Del Amo Superfund Site

Los Angeles, California

U.S. Environmental Protection Agency • Region 9 • San Francisco, CA • June 2010

EPA Requests Comments on Proposed Soil and NAPL Cleanup Plan

Introduction

The United States Environmental Protection Agency (EPA) requests public comments on its Proposed Plan to address contaminated soil at the Del Amo Superfund Site. The EPA, as the lead agency for the Site, has prepared this Proposed Plan in consultation with the California Department of Toxic Substances Control (DTSC).[1] The 60-day comment period is from June 15, 2010 to August 16, 2010. There are several ways to provide comments and these are listed on the last page of this Proposed Plan.

EPA invites you to a Community Meeting where you can hear a presentation on the Proposed Plan and offer your oral and written comments. The meeting will be held on June 30, 2010 at the Holiday Inn Torrance, 19800 South Vermont Avenue, Torrance, from 6:30pm to 8:30 pm.

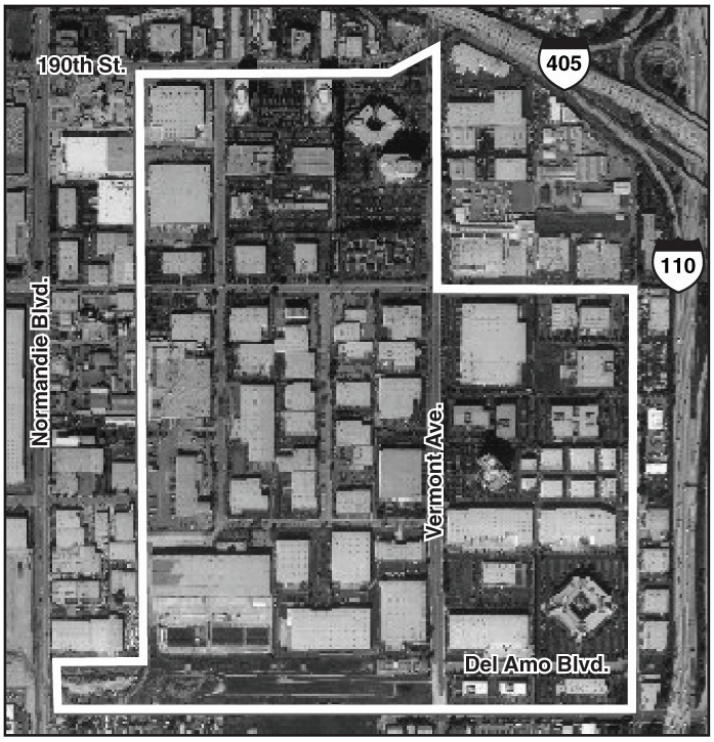


Figure 1: Former Plant Property Outline, Del Amo Superfund Site

Public Comment Period

June 15 – August 16

Public Comment Meeting

Wednesday, June 30th
6:30 p.m. to 8:30 p.m.

Holiday Inn Torrance
19800 South Vermont Avenue
Torrance, California

This Proposed Plan summarizes key information from EPA's investigation and feasibility study reports, including the investigation results and analysis of the cleanup alternatives. It then identifies EPA's preferred method for addressing the contaminants, and explains the ways you can provide public comments. Although EPA has identified a preferred alternative, EPA encourages the public to comment on any or all of the alternatives. All comments will be considered and responded to before a final remedy decision is made in a Record of Decision (ROD). The ROD will include a summary of EPA's responses to the public comments.

For more detailed information, the public is referred to the Remedial Investigation Report, the Feasibility Study Report, and other reports and documents contained within the administrative record, available at the locations specified on the back of this Proposed Plan.

[1] *This Proposed Plan is being issued pursuant to CERCLA §117(a) and the National Contingency Plan §300.430(f)(2).*

Site Background

The Del Amo Superfund site is the former location of a synthetic rubber manufacturing plant, constructed in 1942 to produce rubber for World War II. The former plant covered approximately 280 acres and was located at the southwest corner of the intersection of the 405 and 110 Freeways near Torrance, California. (See Figure 1). It operated until 1972, after which it was dismantled and the land sold to a developer. Through the 1970's and 1980's, the land was subdivided and the majority of the land was redeveloped for commercial and industrial uses.

The former plant used benzene, ethylbenzene, propane, butylene, butane, styrene, and 1,3-butadeine (and lesser amounts of other chemicals) to create the synthetic rubber. During its operations, chemicals were released into soil and groundwater beneath the plant. Some of the plant's releases were leaks from pipelines, storage tanks, and processing units. Plant operators also disposed of waste in unlined pits and ponds. These chemical releases contaminated soil and groundwater beneath the former rubber plant facilities. Some of this contamination exists in a state known as "Non-Aqueous Phase Liquid" (NAPL), which describes chemicals such as benzene that exist as an undissolved liquid in the soil or groundwater. Figure 2 shows an aerial photo of the site in 1971, shortly before demolition.

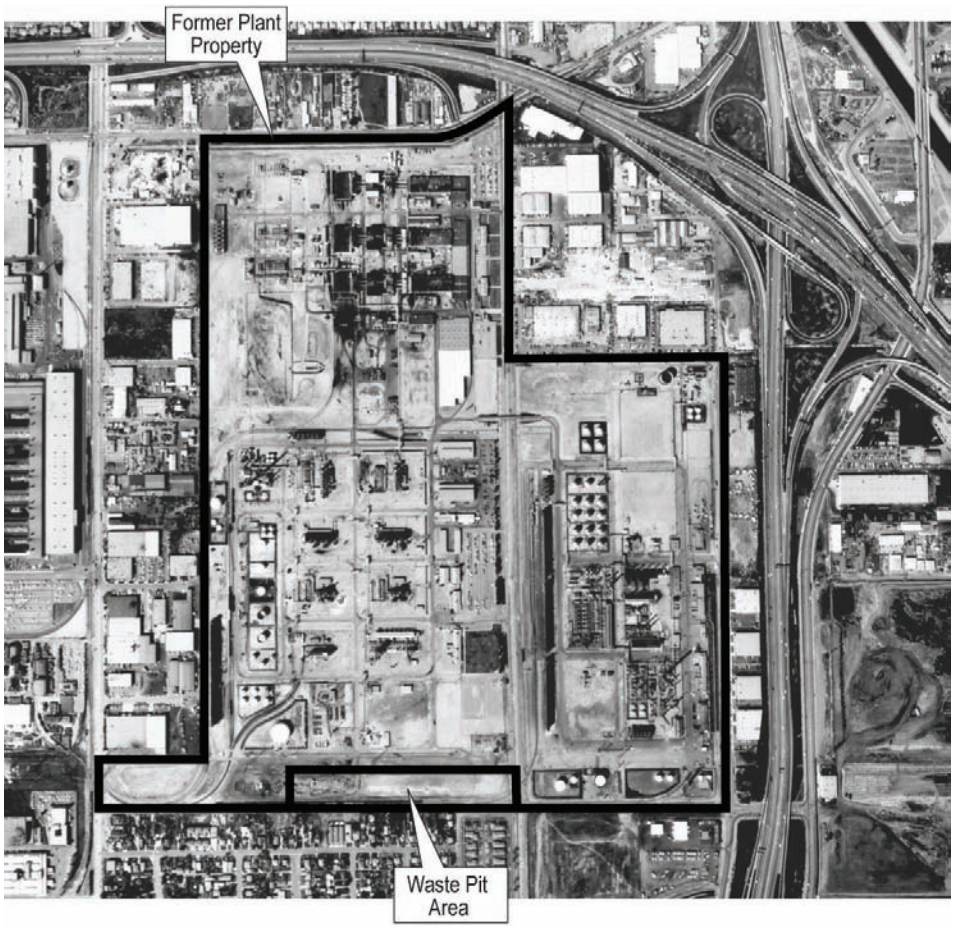


Figure 2: Former Plant Property Photograph, Del Amo Superfund Site

Environmental investigations at the former plant site began in 1982, with the California Department of Health Services (DHS) working with the owners (G.P. Holdings, Inc.) and some of the former operators (Shell Oil Company and The Dow Chemical Company) to investigate and remove some contamination in the Waste Pits Area of the former plant site. These studies were completed in 1990. In 1992, EPA assumed lead agency responsibilities and worked with Shell and Dow to expand investigations to include the entire former plant site. The site was listed on the National Priorities List in 2002.

EPA has engaged the public at the Del Amo Superfund Site, since the mid '90s. EPA has done this through factsheets, open houses, public meetings and workshops. Recently EPA met with community groups, owners and property managers on a one on one basis to familiarize them with EPA's findings to date and discuss the upcoming clean-up plans.

Site-Wide Investigation and Clean-Up Strategy

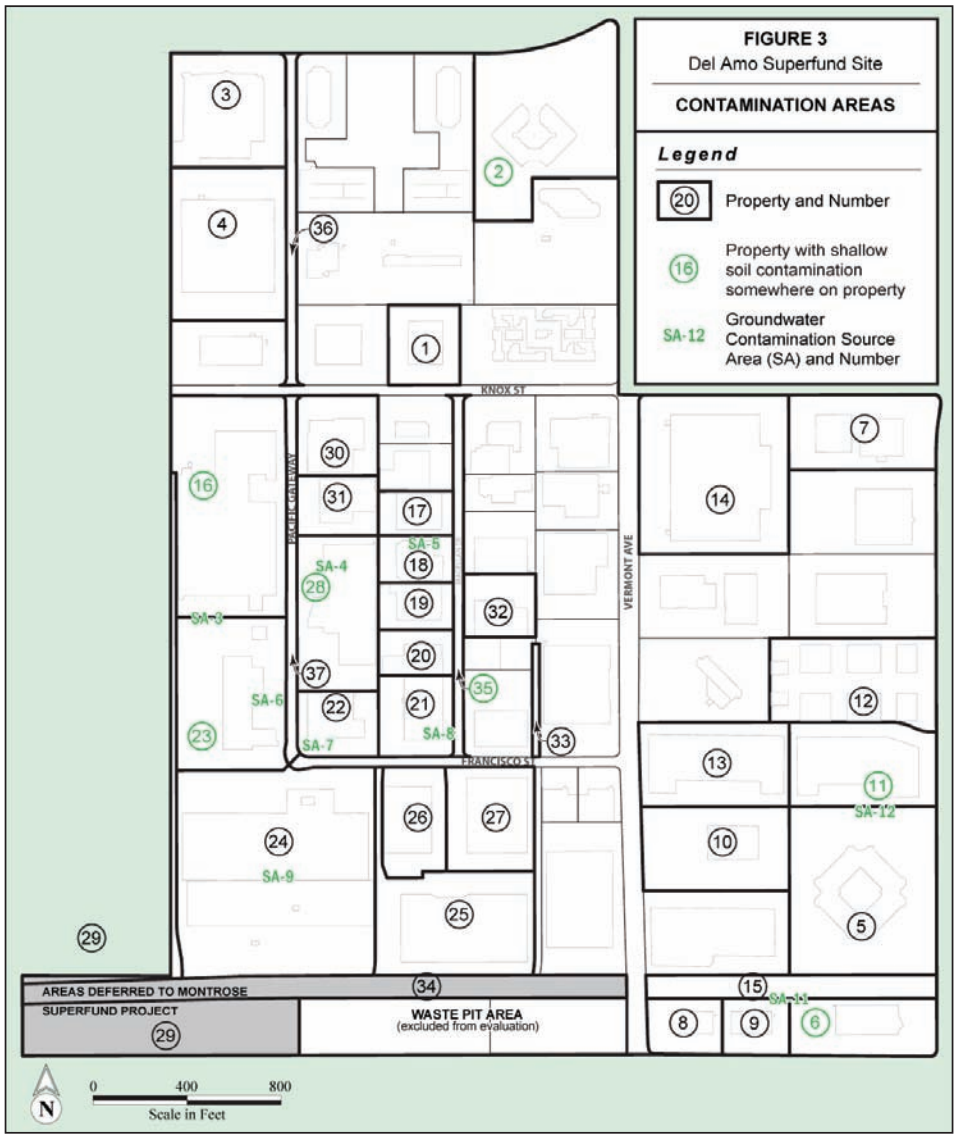
EPA's risk based strategy for the Del Amo Superfund site was to first address the Waste Pits Area, then the contaminated groundwater, and finally the contaminated soil across the rest of the former plant site. The most immediate risk was the Waste Pits Area, since it was emitting hazardous substances into the air adjacent to a residential area. The groundwater was the second most significant risk due to migration of contaminants toward drinking water supply wells. The contaminated soil (outside the Waste Pits area) did not present an immediate threat, as shown by early investigations that found that contamination in the soils was not having a discernible impact on the commercial buildings.

In order to organize the investigation and cleanup activities, EPA divided the Site into the three parts mentioned above, which are called "Operable Units" (OUs). A description of the Operable Units is as follows:

- Operable Unit 1 (OU-1), *Soil & NAPL*. This OU includes all soil outside the Waste Pits Area and is the subject of this Proposed Plan. OU-1 addresses soil contamination, including chemicals in NAPL form, based on potential health risk to current and future occupants of the site, as well as contribution to groundwater contamination. These contaminants constitute the principal threat wastes for OU-1. (See Figure 3).

- Operable Unit 2 (OU-2), *Waste Pits Area*. This OU includes the waste deposited in the Waste Pits as well as the surrounding impacted soil. Early cleanup actions at the Waste Pits Area occurred in the 1980's. The 1997 Record of Decision (ROD) for the Waste Pits Area selected, as its final cleanup system, a multi-layered cap, a soil gas extraction system, and land-use controls. The cap and soil gas systems have been built and are currently being operated, and the land-use controls are in place.

- Operable Unit 3 (OU-3), *Dual-Site Groundwater*. This OU includes the groundwater from the Del Amo site co-mingled with the contamination from the nearby Montrose Superfund site and other neighboring facilities. The cleanup decision for the dual-site groundwater contamination was made in a 1999 ROD, and the cleanup system is currently in the final phase of design. The cleanup system will consist of a groundwater extraction, treatment and re-injection system.



OU-1 is connected to the Dual-Site Groundwater Operable Unit (OU-3) because the OU-1 deep soil contamination, especially in NAPL form, is the source of contamination to the groundwater. Therefore to improve the certainty and long-term effectiveness of the Groundwater OU-3 remedy, the Soil and NAPL OU-1 remedy includes NAPL treatment. Although the NAPL treatment will not be able to remove all the NAPL, a significant reduction will aid in the eventual recovery of the groundwater aquifer.

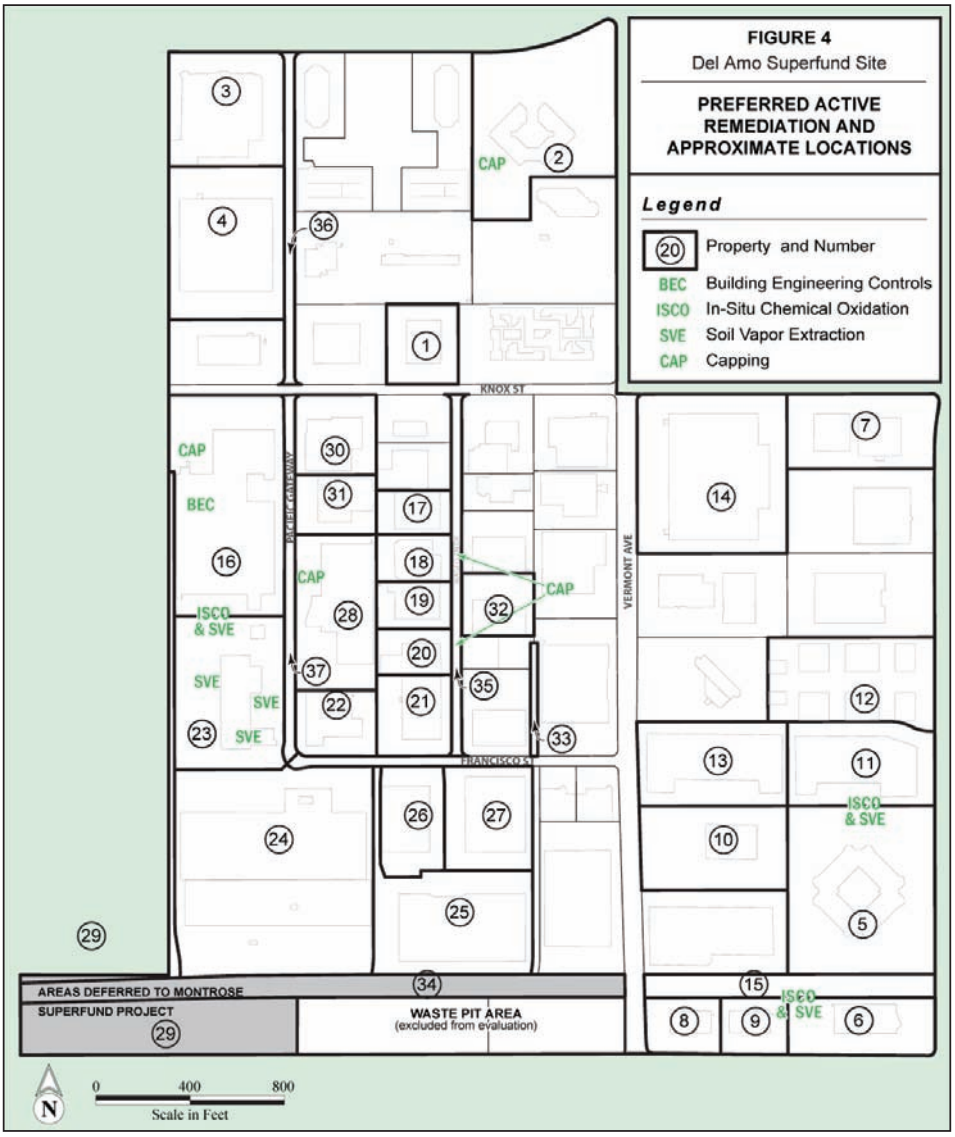
Site Characteristics

Current Land Uses

The former plant site has been redeveloped into a commercial/industrial business park. All surface facilities associated with the former plant have long been dismantled and removed, although some concrete foundations or other remnants of previous structures have been found in the subsurface during the environmental investigations. The former plant site has been subdivided into 67 separate parcels, nearly

all of which are developed. Buildings, paved parking areas, streets, and landscaped areas currently cover more than 90% of the former plant site. The remaining undeveloped areas consist of Los Angeles Department of Water and Power (LADWP) parcels used for high-voltage power transmission lines (one is paved, one is not), the former plant site waste pit area (unpaved but covered with a multi-layer cap), and an adjacent unpaved property used for bin and dumpster storage.

The area surrounding the former plant site is zoned for manufacturing/industry to the north, east and west. Residential and industrial zoned areas border the former plant site to the south. An approximately three block portion of the residential area immediately south of the Waste Pit Area was razed after being purchased by Shell Oil Company and the U.S. Government in 1998 and is currently vacant. A residential area is present approximately 650 feet north of the former plant site, across the 405 freeway.



Contamination Found in Soil

The environmental investigation for the OU-1 soil was completed in 2006. (Some supplemental investigations were performed in 2009 as well). The investigation found varying types and amounts of chemicals throughout the former plant site. The significant chemicals were benzene, tetrachloroethene, i-propyltoluene, trichloroethene, benzo(a) pyrene, indeno(1,2,3-cd)pyrene, benzo(b)fluoranthene, 4,4-DDT, n-nitrosodiphenylamine, arsenic, and copper. The greatest concentration of contamination was in four areas. In two of those areas, investigators observed contamination in a NAPL form.

Chemical releases from the former plant contaminated the shallow soil (top 15 feet) in some locations and the deep soil (down to 80 feet) in other locations. The contamination that reached the deep soil is in NAPL form and has also contaminated the groundwater.

Contamination in the shallow soil (top 15 feet) was found to varying degrees on all parcels across the site that were sampled, but only at seven parcels was it significant enough to warrant remedial action. When NAPL is present at the Del Amo Site it consists primarily of benzene. Benzene is lighter than water and was observed in two locations to be floating on the groundwater surface. NAPL was also found in the soil 25 feet below the groundwater surface, which indicates that it had been initially released into the environment when the groundwater table was lower.

Table 1 shows the chemicals found during EPA's investigation of OU-1 that were of concern, identifies where they were found (shallow or deep soil, or groundwater) and their chemical type.

Table 1: Chemicals Found During EPA's Investigation

	Chemical Name	Shallow Soil (0-15 feet below ground surface)	Deep Soil (>15 feet below ground surface)	Groundwater
VOCs	Benzene	X	X	X
	Ethylbenzene	X	X	X
	Toluene	X	X	X
	Xylene	X	X	X
	Styrene	X	X	X
	Total Petroleum Hydrocarbons (C6-C10)	X	X	X
	Trichloroethene (TCE)	X	–	–
	Tetrachloroethene (PCE)	X	–	–
	1,2,4-trimethylbenzene	X	–	–
	Cyclohexane	X	–	–
	Isopropylbenzene	X	–	–
	Isopropyltoluene	X	–	–
PAHs	Benzo(a)pyrene	X	–	–
	Benzo(a)anthracene	X	–	–
	Benzo(b)fluoranthene	X	–	–
	Benzo(k)fluoranthene	X	–	–
	Indeno(1,2,3-c,d)pyrene	X	–	–
Metals	Arsenic	X	–	–
	Copper	X	–	–
Other	Total Petroleum Hydrocarbons (C11-C23)	X	X	X
	4,4-DDT	X	–	–
	N-Nitrosodiphenylamine (NDPA)	X	–	–

Summary of Risk

Using the investigation's findings, human health and ecological risk assessments were performed to identify and estimate potential risks to people and the environment from shallow soil contamination if unrestricted commercial or residential use were to occur. Similarly, EPA had previously evaluated the deep soil and NAPL risks to groundwater.

The human health risk assessment (HHRA) estimated potential risks for the following groups: (1) commercial workers, (2) future residents (if any), and (3) construction workers. The area is currently covered with asphalt and buildings, preventing exposure to contaminated soil. These estimated risks are potential future risks if current conditions change at the former plant site. If exposures were to occur in the future, the estimated risks could be realized. The HHRA established that the site poses potential risks if steps are not taken to ensure maintenance of current conditions or remediate the hazards posed by contaminated soil. The ecological risk assessment established that no actions are required to address ecological risk.

The former plant site is currently zoned for industrial and commercial use, and it is reasonably anticipated that it will remain so. However, the risk assessment also estimated potential health effects for future residents, in case the land use changes in the future. Land bordering the site to the south is residential, and changes from industrial to residential use have been made in the area in the past.

Exposure to contaminants could potentially occur through direct contact with contaminated soil and dust (inhalation, ingestion, and direct contact), or through inhalation of certain types of contaminants that readily volatilize into the air. If such volatile contaminants enter a building, it is called "vapor intrusion."

Potential risks from cancer-causing contaminants (carcinogens) are defined as the probability of a person getting cancer from a long-term exposure to those carcinogens. This probability is expressed as the number of additional cancers that might occur due to exposure to the contamination. For contaminants that do not cause cancer, but may cause other health effects (non-carcinogens), risk is expressed as a Hazard Index (HI). If the HI is less than or equal to 1.0, no adverse health effects are expected. HI greater than 1.0 indicate an increased risk of health effects; the higher the HI, the more likely the health effects could be experienced, especially by people more sensitive to the chemical's effects.

Human Health Risks

The HHRA found that the majority of the area at the former plant site has very low levels of contamination for which no remedial measures are needed for the current commercial uses. The estimated risk for these areas, if exposure to contaminated soil was to occur, would be below EPA's level of concern.

Nine soil areas were found to be contaminated with one or more chemicals of concern above a level of concern. This means that if the current commercial use configurations were to change in the future in such a way that exposure to the contaminated soil was to occur, these risks could be realized. Two of those areas were determined to be related to the neighboring Montrose Superfund site, so remedial measures are not proposed for those areas in this Proposed Plan. Remedial measures in the seven remaining areas are needed to either ensure maintenance of current conditions or remediate the hazards posed by the contaminated soil.

Ecological Risks

There is a limited amount of wildlife in the site vicinity. The southern margin of the site has had regular confirmed observations of an American kestrel. The Ecological Risk Assessment evaluated the potential risk to the kestrel and concluded that although adverse effects to an individual kestrel may occur from exposure to DDT in the surface soil, effects to the population are expected to be negligible. In addition, the area is not conducive to wildlife habitat but is industrial land that has been incidentally used by local bird species. It is not expected that in the foreseeable future this land will become more suitable to wildlife use.

Basis for Action

There are two bases for action at this site: (1) contaminated shallow soil and its potential threat to receptors on the ground surface, and (2) contaminated deep soil and NAPL and its threat to the groundwater.

(1) Shallow Soil. The former plant site is currently designated for commercial use and is currently occupied by 68 commercial buildings (offices, warehousing, manufacturing, etc). The highest potential risk at the site for commercial workers would be from benzo(a)pyrene, which was calculated to be a 100-in-1 million excess cancer risk at its highest concentration. The Risk Assessment also identified locations where direct exposure of workers to the contaminated soil or vapors, if occurred, could potentially cause an excess cancer risk above 1-in-1 million or a hazard index above 1.0. Due to the presence of large buildings, portions of the site beneath these buildings were not sampled; and due to the pattern of historic contamination at the site, uncertainties in the investigation and risk assessment exist. Remedial action is therefore warranted to address these areas.

The Risk Assessment identified nine locations that warrant action due to chemicals of concern in the shallow soil. As mentioned before, two of the nine locations will be addressed under the neighboring Montrose Superfund Site.

For the seven areas of shallow soil contamination, the exposure pathway would be from outdoor soil, and for two of these areas, an additional potential pathway would be volatile contaminants infiltrating into the indoor air (known as soil vapor intrusion).

In addition to the seven areas that warrant clean-up action, the risk assessment identified 20 other areas where chemicals of concern from the former rubber plant could cause an unacceptable risk to residents if the land use changed. Thus, measures to prevent unrestricted residential use are warranted. Construction activities within existing parcels are common and could uncover previously unidentified contamination. EPA will monitor ongoing construction activity and take additional investigation and remedial actions if the contamination exceeds levels of concern. EPA will either use federal or State screening levels or conduct further risk calculations to define these levels of concern.

(2) Deep Soil and NAPL. The groundwater in the area is classified by the State as having a potential municipal supply beneficial use, and groundwater in deep aquifers is currently used by the Water Replenishment District of Southern California (WRD) to supply drinking water to as many as 3.8 million people in southern California. According to the groundwater risk assessment performed in 1997, the shallow groundwater would pose a risk if used. The principal threat of a continued source of contamination to the groundwater is the NAPL and deep soil contamination, which continues to slowly dissolve into the groundwater. Because of these factors, the risks posed, and the principal threats discussed, EPA considers the groundwater and the principal threats to the groundwater to both be actionable.

A technical impracticability (TI) waiver zone has been established for the groundwater plume beneath Del Amo because of the challenges of meeting protective standards with such complex contaminant sources and lithology over such a large area. Cleanup of the groundwater plume is being addressed by the Del Amo and Montrose Dual Site Groundwater OU and is currently being designed (the anticipated completion date for the design is June 2011). Pursuant to the Dual Site Groundwater OU ROD, the objective of NAPL remedial alternatives for the Del Amo Soil and NAPL OU (i.e., this Proposed Plan) with respect to groundwater is to reduce the amount of NAPL and deep soil contamination in source areas and minimize contribution to groundwater outside the source areas.

The Preferred Alternative identified in this Proposed Plan, or one of the other active remedies, is necessary to protect public health or welfare or the environment from actual releases of hazardous substances in the environment.

Remediation Objectives

The remediation objectives are to:

- Prevent direct contact, ingestion, or inhalation of outdoor soil contaminated above threshold levels for commercial land use or construction activities;*
- Prevent inhalation of VOCs in indoor air above threshold levels for commercial land use;*
- Prevent utilization of impacted groundwater and groundwater in adjacent areas.
- Protect the groundwater outside the impacted areas.

*If land-use were ever to change to residential use, EPA would reevaluate these objectives and determine whether further remedial actions were needed.

What are Institutional Controls?

Legal and administrative controls applied to properties to minimize the potential for human exposure to contamination left on a property or to protect the remedy in place.

Types of Controls for Del Amo

Zoning
General Plan footnote to note parcels are not safe for future residential use if zoning changed.

Building Permit Reviews
Permit applicants referred to EPA to see if contaminated soil could come up or for more sampling/remediation.

Restrictive Covenant
Legal agreement between State and owner placing restrictions on property to prevent exposure to contamination.

Informational Outreach
Mailings, public registries, and websites informing owners/occupants, and public about environmental conditions.

Long Term Monitoring
The effectiveness of the ICs are monitored.

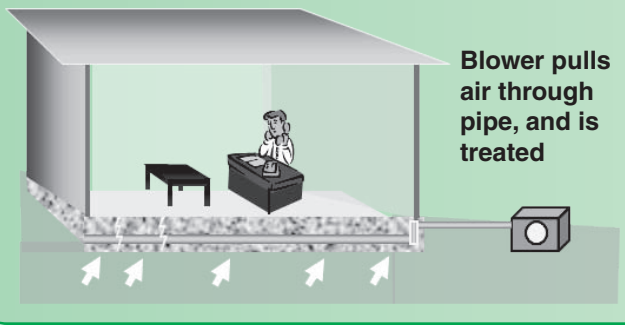
What Are Building Engineering Controls?

Controlling buildings so that contaminated vapors do not build up and cause health concerns by using various methods of control, such as *building pressurization* and *sub slab venting*

Types of building engineering controls

Sub slab venting

Pipes with small holes are installed horizontally under a building and are connected to a blower. This draws out contaminated vapors that are then sent through a filter to remove contamination.



Building Pressurization

Heating and ventilation systems use positive pressure to prevent gasses from entering. Pressure built up inside the building does not allow contaminated gasses from coming in.

Normal Ventilation

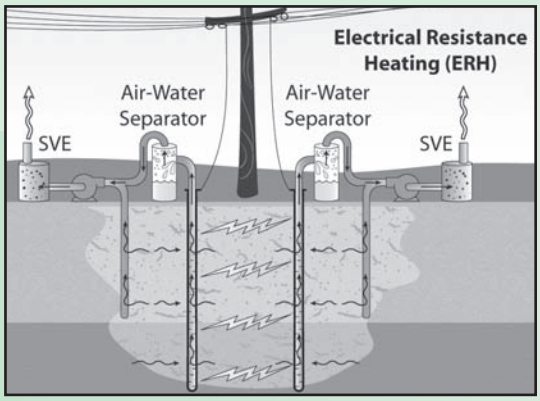
A buildings existing ventilation system is run on schedule to vent the contaminants and not allow them to accumulate to unhealthful levels

At a Glance:

- Used to mitigate chemicals that evaporate easily (VOC's)
- Immediate results to protect against long term health effects

What is In-Situ Soil Heating?

Heating the soil in order to volatilize (vaporize) the contamination, then capturing and treating the vapors in a soil vapor extraction system.



At a Glance:

- Removes large amount of contamination
- Requires large use of electricity
- Handles contaminated vapors above ground
- Intrusive

What is Soil Vapor Extraction (SVE)?

Removes chemicals in the form of vapors by vacuuming vapors out of soil, and treating them by an air treatment technology on- site. Final air emissions meet air pollution regulations.

Types of removal technologies for Del Amo

Adsorption

Adsorbent material like carbon and polymer resin adsorbs contaminants.

Condensation

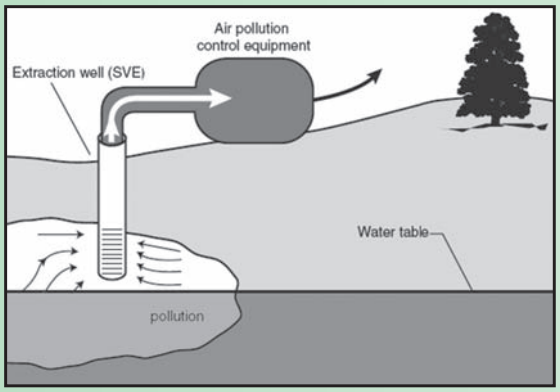
Vapors are cooled until contaminants become liquid and are removed.

Thermal Oxidation

High heat (1400-1800^{0}F) is used to destroy vapor contaminants.

Internal Combustion

An internal combustion engine, similar to a car engine, is used to combust vapors. This can potentially create electricity as a byproduct.

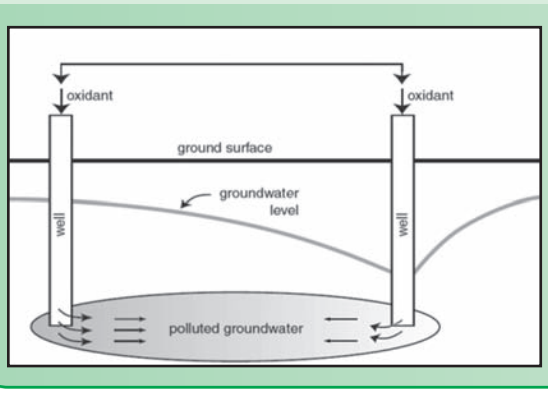


At a Glance:

- Used since the 1970's
- Best uses for removing chemicals that evaporate easily (VOC's)
- Cost effective
- Can be enhanced by adding oxygen or nutrients, causing contaminant-eating bacteria in soil to multiply

What is In-Situ Chemical Oxidation?

Pumping chemical oxidants into the groundwater to break down pollution into harmless substances – water and carbon dioxide.



Wells are drilled or pushed at different spacing and depths in the polluted area. The wells pump the oxidant into the ground. The chemical reaction releases heat, which vaporizes additional contamination. A soil vapor extraction system is used to capture these vaporized contaminants.

At a Glance:

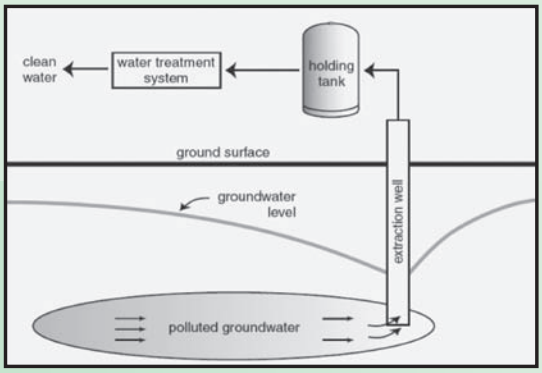
- Removes modest amount of contamination
- Chemical reactions take place underground

What is Hydraulic Extraction?

In the treatment also known as groundwater pump-n-treat, pumps are used to pull contaminated groundwater from the contaminated soil zone to the surface where it is treated to remove the contaminants. This method draws out contamination as it dissolves off the soil and into the groundwater.

At a Glance:

- Very common, over 700 systems operating at NPL sites today
- Removes modest amount of contamination
- Handles contaminated water above ground



Summary of Remedial Alternatives

The complete list of remedial alternatives is presented in Table 2. The alternatives are organized according to the type of media they apply to, either shallow soil outdoors, shallow soil beneath buildings, or deep soil.

Table 2: Summary of Remedial Alternatives

Medium	Alternative 1	Alternative 2	Alternative 3	Alternative 4 (EPA's Preferred Alternative)	Alternative 5
Outdoor Shallow Soil	No Action	Institutional Controls:			
		– Building Permit review {ALL AREAS}	– Building Permit review – Zoning – Restrictive Covenant {27 AREAS}	– Building Permit review – Zoning – Restrictive Covenant {27 AREAS}	– Building Permit review – Zoning – Restrictive Covenant {27 AREAS}
			Cap		Excavation
			(VOC and non-VOC contaminants) {7 AREAS}	(non-VOC contaminants) {4 AREAS}	(VOC and non-VOC contaminants) {7 AREAS}
				SVE	
				(VOC contaminants) {3 AREAS}	
Outdoor Shallow Soil Future Unknown Areas		Excavation			
		{FUTURE AREAS} *IF contamination is beneath building and excavation is infeasible, then:* building engineering controls. *IF other interference makes excavation impractical, then:* SVE(for VOCs) and capping (for non-VOCs). {FUTURE AREAS}			
Shallow Soil Beneath Buildings			Building Engineering Controls		
			{2 AREAS}	{1 AREA}	
				SVE	
				{1 AREA}	{2 AREAS}
NAPL/ Groundwater Contamination Source Areas			SVE		
			{4 AREAS}	{4 AREAS}	{4 AREAS}
			Hydraulic Extraction	In-situ Chemical Oxidation	In-situ Soil Heating
			{4 AREAS}	{3 AREAS}	{3 AREAS}

Alternative 1

No Action

Estimated Capital Cost: $0
Estimated Annual O&M Cost: $0
Estimated Present Worth Cost: $0
Estimated Construction Time Frame: $0

Superfund regulations require that the "no action" alternative be evaluated generally to establish a baseline for comparison. Under this alternative, EPA would take no action at the site to prevent exposure to the soil and groundwater contamination.

Alternative 2

Institutional Controls (building permit reviews), informational outreach, long term monitoring, excavation or building engineering controls as future contingencies.

Estimated Capital Cost: $375,200
Estimated Annual O&M Cost: $145,725
Estimated Present Worth Cost: $3,886,000
Estimated Construction Time Frame: 1 year

The institutional control known as the "building permit review" would be instituted in all areas of the site to ensure EPA's project team reviews any construction plans and that any additional sampling needed is conducted. Informational outreach would be conducted to provide information about the environmental conditions of the land to owners, occupants, and the public. The institutional controls would be monitored in perpetuity to ensure effectiveness.

If during the course of conducting "permit reviews" for future construction projects and subsequent environmental sampling thereof, EPA discovers new contamination areas that exceed EPA's action level for commercial properties, the contingency remedy will be excavation. This would consist of excavating the contaminated soil and replacing it with clean soil so as to provide a work environment for the construction project that eliminates the construction workers' exposure to the contaminated soil.

If the new contamination areas are located beneath current structures such that it is impractical to excavate the contaminated soil, then building engineering controls would be implemented for the new area. If the new contamination areas encounter interference from other structures or infrastructure that makes excavation impractical in whole or in part, then SVE (for VOCs) and capping (for non-VOCs) will also be utilized for the new area.

Alternative 3

Institutional Controls (building permit reviews, zoning, restrictive covenants), Cap both VOC and Non-VOC Contaminated Shallow Outdoor Soil, informational outreach, long term monitoring, excavation or building engineering controls as future contingencies, building engineering controls, soil vapor extraction in deep soil, hydraulic extraction.

Estimated Capital Cost: $12,438,000
Estimated Annual O&M Cost: $4,260,000 (year 1 to year 4)
$2,220,000 (year 5 to year 10)
$380,000 (year 11 onward)
Estimated Present Worth Cost: $49,380,000
Estimated Construction Time Frame: 1 year

Institutional controls including building permit reviews, zoning and restrictive covenants would be instituted. The Building Permit Review would be instituted in all areas. The zoning and restrictive covenants would be instituted in 27 areas, (Areas #2-17, #19, #20, #22-24, #28, #30, #32, #33, #35, and #36 to prevent residential use of the land and to help ensure the EPA project team (consisting of EPA, DTSC, and the Responsible Parties) reviews any construction plans and that any additional sampling needed is conducted. Informational outreach would be conducted to provide information about the environmental conditions of the land to owners, occupants, and the public.

The areas overlying groundwater contamination would have a provision in their restrictive covenants to prohibit drilling into and use of groundwater. This includes Areas #4, #5, #6, #8, #9, #11, #15, #16, #17, #19, #20, #22, #23, #24, #28, #32, #33, and #35. Long-term monitoring of the groundwater would also be conducted, although such monitoring is not an institutional control.

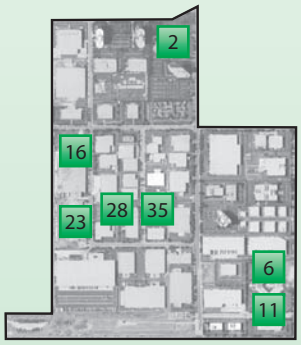
If during the course of conducting "permit reviews" for future construction projects and conducting subsequent sampling, EPA discovers new contamination areas, the contingency remedy will be the same as in Alternative 2, consisting of excavation, building engineering controls, SVE or capping.

Approximately 418,000 square feet would be capped with asphalt, concrete, or clean soil in eight separate areas (#2, #6, #11, #16, #23, #28, and #35 two parts). All of the areas already have asphalt, concrete, or clean landscaping soil covers, which would remain and be monitored and maintained.

Two buildings would have engineering controls implemented to prevent volatile organic contaminants from accumulating inside the buildings. (See Box entitled *"What Are Building Engineering Controls?)*. The buildings are in areas #16 and #23.

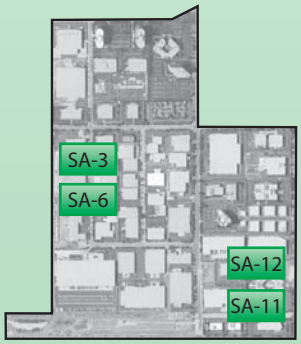
Alternative 3

Capped & Monitored (7 areas)

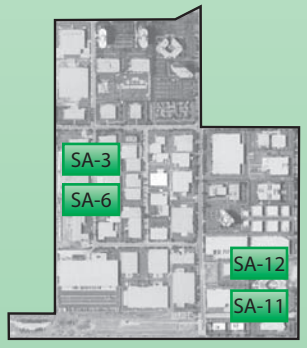


Engineering Controls (2 areas)

Soil Vapor Extraction (4 areas)



Hydraulic Extraction (4 areas)



Soil vapor extraction would be used in approximately 155,900 square feet to remove volatile organic chemicals from the deep soil above the groundwater in four separate areas (source areas SA-3, SA-6, SA-11, and SA-12). (See Box entitled *"What is Soil Vapor Extraction)*.

Hydraulic extraction would be used in approximately 155,900 square feet to remove contaminants dissolved in the groundwater in four separate areas (source areas SA-3, SA-6, SA-11, and SA-12). (See box entitled *"What is Hydraulic Extraction?)*.

Prior to implementing an active remedial alternative such as soil vapor extraction or hydraulic extraction, additional sampling would be performed to confirm the extent of contamination requiring remediation.

The institutional controls, caps, and building engineering controls would be monitored in perpetuity to ensure effectiveness.

The restrictive covenant institutional control would contain a provision to ensure the capped areas are not disturbed, any building engineering controls are not disturbed, and the soil vapor and hydraulic extraction systems are not disturbed while in operation.

Alternative 4 (EPA's Preferred Alternative)

Institutional Controls (building permit review, zoning, restrictive covenants), Cap non-VOC Contaminated Soil, Soil Vapor Extraction for VOC Contaminated Shallow Outdoor Soil, informational outreach, long-term monitoring, excavation or building engineering controls as future contingencies, building engineering controls, soil vapor extraction beneath building, soil vapor extraction in deep soil, in-situ chemical oxidation.

Estimated Capital Cost: $10,180,000
Estimated Annual O&M Cost: $8,980,000 (year 1 to year 3 or 4)
$1,360,000 (for year 5 to year 8)
$190,000 (year 8 onward)
Estimated Present Worth Cost: $50,430,000
Estimated Construction Time Frame: 1 year for construction, 3 to 4 years of operation.

Institutional controls would be used in the same manner as Alternative 3.

Capping would occur in the same manner as Alternative 3 but would only occur in the five areas (#2, #16, #28, and #35 two parts) with non-VOC contamination above EPA's action level. This would cover approximately 288,000 square feet. Soil vapor extraction would be used in approximately 130,000 square feet to remove volatile organic chemicals (VOCs) from the shallow soil in three separate areas (areas #6, #11, and #23).

Informational outreach would occur in the same manner as Alternative 3. The areas overlying groundwater contamination would have a provision in their restrictive covenant institutional control to prohibit drilling into and use of groundwater, in the same manner and same areas as in Alternative 3. Long-term monitoring of the groundwater would also occur, same as in Alternative 3.

If during the course of conducting "permit reviews" for future construction projects and conducting subsequent sampling, EPA discovers new contamination areas, the contingency remedy will be the same as in Alternative 2, consisting of excavation, building engineering controls, SVE or capping.

One building, in Area #16, would have engineering controls, in the same manner as Alternative 3, to ensure vapors do not accumulate within the building.

One building would have soil vapor extraction implemented in the soil beneath the buildings. The building would be in Area #23.

Soil vapor extraction would be used in the deep soil in the same areas and in the same manner as Alternative 3.

In-situ chemical oxidation would be used in approximately 155,900 square feet to oxidize (chemically break-down) the NAPL/soil contamination in the groundwater, converting it into carbon dioxide and water. (See box entitled *"What is In-Situ Chemical Oxidation?)*. This would be implemented in three separate areas (source areas SA-3, SA-11, and SA-12).

Prior to implementing an active remedial alternative such as soil vapor extraction or in-situ soil heating, additional sampling would be performed to confirm the extent of contamination requiring remediation.

The institutional controls, caps, and building engineering controls would be monitored in perpetuity to ensure effectiveness.

The restrictive covenant institutional control would contain a provision to ensure the capped areas are not disturbed, any building engineering controls are not disturbed, the soil vapor extraction systems, and the in-situ chemical oxidation systems are not disturbed while in operation.

Alternative 5

Institutional Controls (building permit review, zoning, restrictive covenants), excavate both VOC and non-VOC contaminated soil, informational outreach, long-term monitoring, excavation or building engineering controls as future contingencies, soil vapor extraction beneath buildings, soil vapor extraction in deep soil, in-situ soil heating.

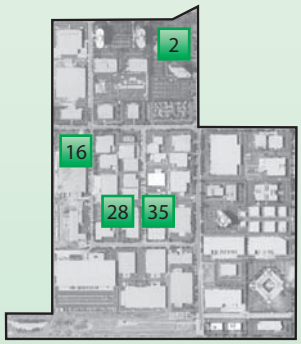
Estimated Capital Cost: $35,830,000
Estimated Annual O&M Cost: $11,770,000 (year 1 to year 3 or 4)
$150,000 (year 5 onward)
Estimated Present Worth Cost: $81,670,000
Estimated Construction Time Frame: 1 year for construction, 3 to 4 years of operation.

Institutional controls would be used in the same manner as Alternative 3.

Approximately 69,530 cubic yards would be excavated from eight separate areas, to depths ranging from 5 to 15 feet below ground surface, and transported off-site to a permitted treatment and/or disposal facility. The areas include areas #2, #6, #11, #16, #23, #28, and 35 (two parts).

Alternative 4

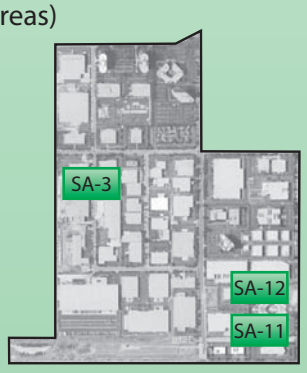
Capped & Monitored (4 areas)



Engineering Controls (1 area)

Soil Vapor Extraction (3 areas)

In-Situ Chemical Oxidation (3 areas)

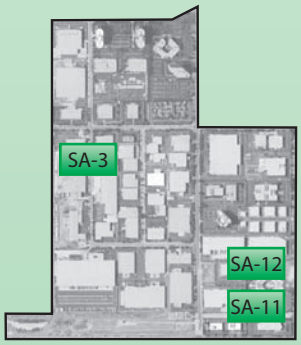


Alternative 5

Excavate Contaminated Soil (7 areas)

Soil Vapor Extraction (2 areas)

In-Situ Soil Heating (3 areas)



Informational outreach would occur in the same manner as Alternative 3. The areas overlying groundwater contamination would have a provision in their restrictive covenant institutional control to prohibit drilling into and use of groundwater, in the same manner and same areas as in Alternative 3. Long-term monitoring of the groundwater would also occur, same as in Alternative 3.

If during the course of conducting "permit reviews" for future construction projects and conducting subsequent sampling, EPA discovers new contamination areas, the contingency remedy will be the same as in Alternative 2, consisting of excavation, building engineering controls, SVE or capping.

Two buildings would have soil vapor extraction implemented in the soil beneath them. The buildings would be in Area #16 and #23.

Soil vapor extraction would be used in the deep soil in the same areas and in the same manner as Alternative 3.

In-situ soil heating would be used in approximately 155,900 square feet to volatilize the NAPL/soil contamination in the groundwater and vadose zone and push it into the soil vapor extraction system in place in the vadose zone, where it would be captured and removed. (See box entitled *"What is In-Situ Soil Heating?)*. This would be implemented in three separate areas (source areas SA-3, SA-11, and SA-12).

Prior to implementing an active remedial alternative such as excavation, soil vapor extraction or in-situ soil heating, additional sampling would be performed to confirm the extent of contamination requiring remediation.

The institutional controls would be monitored in perpetuity to ensure effectiveness.

The restrictive covenant institutional control would contain a provision to ensure the soil vapor extraction systems and the in-situ soil heating systems are not disturbed while in operation.

Evaluation of Alternatives

The NCP requires the use of nine criteria to evaluate the different remediation alternatives individually and against each other in order to select a remedy. This section of the Proposed Plan profiles the relative performance of each alternative against seven of the nine criteria and in comparison to the other alternatives. The nine evaluation criteria are discussed below. The "Detailed Analysis of Alternatives" can be found in the FS.

Overall Protection of Human Health and the Environment, Compliance with ARARs

All the outdoor shallow soil alternatives and the NAPL/groundwater source area alternatives except No Action (#1) are protective of human health and the environment overall. For the shallow soil beneath the buildings, the "building engineering control" (#3 and #4) and the soil vapor extraction (#4 and #5) alternatives would be protective of human health and the environment, but the institutional controls (#2) and the No Action (#1) alternatives would not be.

All the alternatives for the three different types of areas except the No Action ones (#1) would comply with Federal and State applicable or relevant and appropriate requirements.

Long-term Effectiveness and Permanence; Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment

Outdoor Shallow Soil Components

The excavation (#5) and soil vapor extraction (#4) alternatives would provide the best long-term effectiveness and permanence because they would remove the contaminants of concern from the site. These alternatives also provide the best reduction of toxicity, mobility, or volume through treatment. In the case of new contamination discovered during future construction projects, the permanence would be somewhat less if not all the contaminated soil is removed.

Capping with SVE and institutional controls (#4) is the next best alternative because it removes and treats some of the contaminants (the VOCs), with the remainder (non-VOCs) being capped in place. Capping alone (#3) is less effective and permanent. Institutional controls in concert with the engineered actions serve to enhance protectiveness. Institutional controls alone (#2) can be effective as long as they are properly maintained and monitored, although there is inherent uncertainty about maintaining these controls in perpetuity with changes in land use. Capping and institutional controls do not reduce toxicity, mobility or volume through treatment.

Shallow Soil Beneath Buildings Components

The soil vapor extraction alternatives (#4 and #5) are the most effective and permanent alternative and they have the best reduction of toxicity, mobility and volume through treatment because the hazardous substances that could impact property occupants would be removed and treated. The "building engineering controls" alternative also has good effectiveness because it prevents the contaminants from entering the building. However, it is not as permanent as #4 and #5 because the hazardous substances are not removed, and there is some uncertainty about the ability to maintain these physical engineering controls in perpetuity. Maintaining such controls in perpetuity requires continued attention and resources. Institutional controls in concert with the other engineered

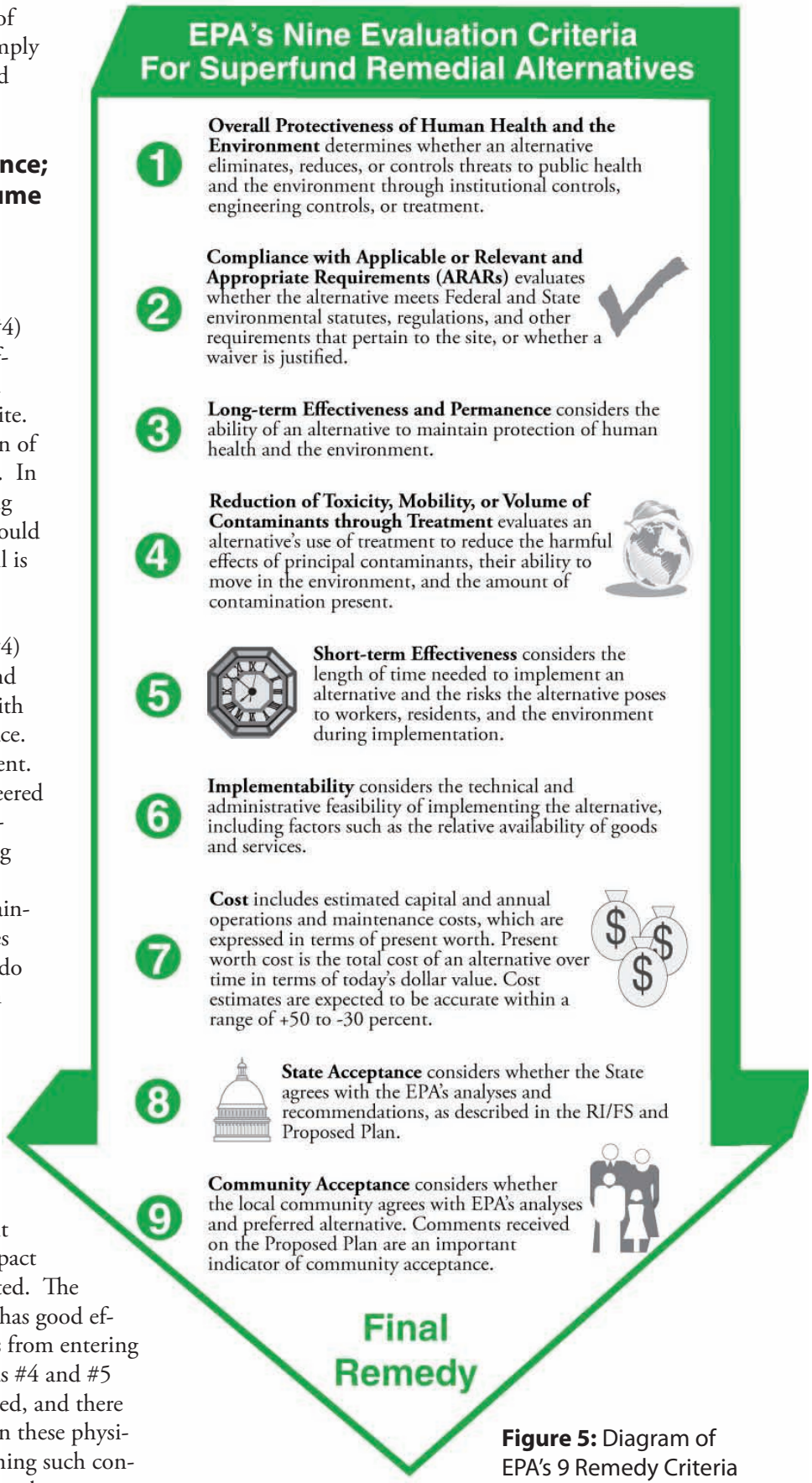


Figure 5: Diagram of EPA's 9 Remedy Criteria

actions serve to enhance their protectiveness. Institutional controls alone (#2) are not considered effective because they do not prevent the contamination from entering the building.

NAPL/Groundwater Contamination Source Areas Components

The most effective alternative has the best reduction of toxicity, mobility or volume through treatment by removing the most contaminant mass that acts as a continuing source of pollution to the groundwater. The more contaminant mass removed, the sooner the groundwater will be cleaned up. The alternative that would remove the most mass is soil heating (#5), followed by chemical oxidation (#4), then hydraulic extraction (#3), each of them being accompanied by SVE (and institutional controls). Institutional controls would be a critical component of the above alternatives since it would ensure protectiveness by preventing exposures to contaminated soil and groundwater, while the groundwater is undergoing treatment. Institutional controls (#2) alone would achieve the least permanence and would not reduce toxicity, mobility or volume because it would not actively remove any contaminant mass.

Short-term Effectiveness, Implementability

Outdoor Shallow Soil Components

Capping is effective in the short term and very implementable because the areas of concern are already capped with asphalt, concrete, or landscaping, and enhancing them as needed is a simple construction project.

The short-term effectiveness of the soil vapor extraction alternative is moderate due to possible emissions during construction or system operation. Although the construction would be engineered and planned to control emissions, short-term vapor releases could occur. The implementability of the soil vapor extraction component is also moderate, since it can be technically challenging to extract soil vapor from the low permeability shallow soil at Del Amo. However, there is proven use of this technology in similar conditions.

The short-term impacts of the excavation alternative would consist of possible dust emissions from the contaminated soil, although best efforts would be taken to control dust emissions. The implementability of the excavation component is moderate, with minor technical challenges due to the proximity of the excavations to occupied buildings. If excavation is to be performed beneath a building, in the case of new contamination discovered during future construction projects, then technical challenges would be expected from needing to operate excavation equipment indoors.

For the institutional controls, no short-term impacts are expected because the existing caps are effective at mitigating direct contact exposures, and interim institutional controls currently in place control exposures during construction projects that involve excavation in impacted areas. The informational component of the institutional controls is highly implementable since there are no impediments to putting site information in public databases and distributing it to owners or occupants. The permit review institutional control is implementable since it is already being implemented on a pilot scale. However, there are some uncertainties about implementing zoning controls since that requires approval of the City Council and Planning Commission. Finally, there is some uncertainty about implementing the restrictive covenant institutional control because these require individual property owners to enter into legal contracts that put restrictions on their property in perpetuity.

Shallow Soil Beneath Buildings Components

The short-term effectiveness of the "building engineering control" alternative is good because ventilation systems can be adjusted with relatively little impact to building occupants. However, installing a sub-slab venting system would have greater impacts on occupants due to dust and possible contaminant off-gassing. "Building engineering controls" are expected to be implementable but can be complicated. It can be complicated to control a building's ventilation system to keep the building pressurized and prevent contaminants from infiltrating the building. It is also complicated to install a venting system beneath the building foundation (if needed) because it requires cutting trenches in the foundation to install the venting pipes.

For the soil vapor extraction alternative, short-term effectiveness is moderate due to possible emissions during construction or system operation. The implementation of the soil vapor extraction system beneath building has some uncertainties. It is challenging to install wells horizontally monitor a system's performance beneath a building.

The institutional controls component, when used in combination with the building engineering controls or SVE, would not have short-term impacts during implementation because the other components would control exposure within buildings. The uncertainties associated with implementing the institutional controls at NAPL/groundwater source areas would be the same as implementing them at the shallow soil areas.

NAPL/Groundwater Contamination Source Area Components

All treatment alternatives, SVE, hydraulic extraction, chemical oxidation and soil heating have the potential for short term impacts if releases are not adequately controlled. Heating of the ground could cause uncontrolled vapor migration and explosions if not properly designed, constructed and operated. The injection of chemical oxidants could cause NAPL migration by displacement and emergence of injected chemicals at the surface. The soil heating alternative could have a greater potential short term impact as it involves handling a greater volume of contaminated media. Generally the more aggressive the alternative the more potential safety issues exist. SVE would have a lesser potential for short-term impacts than chemical oxidation or soil heating.

Implementing the institutional controls at NAPL/groundwater source areas would be the same as implementing them at the shallow soil areas. The soil vapor extraction system and the hydraulic extraction system are both readily implementable technically, but there would be some administrative challenges in coordinating the work with active businesses operating. Implementation of chemical oxidation is technically feasible but could be challenging due to the presence of low permeability soils in some areas. Because a portion of the property would be occupied by the injection and treatment systems, careful coordination with the business would be required. In-situ soil heating is implementable, but there are a limited number of vendors, and implementing this remedial action in close proximity to active businesses would be challenging. As with chemical oxidation, careful coordination with the business would be required due to the space needed for the remediation system.

Cost

The costs of the proposed alternatives are expressed as the "present worth." This is the total funding needed today for the project, including money needed for future years. The present worth allows one to compare projects that take different lengths of time. All the costs expressed in this section are present worth costs.

The costs for the alternatives are summarized in Table 3. In addition, Tables 4 and 5 present the potential future costs for remediating any additional contamination discovered in the future.

The cost of the possible future cleanup of any outdoor shallow soil contamination discovered in the future during construction projects would depend on how much contaminated soil is discovered. The alternatives for addressing such cases are the same as the alternatives evaluated above for known contamination, including capping, soil vapor extraction, and excavation, as well as institutional controls (if not already in place on the parcel). The costs for these alternatives are shown in the table below, based on approximate size of the contaminated area. The table defines the sizes of contaminated area that would be considered small, medium, or large.

Table 3: Costs for Remedial Alternatives

	Alternative	PW Cost ($)
1	**No Action**	0
2	**Institutional Controls** (permit review, informational outreach)	3,890,000
3	**Institutional Controls** (permit review, zoning, restrictive covenant, informational outreach) **Cap** (shallow soil outdoor) **Building Engineering Controls** (contamination beneath building) **Hydraulic Extraction and Soil Vapor Extraction** (NAPL)	49,380,000
4	**Institutional Controls** (permit review, zoning, restrictive covenant, informational outreach) **Cap and Soil Vapor Extraction** (shallow soil outdoor) **Building Engineering Controls and Soil Vapor Extraction** (contamination beneath building) **In-Situ Chemical Oxidation and Soil Vapor Extraction** (NAPL)	50,430,000
5	**Institutional Controls** (permit review, zoning, restrictive covenant, informational outreach) **Excavation** (shallow soil outdoor) **Soil Vapor Extraction** (contamination beneath building) **In-Situ Soil Heating and Soil Vapor Extraction** (NAPL)	81,670,000

Note: *EPA policy recommends that a 7% discount rate typically be used in Present Worth calculations like these. In this case, however, EPA used a 5% discount rate as a more current number. In the Record of Decision following this Proposed Plan, EPA will present the costs using both discount rates for comparison purposes.*

Table 4: Costs for Possible Future Remediation – Outdoor Shallow Soil

Shallow Soil Alternative	Small		Medium		Large	
1 **No Action**	$0		$0		$0	
2 **Institutional Controls** restrictive covenant for: – engineering controls – land use restrictions	 $25,000 per parcel $32,000 per parcel					
3 **Cap**	100 ft^2	$23,000	625 ft^2	$60,000	2500 ft^2	$186,000
4 **Soil Vapor Extraction**	2500 ft^2	$534,000	10,000 ft^2	$880,000	40,000 ft^2	$1,825,000
5 **Excavation**						
– 5 ft. deep, non-hazardous, no VOC	100 ft^2	$42,000	625 ft^2	$105,000	2500 ft^2	$257,000
– 15 ft. deep, non-hazardous, VOCs present	100 ft^2	$150,000	625 ft^2	$298,000	2500 ft^2	$663,000
– 15 ft. deep, mostly hazardous, VOCs present	100 ft^2	$182,000	625 ft^2	$459,000	2500 ft^2	$1,287,000

Table 5: Costs for Possible Future Remediation – Beneath Buildings

Beneath Building Alternative	Small		Medium		Large	
1 **No Action**						
2 **Institutional Control** Add restrictive covenant for: – engineering controls – land-use restrictions	 $25,000 per parcel $32,000 per parcel					
3 **Building Engineering Controls**	2500 ft^2	$202,000	10,000 ft^2	$362,000	40,000 ft^2	$690,000
4 **Building Engineering Controls** *and* **Soil Vapor Extraction**	(see #3 and #5 separately)					
5 **Soil Vapor Extraction**	2500 ft^2	$712,000	10,000 ft^2	$1,117,000	40,000 ft^2	$2,436,000

The institutional controls cost is the cost of installing a restrictive covenant, if the parcel does not already have one, and is not dependent on size of the contaminated area.

The cost of the possible future cleanup of any shallow soil contamination beneath buildings that is discovered in the future would depend on how much contaminated soil is discovered. The costs are shown in the above table for small, medium or large sized areas.

State/Support Agency Acceptance

The State of California supports EPA's Preferred Alternative without additional comment.

Community Acceptance

Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends and will be described in the Record of Decision.

Summary of the Preferred Alternative

EPA's Preferred Alternative was selected over other alternatives because it provides the best balance of the criteria.

The specific areas where the remedy would be applied are listed in Table 6 and shown in Figure 3.

The Preferred Alternative for addressing the known soil and NAPL contamination at the Del Amo Site is Alternative #4, consists of: (1) Institutional Controls, (2) Caps, (3) Soil Vapor Extraction, (4) Building Engineering Controls, and (5) In-Situ Chemical Oxidation. The areas where each remedy component will be applied are listed in Table 6 and shown in Figure 3. In addition, if new contamination areas are discovered in the future during construction projects, where contamination exceeds risk-based levels of concern, then

Table 6: Preferred Alternative Summary

Area Number	Active Components					Institutional Controls				
	Cap	SVE (shallow)	BEC	ISCO	SVE (deep)	1	2	3	4	5
1						X	X			
2	X					X	X	X	X	
3						X	X	X	X	
4						X	X	X	X	X
5				X (SA12)	X (SA12)	X	X	X	X	X
6		X		X (SA11)	X (SA11)	X	X	X	X	X
7						X	X	X	X	
8						X	X	X	X	X
9				X (SA11)	X (SA11)	X	X	X	X	X
10						X	X	X	X	
11		X				X	X	X	X	X
12						X	X	X	X	
13						X	X	X	X	
14						X	X	X	X	
15				X (SA11)	X (SA11)	X	X	X	X	X
16	X		X	X (SA3)	X (SA3)	X	X	X	X	X
17						X	X	X	X	X
18						X	X			
19						X	X	X	X	X
20						X	X	X	X	X
21						X	X			
22						X	X	X	X	X
23		X		X (SA3)	X (SA3, SA6)	X	X	X	X	X
24						X	X	X	X	X
25						X	X			
26						X	X			
27						X	X			
28	X					X	X	X	X	X
29						X	X	X	X	X
30						X	X	X	X	
31						X	X			
32						X	X	X	X	X
33						X	X	X	X	X
34						X	X	X	X	X
35	X					X	X	X	X	X
All Unnumbered Areas						X	X			

Remedy Components

CAP Capping

BEC Building Engineering Controls

ISCO In-Situ Chemical Oxidation

SVE Soil Vapor Extraction

Institutional Controls

1 Information

2 Permit Review

3 Zoning

4 Restrictive Covenants (preventing disruption of clean-up activities, requiring building permit review, allowing sampling prior to construction activity, preventing residential use)

5 Restrictive Covenants (requiring EPA approval prior to drilling into groundwater)

See Figure 3 for locations of all areas.

the Preferred Alternative would be (1) Excavation, and (2) Building Engineering Controls (if contamination is beneath a building and excavation is infeasible).

Shallow Soil Components – Outdoor And Beneath Buildings

The institutional controls, cap and building engineering control elements are highly implementable with minimal short-term effects and costs, although they do not provide reduction of toxicity, mobility, or volume of contamination. These elements have good long-term effectiveness because they use physical barriers to exposure (caps and building controls). The soil vapor extraction element, which would be applied at three areas in the shallow soil outdoors and one area beneath the building, would achieve good long-term effectiveness by using treatment to reduce the contaminant volume. The better long-term effectiveness through the use of SVE outweighs the higher short-term impacts and more difficult implementability because cost savings would be realized. The three areas where SVE will be implemented also have NAPL treatment systems on the same or adjacent parcels, and the two systems can be coordinated to achieve cost savings.

This remedy addresses the objectives of preventing direct contact, ingestion, or inhalation of soil or indoor air containing contaminants above action levels. The institutional controls address this objective by: (1) prohibiting land use that could result in unacceptable exposure to contaminants, and (2) reviewing planned construction activities that could lead to unacceptable exposure to contaminants. Capping addresses the source materials that are the principal threat wastes and it addresses the remedial action objectives by sealing the contaminated soil and physically blocking any exposure. The building engineering control element does not directly address the source materials. Instead, it addresses contamination that migrates from the source materials, and it addresses the objectives by capturing the volatile contaminants with the building's ventilation system. The soil vapor extraction element addresses the source materials and the objectives by removing the volatile contaminants from contaminated soil and removing the contaminants from the extracted air stream.

Future Areas

The institutional control, excavation, and building engineering control elements are moderate to highly implementable. For possible areas discovered in the future with contamination above EPA's action level, the preferred alternative would be excavation of contaminated soils and back fill with clean soil. Excavation has the best long-term effectiveness because it physically removes the contamination, and building engineering controls have good effectiveness because they prevent contaminants from accumulating indoors. This remedy addresses the objectives of preventing direct contact, ingestion, or inhalation of soil or indoor air contaminants above action levels. The excavation element addresses the source materials that constitute the principal threat wastes, and it addresses the objectives by removing the contaminated soil. If excavation is impractical because contamination underlies a structure, then building engineering controls would also be required. The building engineering control element does not directly address the source materials. Instead, it addresses contamination that migrates from the source materials, and it addresses the objectives by capturing the volatile contaminants with the building's ventilation system before they can accumulate above acceptable levels inside the building. If excavation is impractical in whole or in part because of interference with structures or infrastructure, then SVE (for VOCs) and capping (non-VOCs) will also be utilized.

NAPL/Groundwater Contamination Source Areas Components

The institutional control element, which would be implemented in all of the Source Areas and would be the only element implemented in Source Areas SA-4, 5, 7, 8, and 9, is highly implementable with minimal short-term effects and costs. These source areas have the least amount of contaminant mass of all the NAPL areas and the sources are more diffuse, so reducing contaminant toxicity, mobility, or volume in these areas would not affect overall long-term effectiveness as much as a reduction in the more highly contaminated, more concentrated areas. No actions are to be taken in Source Areas SA-1, 2, and 10, so they are not shown on Figure 3.

The soil vapor extraction element that would be implemented in the remaining source areas, SA-3, 6, 10 and 11, would provide better long-term effectiveness by reducing some of the contaminant volume through treatment. The gain in long-term effectiveness achieved with SVE outweighs the additional cost, short-term impacts, and the more difficult implementability. Soil vapor extraction would be the only active element in SA-6 because this source area has more contaminant mass than Source Areas SA-4, 5, 7, 8 and 9, but not as much asSA-3, 11 and 12, and its contamination is located mostly in the vadose zone (soil above the groundwater).

The in-situ chemical oxidation element, which would be implemented in Source Areas SA-3, 11, and 12, would provide the best balance of long-term effectiveness, short-term effectiveness, and implementability of any of the alternatives. This alternative removes less contaminant mass than soil heating but is safer in the short-term and easier to implement. The three source areas to be treated with chemical oxidation have the greatest contaminant mass that is causing the groundwater contamination out of all the source areas. In-situ chemical oxidation would remove as much mass in these areas as feasible,

to a point at which continued implementation no longer results in significant additional mass removal. As discussed in the Del Amo FS approximately 40-50% of the contaminant mass at these three areas is expected to be removed by chemical oxidation. Although chemical oxidation costs more than SVE alone, the gain in long-term effectiveness outweighs the additional cost, short-term impacts, and the more difficult implementability because it shortens the amount of time that the groundwater will remain contaminated and needs to be monitored, and it would allow the groundwater to be returned to beneficial use in a shorter amount of time.

This remedy addresses the objectives of preventing direct contact, ingestion, or inhalation of soil containing contaminants above action levels. It also addresses the objective of preventing use of local groundwater resources within and adjacent to the contaminated zone and protecting groundwater resources outside the contaminated zone. The institutional controls element of this remedy addresses the objective by prohibiting use of the contaminated groundwater. The soil vapor extraction element of this remedy addresses the source materials that constitute the principal threat wastes by removing the volatile organic compounds from the contaminated soil and removing the contaminants from the extracted air steam. The in-situ chemical oxidation element addresses the source materials by using chemical oxidation to break down the volatile organic material into benign substances. The soil vapor extraction and the in-situ chemical oxidation elements address the objective by removing an amount of the contaminant mass, thus protecting groundwater resources outside the contaminated zone and ultimately shortening the time to attain clean water standards.

During remedy design and implementation, EPA will evaluate opportunities to lessen the overall environmental impact of the actions. The principles of EPA's Green Remediation policy will be followed.

Conclusion

Based on the information available at this time, EPA and the State of California believe the Preferred Alternative addressing shallow soil, NAPL, and amending the Groundwater OU-3 remedy, would be protective of human health and the environment, would comply with ARARs, would be cost-effective, and would utilize permanent solutions and alternative treatment technologies to the maximum extent practicable. Because it would treat the source materials constituting principal threats, the remedy also would meet the statutory preference for the selection of a remedy that involves treatment as a principal element. The support agency, the California Department of Toxic Substances Control (DTSC) concurs with EPA's recommended alternative. The Preferred Alternative can change in response to public comments or new information.

Community Participation

As the lead agency, the EPA requests public comments on its Proposed Plan to address contaminated soil at the Del Amo Facility Superfund Site. This is considered the final decision for the Del Amo Superfund Site. The 60-day comment period is from June 15, 2010, through August 16, 2010. There are several ways to provide comments: postal mail, fax, e-mail, or in person at the public meeting.

Postal Mail

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rodriguez.dante@epa.gov

EPA is committed to involving the public in the cleanup decision-making process. Its Community Involvement Program focuses on answering the community's questions about the cleanup effort, providing information to the community about site activities, and incorporating community issues and concerns into Agency decisions, particularly when a cleanup remedy is proposed. To learn more about the Site, you will find an extensive amount of information at EPA's Information Repositories (see back page). One convenient place to find major Site documents is to go to EPA's web site: www.epa.gov/region09/delamo.

EPA has two points of contact for the Del Amo Facility Site, the Remedial Project Manager, Dante Rodriguez, and the Community Involvement Coordinator, Alejandro Diaz. If you have technical questions about EPA's cleanup effort, please call Dante Rodriguez at (415) 972-3166, and if you have questions about public participation, please call Alejandro Diaz at (415) 972-3242 or (800) 231-3075.

Del Amo Superfund Site

Los Angeles, California

EPA Requests Comments on Proposed Soil and NAPL Cleanup Plan

You're Invited!

EPA invites you to a Community Meeting where you can hear a presentation on the proposed plan and offer your oral and written comments. The meeting will be held on **June 30, 2010, at the Holiday Inn Torrance, 19800 South Vermont Avenue, in Torrance, from 6:30 pm to 8:30 pm.**

Information Repositories

Pertinent documents related to the Del Amo Facility Superfund Site can be found at the locations below. Documents at these repositories are part of the Administrative Record for the Site.

Katy Geissert Civic Center Library
3301 Torrance Boulevard
Torrance, CA 90503
Telephone: (310) 618-5959
CDs available for check-out.

Carson Public Library
151 East Carson Street
Carson, CA 90745
Telephone: (310) 830-0901
CDs available for check-out and key documents available in paper copy.

EPA Superfund Records Center
95 Hawthorne Street
San Francisco, CA 94105
Telephone: (415) 536-2000

United States Environmental Protection Agency, Region 9
75 Hawthorne Street (SFD-6-3)
San Francisco, CA 94105
Attn: Alejandro Diaz (Del Amo 6/10)

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