San Fernando Valley
Burbank Operable Unit

Explanation of Significant Differences
to the
Record of Decision

United States Environmental Protection Agency
Region IX - San Francisco, California
November 1990
EXPLANATION OF SIGNIFICANT DIFFERENCES
DECLARATION

SITE NAME AND LOCATION
San Fernando Valley Area 1
Burbank Operable Unit
Los Angeles County, California

STATEMENT OF BASIS AND PURPOSE
This decision document presents this Explanation of Significant Differences (ESD) to the interim remedial action selected in the San Fernando Valley, Burbank Operable Unit Record of Decision (ROD) signed June 1989. It was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. Section 9601 et. seq.) and the National Contingency Plan (40 C.F.R. Section 300 et. seq.). This decision is based on the administrative record for this Operable Unit.

DESCRIPTION OF THE SELECTED REMEDY IN THE ROD

The Burbank Operable Unit (OU) ROD selected extraction of contaminated groundwater, treatment by stripping, and use of the treated water as a public water supply by the City of Burbank. The remedy was estimated to cost $69 Million over 20 years.

The ROD stated that the remedy would be the extraction and treatment of 12,000 gallons per minute (gpm) of groundwater, and that EPA would issue another ROD if additional extraction capacity were necessary. At the time, 12,000 gpm was determined to be the extraction rate necessary hydraulically to contain groundwater with concentrations of 100 parts per billion (ppb) of TCE and 5 ppb of PCE, or greater. The extraction wells were to be located optimally to control plume migration while initiating aquifer restoration in the localized Burbank OU area.

The treatment technology selected by the Burbank OU ROD was either air stripping with vapor phase Granulated Activated Carbon (GAC) adsorption technologies or steam stripping with air emission controls. Air stripping with vapor phase GAC adsorption technologies was to be used unless steam stripping with air emission controls was shown to meet the treatment standards of air stripping with vapor phase GAC. The ROD also stated that EPA could decide to use the two technologies together if such use would maximize efficiency.

The ROD stated that the treated water must meet all existing federal and state Maximum Contaminant Levels (MCLs) and State Action Levels (SALs), including those for Volatile Organic Compounds (VOCs). It also stated that the water would have to meet
all drinking water standards, including any which might require further treatment such as chloramination for disinfection purposes, or reverse osmosis or ion exchange for nitrate.

The treated water was to be delivered directly to the City of Burbank's distribution system for use as a public water supply.

Monitoring wells were to be installed around the extraction wells to monitor the hydraulic performance of the extraction system.

The proposed locations for the extraction wells and treatment system were taken from the Operable Unit Feasibility Study (OUFS), October 1988, for the Burbank OU and outlined as a proposal in the ROD for purposes of comparative analysis. The ROD stated that the extraction well locations would be modified if warranted by new data.

**SUMMARY OF SIGNIFICANT DIFFERENCES**

This ESD clarifies certain points set forth in EPA's June 30, 1989 Burbank OU ROD and, to the extent that the ESD differs from the ROD, the ESD supersedes the ROD. The ESD provides for the following changes to the ROD:

1. The ROD stated that the treated water must meet all drinking water standards, including those standards set for nitrate. The ROD also stated that additional treatment might be necessary for nitrates if they were found to exceed the MCL. Based on new information about nitrate concentrations in the groundwater to be extracted for the Burbank OU, additional measures will be required to meet the MCL for nitrate in any water served as drinking water. After analyzing various options, EPA has decided to require nitrate treatment by blending the water containing nitrate in excess of the MCL with water that does not contain nitrate in excess of the MCL for any water to be served to the public, so that the nitrate MCL will be met in such water supply.

2. The ROD stated that the treated water is to be delivered to the City of Burbank for use as a public water supply. This ESD clarifies that if the City does not accept any or all of the treated water, any remaining portion of water shall be reinjected into the aquifer.

3. This ESD clarifies that the remedy may be designed, constructed, and operated in phases, in order to base technical decisions on the best available information.

4. This ESD clarifies that the remedy selected in the ROD was extraction and treatment of 12,000 gpm of groundwater for twenty years; references to extraction to contain groundwater with concentrations of 100 ppb or greater of TCE and 5 ppb or greater of PCE were for purposes of estimation, not a statement of remedial action selection under the ROD.

5. To the extent that any groundwater is reinjected as part of the remedy, ARARs for this reinjection of the treated groundwater are identified in this ESD. Also, a change to a previously identified ARAR is explained.
DECLARATION

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate to this interim remedial action, and is cost-effective. This remedy satisfies the statutory preference for remedies that employ treatment which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances as a principal element. It also complies with the statutory preference for remedies that utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. As part of the remedy, groundwater monitoring will be conducted to track contaminant levels at the Burbank Operable Unit and to monitor the performance of the extraction and treatment system in order to ensure adequate protection of human health and the environment.

Daniel W. McGovern
Regional Administrator

11/21/96

Date
San Fernando Valley Area 1, Burbank Operable Unit

EXPLANATION OF SIGNIFICANT DIFFERENCES

November, 1990

I. INTRODUCTION

On June 30, 1989, the U.S. Environmental Protection Agency (EPA) signed a Record of Decision (ROD) for the San Fernando Valley (SFV) Area 1 - Burbank Operable Unit (Burbank OU). The purpose of this Explanation of Significant Differences (ESD) is to explain the significant differences between the interim remedial action originally selected in the 1989 ROD and the interim remedy which will be implemented at the Site.

Under Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendment and Reauthorization Act of 1986 (CERCLA), and pursuant to 40 C.F.R § 300.435(c)(2)(i) (55 Fed.Reg. 8666, 8852 (March 8, 1990)), EPA is required to publish an Explanation of Significant Difference when significant (but not fundamental) changes are made to a final remedial action plan as described in a ROD. 1

This document provides a brief background of the Site, a summary of the remedy selected in the ROD, a description of the changes to the ROD that EPA is making (including how the changes

1. If the changes made after the ROD was signed had fundamentally altered the nature of the selected remedy, then a ROD amendment would have been required. 40 C.F.R. § 300.435(c)(2)(ii)(1990).
affect and better define the remedy originally selected by EPA in the June 1989 ROD), and an explanation of why EPA is making these changes to the ROD.

EPA is issuing this ESD in order to take into account technical data received after the ROD was signed in June of 1989 and to clarify any ambiguities regarding the selected remedy. The changes are: (1) a description of issues related to nitrate concentration levels in the groundwater, which were found to be higher than shown by earlier data, and an explanation of how these nitrate levels will be addressed during the remedial action; (2) provision of an option to reinject treated water that the City of Burbank does not accept; (3) provision of an option to phase in the 12,000 gallons per minute (gpm) pump and treat remedy; (4) the decision not to require specific cleanup levels to be met in the groundwater for this interim action; and (5) the identification of additional applicable or relevant and appropriate requirements (ARARs).

This ESD and the supporting documentation will become part of the Burbank OU Administrative Record. Copies of the Administrative Record have been placed at the following locations:

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2. EPA held a thirty day public comment period on this ESD. All comments received and EPA's responses to those comments have been included in the Burbank OU Administrative Record, consistent with 40 C.F.R. § 300.825(b). This additional public comment period is not required for an ESD. (Id.; see also, 40 C.F.R. § 300.435(c)(2)(i).) EPA provided this opportunity in order to encourage continuing public input into the decision process for this Site.
II. BACKGROUND

The following gives a brief background of the Burbank OU Site and a short summary of the remedy selected in the ROD. Further background information can be found in the June 30, 1989 ROD and in the Burbank OU Administrative Record.

1. Site Background and Description

In June 1986, EPA evaluated the threat posed by a number of well fields within the San Fernando and Verdugo Groundwater Basins, and designated them as National Priorities List (NPL) hazardous substance sites. Industrial chemicals had been detected in groundwater from these areas. Although four sites in the basin were listed on the NPL, EPA and DWP are managing the investigation of the four sites and the adjacent area as a single project consistent with CERCLA Section 104(d)(4). Figure 1 shows the original location of the SFV Areas 1 through 4 sites and the SFV study area currently being investigated by EPA.
The San Fernando Valley Groundwater Basin (SFVGB) has historically been, and continues to be, an important source of drinking water for the Los Angeles metropolitan area, including the unincorporated area of La Crescenta, and the cities of Burbank, Glendale, and San Fernando. The groundwater basin provides these communities with enough water to serve approximately 600,000 residents.

Groundwater from the SFVGB is used for residential, commercial, and industrial purposes, and is especially important during years of drought. The groundwater that has become contaminated is difficult to replace. The current water supply from surface water may not always be available in the future because of periodic drought conditions and state and federal water rights issues.

The Burbank OU was developed to address the areal extent of groundwater contamination that is presently generally located in the area of the Burbank Well Field and including any areas to which the groundwater contamination migrates. The Site is part of the SFV Area 1 (North Hollywood) NPL site and includes an area beyond that originally designated as SFV Area 1. Figure 2 shows the area where EPA is currently focusing its efforts relative to

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3. The Burbank OU is the second OU addressing contamination at the SFV Area 1 NPL site. In September 1987, EPA signed the North Hollywood OU ROD for the construction of an extraction and aeration facility to pump and treat contaminated groundwater in the North Hollywood area within the SFV Area 1 NPL site. The plant became operational in March 1989. In September 1989, EPA requested DWP to begin work on the Glendale OU RI, making it the third OU in the SFVB. EPA intends to sign a ROD for the Glendale OU in 1991.
FIGURE 2  BURBANK OPERABLE UNIT STUDY AREA, LOCATION OF BURBANK SUPPLY WELLS, AND POSSIBLE LOCATIONS OF EXTRACTION WELLS AND TREATMENT FACILITY
the Burbank Operable Unit and possible locations for extraction wells and the treatment system (as further outlined in the Ad­
ministrative Record).

The City of Burbank's production wells have been shut down because the water they produce contained trichloroethylene (TCE) and perchloroethylene (PCE) in concentrations exceeding state and federal maximum contaminant levels (MCLs). Consequently, the City of Burbank now purchases 100 percent of its water, which is imported supply, from the Metropolitan Water District of Southern California (MWD).

2. Selected Remedy

The Burbank OU ROD selected extraction of contaminated groundwater, treatment by stripping, and use of the treated water as a public water supply by the City of Burbank. The remedy was estimated to cost $69 Million over 20 years.

The ROD stated that the remedy would be the extraction and treatment of 12,000 gpm of groundwater, and that EPA would issue another ROD if additional extraction capacity were necessary. (See ROD, pp. 19, 21, and 28.) At the time, 12,000 gpm was determined to be the extraction rate necessary hydraulically to contain groundwater with concentrations of 100 parts per billion (ppb) of TCE and 5 ppb of PCE, or greater. (See ROD, pp. 2 and 19.) The extraction wells were to be located optimally to con­
trol plume migration while initiating aquifer restoration in the localized Burbank OU area.

4. It is assumed for the purposes of the Burbank OU ROD and ESD that micrograms/liter = parts per billion.
The treatment technology selected by the Burbank OU ROD was either air stripping with vapor phase Granulated Activated Carbon (GAC) adsorption technologies or steam stripping with air emission controls. Air stripping with vapor phase GAC adsorption technologies was to be used unless steam stripping was shown to meet the treatment standards of air stripping with vapor phase GAC. The ROD also stated that EPA could decide to use the two technologies together if such use would maximize efficiency.

The ROD stated that the treated water must meet all existing federal and state MCLs and State Action Levels (SALs), including those for Volatile Organic Compounds (VOCs). It also stated that the water would have to meet all drinking water standards, including any which might require further treatment, such as chloramination for disinfection purposes, or reverse osmosis or ion exchange for nitrate.

The treated water was to be delivered directly to the City of Burbank's distribution system for use as a public water supply.

Monitoring wells were to be installed around the extraction wells to monitor the hydraulic performance of the extraction system.

The proposed locations for the extraction wells and treatment system were taken from the Operable Unit Feasibility Study (OUFS), October 1988, for the Burbank OU and outlined as a proposal in the ROD for purposes of comparative analysis. The ROD stated that the extraction well locations would be modified if warranted by new data.
III. SUMMARY OF SIGNIFICANT DIFFERENCES

This ESD clarifies certain points set forth in EPA's June 30, 1989 Burbank OU ROD and, to the extent that the ESD differs from the ROD, the ESD supersedes the ROD. The ESD provides for the following changes to the ROD:

1. The ROD stated that the treated water must meet all drinking water standards, including those standards set for nitrate. The ROD also stated that additional treatment might be necessary for nitrate if it exceeds the MCL (ROD, p.29). Based on new information about nitrate concentrations in the groundwater to be extracted for the Burbank OU, additional measures will be required to meet the MCL for nitrate in any water served as drinking water. After analyzing various options, EPA has decided to require nitrate treatment by blending water containing nitrate in excess of the MCL with water which does not contain nitrate in excess of the MCL, for any water to be served to the public, so that the nitrate MCL will be met in such water supply.

2. The ROD stated that the treated water is to be delivered to the City of Burbank for use as a public water supply. This ESD clarifies that if the City does not accept any or all of the treated water, any remaining portion of water shall be reinjected into the aquifer.

3. This ESD clarifies that the remedy may be designed, constructed, and operated in phases, in order to base technical decisions on the best available information.
4. This ESD clarifies that the remedy selected in the ROD was extraction and treatment of 12,000 gpm of groundwater for twenty years; references to extraction to contain groundwater with concentrations of 100 ppb or greater of TCE and 5 ppb or greater of PCE were for purposes of estimation, not a statement of remedial action selection under the ROD.

5. To the extent that any groundwater is reinjected as part of the remedy, ARARs for this reinjection of the treated groundwater are identified in this ESD. Also, a change to a previously identified ARAR is explained.

IV. EXPLANATION AND DETAILED DESCRIPTION OF CHANGES AND CLARIFICATIONS

After the ROD was signed, EPA received and reviewed new data which included information from the Lockheed Aeronautical Systems Corporation (LASC) Phase IV Cluster wells and the Remedial Investigation Vertical Profile Borings/Shallow Monitoring wells. Reports and technical memoranda were received and/or generated as a result of this new information in preparation for this ESD. The new and the existing technical information upon which EPA relied in making the significant changes described in this ESD can be found in the Administrative Record.
1. Treatment of Nitrate
   a. Background

   Currently available information indicates that the groundwater containing VOCs above the MCLs is for the most part found in the upper 200 feet of the aquifer beneath the Burbank OU area, not in the upper 500 feet as assumed in the Burbank OUFS report. Moreover, the information also indicates that shallow groundwater contains nitrate concentrations above the MCL.

   When the OUFS report was prepared, EPA believed that the groundwater to be extracted and treated for VOCs would meet all drinking water standards for constituents other than the VOCs without further treatment (beyond the VOC treatment). The Burbank OU ROD stated that the treated groundwater must meet all ARARs identified in the ROD, including those for extracted groundwater to be served as drinking water (i.e. the drinking water standards), and that additional treatment might be necessary for contaminants such as nitrate if they were found to exceed the MCL (see ROD, p.29). With this ESD, EPA explicitly defines the additional measures required for disposal of VOC-treated effluent containing nitrate concentration levels above the MCL.

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5. It should be noted that conditions can change. For example, fluctuations in groundwater levels can impact the amount of VOC contamination that is either released or not released from the unsaturated zone. Moreover, contamination can migrate both vertically and horizontally into other areas. These factors will be considered during the design phase(s).
The "Nitrate Reduction for the Burbank Operable Unit Technical Memorandum" describes four different options EPA analyzed to address the disposal of VOC-treated effluent containing nitrate concentrations that exceed MCLs. In that memorandum, the necessary capital and operations and maintenance (O & M) requirements as well as the relative advantages and disadvantages of each of those four options are presented.6

b. Options

While CERCLA Section 117(c) and 40 C.F.R. § 300.435(c)(2)(i) merely require an explanation of the significant differences and the reasons for these differences, this ESD sets out in detail four options for disposal of VOC-treated effluent, and EPA's analysis of these options. The four options are as follows:

1. Extraction of groundwater from selected aquifer zones beneath the Burbank OU area. By preferentially pumping from different aquifer zones, the extracted water would be blended in order to lower nitrate concentration levels to below the MCL before VOC treatment by stripping, and use by the City of Burbank. See Figure 3.7

6. The Los Angeles Department of Water and Power prepared, at EPA's request, the "Nitrate Reduction For the Burbank Operable Unit" Technical Memorandum. EPA relied upon the Administrative Record, including this Technical Memorandum, for the development of the four options outlined in the ESD. The Technical Memorandum options 1, 2, 3, 4 generally correspond to the ESD options 1, 3, 4, 2, respectively. The four options analyzed in this ESD are set forth in the next section.

7. In the aquifer zones where the nitrate concentrations appear to be lower, VOC concentrations also appear to be lower. Since some water would be extracted from the zones with lower nitrate concentrations in order to blend this water with the water from the zones with higher nitrate concentrations, the total volume of groundwater extracted under Option 1 would be lower in both nitrate and VOC concentrations.
2. Extraction of groundwater from the most VOC-contaminated zone, VOC treatment by stripping, and: (a) nitrate reduction by blending water containing nitrate in excess of the MCL with water which does not contain nitrate in excess of the MCL\(^8\) and use by the City of Burbank; and/or (b) reinjection of the water into an area with similar nitrate concentrations.\(^9/10\) See Figure 4.

3. Extraction of groundwater from the most VOC-contaminated zone, VOC treatment by stripping, nitrate treatment by ion exchange,\(^11\) and use by the City of Burbank. See Figure 5.

4. Extraction of groundwater from the most VOC-contaminated zone, VOC treatment by stripping, and reinjection of the water into an area with similar nitrate concentrations. See Figure 6.

The option for disposal of VOC-treated effluent containing nitrate concentrations above the MCL that EPA is choosing in this ESD is Option 2. The total blended water supply to be served as a public drinking water supply will meet the nitrate MCL. The following analysis explains why this option is preferred over the others.

8. The California Department of Health Services has determined that such blending is an acceptable form of treatment for nitrate. See Memorandum from Alisa Greene to Administrative Record, dated July 2, 1990.

9. The water to be reinjected will meet all primary drinking water standards other than that for nitrate.

10. Alternative 2, by extracting 12,000 gpm of groundwater and blending it with some unknown amount of surface water may produce a total water supply that is greater than the City of Burbank can use. See page 27, below, for a discussion of this issue.

11. See Administrative Record for a discussion of other nitrate removal treatments that were screened out during the preliminary analysis for this ESD.
Option 1

Extraction Wells

Extracted water meets Nitrate MCL, but is above VOC MCLs

Water supply back-up connection

VOC treatment

City of Burbank

Water meets all MCLs including VOC and Nitrate MCLs

groundwater

\(\nabla\) = ground water table
Option 2

Extraction Wells

- Extracted water is above Nitrate and VOC MCLs
- Higher VOC Concentrations than Option 1

- Water supply (low in Nitrate)
- Nitrate Treatment (Blending)
- City of Burbank
- Water meets all MCLs including VOC and Nitrate MCLs
- Water meets VOC MCLs, but is above Nitrate MCL

groundwater

Water reinjected into Basin
Option 3

Extraction Wells

- Extracted water is above VOC and Nitrate MCLs
- Higher VOC concentrations than Option 1

VOC treatment

Nitrate Treatment (Ion Exchange)

Water meets Nitrate MCL

Blending Facility

Water meets all MCLs including VOC and Nitrate MCLs

City of Burbank

groundwater

\( \heartsuit \) = ground water table

\( \text{Tl} \) = revised 6/21/90 - \text{\textcopyright{}} 2006
c. Analysis of Options for Addressing Nitrate

The four options presented above were compared with each other based on the nine criteria listed and explained in the National Contingency Plan, 40 C.F.R. § 300.430(e)(9)(iii). The nine criteria and the results of the comparison of the options are presented in this subsection. The nine criteria are as follows:

1. compliance with applicable or relevant and appropriate requirements (ARARs),
2. overall protection of human health and the environment,
3. short-term effectiveness in protecting human health and the environment,
4. long-term effectiveness and permanence in protecting human health and the environment,
5. reduction of toxicity, mobility, and volume of contaminants,
6. technical and administrative feasibility of implementation,
7. capital and operation and maintenance costs,
8. state acceptance, and
9. community acceptance.

All four options meet the following criteria equally well:

1. compliance with ARARs,
2. overall protection of human health and the environment, and
3. short-term effectiveness in protecting human health and
Option 4

Extraction Wells

Extracted water above Nitrate and VOC MCLs

Water meets VOC MCLs, above Nitrate MCL

Higher VOC concentrations than Option 1

Water Reinjected into Basin

\[\n\text{high VOCs high Nitrate}\]

\[\text{groundwater}\]

\[\n\text{\(\nabla\) = ground water table}\]
the environment.

Compliance with ARARs

The main purpose of this interim remedial action is to control the spread of the VOC plume in the aquifer. This is being done by the pumping of wells to inhibit the spread of the plume, followed by the treatment of extracted groundwater in a 12,000 gpm treatment plant to remove the VOCs. Because pumping and treating for the VOCs requires that there be a disposal option for the VOC-treated effluent, and because the zones of the the aquifer containing the VOCs also contain nitrate concentrations in excess of the MCL, the four options under consideration were developed for disposal of VOC-treated effluent. There are several sets of requirements that must be considered in analyzing these options.

12. The ROD recognized that chemical-specific ARARs for the groundwater itself would be met in the final remedy for this site. (See ROD, page 23.) Since the remedial action adopted pursuant to the ROD and this ESD is an interim action, these chemical-specific ARARs for the groundwater contaminant plume do not apply to the activities undertaken pursuant to this ESD. In explaining the requirements of the National Contingency Plan ("NCP"), the preamble to the NCP states:

Several commenters also stated that chemical-specific ARARs used as remediation goals, such as MCLs as ARARs for ground water remediation, cannot be attained during implementation. EPA wants to clarify that it recognizes that ARARs that are used to determine final remediation levels apply only at the completion of the action.

See 55 Fed. Reg. 8754 (March 8, 1990). Therefore, chemical-specific requirements to be met in the aquifer at the end of the final remedy are not ARARs for this interim action and therefore are not relevant to choosing among the options available.
First, any water to be reinjected onsite must meet all action-specific ARARs for reinjection. The action-specific ARARs for reinjection are identified below in Subsection 5 of this Section. The reinjection must meet the "Statement of Policy With Respect to Maintaining High Quality of Waters in California," (an ARAR for reinjection), which requires that the reinjected water not unreasonably degrade existing water quality. This ARAR can be met by ensuring that the water is reinjected into an area containing nitrate concentrations similar to the concentrations in the water to be reinjected, by taking into account the quality and quantity of the water to be reinjected, and by ensuring that the water to be reinjected meets the primary drinking water standards for all other contaminants. Options 2 and 4 each: (a) result in the removal of VOCs by the treatment plant; and (b) provide a means whereby the water to be reinjected would meet all ARARs for reinjection.

Secondly, the water to be used as a public water supply off-site must also meet all drinking water standards, including that for nitrate, as explained below. Options 1, 2 and 3 each: (a) result in the removal of VOCs by the treatment plant, and (b) provide a means whereby the MCL for nitrate would be met in the water to be served as a public water supply, without having the treatment plant effluent meet the nitrate MCL. Thus, all MCLs other than the MCL for nitrate would have to be met in the water to be blended. After blending, such water would have to meet all MCLs.
Because of the need to comply with the "Statement of Policy With Respect to High Quality of Waters in California," all primary drinking water standards other than the MCL for nitrate must be met in the treatment plant effluent, whether it is to be used for drinking water or reinjected. Therefore, all primary drinking water standards other than the nitrate MCL are ARARs for the treatment plant effluent.

In addition to meeting ARARs, when any water from the treatment plant is served offsite, all applicable requirements for drinking water in existence at the time that the water is served will have to be met. See 55 Fed. Reg. 8758 (March 8, 1990). Since this activity would take place offsite, these requirements are not ARARs within the meaning of CERCLA Section 121(d), which term refers to onsite actions. Therefore, these requirements, as they apply to the water to be served offsite as a public water supply, are not "frozen" as of the date the ESD is adopted, as are onsite ARARs. See 40 C.F.R. § 300.430(f)(1)(ii)(B). Rather, they change over time as new laws and regulations applicable to drinking water change. See 55 Fed. Reg. 8758 (March 8, 1990).13

13. If a primary drinking water standard or other requirement changed, EPA would ensure that the onsite remedy complied with 40 C.F.R. § 300.430(f)(1)(ii)(B)(1), which states that "[r]equirements that are promulgated or modified after ROD signature must be attained (or waived) only when determined to be applicable or relevant and appropriate and necessary to ensure that the remedy is protective of human health and the environment." Thus, if any requirement changed in the future and EPA determined that the onsite activities had to comply with that new requirement in order to remain protective of human health and the environment, EPA would ensure that the remedy complied with the new requirement.
Options 1 and 3, and Option 2 (unless the City does not accept the water), involve serving the extracted water through the public water supply system. Each of these options include VOC treatment to meet the VOC MCLs and some other treatment method to meet the nitrate MCL before the water is provided as a public water supply, and would result in the achievement of the ARARs identified for the treated effluent, and would also result in the MCL for nitrate being met.

Option 4, and Option 2 (if the City does not accept all of the treated water) involve reinjection of the treated water into the aquifer. The water from the treatment plant would meet all current requirements for drinking water other than the nitrate MCL. Because this option only involves reinjection into an area of the aquifer with similar concentrations of nitrate, and because any other requirements for reinjection, including those stemming from the Water Quality Control Plan for the Los Angeles Basin, would be met, this option would meet the ARARs for reinjection.

Overall Protection of Human Health and the Environment

All four options protect human health and the environment. In Options 1, 2, and 3, institutional controls (e.g. monitoring) would be used to confirm that no contaminated groundwater was being served as drinking water. Under Option 4, no treated groundwater would be served as public drinking water. Thus, public health would be protected under all four options. All
four options would provide environmental protection by instituting interim remedial action to inhibit spreading of the VOC plume and to remove VOCs from the groundwater.

**Short-Term Effectiveness**

For all four options, no adverse short-term impacts would be expected during the construction of the facilities or the remediation. Drinking water supplies would be provided from another water supply (other than treated groundwater) and/or treated groundwater during the interim period before construction is completed (both initially and during the phasing in of the system) and during remediation. Institutional controls would assure that the drinking water would meet drinking water standards.

There are some differences in the options when it comes to the following criteria

1. long-term effectiveness and permanence in protecting human health and the environment,
2. reduction of toxicity, mobility, and volume of contaminants,
3. technical and administrative feasibility of implementation,
4. capital, and operation and maintenance costs,
5. state acceptance, and
6. community acceptance.

**Long-term Effectiveness and Permanence**

All four options would maintain reliable protection of human health and the environment over time. However, Options 2, 3, and 4 would be more effective and permanent than Option 1.
Options 2, 3, and 4 would be more effective in controlling the plume(s) migration and aquifer restoration than would Option 1 because each of the former would remove a greater mass of VOCs per volume of water extracted than would the latter. In order to meet the nitrate MCL, Option 1 would selectively extract groundwater from different zones within the aquifer. These zones have different nitrate (and VOC) concentrations. Generally, where the nitrate concentrations are lower so are the VOC concentrations. Therefore, the total volume of water extracted from the different zones within the aquifer would have lower nitrate concentrations, and lower VOC concentrations, than would the total volume of water extracted from the zones with the highest VOC concentrations. Therefore Option 1 would not extract as great a mass of VOCs per volume as Options 2, 3, and 4, which would extract and treat groundwater from the most contaminated VOC zones.

**Reduction of Toxicity, Mobility, and Volume**

Options 2, 3 and 4 would have the greatest effect on reducing the toxicity, mobility, and volume of VOCs. These three options would treat an equal amount of the VOCs from the groundwater. As explained above under "Long-term Effectiveness and Permanence," Option 1 would not treat as much of the VOC contamination as would Options 2, 3, and 4. Therefore, it would not have as great an impact on the reduction of the toxicity, mobility and volume of VOCs in the groundwater as would the other options.
Option 3, and to a lesser extent Option 1, would also remove nitrate from the groundwater, thereby reducing the toxicity, mobility and volume of nitrate in the groundwater. Option 4 would result in little or no change in the toxicity, mobility and volume of nitrate, but the reinjected water could be used to create a hydraulic barrier to inhibit further migration of VOC-contaminated groundwater or to increase the flow of contaminated water to the extraction wells. To the extent that Option 2, in practice, involved serving the water to the City of Burbank, it would result in a reduction in toxicity, mobility and volume of nitrate similar to that which would occur under Option 3; to the extent that Option 2, in practice, involved reinjecting the water, it would result in no change in the toxicity, mobility and volume of nitrate, but (as with Option 4), the reinjected water could be used to create a hydraulic barrier to inhibit further migration of VOC-contaminated groundwater or to increase the flow of contaminated water to the extraction wells.

**Implementability**

All four options have extraction and monitoring wells and VOC treatment by stripping.\(^\text{14}\)

Option 1 would employ the same treatment as was proposed in the ROD, except for blending. Option 1 would require additional facilities, including a metered MWD connection, a pipeline from

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14. The ROD discusses the implementability of the extraction and monitoring wells and VOC treatment by stripping.
the MWD connection to the City of Burbank’s Valley Forebay, and retrofitting of the Valley Forebay to add blending capability.\(^\text{15}\) Option 1 would provide simple and reliable operation.

Option 3 would add an additional treatment facility to the treatment system chosen in the ROD: ion exchange.\(^\text{16}\) This would be the most difficult option to implement. Although ion exchange is a proven technology, it is more complex and requires more operation and maintenance (O & M) than blending. Additionally, ion exchange generates a brine solution as waste, and it is difficult to either reuse or dispose of this solution. Furthermore, additional space and piping would be needed for facilities to treat the concentrated brine solution prior to its disposal. There is not enough space at the Valley Forebay Station - where the treatment system may be located and to which the water ultimately must be delivered - for the stripping treatment system, ion exchange treatment system, and brine solution waste storage and treatment system. These additional requirements would make Option 3 more difficult to implement than the other options.

\[\begin{align*}
\text{-------------------}
15. & \text{ Option 1 would require the additional facilities as backup in case the nitrate concentrations were still above the MCL after the selective extraction of groundwater and VOC treatment.} \\
16. & \text{ Option 3 would also require the City of Burbank’s Valley Forebay to be retrofitted for blending capacity. After VOC treatment, part of the groundwater would be treated by ion exchange and part of the groundwater would be fed directly into the Forebay for blending. It is a common practice with nitrate removal treatment systems to treat some of the water and blend it with another part to reach the desired concentrations.}
\end{align*}\]
Under Option 4, the only change to the remedy described in the ROD would be that instead of delivering the treated water for use, the VOC-treated water would be reinjected into the aquifer. Under Option 4, nitrate treatment would not be necessary because nitrate concentrations are similar throughout the Burbank OU area (where both the extraction and injection of the groundwater would occur). The reinjection wells could be constructed and operated (they are a proven method for injection of water into an aquifer); however, additional maintenance requirements would be expected due to potential clogging of the reinjection wells. Moreover, the reinjection wells would need to be carefully located to assure that the injection of water would not further complicate the groundwater contamination. Therefore, Option 4 would be a more difficult option to implement than Option 1.

Option 2 would also add additional facilities to the system chosen in the ROD for blending and reinjection. Option 2 would require the same facilities for blending as would Option 1. Furthermore, Option 2 would require the reinjection facilities presented above for Option 4, except that Option 2 may not require as great a reinjection capacity as Option 4; therefore, Option 2 would be more difficult to implement than Option 1, less difficult to implement than Option 3, and possibly less difficult to implement than Option 4 (depending on the necessary reinjection capacity).

Costs

The following discussion compares the additional costs of the options above the estimate given in the June 1989 ROD.\textsuperscript{17}
Option 1 is the least expensive of the four options. The additional capital cost for this option is estimated to be $2.2 Million. The additional annual O & M costs are estimated to be $20,000. The total additional cost for 20 years is estimated to be $2.4 Million.

Option 4 is more expensive than Option 1, but less expensive than Option 3 and potentially less or more expensive than Option 2. The additional capital cost is estimated at $6.8 Million. The additional annual O & M costs are estimated at $20,000. The total additional cost for 20 years is estimated to be $7.0 Million.

Option 2 is more expensive than Option 1 and potentially more or less expensive than Option 4, but less expensive than Option 3. The additional capital cost is estimated to be $8.5 Million. The actual cost will depend on the required reinjection capacity. The cost would be approximately $9.1 Million if all the treated groundwater were reinjected, and the blending facilities were added for backup (equivalent to the costs of Option 1 plus Option 4). If no treated groundwater were reinjected

17. Cost estimates are present worth values with a 10% interest rate.

18. This cost estimate assumes that one-half of the groundwater (6000 gpm) would be used for a public water supply and one-half of the groundwater (6000 gpm) would be reinjected. The cost estimate includes all of the facilities for Option 1 plus Option 4, minus five of the ten reinjection wells (6000 gpm capacity) in Option 4. Five of the ten reinjection wells would not be needed if only 6000 gpm of groundwater were reinjected instead of 12,000 gpm.
than the cost would be approximately $2.2 Million (the same as the cost for Option 1). The additional annual O & M costs are estimated to be slightly less than $40,000. The total additional cost is estimated at $8.8 Million over a twenty year period.

Option 3 is the most expensive option. The additional capital cost is estimated to be $9.2 Million. The additional annual O & M costs are estimated to be $1.8 Million. The total additional cost for 20 years is estimated to be $24.6 Million.

State Acceptance

The California Regional Water Quality Control Board, Los Angeles Region (RWQCB-LA) supports the use of the treated water as drinking water, provided that all requirements for the serving of public drinking water are met, and prefers the options that provide the water from the treatment plant as a public water supply either by blending with surface water to reduce nitrates or by treating for nitrates through ion exchange. See June 8, 1990 Letter from Hank H. Yacoub, RWQCB-LA, to Alisa Greene, EPA, in the Administrative Record. The Regional Water Quality Control Board agrees that treated groundwater containing nitrates can be

19. The estimate depends on the required reinjection capacity. The $40,000 assumes that one-half of the water would be used as a public water supply and one-half of the water would be reinjected (Option 1 + Option 4). See the "Nitrate Reduction For the Burbank Operable Unit" Technical Memorandum.

20. The estimate depends on the required reinjection capacity. The $8.8 Million assumes that one-half of the water would be used as a public water supply and one-half of the water would be reinjected (Option 1 + Option 4, minus approximately $600,000, the cost of five of the ten reinjection wells). See the "Nitrate Reduction For the Burbank Operable Unit" Technical Memorandum.
reinjected into the aquifer (Options 2 and 4) in compliance with the "Statement of Policy With Respect to Maintaining High Quality of Waters in California." See June 20, 1990 Letter from Robert P. Ghirelli, RWQCB-LA, to Alisa Greene, EPA, in the Administrative Record. Although the California Department of Health Services (CA DHS) Toxic Substances Control Division did not state any preferences or rejections of any of the options, it did have comments about reinjection of the water (Options 2 and 4), to which EPA has responded. (See May 15, 1990 Letter from Hamid Saefbar, CA DHS, to Alisa Greene, EPA, in the Administrative Record). The CA DHS - Office of Drinking Water did not state any preferences or rejections of any of the options in their comments to EPA (see June 11, 1990 Letter from Gary H. Yamamoto, CA DHS, to Alisa Greene, EPA, in the Administrative Record).

Community Acceptance

EPA believes that the community would prefer Options 2, 3 and 4 over Option 1, since these options address the VOC contamination more efficiently and more permanently. The community is also expected to prefer Option 2 or 3 over Option 4, since these options either provide a public water supply or have the potential to provide a public water supply.

EPA held a thirty day public comment period on the proposed ESD. No individual members of the public commented. The City of Glendale's Public Service Department commented that they concurred with EPA's decision in selecting a remedy that provides
"flexibility on serving treated water for community use." See Comment by Glendale Public Service Department in the Administrative Record.

d. Decision Regarding Nitrate

Based on the foregoing analysis of the four options, EPA has decided to choose Option 2, which consists of extraction of groundwater from the aquifer zones containing the highest VOC concentrations, VOC treatment by stripping, and then: (a) nitrate reduction by blending and use as a public water supply by the City of Burbank; and/or (b) reinjection of the treated groundwater, (without blending). Option 2 is the preferred alternative for several reasons: (1) it will result in a greater reduction of the toxicity, mobility and volume of VOC contaminants in the aquifer than would Option 1. (The reduction of VOC contamination in the aquifer is one of the two purposes of this interim remedial action, as specified in the ROD.); (2) Option 2 will result in greater long-term effectiveness and permanence in protecting human health and the environment than would Option 1; (3) Option 2 has the potential to result in a greater reduction of nitrate in the groundwater than either Options 1 or 4; (4) Option 2 does not require additional space and avoids the additional operation and maintenance requirements resulting from a more complicated treatment system (such as ion exchange), thereby making implementation of Option 2 more technically and administratively feasible than the implementation of Option 3; (5) Option 2 is less expensive than Option 3, and may be less or more expensive to the cost of Option 4 (depending on how much
water is reinjected), while providing adequate protection of public health and the environment; and (6) Option 2 also has the potential to provide a public water supply to the City of Burbank, (the other purpose for this interim action, as stated in the ROD).

If for any reason the City does not accept the water, then EPA prefers Option 4 over either Option 1 or Option 3. This is implicit in EPA's selection of Option 2, which allows any water not accepted by the City to be reinjected. EPA prefers Option 4 over Options 2 and 3 even if all of the water must be reinjected. EPA prefers Option 4 over Options 1 and 3 because: (1) it will result in greater reduction of volume, toxicity and mobility of VOCs than would Option 1; (2) Option 4 would result in greater long-term effectiveness and permanence in protecting human health and the environment than would Option 1; (3) Option 4 would not require additional space and avoids the additional maintenance requirements resulting from a more complicated treatment system (such as ion exchange), thereby making implementation of Option 4 more technically and administratively feasible than the implementation of Option 3; and (4) Option 4 would be less expensive than Option 3, while providing adequate protection of public health and the environment.

21. In other words, these are the reasons that EPA prefers Option 2 even if all of the water must be reinjected.
2. Use and/or Reinjection

The June 1989 ROD stated that the treated water would be delivered to the City of Burbank for use. Because this ESD provides for nitrate treatment by blending with an additional source of water, the total treated water supply may be greater than that which the City of Burbank can accept. Currently, the City cannot accept more than 12,000 gpm, due to capacity constraints. Of course, over the 20 year cleanup period, the amount of water the City could accept may change. Also, in the future, there could be other reasons why the City of Burbank would not accept some or all of the water. This ESD deals with this contingency by recognizing, in Option 2, that the amount of water the City can accept may vary over time. Because the treatment of VOC contamination in the groundwater depends on having a discharge option for the VOC-treated water, EPA is including in this ESD the ability to reinject any or all of the groundwater that is not accepted as drinking water by the City.

The Burbank OUFS Report discusses, in detail, reinjection with partial use as the discharge option for the treated water (Alternatives 2 and 3 from the OUFS Report). As noted in the Burbank OUFS Report, reinjection could enhance the cleanup process by creating a hydraulic barrier to inhibit further contaminant migration or by increasing the flow of contaminated water toward the extraction wells.

When the ROD was signed there were two concerns with the reinjection discharge option: (1) because of the uncertainties associated with the extent of contamination, further spreading of
contamination could occur if the injection wells were improperly placed; and (2) operational problems encountered with injection wells, such as the clogging of wells.

Given the new information from the LASC Phase IV and EPA RI monitoring results, the extent of contamination is now better characterized. Future monitoring of these and other wells will characterize the extent of contamination even further. Therefore, EPA now believes that the injection wells could be located to enhance, rather than impede, cleanup of the VOCs in the groundwater.22/23

As discussed in the previous section, Analysis of Alternatives for Addressing Nitrate (pages 12 through 24), Option 2 is protective of human health and the environment, complies with all ARARs, and is cost effective (i.e., meets the criteria as discussed in 40 C.F.R. § 300.430(e)(9)(iii)) and thus is an acceptable remedial option. Furthermore, Option 2 also has certain advantages in terms of reduction of toxicity, mobility and volume of hazardous substances and/or contaminants, long-term effectiveness and permanence, implementability, and acceptance by the state and community.24

22. Also, LASC has a temporary permit from the Regional Water Quality Control Board to operate a pilot injection well project. This pilot project will give EPA more information about potential impacts to the receiving groundwater and injection system design and operation, which will result in an increased ability to locate and design properly the injection wells for the reinjection, if it is necessary.
23. EPA approval will be required to assure that the injection well locations will not interfere with other remedial actions or remedial investigation studies or further exacerbate the groundwater contamination.
3. Remedial Action Phasing and Location of Extraction Wells

This ESD makes clear that, as appropriate, the remedial action selected in the 1989 ROD and as modified by this ESD may be implemented in phases. Monitoring and technical evaluations would occur during each phase. These evaluations would provide the data for better characterization of the aquifer with respect to hydraulic parameters and water quality. This would allow for a more effective and efficient performance of the remedial action than if it were to be done all at one time.

If the remedy is implemented in phases, there would most likely be three phases. The first phase would consist of extraction and treatment of 6,000 gpm of groundwater and use and/or reinjection of the treated water supply. The second phase would consist of extraction and treatment of an additional 3,000 gpm of groundwater and use and/or reinjection of the treated water supply. The third phase would include the extraction and treatment of an additional 3,000 gpm of groundwater and use and/or reinjection of the treated water supply.

There is more information regarding the alternative of phasing of the remedial action in the Administrative Record.

Based on new information, EPA also analyzed locations for

24. Option 4 is also protective of human health and the environment, complies with all ARARs not waived, and is cost-effective. Therefore, it is also an acceptable alternative. In Section IV.1.d., above, EPA set forth both the reasons it prefers Option 2 to all of the other options, and the reasons it prefers Option 4 to Options 1 and 3.

25. Data from the LASC Phase IV - Monitoring Program and the EPA Remedial Investigation VPBs/Shallow Monitoring wells indicate that the TCE and PCE contamination extends south of the Burbank Boulevard, which is further south than originally described in
extraction wells other than those analyzed in the Burbank OUFS Report for their overall effectiveness in plume control and aquifer restoration. (See the "Technical Memorandum Supplement to the Administrative Record for the Burbank Operable Unit" in the Administrative Record.)

This Technical Memorandum indicates that more effective plume control would be attained if the extraction wells were located further south than those proposed in the Burbank OUFS Report (see Figure 2 for possible location of the extraction well field).

As in the ROD, EPA will not select the exact locations for the wells and treatment plant in this ESD, but will generally describe possible locations for purposes of comparative analysis. The flexibility to choose the exact locations during the design phases, when further information is available, is necessary to maximize the efficiency, reliability and cost effectiveness of the remedial action.

4. **Amount of Water To Be Extracted and Treated**

The 1989 Burbank OU ROD described the remedy as "extraction and treatment of 12,000 gpm of groundwater for 20 years" and "extraction to capture groundwater containing 100 ppb or greater of TCE and 5 ppb or greater of PCE." (See ROD, pp. 2 and 28.) The remedy was described in this dual fashion because, based on the information available at that time, EPA estimated that the

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the Burbank OUFS Report (See Figures 2.3.5 and 2.3.6 to the Burbank OUFS). That analysis can be found in the Administrative Record.
remedy of extracting 12,000 gpm of groundwater for 20 years would result in capturing groundwater containing 100 ppb and 5 ppb levels of TCE and PCE, respectively. Based on the previously identified new information, EPA believes that the 12,000 gpm extraction system will necessarily capture 100 ppb level for TCE and the 5 ppb level for PCE. Given this information, EPA is clarifying that the remedial action selected for the Burbank Operable Unit is the extraction and treatment of 12,000 gpm of groundwater for twenty years, the reference to clean up levels of 100 ppb TCE and 5 ppb PCE were meant as goals and are hereby superseded. Of course, EPA may, in the future, amend the remedial action selected or may require additional remedial action, including additional extraction, under another operable unit or in the final remedy. EPA will ensure that all ARARs not waived pursuant to CERCLA Section 121(d)(4)(A) are met in the final remedial action.

26. This clarification that EPA meant to describe the selected remedy in terms of the size of the treatment plant rather than in terms of performance criteria (such as cleanup levels) was implied in the ROD by the following statements (page 28): "... the decision to pump and treat 12,000 gpm [as opposed to 16,000 gpm] was determined to be the most appropriate given the amount of technical information currently available" and "[i]f additional extraction is determined necessary, EPA would again go out for public comment with a Proposed Plan before signing another Record of Decision." This definition of the ROD is also supported by the description of Alternative 5, Phases 1 and 2 on pages 18 to 19 of the ROD and the decision to adopt Alternative 5, Phase 1 as the selected remedy under the ROD (page 28 of the ROD), since the major difference between the two phases was that Phase 2 would have involved additional extraction capacity. With this ESD, EPA clears up any ambiguity resulting from the reference in the ROD to specific capture zone levels.
5. **ARARS**

For any reinjection that occurs, the reinjected water must meet all action-specific ARARs for such reinjection. ARARs applicable to the reinjected water include the following:

1. the Los Angeles Regional Water Quality Control Board’s Water Quality Control Plan, which incorporates State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California." See Los Angeles River Basin Plan 4B, Chapter 4, Pages I-4-2 to I-4-3; and

2. Resource Conservation and Recovery Act ("RCRA") Section 3020. This Section of RCRA provides that the ban on the disposal of hazardous waste into a formation which contains an underground source of drinking water (set forth in Section 3020(a)) shall not apply to the injection of contaminated groundwater into the aquifer if: (i) such injection is part of a response action under CERCLA; (ii) such contaminated groundwater is treated to substantially reduce hazardous constituents prior to such injection; and (3) such response action will, upon completion, be sufficient to protect human health and the environment. RCRA Section 3020(b).

In order to comply with these ARARs, the nitrate concentrations in the water to be reinjected will have to be similar to the levels of nitrate concentration in the area of the aquifer where the reinjection will occur, and will also have to meet the current MCLs for drinking water for all other contaminants. The quality and quantity of the water to be reinjected, as well as
the duration of the project, will have to be considered to ensure that the reinjection does not unreasonably degrade the existing water quality. The reinjection, as provided for in this ESD, meets all the requirements of RCRA § 3020(b).

The ROD identified federal and state MCLs as ARARs for the treated effluent. Since the ROD was signed, the proposed state MCL for PCE was promulgated and is now final with a MCL of 5 ppb. EPA has determined that compliance with this level will adequately protect public health and the environment. Therefore, the state MCL of 5 ppb for PCE is now identified as an ARAR for the treated effluent.

Other than the MCL for nitrate, all state and federal MCLs in existence on the date this ESD is signed are ARARs for the treatment plant effluent. The MCL for nitrate is an ARAR for the water to be served as public drinking water. If these MCLs change, or if other requirements are promulgated or modified, EPA will evaluate the selected remedy in light of the new requirements and determine whether these new requirements are applicable.

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27. Since the ROD was signed, EPA has also issued the new National Contingency Plan ("NCP"), effective April 9, 1990. See 40 C.F.R. Part 300, 55 Fed. Reg. 8666 (March 8, 1990). The NCP now provides that the Maximum Contaminant Level Goals ("MCLGs") that are above zero will be attained where relevant and appropriate to the cleanup of ground or surface waters. 40 C.F.R. § 300.430(e)(2)(i)(B). No MCLG presently exists for nitrate. Therefore, the MCL of 45 ppm is the ARAR to be met for nitrate. A level of 10 ppm has been proposed as the federal MCLG for nitrate. In its discretion, EPA considered adoption of the proposed nitrate MCLG as a "to be considered" ("TBC") criteria and determined that requiring compliance with this 10 ppm level for the water to be served as public drinking water would not be appropriate. TCE and PCE have zero MCLGs, so this change in the NCP does not affect the identification of MCLs as the ARARs for these substances.
or relevant and appropriate and, if so, whether attainment (or waiver) of these requirements onsite is necessary to ensure that the remedy is protective of human health and the environment. See 40 C.F.R. § 300.430(f)(1)(ii)(B)(1); see also, 55 Fed.Reg. 8666, 8758 (March 8, 1990). Except as modified by this ESD, the ARARs for this interim action remain the same as described in the ROD.

V. SUPPORT AGENCY COMMENTS

See Section IV.1.c., State Acceptance comments, pages 23-24, above.

VI. SUMMARY OF SELECTED REMEDY

The interim remedy for the Burbank Operable Unit, as selected in the ROD and as modified in this ESD, is extraction of groundwater from the aquifer zones containing the highest VOC concentrations, treatment of VOCs by stripping, and then: (a) reduction of nitrate by blending, and distribution of the water to the City of Burbank for use as a public water supply; and/or (b) reinjection of the VOC-treated groundwater into the aquifer (without blending). If the City of Burbank does not accept any or all of the treated water, then the remaining water will be reinjected into the aquifer in an area containing similar nitrate concentration levels and in a manner that complies with all ARARs for such reinjection. 28

28. As discussed before, EPA approval will be required to assure that the well locations will not interfere with other remedial actions or remedial investigation studies or further exacerbate the groundwater contamination.
For the reasons elaborated in the ROD and in this ESD, EPA considers this remedy to be the best balance of the nine criteria by which remedial action options are compared. 

VII. STATUTORY DETERMINATIONS

Considering the new information that has been developed and the changes that have been made to the selected remedy, the EPA believes that the interim remedy as altered by this ESD remains protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to this interim remedial action, and is cost-effective. In addition, this remedy satisfies the statutory preference for remedies that employ treatment which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances as a principal element. It also complies with the statutory preference for remedies that utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The changes and clarifications contained in this ESD are significant but do not fundamentally change the remedy. They do not include a change in the decision to do an interim pump and treat to inhibit spreading of the contaminated groundwater plume and to treat the VOCs through stripping.

29. See 40 C.F.R. Section 300.430(e)(9)(iii) or page 12, above, for a list of these criteria.
VIII. PUBLIC PARTICIPATION ACTIVITIES

EPA has presented these changes to the remedy in the form of an Explanation of Significant Differences because the changes are of a significant, but not fundamental, nature. EPA held a thirty day public comment period on this ESD. All comments received and EPA's responses to them have been included in the Administrative Record. These additional provisions for public comment are not required for an ESD (see 40 C.F.R. § 300.435(c)(2)(i)); EPA provided this opportunity in order to encourage maximum public input into the ESD process for the Burbank Operable Unit Site.