2003).

3.2 BASELINE GROUNDWATER SAMPLING EVENT

The Fall 2002 groundwater sampling event (conducted December 2002) was established as the baseline event for the Pilot Testing. The baseline data was documented in the *Fourth Quarter 2002 Quarterly Status Report and Semi-Annual (Fall 2002) Ground Water Monitoring Report* (England Geosystem, 2003).

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Only information for selected key wells are discussed below. These wells have been categorized according to their function in the Pilot Study as follows.

- *Upgradient extraction wells* - provide information regarding migration of contaminant into the Pilot Study area.
- *Evaluation wells* - monitoring wells located near the actual ORC[®] injection sites. Because of their proximity to the injection wells, these would be the wells most likely impacted by the ORC[®].
- *Downgradient Trigger Wells* - with the discontinuation of the groundwater pump and treat system, EPA requested that downgradient wells be named as trigger wells along with concentrations which may indicate the plume was advancing. The following table summarizes the downgradient trigger wells and the trigger concentrations. These were defined in the Technical Memorandum (England Geosystem, 2002a).

**Table 3-1
Downgradient Trigger Concentrations**

Southern Plume	Trigger Benzene Concentration (ug/L)	Northern Plume	Trigger Benzene Concentration (ug/L)
MW-35S	1	MW-48S	20
MW-44S	1	MW-49S	20
MW-45S	150	--	--

If a trigger concentration is encountered in the downgradient trigger well, EPA is to be notified and the well is to be immediately resampled. If the results from the resample still exceed the trigger concentration, a contingency plan for groundwater control would be implemented.

There was one instance when an trigger concentration was slightly exceeded. A sample collected from well MW-44S during the third quarter 2004 sampling event had a result of 1.3 parts per billion (ppb) benzene which slightly exceeded the 1.0 ppb benzene trigger. When the results were received, the EPA was notified and the well was resampled. The sample was analyzed using EPA Method 8260B which uses a mass spectrometer to assure there are no false positives. The results of the resample showed that benzene was not detected at or above the method detection limit (MDL) of 0.28 ppb. Subsequent sampling from this well using the standard EPA Method 8021B analyses have also yielded non detectable results for benzene (<0.30 ppb), therefore, the plume was not found to be advancing and no further action was necessary.

Table 3-2 summarizes the key monitoring wells of interest for the Pilot Study by category.

**EVALUATION OF THE
ENHANCED BIOATTENUATION PILOT STUDY**

**Table 3-2
Monitoring Wells of Interest by Category – ORC[®] Pilot Study**

Interest in Well	Southern Plume (Source Control)	Northern Plume (Cutoff Wall)	ORC [®] Sock (Potential Biofouling and Evidence of Oxygen Delivery)
Evaluation Well	MW-39S MW-50S	MW-6S MW-42S	MW-22S MW-32S
Upgradient Extraction Well	EW-4	EW-P2	--
Downgradient Trigger Well	MW-44S MW-35S MW-45S	MW-48S MW-49S	-- -- --

The actual number of wells monitored for the study and to satisfy the requirements of the LARWQCB WDR permit was significantly greater than shown on Table 3-2. Monitoring information for the entire Pilot Study monitoring network is included in Appendix A.

3.2.1 Baseline TPHG/BTEX Results

Table 3-3 summarizes the baseline dissolved-phase TPHG/benzene, toluene, ethyl benzene, and total xylenes (BTEX) analyses for the selected wells of interest measured prior to ORC[®] injection.

**Table 3-3
Summary of Baseline TPHG/BTEX Results in Ground Water**

Area	Well Number	Date Collected	TPHG (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl benzene (µg/L)	Total xylenes (µg/L)
			EPA 8015M	EPA 8021B (* EPA 8260B)			
Southern Plume	EW-4	12/10/02	85,000	61	45	80	58
	MW-35S	12/5/02	<100	<0.30	0.64	<0.30	0.78
	MW-39S	12/10/02	4,800 J	390 J	65 J	13 J	64 J
		12/10/02	-	51*	9.9*	1.2*	5.1*
	MW-44S	12/8/02	<100	0.72 J	2.7 J	<0.30 J	2.7 J
	MW-45S	12/5/02	<100	<0.30 J	0.78 J	<0.30 J	<0.30 J
		12/5/02	-	<0.50*	<1.0*	<1.0*	<2.0*
	MW-50S	12/4/02	200,000 R	3,100 R	13,000 R	3,000 R	17,000 R
		12/4/02	-	510*	130*	24*	62*
		12/4/02	-	480*	120*	21*	52*
Northern Plume	EW-P2	12/10/02	9,300	430	180	120	230
	MW-6S	12/6/02	300	18 J	3.9 J	0.53 J	<0.30 J
		12/6/02	-	20*	4.5*	<1.0*	2.2*
	MW-42S	12/5/02	2,200	140	32	5.5	53
		12/5/02	-	200*	48*	7.8*	49*
MW-48S	12/8/02	520	0.41 J	2.5 J	0.42 J	8.1 J	
MW-49S	12/7/02	120	<0.30 J	0.42 J	<0.30 J	<0.30 J	

J = Estimated
R = Rejected/Unusable data
* Results by EPA 8260B

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

3.2.1.1 Dissolved-Phase TPHG

Dissolved-phase TPHG was detected in all of the upgradient and evaluation well groundwater samples collected in both plume areas. The maximum concentration was 85,000 µg/L at EW-4, however, NAPL is frequently encountered in the ground water at EW-4. The TPHG concentration may have been influenced by NAPL in the local formation or aquifer. These TPHG concentrations exert an oxygen demand.

3.2.1.2 Dissolved-Phase Benzene

Figure 6 is a contour map of benzene concentrations constructed from the baseline analytical data monitored just prior to the ORC[®] injection.

The well with the highest dissolved-phase benzene concentration in the northern plume was EW-P2. In the larger southern dissolved phase benzene plume the highest benzene concentration detected during December 2002, was 510 µg/L at MW-50S.

The following table shows the semi-annual benzene concentrations for the two years prior to the Pilot Study at the wells of concern.

**Table 3-4
Semi-Annual Benzene Concentrations in Ground Water
for the Two Years Preceding Pilot Testing
(Concentrations in µg/L)**

Area	Well	Spring 2001	Fall 2001	Spring 2002	Baseline Event Fall 2002
Southern Plume	EW-4	52	96	86	61
	MW-35S	-	<0.30	-	<0.30
	MW-39S	480	610	690	390 J
	MW-44S	<0.30	<0.30	<0.30	0.72 J
	MW-45S	<0.30	0.51	<0.30	<0.30 J
	MW-50S	-	-	-	510*
Northern Plume	EW-P2	570 J	700	520	430
	MW-6S	0.34	65	150 J	18 J
	MW-42S	140 J	220	15	140
	MW-48S	<0.30	0.57	<0.30	0.41 J
	MW-49S	1.6	0.37	2	<0.30 J

J = Estimated

Analyses by EPA Method 8020 and 8021B

* Analyzed by EPA Method 8260B

3.2.1.3 Dissolved-Phase Toluene

During the baseline event, toluene was reported in groundwater samples at levels ranging from non-detected to 180 µg/L (in EW-P2). The Site ROD cleanup level for toluene is 100 µg/L. The cleanup level for toluene was exceeded in two wells during the baseline event; MW-50S (130 µg/L) in the southern plume and EW-P2 (180 µg/L) in the northern plume.

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

3.2.1.4 *Dissolved-Phase Ethyl Benzene*

During the baseline event, ethyl benzene was reported in groundwater samples at levels ranging from non-detected to 120 µg/L (in EW-P2). All measured dissolved ethyl benzene concentrations were below the ROD cleanup level of 680 µg/L.

3.2.1.5 *Dissolved-Phase Xylenes*

During the baseline event, xylenes were reported in groundwater samples at levels ranging from non-detected to 230 µg/L (in EW-P2). All measured dissolved xylene concentrations were well below the MCL of 1,750 µg/L.

3.3 ORC[®] SLURRY INSTALLATION PROCEDURES

3.3.1 Permitting

Copies of permits associated with the Pilot Study are included in Appendix B.

3.3.1.1 *California Regional Water Quality Control Board – Los Angeles Region*

Injection of ORC[®] slurry into the waters of the State of California requires a General Waste Discharge Permit issued by the LARWQCB. Appropriate application was made and *General Waste Discharge Requirements for ORC Injection Pilot Test* (Order No. R4-2002-0030) was issued on February 6, 2003. However, a significant amount of negotiation was conducted with the LARWQCB after issuance of the permit to modify the onerous monitoring program that had been included in the original permit. After correspondence between the EPA and the LARWQCB a final agreement was reached regarding monitoring requirements for the Pilot Test. On September 6, 2003 the LARWQCB issued an amended permit for the proposed action.

The WDR was rescinded on June 25, 2004 when the LARWQCB responded to the request to rescind and issued a Termination of Coverage Under General Waste Discharge Requirements for Pacific Coast Pipeline Superfund Site, 67 E. Telegraph Road, Fillmore, California (File No. 02-189, CI No. 8510). The original permit, amended permit and termination letter are included in Appendix B-1.

3.3.1.2 *County of Ventura Water Resources Division*

In order to install and subsequently abandon temporary borings for ORC[®] injection, a single permit covering 23 borings and the monitoring well (MW-50S) was obtained from County of Ventura Water Resources Division on November 12, 2002. After discussions with EPA, 10 additional borings were requested and an amended permit for 33 borings and MW-50S was reissued with the same date as the issuance date. The amended permit is included in Appendix B-2.

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

3.3.1.3 *Ventura County Flood Control District (VCFCD)*

Most of the ORC[®] borings in the northern injection area are on Ventura County Flood Control District (name recently changed to Ventura County Watershed Protection District [VCWPD]) property. VCWPD has an easement on the Chevron property in the southern injection area. Therefore, a permit to install MW-50S to install and destroy 23 temporary borings for ORC[®] injection on Flood Control District Property, was obtained from County on November 19, 2002. After discussions with EPA, 10 additional borings were requested and an amended permit for 33 borings and MW-50S was applied for on December 2, 2002 and a revised permit was reissued with the same date. Copies of the original and amended permits are included in Appendix B-3.

3.3.1.4 *City of Fillmore Encroachment Permit*

MW-50S was constructed in the right-of-way of Main Street in the City of Fillmore. An encroachment permit was obtained for the installation of the well. A copy of the permit is included in Appendix B-4.

3.3.2 **ORC[®] Boring Installation**

In February 2003, 33 hollow-stem auger borings were advanced for the express purpose of injecting the ORC[®] slurry by Gregg Drilling Co. Ten borings were advanced to a total depth of 85 feet bgs in the vicinity of the southern plume at the locations presented in Figure 4. Twenty-three borings were advanced to a total depth of 110 feet bgs in the vicinity of the northern plume at the locations presented in Figure 5.

Boring advancement, ORC[®] slurry injection, and boring abandonment was documented in Appendix D of the *Quarterly Status Reporting for 2003 and Ground Water Monitoring Reporting for 2003* report prepared by England Geosystem in June 2004 (England Geosystem, 2004). For reference, a summary of the construction/abandonment details for the ORC[®] slurry injection borings are included as Appendix C.

3.3.3 **Slurry Installation**

The ORC[®] slurry mix was selected after consultation with the ORC[®] manufacturer, Regenesis of San Clemente, California. According to the oxygen demand calculations completed by Regenesis and verified using a spreadsheet computation developed by them, the geometry and material balance required was determined and described in the Work Plan. The final configuration was adjusted slightly in the field upon consultation with Regenesis personnel. The final configuration was as follows:

- **Southern Plume** – Ten injection wells in a grid surrounding MW-39S (ORC-24 through ORC-33) spaced approximately 18 feet apart with approximately 320 lbs of ORC[®] material injected into each boring with 40 gallons of water to create the slurry.

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

- **Northern Plume** - Two rows of injection wells (ORC-01 through ORC-23) oriented in a north-south direction along the eastern bank of Pole Creek (12 in one row 11 in the other offset across ground water flow) and spaced approximately 20 feet apart. The four northernmost wells (ORC-01 through ORC-04) had approximately 70 lbs of ORC[®] material injected into each boring with 14 gallons of water to create the slurry. The remaining wells in the northern plume (ORC-05 through ORC-23) had approximately 80 lbs of ORC[®] material injected into each boring with 16 gallons of water to create the slurry.

Refer to Figures 4 and 5 for boring numbers and Appendix C for the individual specifications for each boring.

The slurry was mixed at the surface and placed into the boring using a tremmie tube that was placed at the bottom of the boring and then slowly raised to approximately 10 feet above the saturated zone. Once all of the slurry was emplaced, the boring was left during construction of at least the next boring. A silica sand was then placed into the boring from the bottom of the boring to approximately 3 feet above the measured saturated zone. Bentonite slurry cement was placed on top of the sand to within 5 feet of the ground surface and a concrete plug was placed at the top of the boring.

3.3.4 ORC[®] Sock Installation

Two-inch diameter ORC[®] socks were laced together to form 10-foot sections, which were hung in monitoring wells MW-22S and MW-32S. The socks were pulled and visually inspected on a monthly basis for potential biofouling and iron bacteria.

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

4.0 MONITORING AND REPORTING

4.1 MONITORING PROGRAM

During the Pilot Study, the routine groundwater monitoring program at the Site was supplemented with additional and more frequent monitoring designed for both evaluation of downgradient benzene and bioattenuation parameters and to comply with the LARWQCB WDR permit monitoring program. Any modifications from the proposed groundwater sampling program were additions only. No monitoring was deleted from the routine program.

Sampling protocols have been previously outlined in the *Monitoring and Confirmation Sampling Plan* (England & Associates, 1995) and the *Revised Technical Memorandum - Recommended Modifications to the Ground Water Sampling Program* (England & Associates, 1997).

4.2 REPORTING

Emails summarizing the Pilot Study groundwater monitoring event were periodically submitted to EPA. Full reports were included in the Quarterly Status Reports (QSR). For reference, a summary of the analytical data and field measurements related to the ORC[®] pilot study are included in Appendix A. WDR permit reports were submitted quarterly to the LARWQCB until the WDR permit was rescinded in June 2004.

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

5.0 EVALUATION OF RESULTS

The effectiveness of aquifer remediation using ORC[®] was evaluated using analytical chemical results and field measurements. The two primary measurable constituents required for quantification of the process are DO concentration and the dissolved-phase benzene concentration in the general vicinity of the injection sources. The primary purpose of the ORC[®] is to add dissolved oxygen to Aquifer I, thus increases in DO would be interpreted to be a direct result of ORC[®] injection. The desired result of the increased oxygen in the aquifer would be increased biological activity, thus reductions in benzene concentrations would also be interpreted to be a direct result of ORC[®] injection.

The results of the Pilot Study did not indicate a positive response to the ORC[®] injection. During the Pilot Study, DO concentrations throughout the Pilot Study area as measured with a low volume flow through cell sampler remained at 0.0 mg/L during all sampling events included in the Pilot Study. Benzene concentrations over time in the southern plume are presented in Figure 7 and in Figure 8 for the northern plume. Vertical dashed lines mark the approximate time that the groundwater treatment system operation was discontinued and when the ORC[®] injection was completed. Benzene concentrations remained relatively stable, fluctuating within historically observed values.

In addition to monitoring the impact of ORC[®] on the measured concentrations of DO and benzene in the ground water, two ORC[®] filter socks were installed in the northern plume at MW-32S and MW-22S. These filter socks were removed and visually inspected for potential ferric iron conversion and deposition on the socks, as well as any increase in biofouling. On September 28, 2003 field measurements were conducted at both of these locations at different depths below the groundwater surface. Table 5-1 lists those results.

**Table 5-1
Downhole Field Measurements Including Dissolved Oxygen Measured September 28, 2003**

Well	Depth to Water (ft)	Depth Below Groundwater Table	pH	Conductivity (mS/cm)	Turbidity (Ntu)	Dissolved Oxygen (mg/L)	Temperature (Deg. C)	ORP (mV)
MW-22S	102.55	2'	10.7	1.1	58	> 19.9	20.2	-4
		7'	10.7	1.1	26	> 19.9	20.2	-17
		15'	8.0	1.7	6	13.4	20.2	-157
		15' after 20 min	7.3	1.7	3	0.1	20.2	-161
MW-32S	92.32	2'	10.5	1.9	10	> 19.9	21.0	26
		7'	10.4	1.9	8	> 19.9	20.7	18
		15'	7.4	1.7	61	4.3	20.4	-168
		15' after 20 min	7.3	1.7	45	0.1	20.4	-171

mS/cm = milli siemens per centimeter; Ntu = nephelometric turbidity unit; mV=millivolts

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

5.1 MONITORING OBSERVATIONS

With the shutdown of the groundwater treatment system (GWTS), there was an expectation based on previous fate and transport modeling performed for the GWTS system design that when the capture zones were removed, additional benzene concentrations would be noted in monitoring wells located downstream of the pumping wells. However, no increase in dissolved benzene concentrations downgradient of the pumping wells was observed following the cessation of groundwater extraction activities. Moreover, there was no measurable increase in DO in the monitoring wells downgradient from the ORC[®] injection points in the southern plume. Benzene concentrations in the southern plume remained stable, fluctuating within historically observed values. DO concentrations remained at 0.0 mg/L in all of the wells monitored during the Pilot Study.

The expected increase in dissolved benzene concentrations was not observed. This is probably due to the benzene plumes being already stable or diminishing. It is likely that the ORC[®] released oxygen was consumed by a combination of solid, chemical, and biological oxygen demand. Most importantly, the non-target compounds, such as TPHG, toluene, ethyl benzene, and total xylenes, exerted a significant oxygen demand and there was not a measurable reduction in benzene. A known shortcoming of ORC[®] is the difficulty in overcoming excessive oxygen demand in the subsurface (Kelmser, 2002). There is typically about 2 to 3 milligrams (mg) of oxygen per liter (L) demand per each mg/L of dissolved organic (O'Reilly and McGrath, 2003). Therefore, ORC[®] is typically limited to low oxygen demand scenarios (Kelmser, 2002).

It may be technically infeasible and/or cost prohibitive to inject enough oxygen into the subsurface to meet the high oxygen demand of dissolved hydrocarbons such that bioremediation is enhanced.

5.2 ORC[®] SOCKS

The ORC[®] socks were installed in two wells (MW-22S and MW-32S) and inspected periodically to evaluate potential ferric iron conversion and deposition on the socks, as well as any increase in biofouling. Based on qualitative visual inspections, a slimy material was developing on the socks indicating that some biofouling was occurring. It appears that the amount of biofouling will not have a detrimental affect upon the dispersion of oxygen into the ground water. The rate of biofouling does not appear to have been accelerated by the presence of the socks, however no quantitative evaluation of this conclusion can be made.

To evaluate the impact of the ORC[®] socks on the dissolved oxygen concentration in the well, downhole DO monitoring was conducted on September 28, 2003 in wells MW-22S and MW-32S to determine if dissolved oxygen was elevated within these wells. DO was measured at >19.9 mg/L in both wells at 2 and 7 feet below the groundwater table. At 15 feet bgs DO declined to 13.4 mg/L in MW-22S and 4.3 mg/L in MW-32S. The probe was left in each well at the 15-foot level for a period of 20-minutes following the initial reading at this level. In both

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

wells the DO concentration declined to 0.1 mg/L after the 20-minute period. The decline in DO after the 20-minute period is most likely due to the fact that DO probes consume oxygen. DO concentrations were elevated within the wells as expected.

There was no apparent affect on the nearby monitoring wells (MW-42S and MW-49S which were located 19 feet and 15 feet from the wells with the ORC[®] socks, respectively) due to the ORC[®] sock emplacement. No change in dissolved oxygen concentration and no significant change in benzene concentration.

The stratification of the dissolved oxygen concentration in the wells would suggest that the ORC[®] socks were relatively ineffective in providing sufficient oxygen to the ground water to make a significant difference in the rate at hydrocarbon degradation.

EVALUATION OF THE ENHANCED BIOATTENUATION PILOT STUDY

6.0 CONCLUSIONS

Analytical results and field measurements indicate that ORC[®] injection was ineffective to measurably reduce benzene concentrations in both the southern and northern plumes. It is likely the oxygen demand exerted by non-target compounds and solid oxygen demand at this depth were significant, consuming a majority of the oxygen released by the ORC[®] slurry without effectively increasing biological activity. A known shortcoming of ORC[®] is the difficulty to overcome excessive oxygen demand in the subsurface (Kelmser, 2002). There is typically about 2 to 3 milligrams (mg) of oxygen per liter (L) demand per each mg/L of dissolved organic (O'Reilly and McGrath, 2003). Therefore, ORC[®] is typically limited to low oxygen demand scenarios (Kelmser, 2002).

Enhancing the natural attenuation process may not be required or desirable at this Site since the historical groundwater monitoring data collected over the last 11 years clearly shows that both the southern and northern plumes are diminishing in size (Figure 9) beneath the Site. This evidence is the most profound argument for the success of monitored natural attenuation as an effective remedial action.

Conceptual plans to collect additional data in support of monitored natural attenuation as a remedial alternative have been discussed with EPA in recent workshops and phone conversations. The work plan describing these plans is being submitted concurrently with this report as the next step in the bioattenuation pilot study. The work plan is entitled *Sampling and Analysis Plan for Natural Attenuation Characteristics and Soil Vapor Characteristics Above Dissolved-Phase Benzene Plumes* by England Geosystem, dated May 26, 2005 (England Geosystem, 2005).

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Figures

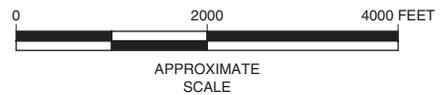
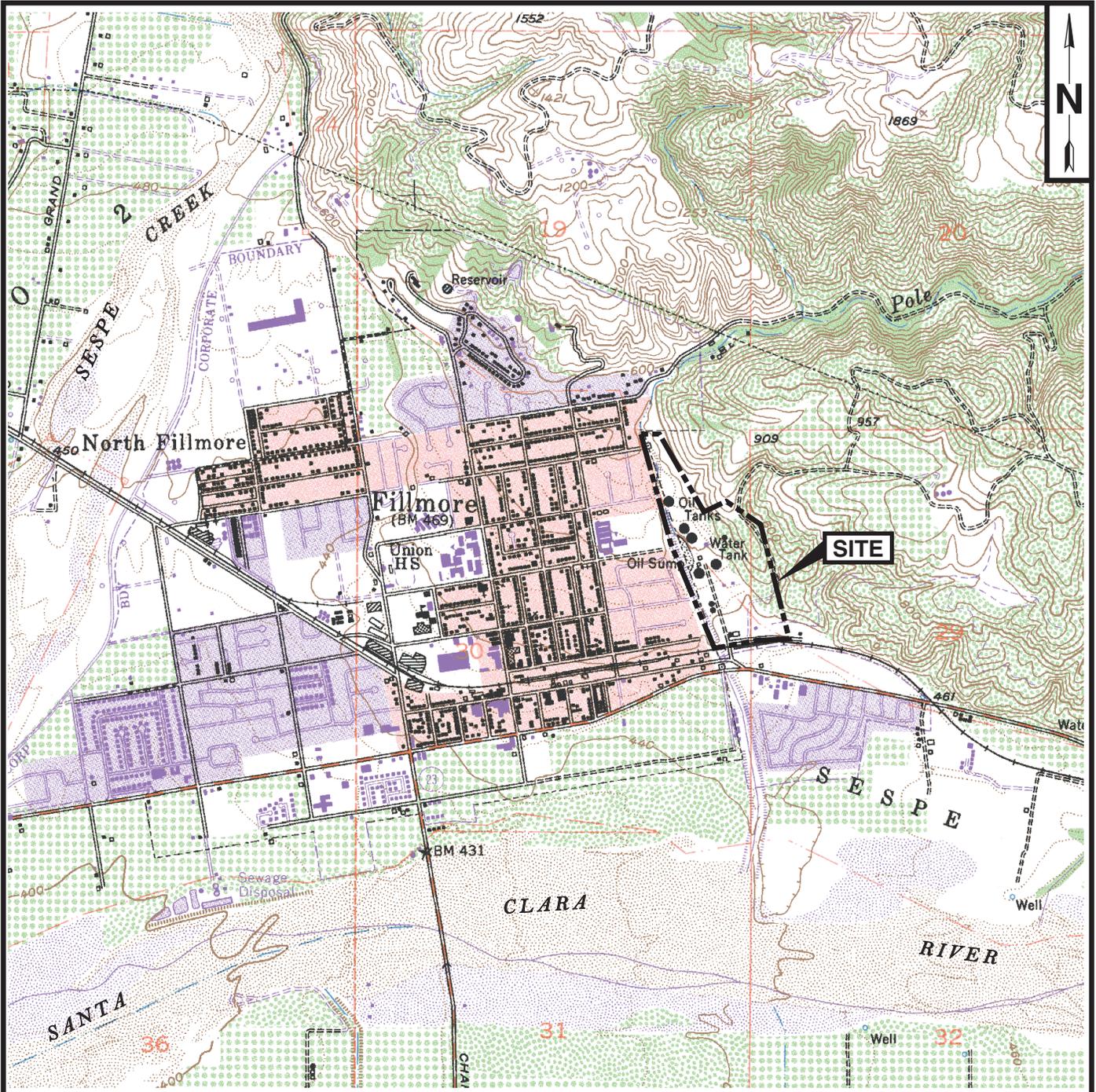
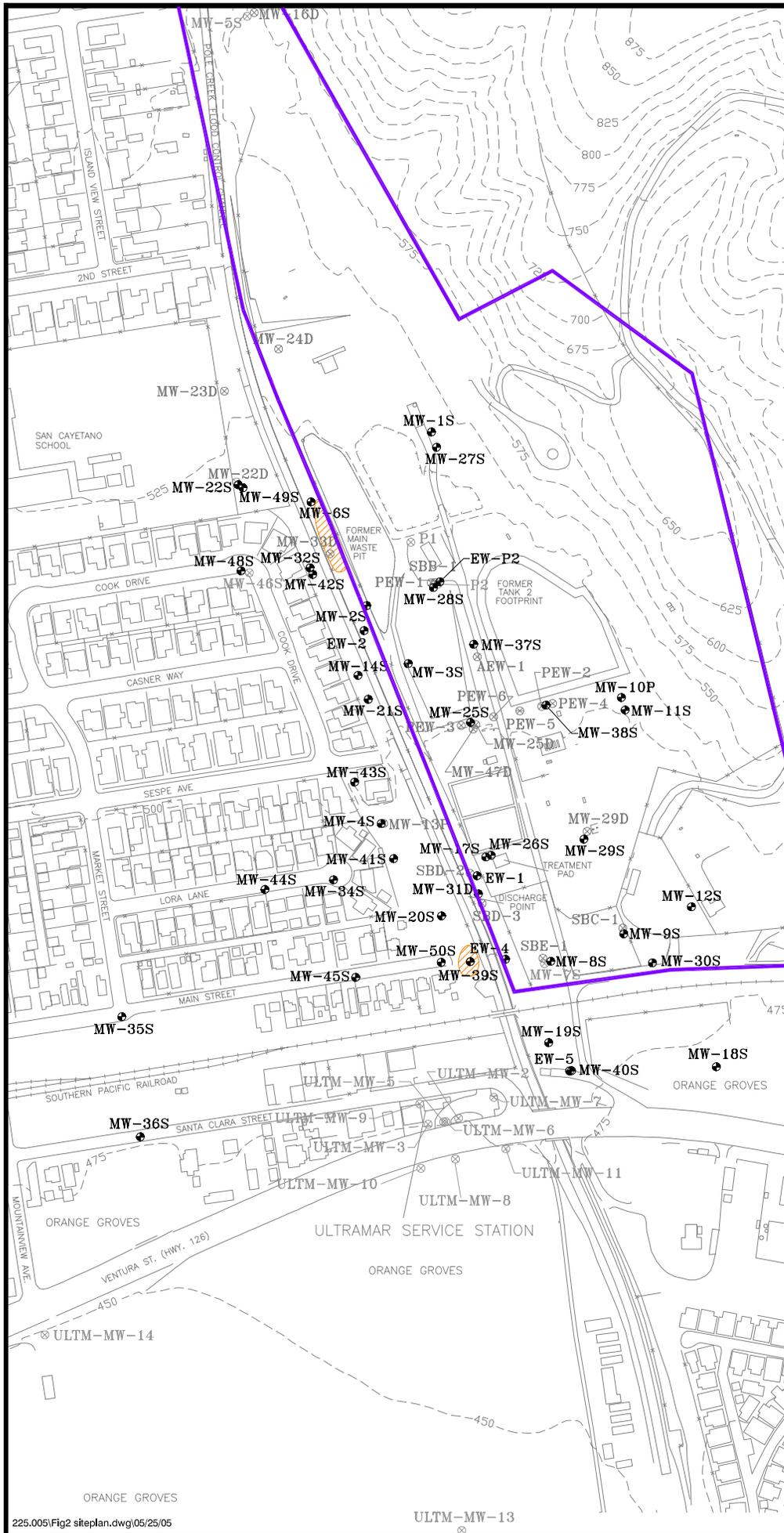


FIGURE 1
SITE LOCATION MAP
 PACIFIC COAST PIPELINE SUPERFUND SITE
 FILLMORE, CALIFORNIA

PREPARED FOR
 CHEVRON

ENGLAND
GEOSYSTEM
 ENVIRONMENTAL ENGINEERING

REFERENCE:
 7.5 MINUTE U.S.G.S. TOPOGRAPHIC
 MAP OF FILLMORE, CALIFORNIA
 DATED: 1951
 PHOTOREVISED: 1988



LEGEND

- MW-12S WELL LOCATION AND WELL ID
- PEW-2 ABANDONED WELL LOCATION AND WELL ID.
- 675 GROUND SURFACE ELEVATION CONTOUR (IN FEET ABOVE MEAN SEA LEVEL). CONTOUR INTERVAL 25 FEET.
- ORC INJECTION AREA
- FORMER REFINERY

NOTES

WELL ID PREFIX DESCRIPTIONS:

- MW MONITORING WELL
- P 2-INCH DIAMETER PIEZOMETER
- SB SOIL BORING CONVERTED TO PERCHED ZONE WELL
- EW AQUIFER I EXTRACTION WELL
- PEW PERCHED EXTRACTION WELL
- AEW AIR EXTRACTION WELL
- ULTM ULTRAMAR MONITORING WELL

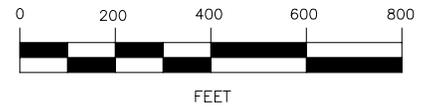


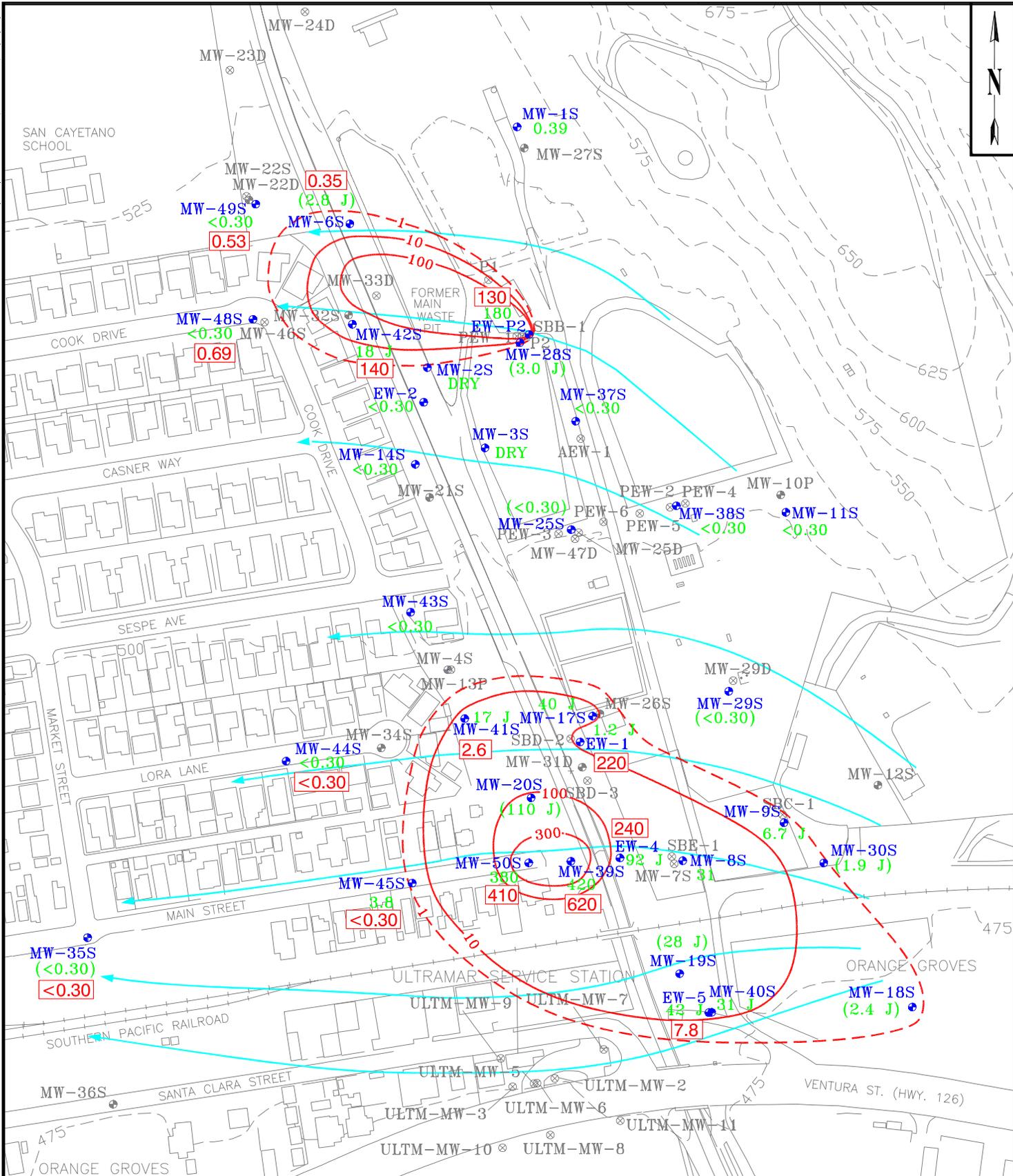
FIGURE 2

SITE PLAN

PACIFIC COAST PIPELINE SUPERFUND SITE
FILLMORE, CALIFORNIA

PREPARED FOR





MW-44S
 ● <0.30
 ○ MW-7S
 100
 675
 <0.30
 MW-44S MONITORING WELL LOCATION AND BENZENE CONCENTRATION IN UG/L. MEASURED DECEMBER 2004. CONCENTRATION IN WELLS WITH SUBMERGED SCREEN ZONES ARE SHOWN IN PARENTHESIS.
 ○ MW-7S ABANDONED MONITORING WELL LOCATION
 100 AQUIFER I BENZENE CONCENTRATION CONTOUR IN UG/L MEASURED DECEMBER 2004. CONTOUR INTERVAL VARIABLE.
 675 GROUND SURFACE ELEVATION CONTOUR. CONTOUR INTERVAL 25 FEET.
 <0.30 PRELIMINARY MARCH 2005 DATA (NOT VALIDATED)

NOTES:
 1. BENZENE ANALYZED BY EPA 8021B, J = ESTIMATED.
 ← GROUND WATER FLOW LINES

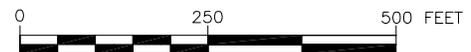
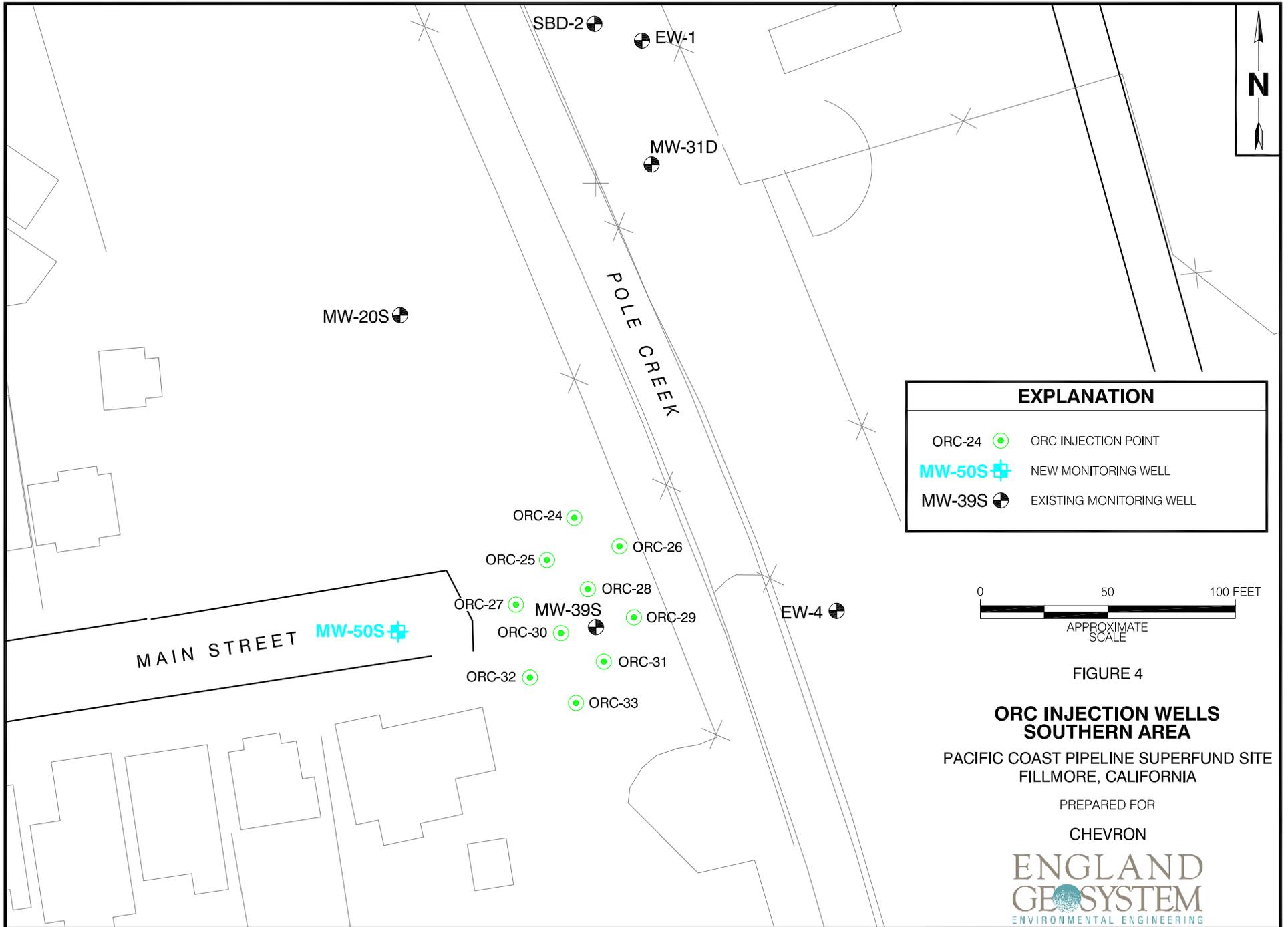


FIGURE 3
BENZENE DISTRIBUTION IN AQUIFER I WELLS FALL 2004
 PACIFIC COAST PIPELINE SUPERFUND SITE
 FILLMORE, CALIFORNIA
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EXPLANATION

- ORC-24  ORC INJECTION POINT
- MW-50S  NEW MONITORING WELL
- MW-39S  EXISTING MONITORING WELL

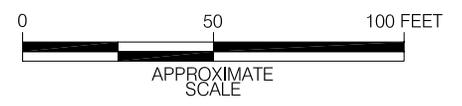


FIGURE 4

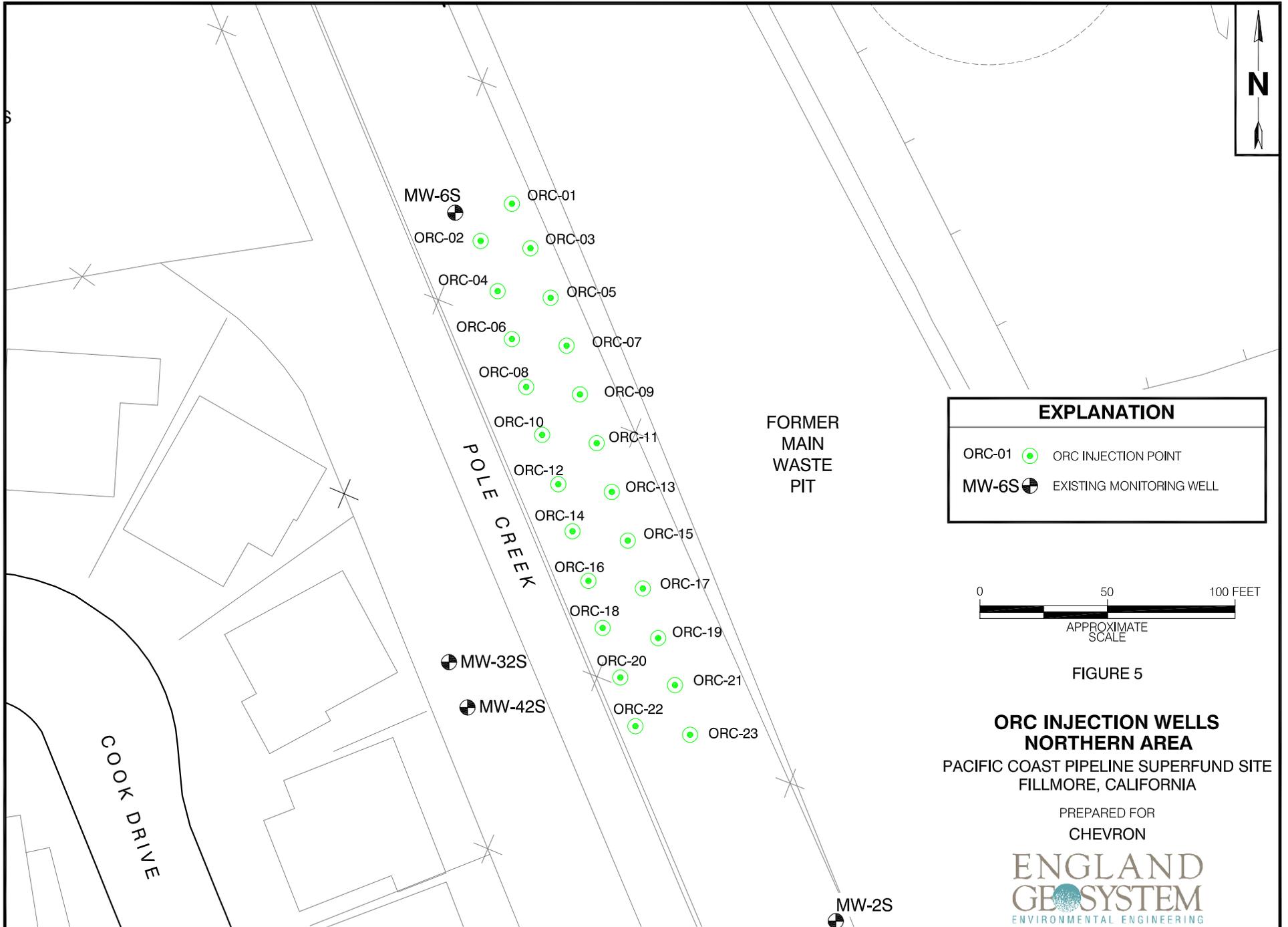
**ORC INJECTION WELLS
SOUTHERN AREA**

PACIFIC COAST PIPELINE SUPERFUND SITE
FILLMORE, CALIFORNIA

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EXPLANATION	
ORC-01	ORC INJECTION POINT
MW-6S	EXISTING MONITORING WELL

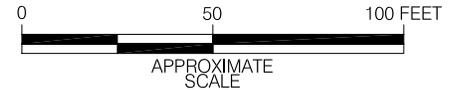
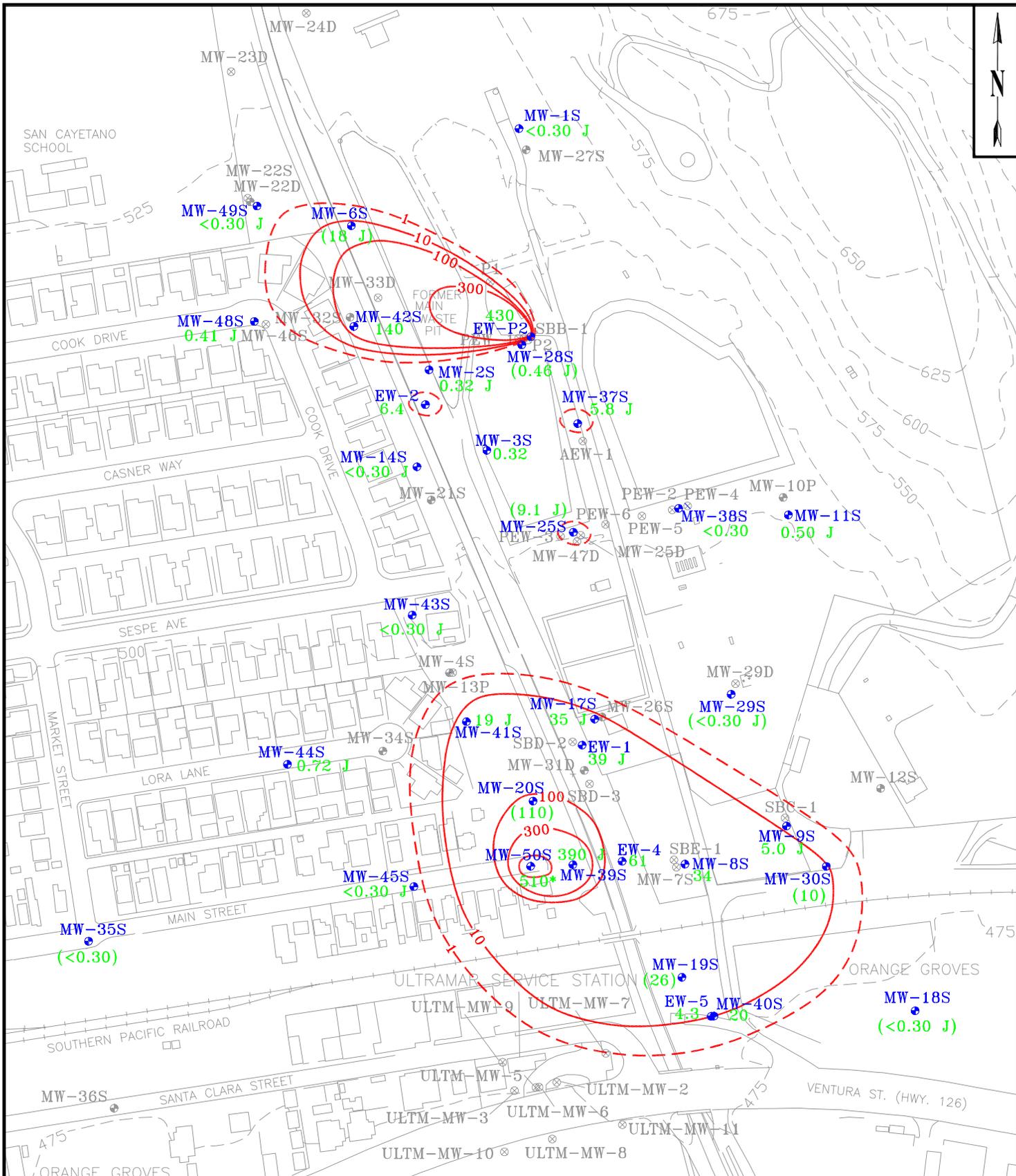


FIGURE 5

**ORC INJECTION WELLS
NORTHERN AREA**
PACIFIC COAST PIPELINE SUPERFUND SITE
FILLMORE, CALIFORNIA

PREPARED FOR
CHEVRON





MW-35S
 ● <0.30
 ○ MW-7S
 - 100

MONITORING WELL LOCATION AND BENZENE CONCENTRATION IN UG/L. CONCENTRATION IN WELLS WITH SUBMERGED SCREEN ZONES ARE SHOWN IN PARENTHESIS.

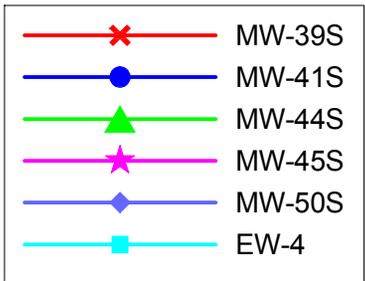
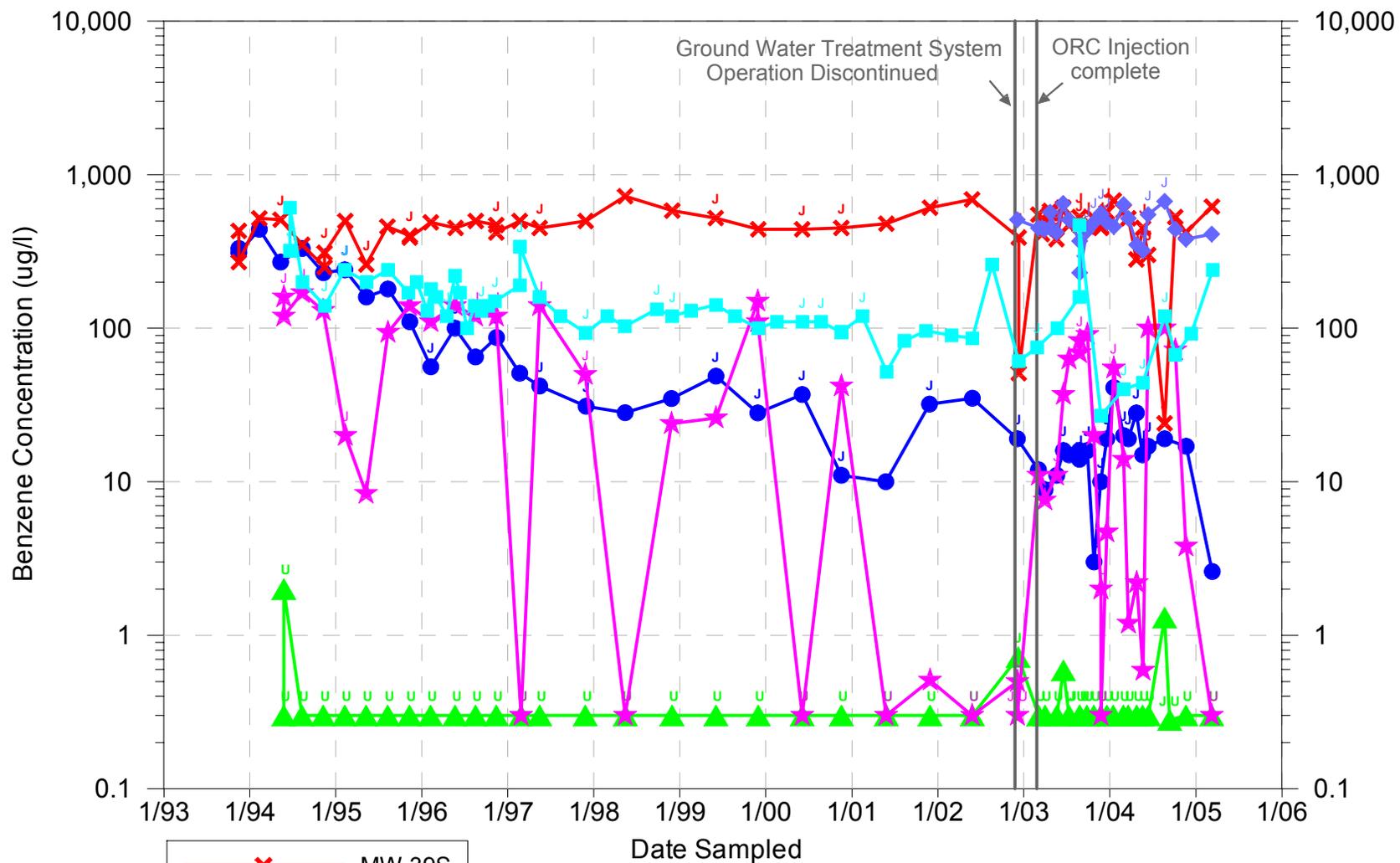
ABANDONED MONITORING WELL LOCATION

AQUIFER I BENZENE CONCENTRATION CONTOUR IN UG/L MEASURED DECEMBER 2002. CONTOUR INTERVAL VARIABLE.

- NOTES:
1. BENZENE ANALYZED BY EPA 8021B, J = ESTIMATED.
 2. CONTOURING IN THE VICINITY OF THE ULTRAMAR STATION IS BASED ON HISTORIC DATA.
 3. * MW-50S ANALYZED BY EPA 8260B



FIGURE 6
BENZENE DISTRIBUTION IN AQUIFER I WELLS FALL 2002
 PACIFIC COAST PIPELINE SUPERFUND SITE
 FILLMORE, CALIFORNIA
 PREPARED FOR
 CHEVRON
ENGLAND GEOSYSTEM
 ENVIRONMENTAL ENGINEERING



Data Qualifiers: J = Estimated; U = Not Detected

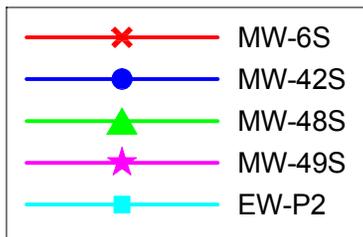
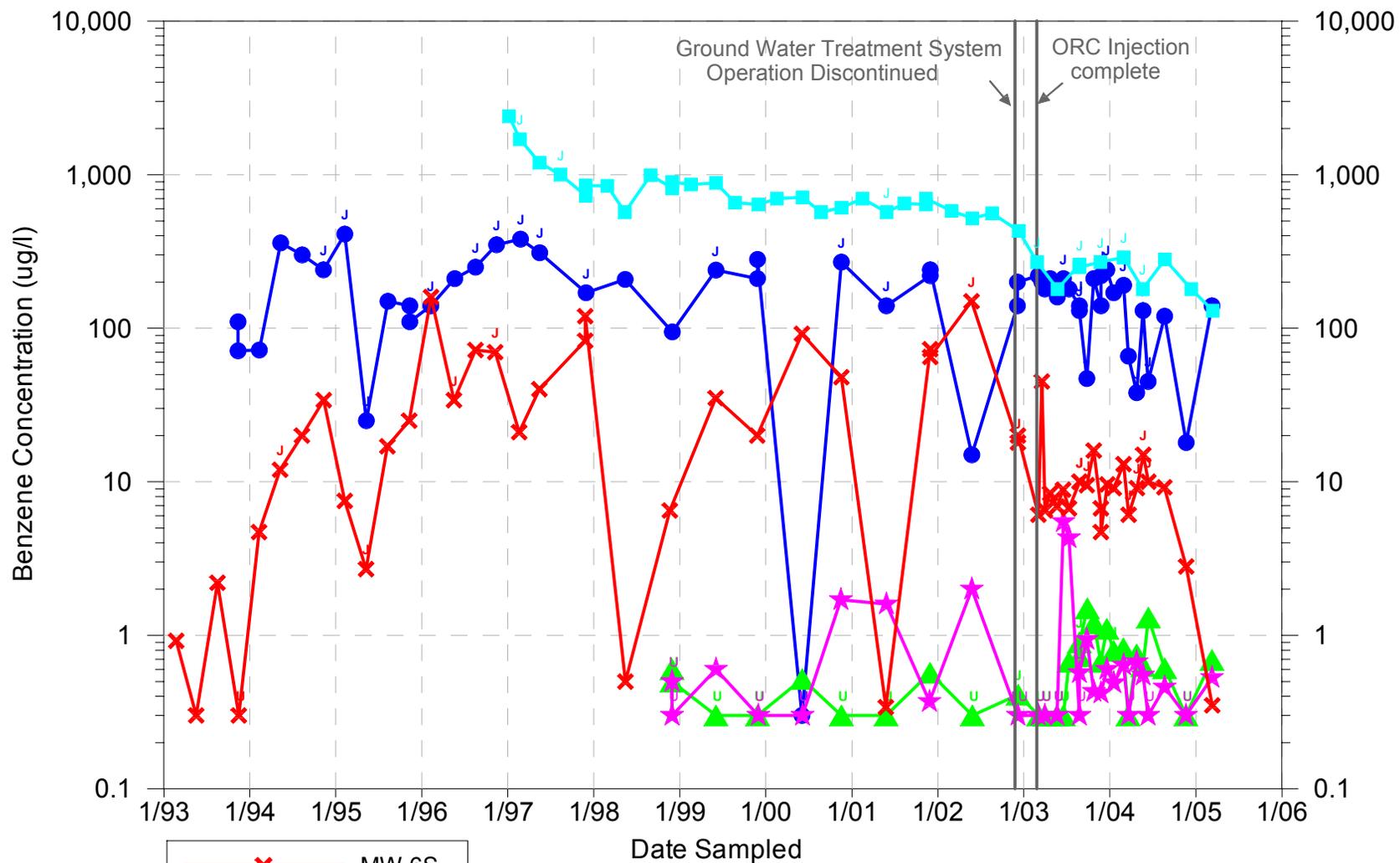
FIGURE 7

SOUTHERN PLUME BENZENE CONCENTRATIONS OVER TIME

PACIFIC COAST PIPELINE SUPERFUND SITE
FILLMORE, CALIFORNIA

PREPARED FOR
CHEVRON





Data Qualifiers: J = Estimated; U = Not Detected

FIGURE 8

NORTHERN PLUME BENZENE CONCENTRATIONS OVER TIME

PACIFIC COAST PIPELINE SUPERFUND SITE
FILLMORE, CALIFORNIA

PREPARED FOR
CHEVRON



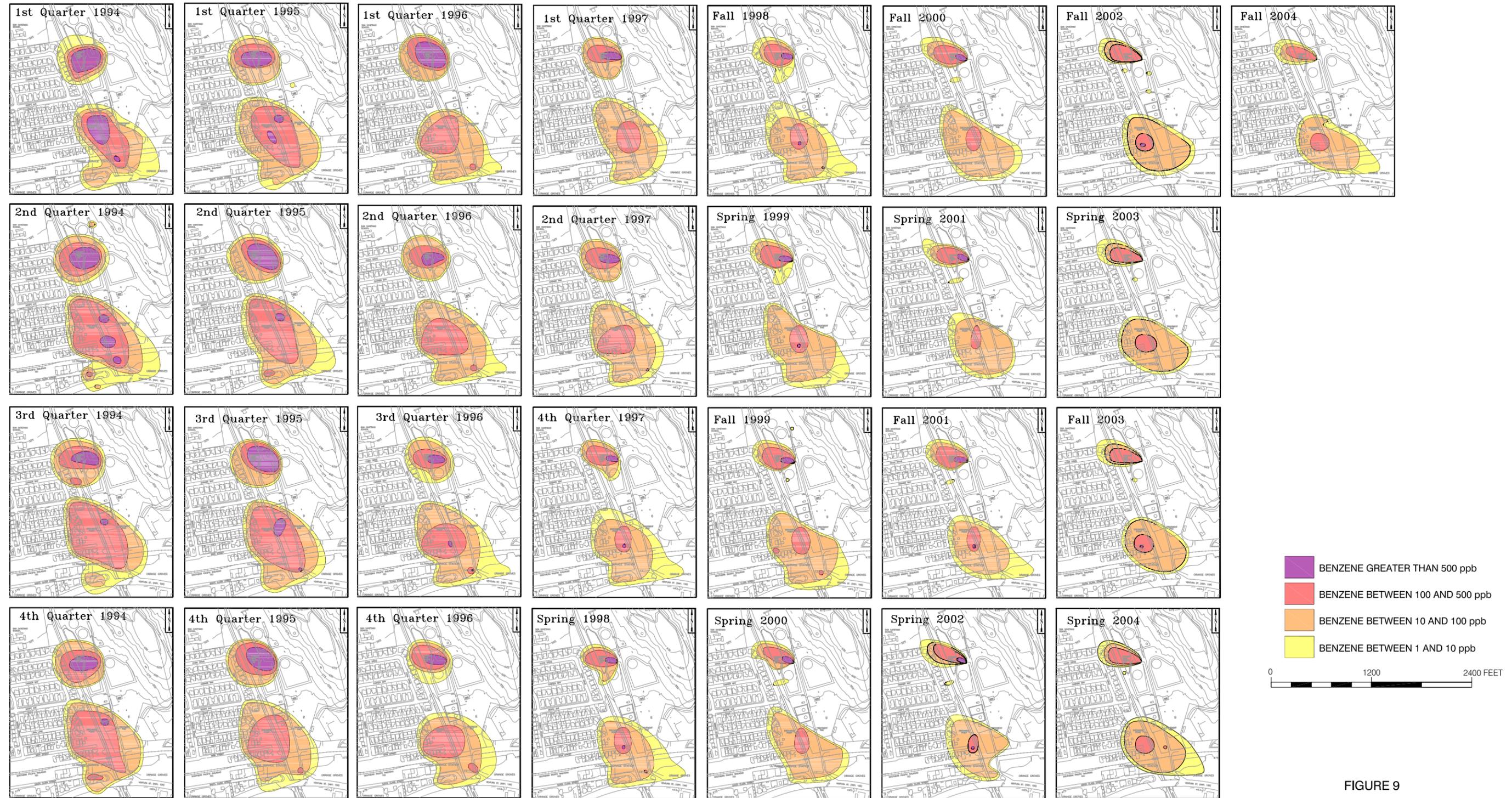


FIGURE 9
BENZENE IN GROUND WATER 1994 TO 2004

PACIFIC COAST PIPELINE SUPERFUND SITE
FILLMORE, CALIFORNIA

PREPARED FOR
CHEVRON
ENGLAND
GEOSYSTEM
ENVIRONMENTAL ENGINEERING

Appendix A

*Summary of Ground Water Sampling Results
ORC[®] Pilot Study*

APPENDIX A
Summary of Ground Water Sampling Results -ORC Pilot Study
PCPL Site, Fillmore, California

Sample ID	Date Collected	TPH as Gasoline	Benzene	Toluene	Ethylbenzene	Total Xylenes	ORP	DO	pH	Cond.	Temp	Ferrous Iron	Sulfate	Chloride	TDS	Boron	Magnesium	
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mV	mg/L		ms/cm	deg C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		EPA 8015M	EPA 8021B				Field						EPA 300		EPA 160.1	EPA 6010B	EPA 6010B	
MW-1S	12/8/02	<100	<0.30 J	<0.30 J	<0.30 J	1.2 J	-156	0.0	6.6	0.8	22.5	-	120	-	-	-	-	
	5/22/03	<100	<0.30	<0.30	<0.30	<0.30	-177	0.0	7.4	2.2	21.0	-	570	-	-	-	-	
	11/21/03	<50	0.46	<0.30	<0.30	<0.60	-140	0.0	7.6	1.3	20.4	-	440	-	-	-	-	
	5/18/04	<50	<0.30	<0.30	<0.30	<0.60	-162	0.0	7.4	1.4	23.4	-	640	-	-	-	-	
	12/11/04	<50	0.39	<0.30	<0.30	<0.60	-144	0.0	7.5	1.7	21.1	-	570	-	-	-	-	
MW-2S	12/6/02	310	0.32 J	1.0 J	<0.30 J	1.5 J	-	-	7.3	0.6	21.6	-	670	-	-	-	-	
	5/23/03	150	1.3	<0.30	<0.30	1.1	-	-	7.0	2.0	22.2	-	360	-	-	-	-	
	11/26/03	75	1.2	0.39	<0.30	1.5	-	-	7.2	1.8	20.6	-	160	-	-	-	-	
	5/19/04	220 J	0.90 J	0.56 J	0.41 J	1.7 J	-	-	7.1	2.0	20.1	-	48	-	-	-	-	
	11/19/04	Well Dry																
MW-3S	12/6/02	130	0.32	0.48	<0.30	<0.30	-	-	7.4	0.4	20.9	-	11	-	-	-	-	
	5/23/03	230	1.6	0.87	<0.30	2.3	-	-	7.1	1.9	21.7	-	60	-	-	-	-	
	11/26/03	170 J	1.1	1.2	0.77	3.2	-	-	7.1	1.6	20.7	-	18	-	-	-	-	
	5/17/04	130 J	<0.30	0.88 J	<0.30	<0.60	-	-	7.1	1.8	22.0	-	6.9	-	-	-	-	
	11/19/04	Well Dry																
MW-6S	12/6/02	300	18 J	3.9 J	0.53 J	<0.30 J	-216	0.0	6.9	1.6	21.5	5.0	290	56	980	0.542	-	
	12/6/02	-	20*	4.5*	<1.0*	2.2*	-	-	-	-	-	-	-	-	-	-	-	
	3/4/03	140	6.1	0.79	<0.30	<0.30	-158	0.0	7.4	1.5	21.0	-	-	-	-	-	-	
	3/18/03	550 J	45	67	1.2	26	-161	0.0	7.3	1.6	21.3	-	-	-	-	-	-	
	4/1/03	250	6.5	1.4	0.46	13	-184	0.0	7.3	1.6	21.8	-	-	-	-	-	-	
	4/22/03	190	8.4	1.5	<0.30	<0.30	-170	0.0	7.4	1.6	21.9	-	-	-	-	-	-	
	5/22/03	210	6.9	1.1	0.40	7.6	-168	0.0	7.4	1.7	21.1	5.0	250	66	1,100	0.557	97.0	
	Duplicate	5/22/03	220	6.8	1.1	0.43	7.1	-	-	-	-	-	-	270	63	1,100	0.563	98.2
	6/17/03	250	8.9	1.4	0.70	13	-203	0.0	7.3	1.7	21.5	-	310	57	1,100	0.559	96.7	
	7/12/03	130	6.7	1.1	0.42	1.8	-159	0.0	7.3	1.6	21.4	-	290	53	1,000	0.545	93.7	
	8/26/03	460	10 J	2.0 J	0.57 J	13 J	-216	0.0	7.5	1.6	21.6	-	290	69	980	0.556	96.5	
	Split	8/26/03	230	10 J	15 J	2.2 J	1.5 J	-	-	-	-	-	-	280	65	1,100	0.57	93
	9/26/03	250	9.5 J	13 J	1.5 J	2.5 J	-167	0	7.3	1.6	21.3	-	-	-	-	-	-	
	10/25/03	310 J	16	19	3.8	7.6	-148	0.0	7.2	1.6	21.6	-	-	-	-	-	-	
	11/25/03	170 J	6.7	6.3 J	4.1 J	3.2 J	-170	0.0	7.3	1.7	21.2	5.0	310	66	1,000	0.51	-	
	Duplicate	11/25/03	180	7.5	7.5	2.8	4.6	-	-	-	-	-	-	320	-	-	-	-
	11/25/03	-	4.7*	<2.0*	<2.0*	<4.0*	-	-	-	-	-	-	-	-	-	-	-	-
	12/21/03	180 J	9.6	9.5	2.6	6.4	-167	0.0	7.3	1.8	21.1	-	-	-	-	-	-	
	1/18/04	210 J	9.1	10	6.3	9.7	-166	0.0	7.3	1.8	21.1	-	-	-	-	-	-	
	2/29/04	190 J	13	1.8	3.4	5.6	-166	0.0	7.3	1.7	21.2	-	-	-	-	-	-	
3/21/04	210 J	6.1 J	2.9 J	0.88 J	6.1 J	-169	0.0	7.3	1.8	21.2	-	-	-	-	-	-		
4/25/04	290	9.1 J	12 J	1.9 J	3.5 J	-178	0.0	7.2	1.8	21.2	-	-	-	-	-	-		
Duplicate	5/22/04	300	15 J	28 R	4.1 J	7.1 J	-189	0.0	7.3	1.7	22.0	5.0	290	72	1,000	0.57	-	
5/22/04	150	8.5	9.0	5.0	7.0	-	-	-	-	-	-	-	280	-	-	-		
6/13/04	290 J	10 J	1.9 J	<0.30	7.3 J	-187	0.0	7.2	1.7	22.1	-	-	-	-	-	-		
8/20/04	250 J	9.2	15	5.6	9.3	-181	0.0	7.2	1.7	21.8	-	-	-	-	-	-		
11/20/04	320 J	2.8 J	6.7 J	6.3 J	3.1 J	-174	0.0	7.2	1.9	21.3	5.0	330	-	-	-	-		
Duplicate	11/20/04	300	9.0	18	8.9	6.0	-	-	-	-	-	-	330	-	-	-	-	
11/20/04	-	3.2*	<2.0*	<2.0*	<4.0*	-	-	-	-	-	-	-	-	-	-	-	-	
3/10/05	100	0.35	<0.30	<0.30	1.9	-170	0.0	7.1	2.0	22.0	-	-	-	-	-	-		

APPENDIX A
Summary of Ground Water Sampling Results -ORC Pilot Study
PCPL Site, Fillmore, California

Sample ID	Date Collected	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes	ORP	DO	pH	Cond.	Temp	Ferrous Iron	Sulfate	Chloride	TDS	Boron	Magnesium
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mV	mg/L		ms/cm	deg C	mg/L	mg/L	mg/L	mg/L	mg/L
		EPA 8015M	EPA 8021B				Field						EPA 300		EPA 160.1	EPA 6010B	EPA 6010B
MW-8S	12/9/02	2,700 J	34	28	4.9	28	-186	0.0	7.0	1.5	21.2	-	4.1	-	-	-	-
	5/23/03	3,500 J	32	23	6.9	26	-94	0.0	6.9	1.8	20.4	-	<1.0	-	-	-	-
	11/24/03	1,800	22 J	15 J	4.2 J	9.9 J	-160	0.0	7.2	1.6	20.6	-	<0.50	-	-	-	-
	5/19/04	3,700	200	130	68	190	-175	0.0	6.9	1.6	21.4	-	<0.50	-	-	-	-
	11/21/04	2,600 J	31	24	4.9	14	-191	0.0	7.0	2.1	21.2	-	20	-	-	-	-
MW-9S	12/9/02	1,300	5.0 J	33 J	6.0 J	33 J	-177	0.0	7.2	1.2	20.6	-	67	-	-	-	-
	5/21/03	340 J	0.49	<0.30	<0.30	0.93	-231	0.0	7.5	1.4	19.9	-	100	-	-	-	-
	11/23/03	430 J	1.0	2.2	<0.60	4.3	-171	0.0	7.6	1.4	20.0	-	92	-	-	-	-
	5/20/04	660 J	2.9 J	0.39 J	1.2 J	2.1 J	-189	0.0	7.2	1.6	20.3	-	78	-	-	-	-
	11/21/04	1,900 J	6.7 J	4.8 J	2.8 J	3.8 J	-167	0.0	6.9	2.2	21.2	-	17	-	-	-	-
MW-11S	12/7/02	<100	0.50 J	2.5 J	<0.30 J	1.5 J	-36	0.0	7.0	2.6	19.5	-	900	-	-	-	-
	5/24/03	<100	<0.30	<0.30	<0.30	<0.30	1	0.0	7.0	3.3	20.3	-	890	-	-	-	-
	11/21/03	<50	<0.30	<0.30	<0.30	<0.60	23	0.0	7.0	2.7	20.6	-	1,100	-	-	-	-
	5/17/04	<50	<0.30	<0.30	<0.30	<0.60	9	0.0	6.9	2.9	21.3	-	1,100	-	-	-	-
	12/11/04	<50	<0.30	<0.30	<0.30	<0.60	-44	0.0	6.9	3.0	21.3	-	1,200	-	-	-	-
MW-14S	12/10/02	200	<0.30 J	<0.30 J	<0.30 J	<0.30 J	-201	0.0	7.0	1.9	21.9	-	240	-	-	-	-
	5/22/03	<100	<0.30	<0.30	<0.30	<0.30	-97	0.0	7.1	2.0	21.5	-	330	-	-	-	-
	11/25/03	120 J	<0.30	0.50	<0.30	1.2	-140	0.0	7.2	2.0	21.2	-	440	-	-	-	-
	5/20/04	99	<0.30	0.70	0.67	<0.60	-146	0.0	7.2	1.9	22.0	-	360	-	-	-	-
	11/20/04	<50	<0.30	<0.30	<0.30	<0.60	-124	0.0	7.2	2.2	21.3	-	480	-	-	-	-
MW-17S	12/10/02	1,000	35 J	14 J	1.8 J	17 J	-210	0.0	6.9	1.7	22.8	-	160	-	-	-	-
	5/24/03	1,100	40	9.1	2.2	11	-149	0.0	7.2	2.4	22.8	-	130	-	-	-	-
	11/25/03	570	11 J	5.4 J	1.5 J	3.0 J	-220	0.0	7.3	1.7	22.9	-	100	-	-	-	-
	5/20/04	880	71	17	2.6	7.6	-139	0.0	6.8	1.6	23.4	-	4.6	-	-	-	-
	11/21/04	1,200 J	40 J	40 J	5.6 J	27 J	-145	0.0	7.0	1.9	20.7	-	180	-	-	-	-
MW-18S	12/9/02	1,200	<0.30 J	<0.30 J	1.1 J	3.5 J	-241	0.0	7.6	2.0	19.2	-	320	-	-	-	-
	5/20/03	440 J	<0.30	<0.30	<0.30	<0.30	-241	0.0	7.2	2.1	20.0	-	400	-	-	-	-
	11/21/03	570 J	<0.30 J	0.75 J	2.3 J	5.3 J	-240	0.0	7.4	2.2	20.0	-	540	-	-	-	-
	5/19/04	370 J	2.1 J	0.74 J	0.64 J	3.0 J	-163	0.0	7.2	2.3	20.8	-	440	-	-	-	-
	11/21/04	460 J	2.4 J	3.0 J	1.4 J	3.6 J	-157	0.0	7.4	2.8	21.3	-	630	-	-	-	-
MW-19S	12/9/02	1,700	26	16	2.1	14	-198	0.0	7.1	1.8	21.5	-	3.7	-	-	-	-
	5/21/03	3800 J	31 J	14 J	<1.5 J	<1.5 J	-160	0.0	7.2	1.4	21.4	-	1.2	-	-	-	-
	11/21/03	2,300 J	41	37	<6.0	14	-167	0.0	7.2	1.6	20.8	-	<0.50	-	-	-	-
	5/18/04	2,000 J	36 J	16 J	<3.0	11 J	-176	0.0	7.1	1.6	21.6	-	1.4	-	-	-	-
	11/21/04	2,600 J	28 J	22 J	2.3 J	9.7 J	-186	0.0	7.1	2.1	21.5	-	<0.50	-	-	-	-
MW-20S	12/8/02	4,600 J	110	100	19	97	-200	0.0	7.1	1.5	20.4	-	4.8	-	-	-	-
	5/20/03	7,700 J	110 J	40 J	7.8 J	26 J	-167	0.0	7.2	1.6	21.3	-	<1.0	-	-	-	-
	11/23/03	5,500	190 J	100 J	25 J	92 J	-142	0.0	7.2	1.8	20.8	-	<0.50	-	-	-	-
	5/19/04	4,500 J	180 J	110 J	10 J	36 J	-168	0.0	7.1	1.8	21.4	-	<0.50	-	-	-	-
	11/20/04	5,100 J	110 J	78 J	11 J	34 J	-179	0.0	7.1	1.8	21.6	-	<0.50	-	-	-	-

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Summary of Ground Water Sampling Results -ORC Pilot Study
PCPL Site, Fillmore, California

Sample ID	Date Collected	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes	ORP	DO	pH	Cond.	Temp	Ferrous Iron	Sulfate	Chloride	TDS	Boron	Magnesium	
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mV	mg/L		ms/cm	deg C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		EPA 8015M	EPA 8021B				Field						EPA 300		EPA 160.1	EPA 6010B	EPA 6010B	
MW-25S	12/6/02	540	9.1 J	57 J	11 J	65 J	-201	0.0	7.2	2.0	20.7	-	500	-	-	-	-	
	5/22/03	<100	<0.30	<0.30	<0.30	<0.30	-160	0.0	7.4	2.4	20.8	-	730	-	-	-	-	
	11/22/03	58	<0.30	<0.30	<0.30	<0.60	-151	0.0	7.3	2.3	20.8	-	850	-	-	-	-	
	5/18/04	65	<0.30	<0.30	<0.30	0.60	-169	0.0	7.2	2.6	21.6	-	880	-	-	-	-	
	12/11/04	<50	<0.30	<0.30	<0.30	<0.60	-167	0.0	7.1	2.6	21.9	-	800	-	-	-	-	
MW-28S	12/7/02	<100	0.46 J	<0.30 J	<0.30 J	<0.30 J	-188	0.0	7.3	1.7	20.8	-	140	-	-	-	-	
	2/26/03	<100	<0.30 J	<0.30 J	<0.30 J	<0.30 J	-159	0.0	7.4	2.0	21.5	-	-	-	-	-	-	
	5/24/03	<100	0.65	<0.30	0.42	1.9	-155	0.0	7.3	2.3	21.1	-	470	-	-	-	-	
	11/22/03	85 J	0.56 J	<0.30	0.59 J	1.4 J	-162	0.0	7.4	2.1	21.3	-	610	-	-	-	-	
	5/18/04	220 J	18 J	9.1 J	1.4 J	11 J	-188	0.0	7.3	2.1	22.1	-	430	-	-	-	-	
	12/11/04	100 J	3.0 J	1.9 J	0.67 J	2.9 J	-179	0.0	7.2	2.3	22.8	-	540	-	-	-	-	
MW-29S	12/9/02	<100	<0.30 J	<0.30 J	<0.30 J	<0.30 J	-152	0.0	6.9	2.7	20.1	-	950	-	-	-	-	
	5/22/03	<100	<0.30	<0.30	<0.30	<0.30	-86	0.0	7.1	2.8	20.2	-	970	-	-	-	-	
	11/21/03	<50	<0.30	<0.30	<0.30	<0.60	-65	0.0	7.0	2.9	19.9	-	1,300	-	-	-	-	
	5/18/04	<50	<0.30	<0.30	<0.30	<0.60	-96	0.0	6.9	3.1	20.6	-	1,300	-	-	-	-	
	12/11/04	<50	<0.30	<0.30	<0.30	<0.60	-114	0.0	7.0	3.3	20.9	-	1,400	-	-	-	-	
MW-30S	12/9/02	2,300	10	6.3	3.4	9.0	-174	0.0	7.1	2.3	19.4	-	530	-	-	-	-	
	5/21/03	1,700 J	4.9 J	<0.60 J	1.7 J	2.8 J	-105	0.0	7.1	2.7	19.6	-	930	-	-	-	-	
	11/21/03	410	0.47	1.0	1.2	2.2	-129	0.0	7.1	2.9	19.1	-	1,300	-	-	-	-	
	5/17/04	1,000 J	6.2 J	8.9 J	2.0 J	2.8 J	-124	0.0	7.0	2.7	19.9	-	1,000	-	-	-	-	
	11/21/04	390 J	1.9 J	1.8 J	0.82 J	1.2 J	-136	0.0	7.0	3.6	20.2	-	1,400	-	-	-	-	
MW-35S Split	12/5/02	<100	<0.30	0.64	<0.30	0.78	-31	0.0	7.0	2.2	21.0	-	510	-	-	-	-	
	3/3/03	<100	<0.30	<0.30	<0.30	<0.30	70	0.0	7.0	2.1	20.7	-	-	-	-	-	-	
	4/1/03	<100	<0.30	<0.30	<0.30	<0.30	71	0.0	7.0	2.0	21.2	-	-	-	-	-	-	
	5/20/03	<100	<0.30 J	<0.30 J	<0.30 J	<0.30 J	-228	0.05	7.0	2.1	21.1	-	590	57	1,500	0.971	103	
	6/17/03	<100	<0.30	<0.30	<0.30	<0.30	-33	0.0	7.0	2.2	20.9	-	600	54	1,500	0.988	102	
	7/11/03	<100	<0.30	<0.30	<0.30	<0.30	111	0.0	7.0	2.1	21.3	-	620	57	1,500	0.977	101	
	8/26/03	<100	<0.30 J	0.59 J	<0.30 J	<0.30 J	-235	0.0	7.1	2.2	21.5	-	670	61	1,500	1.070	116	
	8/26/03	<50	<0.30	<0.30	<0.30	<0.60	-	-	-	-	-	-	670	59	1,700	1.0	100	
	9/26/03	<50	<0.30	<0.30	<0.30	<0.60	-119	0.0	6.9	2.2	21.1	-	-	-	-	-	-	
	10/26/03	<50	<0.30	<0.30	<0.30	<0.60	40	0.0	6.7	2.1	21.2	-	-	-	-	-	-	
	11/21/03	<50	<0.30	<0.30	<0.30	<0.60	76	0.0	7.0	2.2	21.0	-	650	-	-	-	-	
	12/20/03	<50	0.96	3.0	0.60	2.5	52	0.0	6.8	2.3	20.9	-	-	-	-	-	-	
	1/18/04	<50	<0.30	<0.30	<0.30	<0.60	80	0.0	6.9	2.3	20.8	-	-	-	-	-	-	
	2/28/04	<50	<0.30	<0.30	<0.30	<0.60	109	0.0	6.9	2.2	20.8	-	-	-	-	-	-	
	3/20/04	<50	<0.30	<0.30	<0.30	<0.60	62	0.0	7.0	2.3	21.1	-	-	-	-	-	-	
	4/25/04	65	<0.30	<0.30	<0.30	<0.60	5.0	0.0	6.8	2.3	21.1	-	-	-	-	-	-	
	5/19/04	<50	<0.30	<0.30	<0.30	<0.60	-8	0.00	6.8	2.3	21.6	-	650	-	-	-	-	
	6/12/04	<50	<0.30	<0.30	<0.30	<0.60	-19	0.0	6.8	2.2	21.4	-	-	-	-	-	-	
	8/20/04	<50	<0.30	<0.30	<0.30	<0.60	-22	0.0	6.9	2.3	21.7	-	-	-	-	-	-	
	11/20/04	<50	<0.30	<0.30	<0.30	<0.60	-52	0.0	6.9	2.4	21.1	-	650	-	-	-	-	
3/9/05	<50	<0.30	<0.30	<0.30	<0.60	-66	0.0	6.8	2.3	21.9	-	-	-	-	-	-		

APPENDIX A
Summary of Ground Water Sampling Results -ORC Pilot Study
PCPL Site, Fillmore, California

Sample ID	Date Collected	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes	ORP	DO	pH	Cond.	Temp	Ferrous Iron	Sulfate	Chloride	TDS	Boron	Magnesium	
		ug/L	ug/L	ug/L	ug/L	ug/L	mV	mg/L		ms/cm	deg C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
		EPA 8015M	EPA 8021B				Field						EPA 300		EPA 160.1	EPA 6010B	EPA 6010B	
MW-37S	12/6/02	360	5.8 J	17 J	2.4 J	13 J	-196	0.0	7.3	2.1	21.8	-	420	-	-	-	-	
	5/22/03	350	<0.30	<0.30	<0.30	1.6	-156	0.0	7.5	2.4	21.6	-	590	-	-	-	-	
	11/22/03	280 J	<0.30	1.5	1.7	6.9	-135	0.0	7.4	2.2	21.5	-	670	-	-	-	-	
	5/18/04	210 J	<0.30	<0.30	0.60	3.1	-159	0.0	7.3	2.5	22.0	-	740	-	-	-	-	
	12/11/04	300 J	<0.30	<0.30	1.2 J	5.1 J	-160	0.0	7.2	2.4	22.2	-	620	-	-	-	-	
MW-38S	12/6/02	<100	<0.30	<0.30	<0.30	<0.30	-199	0.0	7.2	2.5	21.2	-	750	-	-	-	-	
	5/22/03	<100	<0.30	<0.30	<0.30	<0.30	-167	0.0	7.3	2.6	20.8	-	750	-	-	-	-	
	11/22/03	<50	<0.30	<0.30	<0.30	<0.60	-145	0.0	7.2	2.5	20.9	-	1,100	-	-	-	-	
	5/17/04	<50	<0.30	<0.30	<0.30	<0.60	-167	0.0	7.1	2.8	21.6	-	1,000	-	-	-	-	
	12/11/04	<50	<0.30	<0.30	<0.30	<0.60	-173	0.0	7.1	2.8	21.3	-	1,000	-	-	-	-	
MW-39S	12/10/02	4,800 J	390 J	65 J	13 J	64 J	-201	0.0	6.6	1.4	21.5	4.0	16	70	820	0.813	-	
	12/10/02	-	51*	9.9*	1.2*	5.1*	-	-	-	-	-	-	-	-	-	-	-	
	3/4/03	4,700	550	87	14	75	-158	0.0	7.1	1.4	20.8	-	-	-	-	-	-	
	3/18/03	4,400	410	23	13	63	-148	0.0	7.0	1.4	21.1	-	-	-	-	-	-	
	3/31/03	7,200	470	87	18	71	-154	0.0	7.0	1.3	21.7	-	-	-	-	-	-	
	4/22/03	580	100	22	84	84	-196	0.0	7.1	1.3	21.5	-	-	-	-	-	-	
	4/22/03	-	560*	100*	12*	52*	-	-	-	-	-	-	-	-	-	-	-	
	5/20/03	8,800 J	380 J	58 J	11 J	45 J	-162	0.0	7.1	1.4	21.7	5.5	6.3	67	780	0.841	52.5	
	Duplicate	5/20/03	6,000	380	63	10	56	-	-	-	-	-	6.4	68	770	0.801	50.0	
	Split	6/17/03	8,900 J	610	97	20	64	-172	0.0	7.0	1.4	21.9	-	6.2	65	880	0.820	50.0
		7/11/03	8,800	470	76	18	65	-158	0.0	7.0	1.2	22.2	-	8.6	67	780	0.794	49.9
	Split	8/25/03	13,000	470 J	73 J	19 J	65 J	-163	0.0	7.3	1.4	21.9	-	7.9	65	840	0.796	53.5
		8/25/03	6,200 J	530 J	110 J	15 J	53 J	-	-	-	-	-	-	9.0	67	880	0.82	52
	Duplicate	9/27/03	8,300 J	460 J	110 J	16 J	46 J	-208	0.0	7.0	1.4	21.5	-	-	-	-	-	-
		10/26/03	6,300 J	520	110	16	93	-151	0.0	7.1	1.4	22.4	-	-	-	-	-	-
		11/25/03	5,700 J	460 J	89 J	18	54	-162	0.0	7.1	1.5	21.6	5.0	1.3	72	820	0.74	-
		Duplicate	11/25/03	7,200	570	140	21	69	-	-	-	-	-	1.2	-	-	-	-
		11/25/03	-	450*	94*	<20*	45*	-	-	-	-	-	-	-	-	-	-	-
		12/20/03	6,600 J	570 J	140 J	19 J	59 J	-180	0.0	7.0	1.5	21.6	-	-	-	-	-	-
		1/17/04	8,000 J	680	120	21	65	-182	0.0	7.1	1.5	21.7	-	-	-	-	-	-
2/28/04		7,200 J	580	140	<15	46	-174	0.0	7.1	1.5	21.4	-	-	-	-	-	-	
3/20/04		7700	520	110	39	150	-155	0.0	7.1	1.5	22.5	-	-	-	-	-	-	
4/23/04		5,900	280 J	54 J	12 J	34 J	-162	0.0	7.0	1.6	22.3	-	-	-	-	-	-	
Duplicate	5/21/04	6,700 J	450 J	79 J	<15 J	40 J	-171	0.0	7.0	1.5	22.3	5.0	1.5	72	850	0.82	-	
	5/21/04	6,500	460	31	18	49	-	-	-	-	-	-	1.3	-	-	-	-	
Duplicate	6/12/04	6,400	300 J	52 J	13 J	34 J	-171	0.0	7.0	1.5	22.4	-	-	-	-	-	-	
	8/21/04	1,100	24 J	10 J	<6.0	<12	-166	0.0	7.0	1.5	23.9	-	-	-	-	-	-	
	10/5/04	-	530*	110*	<20*	51*	-161	0.0	6.9	1.6	23.0	-	-	-	-	-	-	
	11/19/04	7,000 J	420	110 J	<15	46	-169	0.0	7.0	1.5	21.9	5.0	1.8	-	-	-	-	
	Duplicate	11/19/04	5,000	430	140	15	83	-	-	-	-	-	0.55	-	-	-	-	
Duplicate	11/19/04	-	450*	98*	<20*	43*	-	-	-	-	-	-	-	-	-	-		
Duplicate	3/9/05	9,200	620	88	<15	35	-171	0.0	7.0	1.8	22.1	-	-	-	-	-		

APPENDIX A
Summary of Ground Water Sampling Results -ORC Pilot Study
PCPL Site, Fillmore, California

Sample ID	Date Collected	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes	ORP	DO	pH	Cond.	Temp	Ferrous Iron	Sulfate	Chloride	TDS	Boron	Magnesium	
		ug/L	ug/L	ug/L	ug/L	ug/L	mV	mg/L		ms/cm	deg C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
		EPA 8015M	EPA 8021B				Field						EPA 300		EPA 160.1	EPA 6010B	EPA 6010B	
MW-40S	12/8/02	82,000	20	42	36	42	-218	0.0	7.0	1.9	21.4	-	5.0	-	-	-	-	
	5/21/03	3,500 J	9.2 J	3.3 J	<1.5 J	9.8 J	-174	0.0	7.0	1.9	21.4	-	<1.0	-	-	-	-	
	11/24/03	2,900	16	16	<15	<30	-166	0.0	7.0	2.0	20.8	-	<0.50	-	-	-	-	
	5/20/04	3,500	15 J	12 J	8.2 J	14 J	-169	0.0	6.9	1.9	21.5	-	<0.50	-	-	-	-	
	11/21/04	2,200 J	31 J	21 J	4.1 J	87 J	-171	0.0	6.9	2.2	21.4	-	1.3	-	-	-	-	
MW-41S	12/5/02	2,300	19 J	34 J	8.4 J	59 J	-249	0.0	7.3	1.8	22.2	-	5.5	-	-	-	-	
	3/4/03	1,700	12	<1.5	<1.5	9.8	-173	0.0	7.2	1.6	21.0	-	-	-	-	-	-	
	4/1/03	1,700	8.9	2.4	4.7	24	-212	0.0	7.1	1.8	21.5	-	-	-	-	-	-	
	5/21/03	2,300 J	11	2.7	4.7	9.1	-183	0.0	7.0	1.8	21.0	-	23	59	940	0.733	70.7	
	6/18/03	2,100 J	16 J	3.3 J	5.0 J	11 J	-219	0.0	7.2	1.7	21.2	-	8.5	52	920	0.746	68.5	
	7/12/03	2,100 J	15	3.0	4.6	9.3	-170	0.0	7.2	1.6	21.5	-	7.4	57	770	0.738	67.3	
	8/25/03	3,300 J	16	4.1	5.2	24	-164	0.0	7.4	1.6	21.5	-	6.5	58	890	0.773	70.8	
	Split	8/25/03	1,700 J	14 J	4.1 J	3.5 J	7.2 J	-	-	-	-	-	-	5.6	55	960	0.79	69
	9/27/03	2,000 J	16 J	5.1 J	3.3 J	6.7 J	-195	0.0	7.2	1.6	21.2	-	-	-	-	-	-	
	10/26/03	3,300	<3.0	16 J	14 J	34 J	-166	0.0	7.2	1.5	21.3	-	-	-	-	-	-	
	11/23/03	2,500	10 J	7.1 J	5.7 J	12 J	-171	0.0	7.3	1.6	20.9	-	5.1	-	-	-	-	
	12/20/03	2,200	19 J	5.7 J	5.6 J	11 J	-196	0.0	7.1	1.7	20.9	-	-	-	-	-	-	
	1/17/04	2,500 J	41	5.3	3.6	27	-197	0.0	7.2	1.7	21.1	-	-	-	-	-	-	
	2/28/04	1,900 J	20 J	19 J	4.0 J	9.3 J	-181	0.0	7.2	1.7	21.1	-	-	-	-	-	-	
	3/20/04	1,700 J	19 J	11 J	3.4 J	9.3 J	-175	0.0	7.2	1.7	21.2	-	-	-	-	-	-	
	4/23/04	3,100	28 J	6.3 J	4.4 J	8.0 J	-172	0.0	7.1	1.7	21.6	-	-	-	-	-	-	
	5/19/04	2,300	15 J	7.6 J	5.1 J	9.7 J	-179	0.0	7.1	1.7	22.2	-	<0.50	-	-	-	-	
6/12/04	2,000	17 J	8.3 J	5.1 J	10 J	-188	0.0	7.0	1.6	22.2	-	-	-	-	-	-		
8/21/04	2,100 J	19	8.4	5.1	13	-172	0.0	7.1	1.6	21.9	-	-	-	-	-	-		
11/20/04	1,400 J	17 J	3.2 J	2.3 J	7.9 J	-152	0.0	7.1	1.7	21.0	-	16	-	-	-	-		
3/10/05	700	2.6	0.74	0.92	2.5	-151	0.0	6.9	2.2	21.8	-	-	-	-	-	-		
MW-42S	12/5/02	2,200	140	32	5.5	53	-187	0.0	7.1	1.4	24.6	5.0	3.1	53	750	0.628	-	
	12/5/02	-	200*	48*	7.8*	49*	-	-	-	-	-	-	-	-	-	-	-	
	3/4/03	3,000 J	220	44	9.1	63	-153	0.0	7.1	1.3	21.8	-	-	-	-	-	-	
	3/18/03	2,900 J	200	130	8.7	74	-150	0.0	7.1	1.3	22.0	-	-	-	-	-	-	
	3/31/03	3,000	180	46	7.8	69	-154	0.0	7.1	1.3	23.0	-	-	-	-	-	-	
	4/22/03	2,900	210	44	7.5	70	-157	0.0	7.2	1.3	22.5	-	-	-	-	-	-	
	5/23/03	3,100 J	160 J	36 J	6.1	61 J	-131	0.0	6.9	1.7	21.7	5.0	2.3	67	780	0.558	45.1	
	5/23/03	3,900	200	44	7.8	72	-	-	-	-	-	-	2.6	-	-	-	-	
	6/18/03	3,400 J	210 J	43 J	8.1 J	73 J	-149	0.0	7.1	1.4	21.8	-	7.8	59	800	0.600	45.4	
	7/11/03	3,400 J	180	36	7.0	61	-148	0.0	7.1	1.3	22.0	-	2.0	63	740	0.575	43.0	
	8/25/03	4,000 J	130 J	27 J	5.2 J	46 J	-141	0.0	7.3	1.4	22.3	-	2.3	70	790	0.638	48.7	
	Split	8/25/03	1,900	140 J	90 J	24 J	33 J	-	-	-	-	-	1.8	66	840	0.63	47	
	9/26/03	2,000 J	47 J	29 J	8.0 J	10 J	-160	0.0	7.0	1.5	22.0	-	-	-	-	-	-	
	10/25/03	2,800 J	210	140	39	42	-169	0.0	7.0	1.5	21.9	-	-	-	-	-	-	
	11/25/03	2,500 J	220 J	45 J	6.8	90 J	-150	0.0	7.1	1.5	21.5	5.0	0.65	77	810	0.54	-	
	Duplicate	11/25/03	2,900	240	50	8.6	100	-	-	-	-	-	-	0.84	-	-	-	-
	11/25/03	-	140*	39*	7.8*	43.8*	-	-	-	-	-	-	-	-	-	-	-	-
12/19/03	2,400 J	240 J	50 J	8.4 J	100 J	-177	0.0	7.0	1.5	21.8	-	-	-	-	-	-		
1/17/04	2,400 J	170	110	31	34	-176	0.0	7.1	1.5	21.8	-	-	-	-	-	-		
2/28/04	2,100	190 J	130 J	36 J	38 J	-165	0.0	7.1	1.5	21.9	-	-	-	-	-	-		

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PCPL Site, Fillmore, California

Sample ID	Date Collected	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes	ORP	DO	pH	Cond.	Temp	Ferrous Iron	Sulfate	Chloride	TDS	Boron	Magnesium
		ug/L	ug/L	ug/L	ug/L	ug/L	mV	mg/L			ms/cm	deg C	mg/L	mg/L	mg/L	mg/L	mg/L
		EPA 8015M	EPA 8021B				Field						EPA 300		EPA 160.1	EPA 6010B	EPA 6010B
Duplicate	3/20/04	1,000	66	14	<6.0	28	-163	0.0	7.1	1.6	22.0	-	-	-	-	-	-
	4/24/04	2,400 J	38 J	26 J	7.9 J	12 J	-159	0.0	7.0	1.5	22.3	-	-	-	-	-	-
	5/21/04	2,400 J	130 J	<6.0 R	25 J	35 J	-158	0.0	7.1	1.7	22.6	5.0	3.7	76	890	0.64	-
	5/21/04	2,200	130	89	24	35	-	-	-	-	-	-	3.7	-	-	-	-
	6/12/04	1,500	45 J	32 J	9.8 J	15 J	-163	0.0	7.0	1.6	22.7	-	-	-	-	-	-
	8/21/04	2,400 J	120	91	30	45	-142	0.0	6.9	1.6	22.6	-	-	-	-	-	-
	11/20/04	1,100 J	18 J	5.9 J	1.3 J	10 J	-165	0.0	6.9	1.6	21.9	5.0	25	-	-	-	-
Duplicate	11/20/04	890	16	4.4	<1.5	8.2	-	-	-	-	-	-	28	-	-	-	-
	11/20/04	-	23*	8.0*	<2.0*	5.3*	-	-	-	-	-	-	-	-	-	-	-
	3/9/05	3,300	140	160	59	81	-181	0.0	6.9	1.7	21.5	-	-	-	-	-	
MW-43S	12/8/02	<100	<0.30 J	<0.30 J	<0.30 J	<0.30 J	-114	0.0	6.9	2.2	20.7	-	610	-	-	-	-
	5/21/03	<100	<0.30	<0.30	<0.30	<0.30	-85	0.0	6.9	2.3	20.6	-	740	-	-	-	-
	11/23/03	<50	<0.30	<0.30	<0.30	<0.60	-76	0.0	7.0	2.5	20.4	-	910	-	-	-	-
	5/19/04	<50	<0.30	<0.30	<0.30	<0.60	-77	0.0	6.8	2.5	21.1	-	950	-	-	-	-
	11/19/04	<50	<0.30	<0.30	<0.30	<0.60	-88	0.0	6.9	2.6	21.0	-	960	-	-	-	-
MW-44S	12/8/02	<100	0.72 J	2.7 J	<0.30 J	2.7 J	-20	0.0	7.1	2.9	20.6	-	950	-	-	-	-
	3/5/03	<100	<0.30	<0.30	<0.30	<0.30	48	0.0	7.1	2.7	20.0	-	-	-	-	-	-
	4/1/03	<100	<0.30	<0.30	<0.30	<0.30	31	0.0	7.0	2.7	20.8	-	-	-	-	-	-
	5/21/03	<100	<0.30	<0.30	<0.30	<0.30	-26	0.0	6.9	2.5	20.7	-	1,000	52	2,000	0.865	180
	6/18/03	<100	0.59	<0.30	<0.30	<0.30	-64	0.0	7.0	2.8	20.5	-	1,200	46	2,000	0.865	175
	7/11/03	<100	<0.30	<0.30	<0.30	1.5	-26	0.0	7.1	2.4	20.9	-	1,200	48	2,000	0.832	170
	8/26/03	<100	<0.30 J	0.67 J	<0.30 J	1.3 J	-240	0.0	7.2	2.5	20.9	-	1,100	52	2,000	0.894	185
	8/26/03	<50	<0.30	<0.30	<0.30	<0.60	-	-	-	-	-	-	1,100	52	2,200	0.89	170
	9/26/03	<50	<0.30	<0.30	<0.30	<0.60	-122	0.0	7.0	2.7	20.9	-	-	-	-	-	-
	10/25/03	<50	<0.30	<0.30	<0.30	<0.60	-127	0.0	7.0	2.8	20.3	-	-	-	-	-	-
	11/23/03	<50	<0.30	<0.30	<0.30	<0.60	40	0.0	7.1	2.9	20.4	-	1,200	-	-	-	-
	12/19/03	<50	<0.30	<0.30	<0.30	<0.60	-69	0.0	6.9	2.9	20.3	-	-	-	-	-	-
	1/16/04	<50	<0.30	<0.30	<0.30	<0.60	-42	0.0	7.0	3.0	20.4	-	-	-	-	-	-
	2/27/04	<50	<0.30	<0.30	<0.30	<0.60	-70	0.0	7.1	2.8	20.2	-	-	-	-	-	-
	3/19/04	<50 J	<0.30	<0.30	<0.30	<0.60	-12	0.0	7.0	3.0	20.6	-	-	-	-	-	-
	4/24/04	50	<0.30	<0.30	<0.30	<0.60	31	0.0	7.0	2.9	21.1	-	-	-	-	-	-
	5/19/04	<50	<0.30	<0.30	<0.30	<0.60	-50	0.0	6.9	2.8	21.1	-	1,100	-	-	-	-
6/13/04	<50	<0.30	<0.30	<0.30	<0.60	-50	0.0	6.9	2.8	21.5	-	-	-	-	-	-	
8/21/04	<50	1.3	<0.30	<0.30	1.2	-77	0.0	7.0	2.6	21.3	-	-	-	-	-	-	
9/11/04	-	<0.28*	<0.36*	<0.25*	<0.76*	-	-	-	-	-	-	-	-	-	-	-	
11/19/04	<50	<0.30	<0.30	<0.30	<0.60	-61	0.0	7.0	2.9	21.4	-	1,300	-	-	-	-	
3/8/05	<50	<0.30	<0.30	<0.30	<0.60	-44	0.0	6.9	2.9	21.1	-	-	-	-	-	-	
MW-45S	12/5/02	<100	<0.30 J	0.78 J	<0.30 J	<0.30 J	-226	0.0	7.1	2.7	20.8	-	830	48	2,000	0.887	-
	12/5/02	-	<0.50*	<1.0*	<1.0*	<2.0*	-	-	-	-	-	-	-	-	-	-	-
	3/4/03	300	11	4.3	<0.30	3.5	-151	0.0	7.2	2.2	20.6	-	-	-	-	-	-
	3/31/03	280	7.6	3.7	0.87	3.9	-283	0.0	7.3	2.1	21.3	-	-	-	-	-	-
	5/20/03	480 J	11 J	1.2 J	<0.30 J	<0.30 J	-364	0.0	7.3	2.0	21.0	-	490	48	1,400	1.02	113
	6/18/03	880 J	37	5.5	2.4	4.0	-340	0.0	7.2	1.8	20.8	-	220	38	1,100	0.979	79.0
	7/12/03	1,700	63	13	2.8	7.3	-320	0.0	7.3	1.6	21.0	-	170	51	920	0.859	62.9
	8/26/03	3,800 J	83 J	18 J	3.5 J	17 J	-250	0.0	7.5	1.5	21.1	-	120	50	950	0.888	65.1

APPENDIX A
Summary of Ground Water Sampling Results -ORC Pilot Study
PCPL Site, Fillmore, California

Sample ID	Date Collected	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes	ORP	DO	pH	Cond.	Temp	Ferrous Iron	Sulfate	Chloride	TDS	Boron	Magnesium	
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mV	mg/L		ms/cm	deg C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		EPA 8015M	EPA 8021B				Field						EPA 300		EPA 160.1	EPA 6010B	EPA 6010B	
Split	8/26/03	1,100	69 J	14 J	2.7 J	6.3 J	-	-	-	-	-	-	84	48	910	0.88	56	
	9/27/03	1,900 J	91	32	4.3	9.9	-280	0.0	7.2	1.6	20.9	-	-	-	-	-	-	
	10/25/03	320	20	5.0	0.61	2.3	-248	0.0	7.1	2.4	21.0	-	-	-	-	-	-	
	11/24/03	<50	<0.30	<0.30	<0.30	<0.60	-83	0.0	7.0	2.7	20.5	-	1,000	59	2,200	0.77	-	
	11/24/03	-	<2.0*	<2.0*	<2.0*	<4.0*	-	-	-	-	-	-	-	-	-	-	-	-
	12/20/03	120	4.7	0.92	0.42	0.96	-286	0.0	7.0	2.6	20.6	-	-	-	-	-	-	-
	1/17/04	1,100 J	55 J	9.7 J	1.5 J	6.3 J	-289	0.0	7.2	1.8	20.9	-	-	-	-	-	-	-
	2/28/04	570 J	14	9.6	<1.5	<3.0	-156	0.0	7.2	1.9	20.8	-	-	-	-	-	-	-
	3/20/04	130	1.2	0.31	0.43	<0.60	-186	0.0	7.0	2.0	21.3	-	-	-	-	-	-	-
	4/24/04	150	2.2	0.58	0.37	1.5	-285	0.0	7.0	2.0	21.2	-	-	-	-	-	-	-
	5/21/04	<50	0.59	<0.30	<0.30	<0.60	-127	0.0	7.1	1.7	21.5	-	190	56	960	0.89	-	
	6/12/04	1,500	100	29	5.2	11	-215	0.0	7.1	1.6	22.1	-	-	-	-	-	-	-
	8/21/04	2,200 J	100	33	7.0	16	-212	0.0	7.0	1.6	21.6	-	-	-	-	-	-	-
	10/5/04	-	72*	25*	<4.0*	11*	-169	0.0	7.1	1.6	21.3	-	-	-	-	-	-	-
	11/19/04	110 J	3.8	2.0	<0.30	<0.60	-118	0.0	6.8	2.5	21.2	-	960	-	-	-	-	-
11/19/04	-	4.6*	2.3*	<2.0*	<4.0*	-	-	-	-	-	-	-	-	-	-	-	-	
3/8/05	53	<0.30	0.36	<0.30	0.7	-110	0.0	6.7	2.0	21.6	-	-	-	-	-	-	-	
MW-48S	12/8/02	520	0.41 J	2.5 J	0.42 J	8.1 J	-203	0.0	6.9	1.5	22.1	-	160	73	940	0.682	-	
	3/5/03	<100	<0.30	<0.30	<0.30	<0.30	-178	0.0	7.3	1.6	21.7	-	-	-	-	-	-	
	3/31/03	<100	<0.30	<0.30	<0.30	6.5	-178	0.0	7.4	1.6	23.4	-	-	-	-	-	-	
	5/22/03	<100	<0.30	<0.30	<0.30	<0.30	-184	0.0	7.4	1.6	21.8	-	160	70	950	0.684	53.2	
	6/18/03	140	<0.30	0.45	<0.30	8.9	-180	0.0	7.4	1.6	21.9	-	130	68	940	0.672	49.0	
	7/12/03	110	0.67	0.42	<0.30	5.4	-242	0.0	7.4	1.5	22.0	-	130	65	830	0.651	47.0	
	8/25/03	160	0.90 J	0.98 J	<0.30 J	8.2 J	-172	0.0	7.6	1.4	21.9	-	95	71	800	0.637	42.7	
	Split 8/25/03	78	0.73 J	<0.30 J	<0.30 J	3.4 J	-	-	-	-	-	-	93	64	870	0.63	41	
	9/27/03	100	1.5	<0.30	<0.30	4.8	-197	0.0	7.3	1.4	22.2	-	-	-	-	-	-	
	10/26/03	89	1.2	<0.30	<0.30	2.9	-178	0.0	7.4	1.4	22.0	-	-	-	-	-	-	
	11/23/03	79	0.67	<0.30	<0.30	1.6	-179	0.0	7.4	1.5	21.4	-	82	70	830 J	0.55	-	
	12/19/03	100	1.1	<0.30	<0.30	2.2	-186	0.0	7.3	1.4	21.4	-	-	-	-	-	-	
	1/17/04	94	0.79 J	1.8 J	3.9 J	2.2 J	-196	0.0	7.3	1.4	21.6	-	-	-	-	-	-	
	2/27/04	99	0.82	2.2	1.1	5.1	-200	0.0	7.4	1.3	21.3	-	-	-	-	-	-	
	3/19/04	98	<0.30	<0.30	<0.30	5.6	-177	0.0	7.3	1.5	21.7	-	-	-	-	-	-	
	4/24/04	95	0.75	2.1	2.4	1.6	-178	0.0	7.3	1.6	22.1	-	-	-	-	-	-	
	5/21/04	110 J	0.63	2.0	3.8	2.0	-196	0.0	7.3	1.5	22.2	-	99	72	840	0.62	-	
	6/13/04	140 J	1.3	<0.30	<0.30	6.6	-198	0.0	7.2	1.4	22.3	-	-	-	-	-	-	
8/21/04	65	0.61	<0.30	3.2	1.8	-196	0.0	7.1	1.5	22.0	-	-	-	-	-	-		
11/19/04	59	<0.30	<0.30	<0.30	4.0	-189	0.0	7.2	1.7	21.1	-	230	-	-	-	-		
3/9/05	94	0.69	0.51	4.2	2.4	-186	0.0	7.0	1.7	21.9	-	-	-	-	-	-		
MW-49S	12/7/02	120	<0.30 J	0.42 J	<0.30 J	<0.30 J	-155	0.0	7.1	1.5	20.0	-	150	54	1,000	0.397	-	
	3/4/03	<100	<0.30	<0.30	<0.30	<0.30	-163	0.0	7.3	1.5	21.4	-	-	-	-	-	-	
	3/31/03	<100	<0.30	0.54	<0.30	3.3	-168	0.0	7.3	1.5	22.6	-	-	-	-	-	-	
	5/22/03	<100	<0.30	<0.30	<0.30	<0.30	-165	0.0	7.3	1.6	21.3	-	280	59	1,000	0.389	81.2	
	6/18/03	110	5.5	<0.30	<0.30	5.0	-158	0.0	7.3	1.6	21.5	-	340	46	1,000	0.393	81.1	
	7/11/03	<100	4.3	<0.30	<0.30	3.8	-152	0.0	7.3	1.5	21.4	-	330	56	1,000	0.397	80.8	
	8/25/03	<100	0.57 J	<0.30 J	<0.30 J	3.0 J	-153	0.0	7.5	1.5	21.7	-	370	58	980	0.405	86.5	
	Split 8/25/03	80 J	<0.30	<0.30	<0.30	2.3	-	-	-	-	-	-	340	55	1,100	0.41	81	

APPENDIX A
Summary of Ground Water Sampling Results -ORC Pilot Study
PCPL Site, Fillmore, California

Sample ID	Date Collected	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes	ORP	DO	pH	Cond.	Temp	Ferrous Iron	Sulfate	Chloride	TDS	Boron	Magnesium
		ug/L	ug/L	ug/L	ug/L	ug/L	mV	mg/L			ms/cm	deg C	mg/L	mg/L	mg/L	mg/L	mg/L
		EPA 8015M	EPA 8021B				Field						EPA 300		EPA 160.1	EPA 6010B	EPA 6010B
	9/26/03	67	0.94	<0.30	<0.30	3.2	-153	0.0	7.2	1.6	21.6	-	-	-	-	-	-
	10/25/03	63 J	0.43	0.81	1.6	1.1	-155	0.0	7.2	1.6	21.3	-	-	-	-	-	-
	11/24/03	59	0.42	<0.30	<0.30	1.8	-161	0.0	7.3	1.6	21.2	-	390	58	1,100	0.36	-
	12/19/03	69 J	0.60	1.1	<0.30	2.0	-186	0.0	7.2	1.7	21.3	-	-	-	-	-	-
	1/17/04	65	0.49	1.1	1.5	1.5	-173	0.0	7.2	1.7	21.4	-	-	-	-	-	-
	2/29/04	51	0.64	<0.30	<0.30	1.2	-167	0.0	7.3	1.6	21.0	-	-	-	-	-	-
	3/21/04	58 J	<0.30	<0.30	<0.30	2.0	-166	0.0	7.3	1.7	21.4	-	-	-	-	-	-
	4/24/04	63	0.67	1.3	<0.30	1.7	-169	0.0	7.2	1.7	21.4	-	-	-	-	-	-
	5/21/04	<50	0.55	0.96	<0.30	1.5	-167	0.0	7.2	1.7	21.5	-	400	60	1,100	0.41	-
	6/12/04	66 J	<0.30	<0.30	<0.30	2.3 J	-185	0.0	7.2	1.7	21.7	-	-	-	-	-	-
	8/21/04	<50	0.46	<0.30	1.1	2.1	-169	0.0	7.1	1.7	21.2	-	-	-	-	-	-
	11/19/04	<50	<0.30	<0.30	<0.30	1.5 J	-171	0.0	7.2	1.8	21.2	-	460	-	-	-	-
	3/8/05	82	0.53	<0.30	2.5	1.2	-177	0.0	7.1	1.8	21.2	-	-	-	-	-	-
MW-50S	12/4/02	-	510*	130*	24*	62*	-147	0.0	7.0	1.5	21.3	2.0	11	42	800	0.970	-
Duplicate	12/4/02	-	480*	120*	21*	52*	-	-	-	-	-	-	11	45	800	0.978	-
	3/4/03	4,500	450	89	15	57	-135	0.0	7.1	1.4	21.1	-	-	-	-	-	-
	3/18/03	6,400	450	36	21	67	-129	0.0	7.0	1.3	21.0	-	-	-	-	-	-
	3/31/03	7,000	440	57	21	63	-136	0.0	7.0	1.4	21.5	-	-	-	-	-	-
	4/22/03	8,500	570	120	26	75	-158	0.0	7.1	1.4	21.4	-	-	-	-	-	-
	4/22/03	-	450*	120*	15*	48*	-	-	-	-	-	-	-	-	-	-	-
	5/20/03	11,000 J	420 J	84 J	16 J	41 J	-148	0.0	7.0	1.4	21.3	5.0	2.7	53	830	0.897	59.6
Duplicate	5/20/03	10,000	400	80	15	51	-	-	-	-	-	-	2.3	-	-	-	-
	6/17/03	11,000 J	650	130	29	<6.0	-199	0.0	7.0	1.5	21.1	-	<1.0	51	840	0.874	55.5
Duplicate	6/17/03	12,000	650	130	30	64	-	-	-	-	-	-	-	-	-	-	-
	7/12/03	9,800	510	100	23	64	-147	0.0	7.1	1.5	21.3	-	1.0	52	790	0.868	55.6
Duplicate	7/12/03	9,400	480	98	23	63	-	-	-	-	-	-	-	-	-	-	-
	8/26/03	7,100	370 J	79 J	16 J	55 J	-246	0.0	7.3	1.4	21.2	-	1.1	54	790	0.874	59.3
Split	8/26/03	2,600	230 J	56 J	11 J	31 J	-	-	-	-	-	-	<0.50	53	820	0.89	56
	9/26/03	7,200 J	430 J	130 J	29 J	56 J	-222	0.0	7.0	1.5	21.4	-	-	-	-	-	-
Duplicate	9/26/03	7,200	440	130	28	64	-	-	-	-	-	-	-	-	-	-	-
	10/25/03	9,200 J	490 J	130 J	24 J	59 J	-200	0.0	7.0	1.5	21.3	-	-	-	-	-	-
Duplicate	10/25/03	9,500	500	130	24	62	-	-	-	-	-	-	-	-	-	-	-
	11/25/03	7,000 J	560 J	140 J	19 J	57 J	-154	0.0	7.0	1.5	20.8	5.0	<0.50	55	830	0.76	-
Duplicate	11/25/03	6,700	590	140	21	64	-	-	-	-	-	-	0.51	-	-	-	-
	11/25/03	-	550*	140*	<20*	51*	-	-	-	-	-	-	-	-	-	-	-
	12/20/03	7,600 J	490 J	150 J	23	71 J	-168	0.0	7.0	1.5	20.8	-	-	-	-	-	-
Duplicate	12/20/03	7,700	450	100	19	53	-	-	-	-	-	-	-	-	-	-	-
	1/17/04	8,000 J	460	140	11	33	-162	0.0	7.0	1.5	20.7	-	-	-	-	-	-
Duplicate	1/17/04	8,000	520	120	15	45	-	-	-	-	-	-	-	-	-	-	-
	2/28/04	8,300	640	190	<30	<60	-175	0.0	7.1	1.4	20.8	-	-	-	-	-	-
Duplicate	2/28/04	8,200	600	180	<30	<60	-	-	-	-	-	-	-	-	-	-	-
	3/20/04	8,300	520	230 J	54	230 R	-151	0.0	7.0	1.5	21.1	-	-	-	-	-	-
Duplicate	3/20/04	7,600	500	130	<15	43	-	-	-	-	-	-	-	-	-	-	-
	4/24/04	8,000	350	100	20	55	-163	0.0	7.0	1.6	21.4	-	-	-	-	-	-
Duplicate	4/24/04	8,400	390	110	22	62	-	-	-	-	-	-	-	-	-	-	-
	5/21/04	8,400 J	320 J	84 J	21 J	49 J	-149	0.0	7.0	1.4	21.5	5.0	<0.50	57	840	0.86	-

APPENDIX A
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PCPL Site, Fillmore, California

Sample ID	Date Collected	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes	ORP	DO	pH	Cond.	Temp	Ferrous Iron	Sulfate	Chloride	TDS	Boron	Magnesium
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mV	mg/L		ms/cm	deg C	mg/L	mg/L	mg/L	mg/L	mg/L
		EPA 8015M	EPA 8021B				Field						EPA 300		EPA 160.1	EPA 6010B	EPA 6010B
Duplicate	5/21/04	7,300	310	74	17	37	-	-	-	-	-	-	<0.50	-	-	-	-
	6/12/04	7,900 J	550 J	140 J	21 J	58 J	-160	0.0	6.9	1.4	22.0	-	-	-	-	-	-
Duplicate	6/12/04	7,400	560	140	22	59	-	-	-	-	-	-	-	-	-	-	-
	8/21/04	7,900	670 J	190 J	37 J	190 J	-163	0.0	6.9	1.5	22.0	-	-	-	-	-	-
Duplicate	8/21/04	7,900	680	230	32	190	-	-	-	-	-	-	-	-	-	-	-
	10/5/04	-	440*	150*	20*	58*	-158	0.0	6.9	1.6	21.9	-	-	-	-	-	-
Duplicate	11/19/04	8,000 J	380	130	12	40	-165	0.0	6.9	1.5	21.4	5.0	1.6	-	-	-	-
	11/19/04	8,200	380	140	12	38	-	-	-	-	-	-	1.7	-	-	-	-
	11/19/04	-	440*	150*	20*	77*	-	-	-	-	-	-	-	-	-	-	-
Duplicate	3/8/05	8,800	410	110	<15	56	-177	0.0	6.8	1.8	21.5	-	-	-	-	-	-
	3/8/05	8,300	530	140	26	49	-	-	-	-	-	-	-	-	-	-	-
EW-P2	12/10/02	9,300	430	180	120	230	-	-	-	-	-	-	3.9	-	-	-	-
	2/26/03	7,000 J	270 J	100 J	52 J	120 J	-122	0.0	7.4	1.6	19.7	-	-	-	-	-	-
	5/24/03	5,000 J	180	91	56	110	-134	0.0	7.2	1.8	21.1	-	68	59	910	0.639	98.4
	8/25/03	11,000	250	110	73	140	-155	0.0	7.4	1.5	21.5	-	4.2	59	800	0.685	99.9
	Split 8/25/03	4,400	260 J	210 J	130 J	140 J	-	-	-	-	-	-	3.7	55	870	0.68	94
	11/22/03	5,500 J	270 J	130 J	78 J	210 J	-156	0.0	7.3	1.5	21.1	-	51	-	-	-	-
	2/29/04	3,400 J	290 J	110 J	69 J	150 J	-189	0.0	7.6	1.6	19.8	-	-	-	-	-	-
	5/20/04	4,400 J	180	190	130	110	-161	0.0	7.2	1.5	21.8	-	30	-	-	-	-
	8/22/04	6,900	280	260	170	320	-169	0.0	7.1	1.7	21.9	-	-	-	-	-	-
	12/12/04	4,700 J	180	120	65	180	-168	0.0	7.1	1.8	22.1	-	75	-	-	-	-
	3/11/05	5,600	130	170	140	150	-176	0.0	7.2	2.1	21.0	-	-	-	-	-	-
EW-1	12/10/02	1,300	39 J	14 J	1.9 J	12 J	-	-	-	-	-	-	230	-	-	-	-
	2/26/03	10,000	77 J	36 J	<6.0 J	33 J	-173	0.0	7.2	2.3	19.6	-	-	-	-	-	-
	5/24/03	1,900	53	19	5.7	23	-164	0.0	7.2	2.7	20.2	-	450	58	1,600	0.716	134
	8/26/03	5,100	94 J	37 J	7.9 J	30 J	-197	0.0	7.4	1.8	21.0	-	870	50	1,700	0.718	174
	Split 8/26/03	7,100 J	170	140	23	180	-	-	-	-	-	-	890	49	1,900	0.73	160
	11/24/03	530	3.6 J	2.3 J	1.8 J	4.2 J	-172	0.0	7.3	1.9	20.9	-	750	-	-	-	-
	2/29/04	280 J	1.3	0.97	1.1	3.3	-177	0.0	7.3	2.4	20.3	-	-	-	-	-	-
	5/20/04	1,600	36 J	54 J	13 J	67 J	-167	0.0	7.1	2.3	20.5	-	660	-	-	-	-
	8/22/04	590 J	11 J	9.1 J	<1.5 J	15 J	-191	0.0	7.2	2.5	21.1	-	-	-	-	-	-
	12/12/04	610 J	1.2 J	0.39 J	1.3 J	2.6 J	-191	0.0	7.2	2.7	20.8	-	930	-	-	-	-
3/11/05	5,200	220	120	17	65	-178	0.0	7	3.0	21.4	-	-	-	-	-	-	
EW-2	12/7/02	840	6.4	44	7.7	46	-189	0.0	7.1	1.8	20.9	-	190	-	-	-	-
	5/23/03	160	<0.30	<0.30	<0.30	<0.30	-99	0.0	7.2	3.1	21.6	-	610	-	-	-	-
	11/24/03	130 J	<0.30	<0.30	<0.30	0.61	-158	0.0	7.4	2.0	21.2	-	360	-	-	-	-
	5/22/04	310 J	1.1 J	0.39 J	0.52 J	2.5 J	-168	0.0	7.2	1.9	22.2	-	260	-	-	-	-
	12/12/04	150 J	<0.30	<0.30	<0.30	<0.60	167	0.0	7.0	1.9	22.2	-	130	-	-	-	-
EW-4	12/10/02	85,000	61	45	80	58	-	-	-	-	-	-	15	-	-	-	-
	2/26/03	4,100 J	75 J	30 J	8.5 J	26 J	-129	0.0	7.1	2.1	19.6	-	-	-	-	-	-
	5/24/03	5,200 J	100	48	13	46	-124	0.0	6.7	2.3	20.2	-	230	77	1,300	0.818	78.1
	8/25/03	40,000 J	470	220	59	200	-146	0.0	7.1	1.8	20.7	-	11	82	1,100	0.881	61.1
	Split 8/25/03	7,800 J	160	160	<15	81	-	-	-	-	-	-	9.1	74	1,100	0.86	57
	11/24/03	2,100 J	27	8.7	3.9	8.2	-160	0.0	7.1	2.5	20.1	-	640	-	-	-	-
2/29/04	2,400 J	40 J	27 J	5.0 J	15 J	-147	0.0	7.0	2.4	19.9	-	-	-	-	-	-	

APPENDIX A
Summary of Ground Water Sampling Results -ORC Pilot Study
PCPL Site, Fillmore, California

Sample ID	Date Collected	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes	ORP	DO	pH	Cond.	Temp	Ferrous Iron	Sulfate	Chloride	TDS	Boron	Magnesium
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	mV	mg/L		ms/cm	deg C	mg/L	mg/L	mg/L	mg/L	mg/L
		EPA 8015M	EPA 8021B				Field						EPA 300		EPA 160.1	EPA 6010B	EPA 6010B
	5/20/04	3,800	44 J	40 J	8.0 J	22 J	-149	0.0	6.9	2.1	20.4	-	250	-	-	-	-
	8/22/04	5,100 J	120 J	110 J	19 J	150 J	-169	0.0	6.9	2.1	20.8	-	-	-	-	-	-
	10/5/2004	-	67*	65*	7.8*	36.7*	-165	0.0	6.8	2.0	20.8	-	-	-	-	-	-
	12/12/04	6,000 J	92 J	88 J	11 J	23 J	-171	0.0	6.9	2.4	20.9	-	350	-	-	-	-
	3/11/05	10,000	240	52	<6.0	52	-165	0.0	6.9	2.4	20.5	-	-	-	-	-	-
EW-5	12/10/02	1,000 J	4.3	4.0	1.1	9.1	-	-	-	-	-	-	22	-	-	-	-
	2/26/03	3,000	34 J	22 J	<6.0 J	16 J	-124	0.0	7.1	1.9	19.7	-	-	-	-	-	-
Split	5/24/03	4,600 J	45	22	5.4	25	-134	0.0	6.9	2.1	20.0	-	3.3	79	1,100	0.855	70.0
	8/26/03	5,700 J	23	12	5.7	19	-139	0.0	7.3	1.7	21.8	-	1.5	79	1,100	1.020	73.7
	8/26/03	3,200 J	27	15	<6.0	20	-	-	-	-	-	-	0.93	74	1,100	1.0	69
	11/24/03	3,100 J	53 J	28 J	<6.0	17 J	-162	0.0	7.0	1.8	20.2	-	0.79	-	-	-	-
	2/29/04	3,000 J	61 J	30 J	6.7 J	16 J	-162	0.0	7.0	1.7	20.1	-	-	-	-	-	-
	5/20/04	2,900	44 J	26 J	7.5 J	18 J	-165	0.0	7.0	1.7	20.3	-	7.3	-	-	-	-
	8/22/04	2,700	64	22	<15	<30	-167	0.0	6.8	2.0	20.4	-	-	-	-	-	-
	12/12/04	2,400 J	42 J	35 J	1.6 J	7.5 J	-173	0.0	6.9	2.1	20.6	-	3.0	-	-	-	-
	3/11/05	3,500	7.8	7.9	5.9	21	-174	0.0	6.9	2.4	21.9	-	-	-	-	-	-

J = Estimated, R = Unusable

* Results are by EPA 8260B

Duplicate = Duplicate sample

Split = Split sample sent to Del Mar Analytical

All samples analyzed up to August 2003 were analyzed at CalScience Environmental Laboratories. Splits and subsequent samples after August were analyzed at Del Mar Analytical.

Appendix B

Permitting

Appendix B-1

California Regional Water Quality Control Board – Los Angeles Region

- 1. Original Waste Discharge Requirement Permit
(February 6, 2003)*
- 2. Amended Monitoring and Reporting Program
(September 26, 2003)*
- 3. Termination of Coverage Under General Waste
Discharge Requirements (June 25, 2004)*



California Regional Water Quality Control Board

Los Angeles Region



Winston H. Hickox
Secretary for
Environmental
Protection

Over 50 Years Serving Coastal Los Angeles and Ventura Counties
Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Gray Davis
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320 W. 4th Street, Suite 200, Los Angeles, California 90013
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February 6, 2003

Mr. Robert W. Conlon
Chevron Texaco
3585 Maple Street, Suite 278
Ventura, CA 93003

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
CLAIM NO. 7002 2410 0006 3316 2216

ENGLAND GEOSYSTEM
 ELECTRONIC SCAN

Dear Mr. Conlon:

GENERAL WASTE DISCHARGE REQUIREMENTS FOR ORC INJECTION PILOT TEST AT PETROLEUM HYDROCARBON FUEL AND/OR VOLATILE ORGANIC COMPOUND IMPACTED SITES – PACIFIC COAST PIPELINE (PCPL) SUPERFUND SITE, 67 E. TELEGRAPH ROAD, FILLMORE, CALIFORNIA (FILE NO. 02-189, CI NO. 8510)

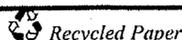
We have completed our review of your application for Waste Discharge Requirements to re-infiltrate slurry of Oxygen Release Compound (ORC[®]) and for installing two ORC[®] socks into two ground water wells (MW-22S and MW-32S) at the Pacific Coast Pipeline Superfund Site located in Fillmore, California (Figure 1. Site Location Map).

For the past nine years, Chevron Texaco (Discharger) has been using pump-and-treat technology to remediate groundwater contaminated with benzene, toluene, ethyl benzene, and xylene. The extracted groundwater was treated on site with granular activated carbon and discharged to Pole Creek under a National Pollutant Discharge Elimination System (NPDES) permit (CA0063240). Recently, the pump-and-treat system has been removed, the wastewater discharge has been discontinued, and the NPDES permit was rescinded on January 30, 2003. The termination of the remediation approach was based on the low progress in remediating the low concentration of the contaminants. To further remediate the contamination, Chevron Texaco is conducting a pilot test to evaluate enhanced intrinsic remediation using ORC[®] as an alternative treatment technology. The goal of the pilot study is to evaluate the efficiency of this remediation approach, to define the properties necessary in this remediation approach, and to estimate the final clean up times. In addition, the pilot study is designed to allow evaluation of expansion of the ORC program to other areas of the site if the performance objectives are met. ORC[®] is a patented formulation of magnesium peroxide that produces a slow and sustained release of molecular oxygen when it is in contact with soil moisture or ground water.

The Discharger proposes to use 23 injection borings in the northern plume to a depth of 110 feet below ground surface (bgs) and 10 injection borings for the southern plume to a depth of 85 feet bgs (Refer to Figure 2 Proposed ORC Injection Wells Northern Area and Figure 3 Proposed ORC Injection Wells Southern Area). ORC[®] slurry will be injected into the bottom 26 feet and the boring will be appropriately abandoned in according to conditions set forth in Ventura County Water Resources Division Well Permit Number 5282. Based on preliminary calculations using a simplified Visual Modflow model of the water-bearing zone of interest beneath the site, there will be an ORC[®] injection event of approximately 2,500 lbs. in the southern plume and a similar event in the northern plume. If the result of the pilot study project indicates good progress in the remediation after one year of continued evaluation, the

California Environmental Protection Agency

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For a list of simple ways to reduce demand and cut your energy costs, see the tips at: <http://www.swrcb.ca.gov/news/echallenge.html>



Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.

Mr. Robert W. Conlon
Chevron Texaco

- 2 -

February 6, 2003

Discharger will conduct additional injections of ORC[®] slurry near the hot spot area of the plume. The Discharger anticipates that the project will have a life of five years, and expects to decrease the benzene concentration in the groundwater from approximately 0.48-milligram per liter (mg/L) to approximately 0.005 mg/L, which is still above the stated clean up goal for the site. In a letter of January 31, 2003 the United States Environmental Protection Agency (USEPA) approved the pump-and-treat remediation, the ORC pilot study action plan, and the proposed monitoring plan.

Regional Board staff have reviewed the information provided and have determined that the proposed discharge meets the conditions specified in Order No. R4-2002-0030, "*General Waste Discharge Requirements for Groundwater Remediation at Petroleum Hydrocarbon Fuel and/or Volatile Organic Compound Impacted Sites*," adopted by this Regional Board on January 24, 2002.

Enclosed are your Waste Discharge Requirements, consisting of Regional Board Order No. R4-2002-0030 (Series No. 015) and Monitoring and Reporting Program No. CI-8510. Please note that the discharge limits in Attachment A (Fillmore area – Pole Creek Fan area) of Order No. R4-2002-0030 are applicable to your discharge.

The Monitoring and Reporting Program requires you to implement the monitoring program on the effective date of this enrollment (February 6, 2003) under Regional Board Order No. R4-2002-0030. All monitoring reports should be sent to the Regional Board, ATTN: Information Technology Unit.

When submitting monitoring or technical reports to the Regional Board per these requirements, include a reference to "Compliance File No. CI-8510", which will assure that the reports are directed to the appropriate file and staff. Also, do not combine other reports with your monitoring reports. Submit each type of report as a separate document.

We are sending a copy of Order No. R4-2002-0030 only to the applicant. A copy of the Order will be furnished to anyone who requests it. If you have any additional questions, please contact Mr. Orlando H. Gonzalez at (213) 620-2267 or Dr. Kwang Lee at (213) 620-2269.

Sincerely,



Dennis A. Dickerson
Executive Officer

Enclosures:

1. Board Order No. R4-2002-0030
2. Monitoring and Reporting Program No. CI-8510
3. Standard Provisions applicable to Waste Discharge Requirements (addressee only)

cc: See mailing list

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Mr. Robert W. Conlon
Chevron Texaco

- 3 -

February 6, 2003

Mailing List

Mr. Robert Sams, Office of Chief Counsel, State Water Resources Control Board
Mr. Michael Lauffer, Office of Chief Counsel, State Water Resources Control Board
Mr. James Evans, Ventura County Environmental Health Division, Liquid waste
Ms. Melinda Talent, Ventura County Environmental Health Division, Land Use Unit
Ms. Joni Fisher, England Geosystem, Inc.
Ms. Holly Hadlock, USEPA

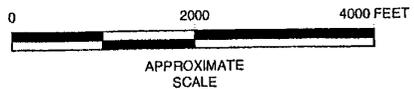
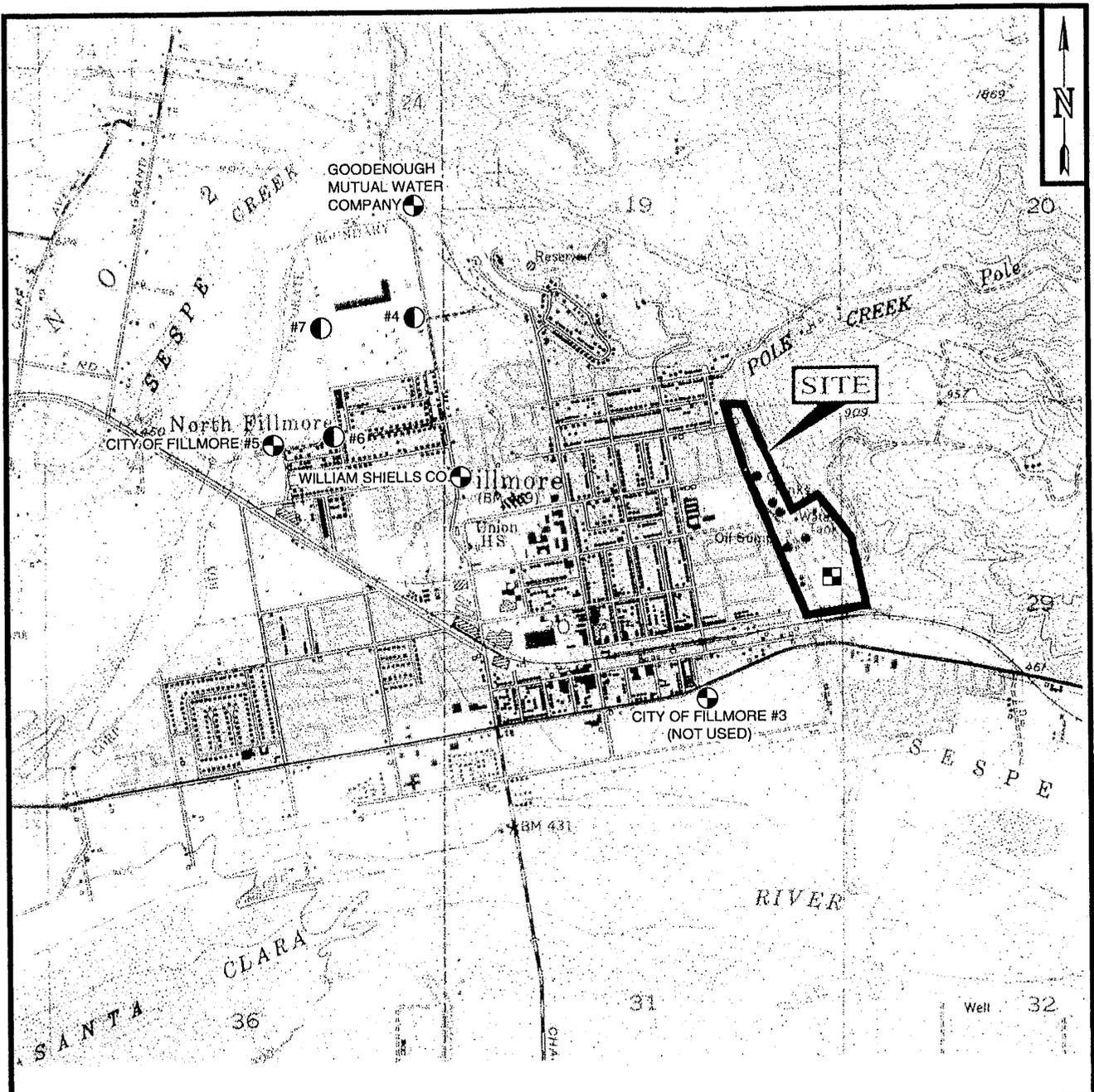
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EXPLANATION	
	APPROXIMATE LOCATION OF WELL SAMPLED IN 1990
	APPROXIMATE LOCATION OF ONSITE PRODUCTION WELL
	APPROXIMATE LOCATION OF OTHER CITY OF FILLMORE WELL

REFERENCE:
 7.5 MINUTE U.S.G.S. TOPOGRAPHIC
 MAP OF FILLMORE, CALIFORNIA
 DATED: 1951
 PHOTOREVISED: 1988

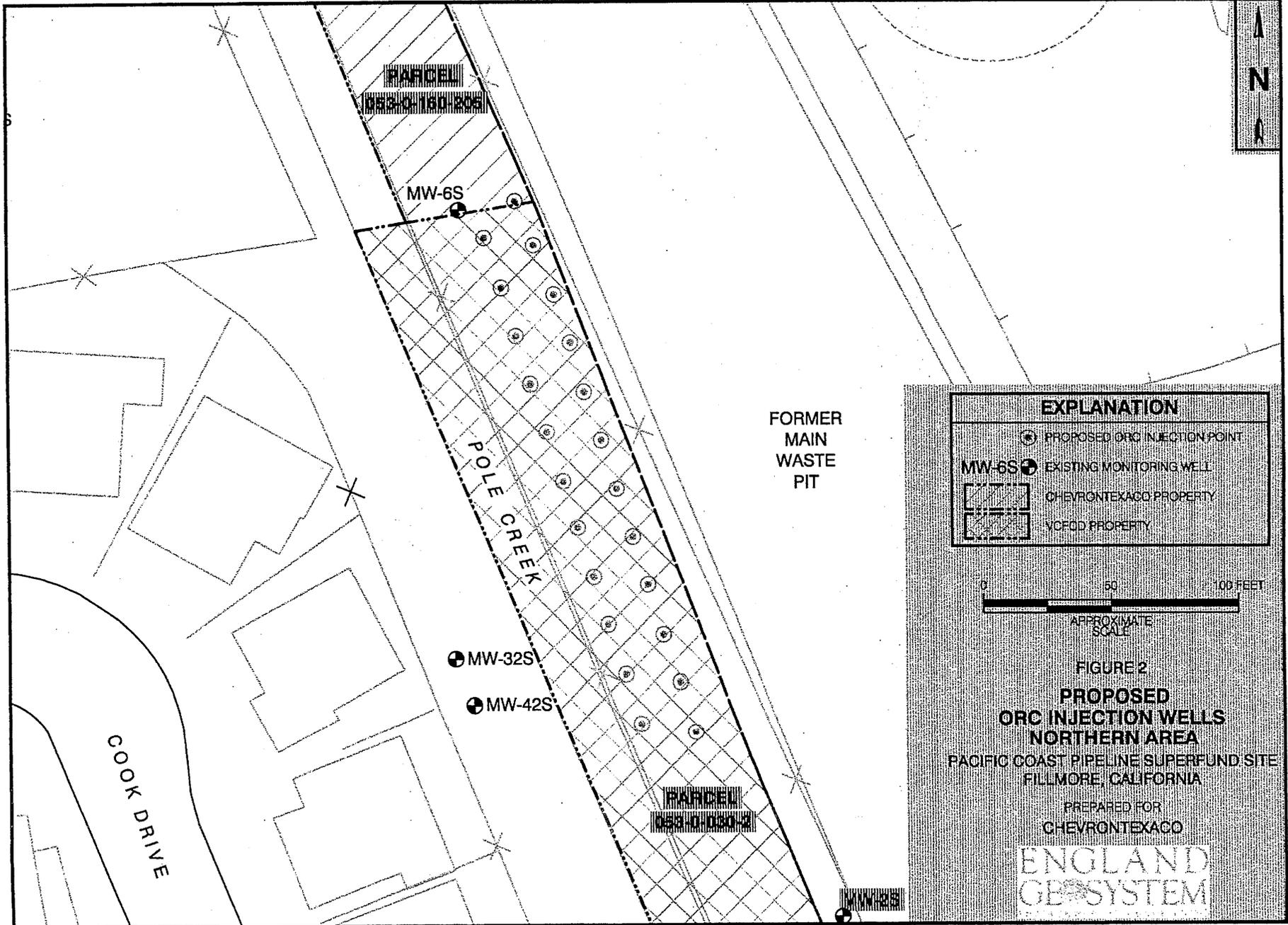
FIGURE 1

SITE LOCATION MAP

PACIFIC COAST PIPELINE SUPERFUND SITE
 FILLMORE, CALIFORNIA

PREPARED FOR
 TEXACO ENVIRONMENTAL SERVICES
 BURBANK, CALIFORNIA

ENGLAND & ASSOCIATES



FORMER
MAIN
WASTE
PIT

MW-6S

⊕ MW-32S

⊕ MW-42S

COOK DRIVE

POLE CREEK

PARCEL
058-0-160-005

PARCEL
058-0-030-0

PARCEL
058-0-050-0

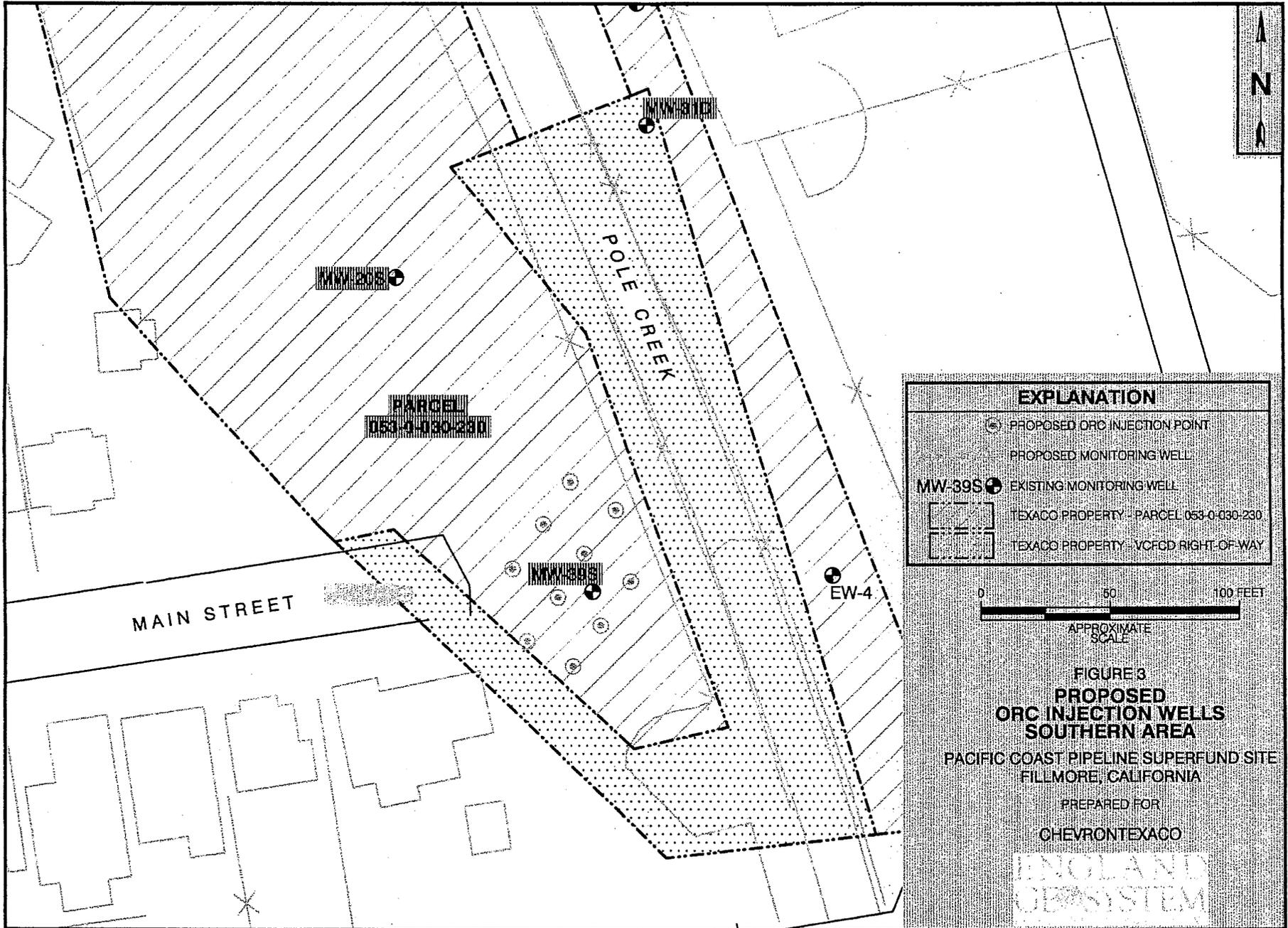


FIGURE 3
PROPOSED
ORC INJECTION WELLS
SOUTHERN AREA
 PACIFIC COAST PIPELINE SUPERFUND SITE
 FILLMORE, CALIFORNIA
 PREPARED FOR
 CHEVRONTXACO
 INGLAND
 GEOSYSTEM

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

MONITORING AND REPORTING PROGRAM NO. CI-8510
FOR
CHEVRON TEXACO
(Pacific Coast Pipeline Superfund Site)

ENROLLMENT UNDER REGIONAL BOARD
ORDER NO. R4-2002-0030 (Series No. 015)
FILE NO. 02-189

I. MONITORING AND REPORTING REQUIREMENTS

- A. Chevron Texaco (hereinafter Discharger) shall implement this monitoring program on the effective date of this enrollment (February 6, 2003) under Regional Board Order No. R4-2002-0030. The first monitoring report under this program, for the monitoring period January - March 2003, shall be received at the Regional Board by April 15, 2003. Subsequent monitoring reports shall be received at the Regional Board according to the following schedule:

<u>Monitoring Period</u>	<u>Report Due</u>
January – March	April 15
April – June	July 15
July – September	October 15
October – December	January 15
Annual Summary Report	March 1 of each year

- B. If there is no discharge during any reporting period, the report shall so state. Monitoring reports must be addressed to this Regional Board, Attention: Information Technology Unit.
- C. By March 1 of each year, the Discharger shall submit an annual summary report to the Regional Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous calendar year. In addition, the Discharger shall discuss the compliance record and the corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the Requirements.
- D. The Discharger shall comply with requirements contained in Section G. of Order No. R4-2002-0030 "Monitoring and Reporting Requirements" in addition to the aforementioned requirements.

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February 6, 2003

ENGLAND GEOSYSTEM
 ELECTRONIC SCAN

II. WATER QUALITY MONITORING

A. Monthly Monitoring

Representative samples of groundwater shall be obtained monthly from wells MW-6S, MW-35S, MW-39S, MW-41S, MW-42S, MW-44S, MW-45S, MW-48S, MW-49S, and MW-50S. For the first two months after ORC[®] installation, wells MW-6S, MW-42S, MW-39S and MW-50S will be monitored twice a month. These sampling stations shall not be changed and any proposed change of sampling locations shall be identified and approved by the Regional Board Executive Officer (Executive Officer) prior to their use. Refer to Figure 4 Groundwater Elevation Map Spring 2002.

The following shall constitute the monthly monitoring program for the groundwater from the above mentioned wells:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
pH	pH units	grab	Monthly
Temperature	°F	grab	Monthly
Total Petroleum Hydrocarbons (as gasoline)	µg/L	grab	Monthly
Benzene	µg/L	grab	Monthly
Toluene	µg/L	grab	Monthly
Ethylbenzene	µg/L	grab	Monthly
Total Xylenes	µg/L	grab	Monthly
Total dissolved solids	mg/L	grab	Monthly
Sulfate	mg/L	grab	Monthly
Chloride	mg/L	grab	Monthly
Boron	mg/L	grab	Monthly
Magnesium	mg/L	grab	Monthly

B. Quarterly Monitoring

Representative samples of groundwater shall be obtained quarterly from wells EW-P2, EW-1, EW-4, and EW-5. These sampling stations shall not be changed and any proposed change of sampling locations shall be identified and approved by the Executive Officer prior to their use.

The following shall constitute the quarterly monitoring program for the groundwater from the above mentioned wells:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
pH	pH units	grab	Quarterly
Temperature	°F	grab	Quarterly
Total Petroleum Hydrocarbons (as gasoline)	µg/L	grab	Quarterly
Benzene	µg/L	grab	Quarterly
Toluene	µg/L	grab	Quarterly
Ethylbenzene	µg/L	grab	Quarterly
Total Xylenes	µg/L	grab	Quarterly
Total dissolved solids	mg/L	grab	Quarterly
Sulfate	mg/L	grab	Quarterly
Chloride	mg/L	grab	Quarterly
Boron	mg/L	grab	Quarterly
Magnesium	mg/L	grab	Quarterly

C. Semi-annual

Representative samples of groundwater shall be obtained semi-annually from wells MW-1S, MW-2S, MW-3S, MW-6S, MW-8S, MW-9S, MW-11S, MW-14S, MW-17S, MW-18S, MW-19S, MW-20S, MW-25S, MW-28S, MW-29S, MW-30S, MW-37S, MW-38S, MW-39S, MW-40S, MW-42S, MW-43S, MW-50S, EW-P2, EW-1, EW-2, EW-4, and EW-5. These sampling stations shall not be changed and any proposed change of sampling locations shall be identified and approved by the Executive Officer prior to their use.

The following shall constitute the semi-annual monitoring program for the groundwater from the above mentioned wells:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
pH	pH units	grab	Semi-annually
Temperature	°F	grab	Semi-annually
Total Petroleum Hydrocarbons (as gasoline)	µg/L	grab	Semi-annually
Benzene	µg/L	grab	Semi-annually
Toluene	µg/L	grab	Semi-annually
Ethylbenzene	µg/L	grab	Semi-annually
Xylenes	µg/L	grab	Semi-annually
Sulfate	mg/L	grab	Semi-annually
Ferrous Iron ⁽¹⁾	mg/L	grab	Semi-annually

(1) Ferrous iron shall be monitored in the field at wells MW-6S, MW-39S, MW-42S, MW-50S.

D. Annual Monitoring

Representative samples of groundwater shall be obtained annually from wells MW-6S, MW-39S, MW-42S, MW-45S, and MW-50S. These sampling stations shall not be changed and any proposed change of sampling locations shall be identified and approved by the Executive Officer prior to their use.

The following shall constitute the annual monitoring program for the groundwater from the above mentioned wells:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
Volatile Organic by EPA Method 8260B	µg/L	grab	Annually
Priority pollutants in Attachment A	µg/L	grab	Bi-annually

All groundwater monitoring reports must include, at minimum, the following :

- a. Well identification, date and time of sampling;
- b. Sampler identification, and laboratory identification; and
- c. Quarterly observation of groundwater levels, recorded to 0.01 feet mean sea level and groundwater flow direction.

III. WASTE HAULING REPORT

In the event that wastes are hauled for further treatment or to a disposal site, the name and address of the hauler of the waste shall be reported in each quarterly monitoring report, along with quantities hauled during the quarter, and the location of the final point of disposal. If no wastes are hauled during the reporting period, a statement to that effect shall be submitted in the quarterly monitoring report.

IV. OPERATION AND MAINTENANCE REPORT

The Discharger shall file a technical report with this Regional Board, no later than 30 days after receipt of these Waste Discharge Requirements, relative to the operation and maintenance program for the groundwater treatment system. The information to be contained in that report shall include, at a minimum, the following:

1. The name, address, and telephone number of the person or company responsible for operation and maintenance of the groundwater treatment system;
2. Type of maintenance (preventive or corrective); and

3. Frequency of maintenance, if preventive.

V. MONITORING FREQUENCIES

Specifications in this monitoring program are subject to periodic revisions. Monitoring requirements may be modified or revised by the Executive Officer based on review of monitoring data submitted pursuant to this Order. Monitoring frequencies may be adjusted to a less frequent basis or parameters and locations dropped by the Executive Officer if the Discharger makes a request and the request is backed by statistical trends of monitoring data submitted.

VI. CERTIFICATION STATEMENT

Each report shall contain the following completed declaration:

"I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

Executed on the _____ day of _____

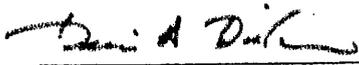
at _____

(Signature)

(Title)"

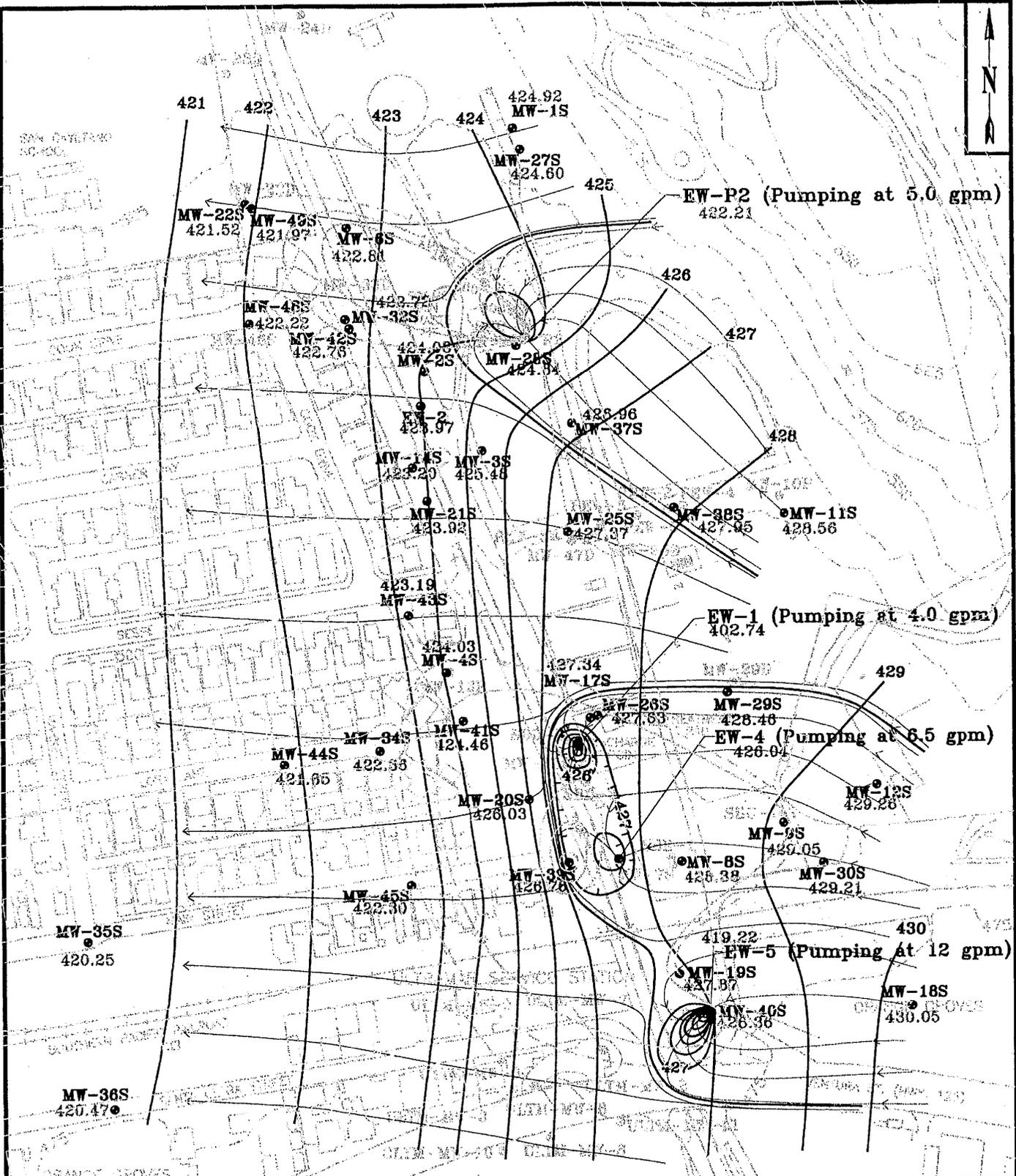
All records and reports submitted in compliance with this Order are public documents and will be made available for inspection during business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region, upon request by interested parties. Only proprietary information, and only at the request of the Discharger will be treated as confidential.

Ordered by:

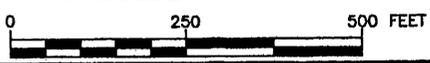


Dennis A. Dickerson
Executive Officer

Date: February 6, 2003



MW-36S MONITORING WELL LOCATION WITH WELL NUMBER AND GROUND WATER ELEVATION IN FEET ABOVE MSL.
 420.47
 429 AQUIFER I GROUND WATER SURFACE ELEVATION CONTOUR MEASURED MAY 27, 2002. CONTOUR INTERVAL 1 FOOT.
 ← GROUND WATER FLOW LINES
 — CAPTURE ZONE



AQUIFER I BENZENE CONCENTRATION CONTOUR IN UG/L, MEASURED MAY 2002. CONTOUR INTERVAL VARIABLE.
 ○ ABANDONED MONITORING WELL LOCATION

1. ULTRAMAR WELLS ABANDONED AFTER SITE CLOSURE. GROUND WATER CONTOURING IN THIS AREA IS BASED ON HISTORIC DATA.

FIGURE 4
GROUND WATER ELEVATION MAP SPRING 2002

PACIFIC COAST PIPELINE SUPERFUND SITE
 FILLMORE, CALIFORNIA
 PREPARED FOR
 CHEVRON/TEXACO

ENGLAND
 CONSULTING

ATTACHMENT A

PRIORITY POLLUTANTS

Metals

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Selenium
Silver
Thallium
Zinc

Miscellaneous

Cyanide
Asbestos (only if
specifically
required)

Pesticides & PCBs

Aldrin
Chlordane
Dieldrin
4,4'-DDT
4,4'-DDE
4,4'-DDD
Alpha-endosulfan
Beta-endosulfan
Endosulfan sulfate
Endrin
Endrin aldehyde
Heptachlor
Heptachlor epoxide
Alpha-BHC
Beta-BHC
Gamma-BHC
Delta-BHC
Toxaphene
PCB 1016
PCB 1221
PCB 1232
PCB 1242
PCB 1248
PCB 1254
PCB 1260

Base/Neutral Extractibles

Acenaphthene
Benzidine
1,2,4-trichlorobenzene
Hexachlorobenzene
Hexachloroethane
Bis(2-chloroethyl) ether
2-chloronaphthalene
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3'-dichlorobenzidine
2,4-dinitrotoluene
2,6-dinitrotoluene
1,2-diphenylhydrazine
Fluoranthene
4-chlorophenyl phenyl ether
4-bromophenyl phenyl ether
Bis(2-chloroisopropyl) ether
Bis(2-chloroethoxy) methane
Hexachlorobutadiene
Hexachlorocyclopentadiene
Isophorone
Naphthalene
Nitrobenzene
N-nitrosodimethylamine
N-nitrosodi-n-propylamine
N-nitrosodiphenylamine
Bis (2-ethylhexyl) phthalate
Butyl benzyl phthalate
Di-n-butyl phthalate
Di-n-octyl phthalate
Diethyl phthalate
Dimethyl phthalate
Benzo(a) anthracene
Benzo(a) pyrene
Benzo(b) fluoranthene
Benzo(k) fluoranthene
Chrysene
Acenaphthylene
Anthracene
1,12-benzoperylene
Fluorene
Phenanthrene
1,2,5,6-dibenzanthracene
Indeno (1,2,3-cd) pyrene
Pyrene
TCDD

Acid Extractibles

2,4,6-trichlorophenol
P-chloro-m-cresol
2-chlorophenol
2,4-dichlorophenol
2,4-dimethylphenol
2-nitrophenol
4-nitrophenol
2,4-dinitrophenol
4,6-dinitro-o-cresol
Pentachlorophenol
Phenol

Volatile Organics

Acrolein
Acrylonitrile
Benzene
Carbon tetrachloride
Chlorobenzene
1,2-dichloroethane
1,1,1-trichloroethane
1,1-dichloroethane
1,1,2-trichloroethane
1,1,2,2-tetrachloroethane
Chloroethane
Chloroform
1,1-dichloroethylene
1,2-trans-dichloroethylene
1,2-dichloropropane
1,3-dichloropropylene
Ethylbenzene
Methylene chloride
Methyl chloride
Methyl bromide
Bromoform
Dichlorobromomethane
Chlorodibromomethane
Tetrachloroethylene
Toluene
Trichloroethylene
Vinyl chloride
2-chloroethyl vinyl ether
Xylene



California Regional Water Quality Control Board

Los Angeles Region

Over 50 Years Serving Coastal Los Angeles and Ventura Counties

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Gray Davis
Governor

Winston H. Hickox
Secretary for
Environmental
Protection

RECEIVED

September 26, 2003

SEP 29 2003

Mr. Robert W. Conlon
Chevron Texaco
3585 Maple Street, Suite 278
Ventura, CA 93003

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
CLAIM NO. 7001 2510 0003 6055 4759

ENGLAND GEOSYSTEM
 ELECTRONIC SCAN

Dear Mr. Conlon:

AMENDED MONITORING AND REPORTING PROGRAM – PACIFIC COAST PIPELINE (PCPL) SUPERFUND SITE, 67 E. TELEGRAPH ROAD, FILLMORE, CALIFORNIA (FILE NO. 02-189, CI NO. 8510)

We received your letter of March 3, 2003 requesting modifications to the Monitoring and Reporting Program (MRP) No. CI-8510 for your waste discharge at the above referenced site. In a letter dated June 23, 2003, Ms. Holly Hadlock of USEPA, recommended that the Regional Board use the monitoring requirements in the workplan approved by USEPA, "with the addition of a total metals analysis at least once". According to Ms. Hadlock, quarterly monitoring is sufficient to evaluate impact to groundwater from the injection of the Oxygen Release Compound.

After careful evaluation of the requested modifications, teleconferences with your consultant Ms. Joni Fisher (England Geosystems), and the monitoring results reported on June 20, 2003, we have modified MRP CI-8510. The modifications to the MRP are as follows: (additions are underlined and deletions are struck out):

Change No 1: Table in Section II.A, Monthly Monitoring, page T-2

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
pH	pH units	grab	Monthly
Temperature	°F	grab	Monthly
Total Petroleum Hydrocarbons (as gasoline)	µg/L	grab	Monthly
Benzene	µg/L	grab	Monthly
Toluene	µg/L	grab	Monthly
Ethylbenzene	µg/L	grab	Monthly
Total Xylenes	µg/L	grab	Monthly
Total dissolved solids	mg/L	grab	Monthly
Sulfate	mg/L	grab	Monthly
Chloride	mg/L	grab	Monthly
Boron	mg/L	grab	Monthly
Magnesium	mg/L	grab	Monthly

California Environmental Protection Agency

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption
For a list of simple ways to reduce demand and cut your energy costs, see the tips at: <http://www.swrcb.ca.gov/news/echallenge.html>



Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.

Change No 2: Table in Section II.B, Quarterly Monitoring, page T-3

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
pH	pH units	grab	Quarterly
Temperature	°F	grab	Quarterly
Total Petroleum Hydrocarbons (as gasoline)	µg/L	grab	Quarterly
Benzene	µg/L	grab	Quarterly
Toluene	µg/L	grab	Quarterly
Ethylbenzene	µg/L	grab	Quarterly
Total Xylenes	µg/L	grab	Quarterly
Total dissolved solids	mg/L	grab	Quarterly
Sulfate	mg/L	grab	Quarterly
Chloride	mg/L	grab	Quarterly
Boron	mg/L	grab	Quarterly
Magnesium	mg/L	grab	Quarterly

Change No 3: Section II.C, Semi-annual Monitoring II., page T-3

Representative samples of groundwater shall be obtained semi-annually from wells MW-1S, MW-2S, MW-3S, MW-6S, MW-8S, MW-9S, MW-11S, MW-14S, MW-17S, MW-18S, MW-19S, MW-20S, MW-25S, MW-28S, MW-29S, MW-30S, **MW-35S**, MW-37S, MW-38S, MW-39S, MW-40S, **MW-41S**, MW-42S, MW-43S, **MW-44S**, **MW-45S**, **MW-48S**, **MW-49S**, MW-50S, EW-P2, EW-1, EW-2, EW-4, and EW-5. These sampling stations shall not be changed and any proposed change of sampling locations shall be identified and approved by the Executive Officer prior to their use.

The following shall constitute the semi-annual monitoring program for the groundwater from the above mentioned wells:

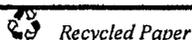
<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
pH	pH units	grab	Semi-annually
Temperature	°F	grab	Semi-annually
Total Petroleum Hydrocarbons (as gasoline)	µg/L	grab	Semi-annually
Benzene	µg/L	grab	Semi-annually
Toluene	µg/L	grab	Semi-annually
Ethylbenzene	µg/L	grab	Semi-annually
Xylenes	µg/L	grab	Semi-annually
Sulfate	mg/L	grab	Semi-annually
Ferrous Iron ⁽¹⁾	mg/L	grab	Semi-annually
Total dissolved solids ⁽²⁾	mg/L	grab	Semi-annually
Chloride ⁽²⁾	mg/L	grab	Semi-annually
Boron ⁽²⁾	mg/L	grab	Semi-annually

(1) Ferrous iron shall be monitored in the field at wells MW-6S, MW-39S, MW-42S, MW-50S.

(2) Those constituents are applicable to monitoring well Nos. MW-6S, MW-39S, MW-42S, MW-45S, MW-48S, MW-49S, and MW-50S.

California Environmental Protection Agency

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption
 For a list of simple ways to reduce demand and cut your energy costs, see the tips at: <http://www.swrcb.ca.gov/news/echallenge.html>



Change No 4: Table in Section II.D, Annual Monitoring, page T-4

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
Volatile Organic by EPA Method 8260B	µg/L	grab	Annually
Priority pollutants ¹	µg/L	grab	Bi-annually One-time

- 1. A complete list of priority pollutants (Attachment A) is attached, but the Discharger is only required to test for metals on the priority pollutant list.**

Enclosed is the amended Monitoring and Reporting Program No. CI-8510. Please note that the amended MRP is effective as of September 26, 2003.

If you have any additional questions, please contact Mr. Orlando H. Gonzalez at (213) 620-2267 or Dr. Kwang Lee at (213) 620-2269.

Sincerely,



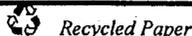
Dennis A. Dickerson
Executive Officer

Enclosure

cc: Mr. Robert Sams, Office of Chief Counsel, State Water Resources Control Board
Mr. Michael Lauffer, Office of Chief Counsel, State Water Resources Control Board
Mr. James Evans, Ventura County Environmental Health Division, Liquid Waste Unit
Ms. Melinda Talent, Ventura County Environmental Health Division, Land Use Unit
Ms. Joni Fisher, England Geosystem, Inc.
Ms. Holly Hadlock, USEPA

California Environmental Protection Agency

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Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

MONITORING AND REPORTING PROGRAM NO. CI-8510
FOR
CHEVRON TEXACO
(Pacific Coast Pipeline Superfund Site)
ENROLLMENT UNDER REGIONAL BOARD
ORDER NO. R4-2002-0030 (Series No. 015)
FILE NO. 02-189

RECEIVED

SEP 29 2003

ENGLAND GEOSYSTEM
 ELECTRONIC SCAN

I. MONITORING AND REPORTING REQUIREMENTS

- A. Chevron Texaco (hereinafter Discharger) shall implement this monitoring program on the effective date of this enrollment (February 6, 2003) under Regional Board Order No. R4-2002-0030. The first monitoring report under this program, for the monitoring period January - March 2003, shall be received at the Regional Board by April 15, 2003. Subsequent monitoring reports shall be received at the Regional Board according to the following schedule:

<u>Monitoring Period</u>	<u>Report Due</u>
January – March	April 15
April – June	July 15
July – September	October 15
October – December	January 15
Annual Summary Report	March 1 of each year

- B. If there is no discharge during any reporting period, the report shall so state. Monitoring reports must be addressed to this Regional Board, Attention: Information Technology Unit.
- C. By March 1 of each year, the Discharger shall submit an annual summary report to the Regional Board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous calendar year. In addition, the Discharger shall discuss the compliance record and the corrective actions taken or planned, which may be needed to bring the discharge into full compliance with the Requirements.
- D. The Discharger shall comply with requirements contained in Section G. of Order No. R4-2002-0030 "Monitoring and Reporting Requirements" in addition to the aforementioned requirements.

February 6, 2003
Revised: September 26, 2003

II. WATER QUALITY MONITORING

A. Monthly Monitoring

Representative samples of groundwater shall be obtained monthly from wells MW-6S, MW-35S, MW-39S, MW-41S, MW-42S, MW-44S, MW-45S, MW-48S, MW-49S, and MW-50S. For the first two months after ORC[®] installation, wells MW-6S, MW-42S, MW-39S and MW-50S will be monitored twice a month. These sampling stations shall not be changed and any proposed change of sampling locations shall be identified and approved by the Regional Board Executive Officer (Executive Officer) prior to their use. Refer to Figure 4 Groundwater Elevation Map Spring 2002.

The following shall constitute the monthly monitoring program for the groundwater from the above mentioned wells:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
pH	pH units	grab	Monthly
Temperature	°F	grab	Monthly
Total Petroleum Hydrocarbons (as gasoline)	µg/L	grab	Monthly
Benzene	µg/L	grab	Monthly
Toluene	µg/L	grab	Monthly
Ethylbenzene	µg/L	grab	Monthly
Total Xylenes	µg/L	grab	Monthly

B. Quarterly Monitoring

Representative samples of groundwater shall be obtained quarterly from wells EW-P2, EW-1, EW-4, and EW-5. These sampling stations shall not be changed and any proposed change of sampling locations shall be identified and approved by the Executive Officer prior to their use.

The following shall constitute the quarterly monitoring program for the groundwater from the above mentioned wells:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
pH	pH units	grab	Quarterly
Temperature	°F	grab	Quarterly
Total Petroleum Hydrocarbons (as gasoline)	µg/L	grab	Quarterly
Benzene	µg/L	grab	Quarterly
Toluene	µg/L	grab	Quarterly
Ethylbenzene	µg/L	grab	Quarterly
Total Xylenes	µg/L	grab	Quarterly

C. Semi-annual

Representative samples of groundwater shall be obtained semi-annually from wells MW-1S, MW-2S, MW-3S, MW-6S, MW-8S, MW-9S, MW-11S, MW-14S, MW-17S, MW-18S, MW-19S, MW-20S, MW-25S, MW-28S, MW-29S, MW-30S, MW-35S, MW-37S, MW-38S, MW-39S, MW-40S, MW-41S, MW-42S, MW-43S, MW-44S, MW-45S, MW-48S, MW-49S, MW-50S, EW-P2, EW-1, EW-2, EW-4, and EW-5. These sampling stations shall not be changed and any proposed change of sampling locations shall be identified and approved by the Executive Officer prior to their use.

The following shall constitute the semi-annual monitoring program for the groundwater from the above mentioned wells:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
pH	pH units	grab	Semi-annually
Temperature	°F	grab	Semi-annually
Total Petroleum Hydrocarbons (as gasoline)	µg/L	grab	Semi-annually
Benzene	µg/L	grab	Semi-annually
Toluene	µg/L	grab	Semi-annually
Ethylbenzene	µg/L	grab	Semi-annually
Xylenes	µg/L	grab	Semi-annually
Sulfate	mg/L	grab	Semi-annually
Ferrous Iron ⁽¹⁾	mg/L	grab	Semi-annually
Total dissolved solids ⁽²⁾	mg/L	grab	Semi-annually
Chloride ⁽²⁾	mg/L	grab	Semi-annually
Boron ⁽²⁾	mg/L	grab	Semi-annually

(1) Ferrous iron shall be monitored in the field at wells MW-6S, MW-39S, MW-42S, MW-50S.

(2) Those constituents are applicable to monitoring well Nos. MW-6S, MW-39S, MW-42S, MW-45S, MW-48S, MW-49S, and MW-50S.

D. Annual Monitoring

Representative samples of groundwater shall be obtained annually from wells MW-6S, MW-39S, MW-42S, MW-45S, and MW-50S. These sampling stations shall not be changed and any proposed change of sampling locations shall be identified and approved by the Executive Officer prior to their use.

The following shall constitute the annual monitoring program for the groundwater from the above mentioned wells:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Minimum Frequency of Analysis</u>
Volatile Organic by EPA Method 8260B	µg/L	grab	Annually
Priority pollutants in Attachment A ¹	µg/L	grab	One-time

1. A complete list of priority pollutants (Attachment A) is attached, but the Discharger is required to test only for metals on the priority pollutant list.

All groundwater monitoring reports must include, at minimum, the following :

- a. Well identification, date and time of sampling;
- b. Sampler identification, and laboratory identification; and
- c. Quarterly observation of groundwater levels, recorded to 0.01 feet mean sea level and groundwater flow direction.

III. WASTE HAULING REPORT

In the event that wastes are hauled for further treatment or to a disposal site, the name and address of the hauler of the waste shall be reported in each quarterly monitoring report, along with quantities hauled during the quarter, and the location of the final point of disposal. If no wastes are hauled during the reporting period, a statement to that effect shall be submitted in the quarterly monitoring report.

IV. OPERATION AND MAINTENANCE REPORT

The Discharger shall file a technical report with this Regional Board, no later than 30 days after receipt of these Waste Discharge Requirements, relative to the operation and maintenance program for the groundwater treatment system. The information to be contained in that report shall include, at a minimum, the following:

1. The name, address, and telephone number of the person or company responsible for operation and maintenance of the groundwater treatment system;
2. Type of maintenance (preventive or corrective); and
3. Frequency of maintenance, if preventive.

V. MONITORING FREQUENCIES

Specifications in this monitoring program are subject to periodic revisions. Monitoring requirements may be modified or revised by the Executive Officer based on review of monitoring data submitted pursuant to this Order. Monitoring frequencies may be adjusted to a less frequent basis or parameters and locations dropped by the Executive Officer if the Discharger makes a request and the request is backed by statistical trends of monitoring data submitted.

VI. CERTIFICATION STATEMENT

Each report shall contain the following completed declaration:

"I certify under penalty of law that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

Executed on the _____ day of _____

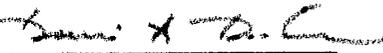
at _____

(Signature)

(Title)"

All records and reports submitted in compliance with this Order are public documents and will be made available for inspection during business hours at the office of the California Regional Water Quality Control Board, Los Angeles Region, upon request by interested parties. Only proprietary information, and only at the request of the Discharger will be treated as confidential.

Ordered by:


Dennis A. Dickerson
Executive Officer

Date: September 26, 2003



California Regional Water Quality Control Board

Los Angeles Region



Over 51 Years Serving Coastal Los Angeles and Ventura Counties

Recipient of the 2001 *Environmental Leadership Award* from Keep California Beautiful

Terry Tamminen
Secretary for
Environmental
Protection

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Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: <http://www.swrcb.ca.gov/rwqcb4>

Arnold Schwarzenegger
Governor

June 25, 2004

Mr. Robert W. Conlon
Chevron Texaco
3585 Maple Street, Suite 278
Ventura, CA 93003

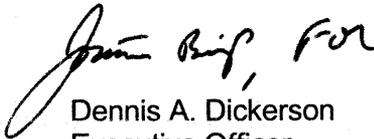
Dear Mr. Conlon:

TERMINATION OF COVERAGE UNDER GENERAL WASTE DISCHARGE REQUIREMENTS FOR PACIFIC COAST PIPELINE (PCPL) SUPERFUND SITE, 67 E. TELEGRAPH ROAD, FILLMORE, CALIFORNIA (FILE NO. 02-189, CI NO. 8510)

We have received a letter dated April 30, 2004, from your consultant, England Geosystem, Inc. (EGI), requesting that we terminate your enrollment under the General Waste Discharge Requirements (Order No. R4-2002-0030), for injection of Oxygen Release Compound (ORC[®]) at the Pacific Coast Pipeline Superfund Site located in Fillmore, California. In the letter, EGI indicated that one year has passed since the ORC[®] was injected and Chevron Texaco has no future plan to use ORC[®] at the site. Regional Board staff conducted a field inspection on June 22, 2004 and verified that no discharges of ORC[®] are occurring.

Since there is no injection of ORC[®] at the site, coverage under Board Order No. R4-2002-0030 for the facility is hereby terminated. If you have any questions, please contact Mr. Orlando H. Gonzalez at (213) 620-2267 or Dr. Kwang Lee at (213) 620-2269.

Sincerely,


Dennis A. Dickerson
Executive Officer

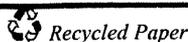
- cc: Mr. Robert Sams, Office of Chief Counsel, State Water Resources Control Board
Mr. Michael Lauffer, Office of Chief Counsel, State Water Resources Control Board
Mr. James Evans, Ventura County Environmental Health Division, Liquid Waste Unit
Ms. Melinda Talent, Ventura County Environmental Health Division, Land Use Unit
Ms. Joni Fisher, England Geosystem, Inc.
Ms. Holly Hadlock, USEPA

RECEIVED

PN:225
JUN 29 2004
cc: SLF

California Environmental Protection Agency

ENGLAND GEOSYSTEM
 ELECTRONIC SCAN



Appendix B-2

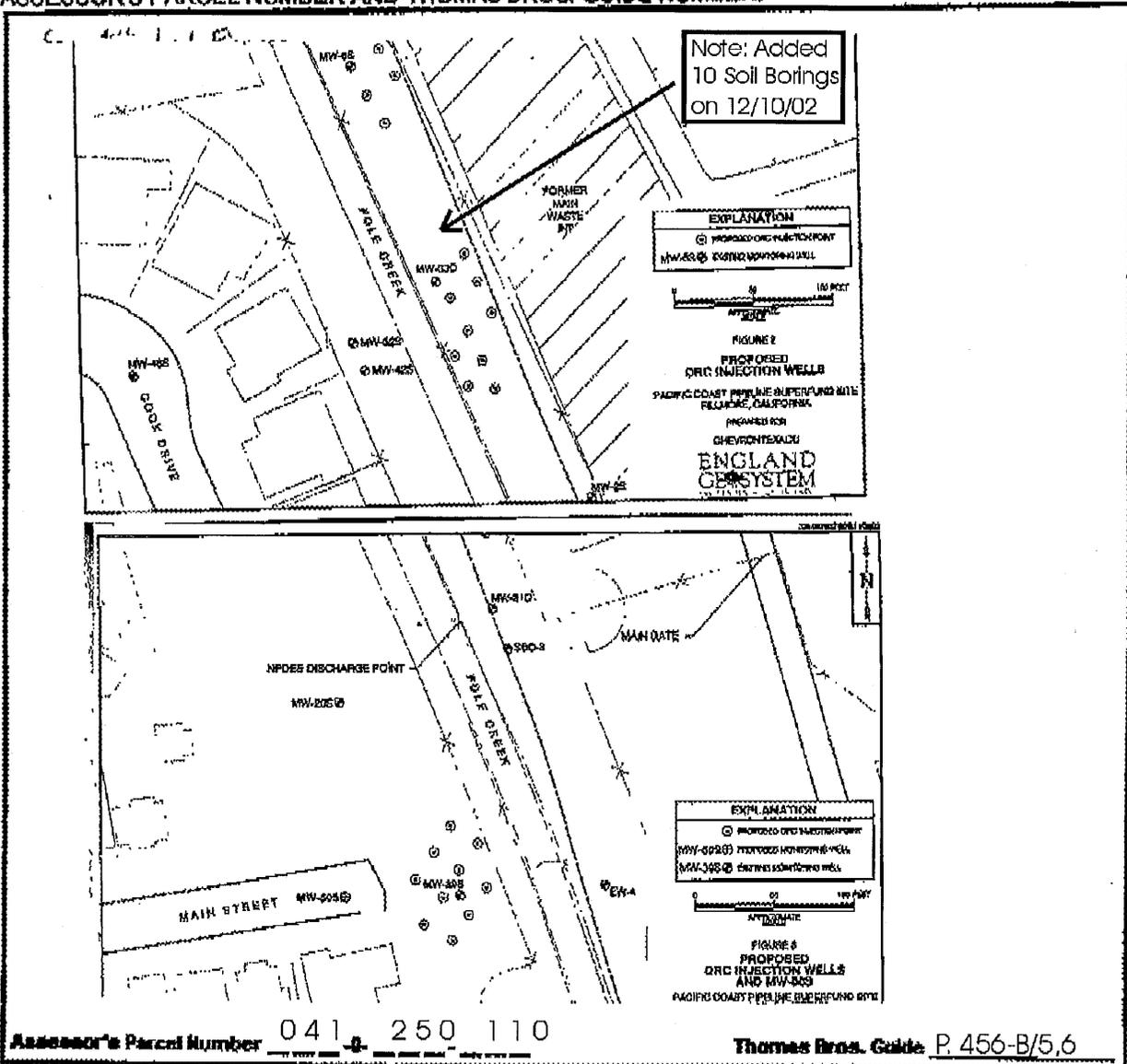
*Ventura County Water Resources Division
(Amended Permit Only)*



County of Ventura
WELL PERMIT APPLICATION
 800 South Victoria Avenue, Ventura CA 93008

Permit No. 5282

INDICATE BELOW THE EXACT LOCATION OF WELL WITH RESPECT TO THE FOLLOWING ITEMS:
 PROPERTY LINES, WATER BODIES OR WATER COURSES, DRAINAGE PATTERN, ROADS, EXISTING
 WELLS, SEWERS AND PRIVATE SEWAGE DISPOSAL SYSTEMS. INCLUDE DIMENSIONS. LIST
 ASSESSOR'S PARCEL NUMBER AND THOMAS BROS. GUIDE NUMBER.



04N19W30H
 STATE WELL NUMBER

6145
 QUAD NUMBER

5282
 PERMIT NUMBER

RECEIPT NO. 5284

PUBLIC WORKS AGENCY
WATER RESOURCES AND DEVELOPMENT DEPARTMENT
WATER RESOURCES DIVISION

RECEIVED FROM: England GeoSystem DATE 10-Dec-02
ADDRESS: 15375 Barranca Pkwy Ste. F106
CITY: Irvine, CA. 92618-2207

FLOOD CONTROL REVENUE 1700-PFA-6300-8771-P029

<u>\$400.00</u>	P6029551	WATER WELL PERMIT NUMBER	<u>5282</u>
		LOCATION:	<u>Fillmore</u>
		OWNER:	<u>ChevronTexaco</u>
<u>\$0.00</u>	P6029552	RE-USE PERMITS	
<u>\$0.00</u>	P6029575	HYDROGEOLOGY REPORT	
<u>\$0.00</u>	P6029574	TECHNICAL INFO. REPORT	
<u>\$0.00</u>	P6029574	GEOHYDROLOGY - VENTURA RIVER REPORT	
<u>\$0.00</u>	P6029576	QUADRENNIAL REPORT (FY85-FY90)	
<u>\$0.00</u>	P6029576	QUADRENNIAL REPORT (FY91)	
<u>\$0.00</u>	P6029599	PHOTO COPYING	
<u>\$0.00</u>	P6029553	WATER WELL PUMP TEST FEES	
<u>\$0.00</u>	P6029599	OTHER MANUAL/REPORTS/ SALES	

FOX CANYON GMA REVENUE 7305-GMA-6650-9772-P029

<u>\$0.00</u>	P6020901	GMA PUMPING CHARGES
<u>\$0.00</u>	P6020902	WELL DESTRUCTION FUND
<u>\$0.00</u>	P6020903	GMA SURCHARGES
<u>\$0.00</u>	P6020901	GMA WELL MAP
<u>\$0.00</u>	P6020901	OTHER SALES

NOTES

(10) Additional Soil Borings @ \$40.00 each
total = \$400.00.

<u>\$0.00</u>	5340-7176	CA. SALES TAX
<u>\$400.00</u>	TOTAL RECEIPT	

CASH: _____ CHECK NO: 23288 RECEIVED BY: Glen Luscombe

ID # 0

Appendix B-3

Ventura County Flood Control District

- 1. Original Permit*
- 2. Amended Permit*

PUBLIC WORKS AGENCY
FLOOD CONTROL DISTRICT

RECEIPT NO. 05547

RECEIVED FROM: England. Geo System DATE: 11/19/02
ADDRESS: 15375 Barranca Hwy. # F106
 Irvine
92618-2207

SECURITY DEPOSITS

PERFORMANCE BOND CERTIFICATE OF DEPOSIT LETTER OF CREDIT
_____ AMOUNT

TRUST DEPOSIT

750.00

6520-7885, ZONE 1
6520-7887, ZONE 3

6520-7886, ZONE 2
6520-7888, Spec. Insp.

PURPOSE OF TRUST DEPOSIT: Inspection Review

REVENUE

FLOOD CONTROL PERMITS 6300-9481

ENCROACHMENT WATERCOURSE EARTH REMOVAL

PERMIT NUMBER: P602942 PROJECT NUMBER: 8A759

LOCATION: Pole Creek

ZONE NO. 2

70.00

INSPECTION DEPOSIT
PLAN CHECK DEPOSIT
APPLICATION
P6029500 INSPECTION FEE
P6029501 INVESTIGATION FEE
P6029502 PLAN CHECK FEE
P6029503 RENEWAL FEE
P6029504 FACILITY USE FEE
P6029505 EARTH REMOVAL FEE
P6029506

CLIENT'S COPY

FLOOD ADMIN OTHER SALES 6300-9761

P6029507 COPIES OF REPORTS/MYLAR
P6029508 HYDROLOGY MANUAL
P6029509 OTHER MANUALS
P6029510 OTHER SALES
5340-7176 CAL SALES TAX _____

FLOOD CONTROL SERVICES 6300-9772

P6029511 BUILDING & SAFETY FEES _____
P6029512 FLOOD HAZARD REPORT _____
P6029513 COMPUTER RUNS & LABOR _____
P6029514 PLANS/STANDARD SPEC SHEET/STRUCTURAL DESIGN _____
P6029515 HYDROLOGY CALCULATION _____
P6029516 RESPONSE TO DATA REQUEST _____ TECH INFO REPORT _____

OTHER REVENUE

820.00

ZONE _____

TOTAL RECEIPT

CASH _____ CHECK NO. 2248 RECEIVED BY Dave P.

DISTRIBUTION: WHITE-CUSTOMER, YELLOW-ACCOUNTING, PINK-FILE

SPECIAL CONDITIONS

EP 2002-142

1. Work shall be completed in accordance with the plans and specifications attached and identified as Exhibit "A", (5 Pages) and the Standard and Special Conditions of this permit.
2. This permit is for the purpose of allowing installation and monitoring of an 8-inch diameter groundwater monitoring well **MW-50S** within the District's easement at the easterly terminus of Main Street. This permit also allows the drilling and abandonment of 12 8-inch diameter ORC injection borings (110-foot depth) within the District's property at APN 053-0-030-025 and east of the channel. An additional 10 injection borings to a depth of 85-feet in the vicinity of Main Street may encroach into the District's easement. This work is being performed for the Chevron Texaco Pacific Coast Pipeline Superfund Site.
3. The drilling and abandonment of the ORC injection sites will occur within the same operation and will not require subsequent monitoring or maintenance within the District's property.
4. Permits required by other agencies and consent of property owners shall be the responsibility of the Permittee.
5. Permittee is responsible for the design, installation, abandonment, monitoring and maintenance of the work authorized under this permit.
6. **Permittee shall notify the District of any changes that may impact the conditions or uses authorized under this permit.**
7. Permittee or Permittee's contractor shall notify the Chief Inspector at (805) 654 -2033 at least 2 working days prior to the pre-construction and final inspection meetings. Any work performed prior to the pre-construction meeting or without the appropriate notification to the Chief Inspector may be subject to rejection and have to be re-done.
8. Activities and uses authorized under this permit are subject to any instructions of the engineer - manager or his representative. All instructions must be strictly observed.
9. Permittee or Permittee's contractor shall notify the Chief Inspector at (805) 654 -2033 **at least 2 working days prior to commencement of work.** Permittee shall keep the District inspector fully informed of the anticipated construction schedule. **Permittee shall also notify the Chief Inspector prior to performing the slurry backfill.**
10. After completion of each phase of the project, borings and wells shall be abandoned per the County of Ventura's Well Permit No.5282 and to the satisfaction of the District.

Blue

WATERCOURSE PERMIT ENCROACHMENT PERMIT
 PUBLIC WORKS AGENCY
 VENTURA COUNTY FLOOD CONTROL DISTRICT
 800 South Victoria Avenue, Ventura, CA 93009
 (805) 654-2001

APPLICANT: CHEVRON TEXACO PERMIT #: 2002142
 ADDRESS: 3585 MAPLE STREET, SUITE 278, VENTURA, CA 93003 PROJECT #: 8A759
 PHONE #: (805) 289-9308 ZONE: 2 MOD#:
 WATERCOURSE: POLE CREEK
 PURPOSE: TO ALLOW INSTALLATION OF ONE MONITORING WELL AND INSTALLATION / ABANDONMENT OF 23 ORC INJECTION BORINGS WITHIN DISTRICT'S RIGHTS-OF-WAY/EASEMENT AS SHOWN IN EXHIBIT "A".

PLAN CHECK DEPOSIT:		DATE:		RECEIPT	
INSPECTION DEPOSIT:	\$750.00	DATE:	11/19/2002	RECEIPT	5547
APPL/RENEWAL FEE:	\$70.00	DATE:	11/19/2002	RECEIPT	5547
INVESTIGATION FEE:		DATE:		RECEIPT	
PLAN CHECK FEE:		DATE:		RECEIPT	
INSPECTION FEE:		DATE:		RECEIPT	
FACILITY USE FEE:		DATE:		RECEIPT	
PERFORMANCE SECURITY		TYPE:			

ESTIMATED COMMENCEMENT DATE: 11/21/2002 ESTIMATED COMPLETION DATE: 04/30/2003
 ISSUE DATE: 11/20/2002 FINAL INSPECTION:
 EXPIRATION DATE: APRIL 30, 2003 FILE CLOSING DATE:

For permits requiring plan check and inspection fee deposits, final fees are for actual costs. After completion of plan checking or construction, a refund will be processed or additional fees required. This permit authorizes only those permitted acts described hereon. All Standard Conditions on the reverse side of this permit and any Special Provisions on the attached addenda are a part of this permit. All modifications of this permit or of the approved plans must be approved by the Ventura County Flood Control District.

**LEGAL DECLARATION
 (WORKERS COMPENSATION DECLARATION)**

I hereby affirm that I have a Certificate of Consent to self-insure, or a Certificate of Worker's Compensation Insurance, or a certified copy thereof (Sec. 3800 Labor Code), which is hereby furnished.
 I, as permittee, am a licensed contractor, or I am exclusively contracting with licensed contractors to construct the project who will furnish the District evidence of Worker's Compensation Insurance prior to beginning work.
 I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Worker's Compensation laws of California. (I acknowledge that, if, after making this certification, I should become subject to the Worker's Compensation provision of the Labor Code, I must forthwith comply with such provisions or this permit shall be deemed revoked.)
 Applicant Jon L. Fisher Date November 14, 2002

I hereby acknowledge that the information above is correct, and that all permitted acts shall be in accordance with Ordinance No. FC 18 (for Watercourse Permit) and approved plans, if applicable. In consideration of the Ventura County Flood Control District issuing this permit. I agree to comply with all terms of this permit including Standard Conditions and Special Provisions. I also agree that all work specified herein shall be commenced within sixty (60) days after the permit is issued or by the date for commencement as set forth above, whichever is earlier, and that all work will be pursued to its completion with reasonable diligence. All work specified herein shall be completed by the date shown below, or if no date is specified, within one hundred eighty (180) days after the issuance of this permit. I understand that this permit may be revoked by the District at any time.

Date 11-14-02 Permittee's Signature Robert W. Conlon

Date Issued 11/20/02 By S.D.
 Engineer - Manager

STANDARD CONDITIONS

1. Permittee shall maintain Ventura County Flood Control District's (District's) right-of-way free from any and all debris resulting from the exercise of this permit.
2. Activities and uses authorized under this permit are subject to any instructions of the Engineer-Manager or his representative. All instructions must be strictly observed.
3. Any work performed under this permit prior to notification of District as to start of work will be subject to whatever action, including restoration to condition existing before work was begun, that the Flood Control District deems necessary to inspect, correct and/or approve said work.
4. Any damage cause to District structures by reason of exercise of this permit shall be repaired at the cost of Permittee to the satisfaction of this District.
5. This permit is valid only to the extent of District jurisdiction. Permits required by other interested agencies and consent of other interested agencies and consent of underlying fee owner of District easement lands shall be the responsibility of the Permittee. Nothing contained in this permit shall be construed as a relinquishment of any rights now held by the District.
6. Permittee shall indemnify, defend and hold District, its officers, agents and employees harmless from any and all claims, costs, expenses, liabilities, defense and legal costs and judgments for damages arising out of, or in any way connected with, the exercise of this permit by Permittee or its contractor, agents, employees and invitees.
7. Unless otherwise specified herein, this permit is subject to all prior unexpired permits, agreements, or easements, privileges or other rights, whether recorded or unrecorded, in the area specified in this permit. Permittee shall make his own arrangements with holders of such prior rights.
8. Any structures or portions thereof placed upon District rights-of-way, or which affect District structures, must be removed, revised, and/or relocated by Permittee without cost to the District, should future activities of the District so require, unless otherwise specified by the District.
9. If the property subject to this permit changes ownership, the Permittee should advise the new owner to contact the District concerning the need for a transfer of the permit.
10. If conditions change or new facts are discerned concerning the effects of the activities and uses authorized under this permit, or for other good cause, the District may modify the permit in order to protect life and property.
11. The Permittee shall provide the District with a record drawing depicting the accurate location of the subsurface encroachment authorized by the permit within 30 days after installation. Furnishing the record drawing shall not relieve the Permittee of the obligation to maintain permanent location records and accurately locate the subsurface encroachment to facilitate District work. The Permittee shall be liable for all costs incurred by the District as a result of inaccurate location data provided by the Permittee.
12. Permittee shall cause any bond, if required by the permit, to remain in effect to guarantee all the work to be performed and all the materials to be furnished under this permit against defects in materials or workmanship for a period of one (1) year from the date of final acceptance of the completed work by the District. Permittee shall, within reasonable time after receipt of written notice thereof, make good (at his own expense or at his surety's expense) and without cost to District, any defects in materials or workmanship which may develop during said one-year period and damage to other work caused by such defects or repairing of same.
13. A pre-construction meeting and final inspection are required with the Flood Control Permit Engineer for all construction projects. Call for meeting and inspection schedules at least 48 hours prior to meetings.
14. Permittee shall comply with the requirements of the Ventura Countywide Stormwater Quality Management Program (VCSQMP), as well as other state and federal requirements of the Clean Water Act.

SPECIAL PROVISION

Attention is directed to Standard Condition No. 5 regarding the permittee's responsibility for obtaining other required permits. As one example, neither the issuance of a watercourse permit nor an encroachment permit precludes the need for the Permittee to comply with the provisions of Section 1603 of the Fish and Game Code of the State of California. In connection therewith, the Department of Fish and Game may determine the project to be subject to the requirements of the California Environmental Quality Act (CEQA), notwithstanding that issuance of watercourse or encroachment permits by the Flood Control District is a ministerial act and exempt from the provisions of the CEQA, as provided in Section IV B 1(I) of the County of Ventura Administrative Supplement to the State CEQA Guidelines (which has been adopted for the Ventura County Flood Control District).

11. Permittee shall take appropriate measures to mitigate potential damage to the existing Flood Control facilities. Any damage caused to Flood Control facilities by reason of exercise of this permit shall be repaired at the expense of the Permittee, to the satisfaction of this District. Permittee shall immediately restore to original conditions or better, all Flood Control facilities that are damaged or disturbed.
12. The gate shall be locked at all times and opened only for entering and exiting. Permittee has installed their own padlock on the gate in conjunction with a previous permit for the purposes of maintenance and monitoring.
13. **The backfill operations on the monitoring well and the concrete slurry backfill into the injection boring sites shall be performed in the presence of the District inspector.**
14. The entire boring site excavated for the 8-inch diameter ORC injection boring holes shall be back filled per Figure 4 of Exhibit "A", noting that the final 2 feet shall be back filled with approved concrete slurry to within 6-inches of finish grade. CMB or native sandy material shall be used to bring the sites to finished grade.
15. All excavated material, including drilling mud, shall be disposed of outside the District's rights-of-way/easement in accordance with all applicable local, state and federal guidelines.
16. No discharge of construction water or drilling mud to downstream channel will be allowed.
17. No material shall be stockpiled within the District's rights-of-way or easement.
18. No dumping of material into the channel or District facilities is allowed. Violation will result in revocation of the permit and possible fines.
19. Permittee shall provide for dust and noise control and shall comply with all applicable local and state requirements.
20. No modification, upgrading, repair or reconstruction of facilities covered by this permit is authorized without prior approval by District.
21. Permittee shall comply with the requirements of the Ventura Countywide Stormwater Quality Management Program (VCSQMP), as well as other state and federal requirements of the Clean Water Act.
22. The discharge of non-storm water (materials other than storm water) is prohibited (per NPDES Permit CAS004002). Storm water discharges containing pollutants that have not been reduced to the maximum extent practicable is prohibited. Permittee is responsible for the quality of discharges that enter the storm drain system and any degradation of receiving water quality resulting from such discharge.

23. Pumped groundwater discharges shall comply with the requirements of the California Regional Water Quality Control Board, Los Angeles Region Order No. 97-043, General NPDES Permit No. CAG994002.
24. Discharges of water resulting from construction activity or passing through the construction site, including pumped groundwater discharges, shall meet the following general criteria:
 - Pollutant concentrations in the discharge shall not cause violation of any applicable water quality objective for the receiving waters.
 - The turbidity shall not increase more than 20% when the natural turbidity is under 50 NTU or over 10% when the natural turbidity is 50 NTU or more.
 - The discharge shall not contain suspended or settleable materials in concentrations that alter the color of the downstream water; or damage or cause formation of deposits in flood control facilities. It shall be absent of visible floating materials including solids, liquids, foams and scum and/or oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the receiving water.
 - The pH of the discharge shall at all times be within the range of 6.5 and 8.5.

These requirements do not exempt the discharger from compliance with any other laws, regulations or ordinances that may be applicable.

When applicable, discharges shall pass through appropriate treatment systems to meet the requirements, or shall be disposed of in a legal manner outside the channel.

Testing for compliance with the above criteria shall be the responsibility of the Permittee as directed by the District representative. Additionally, any testing deemed necessary for determination of compliance with this permit may be performed by the District and is subject to reimbursement by the Permittee.

25. Permittee shall be able to employ temporary BMP's in the immediate work area to provide containment of and to assist in the prevention of the spread of spills.
26. Permittee is in the process of obtaining a Waste Discharge Permit for the ORC injection borings. Permittee is to provide a copy of the LARWQCB Waste Discharge Permit to the District prior to the drilling activities on the injection boring sites.

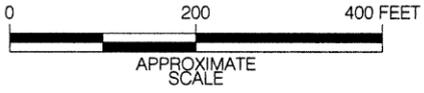
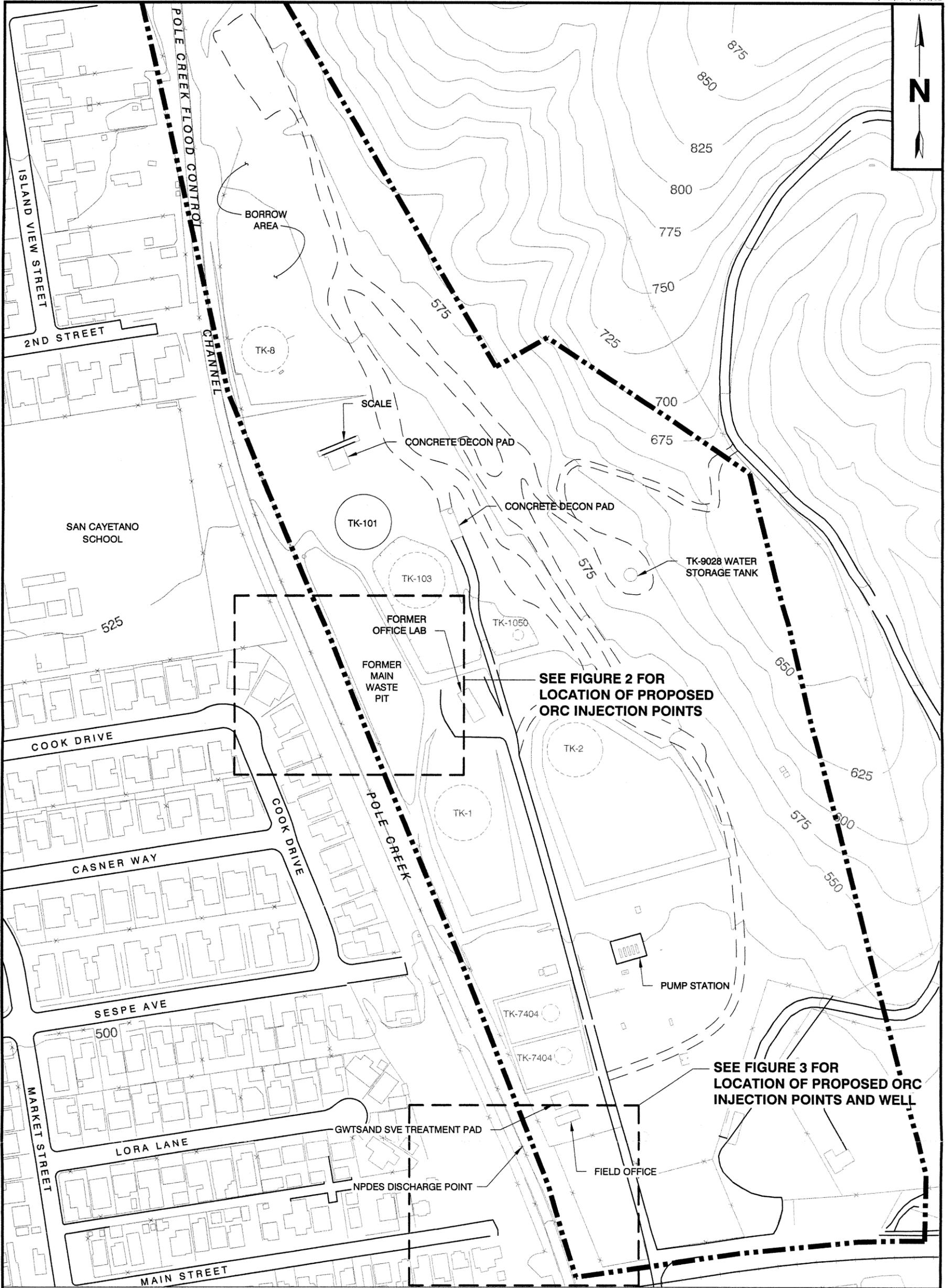


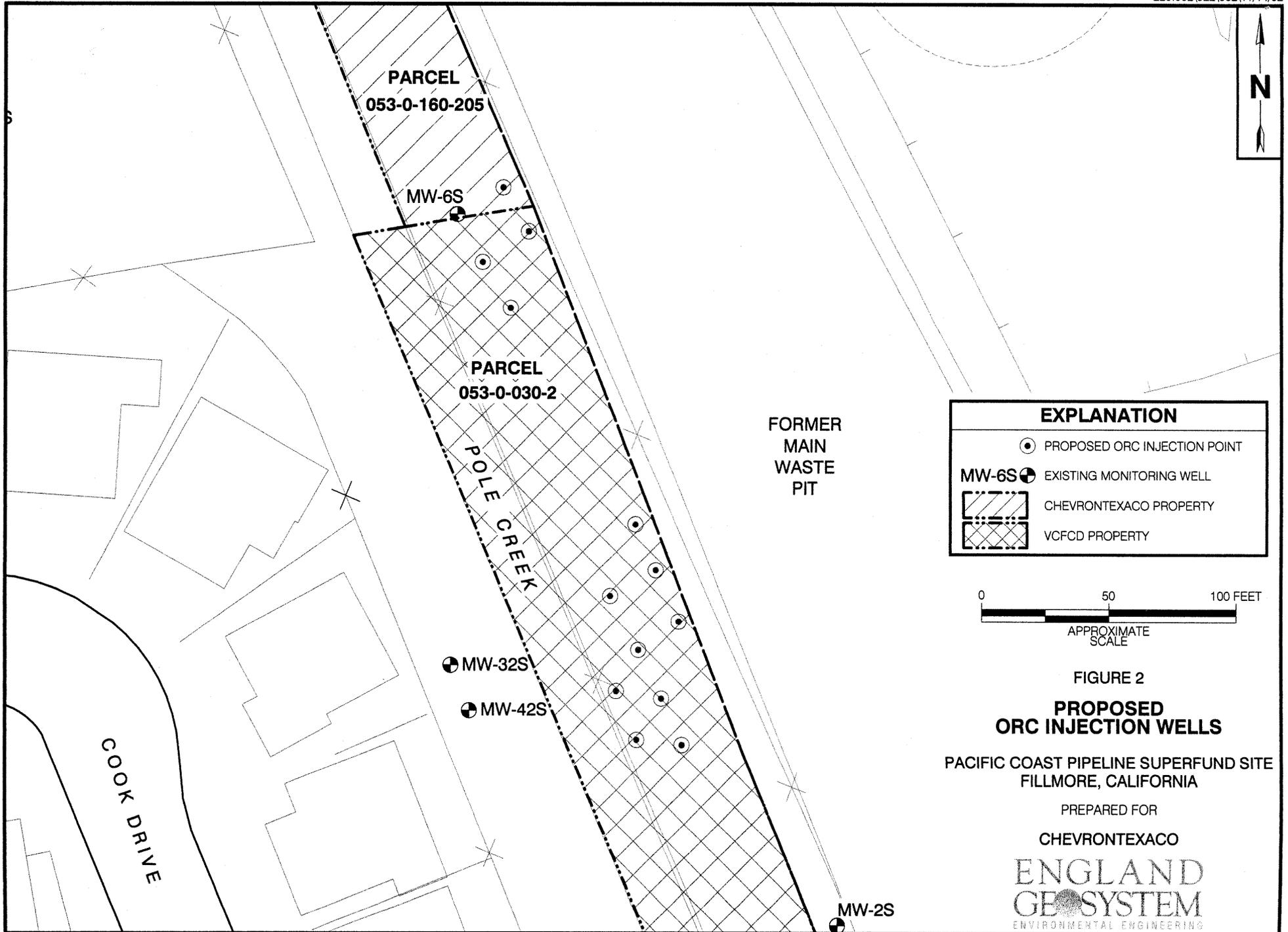
FIGURE 1
SITE PLAN
 PACIFIC COAST PIPELINE SUPERFUND SITE
 FILLMORE, CALIFORNIA
 PREPARED FOR
 CHEVRONTEXO
**ENGLAND
 GEOSYSTEM**
 ENVIRONMENTAL ENGINEERING

CLIENT'S COPY

PERMIT #
EP 2002-142

8A759

EXHIBIT "A"



EXPLANATION

- PROPOSED ORC INJECTION POINT
- MW-6S ● EXISTING MONITORING WELL
- [diagonal lines] CHEVRONTEXACO PROPERTY
- [cross-hatch] VCFCO PROPERTY

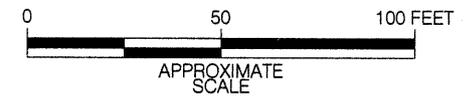
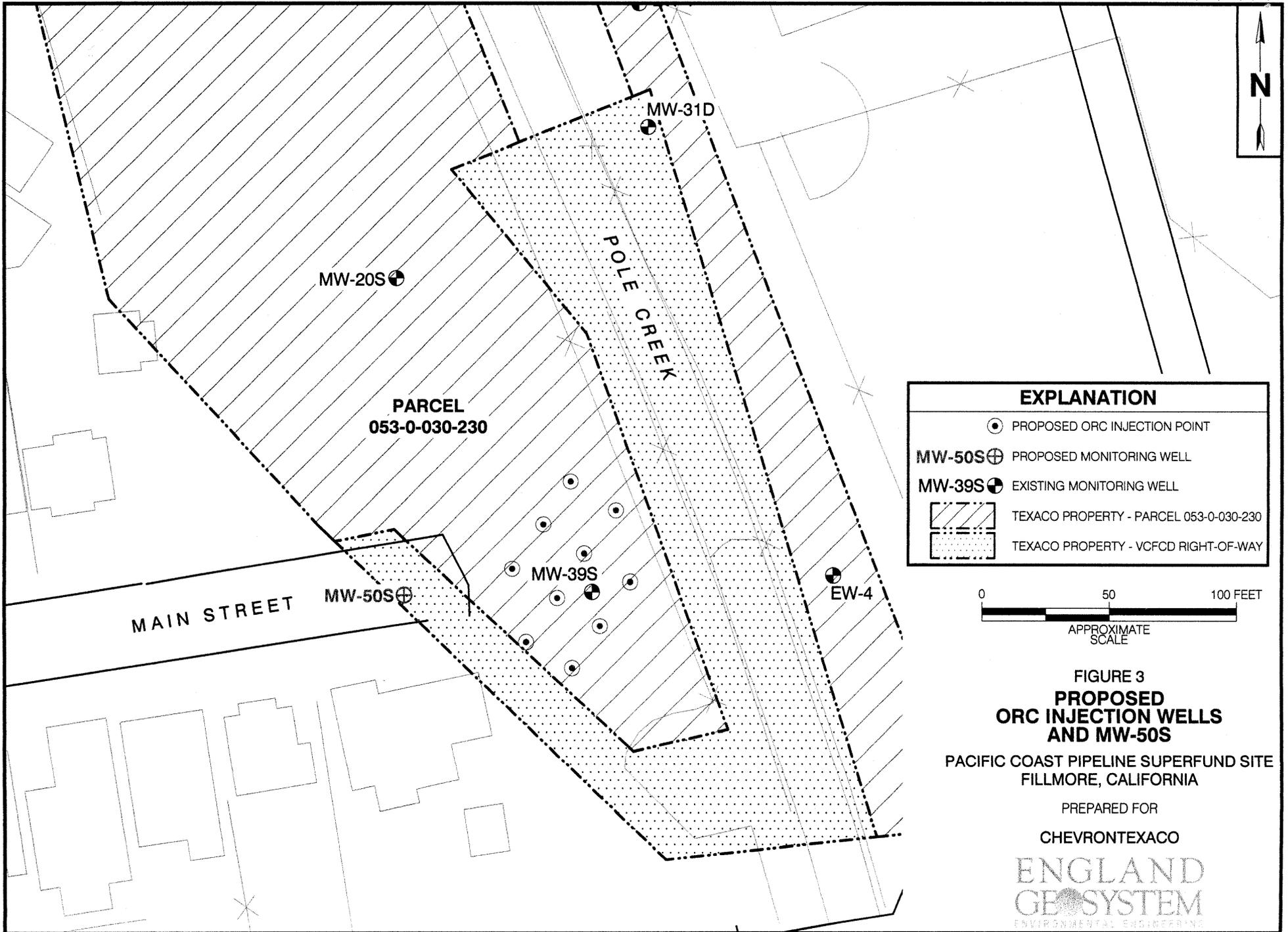


FIGURE 2
PROPOSED ORC INJECTION WELLS
 PACIFIC COAST PIPELINE SUPERFUND SITE
 FILLMORE, CALIFORNIA
 PREPARED FOR
 CHEVRONTEXACO
ENGLAND GEOSYSTEM
 ENVIRONMENTAL ENGINEERING



EXPLANATION	
	PROPOSED ORC INJECTION POINT
	PROPOSED MONITORING WELL
	EXISTING MONITORING WELL
	TEXACO PROPERTY - PARCEL 053-0-030-230
	TEXACO PROPERTY - VCFCD RIGHT-OF-WAY

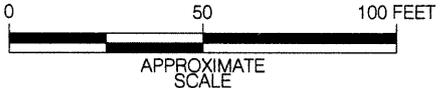


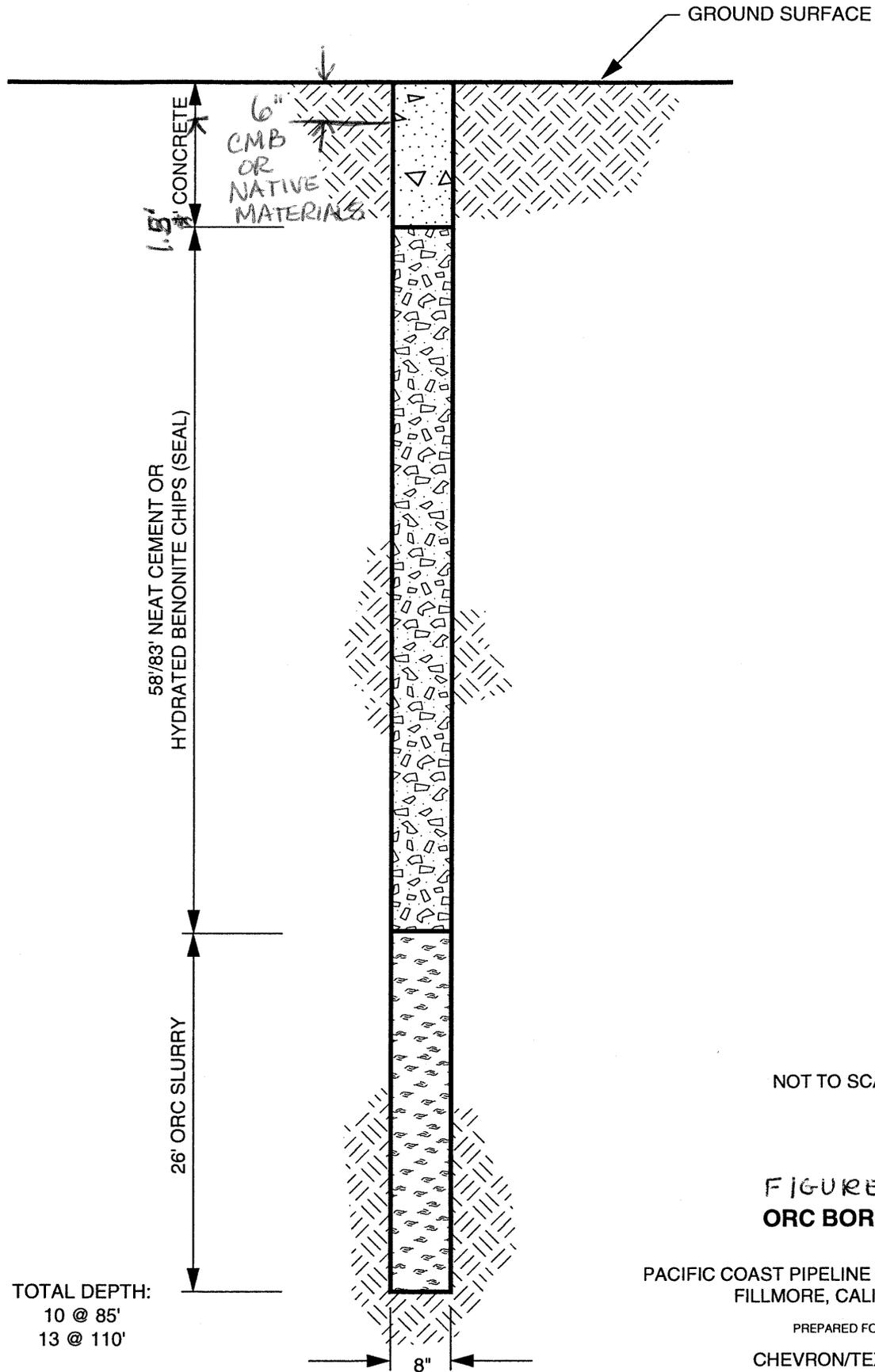
FIGURE 3
**PROPOSED
 ORC INJECTION WELLS
 AND MW-50S**

PACIFIC COAST PIPELINE SUPERFUND SITE
 FILLMORE, CALIFORNIA

PREPARED FOR

CHEVRONTEXACO

ENGLAND
 GEOSYSTEM
 ENVIRONMENTAL ENGINEERING



NOT TO SCALE

**FIGURE 4
ORC BORING**

PACIFIC COAST PIPELINE SUPERFUND SITE
FILLMORE, CALIFORNIA

PREPARED FOR

CHEVRON/TEXACO

**ENGLAND
GEOSYSTEM**
ENVIRONMENTAL ENGINEERING

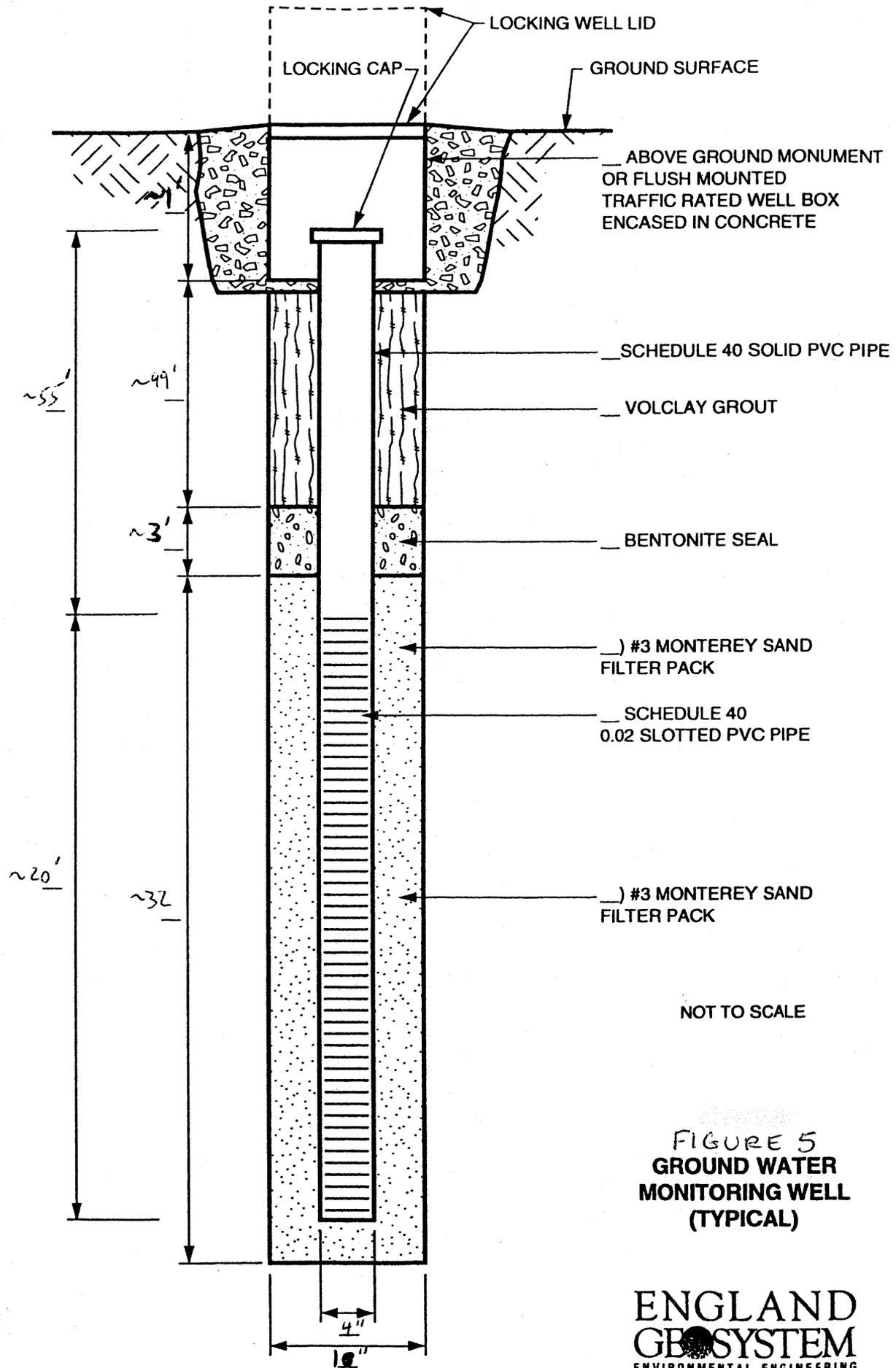


FIGURE 5
GROUND WATER
MONITORING WELL
(TYPICAL)

**PERMIT MODIFICATION
PUBLIC WORKS AGENCY
VENTURA COUNTY FLOOD CONTROL DISTRICT
800 South Victoria Avenue, Ventura, CA 93009
(805) 654-2001**

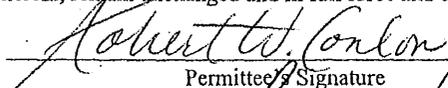
APPLICANT: CHEVRON TEXACO **PERMIT #:** 2002142
ADDRESS: 3585 MAPLE STREET, SUITE 278, VENTURA, CA 93003 **PROJECT #:** 8A759
PHONE #: (805) 289-9308 **ZONE:** 2 **MOD#:** 1
WATERCOURSE: POLE CREEK
PURPOSE: TO ALLOW 10 ADDITIONAL ORC INJECTION BORING SITES (23 TOTAL) WITHIN THE NORTHERN PLUME AREA OF THE DISTRICT'S PROPERTY AT APN 053-0-030-025 AS SHOWN IN EXHIBIT "B".

PLAN CHECK DEPOSIT:		DATE:		RECEIPT
INSPECTION DEPOSIT:		DATE:		RECEIPT
APPL/RENEWAL FEE:	\$70.00	DATE:	12/17/2002	RECEIPT 5575
INVESTIGATION FEE:		DATE:		RECEIPT
PLAN CHECK FEE:		DATE:		RECEIPT
INSPECTION FEE:		DATE:		RECEIPT
FACILITY USE FEE:		DATE:		RECEIPT
PERFORMANCE SECURITY		TYPE:		

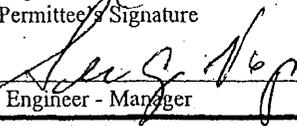
ESTIMATED COMMENCEMENT DATE: 01/06/2003 **ESTIMATED COMPLETION DATE:** 04/30/2003
ISSUE DATE: 12/23/2002 **FINAL INSPECTION:**
EXPIRATION DATE: APRIL 30, 2003 **FILE CLOSING DATE:**

1. All permit conditions contained in the original permit remain in full force except as modified by the conditions contained herein.
2. Work shall be completed in accordance with the plans and specifications attached and identified as Exhibit "B" (Figure 2), and the Standard and Special Conditions of this permit.
3. This permit is issued to revise the existing permit to allow 10 additional Oxygen Release Compound (ORC) injection sites with a depth of 110-feet within the District's property at APN 053-0-030-025. This brings the total number of ORC injection sites to 23 in the Northern Plume Area.

In addition to the above special conditions (if any), all conditions, terms and provisions of the original and/or modified permit(s) not modified herein, remain unchanged and in full force and effect.


Permittee's Signature

Date 12-12-02


Engineer - Manager

Date 12/23/02



PROJECT #
SH 759

EP 2000-142

EXHIBIT "B"

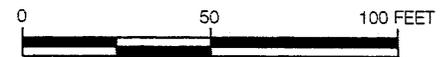
PARCEL
053-0-160-205

MW-6S

FORMER
MAIN
WASTE
PIT

EXPLANATION

-  PROPOSED ORC INJECTION POINT
-  MW-6S EXISTING MONITORING WELL
-  CHEVRONTEXACO PROPERTY
-  VCFOD PROPERTY



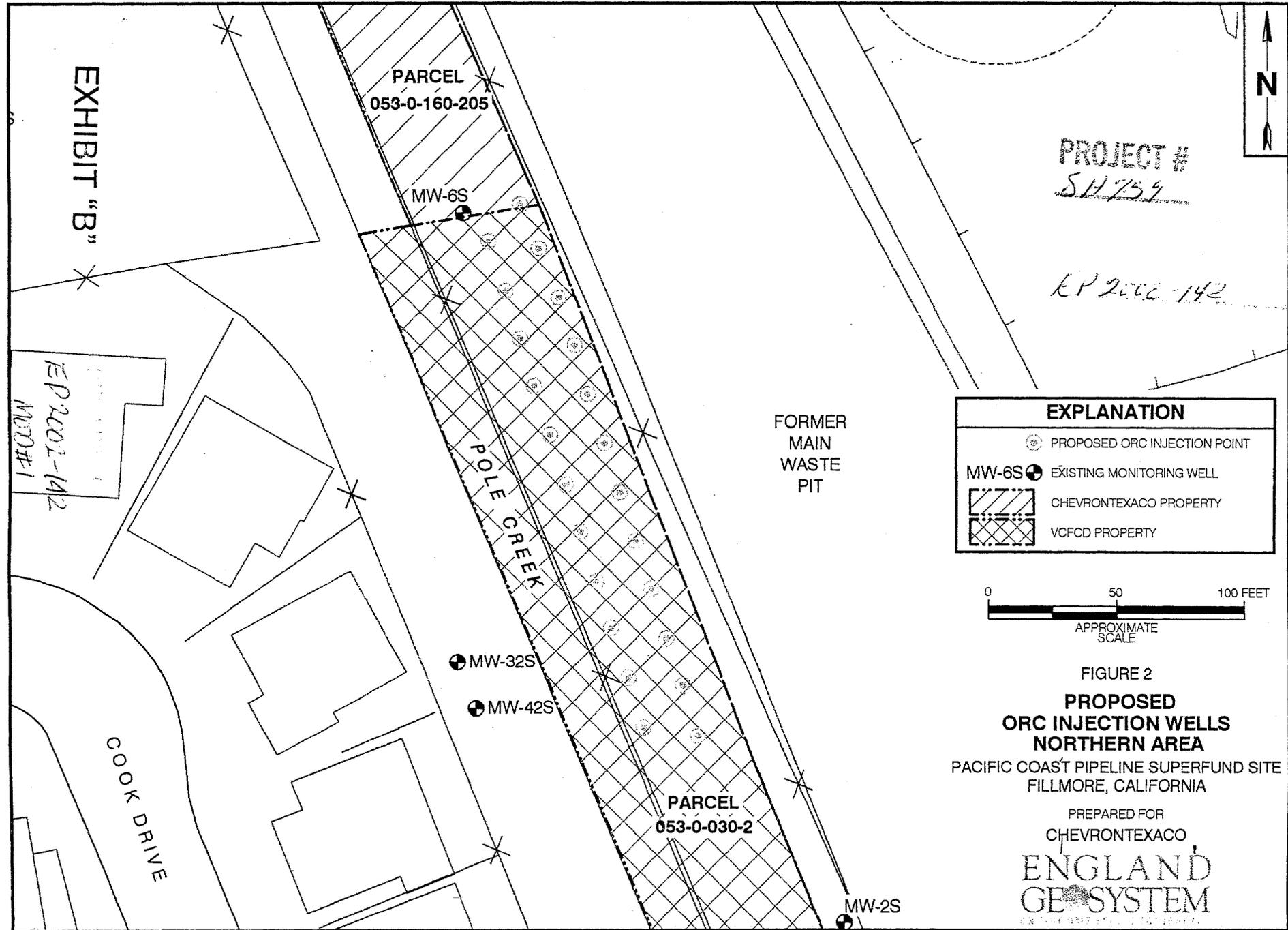
APPROXIMATE
SCALE

FIGURE 2

**PROPOSED
ORC INJECTION WELLS
NORTHERN AREA**

PACIFIC COAST PIPELINE SUPERFUND SITE
FILLMORE, CALIFORNIA

PREPARED FOR
CHEVRONTEXACO
**ENGLAND
GEOSYSTEM**



*EP 2001-142
MWD#1*

COOK DRIVE

MW-32S

MW-42S

PARCEL
053-0-030-2

MW-2S

PUBLIC WORKS AGENCY
FLOOD CONTROL DISTRICT

RECEIPT NO. 05575

RECEIVED FROM: Everglades Canal System DATE: 12/17/02
ADDRESS: 15375 Palmetto Parkway Ste 111b
Delray Beach FL 33433-2207

SECURITY DEPOSITS

PERFORMANCE BOND CERTIFICATE OF DEPOSIT LETTER OF CREDIT
_____ AMOUNT

TRUST DEPOSIT

_____ 6520-7885, ZONE 1 6520-7886, ZONE 2
6520-7887, ZONE 3 6520-7888, Spec. Insp.

PURPOSE OF TRUST DEPOSIT: _____

REVENUE

FLOOD CONTROL PERMITS 6300-9481

ENCROACHMENT WATERCOURSE EARTH REMOVAL

PERMIT NUMBER: E 2107-142 PROJECT NUMBER: 511759

LOCATION: Port Creek

ZONE NO. 2

_____	INSPECTION DEPOSIT
_____	PLAN CHECK DEPOSIT
_____	APPLICATION
_____	P6029500 INSPECTION FEE
_____	P6029501 INVESTIGATION FEE
_____	P6029502 PLAN CHECK FEE
<u>71.00</u>	<u>P6029504 RENEWAL FEE - 1/1000-1</u>
_____	P6029505 FACILITY USE FEE
_____	P6029506 EARTH REMOVAL FEE

CLIENT'S COPY

FLOOD ADMIN OTHER SALES 6300-9761

_____	P6029507 COPIES OF REPORTS/MYLAR
_____	P6029508 HYDROLOGY MANUAL
_____	P6029509 OTHER MANUALS
_____	P6029510 OTHER SALES
_____	5340-7176 CAL SALES TAX

FLOOD CONTROL SERVICES 6300-9772

_____	P6029511 BUILDING & SAFETY FEES
_____	P6029512 FLOOD HAZARD REPORT
_____	P6029513 COMPUTER RUNS & LABOR
_____	P6029514 PLANS/STANDARD SPEC SHEET/STRUCTURAL DESIGN
_____	P6029515 HYDROLOGY CALCULATION
_____	P6029516 RESPONSE TO DATA REQUEST _____ TECH INFO REPORT _____

OTHER REVENUE _____ ZONE _____

71.00 TOTAL RECEIPT

CASH _____ CHECK NO. 23333 RECEIVED BY [Signature]

DISTRIBUTION: WHITE-CUSTOMER, YELLOW-ACCOUNTING, PINK-FILE

Appendix B-4

City of Fillmore Encroachment Permit

CITY OF FILLMORE
250 Central Ave.
Fillmore, Ca 93015
(805) 524-1500 Ext 234

FAX - (805) 524-5707

ENCROACHMENT APPLICATION AND PERMIT

PERMIT NO. <u>18410</u>	FEE <u>\$40</u>	DATE ISSUED <u>11-18-02</u>	ISSUED BY <u>A. K. ...</u>
----------------------------	--------------------	--------------------------------	-------------------------------

ENCROACHMENT ADDRESS See Attached Site Plan

OWNER Chevron Texaco Attn: Robert Conlan

MAIL ADDRESS 3585 Maple Street, Suite 278

CITY Ventura ZIP 93003 PHONE NO. (818) 736-5563

CONTRACTOR England Geosystem, Inc.

EMERGENCY NO. (949) 453-8085

ADDRESS 15375 Barranca Pkwy CITY Irvine ZIP 92618

PHONE NO. (949) 453-8085 CITY BUSINESS LICENSE NO. 002319

When properly validated, a permit is issued subject to the conditions and restrictions set forth by applicable laws.

- The permittee certifies that all employees are covered by Workmen's Compensation Insurance in accordance with the laws of the State of California governing the same.
- Permittee certifies that sole compliance has been made with all provisions of the Contractors License Law and the City of Fillmore Business License Ordinance.
- Each person upon whose behalf this permit is issued and each person whose request and for whose benefit work is performed under or pursuant to this permit agrees to, and shall, indemnify and hold harmless the City of Fillmore, its officers, agents and employees.
- That the issuance of a permit shall not be construed to be a permit for, nor approval of, a violation of any provision of City, County or State ordinance or laws.
- I have read and agreed to Ordinance 417, City of Fillmore.

Signature of Owner or Authorized Agent [Signature]

DESCRIPTION OF WORK Installation and monitoring of groundwater monitoring well in public right of way (MW-505)

SQ FT OF SURFACE EXCAVATION Approx. 4 Sq. Ft DATE OF WORK November/December 2002

DATE OF INSPECTION	FINAL	INSPECTOR
COMMENTS		

Appendix C

Slurry Injection Boring Completion and Abandonment Information

APPENDIX C

Slurry Injection Boring Completion and Abandonment Information
Pacific Coast Pipeline (PCPL) Superfund Site
Fillmore, California

Well Number	Date		Boring Diameter (inches)	Concrete		Neat Cement Slurry			#30 Silver Sand			ORC Slurry			Depth to Saturated Zone (feet bgs)	Total Boring Depth (feet bgs)	# of Grout Pipe Sections ⁽⁵⁾	Ground Surface Elevation ⁽⁶⁾ (amsl)	Northing	Easting
	Started	Completed		Top Depth ⁽¹⁾	Base Depth	Top Depth	Base Depth	Quantity ⁽²⁾	Top Depth	Base Depth	Quantity ⁽³⁾	Top Depth	Base Depth	Quantity ⁽⁴⁾						
ORC-01	2/4/2003	2/4/2003	8	0	1	1	105	1598/137.5/275	--	--	--	105	110	70/20	100-105	110	11	517.784	330104.333451	727043.304440
ORC-02	2/12/2003	2/13/2003	8	0	1	0	75	1692/250	75	105	800	105	110	70/14	95	110	11	515.786	330090.900701	727029.027173
ORC-03	2/4/2003	2/5/2003	8	0	1	1	78	1128/125/200	78	105	1000	105	110	70/14	60-65	110	11	517.662	330085.770200	727050.940393
ORC-04	2/13/2003	2/13/2003	8	0	1	0	75	1504/250	75	105	800	105	110	70/14	90-95	110	11	515.415	330072.228796	727037.163011
ORC-05	2/5/2003	2/5/2003	8	0	1	1	77	1410/112.5/250	77	105	1000	105	110	80/16	100-105	110	11	517.023	330067.455504	727057.496045
ORC-06	2/13/2003	2/13/2003	8	0	1	0	70	1200/200	70	105	300	105	110	80/16	90-95	110	11	514.920	330052.536652	727043.451485
ORC-07	2/6/2003	2/6/2003	8	0	1	1	77	1128/100/200	77	105	1600	105	110	80/16	100-105	110	11	516.561	330048.901829	727062.026249
ORC-08	2/19/2003	2/19/2003	8	0	1	0	75	1316/225	75	105	700	105	110	80/16	50-60	110	11	514.944	330033.817242	727052.470610
ORC-09	2/6/2003	2/6/2003	8	0	1	0	75	940/100/175	75	105	1500	105	110	80/16	100	110	11	516.840	330031.280170	727070.991870
ORC-10	2/19/2003	2/20/2003	8	0	1	0	75	846/150	75	105	800	105	110	80/16	95	110	11	514.395	330016.437029	727058.896844
ORC-11	2/6/2003	2/7/2003	8	0	1	0	70	1128/125/225	70	105	1100	105	110	80/16	95-100	110	11	516.592	330013.028408	727080.193309
ORC-12	2/20/2003	2/20/2003	8	0	1	0	75	1316/225	75	105	700	105	110	80/16	100	110	11	514.066	329997.644112	727066.802085
ORC-13	2/7/2003	2/7/2003	8	0	1	1	76	940/100/200	76	105	1300	105	110	80/16	50-55/95-100	110	11	516.193	329994.740084	727087.542207
ORC-14	2/20/2003	2/21/2003	8	0	1	0	75	1222/200	75	105	700	105	110	80/16	95	110	11	513.622	329979.317254	727073.395071
ORC-15	2/10/2003	2/10/2003	8	0	1	1	76	2068/250	76	105	600	105	110	80/16	95-110	110	11	516.066	329976.377529	727094.572176
ORC-16	2/21/2003	2/21/2003	8	0	1	0	75	1316/225	75	105	900	105	110	80/16	96	110	11	513.163	329959.570512	727081.041684
ORC-17	2/10/2003	2/10/2003	8	0	1	1	73	1786/250	--	--	--	105	110	80/16	95	110	11	515.617	329956.087407	727102.468506
ORC-18	2/21/2003	2/21/2003	8	0	1	0	75	658/100	75	105	1110	105	110	80/16	100	110	11	512.954	329940.885989	727089.002000
ORC-19	2/10/2003	2/11/2003	8	0	1	1	76.5	1692/250	76.5	105	1000	105	110	80/16	65-67.5	110	11	515.191	329937.410103	727110.701057
ORC-20	2/24/2003	2/24/2003	8	0	1	1	75	1316/230	75	105	700	105	110	80/16	95	110	11	512.720	329920.495781	727097.859981
ORC-21	2/11/2003	2/11/2003	8	0	1	0	75	1692/250	75	105	1100	105	110	80/16	100	110	11	514.798	329918.018578	727118.352249
ORC-22	2/24/2003	2/24/2003	8	0	1	1	75	1598/250	75	105	600	105	110	80/16	100	110	11	512.047	329902.002518	727104.315927
ORC-23	2/11/2003	2/12/2003	8	0	1	0	75	1692/250	75	105	900	105	110	80/16	70-85	110	11	514.145	329896.539413	727125.967137
ORC-24	2/14/2003	2/14/2003	8	0	1	1	60	1034/175	60	65	900	65	85	320/40	65-70	85	9	485.470	328921.149840	727434.263822
ORC-25	2/19/2003	2/19/2003	8	0	1	0	60	1034/200	60	65	1000	65	85	320/40	65	85	9	485.432	328900.628266	727429.606403
ORC-26	2/14/2003	2/14/2003	8	0	1	1	60	1128/200	60	65	900	65	85	320/40	60-65	85	9	484.780	328907.958184	727448.918494
ORC-27	2/18/2003	2/18/2003	8	0	1	0	60	752/200	60	65	900	65	85	320/40	65	85	9	484.918	328882.662762	727416.998606
ORC-28	2/18/2003	2/18/2003	8	0	1	0	60	1128/200	60	65	800	65	85	320/40	70	85	9	484.658	328889.036121	727446.094695
ORC-29	2/14/2003	2/14/2003	8	0	1	1	60	846/150	60	65	500	65	85	320/40	65	85	9	484.076	328879.700467	727461.382325
ORC-30	2/18/2003	2/18/2003	8	0	1	0	60	1128/200	60	65	900	65	85	320/40	65-70	85	9	484.267	328865.329018	727432.422591
ORC-31	2/17/2003	2/17/2003	8	0	1	1	60	1222/200	60	65	500	65	85	320/40	60	85	9	484.100	3328860.331753	727448.344590
ORC-32	2/17/2003	2/17/2003	8	0	1	1	60	846/150	60	65	400	65	85	320/40	60-70	85	9	483.415	328847.737495	727429.238669
ORC-33	2/17/2003	2/17/2003	8	0	1	1	60	1222/200	60	65	400	65	85	320/40	60-65	85	9	483.484	328841.517526	727442.958507

⁽¹⁾ All depths in feet bgs, unless otherwise noted

⁽²⁾ 1598/137/275 = pounds of cement/pounds of hydrogel/gallons of water
1692/250 = pounds of cement/gallons of water

⁽³⁾ 800 = pounds of sand

⁽⁴⁾ 70/20 = pounds of ORC/gallons of water

⁽⁵⁾ Used 1-inch tremie pipe in 10-foot sections to inject slurry from bottom to top

⁽⁶⁾ amsl = above mean sea level