EPA San Fernando Valley Superfund Site

San Fernando Valley, California
July 1992

EPA Proposes Cleanup Plan for Glendale Area

This fact sheet is the proposed plan for cleanup of the North **plume** of groundwater contamination in the Glendale Study Area as proposed by the U. S. Environmental Protection Agency (EPA). EPA issues a proposed plan to solicit public review and comment on all potential cleanup alternatives examined by EPA, particularly EPA's preferred alternative. EPA is required to issue a proposed plan to fulfill §117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). EPA is the lead agency for this project and the Department of Toxic Substances Control of the State of California Environmental Protection Agency (CAL-EPA) is the support agency. Please note that **special notice** pursuant to CERCLA §122 has not been issued for the Glendale North OU.

EPA has determined its preferred alternative for the North of **groundwater** contamination in the Glendale Study Area of the San Fernando Valley Superfund site. This interim remedy is referred to as the Glendale North Plume **Operable Unit (OU)**. An OU is a discrete action that comprises an incremental step toward comprehensively addressing **Superfund** site problems.

The proposed remedy involves groundwater treatment for the shallow **aquifer** system in the Glendale area of the San Fernando Valley. Under this alternative, contaminated groundwater would be extracted at a rate of 3000 gallons per minute (gpm) by new wells to be installed in the Glendale Study Area. All the extracted contaminated groundwater would be filtered to remove any suspended solids and then treated by **air stripping** to remove **volatile organic compounds (VOC)**[1]. After treatment the water would meet drinking water standards for VOCs. Air emissions would be treated using a carbon treatment system

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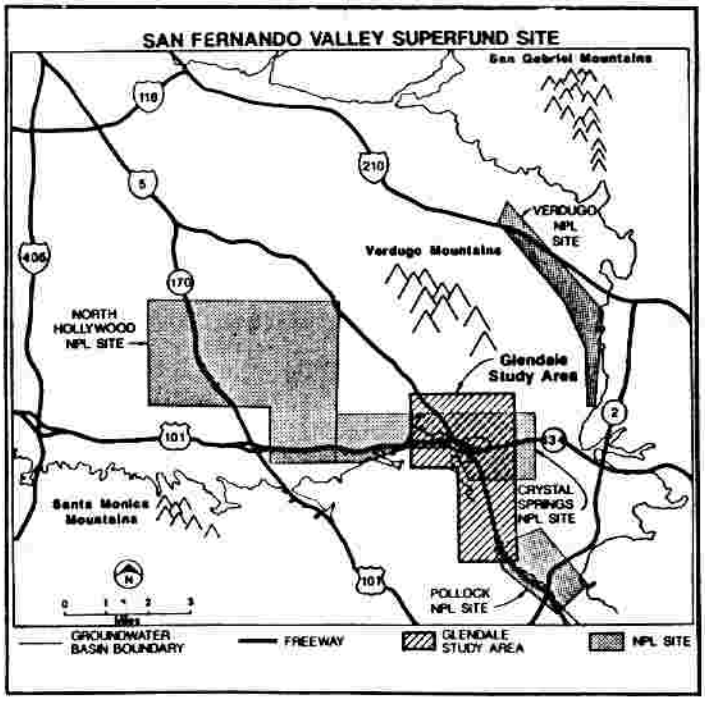

Opportunities For Community Involvement

Community Meeting, Verbal, Written Comments

The public comment period for verbal and written responses to the Proposed Plan for the interim cleanup of the north plume of groundwater contamination in the Glendale Study Area will end on Thursday, August 6, 1992. U.S. EPA will conduct a public hearing Thursday, July 23, 1992 at 6:30 p.m. in the City of Glendale Public Library Auditorium, 222 East Harvard St., Glendale, CA to present its Proposed Plan, respond to questions and receive comments either orally or in writing. Otherwise, written comments, postmarked no later than August 6, 1992, should be sent to:

Claire Trombadore
Remedial Project Manager
U. S. Environmental Protection Agency, Region IX,
75 Hawthorne St. (H-6-4)
San Francisco, CA 94105-3901.

BACKGROUND ON THE GROUNDWATER CONTAMINATION IN THE SAN FERNANDO VALLEY

In 1980, after finding organic chemical contamination in the groundwater of the San Gabriel Valley, the California Department of Health Services (DHS) requested that all major water purveyors using groundwater conduct tests for the presence of certain industrial chemicals in the water they were serving. The results of testing revealed the presence of volatile organic compound (VOC) contamination in the groundwater of the San Fernando Valley. The primary contaminants of concern were and are the solvents trichloroethylene (TCE) and perchloroethylene (PCE), widely used in the variety of industries including: dry cleaning, metal plating, and machinery degreasing.

In 1984, EPA proposed four sites within the San Fernando Valley for inclusion on the National Priorities List (NPL). In 1986 the sites were added to the list. Each site boundary encompasses an area in which production wells produced groundwater containing concentrations of TCE and PCE above state and federal standards in 1984. The four NPL sites in the San Fernando Valley are the North Hollywood, Crystal Springs, Verdugo, and Pollock sites; also referred to as San Fernando Valley areas 1, 2, 3, and 4, respectively. EPA is managing the four sites as one large site. The San Fernando Valley Study Area includes the four sites as listed on the NPL and adjacent areas where contamination has or may have migrated. The basinwide RI Report for the San Fernando Valley Study Area will be completed soon. Groundwater wells installed by EPA as part of the basinwide RI are routinely sampled to continue to monitor the nature and extent of the groundwater contamination in the San Fernando Valley.

EPA has previously signed record of decision documents for two OUs in the San Fernando Valley: the North Hollywood OU (1987) and the Burbank OU (1989). The North Hollywood OU Interim remedy is currently operating and the Burbank OU is in the remedial design phase. In the Glendale Study area.

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Glendale Design Plan, *from page 1*

called vapor phase granular activated carbon (GAC) to ensure that all air emissions meet application standards. The exact number and location of these new wells and air stripping units would be determined during the remedial design phase of the project. After treatment to remove VOCs, the water would be blended with an alternative drinking water source to meet the drinking water standard for nitrate, if necessary. The water would then be conveyed to the City of Glendale for distribution thorough its public water supply system. As a contingency, if the City of Glendale does not accept any or all of the treated water, any remaining portion of water would be reinjected into the aquifer. The total duration of the remedy would be 15 years and would include provisions for continued groundwater monitoring.

The Glendale study area is in the vicinity of one of the four San Fernando Valley NPL sites and includes two portions of the aquifer where high concentrations of contaminants have been identified: the North Plume and the South Plume. The Glendale North OU includes adjacent areas where contamination is known or believed to have migrated. EPA conducted a remedial investigation (RI) that characterized the nature and extent of contamination in the Glendale study area. In January 1992, the RI was completed and a feasibility study (FS) was undertaken for the Glendale North OU which evaluated a range of cleanup alternatives for addressing the contaminated groundwater.

In addition to describing the alternatives considered in the Glendale North FS report, including EPA's preferred alternative, this fact sheet describes the history of the site, explains the federal Superfund program, and indicates opportunities for public participation. In addition, a glossary of terms that appear in BOLD letters is found on page 13. This proposed plan highlights key information from the RI and FS reports but is not substitute for these documents. Both the RI and FS reports are available for review at the five information repositories identified on page 14. While EPA has identified a preferred alternative based on available information, the Agency has not yet made a final decision on what remedy to implement. Changes to the preferred alternative or a change from the proposed alternative to another alternative may be made if public comments or additional data indicate that such a change would better achieve the cleanup goals for the site. The community is encouraged to participate in EPA's remedy selection process by commenting on all of the alternatives included in the Glendale North FS report, including the preferred alternative.

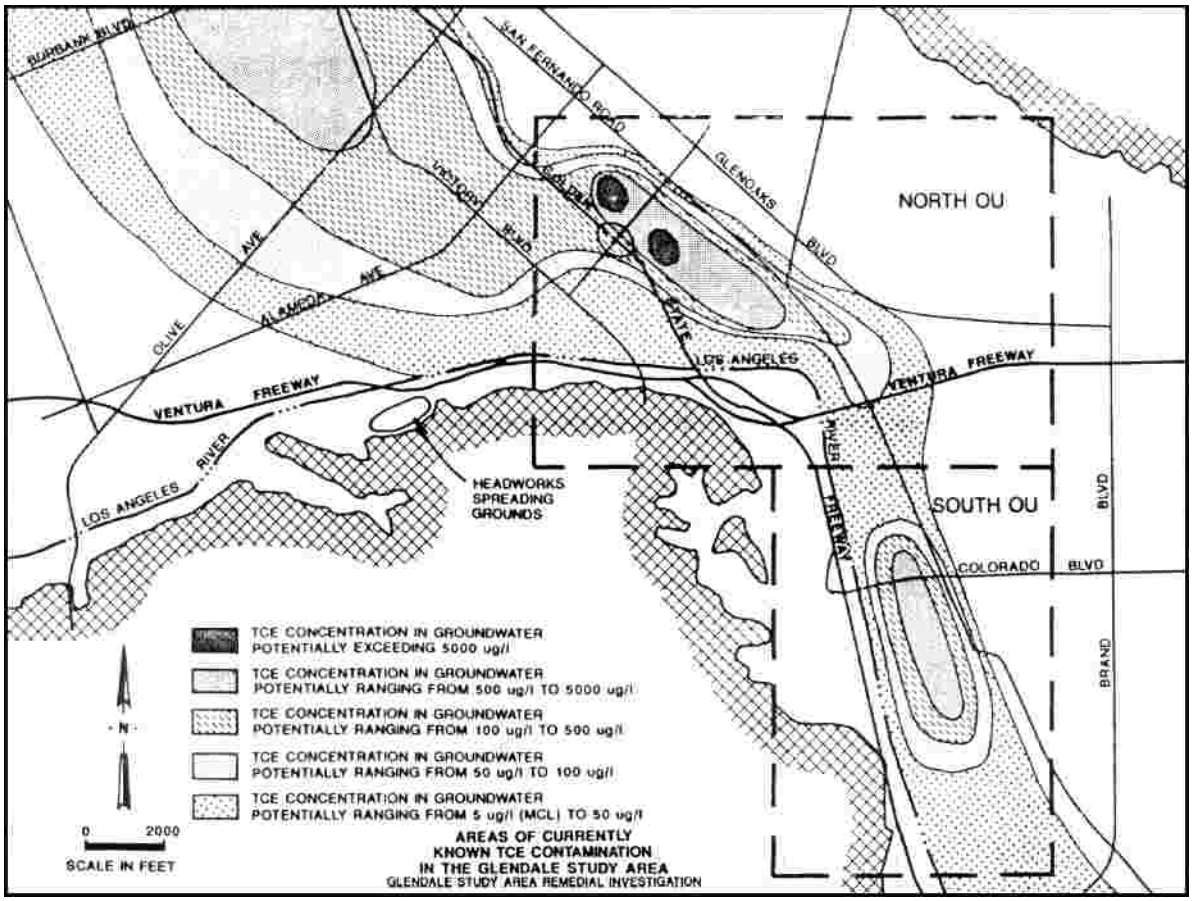
Background, *from page 2*

EPA has identified two OUs: the Glendale North OU and the Glendale South OU. All of these OUs represent discrete, interim cleanups currently in progress throughout the eastern portion of the San Fernando Valley. All remedial actions established by EPA in the Record of Decision of each OU are interim measures but are intended to be consistent with the overall remediation of the San Fernando Valley.

TCE and PCE have been detected in the majority of the City of Glendale's wells at levels that are above the federal Maximum Contaminant Level (MCL), which is 5 parts per billion (ppb) for both VOCs. The State of California MCL is also 5 ppb for both TCE and PCE. Other VOC contaminants detected above state and/or federal MCLs in the Glendale area, as a result of at least one sampling event, include: benzene; carbon tetrachloride; 1,1-dichloroethane (1,1-DCA); 1,2-dichloroethane (1,2-DCA); 1,1-dichloroethene (1,1-DCE): total 1,2-dichloroethene (1,2-DCE); and 1,1,2,2-tetrachlorethane. TCE and PCE were the most prevalent. Other VOCs have also been detected in trace quantities. In addition, nitrate, an inorganic contaminant, has been detected consistently at levels in excess of the MCL (45 mg/l) in the groundwater of the Glendale Study Area. Nitrate contamination can be the result of past agricultural practices and/or spetic systems in the San Fernando Valley.

As a result of the groundwater contamination, the majority of the City of Glendale's wells have been taken out of service. The most prevalent contaminants are TCE and PCE. To date, the highest measured levels of TCE and PCE in Glendale's wells are 186 ppb and 8.3 ppb, respectively. If should be noted that the City of Glendale closely monitors the quality of drinking water delivered to residents. The water meets all federal and state requirements. Currently, nearly all of the water delivered by the City of Glendale is purchased from the Metropolitan Water District (MWD) of Southern California.

The RI report for the Glendale Study Area was completed in January 1992. The FS for the Glendale North OU was completed in April 1992. Both the RI Report for the Glendale Study Area (January 1992) and the FS for the Glendale Study Area North Plume OU (April 1992) are available for review at the information repositories identified on page 14.



THE RISK ASSESSMENT

Data regarding contaminants in the groundwater in the Glendale Study Area obtained by EPA during the remedial investigation was used to estimate the health risks associated with exposure to the groundwater. This estimate, called a **risk assessment**, was then used to identify which contaminants pose risks to human health. EPA prepared a "baseline risk assessment" for the Glendale North OU to evaluate the potential effects of the no-action alternative.

Risk assessments estimate the possibility that one additional occurrence of cancer would result from exposure to contamination. A risk of 1 in 1,000,000 (one million) means that one person in one million exposed could develop cancer as a result of the exposure. EPA considers risks greater than one in ten thousand (10^{-4}) "unacceptable."

In preparing risk assessments, EPA uses very conservative assumptions that weigh in favor of protecting public health. For example, EPA may assume that individuals consume two liters of drinking water per day from wells situated within a contaminant plume, over a 70-year lifetime or that a person is exposed to a chemical, 24 hours a day, 365 days a year, for a 30-year period, even though typical exposure to the chemical would be far less.

In January 1992, EPA completed a risk assessment for the Glendale North OU that estimated the potential risks to public health under current situations and under potential future situations. The risk assessment examined the potential health effects if individuals were exposed to contaminated groundwater from the upper and lower zones of the aquifer.

EPA evaluated four potential methods of exposure to water from both the upper and lower zones of the aquifer: (1) exposure during residential use, (2) worker exposure during operations at the Glendale Steam Plant (3) exposure from discharge into the Los Angeles River, or (4) exposure in various other commercial uses.

EPA included three potential exposure routes (ways the contamination gets into the body) in the risk assessment: (1) drinking the groundwater during residential use, (2) inhaling the chemicals in groundwater vapors during showering, and (3) inhaling groundwater vapors during steam plant operations. Dermal contact (contact with skin) was also considered but was found by EPA not to pose a significant risk. Chemicals of potential concern for the Glendale North OU used in the risk assessment calculations included: TCE, PCE, carbon tetrachloride, 1,1-DCA, 1,2-DCA, 1,1-DCE, total 1,2-DCE, nitrate, and others.

If the groundwater were used as drinking water, without treatment, as many as 1 in 500 persons would be more likely to develop cancer during their lifetimes.

The results of the risk assessment indicated that contaminant levels in the upper zone of the aquifer of the Glendale Study Area would pose an unacceptable risk (10^{-3}) to human health if this water were to be delivered directly to local residents, without being treated.

Technical Assistance Grants (TAGs) Program

Under this program, one eligible community group at each Superfund site may obtain one grant up to $50,000 in federal funds to provide technical assistance in understanding site documents. To be eligible, a group must:

- incorporate
- meet a 20% matching funds requirement (in-kind contributions, i.e., donated goods and services, are permissible) or obtain a waiver of this requirement
- meet financial and administrative requirements, and
- prepare a plan to use technical assistance based on EPA's technical work schedule.

It will take an estimated six to nine months to process the application and distribute the grant.

FOR MORE INFORMATION ABOUT TAG CALL FRASER FELTER AT (415) 744-2181

SELECTION OF CLEANUP ALTERNATIVES

Project Objectives

All of the potential cleanup alternatives for the Glendale North OU were screened for: 1) effectiveness at protecting public health and the environment, 2) technical feasibility (implementability), and 3) cost. In addition, the alternatives were developed to meet the following specific cleanup objectives for the Glendale North OU:

- To inhibit vertical and horizontal migration of groundwater contamination in the North Plume of the Glendale Study Area
- To begin to remove contaminant mass from the upper zone of the aquifer in the North Plume of the Glendale Study Area

Summary of Cleanup Alternatives

Based on the results of the RI, EPA identified seven cleanup alternatives for addressing groundwater contamination in the Glendale North OU. Detailed descriptions of these alternatives are provided in the FS report for the Glendale North OU, located in the information repositories listed on page 14. These seven alternatives were evaluated based on nine specific criteria:

1) Overall Protection of Human Health and the Environment,
2) Compliance with **Applicable or Relevant and Appropriate Requirements (ARARs)**,
3) Long-term Effectiveness and Permanence,
4) Reduction of Toxicity, Mobility or Volume through treatment,
5) Cost,
6) Short-term Effectiveness,
7) Implementability,
8) State Acceptance,
9) Community Acceptance.

(See ***Selecting A Cleanup Remedy***, page 11.)

After the public comment period, EPA will select one of these alternatives or a combination of them to begin cleanup of groundwater contamination in the Glendale area. EPA will summarize the alternative selected in the Record of Decision document for the Glendale North OU.

The Glendale North OU is an interim action and is not the final remedy for cleanup of contaminated groundwater in the Glendale area. With the exception of the no action alternative, all of the alternatives involve the extraction of 3,000 gpm of groundwater for a period of 12 years. The total duration of the remedy is 15 years, but during the first three years the remedy would be in the remedial design and initial implementation phases and no extraction or treatment of groundwater would be taking place. A computer model was developed and used to determine that the extraction rate of 3,000 gpm over a 12 year period would result in the most effective inhibition of plume migration and optimal contamination removal for this interim action. With the exception of the Alternative 1 - No Action, all of the alternatives would involve the construction and operation of a VOC treatment system. EPA intends to then send Special Notice letters and to conduct negotiations to fund past and future cleanup costs associated with the Glendale North OU. It is possible that as a result of negotiations it may be agreed that the remedy would be designed and constructed by a private party in cooperation with the City of Glendale and that it would be operated either by a private party or by the City of Glendale.

ALTERNATIVE 1: No Action

The No Action alternative serves as a "baseline" against which other alternatives are compared. This alternative is evaluated to determine the risks that would be posed to public health and the environment if no action were taken to treat or contain the contamination. The no action alternative would involve only groundwater monitoring; no additional cleanup activities would be conducted.

ALTERNATIVE 2 and ALTERNATIVE 7: EPA's Preferred Alternative Extract/Treat(Air Stripping)/Public Water System and/or Reinject

Alternative 2 involves the extraction of 3,000 gpm of contaminated groundwater for 12 years. The extraction wells will be located to effectively inhibit migration of the contaminant plume. The extracted groundwater would be filtered to remove any suspended solids and then treated for volatile organic compounds (VOCs) using dual-stage air stripping with vapor-phase granular activated carbon (GAC) adsorption for emissions control. The treated water would be blended with water which does not contain nitrate in excess of the nitrate Maximum Contaminant Level (MCL) to reduce nitrate levels to meet the nitrate MCL. The treated and blended water would meet all legal requirements and would be conveyed to the City of Glendale for distribution through its public supply system. Existing production wells that may provide pathways for vertical migration of contamination would be abandoned or rehabilitated, if required. Groundwater monitoring wells would be installed to evaluate the effectiveness of the remedial action. In addition, EPA has selected Alternative 7, reinjection of the treated water, as a contingency if the City of Glendale does not accept any or all of the treated water. As a result, any remaining portion of water would be reinjected into the aquifer, per Alternative 7.

EPA's preferred alternative, Alternative 2 in combination with Alternative 7, would meet all of the nine evaluation criteria described above. This preferred alternative is equally effective as the other alternatives in the short-term and long term reduction of risk to human health and the environment by removing contaminants from the upper zone of the aquifer, by inhibiting further downgradient and vertical migration of the contaminant plume, and by reducing the toxicity, mobility, and volume of contaminants in the aquifer. This preferred alternative is estimated to remove approximately 82% of the total estimated initial TCE mass, and may reduce the maximum TCE concentration remaining in the upper zone of the aquifer by as much as 88%. The VOC treatment technology that would be used is technically feasible and effective in meeting ARARs for VOCs in the extracted and treated groundwater. The other treatment technology, perozone oxidation, may not be technically feasible because it is not a proven technology for treating a volume of water as large as 3000 gpm. Alternative 2, in combination with Alternative 7, could be implemented, both technically and administratively. Other alternatives which dispose of the water by spreading at the Headworks Spreading Grounds may not be implementable because Headworks is widely used and may not be available. In a letter dated June 16, 1992, the State expressed concurrence with EPA's preferred alternative. EPA anticipates that the public will support its preferred alternative because it is protective of human health and the environment, meets ARARs, and unlike some other alternatives, such as that which includes discharge of the treated water to the Los Angeles River, provides a beneficial use for the treated water. The estimated cost of Alternative 2 has a total present worth of $36,400,000, which is in the middle of the range for all seven alternatives.

In summary, EPA anticipates that the preferred alternative would satisfy the statutory requirements of CERCLA Section 121. It is protective of human health and the environment, complies with ARARs, is cost-effective, utilizes permanent solutions and alternative treatment to the maximum extent practicable, and uses treatment as a principal element.

ALTERNATIVE 3: Extract/Treat(Perozone Oxidation)/Public Water System

Alternative 3 involves the extraction of 3,000 gpm of contaminated groundwater for 12 years. The extraction wells would be located to effectively inhibit migration of the contaminant plume. The extracted groundwater would be filtered to remove any suspended solids and then treated for VOCs using **perozone oxidation**, followed by air stripping with vapor-phase GAC adsorption for emissions control. Air stripping would be required to remove any carbon tetrachloride in the extracted groundwater because the perozone oxidation process alone does not effectively treat this VOC. The treated water would be blended with water which does not contain nitrate in excess of the nitrate MCL to reduce nitrate levels to meet the nitrate MCL. The treated and blended water would meet all legal requirements and would be conveyed to the City of Glendale's Public Distribution System. Existing production wells that may provide pathways for vertical migration of contamination would be abandoned or rehabilitated, if required. Groundwater monitoring wells would be installed to evaluate the effectiveness of the remedial action.

ALTERNATIVE 4: Extract/Treat/River

Alternative 4 involves the extraction of 3,000 gpm of contaminated groundwater for 12 years. The extraction wells would be located to effectively inhibit migration of the contaminant plume. The extracted groundwater would be filtered to remove any suspended solids and then treated for VOCs using dual-stage air stripping with vapor-phase GAC adsorption for emissions control. The treated water would be discharged to the Los Angeles River. Existing production wells that may provide pathways for vertical migration of contamination would be abandoned or rehabilitated, if required. Groundwater monitoring wells would be installed to evaluate the effectiveness of the remedial action.

ALTERNATIVE 5[2]: Extract/Treat plus Ion Exchange/Reinject

Alternative 5 involves the extraction of 3,000 gpm of contaminated groundwater for 12 years. The extraction wells would be located to effectively inhibit migration of the contaminant plume. The extracted groundwater would be filtered to remove any suspended solids and then treated for VOCs using dual-stage air stripping with vapor-phase GAC adsorption for emissions control. Subsequently, the treated water would be treated using ion exchange to reduce the nitrate levels in the water to meet the nitrate MCL. The treated water would then be reinjected. Existing production wells that may provide pathways for vertical migration of contamination would be abandoned or rehabilitated, if required. Groundwater monitoring wells would be installed to evaluate the effectiveness of the remedial action.

ALTERNATIVE 6: Extract/Treat/Spreading Grounds

Alternative 6 involves the extraction of 3,000 gpm of contaminated groundwater for 12 years. The extraction wells would be located to effectively inhibit migration of the contaminant plume. The extracted groundwater would be filtered to remove any suspended solids and then treated for VOCs using dual-stage air stripping with vapor-phase GAC adsorption for emissions control. The treated water would be recharged at the Headworks Spreading Grounds. Existing production wells that may provide pathways for vertical migration of contamination would be abandoned or rehabilitated, if required. Groundwater monitoring wells would be installed to evaluate the effectiveness of the remedial action.

ALTERNATIVE 7[3]: Extract/Treat/Reinject

Alternative 7 involves the extraction of 3,000 gpm of contaminated groundwater for 12 years. The extraction wells would be located to effectively inhibit migration of the contaminant plume. The extracted groundwater would be filtered to remove any suspended solids and then treated for VOCs using dual-stage air stripping with vapor-phase GAC adsorption for emissions control. The treated water would then be reinjected. Existing production wells that may provide pathways for vertical migration of contamination would be abandoned or rehabilitated, if required. Groundwater monitoring wells would be installed to evaluate the effectiveness of the remedial action.

SUMMARY OF

Components	Alternative 1	Alternative 2	Alternative 3
Groundwater Extraction	• None	• Extract 3000 gpm groundwater from 12 wells	• Same as Alternative 2
Treatment	• None	• Treat VOCs with dual-stage air stripping and vapor-phase GAC • Meet nitrate MCL by blending	• Treat VOCs with perozone oxidation, airstripping, and vapor-phase GAC • Same as Alternative 2
Final Use	• Monitor groundwater quality	• Convey treated, blended water to City of Glendale's Public Distribution System	• Same as Alternative 2
CRITERIA	**EVALUATION**		
Effectiveness and Permanence	• Not effective in the short or long-term	• Inhibit vertical and lateral migration of contaminant plume • No contaminated groundwater discharged to Los Angeles River • Remove contaminant mass from aquifer • Treated groundwater would meet drinking water standards	• Same as Alternative 2 • Same as Alternative 2 • Same as Alternative 2 • Same as Alternative 2
Reduction of Toxicity, Mobility, Volume, and Treatment	• No reduction of toxicity, mobility, or volume	• Estimated to reduce TCE concentrations in the aquifer from 600 ppb to less than 100 ppb after 12 years • Removes 82% of the initial mass of TCE in the aquifer	• Same as Alternative 2 • Same as Alternative 2
Compliance with ARARs	• Will not meet ARARs	• Will meet ARARs	• Same as Alternative 2
Overall Protection of Human Health and Environment (Human Health)	• Low risk to public health because institutional controls will reduce risk of ingesting contaminated groundwater	• Protective of human health and the environment • Low risk to public health because institutional controls will reduce risk of ingesting contaminated groundwater	• Same as Alternative 2
(Environment)	• Not protective of environment	• Environmental degradation will be reduced because migration of groundwater containing TCE concentrations inhibited and TCE mass removed	• Same as Alternative 2
Implementability (Technical)	• Monitoring wells easy to construct. Spread of groundwater plume could make future remediation difficult	• Can be implemented	• Same as Alternative 2
ESTIMATED COSTS			
Total Capital Cost Annual O&M Total Present Worth	$230,000 $110,000 $791,000	$19,800,000 $3,240,000 $36,400,000	$17,800,000 $2,610,000 $31,200,000

EPA's Preferred alternatives.

ALTERNATIVES

Alternative 4	Alternative 5*	Alternative 6	Alternative7**
• Same as Alternative 2	• Same as Alternative 2	• Same as Alternative 2	• Same as Alternative 2
• Same as Alternative 2	• Same as Alternative 2, plus treatment of nitrate with ion exchange	• Same as Alternative 2	• Same as Alternative 2
• Discharge treated water to Los Angeles River	• Inject 3,000 gpm treated water into 12 wells	• Discharge treated water to Headworks Spreading Ground	• Same as Alternative 5
EVALUATION			
• Same as Alternative 2	• Same as Alternative 2	• Same as Alternative 2	• Same as Alternative 2
• Same as Alternative 2	• Groundwater discharge to Los Angeles River may be greater than Alternative 2 (but TCE concentrations lower)	• Same as Alternative 2	• Same as Alternative 5
• Same as Alternative 2	• Same as Alternative 2	• Same as Alternative 2	• Same as Alternative 5
• Treated groundwater would meet drinking water standards for VOCs and surface water discharge standards for nitrates	• Same as Alternative 2	• Treated groundwater would meet drinking water standards for VOCs and groundwater recharge standards for nitrates	• Same as Alternative 5
• Same as Alternative 2	• Estimated to reduce TCE concentrations from 800 ppb to less than 100 ppb after 12 years	• Same as Alternative 2	• Same as Alternative 5
• Same as Alternative 2	• Removes 89% of initial mass of TCE in the plume	• Removes 86% of the initial mass of TCE in the plume	• Same as Alternative 5
• Same as Alternative 2	• Same as Alternative 2	• Same as Alternative 2	• Same as Alternative 2
• Same as Alternative 2	• Same as Alternative 2	• Same as Alternative 2	• Same as Alternative 2
• Same as Alternative 2	• Same as Alternative 6, except greater mass of TCE removed	• Same as Alternative 2, except greater mass of TCE removed	• Same as Alternative 5
• Same as Alternative 2	• Same as Alternative 2; issues associated with waste brine disposal (from ion exchange) and with injection (e.g., potential for clogging) will have to be addressed	• Same as Alternative 2; one administrative issue may be the availability of the Headworks Spreading Grounds for recharge	• Same as Alternative 2, except issues associated with injection (e.g., clogging), which will have to be pilot-tested prior to full-scale implementation
$17,700,000 $3,050,000 $33,300,000	$37,000,000 $4,760,000 $61,400,000	$19,600,000 $3,300,000 $36,500,000	$21,800,000 $3,300,000 $38,700,000

* Alternative #5 presented here in this Proposed Plan was formerly Alternative #8 in the Feasibility Study for the Glendale Study Area: North Plume Operable Unit (April 1992).

** Alternative #7 presented here in this Proposed Plan was formerly Alternative #10 in the Feasibility Study for the Glendale Study Area: North Plume Operable Unit (April 1992).

SUMMARY OF WATER TREATMENT TECHNOLOGIES

Carbon Adsorption

Using this process, contaminants are removed by forcing (in a pressurized vessel) the contaminated groundwater through granular activated carbon (GAC). GAC has a very high surface area and a strong attraction for many organic compounds. Contaminated water would be pumped from the wells to the top of pressure vessels containing GAC. As the liquid flows down through the carbon beds, the VOCs would be removed from the water, by clinging to the carbon material (referred to as adsorption), and the concentration of VOCs in the water would decrease.

Carbon adsorption systems can be designed to use single or dual carbon beds. Dual-bed carbon adsorption allows for more efficient GAC usage and a higher safety margin than does the single-bed system because the water passes through two separate carbon beds instead of only one. The margin of safety is higher because if contamination is not removed completely in the first bed, the second bed can provide additional treatment. Dual-bed systems do, however, involve a significantly higher capital cost than single bed systems.

Air Stripping

Air stripping involves a mass-transfer process in which a solute in water is removed by exposure to an air-water interface. The application of this process to groundwater is made by running a volume of groundwater treatment through a vertical column containing packing media. The media provides a large surface area over which a counter current flow of air is introduced. The contaminant is transferred from the water to the air phase. Removal efficiencies of greater than 99% can be achieved in property designed packed towers. Air pollution control technologies can be added for control of VOC air emissions.

Air Stripping with Vapor Phase GAC

The VOCs removed from the water by the air stripper (also referred to as the air stripping tower) remain in the air that leaves the top of the tower. If it is necessary to control these VOC emissions, an off-gas carbon treatment system can be added to the air stripping system. Off-gas carbon treatment filters the air containing VOCs through a vessel containing granular activated carbon. Contaminants adsorb onto the carbon, thereby reducing the level of contaminants released into the air. Once the GAC is spent, it may be disposed of and replaced with fresh carbon

Ion Exchange

Ion exchange is a physical-chemical process by which ions are transferred from a solid to a liquid phase or vice versa. Ion exchange is used to soften water or remove minerals from water and is effective in reducing the concentration of nitrates in groundwater. The process involves sending contaminated groundwater through basic anion exchange columns where it is blended with sodium chloride. Ion exchange is the primary nitrate removal technology used for drinking water in the United States. A number of full-scale systems are currently in use for removing nitrate from groundwater.

Perozone Oxidation with Liquid-Phase GAC Adsorption System

This process consists of an oxidation reactor in which the organic contaminants are oxidized (treated) to nonhazardous compounds like carbon dioxide and water. The major advantage to using an oxidation process is that 85% to 95% of the VOCs are destroyed on site rather than merely transferred from the liquid to the solid phase. Additionally, using an oxidation process before a liquid-phase GAC adsorption system reduces the volume of VOCs on the carbon system and may extend the carbon life by as much as 70%. An ozone destruction system would be needed to assure that no emissions of ozone occur.

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[1] For all of the alternatives, single-stage air stripping or liquid-phase Granular Activated Carbon (GAC) may be used instead of dual stage air stripping because EPA determined during the FS that these treatment technologies are equally effective at removing VOCs and are similar in cost. And both have been proven to be reliable in similar applications. The VOC treatment technology to be used for the Glendale North Plume OU will be determined during the remedial design phase. The State expressed concern as to whether single-stage airstripping is appropriate. EPA is specifically requesting public comment on the use of single stage airstripping.

[2] Note: Alternative #5 presented here in this Proposed Plan was formerly Alternative #8 in the **Feasibility Study for the Glendale Study Area: North Plume Operable Unit (April 1992).**

[3] Note: Alternative #7 presented here in this Proposed Plan was formerly Alternative #10 in the **Feasibility Study for the Glendale Study Area: North Plume Operable Unit (April 1992).**

SELECTING A CLEANUP REMEDY

The U.S. EPA uses nine criteria to evaluate alternatives for cleaning up a hazardous waste site. The nine criteria are as follows:

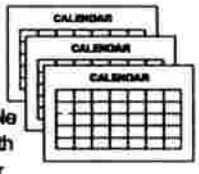
1 Overall Protection of Human Health and the Environment

Addresses whether a remedy provides adequate protection of human health and the environment, and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Addresses whether a remedy will meet all ARARs or Federal and state environmental statutes and/or provide grounds for invoking a waiver.

3 Long-term Effectiveness



Refers to the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

4 Reduction of Toxicity, Mobility, and Volume and Treatment (TMV)

Refers to the anticipated ability of a remedy to reduce the toxicity, mobility and volume of the hazardous components present at the site.

5 Cost

Evaluates the estimated captial, operation and maintenance costs of each alternative.

6 Short-term Effectiveness

Addresses the period of time needed to complete the remedy, and any adverse impacts on human health and the environment that may be posed during the construction and implementation period, until the cleanup goals are achieved.

7 Implementability

Refers to the technical and administrative feasibility of a remedy, including the availability of materials and services needed to carry out a particular option.

8 State Acceptance

Indicates whether, based on its review of the information, the state concurs with, opposes, or has no comment on the preferred alternative..

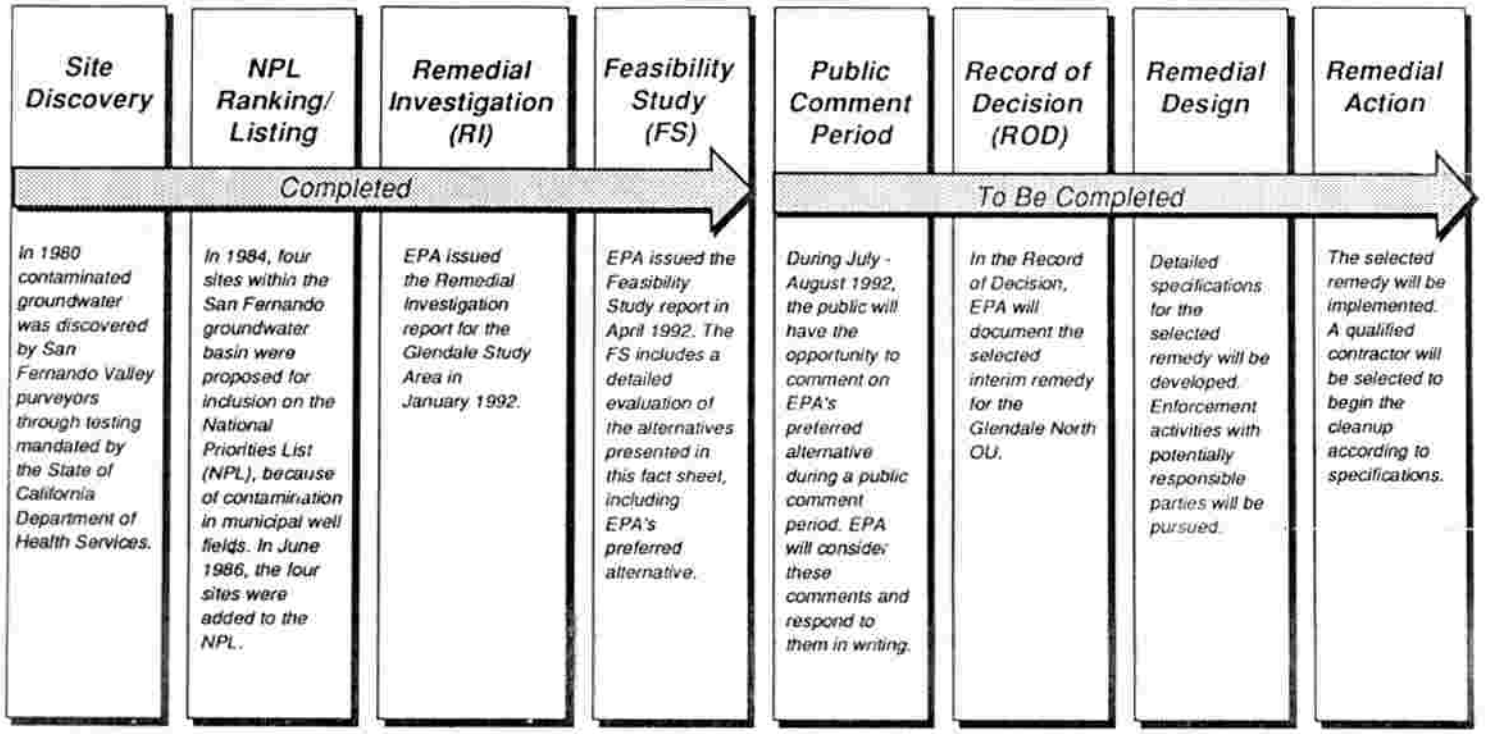
9 Community Acceptance

Indicates whether community concerns are addressed by the remedy and whether the community has a preference for a remedy.

Although public comment is an important part of the final decision, EPA is compelled by law to balance community concerns with all of the previously mentioned criteria.

FINAL REMEDY

Superfund Process For Glendale North OU



What is Superfund?

Superfund is the commonly used name for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLAS), a federal law enacted in 1980 and amended in 1986. CERCLA enables EPA to respond to hazardous sites that threaten public health or the environment where owners or operators are either unwilling or unable to address the contamination themselves.

Two major steps in the Superfund process are to conduct an in-depth investigation of a site (called a Remedial Investigation) and evaluate possible cleanup alternatives (the Feasibility Study). During the Remedial Investigation, information is gathered to determine the general nature, extent, and sources of contamination at a site. Using the alternatives developed during the Feasibility Study, EPA selects a preferred cleanup alternative considering the following criteria: (1) overall protection of human health and the environment; (2) compliance with state and federal laws; (3) long-term effectiveness; (4) reduction of potency of the contamination (toxicity), ability of the contaminants to move through the environment (mobility), and the amount of contamination (volume); (5) cost,; (6) short-term effectiveness; (7) how easily an alternative can be applied (implementability); (8) state acceptance; and (9) community acceptance. (see Figure on page 11.)

Once the final cleanup plan has been selected, EPA formalizes this decision by signing a Record of Decision (ROD). The ROD also contains a Responsiveness Summary, EPA's response to public comments. Design and actual cleanup activities (Remedial Design and Remedial Action) can then proceed.

GLOSSARY

AQUIFER An underground formation composed of materials such as sand, soil, or gravel that can store and supply groundwater to wells and springs. Most aquifers in the United States are within a thousand feet of the earth's surface.

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs) Remedial actions must comply with all substantive elements of Federal laws and more stringent state laws that apply or are determined to be relevant and appropriate to the remedy.

CONTAMINANT PLUME A three-dimensional zone within the groundwater aquifer containing contaminants that generally move in the direction of, and with groundwater flow.

GROUNDWATER Underground water that fills pores between particles of soil, sand, and gravel or openings in rocks to the point of saturation. Where groundwater occurs in significant quantity, it can be used as a source of water supply.

MAXIMUM CONTAMINANT LEVEL (MCL) The maximum permissible level of a contaminant in water delivered to any user of a public water system. MCLs are enforceable standards.

MONITORING WELLS Special wells drilled at specific locations on or off a hazardous waste site where groundwater can be sampled at selected depths and studied to determine such things as direction in which groundwater flows and the types and amounts of contaminants present.

NATIONAL PRIORITIES LIST (NPL) A list of the top-priority hazardous waste sites in the country that are eligible for investigation and cleanup under the Superfund program.

NITRATE A salt of nitric acid (a colorless, corrosive acid containing nitrogen). Nitrate groundwater contamination can be caused by agricultural practices and septic systems.

OPERABLE UNIT A distinct action taken at a Superfund site that contributes to the permanent site cleanup. A number of operable units can be taken in the course of a Superfund project.

PARTS PER BILLION (PPB) Units commonly used to express low concentrations of contaminants. For example, 1 ounce of trichloroethylene (TCE) in 1 billion ounces of water is 1 ppb.

PERCHLOROETHYLENE (PCE) A nonflammable solvent used commonly in dry cleaning and to remove grease from equipment. It is a suspected carcinogen.

RECORD OF DECISION (ROD) A public document that selects the cleanup alternatives to be used at National Priorities List sites. The Record of Decision is based on information and technical analysis included in the administrative record including data generated during the remedial investigation/feasibility study and consideration of public comments and community concerns.

REMEDIAL ACTION The construction or implementation of the selected clean-up alternative, which occurs after the feasibility study is completed and EPA has signed the Record of Decision.

REMEDIAL DESIGN An engineering phase that follows the Record of Decision when technical drawings and specifications are developed for the subsequent remedial action at a site on the National Priorities List.

REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) A two-part study of a hazardous waste site that must be completed before the site remedy is chosen and implemented. The first part, or Remedial Investigation, examines the nature and extent of site contamination. The second part, or Feasibility Study, identifies and evaluates alternatives for addressing site contamination.

RISK ASSESSMENT An evaluation performed as part of the remedial investigation to assess conditions at a Superfund site and determine the risk posed to public health and/or the environment.

SPECIAL NOTICE Letter to past and present owners and operators of facilities, or generators, or transporters of hazardous substances indicating that EPA has determined that they are potentially liable for contamination. The special notice letter triggers a negotiation period for the cleanup remedy between EPA and the noticed parties. Parties that receive special notice are referred to as potentially responsible parties (PRPs).

SUPERFUND The common named used for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act (SARA).

TRICHLOROETHYLENE (TCE) A nonflammable liquid used commonly as a solvent to remove grease from metal. It is a suspected carcinogen.

VOLATILE ORGANIC COMPOUND (VOC) An organic compound (carbon containing) that evaporates (volatilizes) readily at room temperature.

SAN FERNANDO VALLEY INFORMATION REPOSITORIES

Copies of the Remedial Investigation Report for the Glendale Study Area (January 1992), the Feasibility Study for the Glendale Study Area North Plume Operable Unit (April 1992), and other study-related documents are available for public review at the following five locations. If the copies are not available, contact Fraser Fetter, Community Relations Coordinator, at (415) 744-2181.

City of Burbank Public Library
110 North Glenoaks Boulevard
Burbank, CA 91502
(818) 953-9741
Contact: Helen Wang

(Note: This library will be closed July and August, 1992 for renovations.)

Hours: M-Th 9:30 am-9:00 pm
F 9:30 am-6:00 pm
Sat 10:00 am-6:00 pm

California State University
Northridge Library
18111 Nordhoff Street
Northridge, CA 91330
(818) 885-2285
Contact: Mary Finley

Hours: M-Th 8:00 am-10:00 pm
F 8:00 am-5:00 pm
Sa t. 9:00 am-5:00 pm

City of Glendale Public Library
222 East Harvard Street
Glendale, CA 91205
(818) 548-2021
Contact: Lois Brown

Hours: M-Th 10:00 am-8:55 pm
F-Sat 10:00 am 5:55 pm

Los Angeles Department of Wate and Power (LADWP) Library
111 North Hope Street, Room 518
Los Angeles, CA 90012
(213) 481-4612
Contact: Joyce Purcell

Hours: M-F 7:30 am-5:30 pm

The University of Research Library/U.C.L.A
Public Affairs Service
405 Hilgard Avenue
Los Angeles, CA 90024
(310) 825-4003
Contact: Barbara Silvernall

Hours: M-F 10:00 am-7:00 pm
Sat. 1:00 pm-5:00 pm

For further information about this site, contact:

Claire Trombadore
Remedial Project Manager
U.S. EPA, Region IX
75 Hawthorne St. (H-6-4)
San Francisco, CA 94105
(415) 744-2249

Fraser Felter
Community Relations Coordinator
U.S. EPA, Region IX
75 Hawthorne St. (H-1-1)
San Francisco, CA 94105
(415) 744-2181

Media Contact: Paula Bruin, (415) 744-1587

United States Environmental Protection Agency
Region 9
75 Hawthorne Street (H-1-1)
San Francisco, CA 94105
Attn: Fraser Felter

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INSIDE: Proposed Plan for Cleanup at San Fernando Valley Superfund Site