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PACIFIC COAST PIPELINE
(TEXACO FILLMORE REFINERY)
SUPERFUND SITE

RECORD OF DECISION

U.S. EPA

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DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Pacific Coast Pipeline
Texaco Fillmore Facility
67 East Telegraph Road
Fillmore, CA

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) presents the remedial action selected for the Pacific Coast Pipeline (also referred to as the Texaco Fillmore Facility) Site ("the Site") in the City of Fillmore, County of Ventura, California. This remedial action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (42 U.S.C.§9601 et seq.), and, to the extent practicable, with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP)(40 U.S.C.§300 et seq.). The attached Administrative Record Index (Attachment A) identifies the documents upon which the decision is based. The State of California concurs with the selected remedy.

ASSESSMENT OF THE SITE

If the actual or threatened releases of hazardous substances from the Site are not addressed by implementing the remedial response action selected in this ROD, the Site may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

EPA has selected Alternative 6 as the remedy for the Pacific Coast Pipeline Site. The selected remedy for contaminated ground water at the Pacific Coast Pipeline Site consists of:

1) Design, construction and operation of a ground water extraction and treatment system to treat extracted ground water to levels that meet the cleanup standards set forth in this ROD;

2) Discharge of treated ground water to the aquifer at the Site by injection or provision of the treated ground water to beneficial users of the treated ground water;

3) Soil Vapor Extraction for those areas that threaten to contaminate ground water at levels above Site cleanup standards following a one year subsurface study;

4) Ground water monitoring to demonstrate that the extraction system is effectively capturing the contaminant plume and ultimately, to demonstrate achievement of the cleanup standards throughout the aquifer; and

5) Maintenance of perimeter fencing at the Site until cleanup standards are met.

Implementation of this remedy will prevent the spread of ground water contamination and reduce the principal risk of exposure to contaminated ground water. The ground water extraction and treatment system will operate until the cleanup standards are achieved through the aquifer. Because this remedy will not result in hazardous substances remaining on the site above health-based levels, the five-year review will not apply to this action. The selected remedy will undergo periodic performance evaluations at a frequency to be determined in the Remedial Design Workplan.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate for the remedial action, and is cost-effective. This remedy uses permanent solutions and alternative treatment technologies to the maximum extent practicable and satisfies the statutory preference for remedies that employ treatment to reduce toxicity, mobility, or volume as a primary element.

March 31, 1992

Daniel W. McGovern
Regional Administrator

Date

CONCURRENCES
PACIFIC COAST PIPELINE SITE
RECORD OF DECISION

for _____ 5/31/92

Nora McGee
Assistant Regional Administrator
Office of Policy and Management

Date

_____ _____

Nancy Marvel, Regional Counsel
Office of Regional Counsel

Date

_____ _____

Harry Seraydarian
Water Management Division

Date

CONCURRENCES
PACIFIC COAST PIPELINE SITE
RECORD OF DECISION

Nora McGee Assistant Regional Administrator Office of Policy and Management	Date
Lisa Feldman for Nancy Marvel, Regional Counsel Office of Regional Counsel	3/31/92 Date
Harry Seraydarian Water Management Division	Date

CONCURRENCES
PACIFIC COAST PIPELINE SITE
RECORD OF DECISION

Nora McGee Assistant Regional Administrator Office of Policy and Management	Date
Nancy Marvel, Regional Counsel Office of Regional Counsel	Date
for Harry Seraydarian Water Management Division	31 March 1992 Date

DECISION SUMMARY

This Decision Summary provides an overview of the problems posed by the Pacific Coast Pipeline Site. It also includes a description of the remedial alternatives considered and the analysis of these alternatives against criteria set forth in the National Contingency Plan (NCP). This Decision Summary explains the rationale for the remedy selection and how the selected remedy satisfies the statutory requirements of CERCLA.

I. SITE LOCATION AND DESCRIPTION

A. SITE NAME AND LOCATION

Pacific Coast Pipeline
Texaco Fillmore Facility
67 East Telegraph Road
Fillmore, CA

B. SITE DESCRIPTION

The Pacific Coast Pipeline (Texaco Fillmore Facility) site (the "Site") is located in Ventura County, California, on the eastern edge of the City of Fillmore (see Figure #1). The Site address is 67 East Telegraph Road, Fillmore, California. The 20 acre Site was the location of a former Texas Company Inc. ("Texaco") petro-chemical refinery which operated from the 1920s to 1950. The Site is currently used by Texaco as a pumping station for crude oil produced in the local oil fields of Ventura County. The Site is located just north of State Highway 126, which runs in an east to west direction between U.S. highways 101 and 5.

C. LAND AND WATER USE

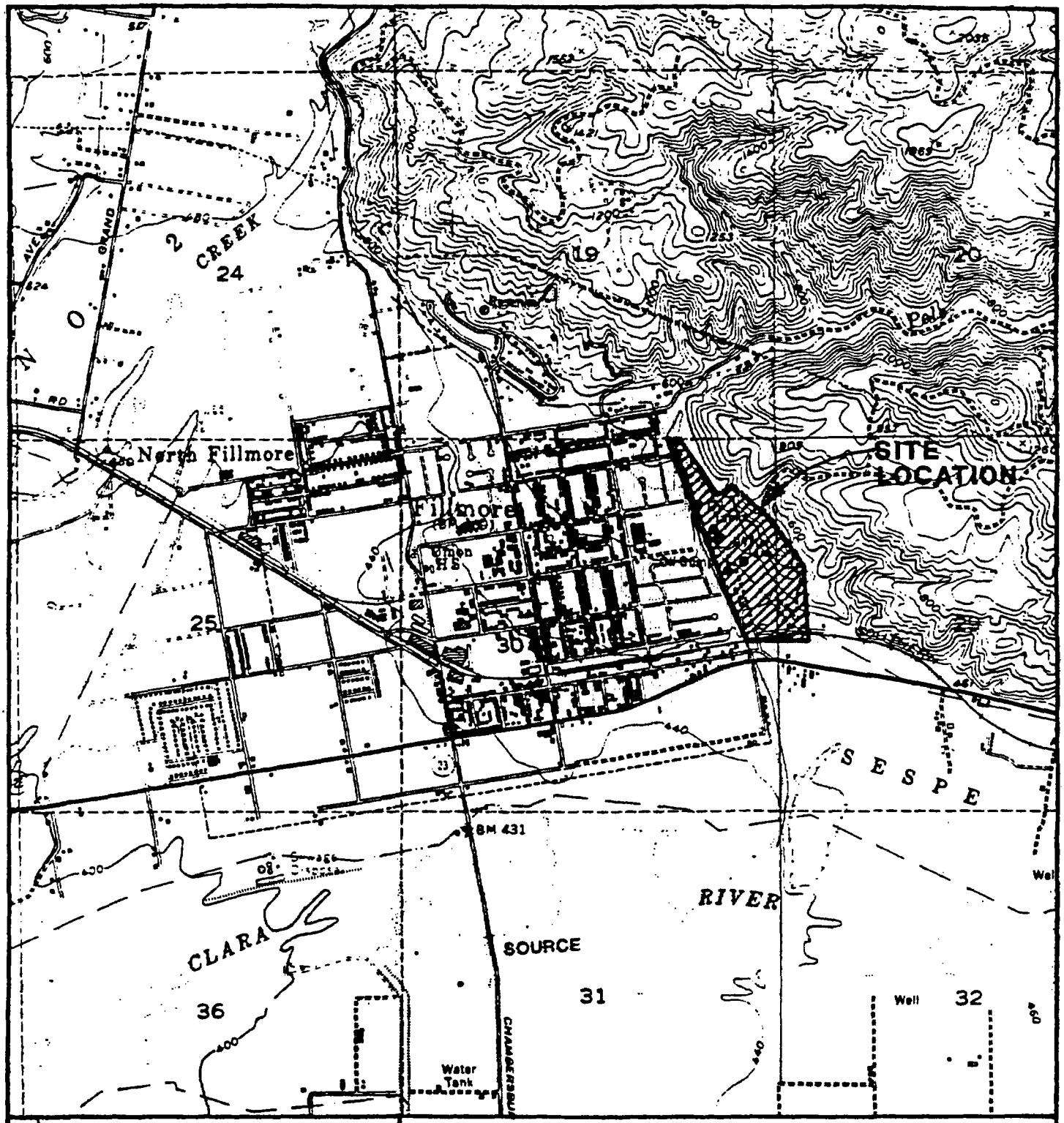
Along the western boundary of the Site are residential homes and San Cayetano Elementary School. To the north and east of the Site is vacant land with some agricultural use. Industrial and residential properties are located to the south of the Site. To the southwest of the Site is a gas station that removed leaking fuel tanks in 1989.

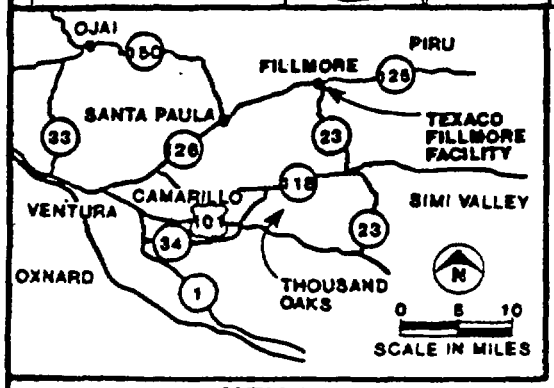
Private agricultural, industrial and residential ground water supply wells exist within a half mile radius of the Site. An onsite production well is used to irrigate the orchards on a hill to the east of the Site. City of Fillmore municipal wells are located to the southwest of the Site. These wells are planned for use by the City of Fillmore.

The Site surface structures include large holding tanks, piping and a small operations building. There are no wetlands on or near the Site.

D. REGIONAL TOPOGRAPHY

The Site is located between the Topa Topa Mountains to the northwest and the Fillmore ground water basin to the southwest. Site elevations range between 480 to 625 feet above mean sea level. The





KEY MAP

BASE MAP: USGS 7.5 MIN. FILLMORE QUADRANGLE
PHOTOREVISED 1969

N

0 1000 2000
SCALE IN MILES

FIGURE 1
SITE LOCATION MAP
TEXACO FILLMORE FACILITY
VENTURA COUNTY, CALIFORNIA

Santa Clara River is approximately one half mile to the south of the Site. The Site slopes generally to the south and west toward the Santa Clara River and is bordered on the west by Pole Creek, the natural surface water drainage system in the immediate vicinity of the facility. The average topographic gradient is above 0.05 foot per foot.

The Site is located near the confluence of three major drainages: the Santa Clara River, Sespe Creek and Pole Creek. Pole Creek emptied directly into the Site prior to the construction of a flood control channel. Water in the Pole Creek Flood Control Channel discharges into the Santa Clara River. Surface water from the Site is either channeled along graded roads for collection in bermed storage areas or in excavated pits, or it flows into Pole Creek either over the ground's surface or through drainage pipes.

The San Cayetano Thrust Fault that crosses the Site is associated with areas of natural oil seeps. Fractures associated with folding and fault zones can act as either seals or conduits for the migration of fluids.

E. HYDROLOGY

The Site lies at the eastern end of the Fillmore ground water basin. The Fillmore basin, the Piru basin and the Santa Clara River Valley sediments form a large connected ground water system. The ground water gradient slopes down toward the west with local variations reflecting irregularities along the boundaries of the basin. At the Site, the Fillmore basin suddenly widens and the regional ground water gradient turns towards the northwest on the north side of the Santa Clara River Valley. In the vicinity of the Site, the gradient is estimated to be approximately 35-ft per mile (0.66-foot per 100 feet) toward the west.

Geologic Units

The most correlative single soil unit at the Site is a fine-grained unit that occurs at a depth ranging from 40 to 60 feet below grade. This unit is approximately one to five feet thick and has acted as a vertical barrier to water migration in scattered locations.

Another soil horizon with properties similar to the shallow fine-grained unit appears at a depth of approximately 135 to 140 feet below grade. The textural properties and fine-grained composition of this unit appear to make it an impediment to fluid migration. It serves as a substantial confining layer to aquifers penetrated in at least eight deep monitoring wells. In each of these wells, ground water was initially encountered at an elevation near 380 to 385 feet above mean sea level (msl). Subsequently, the water elevation rose in the wells to approximately 395 feet above msl. The thickness of this soil unit varies between one to 20 feet throughout the Site with the greatest thickness to the north of the Site and in the vicinity of the main waste pit.

Ground Water

Three possible hydrogeologic units were identified during the Remedial Investigation. From the surface down they are as follows:

- A perched zone generally shallower than 40 to 50 feet below grade;

- Aquifer 1, is unconfined and found between 80 to 100 feet below grade; and

- Aquifer 2, is confined and found generally 100 feet below grade.

The base of Aquifer 1 is formed by the unit described as the deep fine-grained unit. Ground water in this unit flows in a westerly or northwesterly direction. Aquifer 2 appears to be confined beneath the same deep fine-grained unit, which is described above. Ground water in this unit flows in a northwesterly direction. There appears to be some vertical migration of ground water down from Aquifer 1 to Aquifer 2 in the southern portion of the Site where the deep fine-grained soil unit is thinnest.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

Texaco operated a petroleum refinery at the Site from 1928 to 1950. The primary products of the Texaco refinery were gasoline, diesel and fuel oil. Wastes from the refinery process are believed to have consisted primarily of tank bottoms, filter clays, and sludges.

These refinery wastes were disposed of onsite from 1928 to 1950 in a large main waste pit (MWP) located on the western border of the Site, and in eight smaller unlined sumps and pits located throughout the Site. In 1950, Texaco dismantled and converted the refinery to a crude oil pumping station. It is believed that the onsite refinery wastes disposal areas were not used since 1950.

In 1986, under the guidance of the California Department of Toxic Substances Control (CA DTSC), Texaco removed 33,000 cubic yards of waste material and contaminated soils from the MWP and eight other waste disposal areas. These areas contained contaminants at concentrations considered to be hazardous substances (DHS Criteria). The contaminants found in the MWP are listed in Table A.

Texaco installed a total of 17 ground water monitoring wells between 1983 and 1988 voluntarily and at the direction of the CA DTSC. These wells indicated that ground water at the Site has been contaminated with a variety of petroleum refining waste contaminants.

In June of 1988, the Site was proposed for the National Priorities List (NPL) and final listing occurred in September of 1989. EPA conducted a Potential Responsible Party ("PRP") Search in 1989.

EPA issued a Special Notice Letter to Texaco on June 26, 1989. EPA and Texaco signed an Administrative Order on Consent (AOC) for the Remedial Investigation and Feasibility Study ("RI/FS") in October 1989. This agreement required Texaco to conduct the RI/FS at the Site under EPA's oversight.

For the next two and one-half years investigations were conducted by Texaco until sufficient information was gathered to propose a remedy. The Feasibility Study which resulted in the seven remedial action alternatives discussed in detail below was completed in February 1992.

III. HIGHLIGHTS OF COMMUNITY INVOLVEMENT

The Community Relations Plan (CRP) was completed in August 1989 by EPA Community

TABLE A

Maximum Recorded Concentrations of Hazardous and Other Substances From Excavated Main Waste Pit Material

Compounds	Maximum Concentration (ppm)
Arsenic (As)	19.0
Barium (Ba)	140.0
Cadmium (Cd)	11.0
Chromium (Cr)	120.0
Lead (Pb)	3,700.0
Mercury (Hg)	None Detected
Selenium (Se)	1.2
Silver (Ag)	None Detected
Benzene	9.3
Toluene	16.0
Ethylbenzene	10.0
Alcohols[a]	200.0
Ketones[a]	100.0
Aliphatic and Alicyclic Hydrocarbons[a]	450.0
Aromatic Hydrocarbons[a]	140.0
Alkene and Alkyne Hydrocarbons[a]	120.0

[a] Individual compounds combined and reported in their major hydrocarbon groups.

Relations staff, following EPA guidance. Development of the CRP was based on a series of informational interviews with members of the community. Consistent with the recommendations of the CRP, the EPA Project Manager, communicated regularly with the parties that had expressed a high degree of concern regarding Site activities and provided general fact sheets to the community to notify them of major milestone events.

In November 1989, EPA issued a Fact Sheet to the community of Fillmore to announce the signing of the AOC for the RI/FS with Texaco. Shortly after, the EPA project manager presented the project RI/FS workplan to the Fillmore City Council and the teachers and staff of San Cayetano School. The San Cayetano School is located directly on the western border of the property. The EPA project manager met again with the teachers and staff of the school in April 1990. In July 1990, EPA issued a second Fact Sheet and later in September met with parents of students at the school. A tour of the Site for the press and other interested community members was conducted by the EPA project manager in July 1990.

In December 1990, a third Fact Sheet was issued by EPA to announce the preliminary results of the Remedial Investigation. No responses were received following the distribution of this Fact Sheet.

In addition to efforts to provide information on the progress of the investigation to the community, a regulatory technical steering committee met regularly. The purpose of the committee has been to foster communication relating to the Site activities at all levels of government. The committee includes representatives of the City of Fillmore, the County of Ventura Environmental Health Department, California EPA Department of Toxic Substances Control and U.S. EPA. The committee met regularly throughout the Site RI/FS.

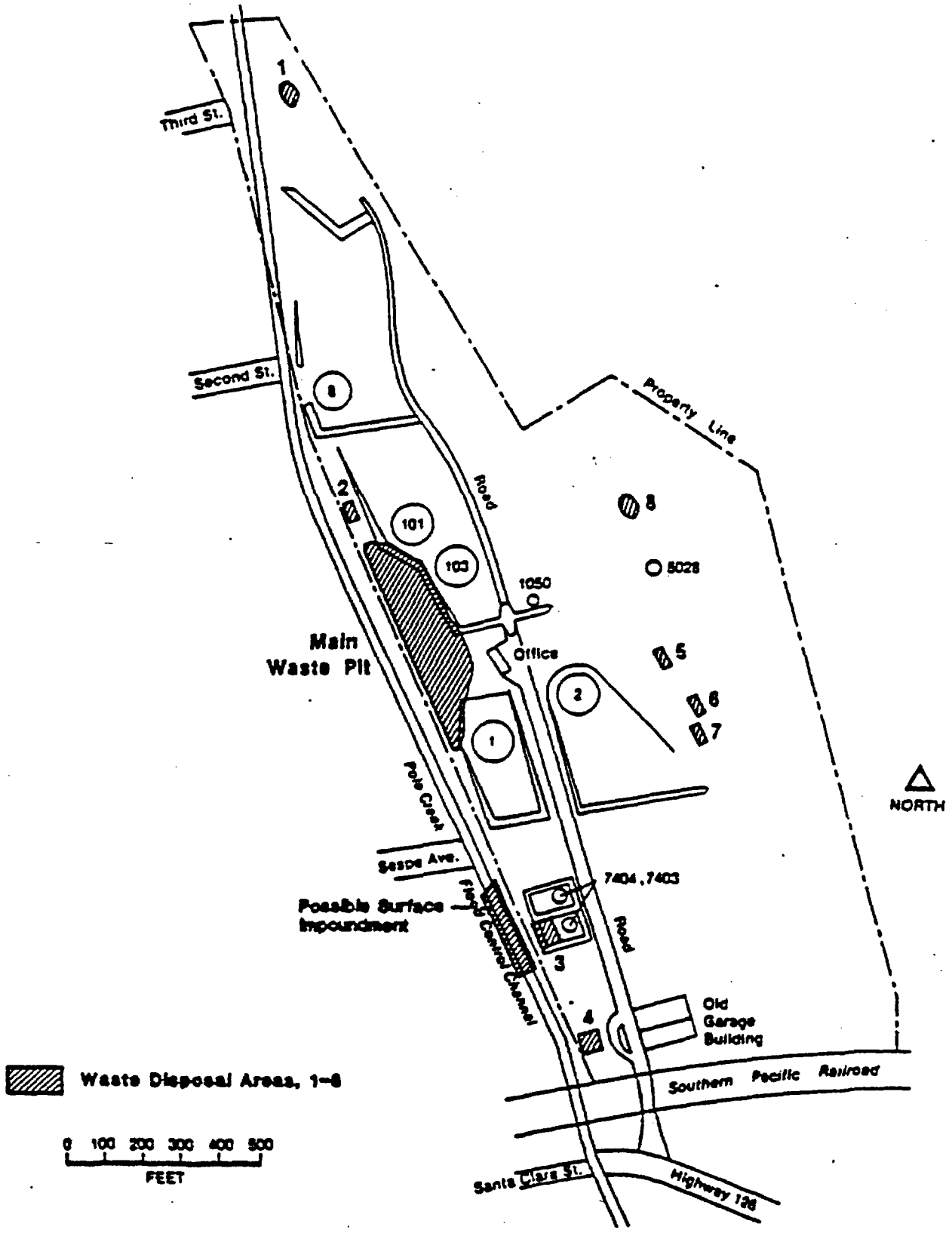
In February 1992, EPA issued a Proposed Plan outlining the remedial action alternatives for the Site. An announcement was printed in the Fillmore Gazette on February 24, 1992, announcing the Proposed Plan, public comment period and public meeting. EPA held the public meeting on March 10, 1992 at the San Cayetano Elementary School in Fillmore. The meeting was attended by 25 community members and representatives of the City government. EPA received three comment letters during the public comment period, which officially closed on March 25, 1992.

Details of community involvement activities and responses to public comments on the Administrative Record are presented in the Responsiveness Summary (Attachment B).

The public participation requirements of Sections 113(k)(2)(B)(i-v) and 117 of CERCLA have been satisfied in the remedy selection process.

IV. SCOPE AND ROLE OF THE RESPONSE ACTION

The 1986 removal of the wastes and contaminated soil from the MWP and the other eight waste disposal areas significantly reduced the amount of risk to human health and the environment at the Site. Based on the results of the Risk Assessment prepared in December 1991, the residual extent and concentration of contamination in the surface soils do not present a known significant threat to human health or the environment. However, contaminant concentrations in the ground water exceed the Federal and California standards for drinking water and may present an imminent and substantial endangerment



SOURCE: RADIAN 1984, AS PRESENTED IN FIELD SAMPLING PLAN FOR SURFACE SOILS, ENSR 1990.

FIGURE 2
LOCATIONS OF
WASTE DISPOSAL AREAS
FILLMORE FACILITY

to human health if not remediated. Therefore, remediation of the ground water is required to reduce contaminant concentrations in the ground water.

V. SUMMARY OF SITE CHARACTERISTICS

A Remedial Investigation was conducted between December 1989 and February 1992. The investigation program consisted of sampling programs to: (1) characterize known onsite areas where hazardous substances were disposed of in the past and (2) screen for the presence of contaminants that may have migrated or are migrating from the Site. The screening program included sampling and analysis of soil gas, stream sediment, surface water, and ambient air sampling. The sampling program to characterize known areas of contaminant disposal included surface soil, sub-surface soil and ground water sampling.

A. SURFACE SOILS

Historical layouts and early Site investigation work provided a foundation for design of the surface soil sampling program. The program was designed to provide a site-wide survey of possible surface soil contamination.

A total of 36 surface soil samples were collected at the Site during the Remedial Investigation. Surface soil sampling was conducted within 250 foot by 250 foot grids. Sample results indicated that in areas of known and suspected past refinery waste disposal, volatile organic compounds (VOCs) ranged from not-detectable to low-concentrations. In these same areas, semi-volatile organic compounds (SVOCs) ranged from non-detect to concentrations in the hundred parts per billion (ppb) range for select poly-aromatic hydrocarbons (PAHs), such as Chrysene. Figure #2 indicates the known and suspected waste disposal areas.

Concentrations of metals throughout the Site are presently consistent with background samples.

B. SUB-SURFACE SOIL

The extent of sub-surface soil contamination was established from the analysis of 785 samples from 78 exploratory boreholes drilled in known and suspected waste disposal areas and in uncontaminated areas to provide a bench-mark for natural Site conditions. The following section is a description of the contaminants discovered during the Remedial Investigation.

<u>Total Petroleum Hydrocarbons (TPH) and Tentatively Identified Compounds (TIC)</u>

TPH was found throughout the Site, however high concentrations were predominantly in the MWP and southwestern portion of the Site, corresponding with the areas of ground water contamination. TIC were detected in prior disposal areas at the Site. TPH and TIC are not known to be of concern to human health however.

<u>Volatile Organic Compounds (VOCs)</u>

Toxicity Characteristics Leaching Procedure (TCLP) for VOCs was conducted on approximately

142 samples. Benzene was detected in 15 of 142 samples and was generally present in subsurface soils below 11 ppb with a maximum concentration of 38 ppb. Ethylbenzene was detected in 42 of the samples with concentrations ranging from non-detectable ("ND") to a maximum of 260 ppb. Toluene was detected in 49 samples at concentrations ranging from ND to a maximum of 300 ppb. Xylenes were detected in 58 samples ranging in concentration from ND to 860 ppb. Four other VOCs were detected in sub-surface soils. However, they were only detected in one to two samples each and at low concentrations.

Given the age of the facility and the 1986 removal of the refinery wastes from the waste disposal areas, it appears that the majority of VOCs in the subsurface soils have either migrated to ground water, volatilized dispersing laterally and vertically, or degraded through natural processes.

Semi-Volatile Compounds (SVOCs)

The primary SVOCs detected included 2-Methylnaphthalene and Naphthalene. 2-Methylnapthalene was detected in 34 of the 154 samples with reported results ranging from 10 ppb to 160 ppb. Napthalene was detected in 60 samples at concentrations ranging from 10 to 160 ppb.

Metals

Metals concentrations presently in sub-surface soils were found to be consistent with background levels for the Site and for the region.

SUMMARY

The lateral and vertical distribution of VOCs and the range of VOC concentrations detected in subsurface soils do not indicate the presence of a principal threat in soil. However, the low levels of VOCs (specifically benzene) in the vadose zone or capillary fringe may result in ongoing contamination of ground water. The investigation results indicate that studies must be conducted to determine the need for response action in sub-surface soils in order to achieve the Site cleanup standards in ground water. Data indicate that vadose zone contamination may threaten ground water quality.

C. GROUND WATER

Ground water contamination was originally detected in 1983 with the initial installation of three monitoring wells. Water quality data from these wells indicated VOCs in the parts per million (ppm) range. Fourteen additional monitoring wells were installed by Texaco at the Site prior to EPA involvement at the Site. Between mid-1990 and mid-1991, 20 more monitoring wells were drilled and completed at the Site as a part of the Remedial Investigation bringing the total number of wells at the Site to 37. These 37 wells have been sampled quarterly for TPH, VOCs, SVOCs, Metals and Ethylene Dibromide (EDB).

Water quality data indicates that ground water contamination consists mainly of TPH, TIC, VOCs and SVOCs in Aquifer #1. VOCs have only been detected in Aquifer #2 in well 25D. VOC contamination in ground water consists primarily of benzene, toluene, ethylbenzene and xylenes. These

contaminants and their respective regulatory standards are presented in Table B.

SVOCs detected were generally limited to naphthalene and 2-Methylnaphthalene. However, SVOCs were infrequently detected and generally in the low (<100ppb) range. Metals did not frequently exceed background levels and, with the exception of one sample, were not detected or detected at concentrations in compliance with existing drinking water standards.

Table B

Primary VOCs in Ground Water and Cleanup Standards

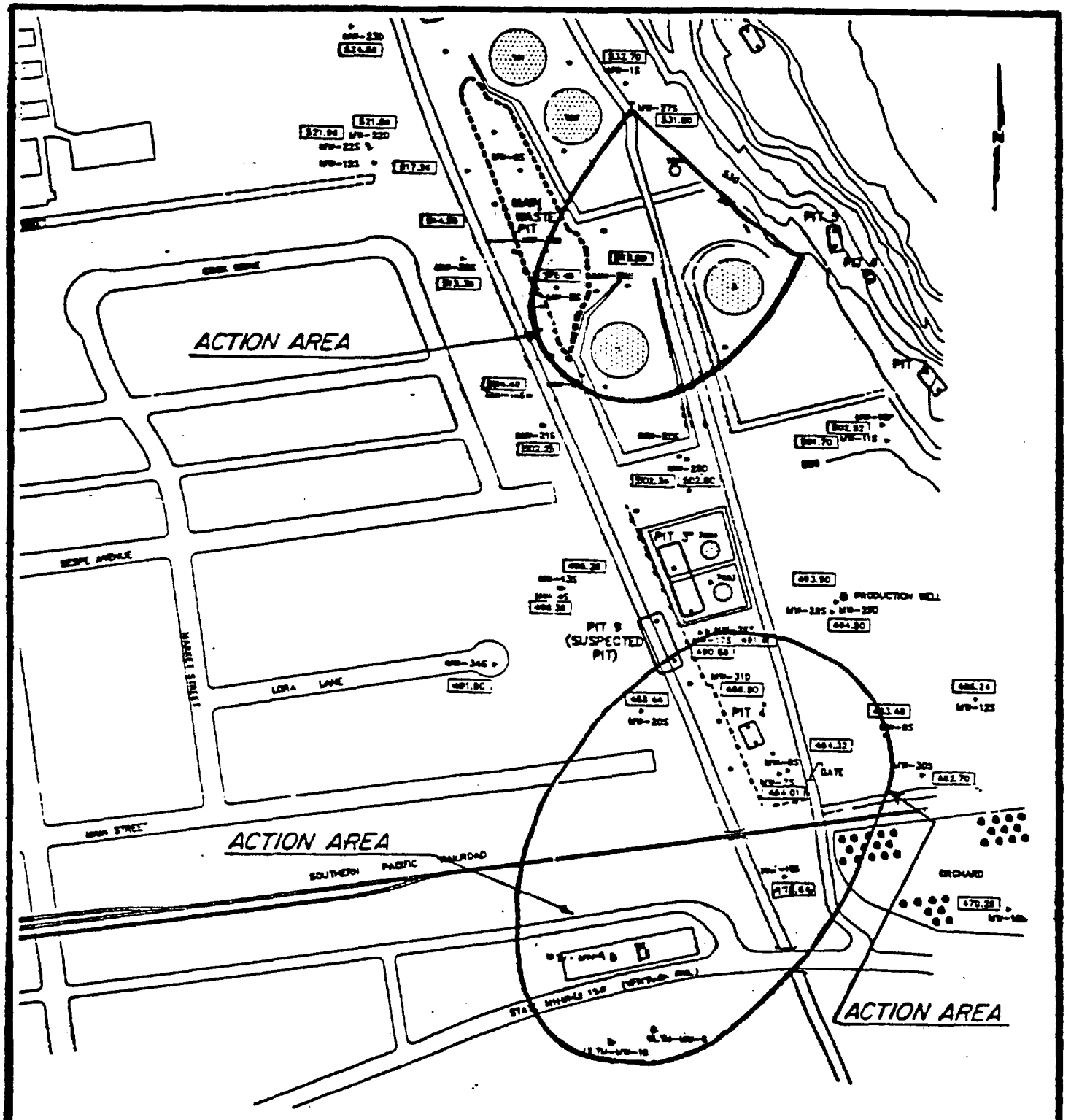
	Ground Water Quality Concentration (ppb)		Drinking Water Standards (ppb)		Clean-up Standards (ppb)
Contaminants	Minimum	Maximum	State	Federal	
Benzene	2	720	1	5	1
1,2-Dichloroethane	1	9	0.5	5	0.5
Ethylbenzene	1	150	680	700	680
Methylene chloride	6.9	56	40*	5**	5
Toluene	3	110	100*	1,000	100

**State Action Level/TBC*
***Proposed MCL/TBC*

There are currently two areas of VOC ground water contamination; one beneath the former MWP and one in the southwestern portion of the Site. The source of ground water contamination beneath the MWP is likely to have come from the refinery wastes in the MWP. The ground water contamination plume in the southern portion of the Site is likely to derive its source from suspected refinery waste pits located in the southern portion of the Site. However, the southern plume may also have been connected with sources in the northern portion of the facility given the high historical contaminant concentrations beneath the MWP. Since the removal of the refinery wastes in the MWP, concentrations of these contaminants in ground water have decreased.

A recent contour map of the ground water contamination plumes is presented in Figure 3. This presents ground water concentration contours for benzene in Aquifer #1 as described in the Site hydrology section.

Texaco sampled private production wells within a one half mile radius of the Site during the



LEGEND

——— ESTIMATED BOUNDARIES OF REMEDIATION ACTION AREAS (BASED ON 10 ppb BENZENE CONTOURS OF SECOND, THIRD AND FOURTH QUARTER 1991 GROUNDWATER MONITORING SAMPLE DATA).

NOT TO SCALE

FIGURE 3

DEFINITION OF ACTION AREAS TEXACO FILLMORE SITE

Remedial Investigation. Sample results indicate that no contaminants were detected.

D. SCREENING INVESTIGATIONS

A soil-gas survey was conducted. No statistical correlation was found to exist between soil-gas survey results and surface soil. However, subsurface soil data from the area of high soil gas concentrations indicate TPH, TIC and VOCs concentrations in the parts per million. However, limited TCLP data does not indicate significant leachable VOCs. It is unclear whether soil gas data indicates a potential subsurface source of leachable contaminants.

Stream sediment and surface water samples were collected from Pole Creek flood control channel and analyzed during the RI. Four sediment samples were collected, two upstream from the Site and two downstream. Eleven water quality samples were collected from seven sampling locations along Pole Creek. Samples were analyzed for metals, VOCs, SVOCs and EDB.

Stream sediment and surface water quality sampling results indicated low-levels of VOCs and SVOCs some of which may have been associated with the Site. Metals were either not detected or detected at similar concentrations in upstream samples, with the exception of a few compounds, one of which was total chromium.

Upwind and downwind ambient air samples were collected over three consecutive days. Target metal, VOCs and SVOCs in ambient air samples were either found to be below detectable limits or the upwind and downwind concentrations were determined to be insignificantly different.

E. DATA VALIDATION

Review and validation of sub-surface soils, surface soils, ground water, stream sediment and surface water, as well as equipment rinsate samples and trip blanks followed EPA Functional Guidelines.

EPA's selected 10% of the laboratory data packages for full review. The review and validation of analytical data followed EPA Functional Guidelines. A more detailed description of the data review and validation activities and results are presented in the RI Report and the Risk Assessment Report.

VI. SUMMARY OF SITE RISKS

A Risk Assessment for the Site was completed by EPA in December 1991. The purpose of the Risk Assessment was to evaluate the public health and environmental risks posed by VOCs and other contaminants detected in the different media at the Site.

There were forty five (45) chemicals of potential concern detected at the Site, including VOCs, SVOCs and metals. Metals in surface and subsurface soils samples were detected in concentrations similar to concentrations detected in offsite background samples. The chemicals of potential concern are presented in Table C.

Potentially exposed populations at and near the Site include current onsite workers, visitors or trespassers at the Site, and nearby offsite workers and residents. As a conservative estimate and because

Table C
Potential Compounds of Concern and Criteria for Selection
Texaco Fillmore Site

Sheet 1 of 2

Compound	Toxicity Values	Toxicity Concerns	Other Factors
Acenaphthene	a		
Benzene	b		
Benzo(a)anthracene		c	
Benzo(a)pyrene		c	
Benzo(b)fluoranthene		c	
Benzoic Acid	a		
Bis(2-ethylhexyl)phthalate	a,b		
2-Butanone (MEK)	a		
Carbon disulfide			d
Chlorobenzene	a		
2-Chlorophenol	a		
Chrysene		c	
1,2-Dibromoethane	b		
1,4-Dichlorobenzene	b		
1,2-Dichloroethane	b		
1,1-Dichloroethylene	a,b		
1,2-Dichloroethylene	a		
Dimethyl phthalate	a		
2,4-Dinitrotoluene	b		
Ethylbenzene	a		
2-Methylnaphthalene			d
Naphthalene	a		
4-Nitrophenol			d
N-nitroso-di-n-propylamine	b		
N,N-Dimethyl acetamide	--		--
Phenanthrene			d
Phenol	a		

Table . C (continued)
Potential Compounds of Concern and Criteria for Selection
Texaco Fillmore Site

Sheet 2 of 2

Compound	Toxicity Values	Toxicity Concerns	Other Factors
Pyrene	a		
Styrene	a,b		
Toluene	a		
1,2,4-Trichlorobenzene	a		
1,1,1-Trichloroethane	a		
1,1,2,2-Tetrachloroethane	b		
Trichloroethylene	b		
Trichlorotrifluoroethane	–	–	d
Vinyl acetate	a		
Xylenes, total	a		
Arsenic	b		
Barium	a		
Cadmium	a,b		
Chromium	b		
Copper	a		
Lead		c	
Nickel	a		
Vanadium	a		

[a]Has a Reference Dose (RfD) (oral or inhalation) (as defined in Chapter 4, Toxicity Assessment)
[b]Has a Cancer Slope Factor (CSF) (oral or inhalation)
[c]Potential carcinogenicity
[d]Frequency of occurrence or site history

residential development is located immediately adjacent to the Site, risks for the Texaco Site have been evaluated assuming a future residential exposure scenario.

Potential exposure pathways identified in the Risk Assessment included ingestion of ground water, inhalation of VOCs from ground water, and direct contact with surface site soil. Screening level evaluations were also performed for ingestion of surface water, inhalation of VOCs in surface water, ingestion of stream sediment, and inhalation of ambient air. In addition, worker exposure to soil gas contaminants while trenching onsite was also a screening level evaluation. The exposure pathways are summarized in Table D.

Toxicity values for the chemicals of concern are presented in Table E.

The excess lifetime cancer risks assuming residential use of contaminated ground water (ingestion and inhalation) located at the Site, is estimated at $6x10^{-5}$. The major contributor to this risk was benzene with an estimated cancer risk of $5x10^{-5}$. Although the risk associated with ground water ingestion and inhalation is within the range generally considered to be acceptable by EPA [10^{-4} to 10^{-6}] pursuant to the National Contingency Plan, 40 C.F.R. Sec 300.430(e)(2)(1)(A)(2), benzene and other known carcinogens are present in the ground water at levels that significantly exceed the federal and California drinking water standards for those chemicals.

Drinking water (chemical-specific) standards are health-based levels and may be used to determine whether an exposure is associated with an unacceptable risk to human health. To determine whether remediation is warranted at a site, EPA considers the results of the baseline risk assessment and compares site concentrations to chemical-specific standards to assess whether there is an unacceptable risk to human health or the environment (see OSWER Directive 9355.0-3.0, pg. 4, April 22, 1991). EPA has determined that the ground water contamination at this Site poses an unacceptable risk to human health because ground water at the Site is a potential source of drinking water and contains carcinogens that exceed federal and state drinking water standards.

The total estimated hazard index for non-carcinogens in the ground water, based on a child exposure scenario, was 5.0. The hazard index is a measure of the chemical-specific noncarcinogen risk. A hazard index of one (1.0) or more indicates a potential concern. Arsenic and cadmium in the ground water were the major contributors to the hazard index. It should be noted, however, that the concentrations of both of these compounds in the ground water are believed to be at naturally occurring levels and are in compliance with existing standards for drinking water. Therefore, EPA is not requiring any remediation of metals in the ground water. The risk calculation for ground water is summarized in Table F.

The estimated excess lifetime cancer risk for ingestion of surface soils assuming future onsite residential use is $4x10^{-5}$. The major contributor to this surface soil risk was chrysene with an estimated excess lifetime cancer risk of $1X10^{-5}$. Three additional chemicals, n-nitro-sodi-propylamine, benzo(a)pyrene, and benzo(a)flouranthene had excess lifetime cancer risks within EPA's acceptable risk range of 10^{-4} and 10^{-6}. The total estimated hazard index for non-carcinogenic effects due to soil ingestion was .005. This risk calculation is summarized in Table G.

Risk estimates were conducted by EPA for exposure to ambient air, stream sediment, surface water, and soil gas to determine where other possible sources of risk might be located. Evaluations were

Table D
Exposure Scenarios and Assumptions
Baseline Risk Assessment
Texaco Fillmore Site

	Major Exposure Pathways	Exposure Scenarios	Exposure Assumptions*
Groundwater	Ingestion; Inhalation/Dermal (in-home use)	No known current use as drinking water. Private wells within 1/2 mile. Conservative assumption of future residential ingestion of groundwater based on importance of area groundwater as eventual drinking water source.	Adult: 70-kg body weight 2 liters per day ingestion Child: 10-kg body weight 1 liter per day ingestion 30-year exposure duration (except children) 350 days per year exposure frequency
Surface Water/ Sediments	Dermal Contact; Ingestion	Stream often dry; exposures of low frequency, duration, and magnitude. Channel is fenced; assume occasional trespass by children. Not a drinking water source.	Screening assessment to check detected compounds.
Surface Soils	Ingestion; Dermal Contact; Inhalation (particulates)	Only consistent, current exposures are to onsite personnel. Conservative assumption is future residential use.	Adult: 70-kg body weight 100 mg per day soil ingestion 24-year exposure duration Child: 15 kg body weight 200 mg per day soil ingestion 6-year exposure duration Total exposure (Adult+Child) = 30 yrs 350 days per year exposure frequency

Table D (continued)
Exposure Scenarios and Assumptions
Baseline Risk Assessment
Texaco Fillmore Site

	Major Exposure Pathways	Exposure Scenarios	Exposure Assumptions[a]
Subsurface Soils	Current: Incidental Ingestion/Dermal Contact for Onsite Worker Future: Incidental Ingestion/Dermal Contact for Residential or Recreational Use	No direct exposure expected unless soils are excavated. Exposures of low frequency, duration, and magnitude.	Screening Assessment
Air	Inhalation	Exposure to residents at boundary represents realistic potential scenario.	Adult: 70-kg body weight 20 m^3/day inhalation Child: 10-kg body weight 5 m^3/day inhalation 30-year exposure duration (except children) 350 days per year exposure frequency
Soil-Gas	None	No direct exposure expected except as compounds move into ambient air. Important as evidence of continuing sources and site-specificity of contaminants. Conservative assumptions of worker in trench.	Workers: 8 hours per day 20 m^3/day inhalation 25-year exposure duration 250 days per year exposure frequency

[a]From EPA, 1980, 1989 and 1990a

Table E
Selected Toxicity Values for Compounds of Concern
Texaco Fillmore Site

Sheet 1 of 4

Compound	Oral RfD(mg/kg/d)	Inhalation RfD(mg/kg/d)	Weight of Evidence	Oral CSF(kg-d/mg)	Inhalation UR(/ug/m^3)	Inhalation CSF (kg-d/mg)
Acenapthene	0.06	--	--	--	--	--
Benzene	--	--	A	0.029	8.3E-06	0.029
Benzo(a)anthracene	--	--	B2	11.5[b]	1.7E-03[b]	6.1[b]
Benzo(a)pyrene	--	--	B2	11.5[a]	1.7E-3[a]	6.1[a]
Benzo(b)fluoranthene	--	--	B2	11.5[b]	1.7-E-03[b]	6.1[b]
Benzoic Acid	4.0	--	D	--	--	--
Bis(2-ethylhexyl) phthalate	0.02[a]	--	B2	0.014[a]	--	--
2-Butanone (MEK)	0.05	0.09[a]	D	--	--	--
Carbon disulfide	0.1	0.003[c]	--	--	--	--
Chlorobenzene	0.02	0.005[a]	D	--	--	--
2-Chlorophenol	0.005	--	--	--	--	
Chrysene	--	--	B2	11.5[b]	1.75-03[b]	6.1[b]
1,2-Dibromoethane (EDB)	--	--	B2	85[a]	2.2E-04[a]	0.76
1,4-Dichlorobenzene	--	0.2[c]	--	0.024	--	--
1,2-Dichloroethane	--	--	B2	0.091	2.6E-05	0.091
1,1-Dichloroethylene	0.009	--	C	0.6	6E-05	1.2

Table E (continued)
Selected Toxicity Values for Compounds of Concern
Texaco Fillmore Site

Sheet 2 of 4

Compound	Oral RfD(mg/kg/d)	Inhalation RfD(mg/kg/d)	Weight of Evidence	Oral CSF(kg-d/mg)	Inhalation UR(/ng/m^3)	Inhalation CSF (kg-d/mg)
Cis 1,2-Dichloroethylene	0.01[a]	--	D	--	--	--
trans 1,2-Dichloroethylene	0.02	--	--	--	--	--
Dimethyl phthalate	1.0[a]	--	D	--	--	--
2,4-Dinitrotoluene	--	--	B2[a]	0.68[a]	--	--
Ethylbenzene	0.1	0.286[ac]	D	--	--	--
2-Methylnaphthalene	--	--	--	--	--	--
Naphthalene	0.004[a]	--	--	--	--	--
4-Nitrophenol	--	--	--	--	--	--
N-nitroso-di-n-propylamine	--	--	B2	7.0	--	--
N,N-Dimethyl acetamide	--	--	--	--	--	--
Phenanthrene	--	--	D	--	--	--
Phenol	0.6	--	D	--	--	--
Pyrene	0.03[a]	--	--	--	--	--

Table E(continued)
Selected Toxicity Values for Compounds of Concern
Texaco Fillmore Site

Compound	Oral RfD(mg/kg/d)	Inhalation RfD(mg/kg/d)	Weight of Evidence	Oral CSF(kg-d/mg)	Inhalation UR(/ug/m^3)	Inhalation CSF (kg-d/mg)
Styrene	0.2	--	B2	0.03[a]	5.7E-07[a]	0.002[a]
Toluene	0.2	0.572[c]	D	--	--	--
1,1,1-Trichloroethane	0.09	0.3[a]	D	--	--	--
1,1,2,2-Tetrachloroethane	--	--	C	0.2	5.8E-05	0.2[a]
Trichloroethylene	--	--	B2[a]	0.011[a]	1.7E-06[a]	0.017[a]
1,1,2-Trichloro-1,2,2-trifluoroethane	30	7.7[c]	--	--	--	--
Vinyl acetate	1.0[a]	0.057[c]	--	--	--	--
Xylenes, total	2	0.086[c]	D	--	--	--
Arsenic	0.001[a]	--	A	--[d]	4.53E-03	50
Barium	0.07	0.0001[a]	--	--	--	--
Cadmium	0.0005[e] 0.001[f]	--	B1	--	1.8E-03[a]	6.1
Chromium III	1	5.7E-07[c]	--	--	--	--
Chromium VI	0.005	5.7E-07[c]	A	--	1.2E-02	41
Copper	--	--	D	--	--	--

Table E (continued)
Selected Toxicity Values for Compounds of Concern
Texaco Fillmore Site

Compound	Oral RfD(mg/kg/d)	Inhalation RfD(mg/kg/d)	Weight of Evidence	Oral CSF(kg-d/mg)	Inhalation UR(/ug/m^3)	Inhalation CSF (kg-d/mg)
Lead	--	--	B2	--	--	--
Nickel	0.02	--	--	--	--	--
Vanadium	0.007	--	--	--	--	--

Notes:
Source of Toxicity Values = IRIS 1991, unless noted.
[a]From HEAST, Annual FY1991
Oral RfD = Oral Reference Dose
Inh RfD = Inhalation Reference Dose
Oral CSF = Oral Cancer Slope Factor
Inh UR = Inhalation Unit Risk
Inh CSF = Inhalation Cancer Slope Factor
CA Weight-of-Evidence Classifications:
A Human carcinogen
B1 Probable human carcinogen, limited human data
B2 Probable human carcinogen, adequate animal evidence and inadequate or no human data
C Possible human carcinogen
D Not classified as to human carcinogenicity
"--" = Not available or not applicable
[b]Toxicity assumed equal to benzo(a)pyrene. Based on U.S. EPA policy (Memo from Pei-Fung Hurst/U.S. EPA Coordinator, Superfund Technology Support center, to Dana Davoli/U.S. EPA Region IX, September 18, 1990.
[c]Backcalculated from HEAST value in mg/m^3 using 20 m^3 inhalation rate and 70 kg body weight.
[d]Unit risk of 5E-05 (μg/L) proposed (IRIS, February, 1991).
[e]Water
[f]Food

based on conservative exposure assumptions using the highest concentration detected for each contaminant. Evaluations for ambient air, stream sediment, and surface water are based on a future onsite residential scenario. Evaluations for soil gas were based on the scenario of a worker excavating onsite soils.

The estimated excess lifetime cancer risk due to inhalation of chemicals detected in the ambient air was $4x10^{-5}$. The estimated hazard index for this pathway is .08. The estimated excess lifetime cancer risk due to ingestion and inhalation of chemicals detected in surface water was $5x10^{-6}$, while the risk due to ingestion of chemicals detected in stream sediment was $2x10^{-6}$. The hazard indices for both scenarios were less than one. The risks for both scenarios are within EPA's acceptable risk range of 10^{-4} and 10^{-6}.

The estimated excess lifetime cancer risk for worker exposure to soil gas while trenching was $4x10^{-3}$. This initial onsite worker calculation was a conservative estimate. A more realistic recalculation would likely fall within the EPA acceptable risk range. However, additional characterization of soil gases is required.

ENVIRONMENTAL RISK

In the qualitative environmental assessment portion of the Risk Assessment, information was collected regarding the sensitive species and habitats in the area. Nine birds and seven mammals were identified as special status species potentially occurring in the vicinity of the Site. Potential exposure pathways include direct contact with detected chemicals in surface soils, surface water, and creek sediment.

Pole Creek flows into the Pole Creek Flood Control Channel along the western border of the Site and eventually to the Santa Clara River. Chemical concentrations detected in Pole Creek were compared to regulatory criteria for the protection of freshwater aquatic life. All chemicals with criteria were detected at concentrations below the corresponding criteria for the protection of aquatic species.

SUMMARY

Releases of hazardous substances from the Site have resulted in the contamination of ground water presenting an imminent and substantial endangerment to public health, welfare or the environment if the releases from the Site are not addressed by implementing the remedial response action selected in this ROD. Interim removal of the refinery wastes in the MWP and other areas has significantly reduced Site risks. However, ground water contamination beneath the Site still exceeds drinking water standards and requires remedial action.

VII. DESCRIPTION OF ALTERNATIVES

This section will describe seven alternatives that EPA has evaluated in selecting the final cleanup plan for the Site. The seven alternatives were evaluated and compared to the nine criteria required by the NCP (40 CFR Sec. 300.430(e)(9)) in the Feasibility Study. The nine criteria are: overall protection of human health and the environment; compliance with applicable or relevant and appropriate requirements (ARARS); long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short term effectiveness; implementation; cost; state acceptance; and community

Table F
Risk Characterization for Groundwater
Texaco Fillmore Site

		Onsite Residential Scenario Excess Lifetime Cancer Risk			Child Residential Scenario Noncarcinogenic Hazard Quotients		
Compound[a]	Groundwater Concentration[b] (mg/l)	Ingestion	Inhalation	TOTAL	Ingestion	Inhalation	TOTAL
Benzene (A)	0.071	2.4E-05[c]	2.4E-05	4.8E-05	--	--	--
Carbon disulfide	0.0032	--	--	--	0.0031	0.10	0.10
Chlorobenzene	0.001	--	--	--	0.0048	0.019	0.024
1,2-Dichloroethane (B2)	0.0021	2.2E-06	2.2E-06	4.4E-06	--	--	--
Ethylbenzene (D)	0.01	--	--	--	0.01	0.0034	0.013
2-Butanone (MEK) (D)	0.018	--	--	--	0.034	0.019	0.053
Naphthalene	0.011	--	--	--	0.26	--	0.26
2-Methylnaphthalene	0.0073	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane (C)	0.001	2.3E-06	2.3E-06	4.6E-06	--	--	--
Toluene (D)	0.015	--	--	--	0.0072	0.0025	0.0097
Xylenes (D)	0.01	--	--	--	0.00048	0.011	0.011
Arsenic (A)	0.018	--	NC	--	1.7	NC	1.7
Barium	0.324	--	NC	--	0.44	NC	0.44
Cadmium (B1)	0.0048	--	NC	--	0.92	NC	0.92
Chromium	0.015	--	NC	--	0.0014	NC	0.0014

Table F (continued)
Risk Characterization for Groundwater
Texaco Fillmore Site

		Onsite Residential Scenario Excess Lifetime Cancer Risk			Child Residential Scenario Noncarcinogenic Hazard Quotients		
Compound[a]	Groundwater Concentration[b] (mg/l)	Ingestion	Inhalation	TOTAL	Ingestion	Inhalation	TOTAL
Chromium VI	0.02	--	NC	--	0.38	NC	0.38
Copper	0.022	--	NC	--	--	NC	--
Lead (B2)	0.0029	--	NC	--	--	NC	--
Nickel	0.04	--	NC	--	0.19	NC	0.19
Vanadium	0.032	--	NC	--	0.44	NC	0.44
TOTALS		3E-05	3E-05	6E-05	4.4	0.2	5

[a]Letters in parentheses are carcinogenic weight-of-evidence classifications.
[b]95% upper confidence limit of the mean or the maximum detected value, whichever is lower (from Table 1-3).
[c]9.7E-05 = 9.7×10^{-5}
--No toxicity value available.
NC = Not calculated

Table G
Risk Characterization for Surface Soils
Texaco Fillmore Site

Compound	Conc[a] (µg/kg)	Excess Lifetime Cancer Risk Ingestion	Noncarcinogenic Hazard Quotients Child/Ingestion
Acenaphthene	1169	--	2.49E-04
Benzene (A)[b]	10.9	4.95E-10	--
Benzo(a)anthracene (B2)	61	1.10-06	--
Benzo(a)pyrene (B2)	250	4.50E-06	--
Benzo(b)fluoranthene (B2)	93	1.62E-06	--
Bis(2-ethylhexyl)phthalate (B2)	890	1.95E-08	5.69E-04
2-Butanone (MEK) (D)	19.6	--	5.01E-06
Chlorobenzene (D)	7.61	--	4.86E-06
2-Chlorophenol	1263	--	3.23E-03
Chrysene (B2)	800	1.44E-05	--
1,2-Dibromoethane (B2)	3.22	4.28E-07	--
1,4-Dichlorobenzene	1162	4.37E-08	--
1,1-Dichloroethylene	6.45	6.06E-09	9.16E-06
2,4-Dinitrotoluene (B2)	1181	1.26E-06	--
Ethylbenzene (D)	4.67	--	5.97E-07
4-Nitrophenol	5591	--	--
N-nitrosodi-n-propylamine (B2)	1178	1.29E-05	--
Phenanthrene (D)	110	--	--
Phenol (D)	1220	--	2.60E-05
Pyrene	1177	--	5.02E-04
Toluene (D)	173	--	1.11E-05
1,1,1-Trichloroethane (D)	4.7	--	6.68E-07
Trichloroethylene (B2)	6.99	1.20E-10	--
Vinyl acetate	15.3	--	1.96E-07
Xylenes (Total) (D)	9.69	--	6.19E-08
TOTALS		4E-05	0.005

[a]Ninety-five percent upper confidence limit on the mean (from Table 2-2).
[b]Letters in parentheses are carcinogenic weight-of-evidence classifications.

acceptance. The nine criteria are described in more complete detail in Part VIII of this decision document, entitled Summary of Comparative Analysis of Alternatives.

The focus of the Feasibility Study was the achievement of drinking water standards in ground water. The aquifers at the Site are designated by the State of California as potential sources of drinking water and therefore must be restored to drinking water quality standards. The federal and state drinking water standards for the compounds of concern are presented in Table B. The alternatives described below, except the no-action alternative, are designed to meet these standards in the aquifer over different restoration time periods, employing different treatment technologies.

Each alternative would require periodic ground water monitoring to determine the effectiveness of the cleanup and to verify achievement of the cleanup standards. The specific ground water monitoring program will be defined more precisely during Remedial Design/Remedial Action.

A. ALTERNATIVE 1

The NCP requires that a no-action alternative be considered at every site. The no-action alternative serves primarily as a point of comparison to other alternatives. There are no costs associated with this alternative. No active treatment systems exist at the site and none would be implemented in this alternative.

B. ALTERNATIVE 2

Remedial Alternative 2 consists of continuing (1) existing restrictions to access to the Site by maintaining perimeter fencing until the cleanup standards are achieved and (2) ground water monitoring presently performed at the Site. However, no action would be taken to remove contamination from the ground water or soils.

There would be a capital cost of $55,000 for this alternative. The annual operation and maintenance costs for Alternative #2 would be $120,000. Net present value for this alternative would range between $500,000 and $1,500,000. Cleanup time frames are presented as a range to account for the variable influence that natural degradation may have on the time it takes to achieve the cleanup standards in groundwater.

C. ALTERNATIVE 3

Alternative 3 would involve continuing the activities described in Alternative 2 plus the installation of caps or covers over the waste pit areas to inhibit leachate migration from the soils to ground water. However, no action would be taken to remove the contaminants from the ground water or soils or to prevent the migration of ground water contamination.

Capping the waste pit areas would involve importing native fill from other locations at the Site, combining the fill with clay, and covering the waste pit with this mixed material. Capping with a synthetic cover would involve installing the cover over the area and capping it with imported fill from other locations at the Site. Both scenarios would involve final surface grading and revegatation to control surface drainage.

There would be a capital cost of $970,000 for this alternative which includes maintaining the existing perimeter fencing and quarterly ground water monitoring. The annual operation and maintenance costs for Alternative 3 would be approximately $140,000. Likely net present value would range between $1,600,000 and $2,700,000.

D. ALTERNATIVE 4

Remedial Alternative 4 includes: (1) continuing maintenance of perimeter fencing, (2) quarterly ground water monitoring that is currently conducted at the Site and (3) a ground water extraction and surface treatment system. No action would be taken to prevent or inhibit the migration of low levels of leachable contaminants from the subsurface soils to the ground water under this alternative.

Under this alternative the ground water extraction system would consist of a set of recovery wells strategically situated within both areas of ground water contamination. The placement and number of wells will be determined by EPA once aquifer testing and ground water modeling has been completed. Preliminary conceptual design work indicates that somewhere between four to seven extraction wells may be required for the ground water system.

The extracted ground water will be treated at the surface using carbon adsorption. Carbon adsorption was selected as the most cost effective and implementable treatment system in the Feasibility Study. Carbon adsorption is a physical process in which materials are transferred from the aqueous phase to the surface of a solid (carbon), where they are concentrated. Granular activated carbon (GAC) is the most common adsorbent used in water and waste water treatment. The internal pore structure provides a large surface area for adsorption of different organic compounds.

The carbon after use needs to be replaced or regenerated. Regeneration and or replacement of the carbon constitutes the majority of the operation costs associated with carbon adsorption. The specific design of the GAC system will be determined during the remedial design phase. Spent carbon will be thermally destroyed or regenerated.

Treated ground water will be injected into the aquifer or reused in a beneficial manner such as irrigation.

There would be a capital cost of $550,000 for this alternative. The annual operation and maintenance costs for Alternative 4 would be $240,000. Net present value for this alternative ranges from $1,200,000 to $3,500,000.

E. ALTERNATIVE 5

Remedial Alternative 5 would include an in-situ bioremediation system to cleanup ground water. In-situ bio-remediation consists of enhancing environmental conditions in the subsurface where contaminants are present to optimize natural microbial metabolism of organic compounds. The conceptual layout of the system includes: (1) extraction of ground water from the areas with contaminated ground water, (2) surface treatment of the extracted groundwater with activated carbon to remove residual constituents, (3) addition of oxygen and nutrients to the treated ground water; and (4) re-infiltration of the enhanced water through the vadose zone soils to the ground water.

The system would require the use of extraction wells, infiltration galleries, and injection wells. Maintenance of the perimeter fencing and quarterly ground water monitoring would be continued under this alternative.

Laboratory or field studies are usually required to determine biodegradation rates, oxygen and nutrient requirements, and effects of different parameters such as pH and temperature on bio-degradation. Once implemented, bio-remediation systems require significant operational efforts to monitor and maintain optimum conditions for microbial growth, and to prevent fouling or plugging that may render the system ineffective.

The total capital cost associated with this alternative is approximately $790,000. The annual operation and maintenance costs are estimated at $300,000. The estimated net present value for this alternative ranges between $1,300,000 and $4,500,000, depending upon the rate of natural degradation that may be occurring at the Site.

F. ALTERNATIVE 6

Alternative 6 consists of the ground water extraction and carbon treatment described in Alternative 4, plus soil treatment by soil vapor extraction (SVE). Maintenance of the perimeter fence and periodic ground water monitoring would be required. Treated ground water will be injected into the aquifer or reused in a beneficial manner such as irrigation.

The remedial action objective for SVE would be to remove the potential for continued ground water contamination due to migration of contamination from the vadose zone. The criteria for the need to conduct the SVE and the extent of such an action would be triggered by a residual distribution and mass of VOCs in the vadose zone that threatens to contaminate underlying ground water at levels exceeding federal or state drinking water standards (Maximum Contaminant Levels, or MCLs) selected in this ROD. The distribution and mass of residual VOCs would be evaluated at regular intervals throughout operation and/or monitoring of the SVE system.

SVE removes contaminants in the vapor phase from pore spaces in the unsaturated zone by drawing air through the subsurface. This is accomplished by installing and drawing a vacuum on vapor recovery wells. The flow of air through the subsurface enhances the volatilization rate of contaminants. Significant increases in the subsurface biological degradation of many compounds has also been confirmed through the use of the SVE. Extracted soil vapor will be treated by vapor-phase carbon adsorption or equivalent treatment method.

Prior to initiating the design of the SVE system, a one year subsurface study will be conducted. Components of the study will include: (1) an assessment of soil parameters potentially influencing rates of natural degradation in the sub-surface soil; (2) performance of additional field work to collect data on soil vapors in target areas; (3) a calculation of sub-surface soils impact to ground water using "Designated Level Methodology" or "V-Leach" or a similar analytical tool approved by EPA; and (4) collection of additional ground water monitoring data. Values for soil, contaminant, and underlying saturated zone parameters to be used in the application the analytical tool and the mixing zone calculations shall be those selected by EPA. Following an analysis of the results of the one year subsurface study, EPA shall require SVE for those areas that threaten to contaminate groundwater at levels above site cleanup standards.

The total capital cost for this alternative is $1,075,000 or lower depending on whether an SVE is included in the alternative following the one-year soil study. Annual O&M costs would be $480,000. Net present value for the remedy would range from $2,300,000 to $7,000,000.

G. ALTERNATIVE 7

Alternative 7 would consist of the in-situ ground water treatment system as described in Alternative 5, plus soil treatment by SVE. The perimeter fencing would be maintained, and periodic ground water monitoring would be continued. The in-situ soil bioremediation system would differ from that described for Alternative 5 in that the ground water enhanced with oxygen and nutrients would be reinjected into the subsurface only through the injection well rather than through infiltration galleries. The SVE system would be similar to that described in Alternative 6.

The total estimated capital cost for this alternative is $1,270,000. Annual O&M costs, including maintaining perimeter fencing and ground water monitoring, would be $540,000. The estimated net present value for this alternative would range between $1,800,000 and $8,000,000.

VIII. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

A. PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

Overall protection of human health and the environment addresses whether an alternative provides adequate protection from exposure to contamination and describes how risks for the exposure pathways are eliminated or reduced.

The no-action Alternative 1 would not provide any protection from exposure to ground water contamination at the Site and there would be no reduction of Site risk. Alternatives 2 and 3 would not actively eliminate or reduce risks posed by ground water contamination and could result in the contamination spreading. Ground water monitoring would measure possible natural processes such as degradation and attenuation, however, these processes are uncertain and do not provide as much protection as provided by alternatives 4, 5, 6 and 7.

Alternative 4 and 6 through the use of engineering controls in the form of a ground water extraction and treatment system would protect against the spread of contaminated ground water and reduce the risk of exposure to contaminants in ground water by the treatment of contaminants in ground water to the state or federal standard for drinking water, whichever is more stringent. Alternatives 5 and 7, would to the degree that they would be able to affect the full extent of ground water contamination down to the cleanup standards, provide protection from the migration of contaminants equal to the level provided by alternatives 4 and 6. However, in-situ systems are not as robust in capturing the full extent of ground water contamination.

B. COMPLIANCE WITH ARARS

Section 121(d) of the CERCLA, 42 U.S.C. §9621(d), requires that remedial actions selected under CERCLA attain a level or standard of control of the hazardous substances at a Site which complies with "applicable or relevant and appropriate requirements" ("ARARS") of federal environmental laws and more stringent state environmental and facility siting laws, that have been identified by the state in a timely manner.

"Applicable" requirements are those cleanup standards, standards of control, and other substantive requirements or limitations that have been promulgated under federal or state environmental and facility siting laws that specifically address a hazardous substance, pollutant or contaminant, remedial action or other circumstance at a particular CERCLA Site. "Relevant and appropriate" requirements are cleanup standards, standards of control and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not directly applicable, to a hazardous substance, pollutant, contaminant, remedial action, location or other circumstance at a CERCLA Site, address problems or situations sufficiently similar to those encountered at the particular Site that their use is well suited to the particular Site. If an ARAR does not cover a particular situation, or if an ARAR is determined to be insufficient to protect human health or the environment, non-promulgated advisories or guidance (To Be Considered or TBCs) may be used in determining the necessary cleanup level for protection of health or the environment.

There are three categories of ARARs or TBCs: (1) contaminant-specific, (2) action-specific and (3) location-specific. Contaminant-specific ARARs and TBCs are limits on concentrations of specific hazardous substances, pollutants or contaminants in the environment. Examples of this type of requirement are drinking water standards and ambient water quality criteria. Action-specific ARARs and TBCs are restrictions that are triggered by a particular type of activity at a Site such as Resource Conservation and Recovery Act regulations regarding hazardous waste treatment, storage or disposal. The third type of ARARs or TBCs are restrictions on certain types of activities based on the location of the Site. These include restrictions on activities in wetlands, floodplains and historic areas.

Contaminant-Specific ARARs and TBCs

A total of forty five (45) contaminants were identified for evaluation in the risk assessment because they were detected at the Site. The risks from these contaminants were determined to be within EPA's acceptable risk range for all exposure pathways for all contaminants. However, four of these contaminants exceed their federal or state drinking water standards and therefore present an unnacceptable risk to human health.

The contaminant-specific ARARs for the Site are Federal and State of California drinking water standards because the Site ground water is a potential source of drinking water. The NCP (40 C.F.R. §300.430(f)(5)) requires that remedial actions attain the Maximum Contaminant Level Goal (MCLGs) established under the federal Safe Drinking Water Act that are set above zero for ground water that is a current or potential source of drinking water. If a MCLG is set at zero or is not relevant and appropriate under the circumstances, the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act will be an ARAR. The MCLs and MCLGs for the constituents of concern are set forth in Table B. EPA considers the proposed MCL for Methylene Chloride as the TBC because it is the most protective standard.

The State of California has also promulgated MCLs for the constituents of concern as shown in Table B. The California MCLs are either equal to or more stringent than the federal MCLs and MCLGs for the constituents of concern.

EPA also considered the California Department of Health Services drinking water action levels (ALs) as TBCs. ALs are health-based chemical concentrations designed to limit public exposure to substances that do not have state MCLs at this time. ALs are advisory standards that apply at the tap for public water supplies. Toluene has a California AL.

EPA has selected the California AL as the ground water cleanup standard for toluene because the federal MCLG for toluene is not as protective of ground water as the State AL. In addition, EPA has selected the proposed federal MCL, as the cleanup standard for methylene chloride because that standard is the most protective standard for the ground water. For the other contaminants, EPA has selected as the cleanup standard for ground water the current federal MCLs or federal MCLGs or state MCLs, whichever is most stringent for the particular contaminant. Table B sets forth the cleanup standards for five contaminants.

All of the alternatives could possibly achieve the chemical-specific ARARs. However, the ARARs would be achieved in varying time frames under the various alternatives. Alternatives 1 through 3 rely entirely on natural degradation of contamination and represent the alternatives least likely to achieve ARARs. Alternatives 5 and 7 would rely on certain natural conditions to enhance the rate of degradation, which are more difficult to control but would likely achieve the ARARs, particularly Alternative 7. Alternatives 4 and 6 are also likely to achieve ARARs. Without site specific results from implementation of each of the alternatives, it is very difficult to estimate any particular alternative's ability to achieve a cleanup standard as low as 1 ppb, as in the case for benzene at this Site.

Action Specific ARARs and TBCs

Injection of Treated Effluent into Aquifer

Alternatives 4, 5, 6 and 7 include ground water extraction and treatment, and possible injection of treated effluent into the ground water. Effluent from the ground water treatment system that is injected into the aquifer at the Site must meet the following ARARs: (1) the Los Angeles Regional Water Quality Control Board's Water Quality Control Plan, which incorporates State Water Resources Control Board (SWRCB) Resolution No. 68-16 "Statement of Policy with Respect to Maintaining High Quality of Waters in California," (2) Section 3020 of the Resource Conservation and Recovery Act, (3) the California Safe Drinking Water Act (Proposition 65), and (4) the federal Underground Injection Control (UIC) Program for class V wells set forth in 40 C.F.R. Part 144.

SWRCB Resolution #68-16 requires maintenance of existing State water quality unless it is demonstrated that a change will benefit the people of California, will not unreasonably affect present or potential uses, and will not result in water quality less than that prescribed by other State policies.

Section 3020 of the Resource Conservation and Recovery Act prohibits disposal of hazardous waste above or into a formation which contains a source of drinking water. This prohibition does not apply to injection of treated contaminated ground water into an aquifer if (1) such injection is part of a response

action under CERCLA, (2) the contaminated ground water is treated to substantially reduce hazardous substances prior to such injection, and (3) the response action will upon completion be adequate to protect human health and the environment.

Proposition 65 prohibits the discharge of chemicals known to the State to cause cancer or reproductive toxicity into ground water or surface water drinking water sources or onto land which may pass into a drinking water source. Benzene, and other constituents of concern at the Site, have been identified as carcinogens by the State of California.

The federal Underground Injection Control Program requires that injection wells such as those that would be located at the Site not, (1) cause a violation of primary MCLs in the receiving aquifer, and (2) not adversely affect the health of persons (40 C.F.R. Sec. 144.12).

To meet these ARARs, any treated ground water that is reinjected at the Site will be treated to concentrations below federal MCLs/MCLGs or State MCLs, whichever is more stringent, for all the constituents of concern, except toluene, for which the ground water must be treated to below the State AL and methylene chloride for which the ground water must be treated to below the proposed federal MCL.

Reuse of Treated Ground Water

Alternatives 4 and 6 include ground water extraction and treatment that results in treated effluent that could be reused in a beneficial manner. The action-specific ARARs or TBCs that are applicable to the use of treated ground water from the Site in a public drinking water system are (1) the State and federal drinking water standards, (2) the SWRCB's Resolution #68-16 and (3) California's Proposition 65. To meet these ARARs, any treated ground water that is delivered from the Site to public water supplies must be treated to concentrations below the State or federal MCLs, whichever is more stringent for the contaminants of concern except the ground water will have to be treated to below the California AL for toluene.

The three requirements listed above have been identified by EPA as TBCs if the ground water extracted from the Site is provided at the Site for use as non-potable water. EPA has determined that this is necessary to protect human health and the environment from the use of inadequately treated ground water. Accordingly, the ground water must be treated to below the State or Federal MCLs, whichever is more stringent for the contaminants of concern before reuse of any type.

Carbon Adsorption

Use of activated carbon for treatment of organics under alternatives 4, 5, 6, and 7 could trigger Resource Conservation and Recovery Act (RCRA) and California Hazardous Waste Control Act (HWCA) requirements for hazardous waste generators if the spent carbon contains sufficient quantities of hazardous constituents that cause the spent carbon to be classified as a characteristic hazardous waste under RCRA or HWCA. If the spent carbon is a characteristic hazardous waste under RCRA and HWCA, the ARARs for handling such waste are the requirements for hazardous waste generators set forth in 40 C.F.R. Part 262 and Part 268 and HWCA regulations at Title 22 Sections 66470-66515 and Title 22 Chapter 30, Article 15. Storage of contaminated carbon that is classified as a characteristic hazardous waste for more than 90 days triggers the hazardous waste storage requirements set forth in 40 C.F.R. Part

264 and HWCA Title 22 Sections 67180-67194.

Soil Vapor Extraction

Alternatives 6 and 7 include soil vapor extraction which may result in the release of pollutants into the air. In California, the authority to regulate stationary sources has been delegated to local air quality management districts. The Site is located within the jurisdiction of the Ventura County Air Pollution Control District (APCD). Accordingly, action-specific ARARs for emmissions from a soil vapor extraction system at the site include the substantive requirement of APCDs Rules 26.2 (New Source Review) if the emmissions are determied to be of the type and quantity to be covered by these rules.

Location-Specific ARARs and TBCs

EPA has not identified any location-specific ARARs or TBCs for the Site.

C. LONG-TERM EFFECTIVENESS AND PERMANENCE

Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time. This criterion includes the consideration of residual risk and the adequacy and reliability of controls after implementation of the remedy. The residual risk, or risk remaining after completion of the cleanup, is the same for all of the alternatives because the cleanup standards are the same for all alternatives. The residual risk for benzene at the cleanup standard of 1 ppb is approximately 1×10^{-6}. Other contaminants are present at concentrations that would adequately be reduced during the cleanup of benzene to 1 ppb. These other residual contaminants would not contribute additional significant residual risk.

Long-term effectiveness is also measured by the adequacy and reliability of controls. Alternatives 4 through 7 would have the greatest ability to maintain reliable protection of human health and the environment over time because active measures are used under these alternatives to control the spread of contamination and to restore the aquifer. All alternatives include ground water monitoring. Alternatives 2 and 3 have no hydraulic controls, and therefore provide the least amount of control over ground water when compared with alternatives 4 through 7. Alternatives 1 through 3 might allow contamination to spread to clean zones within the aquifers in the Fillmore basin.

D. REDUCTION OF TOXICITY, MOBILITY, OR VOLUME THROUGH TREATMENT

Reduction of toxicity, mobility, or volume through treatment refers to the preference for a remedy that uses treatment to reduce health hazards, contaminant migration, or the quantity of contaminants at the Site.

Alternatives 1, 2 and 3 do not employ treatment and therefore provide no measurable beneficial effect for this criteria when compared with the other alternatives. Alternative 4 would reduce contaminants by extracting them from the ground water and destroying them through the regeneration of the spent carbon. Alternative 5 would provide a slightly higher degree of treatment by enhancing degradation occurring in soils, and not relying upon the rate of contaminant removal via extraction wells. Alternative 6 would provide an even greater degree of treatment than alternative 5 by simultaneously

effecting a greater reduction of contaminants in soils, since SVE will remove contaminants and stimulate biodegradation in the vadose zone. Alternative 7 through the use of in-situ bio-remediation would be likely to provide treatment equal to Alternative 6, depending on the enhanced rate of degradation that may be achieved in ground water. However, it is difficult to predict how well biodegradation would work due to the variability of natural conditions.

E. SHORT-TERM EFFECTIVENESS

Short-term effectiveness refers to the period of time needed to complete the remedy and to prevent adverse impacts on human health and the environment that may be posed during construction and implementation of the remedy. Since a complete health and safety plan would be completed prior to the implementation of the remedies, short-term adverse impacts during construction of the remedies would minimized. The alternatives are estimated to achieve the cleanup standards within varying time periods.

Alternatives 1 and 2 would provide the slowest anticipated cleanup because they rely on natural degradation of contamination to accomplish the cleanup. Alternative 3, which includes a soil cover, may prevent the future leaching of contaminants from soil to ground water which would achieve a slightly faster clean-up when compared with Alternative 1 and 2. Alternatives 4, 5, 6 and 7, by actively controlling migration of contaminants and restoring the ground water, would achieve the cleanup standard in the shortest period of time.

It is difficult to estimate with accuracy the degree to which natural degradation in ground water may be enhanced under Alternatives 5 and 7 (bio-degradation) to provide a faster cleanup than under Alternatives 4 and 6 (extraction and treatment). Similarly, it is difficult to predict the degree to which natural rates of degradation in the soils may be enhanced through infiltration of oxygen and nutrient enhanced water (Alternative 5) in comparison with SVE (Alternatives 6 and 7). However, SVE (Alternative 6), as a proven and reliable treatment technology, is more likely to remove contaminants from the vadose zone soil and stimulate bio-degradation resulting in a faster cleanup of soils and ultimately of ground water.

F. IMPLEMENTABILITY

Implementability refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the selected remedy. It also includes coordination of Federal, State and local governments in cleanup of the Site.

All of the alternatives are implementable. Technically and administratively, Alternatives 1 and 2 are the easiest alternatives to implement because they require little or no work. The most difficult alternatives to implement are 5 and 7 as they require significant technical oversight in the balancing of oxygen and nutrient levels to optimize the stimulation of degradation. Variables and uncertainties for Alternatives 5 and 7 could lead to delays. Alternatives 3, 4 and 6 would employ reliable technologies that are relatively easy to implement.

G. COST

This criteria examines the estimated costs for each remedial alternative. For comparison, capital costs and annual O&M costs are used to calculate a total net present worth cost for each alternative.

Alternative 1 is not discussed in detail in this section because it requires no-action and therefore no costs.

Alternative 2 would not require significant capital costs and the annual O&M costs would be limited to ground water monitoring of approximately $120,000. Alternative 2 has a total net present value of $1.5 million after 30 years of operation.

Alternative 3 has an estimated capital cost of $970,000 plus annual O&M costs to monitor ground water equal to $140,000. The total net present value for alternative 3 is $2.7 million assuming 30 years of operation.

Alternative 4 has an estimated capital cost of $550,000 plus an annual O&M cost of $240,000. The total net present value for alternative 4 is $3.5 million assuming 30 years of operation.

Alternative 5 has an estimated capital cost of $790,000 plus an annual O&M cost of $300,000. The total net present value for alternative 5 is $4.5 million assuming 30 years of operation.

Alternative 6 has an estimated capital cost of $1,075,000 plus an O&M cost of $480,000. The total net present value for alternative 6 is $7.0 million assuming 30 years of operation.

Alternative 7 has an estimated capital cost of $1,270,000 plus an annual O&M cost of $540,000. The total net present value for alternative 7 is $8.0 million assuming 30 years of operation.

H. STATE ACCEPTANCE

State acceptance indicates whether, based a State's review of the RI/FS and Proposed Plan, the state in which the Site is located agrees with the preferred alternative.

EPA has involved the Los Angeles Office of California EPA Department of Toxic Substances Control in the development of the RI/FS and the selection of the remedy. The Department of Toxic Substances Control, on behalf of the State of California, has stated a preference, and concurs with EPA, on the selection of Alternative 6 as the preferred remedy.

I. COMMUNITY ACCEPTANCE

Community acceptance indicates the public support of a given alternative.

EPA has solicited input from the community on the alternatives evaluated for the Site. The public, with the exception of one letter endorsing the no-action alternative, has supported the preferred alternative. A response to these comments is provided in Attachment B.

IX. SELECTED REMEDY

EPA has selected Alternative 6 as the remedy for the Pacific Coast Pipeline Site. The selected remedy for contaminated ground water at the Pacific Coast Pipeline Site consists of:

1) Design, construction and operation of a ground water extraction and treatment system

to treat extracted ground water to levels that meet the cleanup standards set forth in this ROD;

2) Discharge of treated ground water to the aquifer at the Site by injection or provision of the treated ground water to beneficial users of the treated ground water;

3) Soil Vapor Extraction for those areas that threaten to contaminate ground water at levels above Site cleanup standards following a one year subsurface study as described on page 30 of this ROD;

4) Ground water monitoring to demonstrate that the extraction system is effectively capturing the contaminant plume and ultimately, to demonstrate achievement of the cleanup standards throughout the aquifer; and

5) Maintenance of perimeter fencing at the Site until cleanup standards are met.

Implementation of this remedy will prevent the spread of ground water contamination and reduce the principal risk of exposure to contaminated ground water. The ground water extraction and treatment system will operate until the cleanup standards are achieved. Because this remedy will not result in hazardous substances remaining on the site above health-based levels, the five-year review will not apply to this action. The selected remedy will undergo periodic performance evaluations at a frequency to be determined in the Remedial Design Workplan.

The decision to select Alternative 6 as the remedy is based on a comparative analysis of the alternatives presented above and provides the best balance of trade-offs with respect to the nine evaluation criteria.

The ground water extraction system will operate until the cleanup standards are achieved and continuously maintained throughout the aquifer; EPA will periodically re-evaluate the remedy at a rate to be determined during the Remedial Design. It may become apparent, during implementation or operation of the ground water extraction system, that contaminant levels have ceased to decline and are remaining constant at levels higher than the cleanup standards. Based on performance data, operation of the extraction system will be adjusted as warranted if so determined by EPA during the periodic EPA evaluations.

GROUND WATER EXTRACTION AND TREATMENT SYSTEM

Ground water shall be extracted using multiple extraction wells, the exact location, number, and pumping rates shall be determined during the design of the ground water recovery system. Recovered ground water shall be treated using an onsite treatment system. Ground water shall be treated using activated carbon treatment. Final flow rates and treatment unit dimensions will be determined during the remedial design. The treated effluent shall be reused for beneficial purposes or injected back into the subsurface through injection wells constructed as a part of the remedial action.

CLEANUP STANDARDS FOR GROUNDWATER

The cleanup standards for the ground water are set forth in Table B of Section II of the Decision Summary. The selected remedy, when complete, will have reduced the concentrations of contaminants in ground water to below the cleanup standards thereby satisfying the chemical-specific ARARs (Federal

or State MCLs, whichever is more stringent and the TBCs State Action Level for toluene) for the Site. In addition, during remediation, this remedy will meet action-specific ARARs for discharging the treated water into the aquifer by injection or for providing treated water to beneficial users of the water. For any waste carbon that is generated during the ground water or soil vapor treatment by activated carbon, the applicable Resource Conservation and Recovery Act and more stringent California Hazardous Waste Control Act requirements will be met.

GROUND WATER REMEDY IMPLEMENTATION

An operation and maintenance plan for the ground water extraction and treatment system shall be required. The performance of the ground water extraction and treatment system shall be carefully monitored on a regular basis and the system may be modified, as warranted by the performance data collected during operation and at the discretion of EPA.

A long-term ground water monitoring program shall be implemented to evaluate the effectiveness of the ground water pumping and treatment system and to demonstrate achievement of cleanup standards. Additional monitoring wells shall be installed if necessary.

X. STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment as required by section 121 of CERCLA. The selected remedial action, when complete, shall comply with applicable or relevant and appropriate environmental standards established under Federal and State environmental laws, unless a statutory waiver is granted. The selected remedy is cost-effective, uses permanent treatment technologies to the maximum extent practicable and includes treatment as a principal element. The following sections discuss how the selected remedy for the Pacific Coast Pipeline Site meets these statutory requirements.

PROTECTION OF PUBLIC HEALTH AND THE ENVIRONMENT

Attainment of clean-up standards will assure that the levels of the contaminants of concern in the ground water at the site will not exceed health-based drinking water standards. Alternative 6 uses engineering controls in the form of a ground water extraction treatment system to remove contaminated ground water from the aquifer where it could be used for consumption. The extraction of VOC-contaminated ground water will significantly reduce the threat of exposure to residents. The implementation of this remedy will not create any short-term risks nor any negative cross-media impacts.

ATTAINMENT OF ARARS

All ARARS will be met by the selected remedy. The selected remedy will achieve compliance with chemical-specific ARARs by treating ground water to concentrations at or below the chemical-specific cleanup standards. Action-specific ARARs will be met for the selected discharge option and for the SVE system. There are no location-specific ARARs.

COST-EFFECTIVENESS

EPA believes the selected remedy is cost-effective and treats the contaminated ground water within a reasonable period of time. The selected remedy fulfills the nine criteria of the NCP and provides overall effectiveness in relation to its cost.

Alternative 6 has a capital cost of approximately $1,075,000 and an approximate annual O&M cost of $480,000. The total net present value is between $2.3 and $7.0 million depending on the time required to cleanup the Site.

USE OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE

The selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be used in a cost-effective manner for the Pacific Coast Pipeline Site. Of those alternatives that are protective of human health and the environment and comply with ARARs, EPA has determined that the selected remedy provides the best balance of long-term effectiveness and permanence; reduction of toxicity, mobility and volume through treatment; short-term effectiveness; implementability, and cost effectiveness. The selected remedy has also been accepted by the state and community.

PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

Contaminants of concern in the ground water will be extracted, and treated. The treatment will occur in the carbon adsorption treatment system to remove and concentrate the contaminants. Captured contaminants will be destroyed when the carbon is regenerated or replaced and thermally destroyed. Therefore, this remedy satisfies the statutory preference for remedies that employ treatment which permanently and significantly reduces toxicity, mobility or volume of hazardous substances as a principal element.

ATTACHMENT A

PACIFIC COAST PIPELINES
Fillmore, California
ADMINISTRATIVE RECORD INDEX

DATE yy/mm/dd	AR #	AUTHOR	ADDRESSEE	SUBJECT
00/00/00	AR 1			Newspaper article: Possible small toxic leak from old Texaco refinery poses no danger, EPA tells city
81/06/09	AR 2	R Mattson Texaco Inc	Environmental Protection Agency - Region 9	Notification of hazardous waste site w/attch site history abstract, California site evaluation sheets
84/02/00	AR 3	Radian Corp	Texaco Inc	Environmental evaluation, final rpt
85/03/01	AR 4	Linda Hogg, Dave Hartley CA Dept of Health Services	Texaco Inc	Ltr: CADOHS investigating possible hazardous waste sites, requests completion of survey form, w/o attchs, w/marginalia
85/09/23	AR 5	Raymond Delacourt CA Regional Water Quality Control Board - Los Angeles Basin Region	Lowell Craft Texaco Inc	Ltr: Concern re delay in cleanup & mitigation, request rpt re reasons for delay, new schedule
85/10/17	AR 6	Gordon Turl Texaco Inc	Raymond Delacourt CA Regional Water Quality Control Board - Los Angeles Basin Region	Ltr: Response to 9/23/85 ltr re cleanup delay
87/01/09	AR 7	Gordon Turl Texaco Inc	Raymond Delacourt CA Regional Water Quality Control Board - Los Angeles Basin Region	Ltr: Geohydrologic investigation, w/attch groundwater assessment well MW-8, 1/8/87 WK Specs for Trihydro, 2/24/87 re same, 3/2/87 backup memo
87/07/22	AR 8	Gordon Turl Texaco Inc	Athar Khan CA Regional Water Quality Control Board	Ltr: Initial information re monitoring wells w/attch well data, location map
87/10/20	AR 9	Gordon Turl Texaco Inc	R Delacourt, A Belamo CA Regional Water Quality Control Board - Los Angeles Basin Region	Ltr: Progress rpt re groundwater investigation w/o attch Trihydro rpt
87/12/18	AR 10	Henry Richter TriHydro Corp	Gordon Turl Texaco Inc	Ltr: Data re local & regional ground-water flow directions, ID water wells in facility & town areas w/attch well inventories, flow well maps
88/06/20	AR 11	Jerry Clifford Environmental Protection Agency - Region 9	Wendall Clark Texaco Inc	Ltr: EPA proposing to add Pacific Coast Pipelines to NPL list, 60-day comment period opened by Federal Register notice

PACIFIC COAST PIPELINES
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DATE yy/mm/dd	AR #	AUTHOR	ADDRESSEE	SUBJECT
88/06/27	AR 12	TriHydro Corp	Texaco Inc	Ground-water & soils assesment progress rpt, Texaco Fillmore Facility (draft)
89/03/17	AR 13	Glenn Anderson ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	TL: Rpts dated 12/18/87 w/o rpts, requested rpts of 12/18/87 & 1/12/89 w/o rpts
89/03/30	AR 14	Jerry Clifford Environmental Protection Agency - Region 9	Keate Worley Texaco Inc	General notice ltr w/attch mail receipt #(not given), concurrence page
89/04/18	AR 15	TriHydro Corp	Texaco Inc	2/89 Water quality monitoring results, Texaco Fillmore facility
89/04/24	AR 16	Judith Wenker Texaco Inc	William Keener Environmental Protection Agency - Region 9	Ltr: Acknowledges receipt of general notice ltr of 3/30/89
89/05/17	AR 17	Michael Montgomery Environmental Protection Agency - Region 9	Gordon Turl Texaco Inc	Ltr: Requests rpts & other documents re site, 4/25 workplan inadequate w/attch draft SOW
89/06/09	AR 18	Gordon Turl Texaco Inc	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Community relations effort w/overheads, rpt: Assesment of exposure & public health.., mtg materials rpt: Current... remediation project
89/06/26	AR 19	Jerry Clifford Environmental Protection Agency - Region 9	James Kinnear Texaco Inc	Ltr: Notification of special notice moratorium, criteria for good faith offer to do RI/FS w/o consent order, w/certified mail receipt #P918448216
89/06/27	AR 20	Michael Montogomery Environmental Protection Agency - Region 9	Glenn Anderson ENSR Consulting & Engineering	TL: 2/89 water quality monitoring results, Texaco Fillmore facility w/o rpt
89/08/09	AR 21	Gordon Turl Texaco Inc	Jerry Clifford Environmental Protection Agency - Region 9	Ltr: Response to 6/30/89 ltr-willing to do RI/FS, ENSR to be consultant, intent to submit good faith offer
89/09/13	AR 22	Gordon Turl Texaco Inc	Jerry Clifford Environmental Protection Agency - Region 9	Ltr: Comments on Remedial investigation/feasibility study workplan draft rpt w/o attchs
89/09/14	AR 23	Michael Montgomery Environmental Protection Agency - Region 9	Terrence Gilday Ventura County - Environmental Health Dept	Ltr: Request for meeting location for first technical steering commitee

PACIFIC COAST PIPELINES
Fillmore, California
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DATE yy/mm/dd	AR #	AUTHOR	ADDRESSEE	SUBJECT
89/09/21	AR 24	Michael Montgomery Environmental Protection Agency - Region 9	Gordon Turl Texaco Inc	Ltr: Extension of moratorium, receipt of draft workplan, w/attch comments on workplan
89/09/29	AR 25	ENSR Consulting & Engineering	Texaco Inc	Remedial Investigation/Feasibility study workplan for the Texaco facility
89/10/00	AR 26	Environmental Protection Agency - Region 9		Pacific Coast Pipelines community relations plan
89/10/03	AR 27	Gordon Turl Texaco Inc	Michael Montgomery Environmental Protection Agency - Region 9	TL: Manifest summaries from Fillmore remediation site manifest logs, w/o attch handwritten summaries
89/10/04	AR 28	Micheal Montgomery Environmental Protection Agency - Region 9	Gordon Turl Texaco Inc	Ltr: Consent order can be signed, community relations plan (CRP) prepared, w/o attch CRP, fact sheet
89/10/06	AR 29	Terrence Gilday Ventura County - Environmental Health Dept	Environmental Protection Agency - Region 9	Ltr: Comments on community relations plan w/attch corrections, mailing envelope
89/10/16	AR 30	Michael Montgomery Environmental Protection Agency - Region 9	Gordon Turl Texaco Inc	Ltr: Meeting schedules, rpts w/o PRP SAP guidance pole creek construction, ecological assesment group notes
89/11/00	AR 31	Environmental Protection Agency - Region 9		Fact sheet: EPA signs agreement with Texaco to continue investigation of contamination at former refinery
89/11/15	AR 32	Jeff Zelikson Environmental Protection Agency - Region 9	R R Dickinson Texaco Inc	Administrative consent order, docket #90-03
89/12/00	AR 33	Texaco Inc	Environmental Protection Agency - Region 9	12/89 Monthly status rpt per order #90-02 w/TL to Michael Montgomery from Gordon Turl, 1/10/90
89/12/06	AR 34	Gordon Turl Texaco Inc	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Purpose of initial monthly status rpt per admin order #90-03 w/attch 11/89 rpt
90/01/08	AR 35	Michael Montgomery Environmental Protection Agency - Region 9	Gordon Turl Texaco Inc	Ltr: Request Tri-Hydro docs be sent to CH2M Hill, need for permits, steering committee mtg scheduled for 3/16/90
90/01/15	AR 36	ENSR Consulting &	Texaco Inc	Remedial investigation site backround

PACIFIC COAST PIPELINES
Fillmore, California
ADMINISTRATIVE RECORD INDEX

DATE yy/mm/dd	AR #	AUTHOR	ADDRESSEE	SUBJECT
		Engineering		summary draft rpt
90/01/15	AR 37	Gordon Turl Texaco Inc	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Site backround summary rpt, facility not appropriate for NPL listing w/o rpt
90/01/30	AR 38	Michael Montgomery Environmental Protection Agency - Region 9	Gordon Turl Texaco Inc	Ltr: Comments on draft remedial investigation site background study w/attch 1 & 2
90/02/00	AR 39	Texaco Inc	Environmental Protection Agency - Region 9	1/90 monthly status rpt per admin order #90-03 w/TL to Michael Montgomery fr Gordon Turl, 2/20/90
90/02/02	AR 40	Gregory Smith Ventura County - Environmental Health Dept	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Arrangements for next technical steering committee meeting
90/03/00	AR 41	ENSR Consulting & Engineering	Texaco Inc	Remedial investigation/site backround summary w/TL to Michael Montgomery fr Gregory Rumford, 3/2/90
90/03/00	AR 42	Texaco Inc	Environmental Protection Agency - Region 9	3/90 monthly status rpt per admin order #90-03 w/attch meeting agenda & attendees list, TL to Michael Montgomery from Gordon Turl
90/03/00	AR 43	Texaco Inc		2/90 monthly status rpt per admin order #90-03 w/attach chain of custody records & Water quality monitoring results w/TL to M Montgomery from G Turl
90/03/01	AR 44	Michael Montgomery Environmental Protection Agency - Region 9	Technical steering commitee	Memo: Next Technical steering commitee meeting scheduled for 3/16/90 w/attch commitee mailing list & meeting attendees list
90/03/23	AR 45	Gregory Rumford ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Links in field activites w/attch schedule & PERT Chart
90/04/00	AR 46	Texaco Inc		4/90 monthly status rpt per admin order #90-03 w/meeting attendees revised schedule of deliveries & TL to Michael Montogomery from Gordon Turl,5/16/90
90/04/12	AR 47	CA Dept of Health	Environmental Protection	Comments to field sampling plans w/TL to

PACIFIC COAST PIPELINES
Fillmore, California
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DATE yy/mm/dd	AR #	AUTHOR	ADDRESSEE	SUBJECT
		Services	Agency - Region 9	Michael Montgomery from Hamid Saebfar
90/04/18	AR 48	Michael Montgomery Environmental Protection Agency - Region 9	Gordon Turl Texaco Inc	Ltr: Comments on Draft QAPP & Field sampling plans w/8 attchs
90/04/26	AR 49	Greg Rumford ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	TL: Revised maps borehole & monitoring well locations w/marginalia w/subsurface & hydrogeologic sampling rationale w/marginalia, soil gas survey rpt
90/05/00	AR 50	Texaco Inc	Environmental Protection Agency - Region 9	5/90 monthly status rpt re admin order #90-03 w/TL to Michael Montgomery fr Gordon Turl, 6/14/90
90/05/03	AR 51	ENSR Consulting & Engineering	Environmental Protection Agency - Region 9	3/91 monthly status rpt per admin order #90-03 w/TL to Michael Montgomery fr Gregory Rumford, 5/3/90
90/05/04	AR 52	TriHydro Corp	Texaco Inc	2/90 water quality monitoring results, w/TL to Michael Montgomery fr George Hood, 5/4/90
90/06/00	AR 53	Texaco Inc		6/90 Monthly status rpt per admin order #90-03, w/TL to Michael Montgomery fr Gordon Turl, 7/2/90
90/06/08	AR 54	ENSR Consulting & Engineering		Memo: Errata sheets, pages to replace pages now in sampling plans
90/06/18	AR 55	Michael Montgomery Environmental Protection Agency - Region 9	Gordon Turl Texaco Inc	Ltr: Preliminary comments to revised sampling plans & QAPP & project schedule revision w/attchs
90/06/28	AR 56	Glenn Mayer et al CH2M Hill	Michael Montgomery Environmental Protection Agency - Region 9	Memo: Phone conversation re ambient air sampling plan w/fax cover to Mike Montgomery fr Terry Foreman, 6/28/90
90/07/00	AR 57	ENSR Consulting & Engineering	Texaco Inc	Field sampling plan for air remedial investigation/feasibility study (RI/FS)
90/07/00	AR 58	ENSR Consulting & Engineering	Texaco Inc	Field sampling plan for subsurface soil remedial investigation/feasibility study (RI/FS)
90/07/00	AR 59	ENSR Consulting & Engineering	Texaco Inc	Field sampling plan for hydrogeologic remedial investigation/feasibility study

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DATE yy/mm/dd	AR #	AUTHOR	ADDRESSEE	SUBJECT
				(RI/FS)
90/07/00	AR 60	ENSR Consulting & Engineering	Texaco Inc	Field sampling plan for surface soils remedial investigation feasibility study (RI/FS)
90/07/00	AR 61	ENSR Consulting & Engineering	Texaco Inc	Field sampling plan for soil gas remedial investigation/ feasibility study (RI/FS)
90/07/00	AR 62	ENSR Consulting & Engineering	Texaco Inc	Site safety plan for remedial investigation/feasibility study (RI/FS)
90/07/00	AR 63	ENSR Consulting & Engineering	Texaco Inc	Quality assurance project plan remedial investigation/feasibility study (RI/FS) v1 of 3
90/07/00	AR 64	ENSR Consulting & Engineering	Texaco Inc	Quality assurance project plan remedial investigation/feasibility study (RI/FS) v2 of 3, appendices A-C
90/07/00	AR 65	ENSR Consulting & Engineering	Texaco Inc	Quality assurance project plan remedial investigation/feasibility study (RI/FS), v3 of 3, appendices D-H
90/07/00	AR 66	ENSR Consulting & Engineering	Environmental Protection Agency - Region 9	7/90 monthly status rpt per admin order #90-03 w/TL to Michael Montgomery from Gregory Rumford, 8/16/90
90/07/00	AR 67	Environmental Protection Agency - Region 9		Fact sheet: Texaco begins field investigation work at former Texaco refinery, (bilingual Spanish/English)
90/07/07	AR 68	Gregory Rumford ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Review of field sampling & quality assurance project plan w/attch comments,FAX cover sheet to Michael Montgomery for Greg Rumford, 7/9/90
90/07/11	AR 69	Gregory Rumford ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	TL: Field sampling plans for Hydrogeologic, Surface soil remediation, surface water & stream sediment, subsurface soil RI/FS w/o rpts
90/07/12	AR 70	ENSR Consulting & Engineering	Environmental Protection Agency - Region 9	6/90 monthly status rpt per admin order 90-03 w/attch ltr to Michael Montgomery fr Jorge Penalba, 7/12/90

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DATE yy/mm/dd	AR #	AUTHOR	ADDRESSEE	SUBJECT
90/07/12	AR 71	G Rumford, J Penalba ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	TL: FSP for soil gas RI/FS w/o rpt
90/07/20	AR 72	Michael Montgomery Environmental Protection Agency - Region 9	Gordon Turl Texaco Inc	Ltr: Approval granted for planning documents for remedial investigation field work per consent order w/o attch
90/07/21	AR 73	Gregory Rumford ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: RI errata to field sampling & QAPP plans
90/08/00	AR 74	ENSR Consulting & Engineering	Texaco Inc	Surface water & stream sediment remedial investigation rpt
90/08/00	AR 75	ENSR Consulting & Engineering	Texaco Inc	Private well investigation hydrogeological RI/FS w/FAX TL to Michael Montgomery fr Bob Tait, 8/20/90
90/08/01	AR 76	CH2M Hill	Environmental Protection Agency - Region 9	Admendment to field sampling plan for split sampling, (contract #068-W9-009, TES 12 WA #C09020) w/TL to Michael Montgomery from Terry Foreman,8/31/90
90/08/15	AR 77	Michael Montgomery Environmental Protection Agency - Region 9	Technical Steering Commitee	Memo: Scheduling of next steering commitee for 9/05/91 w/o encl monthly status rpt
90/08/15	AR 78	Everard Ashworth ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Confirms telephone conversations re air sampling program
90/08/16	AR 79	ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Revisions for QAPP, 7/90 w/QAPP signature page, Appendix F: Analytical method description
90/09/00	AR 80	ENSR Consulting & Engineering	Texaco Inc	Texaco Fillmore facility monthly status rpt
90/09/04	AR 81			List of attendees for steering committee meeting
90/09/05	AR 82			Agenda for technical steering committee meeting at Ventura county government center
90/09/07	AR 83	TriHydro Corp	Texaco Inc	Soil gas RI/FS investigation

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90/09/07	AR 84	John Ahern TriHydro Corp	Michael Montgomery Environmental Protection Agency - Region 9	TL: Soil & gas RI/FS w/o rpt
90/10/00	AR 85	ENSR Consulting & Engineering	Texaco Inc	10/90 monthly status rpt, v1 of 2
90/10/00	AR 86	ENSR Consulting & Engineering	Texaco Inc	9/90 monthly status rpt, v2 of 2-Errata sheets for surface soils remedial investigation rpt, September 1990
90/10/01	AR 87	Marni McEntee Star Free Press	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Cleanup article focus on residents w/attch newsclip: oil waste is part of life in Fillmore, 9/10/90
90/10/24	AR 88	Janet Bergano Los Angeles Times		Newsclip: Fillmore: Wells to monitor pollution at school
90/10/29	AR 89	Hamid Saebfar CA Dept of Health Services	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Comments on air sampling program results,10/90
90/11/00	AR 90	ENSR Consulting & Engineering	Texaco Inc	RI/FS Hydrogeologic field investigation preliminary draft rpt
90/11/00	AR 91	ENSR Consulting & Engineering	Texaco Inc	10/90 monthly status rpt w/TL to Michael Montgomery fr Gregory Rumford
90/11/00	AR 92	ENSR Consulting & Engineering	Texaco Inc	10/90 monthly status rpt, attachment A
90/11/13	AR 93	Micheal Montgomery Environmental Protection Agency - Region 9	Gordon Turl Texaco Inc	Ltr: Preliminary comments on field investigation rpts w/o attch comments
90/11/21	AR 94	Gregory Rumford ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Explanation of planned field work re phase 2 monitoring wells w/attchs
90/12/00	AR 95	Environmental Protection Agency - Region 9		Factsheet: Texaco to install additional wells off-site, (bilingual, Spanish/English)
90/12/06	AR 96	Gregory Smith Ventura County - Environmental Health Dept	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Technical steering committee meeting arrangements

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DATE yy/mm/dd	AR #	AUTHOR	ADDRESSEE	SUBJECT
90/12/17	AR 97	Gregory Rumford ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	TL: 11/90 monthly status rpt per admin order #90-03 w/rpt
90/12/18	AR 98	Michael Montgomery Environmental Protection Agency - Region 9	Technical Steering Commitee	Memo: Upcoming technical steering commitee meeting, 1/23/91
90/12/27	AR 99	Michael Montgomery Environmental Protection Agency - Region 9	Jim Ross et al CA Regional Water Quality Control Board	Memo: State or local environmental protection criteria, standard of control, requirements... w/attch appendix A: ARARs & water quality goals
91/01/00	AR 100	ENSR Consulting & Engineering	Texaco Inc	Draft remedial investigation rpt, v1
91/01/00	AR 101	ENSR Consulting & Engineering	Texaco Inc	Draft remedial investigation rpt, v2
91/01/00	AR 102	ENSR Consulting & Engineering	Texaco Inc	Draft remedial investigation rpt, appendices
91/01/10	AR 103	Gregord Rumford ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Proposed restriction of analyses in phase 2 sampling
91/01/10	AR 104	Gregory Rumford ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Proposed restriction of analyses in phase 2 sampling w/FAX to Michael Montgomery fr Greg Rumford 1/10/91
91/01/11	AR 105	Michael Montgomery Environmental Protection Agency - Region 9	Glenn Anderson Texaco Inc	Ltr: Response to 1/10/91 ltr fr Greg Rumford re reduction of analysis for ground water sampling
91/01/22	AR 106	ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	Data review summary of groundwater & subsurface soil investigation results w/2 TLs to Montgomery from Rumford
91/01/23	AR 107	ENSR Consulting & Engineering		Overheads for Texaco Fillmore RI/FS Technical steering committee meeting
91/03/00	AR 108	ENSR Consulting & Engineering	Texaco Inc	Final Remedial Investigation rpt, Texaco Fillmore facility
91/03/06	AR 109	Michael Montgomery Environmental Protection Agency - Region 9	Glenn Anderson Texaco Inc	Ltr: Draft comments on draft remedial investigation rpt, amended deliverables schedule w/attch comments

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91/03/08	AR 110	Hamid Saebfar CA Dept of Health Services	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Comments on transmittal of ARARs of 12/27/90 w/attch applied action levels, title sheet
91/03/15	AR 111	Michael Montgomery Environmental Protection Agency - Region 9	Glenn Anderson Texaco Inc	Ltr: Preliminary discussion of potential contaminants and related "standards"
91/04/17	AR 112	Michael Montgomery Environmental Protection Agency - Region 9	Greg Rumford ENSR Consulting & Engineering	Ltr: Recommendation of restricted level of chemical analysis for 4/91 monitoring w/FAX TL to M Montgomery fr G Rumford, 4/17/91
91/05/00	AR 113	ENSR Consulting & Engineering	Texaco Inc	RI/FS 4/91, monthly status rpt
91/05/21	AR 114	Terrence Fox Ultramar, Inc	David Wadsworth Ventura County - Environmental Health Dept	Ltr: Comments on rpt received on 5/21/91, w/attch envelope
91/05/29	AR 115	Glenn Anderson Texaco Inc	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Recap of 3/8/91 meeting, description of deliverables, w/attch table of contents for groundwater FS rpts w/27 maps in plastic folders
91/06/00	AR 116	ENSR Consulting & Engineering	Texaco Inc	Final remedial investigation rpt, v1, (appendix A)
91/06/00	AR 117	ENSR Consulting & Engineering	Texaco Inc	Final Remedial Investigation rpt, v 3, (appendices J)
91/06/00	AR 118	ENSR Consulting & Engineering	Texaco Inc	Final Remedial Investigation rpt, v2, (appendices B-I)
91/06/00	AR 119	ENSR Consulting & Engineering	Texaco Inc	Final remdial investigation rpt, v4, (appendices)
91/06/00	AR 120	ENSR Consulting & Engineering	Texaco Inc	Final remedial investigaton rpt, v5, (appendices)
91/06/00	AR 121	ENSR Consulting & Engineering	Texaco Inc	RI/FS May 1991 monthly status rpt
91/06/00	AR 122	ENSR Consulting & Engineering	Texaco Inc	Draft remedial alternative development & screening
91/07/24	AR 123	ENSR Consulting &	Environmental Protection	Ltr: Third quarter groundwater sampling

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		Engineering	Agency - Region 9	w/TL to Michael Montgomery from Ellen Hedfield, 7/24/91
91/07/24	AR 124	Ellen Hedfield ENSR Consulting & Engineering	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Recommends more focused level of analysis for 8/91 quarterly monitoring w/Tl to Michael Montgomery from Ellen Hedfield, 7/24/91
91/08/00	AR 125	ENSR Consulting & Engineering	Texaco Inc	7/91 monthly status rpt
91/08/13	AR 126	CH2M Hill	Environmental Protection Agency - Region 9	Draft baseline risk assessment
91/08/27	AR 127	Michael Montgomery Environmental Protection Agency - Region 9	Technical Steering Commitee	Memo: Upcoming Technical Steering commitee meeting will be held 9/12/91
91/09/00	AR 128	ENSR Consulting & Engineering	Texaco Inc	Monthly status rpt 8/91 per admin order
91/09/12	AR 129	Environmental Protection Agency - Region 9		Agenda: Technical steering commitee meeting
91/09/12	AR 130			List of attendees at technical steering committee meeting
91/09/19	AR 131	Glenn Anderson Texaco Inc	Terrence Fox Ultramar, Inc	Ltr: Location of proposed monitoring wells in Fillmore w/attch map
91/09/20	AR 132	Hamid Saebfer CA Environmental Protection Agency - Dept of Toxic Substances Control	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Comments on draft remedial alternative development & screening rpt 6/91 & draft baseline risk assessment 8/13/91
91/10/00	AR 133	ENSR Consulting & Engineering	Texaco Inc	Aquifer testing rpt
91/10/00	AR 134	Texaco Inc	Environmental Protection Agency	10/91 monthly status rpt per admin order #90-03
91/10/02	AR 135	Mark Passarini Texaco Inc	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Location of sampling wells w/attch well map & transmittal cover sheet to Mike Montgomery, 10/02/91
91/10/08	AR 136	David Wadsworth	Terrence Fox	Ltr: Approval of 2/15/91 proposal with

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DATE yy/mm/dd	AR #	AUTHOR	ADDRESSEE	SUBJECT
		Ventura County - Environmental Health Dept	Ultramar, Inc	comments & conditions w/attch envelope
91/10/14	AR 137	Texaco Inc		Site health & safety plan, RI/FS study
91/10/15	AR 138	Hamid Saebfar CA Dept of Health Services	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Review of draft detailed analysis of remedial alternatives w/attch comments
91/10/28	AR 139	Glenn Anderson Texaco Inc	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Comment on draft risk assessment
91/10/30	AR 140	Mark Passarini Texaco Inc	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: Proposed fourth quarter groundwater sampling
91/11/00	AR 141	Texaco Inc	Environmental Protection Agency - Region 9	Monthly status rpt 11/91 per admin order #90-03
91/11/00	AR 142	ENSR Consulting & Engineering	Texaco Inc	Third quarter groundwater sampling rpt per admin order 90-03
91/11/11	AR 143	Michael Montgomery Environmental Protection Agency - Region 9	Glenn Anderson Texaco Inc	Ltr: Comments on detailed analysis of remedial alternatives 10/91 by EPA & CAL-EPA, RI/FS deliverables schedule w/attchs
91/11/18	AR 144	David Wadsworth Ventura County - Environmental Health Dept	Joshua Workman CA Regional Water Quality Control Board - Los Angeles Basin Region	Ltr: Lead agency transfer Beacon/Ultramar service station w/attch photocopies of business cards, site maps, mailing envelope
91/11/21	AR 145	CA Dept of Water Resources		Water well driller rpt for Ultramar
91/11/22	AR 146	CA Toxic Substances Control Div	Amancio Sycip CA Toxic Substances Control Div	Memo: Comments on evaluation of draft risk assessment for the site
91/11/22	AR 147	Glenn Anderson Texaco Inc	Michael Montgomery Environmental Protection Agency - Region 9	TL: Comments on draft baseline risk assessment, 8/13/91 w/attch
91/12/00	AR 153	Texaco Inc	Environmental Protection Agency - Region 9	12/91 monthly status rpt per admin order #90-03 w/attch maps

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91/12/11	AR 148	CH2M Hill	Planning Research Corp	Final baseline risk assessmant, (WA #PRC C09020, cont #68-W9-0009), w/TL to Michael Montgomery fr Terry Foreman, 12/10/91
91/12/23	AR 149	ENSR Consulting & Engineering	Texaco Inc	Feasibility study rpt, (draft)
92/01/00	AR 150	ENSR Consulting & Engineering	Texaco Inc	Feasibility study rpt revised (draft)
92/01/13	AR 151	Michael Montgomery Environmental Protection Agency - Region 9	Amancio Sycip CA Toxic Substances Control Div	Ltr: Request completion of identification of proposed state ARARs by 1/31/92, meeting for week of 2/3/92
92/01/23	AR 152	Environmental Protection Agency - Region 9		Guidance documents
92/02/00	AR 154	ENSR Consulting & Engineering	Texaco Inc	Final feasibility study (FS) rpt
92/02/00	AR 155	Environmental Protection Agency - Region 9		Fact sheet: EPA announces proposed plan for cleanup...(bilingual English-Spanish)
92/02/04	AR 156	CA Environmental Protection Agency - Dept of Toxic Substances Control	Amancio Sycip CA Environmental Protection Agency - Dept of Toxic Substances Control	Memo: Comments on feasibility study (FS)
92/02/07	AR 157	Michael Montgomery Environmental Protection Agency - Region 9	Glenn Anderson Texaco Inc	Ltr: Final comments on draft feasibility study dated January 1992, suggests conference call for 2/18/92 w/attch
92/02/11	AR 158	Mark Passarini Texaco Inc	Michael Montgomery Environmental Protection Agency - Region 9	Ltr: First quarter sampling will begin 2/18/92, sampling will last 7 to 10 days, will not include semi-volatile organics
92/02/15	AR 159	Mark Passarini Texaco Inc	Michael Montgomery Environmental Protection Agency - Region 9	1/92 monthly status rpt per administrative order #90-03

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No. of Records: 159
\arfinal1.rpt

Attachment B

PACIFIC COAST PIPELINE SUPERFUND SITE
CITY OF FILLMORE, COUNTY OF VENTURA
CALIFORNIA

RESPONSIVENESS SUMMARY

A. OVERVIEW

At the time of the public comment period, EPA proposed a preferred alternative for the Pacific Coast Pipeline Superfund site in Fillmore, California. Judging from the few comments received during the public comment period, there is moderate community concern about risk from the site. EPA's clean-up remedy appears to be supported by area residents.

These sections follow:

* Background on Community Involvement;
* Summary of Comments Received during Public Comment Period and Agency Responses;
* Community Relations Activities at the Pacific Coast Pipeline site.

B. BACKGROUND ON COMMUNITY INVOLVEMENT

Through the development of the Community Relations Plan, several groups were identified as having a high level of interest in the site. These groups included the City Council, Staff of San Cayetano Elementary School, and the parents of students attending the school. EPA provided periodic presentations on the status of site activities to these groups. In addition, Fact Sheets were sent to area residents summarizing major milestones. To summarize past community involvement, most residents seemed satisfied with the information they received about the site, and confident in the work EPA and Texaco were conducting during the Remedial Investigation/Feasibility Study (RI/FS).

C. SUMMARY OF COMMENTS RECEIVED DURING PUBLIC COMMENT PERIOD AND AGENCY RESPONSES

Comments raised during the Pacific Coast Pipeline public comment period and agency responses are summarized below. The comment period was held from February 20 to March 25, 1992. All of the following were expressed in letters received by EPA during the public comment period. No comments specific to the proposed plan were made at the public meeting held on March 10, 1992.

1. The site poses insignificant risks to humans and therefore EPA should select the no action alternative; no more public or private funds should be expended on the site.

EPA Response: There is ground water contamination at the site that exceeds the State and Federal standards for drinking water and ground water in this area is used for agricultural and residential purposes. State and Federal drinking water standards are health-based standards and are used by EPA to define acceptable risk. Therefore, EPA believes the ground water contamination presents an imminent and substantial endangerment to public health and warrants remedial action. The Superfund law requires that clean-up remedies meet State and Federal standards that are applicable to the site. In this case, the drinking water standards apply to the ground water. The no-further action would not meet this requirement.

2. What impact does the site have on citrus production in the area?

EPA Response: This comment does not address the proposed remedy or other alternatives presented in the Administrative Record. However, no impacts would be anticipated based on the results of the Remedial Investigation.

3. The levels of compounds found in soil and water in and around the site are extremely low relative to other petroleum remediation sites. We believe this may be the direct result of actions taken by Texaco to remove 38,000 tons of waste material and degraded soils from the site in 1986 as well as the level of natural biodegradation which has been and continues to take place there. In preparing your comments on the Final Feasibility Study (for which we are preparing separate responses) and in your Proposed Cleanup Plan, you acknowledge that biodegradation is indeed occurring and that it should be evaluated.

Please note the relatively low benzene levels and biodegradation were not discussed at the March 10 community meeting. Also, note that Texaco conducted waste removal operations and was not under order from the California Department of Health Services. This latter point was incorrectly reported in the Site History portion of the Proposed Cleanup Plan and should have been corrected at the March 10 community meeting.

EPA Response: During the March 10, 1992 community meeting, site contaminant concentrations were referred to as representing "low levels" and biodegradation at the site was also discussed. The text of the ROD recognizes that Texaco was not under "order" but did submit documents for review to the California Department of Health Services during the excavation.

4. Using a conservative approach, EPA determined environmental and human health risks associated with the low levels of substances found in and around the site to be within the acceptable risk range

and would not have significant effects on public health. In addition, it is likely that the biodegradation observed at the site has reduced the risks from those levels reported in the risk assessment. For example, the highest benzene level recorded in site groundwater and used in the risk assessment was 720 parts per billion (ppb) in Texaco monitoring well MW-26S. Levels in that well have been over 100 times lower than that amount over the past several sampling periods and the highest levels recorded in all wells since the Second Quarter 1991 sampling have been 370 ppb in Texaco monitoring well MW-19S and 250 ppb in Ultramar monitoring well MW-9. In any event, some benzene levels found in site groundwater exceed the drinking water standards and, although not currently used as a potable water source, further cleanup of portions of the first encountered aquifer has been specified as the cleanup goal.

In general, achievement of drinking water standards as cleanup goals is a formidable undertaking given: (1) the low levels of compounds, such as benzene, at the site; (2) the complex behavior of such substances in soil and groundwater; and (3) the constraints of current remedial technology. Recent reports prepared for EPA and the Oak Ridge National Laboratory, indicate that "groundwater pumping is ineffective for restoring aquifers to health-based levels." If biodegradation is found to play a key role in reducing benzene levels at the PCPL Superfund Site, then it may be possible to achieve drinking water-based cleanup goals. If not, there needs to be flexibility in the Record of Decision (ROD) and design and implementation processes to account for the technical inability to achieve the proposed cleanup goal with current technology.

EPA Response: EPA is aware of the recent study results regarding groundwater extraction and treatment systems and has incorporated an appropriate level of flexibility into the ROD to address this issue. EPA has not determined that the risk associated with the ground water contamination at the site is acceptable. As discussed in the response to comment 1, levels of contaminants in the ground water at the site exceed state and federal drinking water standards and therefore the ground water contamination presents an imminent and substantial endangerment to public health.

5. It is difficult to achieve extremely low cleanup levels due to complex behavior of substances in soil and groundwater. Based on recent experience at similar sites, it is clear that the level of cleanup and the treatment time must be determined by performance evaluations of the groundwater remediation system. As referenced in the EPA guidance document <u>Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites, December, 1988</u>, performance evaluations are conducted periodically to compare actual performance to expected performance. These evaluations are part of a flexible approach to achieving remedial action objectives. Furthermore, they should be conducted periodically

during the first several years of operation depending on site-specific conditions and operational parameters. Figure 1 presents a decision tree which offers a flexible and reasonable process for assessing performance of groundwater remediation and in deciding when to terminate the remedy. We recommend that Figure 1 be incorporated into the ROD for this site.

EPA Response: EPA has established a minimum periodic review of the remedy to be conducted every 5 years. The frequency of this review may be increased if deemed necessary by EPA during the approval of the Remedial Design/Remedial Action Workplan. The decision tree recommended is flexible however it does not take into account the various modifications recommended by EPA guidance (Suggested Language for Various Ground Water Remediation Options, OSWER Directive 9283.1-03). For example, the guidance recommends that modifications should be considered for sites presenting low uncertainty that the remedy will be able to achieve the cleanup standards. These modifications include:

a) Discontinuing pumping at individual wells where clean-up goals have been met;
b) Alternate pumping at wells to eliminate stagnation points;
c) pulse pumping to allow adsorbed contaminants to partition into ground water; and
d) installation of additional extraction wells to facilitate or accelerate cleanup of the contaminated plume.

The "decision tree" proposed by the commentor does not provide contingencies but relies instead on the provision of a waiver from meeting the site cleanup standards, which is not a contingency recommended by the guidance for this type of site.

6. During the RI/FS process, water quality data indicated generally decreasing plume size (s) and limited horizontal movement for benzene in site groundwater. This may have, for the most part, been due to biodegradation. More recently, changes in the data have occurred which appear to be in response to fluctuations in groundwater levels. While these fluctuations are assessed and the rate of biodegradation is evaluated, there should be flexibility to appropriately respond to conditions encountered through the continued quarterly and specially-conducted monitoring. The remedial systems which may be installed on this site should be designed on a modular basis to provide this flexibility and should only be installed where required and warranted. We also suggest the need for some flexibility relative to the types of technology which may be applied. For example, in lieu of activated carbon for the treatment of air stripping off-gases, catalytic oxidation is included as an option in the Final FS Report and may ultimately be chosen during the design phase to treat said gases. In general, we believe the specification of particular treatment and discharge options in the ROD is unnecessary and would lead to confusion during later stages of the project. The actual choice and arrangement of process equipment should be left for the pre-

design/design phase to allow for maximum flexibility.

EPA Response: EPA will allow reasonable flexibility in the design of the remedy. However, based on the Final Feasibility Study EPA selected activated carbon. In section 3.1 of the Final Feasibility Study "thermal oxidation" was rejected on the basis of cost due to the low levels of constituents in subsurface soils. Similarly, Section 5.4.1.2 of the Final Feasibility Study states,

> "...although carbon adsorption can be expensive for removal of large concentrations of organic contaminants, the total amount of constituents to be removed at this site are low. In addition, no air emission controls or permits will be required with the carbon system. Carbon adsorption is therefore the most effective groundwater treatment technology for this site, and will be included in alternative #4."

However, in the event that a change in the treatment technology is determined to be necessary, EPA shall prepare an explanation of significant difference to the ROD to account for such changes.

7. The existence of an Underground Storage Tank (UST) problem in and around the Ultramar Inc. (formerly Conoco) service station was not included in the Proposed Cleanup Plan and was not discussed at the March 10 community meeting. The service stations is located within Action Area 2 addressed by Texaco in the Final FS Report and has affected soils and groundwater therein. A significant gasoline spill reportedly occurred at that location in 1986 and Ultramar has installed and has recently begun operating a vapor extraction system therein for the remediation of benzene and other chemicals in the soil and groundwater. The progress of Ultramar's current efforts to remediate "their site" will be an important consideration during activities leading to design of those remedial systems which may be appropriate to the PCPL Superfund Site.

EPA Response: This comment, while valid, does not bear directly upon the remedy selected by EPA or the alternatives considered for the Pacific Coast Pipeline Site. Ultramar Inc. is conducting cleanup of soils at its site under the direction of the State's leaking underground gasoline storage tank program.

8. In your Proposed Plan, you mention that a one-year soil study and soil monitoring program will be conducted to assess the rate of biodegradation. While provisions for a so-called soil study were included in the Final FS Report (in fact a one-to two-year study), it also includes provisions to evaluate the rate of degradation taking place in groundwater. We believe it is vital to evaluate groundwater degradation first. Then, after developing a strategy which specifically addresses groundwater cleanup, we would look at specific areas, if any, where soils may be contributing to significant groundwater degradation. In any event, please recognize that the studies of soil and groundwater degradation are not recommended in the Final FS Report per se; rather, action-oriented, "pre-design" evaluations of the existing database, on-

going groundwater monitoring data and specialized sampling results to determine the type, degree and location of degradational activity taking place at the site and what may be required and warranted therein to achieve cleanup and/or accelerate the cleanup process.

EPA Response: EPA's preferred alternative includes a one-year study of soil and ground water conditions prior to conducting the soil vapor extraction program.

9. Whether the EPA-Preferred Remedy (i.e. Extraction and Treatment Plus Soil Vapor Extraction/Bioventing) or an alternate remedy is chosen, we believe it is important to fully understand the issues and consequences of any action which may actually be taken at the site before embarking on detailed design activities and implementation. These issues include the effects of groundwater level fluctuations, specifics of biodegradation in soil and groundwater in the area, long-term effects of pumping, existence of the Ultramar UST problem and others. While EPA's Preferred Remedy may be prove to be an effective option, we believe the above issues are extremely important and that they should be seriously considered in the future to ensure the overall success and effectiveness of the remedial efforts at the PCPL Superfund Site.

EPA Response: The EPA selected remedy includes a one year study. Data indicate that vadose zone contamination may threaten ground water. The above issues shall be taken into account when evaluating the distribution and mass of VOCs in the vadose zone and their possible migration and mixing with groundwater.