

FIVE-YEAR REVIEW REPORT

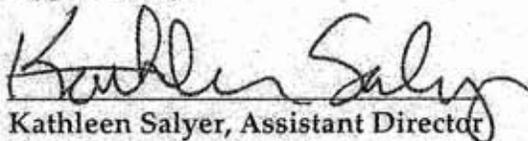
First Five-Year Review Report

**For
San Fernando Valley - Area 2 Superfund Site
Los Angeles County, California**

September 2008

Approved by:

Date:



9/30/08

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List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
BOU	Burbank Operable Unit
CCR	California Code of Regulations
CDPH	California Department of Public Health
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	constituents of concern
DCE	dichloroethene
DHS	California Department of Health Services
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
GAC	granular activated carbon
GNOU	Glendale North Operable Unit
GSOU	Glendale South Operable Unit
gpm	gallons per minute
LADWP	Los Angeles Department of Water and Power
LPGAC	liquid-phase granular-activated carbon
MCL	maximum contaminant level
MtBE	methyl <i>tertiary</i> -butyl ether
MWD	Metropolitan Water District
µg/L	micrograms per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	operation and maintenance
OEHHA	Office of Environmental Health Hazard Assessment
OU	Operable Unit
PCE	perchloroethylene

pCi/L	picocuries per liter
PHG	public health goal
PRP	potentially responsible party
RCRA	Resource Conservation and Recovery Act
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SAL	State Action Level
SARA	Superfund Amendments and Reauthorization Act
SCAQMD	South Coast Air Quality Management District
SFV	San Fernando Valley
SVOC	semivolatile organic compounds
TBC	to be considered
TCE	trichloroethylene
1,2,3-TCP	1,2,3-trichloropropane
UAO	Unilateral Administrative Order
ULARA	Upper Los Angeles River Area
VOC	volatile organic compound
VPGAC	vapor phase granular activated carbon

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name : San Fernando Valley - Area 2 Superfund Site

EPA ID: CAD980894901 **CERCLIS ID :** 09N2

Region: IX **State:** CA **City/County:** Glendale / Los Angeles

SITE STATUS

NPL status: Final Deleted Other (specify) _____

Remediation status (choose all that apply): Operating Complete

Multiple OUs? YES NO **Construction completion date:** N/A

Glendale North OU, Glendale South OU

Has site been put into reuse? YES NO N/A (groundwater-only site)

REVIEW STATUS

Reviewing agency: EPA State Tribe Other Federal Agency _____

Author name: David Stensby

Author title: Remedial Project Manager **Author affiliation:** EPA Region IX

Review period: April – September 2008

Date(s) of site inspection: April 22, 2008

Type of review: Statutory
 Policy Post-SARA Pre-SARA NPL-Removal only
 Non-NPL Remedial Action Site NPL State/Tribe-lead
 Regional Discretion)

<p>Review number: <input checked="" type="radio"/> 1 (first) <input type="radio"/> 2 (second) <input type="radio"/> 3 (third) <input type="radio"/> Other (specify)</p>
<p>Triggering action:</p> <p><input checked="" type="radio"/> Actual RA Onsite Construction at OU</p> <p><input type="radio"/> Actual RA</p> <p><input type="radio"/> Previous Five-year Review Report</p> <p><input type="radio"/> Construction Completion</p> <p><input type="radio"/> Other (specify) _____</p>
<p>Triggering action date: October 17, 1997</p>
<p>Due date (five years after triggering action date): 2002</p>
<p>Issue:</p> <p>Operational problems caused by the chromium river discharge limit currently affect plume containment and must be addressed to achieve long-term protectiveness.</p> <p>Protectiveness Statement (s):</p> <p>The interim remedies at the San Fernando Valley, Area 2, Superfund Site are protective of human health and the environment because all exposure pathways are currently being controlled. To be protective in the long-term, the operational problems due to the chromium discharge limit and their effect on plume containment must be addressed.</p>

Executive Summary

The U. S. Environmental Protection Agency Region 9 has conducted the first five-year review (FYR) of the San Fernando Valley (SFV) - Area 2 Superfund Site in Glendale, California. The purpose of this FYR is to determine whether the interim remedial actions implemented at the site are protective of human health and the environment. This FYR is required because hazardous substances remain on-site above the risk-based levels determined in the Records of Decision (RODs) that would allow for unlimited use and unrestricted exposure. The methods, findings, and conclusions of the review are documented in this report. In addition, this report summarizes issues identified during the review and includes recommendations and follow-up actions to address them.

The SFV - Area 2 Site includes two operable units (OUs) - Glendale North Operable Unit (GNOU) and Glendale South Operable Unit (GSOU) - for which interim remedies have been selected and implemented. The triggering action for the SFV - Area 2 FYR is the remedial action start date of October 17, 1997.

The Remedial Action Objectives (RAOs) presented in the GNOU and GSOU RODs are:

- To inhibit vertical and horizontal migration of groundwater contaminants in the North and South Plumes of Area 2; and
- To begin to remove contaminant mass from the upper zone of the aquifer in the North and South Plumes of the Area 2.

The interim remedies were intended to address large plumes of groundwater contaminated with volatile organic compounds (VOCs). The primary contaminants in these VOC plumes are trichloroethylene (TCE) and perchloroethylene (PCE).

To address the above RAOs, a pump-and-treat approach was selected as the interim remedy for both OUs. There are four groundwater extraction wells in the GNOU and four groundwater extraction wells in the GSOU. Contaminated groundwater pumped from both the GNOU and GSOU wells flows to a 5,000 gallon per minute VOC treatment plant located between the two extraction well fields. The treatment plant is operated by the City of Glendale, and the treated water is incorporated into the City's water supply system. The groundwater treatment system started operation in 2000.

The FYR found that the remedy was constructed in accordance with the requirements of the interim RODs and that the remedy is generally functioning as designed. Operational issues resulting from the presence of chromium have impacted the remedy during the review period and resulted in a limited loss of plume capture. There are governmental controls in place that prevent exposure to untreated groundwater. The immediate threats have been addressed and the remedy is protective in the short term. A permanent solution to manage chromium contamination must be implemented to insure long-term protectiveness.

1.0 Introduction

The United States Environmental Protection Agency (EPA) Region IX conducted a five-year review (FYR) of the remedial actions implemented at the Glendale North Operable Unit (GNOU) and Glendale South Operable Unit (GSOU) of the San Fernando Valley (SFV) - Area 2 Superfund Site ("Site"), in Los Angeles County, California (Figure 1-1). This five-year review was conducted from April to September 2008 and covers the period from 2000 (interim remedial action start up) until present. This report documents the results of the review.

The five-year review process evaluates whether the interim remedies at the GNOU and GSOU remain protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify any potential issues found during the review and provide recommendations for addressing the issues.

The Agency is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

Accordingly, this five-year review report has been completed because hazardous substances, pollutants, or contaminants remain at the GNOU and GSOU above levels that allow for unrestricted use and unlimited exposure.

This is the first five-year review report for the GNOU and GSOU. The triggering action for the Glendale five-year review report is the remedial action start date of October 17, 1997.

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2.0 Site Chronology

Table 2-1 provides a chronology of events at the GNOU and GSOU.

TABLE 2-1
Chronology of Site Events
San Fernando Valley (Area 2) Superfund Site
Los Angeles County, California

DHS detected trichloroethylene (TCE), perchloroethylene (PCE), and other volatile organic compounds (VOCs) in a large number of production wells exceeding their respective maximum contaminant level (MCL) and/or State Action Level (SAL); those wells were removed from service. Alternative water supply was obtained from the Metropolitan Water District (MWD) where needed.	1980
Groundwater Management Plan - San Fernando Valley Basin completed. The study detected widespread VOC contamination in the eastern San Fernando Valley and also located a contaminant plume migrating to the southeast at 300 feet per year.	July 1983
San Fernando Valley Areas 1, 2, 3 and 4 were listed on the National Priorities List (NPL).	1986
Initiated basin-wide remedial investigation/feasibility study (RI/FS) under LADWP lead.	1987
RWQCB issued Cleanup and Abatement Order No. 87-161 directing Lockheed to implement specific assessment and remediation tasks at its B1 Plant near Building 175 in Burbank, CA.	December 1987
RI of entire San Fernando Valley completed (including Area 2).	April 1992
Records of Decision signed for Glendale North and South Operable Units	June 1993
Well Construction Start	November 1997
Groundwater Treatment Plant Construction Start	July 1998
City of Glendale initiated application process pursuant to DHS Policy 97-005 for the Glendale Treatment Plant.	November 1998
EPA initiated chromium source investigation by providing funds to RWQCB to investigate 4,040 potential chromium users in the SFV.	January 1999
The Office of Environmental Health Hazard Assessment (OEHHA) of California EPA formally adopted a public health goal (PHG) for total chromium of 2.5 µg/L. The PHG assumed a concentration of 0.2 µg/L for hexavalent chromium.	February 1999
Began operation of plant in "start-up" mode (except Well GS-1 - DHS permit did not allow operation of GS-1, thus, full operation not achieved)	Aug 1, 2000
GS-1 begins operation after DHS approval of City of Glendale's focused 97-005 application. Full operation is achieved.	June 6, 2002
City proposes new pumping rates for GS-3 and other extraction wells ("alternative pumping scheme") to moderate chromium concentrations.	August 2002
City initiates bench-scale study of chromium treatment technologies	Late 2002

TABLE 2-1
 Chronology of Site Events
 San Fernando Valley (Area 2) Superfund Site
 Los Angeles County, California

City of Glendale performs capture analysis to demonstrate their alternate pumping scheme provides equal containment to treatment plant operation at design flows. EPA approves alternate pumping scheme.	May 2003
EPA assigns contractor support staff to RWQCB for investigation of chromium-related sites	June 2003
EPA performs modeling study for Chromium fate and transport	April 2004
RWQCB completed Chromium Investigation: San Fernando Valley Phase 1 - Inspections Final Report. Further assessment was recommended for 105 sites. RWQCB issued four Cleanup and Abatement Orders.	August 2004
Well GN-3 well screen fails – Well offline about 21 months	March 2005
City conducts batch pilot tests on various chromium treatment technologies	Early 2006
EPA conducts well survey to augment monitoring well network	September 2006
RWQCB general permit revision lowering the river discharge limit for hexavalent chromium to 8 ppb becomes effective, creating a similar requirement for Glendale.	June 2007
EPA approves alternate pumping of GS-3 and GN-3 (the two highest chromium wells) to aid compliance with new chromium standard for the river discharge.	June 2007
City pilot tests (continuous flow) Reduction/Coagulation/Filtration (RCF) process	February 2008
EPA approves a modification to the Statement of Work of the Consent Decree to allow construction of Demonstration Projects for hexavalent chromium treatment at the GOU.	August 2008
EPA approves and City of Glendale constructs pipeline system for discharging minor wastewater sources to industrial sewer.	August 2008
EPA approves the final design/build proposal for the weak-base anion exchange and RCF Demonstration Projects for chromium treatment.	September 2008

3.0 Site Background

The San Fernando Valley - Area 2 Superfund Site (Glendale) is located within the San Fernando Basin. This area includes the western portion of the City of Glendale and portions of the City of Los Angeles and Burbank. Glendale North and South Operable Units (OUs), the focus of this Five Year Review, are located within Area 2. The following section presents physical characteristics, land and resource use, and geology/hydrogeology for the Area 2.

3.1 Physical Characteristics

The San Fernando Basin is located within the Upper Los Angeles River Area (ULARA), which consists of the entire watershed of the Los Angeles River and its various tributaries. The San Fernando Basin covers approximately 122,800 acres. The basin is approximately 23 miles long in an east-west direction and up to approximately 12 miles wide in a north-south direction. The elevation of the Los Angeles River valley floor slopes from 1,100 feet above mean sea level (msl) in the northwestern portion of the valley to approximately 350 feet above msl near the southern portion of the Los Angeles Narrows. The valley is bounded on the north and northwest by the Santa Susana Mountains, on the northeast by the San Gabriel Mountains, on the west by the Simi Hills, and on the south by the Santa Monica Mountains.

The Glendale North and South OUs are located in the southeast portion of the San Fernando Basin, where the Los Angeles River turns southward from its west to east course. The San Fernando Valley - Area 2 Superfund Site (also known as the Crystal Springs National Priorities List (NPL) Site) is adjacent to the Los Angeles River (Figure 1-1). The Glendale North OU is located at the north end of the Los Angeles River Narrows, and the Glendale South OU is located within the Narrows itself.

A single treatment facility for both the GSOU and GNOU is located at 800 Flower Street, Glendale. There are eight extraction wells associated with the Glendale Water treatment facility (Figure 3-1). Three of these extraction wells (GN-1, GN-2, and GN-4) are located along Flower Street. One well (GN-3) is located along Grand Central. Two extraction wells (GS-1 and GS-2) are located along West Chevy Chase Drive. Two extraction wells (GS-3 and GS-4) are located along Goodwin Ave.

3.2 Land and Resource Use

The Site and its vicinity encompass an area of mixed land use. The area supports light and restricted industrial use, medium to low density residences, and recreational use. There are also some commercial businesses located along major roads. The area straddles the border between the cities of Glendale and Los Angeles. (JMM 1992a).

The San Fernando Basin is a significant source of drinking water, with an estimated total volume of 3 million acre-feet of groundwater stored in aquifers within the alluvial fill of the basin. The groundwater of the San Fernando Basin has been used as a source of drinking

water for more than 800,000 residents within the cities of Los Angeles, Burbank, Glendale, and San Fernando. Groundwater extractions within the San Fernando Basin typically provide 13 percent of the annual average water supply for Los Angeles and historically have accounted for between 25 and 100 percent of the water needs of the other cities.

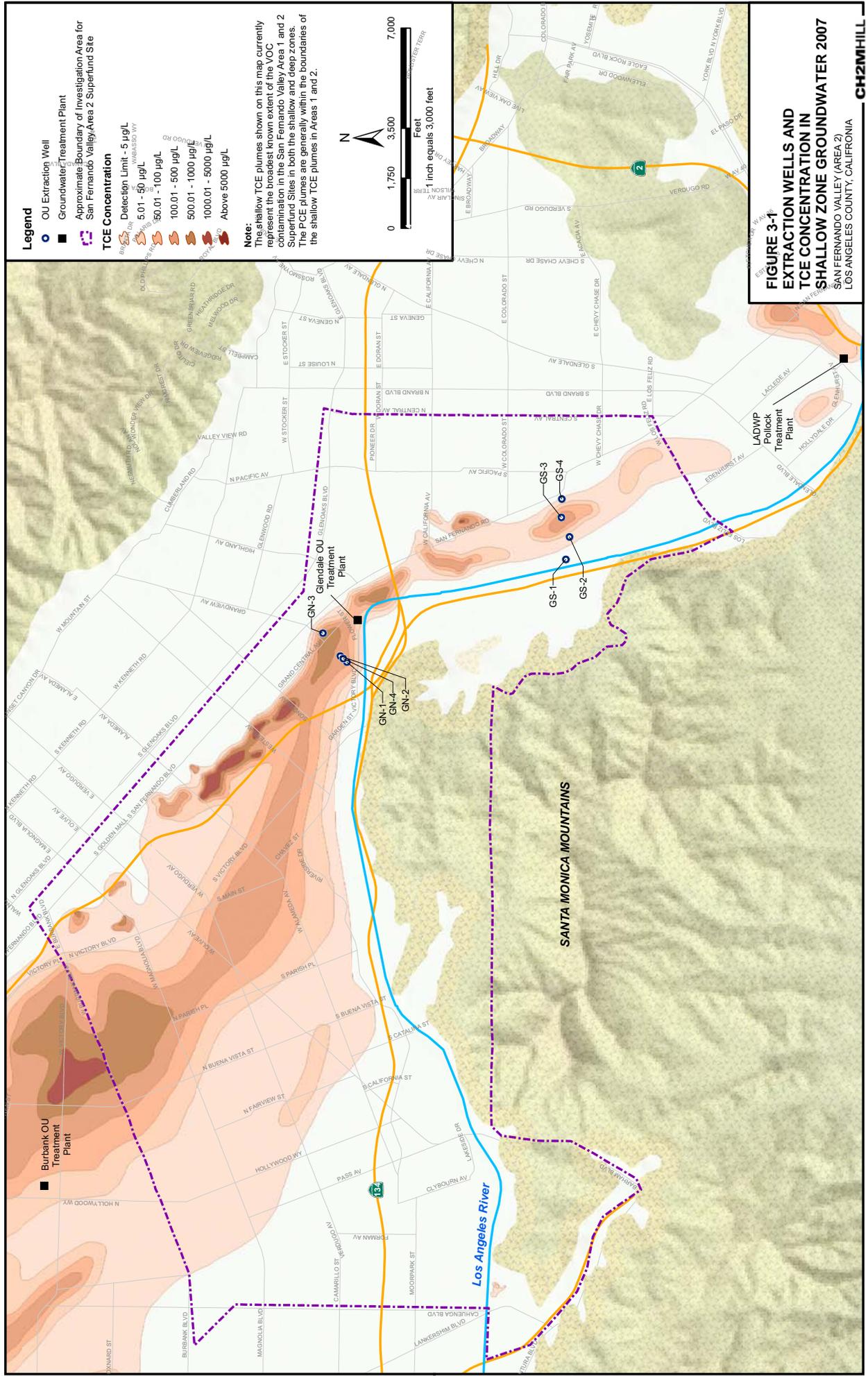
3.2.1 Geology/Hydrogeology

The uplands surrounding the SFV are comprised of crystalline and sedimentary rocks. Quaternary alluvium up to 2,000 feet thick was derived by erosion of the surrounding uplands (RWQCB 2002). Lateral zonation is present due to the changes in the pattern of deposition of the Tujunga fan at the northeast corner of the SFV.

Groundwater in the eastern SFV occurs primarily in alluvial valley-fill deposits of Quaternary age, eroded from the adjacent San Gabriel and Verdugo Mountains. The valley fill is estimated to be at least 1,200 feet thick in places, and is bounded to the east and at depth by granitic and metamorphic bedrock of low permeability. The valley-fill deposits of the eastern SFV are relatively permeable and have been subdivided into four distinct lithologic/aquifer zones as follows (JMM 1992b):

- Upper Zone - The Upper Zone consists of layers and lenses of silt, sand, and gravel from land surface to a depth of approximately 250 feet below land surface. According to aquifer tests conducted during the SFV RI in the North Hollywood and Crystal Springs Study Areas, hydraulic conductivities in the Upper Zone range from about 30 to 360 feet per day (ft/day).
- Middle Zone - The Middle Zone is approximately 50 feet thick and contains increased proportions of fine-grained sand and silt compared to the other zones. Because of its fine-grained nature and anticipated poor yield characteristics, few production wells have been completed in this zone. The Middle Zone appears to grade to coarser-grained deposits in the Glendale South OU, where the Upper and Middle Zones become difficult to distinguish lithologically.
- Lower Zone - The Lower Zone consists of interbedded sand, silt, and gravel, with cobbles in the upper portion. Thickness of this zone is estimated to be 200 to 250 feet, and hydraulic conductivity ranges from 130 to 900 ft/day. Most of the groundwater pumped from the eastern SFV is pumped from this highly productive zone.
- Deep Zone - Where encountered during drilling, the Deep Zone consists mainly of fine-grained, relatively low-permeability sediments, including silt and clay. Few wells have penetrated this zone; therefore, thickness and hydraulic characteristics of this zone are poorly understood.

Depths to groundwater measured recently at monitoring wells in the eastern SFV range from approximately 30 to 200 feet below land surface (CH2M HILL, 2003). Therefore, groundwater is typically first encountered in the Upper Zone; the Middle, Lower, and Deep Zones are believed to be fully saturated through most of the study area. The water table or potentiometric surface typically occurs within the Upper or Middle Zone of the regional aquifer. Groundwater levels at these monitoring wells have commonly declined



approximately 30 feet since the mid-1990s, resulting from several factors, including: (1) large-scale groundwater withdrawals, (2) less-than-average precipitation during the past decade, and (3) an approximate 70 percent reduction in the amount of groundwater recharged through the spreading.

Horizontal hydraulic gradients in the Glendale OUs and the SFV Area 1 Site's Burbank OU (BOU) are generally southeast toward the Los Angeles River Narrows, where essentially all groundwater and surface water outflow from the SFV occurs. Localized deviations to this pattern occur in the vicinity of pumping wells at several locations in the study area, and a large cone of depression is present in the Burbank OU.

Groundwater flow velocities in the eastern SFV are estimated by the Watermaster to range from approximately 300 to 1,300 feet per year (ft/yr), depending on location (Upper Los Angeles River Area Watermaster, 2002). Groundwater flow velocities are estimated to be generally highest in the southeast part of the SFV in the Glendale South OU and Los Angeles River Narrows area.

Vertical hydraulic gradients in the eastern SFV generally are much smaller than horizontal gradients, but can be strongly influenced in the vicinity of wellfields by groundwater withdrawals (JMM 1992b). The Glendale and Burbank OU extraction wells are mostly screened in the lower portion of the Upper Zone, and for this reason, upward gradients from the Middle and Lower Zones are assumed to occur near these wellfields. However, the SFV RI concluded that the relatively fine-grained, low-permeability nature of the Middle Zone impedes movement of groundwater between the Upper and Lower Zones in much of the eastern SFV. Deposits that comprise the Middle Zone become coarser in the Glendale South OU and in the Los Angeles River Narrows, making the Middle Zone less distinct hydraulically from the Upper and Lower Zones. In this area, the Middle Zone probably does not substantially impede vertical groundwater movement.

3.3 History of Contamination

In 1979, the DHS requested that all major water providers sample and analyze groundwater for contamination as part of a statewide groundwater quality surveillance effort (EPA 1989). TCE was consistently detected in a large number of production wells in the SFV at concentrations greater than the MCL (EPA 2003b). Chlorinated solvents including TCE and PCE were widely used from 1940 to 1967 for dry cleaning and degreasing machinery, and disposal of these solvents was not well-regulated.

The San Fernando Valley, Area 2 Superfund Site includes two portions of the aquifer where high concentrations of contaminants have been identified: the North Plume and the South Plume. Although contamination has been detected throughout the Site in an apparently contiguous plume, differences exist between the North Plume and South Plume, including the types of contaminants detected and the concentrations of the contaminants. An area of lower-level groundwater contamination separates the Glendale North and South Plumes. Figure 3-1 shows the current extent of the shallow VOC plumes at the SFV.

Initial Response

In 1980, LADWP conducted a two-year study to define the extent of contamination in the San Fernando Valley. The results of the study, published in 1983, revealed widespread VOC-contaminated groundwater in the SFV, specifically a contaminant plume migrating to the southeast at a rate of 300 feet per year. These findings resulted in a number of municipal supply wells for the cities of Los Angeles, Burbank and Glendale being taken out of service. Water for the City of Glendale was purchased from the Metropolitan Water District (MWD) of Southern California.

From the late 1980s to late 1990s, EPA provided funds to the RWQCB to conduct assessments of facilities in the SFV to determine the extent of VOC solvent usage and to assess past and current chemical handling, storage, and disposal practices. These investigations were conducted pursuant to the RWQCB's Well Investigation Program and resulted in source remediation activities at facilities within the SFV where the release of solvents had occurred. Source investigations and remediation activities are currently in progress under the lead of the RWQCB and the California Department of Toxic Substances Control (DTSC).

In 1999, EPA provided funds to the RWQCB to investigate potential chromium sources in the SFV. In November 2002, the RWQCB released the findings from its investigation of more than 4,000 potential source sites, recommending further assessment of 106 sites. Of these 106 sites, 7 facilities in the SFV were issued CAOs from the RWQCB. Other potential chromium groundwater contaminant sources in the SFV are being evaluated by RWQCB, DTSC, and EPA. Fifteen additional potential chromium source facilities are currently under investigation by the RWQCB. There are 2 potential chromium source facilities currently under investigation by DTSC. Of the 4 potential chromium source facilities currently under investigation by EPA, 3 facilities were issued orders (2 of them consent orders) and EPA completed a removal action on the other facility in December 2007. Figure 3-2 shows the current extent of the chromium plume at the SFV.

The most prevalent groundwater contaminants are TCE and PCE. In 1992, the highest concentrations of TCE and PCE detected in EPA monitoring wells in the SFV were 1,700 µg/L and 160 µg/L, respectively. A basin-wide RI was completed in 1992, and 87 groundwater monitoring wells were installed throughout the eastern SFV. To evaluate data on a regional scale, a basin-wide groundwater monitoring program was initiated and continues to date.

3.4 Basis for Taking Action

TCE and PCE were discovered in the groundwater in the GNOU and GSOU areas at concentrations greater than the MCL. The VOC-impacted groundwater was in a known drinking-water supply aquifer. TCE and PCE are constituents of concern (COCs) due to the potential risk from ingestion, dermal contact, and inhalation of volatilization fractions during showering or bathing. TCE and PCE are classified as probable human carcinogens, based on laboratory studies performed on animals.

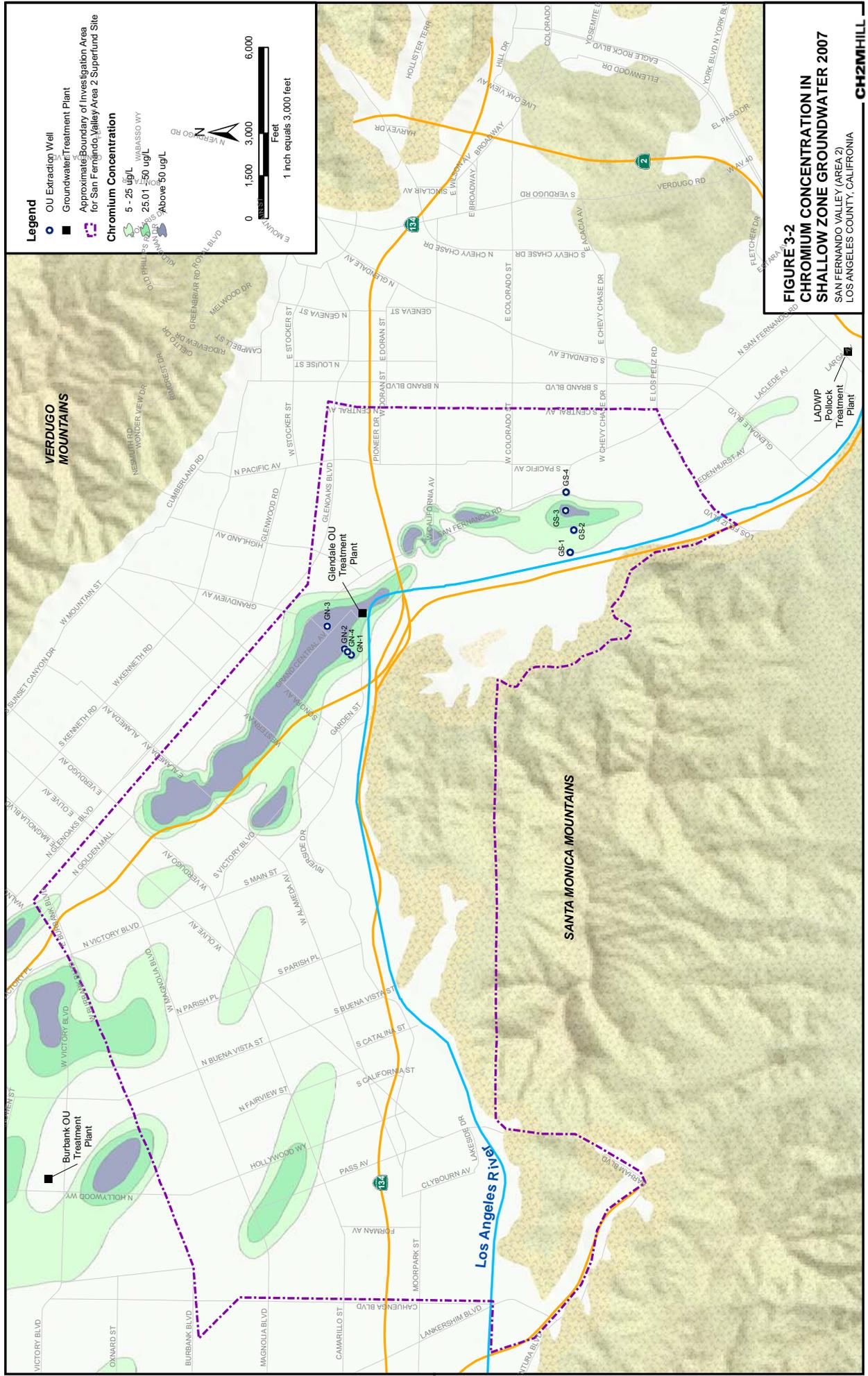


FIGURE 3-2
CHROMIUM CONCENTRATION IN
SHALLOW ZONE GROUNDWATER 2007
 SAN FERNANDO VALLEY (AREA 2)
 LOS ANGELES COUNTY, CALIFORNIA
CH2MHILL

4.0 Remedial Actions

The RODs for the GNOU and GSOU selected interim remedies to address the VOC-contaminated groundwater plume in the Glendale area. The remedial action objectives (RAOs) for GNOU and GSOU were presented in the RODs as follows:

- To inhibit vertical and horizontal migration of groundwater contaminants in the North and South Plumes of the Glendale Study Area; and
- To begin to remove contaminant mass from the upper zone of the aquifer in the North and South Plumes of the Glendale Study area.

The RODs selected groundwater extraction, treatment of VOCs by air stripping and liquid phase granular activated carbon (GAC), blending to meet the nitrate MCL, and conveyance to a public water distribution system. In addition, the RODs stated the air stream resulting from air stripping will be treated using vapor-phase GAC to ensure that air emissions meet Federal air quality standards as regulated by the South Coast Air Quality Management District (U.S. EPA 1993a) (U.S. EPA 1993b). The RODs selected a combined treatment system for both OUs.

4.1 Remedial Action Implementation

The GNOU and GSOU remedy construction occurred from 1997 to 2000 and included:

- Installation of eight extraction wells (GN-1 through GN-4 and GS-1 through GS-4), capable of producing a total of 5,000 gpm.
- Conveyance piping from extraction wells to the groundwater treatment facility.
- Design and construction of the groundwater treatment facility capable of treating 5,000 gpm.
- Conveyance piping of treated water from groundwater treatment facility to City of Glendale Grandview Reservoir.
- Conveyance piping for discharge of treated water to the Los Angeles River during routine maintenance or in the event of a system malfunction.

4.2 Operation and Maintenance

Monthly progress reports are submitted to EPA by the Glendale treatment plant operator. Operations and Maintenance Costs are summarized in Table 4-1 and reflect the actual maintenance costs for the years 2003 through 2007.

Table 4-1
Glendale Operable Units
Operation and Maintenance Costs 2003 – 2007

Year	Total O&M Costs
2003	\$1,857,486
2004	\$2,316,132
2005	\$2,284,664
2006	\$2,517,780
2007	\$2,586,208
Total for Years 2003 - 2007	\$11,562,270

Operational difficulties in addressing hexavalent chromium (Cr6) have been a constant challenge during the operational history of the treatment plant. Although the levels of total chromium in the Glendale treatment plant influent are still well below both the federal MCL (100 ppb total chromium) and the State MCL (50 ppb total chromium), the cities of Glendale, Burbank and Los Angeles have all adopted “voluntary” limits on the levels of hexavalent chromium that they are willing to allow in drinking water served to the public. In Glendale’s case, its limit was (and is) 5 ppb, which it has been able to accomplish without interruption of operations by blending the treated water from the Glendale facility with water from other facilities before distribution. The treatment plant operated in this mode until mid-2007, producing an effluent that averaged 10 ppb of hexavalent chromium before blending.

In April 2007, the Los Angeles Regional Water Quality Control Board (“RWQCB”) changed the effluent standards for the maintenance and emergency discharges of treated water to the Los Angeles River (LA River). In order to maintain the treatment plant effluent below the new 8 ppb standard for hexavalent chromium, the City began alternating pumping of wells GS-3 and GN-3, the two extraction wells with concentrations of hexavalent chromium approaching the State MCL. Each well was alternatively pumped for a 24-hour period. EPA approved the alternate pumping scheme temporarily with the condition that alternatives to modify the plant to meet the 8 ppb discharge limit be developed that allow the plant to return to design pumping rates.

The City has developed Demonstration Projects to evaluate weak-base anion exchange and reduction, coagulation and filtration (RCF) as methods of treating Cr6. EPA has approved the Demonstration Projects, and will evaluate their results as possible means of returning the operations to design pumping. Removing the high hexavalent chromium concentrations from groundwater produced by GS-3 will lower the treated plant effluent concentration to below 8 ppb and allow the plant to return to normal design flow operations. Installation of the GS-3 well-head treatment system Demonstration Project is scheduled to begin in October 2008 and be completed by January 2009.

In April 2005, well GN-3 experienced a mechanical failure of the well screen apparently as the result of an overaggressive well cleaning effort. Well GN-3 was removed from service for subsequent investigation and repairs and not returned to service until November 2006. While GN-3 was offline, pumping was increased at the other wells to compensate. GN-3 has historically had the highest VOC concentrations and often the highest chromium concentrations of all Glendale extraction wells. Therefore, mass removal of VOCs temporarily decreased. However, the outage of GN-3 allowed the City to increase pumping from the other higher chromium concentration extraction well, GS-3. This improved the plume capture at the South Well Field. Past hydrogeologic studies have shown that the VOC plume that escapes through the North Well Field will be captured at the South Well Field. As a result of the Well GN-3 outage, the City of Glendale prepared a Well Maintenance Plan to routinely evaluate and maintain the other wells to avoid similar unplanned outages. In addition, EPA has prepared a study evaluating the potential impacts of other unplanned well outages and potential response measures.

The Glendale groundwater treatment system includes discharge of air that has passed through the air stripper, and thus contains VOCs. Two trains of VPGAC units (three VPGAC adsorber vessels per train) filter the air from the air stripper and remove the VOCs prior to discharge into the atmosphere. The air discharge is monitored monthly, at a minimum, to ensure compliance with the SCAQMD permit by rule. Reporting is not required; however, regular air-quality monitoring of emissions is required to ensure that the quantity of VOCs discharged to the atmosphere does not exceed 1 pound/day total VOCs. There has been one known exceedence of the 1 pound/day limit during the review period. This was the result of higher emissions than projected just prior to a VPGAC changeout. The higher concentration of VOCs in the vapor stream caused breakthrough more rapidly than predicted from historical experience. The VPGAC was changed immediately. The corrective action that has been implemented is to initiate VPGAC changeout at a lower threshold to prevent a recurrence.

5.0 Progress Since Last Five-Year Review

This is the first five-year review produced for the Glendale North and Glendale South OUs.

6.0 Five Year Review Process

6.1 Administrative Components of Five-year Review Process

The five-year review consisted of: a review of relevant documents; a regulatory review; interviews with staff associated with O&M of the treatment system, DHS staff, and the Watermaster; and a site inspection.

6.2 Community Notification and Involvement

A public notice that EPA was conducting the five-year review was published in *Los Angeles Daily News* newspaper on September 10, 2008. The five-year review report will be placed in site information repositories, and the public notice provided instructions on how to access a copy.

6.3 Document Review

As a part of the five-year review process, EPA and its support contractor conducted a brief review of numerous documents related to site activities. The documents available for review were dated predominantly from 2000 to present but ranged in publication date from 1992 to the present. Appendix A provides a list of the documents reviewed.

6.4 Data Review

To evaluate whether the interim remedies at the GNOU and GSOU are meeting the RAOs and remain protective of human health and the environment, data regarding groundwater quality throughout Area 2, and plume containment achieved by OU extraction wells were reviewed. A detailed discussion of the data review analysis can be found in Appendix B, Data Review.

6.4.1 Area 2 Groundwater Quality

The contaminants of primary concern at the SFV Area 2 Site are TCE, PCE and chromium. Nitrate is also present in groundwater in excess of the MCL, as a result of past agricultural and sewage disposal practices in the SFV, but is not targeted for treatment as part of the GNOU or GSOU interim remedies. TCE and PCE plumes in Area 2 appear relatively stable or exhibit a gradual decline in size and concentration. Concentrations of TCE and PCE in groundwater have fluctuated over time at some wells in Area 2, rather than following a steady trend. These fluctuations may be in response to changing groundwater levels, migration of plumes, changes in geochemical conditions in the aquifer, or incorporation of additional (or more recent) water quality data. However, the overall trend suggests a gradual decline in TCE and PCE concentrations in most of Area 2.

Concentrations of 1,1-dichloroethane (DCA), 1,2-DCA, 1,1-dichloroethene (DCE), carbon tetrachloride, cis-1,2-DCE, benzene, methylene chloride, and vinyl chloride have consistently been reported in excess of the MCLs for these compounds in Shallow Zone (less than 50 feet below the water table) groundwater samples from Area 2 since 2000. Of these, 1,1-DCE, carbon tetrachloride, cis-1,2-DCE, and methylene chloride have consistently been detected in excess of the MCLs for these compounds in the Deeper Zone (greater than 50 feet below the water table). However, these other VOCs typically occur in the same areas as TCE and PCE in Area 2, and at lower concentrations. As with the TCE and PCE plumes, there is, overall, a gradual decreasing trend in concentrations of these VOCs.

Chromium plumes in Area 2 (which are dominated by hexavalent chromium) have fluctuated in size and concentration during the review period, but do not show a consistent increasing or decreasing trend. Some of the apparent changes over time are a result of improved plume delineation, as more wells in the GNOU and GSOU have been sampled for chromium. Several metals other than chromium have been detected in groundwater samples at concentrations exceeding State or EPA primary drinking water MCLs during the review period. However, half of these exceedances occurred solely at the All Metals Plating facility, and do not follow a consistent increasing trend.

The emerging contaminants 1,2,3-TCP, 1,4-dioxane, and NDMA are most frequently detected in excess of the CDPH notification levels at the GNOU and GSOU extraction wells. Other emerging contaminants (i.e., perchlorate, and MtBE) were infrequently and sporadically detected in the Shallow Zone.

6.4.2 Groundwater Extraction and Treatment System

The City of Glendale has been responsible for day-to-day operations of the GOU treatment facility since they assumed responsibility as the Operator on March 24, 2001. With the exception of nitrate, water delivered to the blend point must comply with all MCLs. To date, there have been no reported exceedances of MCLs in water samples from the treatment plant effluent.

The treatment system does not include a process for chromium treatment, and the City of Glendale is required to keep hexavalent chromium concentrations in the combined discharge from the extraction wells below 8 µg/L in order to ensure that any emergency bypasses do not violate the current river discharge limits. The 8 µg/L limit became effective in June 2007. Therefore, since June 22, 2007, pumping rates from extraction wells GN-3 and GS-3 (the extraction wells with the highest chromium concentrations) have been reduced below design pumping rates, resulting in approximately a 13% reduction of hydraulic containment of the TCE and PCE plumes in Area 2. The installation of a weak-base anion exchange Demonstration Project to evaluate this chromium treatment process is planned to begin in October 2008 at well GS-3 and completed by January 2009. The chromium removal provided by the weak-base anion exchange system will allow the entire treatment system to return to design-flow operation during the period of performance of the Demonstration Project. EPA intends to maintain design-flow pumping rates that will insure plume capture either by requiring continued operation of the Demonstration Project or development of alternatives to assure compliance with the river discharge limits for hexavalent chromium.

1,2,3-TCP and 1,4-dioxane have frequently been detected in the GNOU extraction wells, in some cases at concentrations exceeding CDPH notification levels. However, 1,2,3-TCP is effectively treated by LPGAC, which is the polishing treatment process provided by the RODs for VOCs. Concentrations of 1,4-dioxane slightly in excess of the CDPH notification level (3 µg/L) have been detected at extraction well GN-3. However, 1,4-dioxane concentrations at this well have generally declined during the review period, and the concentration in the combined influent from all of the GNOU and GSOU extraction wells is below the DPH notification level.

Approximately 17.1 billion gallons of groundwater have been extracted by these wells and treated since 2000, resulting in the removal from the aquifer of approximately 24,600 pounds of VOCs

6.4.3 Containment of Contaminated Groundwater

The primary RAO for the GNOU and GSOU groundwater extraction and treatment systems is to inhibit vertical and horizontal migration of groundwater contaminants in the North and South Plumes of the Glendale Study Area. The contaminants of concern when the interim remedies were designed were VOCs, particularly TCE and PCE.

Groundwater flow modeling in 2003 and 2008 was conducted to evaluate the effectiveness of the GNOU and GSOU extraction well fields at achieving hydraulic containment of the TCE and PCE plumes. Modeling results indicate that GNOU extraction wells capture most of the highly contaminated groundwater present in the Shallow and Deeper Zones in the GNOU when all four wells are operating. However, modeling results suggest that some contaminated groundwater is not captured, passing between extraction wells GN-2 and GN-3. Significant downtime for GN-3 in 2005 and 2006 because of well-screen problems likely allowed substantially more contaminated groundwater to flow to the south than is typical for the GNOU extraction well field. Most of the Shallow Zone VOC mass not captured by the GNOU extraction well field is projected to migrate southward toward, and be captured by, the GSOU extraction well field.

For the GSOU, modeling results indicate that the extraction wells capture all of the contaminated groundwater present in the Shallow Zone and all contaminated groundwater above MCLs in the Deeper Zone when operating at design pumping rates. The modeling found that the VOC plume is captured by the Glendale South extraction wells to a depth of 153 feet below the water table when the system is operated as designed. Monitoring well data show that VOC concentrations from wells screened at that depth downgradient of the South extraction wells are below MCLs. However, reduced pumping rates at well GS-3 since June 2007 (to limit chromium concentrations in the combined discharge from all extraction wells) are forecast to allow escape of approximately 13 percent of the Shallow Zone VOC plume in the vicinity of the GSOU extraction well field. As noted above, installation of a Demonstration Project to evaluate methods of Cr6 wellhead treatment for extracted groundwater at well GS-3 will begin in October 2008. The GS-3 Demonstration Project is scheduled to start operation in January 2009. If successful, the wellhead treatment unit would allow resumption of pumping at the design extraction rates and enable the system to achieve complete capture of Shallow Zone VOC contamination at the GSOU extraction well field.

6.5 Site Inspection

Jenny Eng (from CH2M HILL), Bob Fitzgerald and David Stensby (from EPA) and Leighton Fong (from the City of Glendale) took part in a Site inspection on April 22, 2008. Charles Cron, Site Manager for CDM, led the inspection of the Glendale WTP.

The Site Manager reported that there has only been one instance of vandalism at Glendale WTP. No release of contaminated water or treated ground water occurred as a result of this incident.

The water treatment plant, including air strippers, air blowers, liquid phase granular activated carbon adsorbers, vapor phase granular activated carbon adsorbers, liquid phase granular activated carbon adsorber backwash system, and chemical additive systems, appeared to be well maintained and in good condition.

Charles Cron noted several issues regarding the O&M during the Site inspection. The interior linings of the liquid phase carbon vessels have been damaged as a result of carbon cementing. As a result, the tanks are tested after every third change out of carbon. In addition, the backwash tank is in need of repainting. He also indicated that there were some unexpected O&M difficulties at the Site during the review period. These unexpected difficulties included the following:

- 1) Significant well casing corrosion, scaling and plugging at wells GN-3 and GN-4,
- 2) LPGAC interior lining failures and repair,
- 3) Hypochlorite injector continues to frequently clog,
- 4) Frequent communication system failures that have lasted up to 72 hours, and
- 5) Frequent positive bacteria sample results during fresh carbon startup routines that have required the immediate caustic wash of carbon upon loading the LPGAC units.

The Site inspection checklist is incorporated in Appendix C of this five-year review report. Select site photographs are found in Appendix D.

6.6 Interviews

As part of the five-year review process, technical interviews were conducted with personnel having knowledge of and/or concerns with the San Fernando Valley - Area 2 Superfund Site.

Gene Matsushita and Linda Gertler, of the Glendale Respondents Group, LLC (GRG), represent the responsible parties for the remedial activities being conducted at the Glendale Operable Unit in the SFV.¹ CDM is the operating contractor for the City of Glendale. Dan

¹ In 2000, EPA entered into a Consent Decree with the GRG and the City of Glendale for the O&M of the Glendale OUs ("Consent Decree"). The GRG funds the O&M and the City conducts the O&M pursuant to the Consent Decree. The City joined the Consent Decree voluntarily and is not considered a potentially responsible party for the contamination.

Hutton of CDM was involved with the Site during construction, completion of setup, and operation in late 1999 and early 2000. Charles Cron is the site manager and conducts day to day activities on site, including treatment system operations, groundwater monitoring, site inspections, routine maintenance, etc. The City of Glendale oversees the operations, maintenance and reporting requirements for the site.

6.6.4 Responsible Party Interviews

According to Gene Matsushita and Linda Gertler, the overall impression of the remedial action work being conducted at the site is positive and the remedies are functioning as expected. The GRG indicated that optimization is an evolving and ongoing process at the Glendale Operable Unit. The GRG is concerned that O&M and sampling optimization efforts have been offset by new requirements as a result of 1,2,3-TCP and hexavalent chromium concentrations in groundwater. Overall, the GRG believes that the Glendale Water Treatment Plant is well run and reliably supplies drinking water to the City of Glendale.

6.6.5 Operating Contractor Interviews

Mr. Hutton indicated that he is impressed with the reliability of the groundwater treatment plant system and relative ease of the process control and operations. He recommended increasing treatment flows through the facility to meet the target of 90 percent time online and 5,000 gallons per minute. Charles Cron indicated that the remedial action is not currently meeting the ROD objectives and the remedies are not functioning as expected due to increasing hexavalent chromium. Other O&M difficulties include significant well casing corrosion, scaling and plugging, LPGAC interior lining failures and repairs. Additionally, frequent and sustained AT&T communication system failures have consumed a significant amount of time to resolve. Mr. Cron specified a need for increase in plant staff in order to meet and exceed all project expectations.

The GRG and CDM are not aware of any community concerns at the Site.

6.6.6 City of Glendale Interviews

Don Froelich, formerly with City of Glendale, conveyed his overall impression that the GOU(s) is a well-run facility. The City of Glendale is concerned with AT&T communication system failures. Mr. Fong believes that the presence of hexavalent chromium in groundwater and the substantive NPDES requirements complicate operations at the Site.

Mr. Froelich mentioned that although he is not aware of any community concerns, he knows that the community is interested in the Site due to research efforts associated with hexavalent chromium removal.

6.6.7 ULARA Watermaster Interview

Mark Mackowski, ULARA Watermaster, indicated that the overall impression of the remedial action work at Glendale operable unit is good, with the exception of plant efficiency and discharge to the Los Angeles River. He suggested that O&M activities should be reviewed to assess the discharge problem.

6.6.8 State Agency Interviews

EPA is the lead agency overseeing the remedial activities at the Glendale Operable Units. The two state agencies that serve in supporting roles for oversight are the California Department of Public Health (CDPH) and the Regional Water Quality Control Board (RWQCB). The project manager from RWQCB could not be contacted for an interview. Alan Sorsher with CDPH was interviewed as part of the five year review process. Mr. Sorsher indicated that CDPH is satisfied with the quality of water produced by the treatment plant. He believes that operation and maintenance activities are satisfactory and maintenance issues are being addressed as soon as they come up. Overall, he indicated that the plant has been able to maintain the effectiveness and protectiveness of the remedy.

Mr. Sorsher stated that he is not aware of any ongoing community concerns regarding the Site or its administration and does not believe that there are any existing concerns because of the relatively low-profile situation of the operable units.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by decision documents?

7.1.1 Remedial Action Performance

All interim remedial actions, as selected in the 1993 RODs, have been implemented. The Glendale groundwater treatment facility has provided water to the City of Glendale that has met all water quality requirements, including primary and secondary drinking water quality standards, since the start-up of the facilities. Achievement of the primary RAO for the GNOU and GSOU remedy, to inhibit vertical and horizontal migration of groundwater contaminants in the North and South Plumes of the Glendale Study Area, has been evaluated by modeling conducted in 2003 and 2008. The modeling found that the VOC plume is captured by the Glendale South extraction wells to a depth of 153 feet below the water table when the system is operated as designed. Monitoring well data show that VOC concentrations from wells screened at that depth are below MCLs. However, reduced pumping rates in the Glendale South shallow zone since June 2007 as an interim means of addressing Cr6 contamination have resulted in a loss of capture of approximately 13% of the shallow zone VOC plume.

Exposure to the VOCs not captured by the GNOU and GSOU extraction wells is prevented by several mechanisms. The SFV is an adjudicated basin in which only the three cities (Los Angeles, Burbank and Glendale) have water rights, and the ULARA Watermaster prevents unauthorized groundwater pumping in the SFV. Additionally, any VOC-contaminated groundwater not captured during the temporary adjustment in pumping at GSOU would migrate south towards the Pollock Well Field, operated by LADWP as part of the City's water supply system. The California Department of Public Health regulates (via permits) and oversees all drinking water systems to ensure that treated water (such as that from LADWP's Pollock Treatment Plant) meets drinking water standards. If VOC-contaminated groundwater is not captured by the Pollock Well Field, it would continue to flow to the Central Groundwater Basin of the Los Angeles Coastal Plain (Central Basin). The Central Basin was adjudicated in 1965 to prevent unauthorized groundwater pumping. Any city pumping groundwater from the Central Basin would also require a CDPH permit. Installation of a Demonstration Project to evaluate wellhead chromium treatment options for extraction well GS-3 is planned to begin in October 2008 and completed by January 2009, which, if successful, could allow resumption of pumping at the design extraction rates and complete capture of the GSOU VOC plume.

7.1.2 System Operations/O&M

Operation and maintenance of the Glendale North and the Glendale South extraction and treatment facilities have been effective. There have been no exceedances of MCLs in water samples from the treatment plant effluent. Approximately 17.1 billion gallons of

groundwater have been extracted and treated since 2000, resulting in the removal of approximately 24,600 pounds of VOCs.

In April 2005, well GN-3 experienced a mechanical failure of the well screen. Well GN-3 was removed from service for subsequent investigation and repairs and not returned to service until November 2006. While GN-3 was offline, pumping was increased at the other wells to compensate, but overall mass removal of VOCs temporarily decreased. However, the outage of GN-3 allowed the City to increase pumping from the extraction well with elevated chromium concentrations, GS-3. This insured prevention of plume migration. The City of Glendale prepared a Well Maintenance Plan to routinely evaluate and maintain all extraction wells to avoid similar unplanned outages.

7.1.3 Opportunities to Optimize

There were no opportunities for system optimization observed during this review.

7.1.4 Implementation of ICs and Other Measures

There are no specifically tailored institutional control (IC) instruments required by the 1993 RODs. However, the governmental controls in place at the Site act as effective institutional controls to prevent groundwater pumping that would interfere with the remedies. The primary governmental control is the 1979 Final Judgment in the Superior Court of Los Angeles County, (Superior Court Case No. 650079) in the case titled *Los Angeles v. San Fernando*. The 1979 Final Judgment concluded over twenty years of litigation, including a California Supreme Court decision in 1975, which upheld the Pueblo Right of the City of Los Angeles to all groundwater in the ULARA Basin from precipitation within the ULARA and all surface and groundwater flows from the Sylmar and Verdugo Basins. 14 Cal. 3d 199 (1975). The Final Judgment also established the water rights of the cities of Los Angeles, Glendale and Burbank to all water imported from outside the Basin and either spread or delivered within the Basin. The Final Judgment created the entity known as the "Watermaster" with full authority to administer the adjudication, under the auspices of the Superior Court.

Under the Final Judgment, only the cities of Los Angeles, Burbank and Glendale are permitted to extract groundwater in significant quantities from the Basin. (Certain parties were permitted by the Final Judgment to continue their previously existing uses of groundwater, under the Watermaster's oversight, provided compensation is paid to the appropriate city.) Each of these municipalities administers a public drinking water system, which is regulated and subject to permits issued by the California Department of Public Health. These drinking water regulatory controls and the Watermaster's authority to regulate and allocate water resources eliminate unregulated use of area groundwater.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

A review of the existing ARARs indicates that, to date, there have been no significant changes or updates that would impact the protectiveness of the remedial actions.

The exposure assumptions used to develop the Baseline Risk Assessment for both the North and the South Glendale Plumes were for potential future exposure if untreated groundwater were to be used for drinking water and if residential uses were to occur. There has been no change to the exposure assumptions.

There have been a number of changes to the toxicity values for specific constituents of concern in groundwater at the Glendale Study Area since the Baseline Risk Assessment was submitted in 1992. For example, for cancer risks, the oral slope factor for benzene is more stringent currently than in 1992, while the inhalation slope factors for methylene chloride and vinyl chloride are less stringent. In addition, since the 1992 Baseline Risk Assessment, EPA initiated a re-assessment of PCE and TCE toxicity; these assessments are currently under review. In the interim, EPA is using toxicity values developed by Cal/EPA, because they meet the criteria outlined in Superfund's policy on provisional peer-reviewed toxicity values. The Cal/EPA toxicity value is reflected in EPA's 2008 Regional Screening Level (RSL) table. The RSL table was developed using the latest toxicity values, default exposure assumptions and physical and chemical properties and is consistent with the OSWER chemical toxicity hierarchy. For PCE, the RSL table has a tap water screening level of 0.11 ug/L. This corresponds to an increased cancer risk of one in one million. The PCE concentration equivalent to the upper end of EPA's risk range (one in ten thousand excess lifetime cancers) would be 11 ug/L. The State MCL for PCE remains 5 ug/L, which is within EPA's risk range. The same is true for the TCE, for which the current MCL is 5 ug/L and the concentrations at either end of EPA's risk range using the Cal/EPA toxicity values are 1.7 ug/L to 170 ug/L.

However, since there is no exposure to untreated water, these changes do not affect the protectiveness of the remedy.

7.3 Has any other information come to light that could call into question the protectiveness of the remedy?

The presence of several emerging contaminants does not affect the protectiveness of the remedy due to their low concentration. Perchlorate, MtBE, 1,4-dioxane, 1,2,3-TCP and NDMA have been sporadically detected at various locations in the plume, but have not affected the ability of the extraction and treatment system to achieve the objective of containing the plume and producing treated water that meets all drinking water standards.

There is no other information that calls into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

According to the data reviewed, the Site inspection, and the interviews, the remedies have generally functioned as intended by the interim RODs. However, the presence of hexavalent chromium has required a temporary adjustment in the extraction program since June 2007, resulting in an approximate 13% reduction in plume containment. Protectiveness of the remedy is insured because any exposure to VOC-contaminated groundwater not captured by the Glendale system is effectively prevented by the two layers of governmental controls described in section 6.1.4. First, the SFV is an adjudicated basin in which only the three cities (Los Angeles, Burbank and Glendale) have water rights, and the ULARA Watermaster prevents unauthorized groundwater pumping in the SFV. Second, any VOC-contaminated groundwater not captured during the temporary adjustment in pumping at GSOU would migrate south towards the Pollock Well Field, operated by LADWP as part of the City's water supply system. The California Department of Public Health regulates (via permits) and oversees all drinking water systems to ensure that treated water (such as that from LADWP's Pollock Treatment Plant) meets drinking water standards. The Central Basin, downgradient of the SFV basin, is also adjudicated to prevent unauthorized pumping.

The installation of a Demonstration Project for chromium treatment is scheduled to begin in October 2008 at well GS-3 and be completed by January 2009. The chromium removal provided by the Demonstration Project will allow the entire treatment system to return to design-flow operation. Upon completion of the Demonstration Project, EPA will either require continued operation of the chromium removal system or implementation of alternative methods to assure plume containment.

There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. The ARARs cited in the RODs have been met. There have been no significant changes in the toxicity factors of the contaminants of concern that were used in the baseline risk assessment, and there has been no significant change to the standard risk assessment methodology that would currently affect the protectiveness of the remedy.

8.0 Issues and Recommendations

The current remedial operations and monitoring are effective in treating the contaminants in groundwater remaining in GNOU and GSOU. Operational issues resulting from the presence of chromium have impacted the remedy during the review period. Since June 2007, this has affected containment of the VOC plume. However, the chromium removal provided by installation of a weak-base anion exchange wellhead treatment system Demonstration Project at GS-3 will allow the entire treatment system to return to design-flow operation. This will allow full capture of the VOC plume during the period of performance of the Demonstration Project. After the period of performance of the Demonstration Project, EPA intends to maintain design-flow pumping rates that will insure plume capture either by requiring continued operation of the Demonstration Project or development of alternatives to assure compliance with river discharge limits for hexavalent chromium.

TABLE 8-1
Issues

Issues	Affects Protectiveness (Y/N)	
	Current	Future
Reduced pumping of two extraction wells due to high chromium concentrations has caused some loss of plume capture and migration of VOCs	N	Y

TABLE 8-2
Recommendations and Follow-up Actions

Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects Protectiveness (Y/N)	
				Current	Future
Complete Chromium Demonstration Project	City of Glendale	EPA	January 2009	N	Y

9.0 Protectiveness Statement

The interim remedies at the San Fernando Valley, Area 2, Superfund Site are protective of human health and the environment because all exposure pathways are currently being controlled. To be protective in the long-term, the operational problems due to the chromium discharge limit and their effect on plume containment must be addressed.

10.0 Next Review

The next comprehensive five-year review for SFV Area 2 Glendale North and Glendale South OUs will be conducted on or before September 2013.