EXPLANATION OF SIGNIFICANT DIFFERENCES
TO THE 1999 RECORD OF DECISION
EL MONTE OPERABLE UNIT
SAN GABRIEL VALLEY SUPERFUND SITES, AREA 1

Introduction and Purpose

The United States Environmental Protection Agency (EPA) is updating the Superfund cleanup plan for the El Monte Operable Unit ("El Monte OU") of the San Gabriel Valley (Figure 1) in Los Angeles County, California in response to the detection, in 2000 and 2001, of several new pollutants in the groundwater underlying the area. The EPA adopted the original El Monte OU cleanup plan in 1999 after extensive public comment. The newly detected chemicals include:

- perchlorate, used in solid rocket fuel;
- hexavalent chromium, used in metal plating;
- N-nitrosodimethylamine (NDMA), found in liquid rocket fuel; and
- 1,4-dioxane, a stabilizer in chlorinated solvents.

In addition to the recently detected contaminants, groundwater in the El Monte OU is contaminated with perchloroethylene (PCE), trichloroethylene (TCE), and other chlorinated solvents. Chlorinated solvents are members of a group of chemicals called "volatile organic compounds" or VOCs.

The detection of perchlorate, hexavalent chromium, NDMA, and 1,4-dioxane will change the cleanup project in the El Monte OU in one significant way. The technologies typically used to remove chlorinated solvents from water (air stripping and carbon adsorption) do not effectively remove perchlorate, hexavalent chromium, NDMA, or 1,4-dioxane. If installation of additional treatment facilities is required to treat the newly detected contaminants in the groundwater, it will significantly increase the cost of the cleanup, as described below. Final decisions on treatment processes will be made during remedial design.

When significant changes are needed in a Superfund cleanup plan, the EPA informs the community through an Explanation of Significant Differences (ESD) or a Record of Decision (ROD) amendment. In this instance, EPA has determined that an ESD is appropriate. The remainder of the document provides a brief history of the El Monte OU cleanup, summarizes the 1999 cleanup plan, and describes the change to the 1999 plan in more detail.

EPA is issuing this Explanation of Significant Differences to satisfy its public participation responsibilities under CERCLA Section 117(c) and NCP Section 300.435(c)(2)(i).

This ESD will become part of the Administrative Record file for the El Monte OU pursuant to NCP Section 300.825(a)(2) and will be available to the public at the following locations:

EPA Region 9 Superfund Records Center
75 Hawthorne Street
San Francisco, CA 94105 • (415) 536-2000

The Record Center's hours are 8:00 am to 5:00 p.m., Monday through Friday.

West Covina Public Library
1601 West Covina Parkway
West Covina, CA 91790
(626) 962-3541

Rosemead Library
8800 Valley Boulevard
Rosemead, CA 91770
(626) 573-5220

For hours of operation, interested parties may call the libraries at the numbers listed above.

The ESD is also available on the EPA's web site at http://yosemite.epa.gov/r9/sfund/rodex.nsf under the San Gabriel Valley (Area 1) heading.

The El Monte Cleanup: A Brief History

The Context: San Gabriel Valley Groundwater Contamination

Groundwater contamination in the San Gabriel Valley was discovered in 1979. In 1984, the EPA added four portions of the San Gabriel Valley to the national Superfund list. The El Monte OU is officially part of the *San Gabriel Valley Area 1* Superfund site. Investigations by the EPA and others revealed the large extent of groundwater contamination in the El Monte OU and the San Gabriel Valley. During the past 20 years, numerous water supply wells throughout the San Gabriel Valley have been found to be contaminated with chlorinated solvents and other VOCs. In response to the contamination, water companies have shut down contaminated wells, installed new treatment facilities, and taken other steps to ensure that they can continue to supply water meeting State and Federal drinking water standards for VOCs.

Contamination of El Monte Groundwater

In 1998, the Northwest El Monte Community Task Force ("NEMCTF"), a group of fifteen parties considered potentially responsible for contamination of groundwater (Potentially Responsible Parties or "PRPs") in the El Monte area, completed the remedial investigation/feasibility study ("RI/FS") for the El Monte OU of the San Gabriel Valley Superfund sites. The remedial investigation determined that PCE, TCE, and other volatile organic compounds were contaminating the shallow and deep groundwater aquifers in a ten-square-mile area of the San Gabriel Valley around El Monte. Businesses in El Monte and surrounding areas had used these chemicals for degreasing, metal cleaning, and other purposes, and had probably released them to the ground through a combination of on-site disposal, careless handling, leaking pipes, and other means.

The study found that the uppermost, or shallow, aquifer includes most of the known sources of the groundwater contamination. VOC contaminant concentrations in portions of the shallow aquifer are hundreds of times drinking water standards (see Figure 2). In the deep aquifer, VOC contaminant concentrations are lower but still exceed drinking water standards (see Figure 3).

The NEMCTF has since continued to install and sample monitoring, extraction, and compliance wells, model the groundwater aquifers, and evaluate options for discharging treated groundwater, all in order to prepare for the implementation of cleanup work.

EPA Adopts Cleanup Plan

On June 23, 1999, the EPA adopted a cleanup plan for the El Monte OU known as the *El Monte Operable Unit Record of Decisio*n. The plan addresses the contamination described in the RI/FS. The goals of the 1999 cleanup plan are to prevent exposure of the public to VOC-contaminated groundwater, limit the movement of VOC-contaminated groundwater into clean or less contaminated areas and depths, reduce the impact of continued contaminant migration on downgradient water supply wells, and protect future uses of uncontaminated areas.

The 1999 cleanup plan calls for pumping the VOC-contaminated groundwater from two aquifers beneath the El Monte OU and treating it to remove the contaminants. More specifically, the plan calls for the construction and operation of groundwater extraction wells, treatment facilities, and conveyance facilities capable of pumping and treating approximately 1,325 and 330 gallons per minute of VOC-contaminated groundwater from the deep and shallow aquifers, respectively. The plan will require construction of new wells and treatment facilities for the shallow aquifer. For the deep aquifer, the plan allows for the use of existing water supply wells, treatment systems, and pipelines if possible, and the construction of new facilities where needed. Final decisions on extraction rates and locations will be made during the remedial design phase of the project.

Reason for this Action: Detection of Perchlorate, Hexavalent Chromium, NDMA, and 1,4-Dioxane in the El Monte OU

After the discovery in 1997 and 1998 of perchlorate, NDMA, and 1,4-dioxane in the Baldwin Park area, and hexavalent chromium in the San Fernando Valley approximately 10 miles northeast of the San Gabriel Valley, the Los Angeles Regional Water Quality Control Board requested that facilities in several areas of the San Gabriel Valley, including the El Monte OU, sample their groundwater monitoring wells for these “emergent chemicals.” In 2000 - 2001, the NEMCTF and its members sampled selected shallow groundwater monitoring wells within areas of VOC contamination as part of the pre-design activities in the El Monte OU and tested for emergent chemicals. Perchlorate, hexavalent chromium, NDMA, and 1,4-dioxane were detected in shallow groundwater in the El Monte OU.

Maximum concentrations of perchlorate and NDMA exceed the State drinking water action levels of 4 ppb and 0.010 ppb, respectively. The maximum concentration of 1,4-dioxane is more than 20 times the State drinking water action level of 3 ppb. The maximum concentration of hexavalent chromium does not pose a risk to human health but exceeds the Federal standard for protection of freshwater aquatic life in inland surface waters and is of concern if treated water is discharged to surface water. Figures 4, 5, 6 and 7 depict the approximate extent of perchlorate, hexavalent chromium, NDMA and 1,4-dioxane contamination in shallow groundwater in the El Monte OU.

Sampling of groundwater in the deep aquifer of the El Monte OU shows that perchlorate is the only one of the four constituents that has exceeded the State drinking water action level. Perchlorate was detected at a concentration of 5.9 ppb in a well that was subsequently destroyed. Perchlorate was not detected in wells downgradient of the destroyed well and thus additional treatment processes for groundwater extracted from the deep aquifer in the El Monte OU are not anticipated to be necessary at this time, but may be required in the future.

In July 2001, EPA sent *Special Notice* letters to 27 PRPs to begin formal EPA-PRP negotiations to obtain a binding commitment from the PRPs to carry out the El Monte cleanup plan for the design, construction, and operation of the groundwater extraction, treatment, and discharge facilities specified in the El Monte OU ROD. EPA is currently negotiating this commitment, called a Consent Decree, including provisions for treatment of emergent chemicals, if warranted, with a group of El Monte OU PRPs.

Because the emergent chemicals were discovered after EPA issued the El Monte OU ROD, EPA is now modifying the cleanup decision to address the emergent chemicals. The emergent chemicals may require treatment, and if so, one or more of the treatment technologies described below will be required. To the extent treatment is required for the emergent chemicals, the groundwater has to be treated to achieve the treatment levels described below.

Table 1 shows the significant differences between the remedy as presented in the 1999 ROD and the action now proposed.

Description of Treatment Options

Perchlorate

Since 1997, when perchlorate was discovered in the San Gabriel Valley groundwater basin, technology for removing perchlorate from groundwater has made great strides. The California Department of Health Services (DHS) has determined that two perchlorate removal technologies are acceptable: biological treatment and ion exchange.

In the biological treatment process, nutrients are added to the contaminated water to sustain microbes that destroy perchlorate. The microbes convert the perchlorate ion to oxygen and chloride, which are present at low levels in all drinking water. The biological treatment process is being used in a full-scale treatment system at the Aerojet Superfund site in northern California. Biological treatment methods are new to many water utilities, but *biologically active* filters have been used in drinking water treatment for decades to help remove particles and biodegradable organic matter.

The second perchlorate-removal technology is ion exchange, in which the perchlorate ion is replaced by chloride, a chemically similar but non-toxic ion. Ion exchange processes have been used in homes and businesses for *softening* hard water for decades. In the Spring of 2001, a 2,500-gallon-per-minute groundwater treatment system using ion exchange to remove perchlorate went online in the Baldwin Park Operable Unit, producing potable water for use in the San Gabriel Valley. The principal disadvantage of ion exchange systems is that they only remove the perchlorate, they don't destroy it, and the perchlorate still needs to be appropriately managed after it is removed.

Both biological treatment and ion exchange processes have an added benefit. The groundwater in some parts of the San Gabriel Valley, including portions of the shallow aquifer in the El Monte OU, is unusable because of high levels of nitrate believed to be the result of past agricultural practices in the Valley. Both treatment process would also remove much of the nitrate from the water.

Other technologies have been proven capable of removing perchlorate from water, but probably at a higher cost. Liquid-phase granular-activated-carbon (LGAC) filtration can potentially remove perchlorate, but only for a limited period of time before regeneration or replacement of the carbon is required. Frequent carbon replacement would make relying solely on LGAC for perchlorate removal very expensive. Conventional filtration, sedimentation, or air-stripping technologies cannot remove perchlorate from water.

Hexavalent Chromium

Ion exchange treatment can remove hexavalent chromium from groundwater just as it does perchlorate. A benefit of using ion exchange treatment is that it would remove both perchlorate and hexavalent chromium from the water. Reverse osmosis will also remove hexavalent chromium from groundwater, but is much more expensive to operate than the ion exchange process. Chemical reduction technologies can also remove hexavalent chromium from water. Chemical reduction involves adding a chemical to provide a source of electrons to reduce hexavalent chromium (Cr^{+6}) to trivalent chromium (Cr^{+3}), which precipitates from the water. Though chemical reduction is comparable in cost to ion exchange treatment for removing hexavalent chromium, it does not also remove perchlorate from the water as ion exchange treatment does.

NDMA and 1,4-Dioxane

Ultraviolet (UV) light can remove NDMA from groundwater. In a UV treatment system, the water passes though a tank containing numerous ultraviolet lamps. The NDMA molecules absorb the light energy, which cause them to break down into smaller nontoxic molecules. UV light treatment, in combination with injection of an oxidant such as hydrogen peroxide, also removes 1,4-dioxane. UV treatment systems have successfully removed both chemicals from water in locations throughout the United States. A 2,500-gpm treatment system using UV with oxidation for NDMA and 1,4-dioxane removal is in operation in the Baldwin Park Operable Unit of the San Gabriel Valley sites.

Treatment Levels

Drinking Water Standards

The treatment technologies used in the El Monte OU will have to be capable of effectively and reliably removing VOCs, and, if necessary, perchlorate, hexavalent chromium, NDMA, and 1,4-dioxane, from the groundwater. If any of the treated groundwater, shallow or deep, is to be used as drinking water, treatment technologies must reduce the concentrations of all contaminants to below Federal and State drinking water standards in existence at the time that the water is treated, as measured at the consumers' taps. Generally, the applicable drinking water standard is the Maximum Contaminant Levels (MCL) established by State and Federal regulation. However, while MCLs have been established for some of the chemicals in the groundwater in the El Monte OU, none of the recently detected "emergent chemicals" has a MCL. *Total* chromium (e.g., Cr^{+3} and Cr^{+6} concentrations combined) has a MCL of 50 ppb, which is considered to protect the public's health from hexavalent chromium.

Safe levels for some chemicals that lack MCLs are specified by *action levels* developed by the California Department of Health Services (DHS). DHS has established action levels for perchlorate (4 ppb); NDMA (0.010 ppb); and 1,4-dioxane (3 ppb). Although not an enforceable standard, an action level is the concentration of a contaminant in drinking water that DHS has determined, based on available scientific information, provides an adequate margin of safety to prevent potential risks to human health. California Health & Safety Code Section 116455 requires that the operator of a public water system notify local government authorities when a drinking water well exceeds an action level. In addition, DHS recommends that drinking water purveyors notify the public if action levels are exceeded, unless the wells in question are taken out of service.

Applicable or Relevant and Appropriate Requirements: Water Quality Standards

EPA's cleanup plan also allows for recharging some or all of the treated water, that is, pumping it back into the groundwater basin instead of delivering it for use as drinking water. As discussed in greater detail in the Record of Decision, any recharged water must comply with the pertinent water quality objectives in the Los Angeles Regional Water Quality Control Board Basin Plan. In addition, State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," applies to any recharge of treated groundwater into the aquifer. Resolution No. 68-16 requires maintenance of existing State water quality unless it is demonstrated that a change will benefit the people of California, will not unreasonably affect present or potential uses, and will not result in water quality less than that prescribed by other State policies. In addition, in accordance with the Clean Water Act, EPA has established water quality goals for organic and inorganic constituents in water discharged to inland surface waters. These goals, referred to as the California Toxics Rule (CTR), were established to be protective of human health and freshwater aquatic life. The goal for hexavalent chromium is a 4-day average concentration of 11 ppb. In light of these requirements, any groundwater recharged into the aquifer, including water discharged to surface water channels, must be below action levels of 4 ppb for perchlorate, 0.010 ppb for NDMA, and 3 ppb for 1,4-dioxane, and below the CTR goal of 4-day average concentration of 11 ppb for hexavalent chromium.

The treatment levels discussed above apply to the groundwater after it is pumped above ground. Though the 1999 cleanup plan for the El Monte OU established contaminant levels to meet the objective of limiting the movement of contaminated groundwater into clean or less contaminated areas and depths, neither the 1999 cleanup plan nor this update establish cleanup levels for water in situ (i.e., in the aquifer). EPA plans to evaluate in-situ cleanup levels in a future action, as part of the final Record of Decision for the El Monte OU.

In 1999, the EPA estimated the cost of the cleanup at $8 million in capital costs and $960,000 per year for operation and maintenance costs. EPA's revised cost estimate, which includes additional treatment for removing the newly detected chemicals in shallow groundwater, is a potential $13 million in capital costs and $1.5 million per year in operation and maintenance costs. The revised cost estimate is based on evaluation of the latest treatment options for the newly detected chemicals and on extraction and treatment rates from the 1999 cleanup plan.

The additional treatment technologies that may be needed to remove the new contaminants are responsible for the increase in the estimated cost of the cleanup in the El Monte OU.

Final Selection of Treatment Technologies

EPA will select the final treatment technologies for the El Monte OU over the next year during completion of pre-design activities and the design of the El Monte cleanup facilities. During this time, additional cost and performance data from operation of full-scale treatment systems in the San Gabriel Valley and the results of treatment studies elsewhere will become available. EPA will incorporate this information into the selection of treatment technologies for the El Monte OU.

State Concurrence

The State of California, through the Department of Toxic Substances Control and the Los Angeles Regional Water Quality Control Board, supports the changes described in this document.

Statutory Determination

The modified cleanup plan for the El Monte OU remains protective of human health and the environment and will continue to meet all applicable or relevant and appropriate requirements identified in the 1999 Record of Decision, as required by CERCLA Section 121(d).

Public Participation Compliance

Several EPA community involvement opportunities have occurred in response to EPA and PRP actions in the El Monte OU. EPA issued an update on the San Gabriel Valley Superfund Sites in

April 1998, which mentioned development of an "early action" project for the El Monte OU. EPA's Proposed Plan to address groundwater contamination in the El Monte OU was mailed in October 1998 with a 60 day public comment period. This was followed by a community meeting on the Proposed Plan where the public was again given the opportunity to comment. EPA addressed all comments on the Proposed Plan in a Responsiveness Summary attached to the 1999 ROD. The community meeting was followed by a fact sheet issued in July 1999, in which EPA updated the status of the El Monte OU interim remedy design activities. And, EPA issued an update on the San Gabriel Valley Superfund Sites in May 2002, which mentioned the detection of perchlorate, hexavalent chromium, NDMA, and 1,4- dioxane in the shallow groundwater of the El Monte OU.

An ESD notice was published in July 2002 in a local newspaper as required by the NCP, section 300.435(c)(2)(i)(B). The public participation requirements set out in the NCP, sections 300.435(c)(2)(i) and 300.825(a)(2) will continue to be met.

_____/Signed/______________________ __August 22, 2002__

John Kemmerer, Chief Date

Superfund Site Cleanup Branch

U.S. Environmental Protection Agency, Region 9

Table 1. Comparison of Cleanup Plans – Most Aspects of the 1999 Plan Have Not Changed

	ORIGINAL CLEANUP PLAN	**UPDATED CLEANUP PLAN**
Remedial Objectives	Prevent exposure, limit further migration of contaminated groundwater, reduce impacts on down-gradient water supply wells, protect future uses of clean areas.	Same
Groundwater Extraction Areas	Extract groundwater from the deep aquifer and two areas of contamination in the shallow aquifer	Same
Groundwater Extraction Rates	Extract contaminated groundwater at rates needed to meet remedial objectives. Determine final rates during remedial design. Initial estimate was 1,325 gpm deep and 330 gpm shallow	Same
Groundwater Treatment Technologies light	Use air stripping and carbon treatment to remove VOCs from the groundwater . Finalize technologies during remedial design	Use same technologies to remove VOCs. Potentially use ion exchange to reduce perchlorate and hexavalent chromium, UV to remove NDMA and with oxidation, 1,4-dioxane. Select technologies during remedial design**.**
Groundwater Treatment Standards	Design treatment systems to reduce VOC concentrations to below MCLs	Reduce VOC concentrations to below MCLs**,** reduce perchlorate, NDMA, and 1,4-dioxane concentrations to below State action levels, and hexavalent chromium to Federal surface water goals
Use of Treated Groundwater	Supply deep water to water companies for distribution, return shallow water to the groundwater basin or supply to industries. Make final decision during remedial design	Same
Project Costs	Estimated capital costs of $8 million; estimated operation and maintenance costs of $960,000/ year	Estimated capital costs potentially increase to $13 million; estimated operation and maintenance costs potentially increase to $1.5 million/year

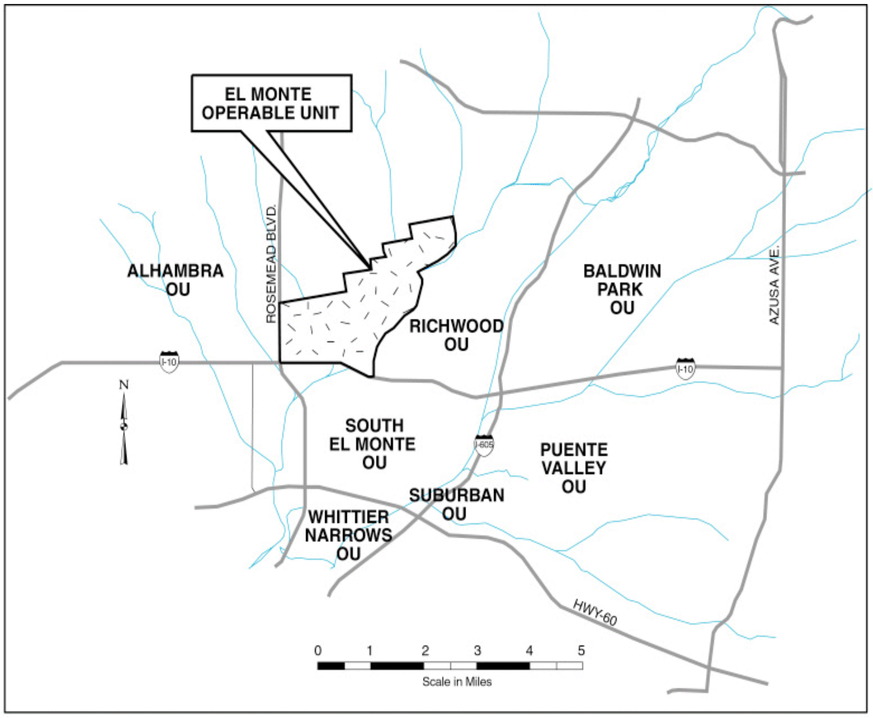

Figure 1: Location of the El Monte Operable Unit and other San Gabriel Valley Superfund Site Projects

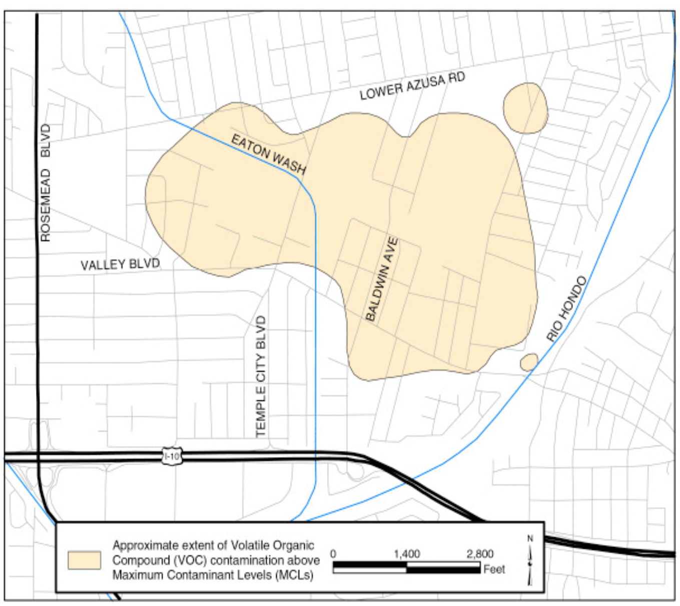

Figure 2: Approximate extent of VOC contamination in shallow groundwater

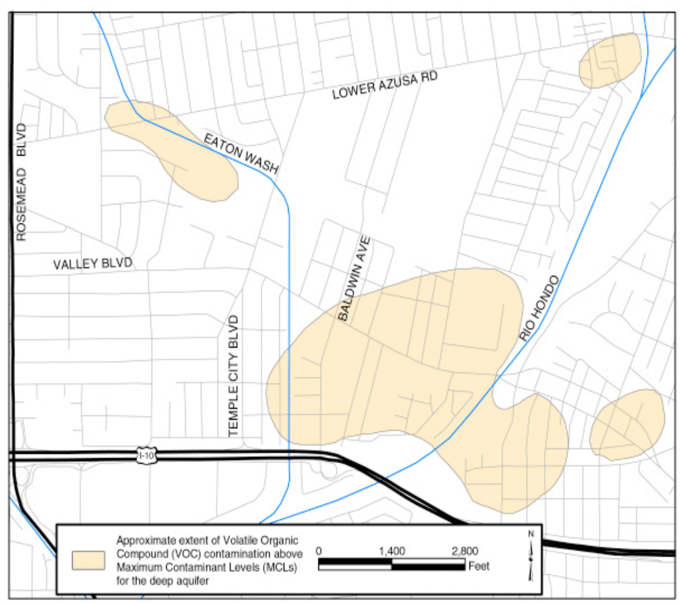

Figure 3: Approximate extent of VOC contamination in deep groundwater

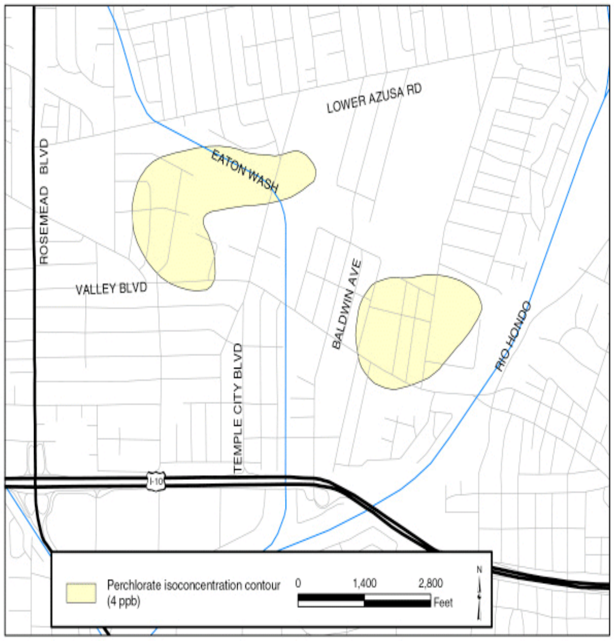

Figure 4: Approximate extent of Perchlorate contamination in shallow groundwater

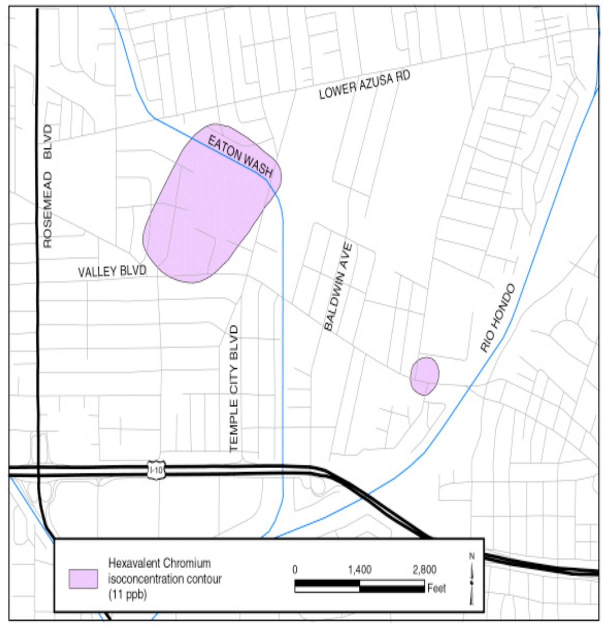

Figure 5: Approximate extent of Hexavalent Chromium contamination in shallow groundwater

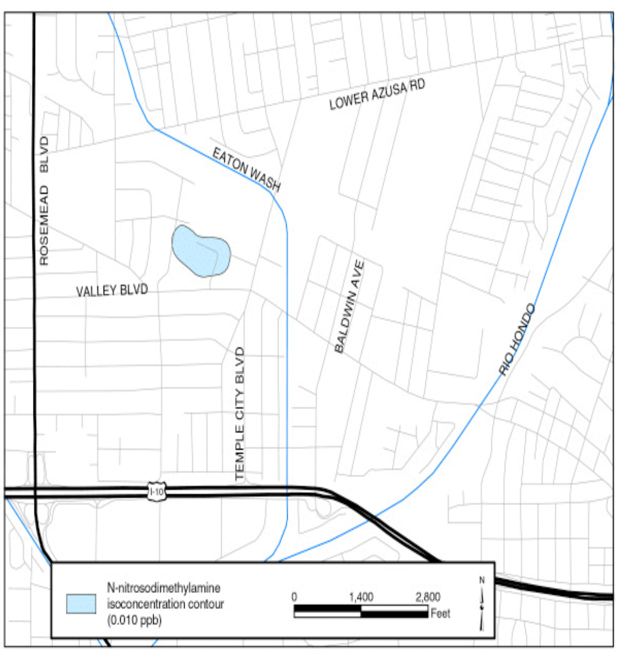

Figure 6: Approximate extent of NDMA contamination in shallow groundwater

Figure 7: Approximate extent of 1,4-Dioxane contamination in shallow groundwater