

FIVE-YEAR REVIEW REPORT

for

**Sola Optical USA, Inc.
Petaluma, California**

September 2000

Prepared by:

**Region 9
U.S. Environmental Protection Agency
San Francisco, California**

Sola Optical Site Five-Year Review Report

I. Introduction

A. Scope and Intent of Five-Year Review

EPA Region 9 has conducted this five-year review of the remedial actions implemented at the Sola Optical site in Petaluma, Sonoma County, California. The purpose of the five-year review is to determine whether the remedy at a site is functioning as intended and is protective of human health and the environment.

This is the first five-year review for the Sola Optical site and is a Type I policy review, a review performed for sites where remedial action is ongoing, waste will not remain after the cleanup is completed, and the use of the property will not be restricted or limited, as described in OSWER Directive 9355.7-02A. The triggering action for this review is the completion of the preliminary Close Out Report on August 14, 1992.

This review included a review of the ROD, the Preliminary Close Out Report, an ARARs review, and interviews with appropriate SF Bay RWQCB and City of Petaluma staff.

B. Summary of Review Results

The results of the Five-Year Review of the remedial action at the Sola Optical site are:

1. the groundwater plume has been contained;
2. the groundwater treatment system is no longer operating;
3. the present monitoring program is adequate;
4. the original cleanup objectives remain protective of human health and the environment;
and
5. there are no new ARARs which would make the remedial action insufficient.

II Background

The Sola Optical site is located in southern Sonoma County, California on the southeastern edge of the City of Petaluma (see Figure 1). Sola has been manufacturing ophthalmic lenses since 1978 at its 35-acre facility in Petaluma's industrial area. The facility address is 1500 Cader Lane and is located just west of Lakeville Highway. The facility comprises a manufacturing building and an adjoining administration office building. The former underground storage tanks were located behind the rear north corner of the manufacturing part of

the facility.

Sola manufactures hard-resin ophthalmic lenses. The manufacturing process involves the injection of a catalyzed, thermosetting resin into a cavity between polished glass molds. The mold assembly is subsequently placed in an air oven to cure the resin. The assembly is removed from the oven, the cured resin lenses removed from the assembly, and the assembly is put through a cleaning process before production is repeated.

In May 1982, Sola identified low levels of solvents in groundwater under the Sola property near six underground storage tanks. Sola used these six 1,000 gallon underground tanks to store 1,1,1-trichloroethane (1,1,1 TCA), acetone, and methanol. In 1985, Sola independently removed the underground tanks. The removal of the tanks reportedly included the excavation of gravel back-fill and an additional three feet of native soil from the sides and bottom of the tank excavation.

Sola's early investigation also confirmed that groundwater at the site was contaminated with VOCs, including 1,1,1-TCA, 1,1-dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), and methylene chloride. In 1983, the San Francisco Regional Water Quality Control Board directed Sola to investigate the groundwater at the site. In 1987, the Board issued a cleanup order to construct a groundwater extraction and treatment system. Sola began operating its groundwater extraction and treatment system in 1988.

The site was proposed for the NPL in 1988 and was placed on the NPL on February 22, 1990. Sola Optical USA, Inc. is the responsible party and has assumed responsibility for cleaning up the site.

Table 1 lists the chronology of events for the Sola Optical site.

Date	Event
May 1982	solvents discovered in groundwater
1985	underground tanks removed
1987	RWQCB Cleanup Order issued
August 1988	interim groundwater treatment begins
2/22/90	NPL Listing
9/27/91	ROD signed
1/9/92	Remedial design start
8/14/92	Construction completion

III Remedial Actions

A. Remedy Selection

On September 27, 1991 EPA signed the Record of Decision for the Sola Optical Site. The remedial action objectives are to control further migration of the contaminated groundwater and to recover and treat contaminated groundwater until the aquifer is restored and groundwater contamination is below cleanup levels. The cleanup levels established in the ROD are current drinking water standards. Those standards are:

1,1 DCE	6 ppb
1,1 DCA	5 ppb
1,1,1 TCA	200 ppb

EPA selected a remedy that includes the following:

- groundwater monitoring to assure capture of contaminated groundwater;
- operation of existing extraction wells (9);
- construction and operation of two additional shallow extraction wells;
- conversion of two monitoring wells to deep extraction wells;
- construction and operation of additional piping for the new and converted wells; and
- on-site treatment and discharge to nearby Adobe Creek.

At the time the ROD was signed EPA anticipated that the groundwater would be restored to the cleanup standards in 15 to 20 years.

B. Remedy Implementation

Pursuant to a RWQCB Order, Sola started operating the groundwater treatment system at the site in 1988. Pursuant to an EPA Administrative Order issued in January 1992, Sola prepared the remedial design for the two additional extraction wells and the conversion of the monitoring wells as specified in the ROD. The new extraction wells began operating in July 1992.

The site achieved construction completion status when the Preliminary Close Out Report was signed on August 14, 1992.

C. System Operations

System operations requirements for the site included quarterly monitoring and an annual groundwater report. Since 1998 the groundwater has been monitored on a semi-annual basis.

Over the years there have been few operation and maintenance problems. The biggest problem was that of rodents chewing through the electrical system.

By 1997 groundwater concentrations of 1,1-DCE and 1,1-DCA leveled off. Contaminant levels, while much lower than when the groundwater treatment system began operating, no longer appeared to be influenced by the treatment system. Analysis of the groundwater from the extraction wells revealed that a large quantity of relatively clean water was being extracted and treated.

Of the 13 extraction wells, for 1,1-DCE two wells were above MCL, 6 were below MCL, and 5 were non-detect. For 1,1-DCA 4 wells were above MCL, 4 were below, and 5 were non-detect.

One factor that EPA believes is contributing to continuing levels of VOCs in excess of cleanup levels is the site's geologic conditions. The area of residual contamination is primarily a tightly bound clay, or adobe, with very low hydraulic conductivity. As a result, it appears that the VOCs have adsorbed to the clay.

In March 1997 EPA gave Sola permission to shut off the groundwater treatment system for a six-month test period to determine the effectiveness of the pump and treat system. Sola turned off the system on March 19, 1997, and continued to monitor the groundwater. At the end of the test period groundwater monitoring results indicated that there was no increase in either the contaminant levels or the plume configuration after the extraction system was turned off.

The groundwater treatment system has remained off and contaminant levels have continued to slowly decline. The maximum level of 1,1-DCE has declined to 12 ppb; the maximum level of 1,1-DCA has declined to 20 ppb. Sola believes that natural attenuation is largely responsible for these declines and is preparing documentation to present to EPA.

O & M costs were approximately \$40,000 - \$50,000 a year when the system was fully operational and extracting groundwater from 13 wells. Now, with semi-annual monitoring the only site activity, the O&M costs are approximately \$5,000 - \$6,000 a year.

IV ARARs Review

The following standards were identified as applicable or relevant and appropriate requirements (ARARs) in the ROD. They were reviewed for changes that could affect protectiveness.

- Section 1412 of the Safe Drinking Water Act (SDWA), 42 U.S.C. §300g-1 "National Drinking Water Regulations"; National Primary Drinking Water Regulations, 40 CFR Part 141
- California Safe Drinking Water Act, California Domestic Water Quality Monitoring Regulations, CAC Title 22 Division 4, Chapter 15

Standards for the contaminants of concern have not become more stringent since the signing of the ROD in 1991. There were no location-specific requirements identified in the ROD.

V Site Inspection

Holly Hadlock of the EPA conducted a site inspection on May 16, 2000. The groundwater plume is under a flat, undeveloped field owned by Sola Optical and adjacent to the Sola Optical facility. The groundwater treatment system equipment is still in place even though the extraction system has not operated since 1997. All groundwater monitoring well covers were intact and locked, with no sign of damage. The groundwater treatment system is still in place and could be operated if necessary.

The following individuals were contacted by telephone as part of the five-year review:

John Jang, SF Bay RWQCB

Michael Ginn, City of Petaluma

They both said that they are not aware of any problems with Sola Optical site. No one from the community has contacted them with any concerns or complaints about the site.

VI Data Review

The data show that contaminant concentrations have steadily decreased since 1991. Table 2 shows historical concentrations for well W-14 which has historically had the highest concentrations.

Table 2: Comparison of Initial and Current Groundwater Concentrations

Contaminant	Well	1986 (ppb)	1997 (ppb)	2000 (ppb)	Cleanup Level (ppb)
1,1-Dichloroethane	W-14	680	52	1.9	5
1,1-Dichloroethene	W-14	3,300	19	1.0	6
1,1,1-Trichloroethane	W-14	1,700	<0.5	<0.5	200

Of the 48 monitoring wells and 13 extraction wells at the site only two have concentrations that remain above cleanup goals. These two wells are monitoring well W-27 with 10 ppb 1,1-DCE and 20 ppb 1,1-DCA; and extraction well E-5 with 12 ppb 1,1-DCE (Figure 2).

Approximately 123,352,000 gallons of water have been treated since Sola began operating the groundwater treatment system in 1988. This system removed approximately 10 pounds of VOC contaminants.

1,1-DCE levels have dropped tremendously since the treatment system was installed in 1988, from a high of 3,300 ppb to the current 10 ppb. Contaminant levels have continued to decline since the treatment system was turned off in 1997. This drop may be attributable to natural attenuation of the VOCs. Sola believes that natural attenuation has been responsible for the majority of the contaminant reduction, both before and after the groundwater treatment system was turned off. Sola is in the process of evaluating the natural attenuation process at the site and has indicated it will submit a report to EPA. If EPA determines that cleanup goals can be met through natural attenuation, EPA may issue a ROD Amendment or an Explanation of Significant Differences (ESD) changing the remedy from groundwater treatment to monitored natural attenuation.

A review of the Health and Safety Plan indicates that it is in place and sufficient for the on-going monitoring at the site.

In summary, the remedial action objectives of preventing the migration of contaminated groundwater and restoring the aquifer to state and federal cleanup levels continues to be met at the site, even though the groundwater treatment system is no longer operating.

VII Areas of Noncompliance

There were no areas or conditions of noncompliance with the goals of the remedial action at the site.

VIII Statement of Protectiveness

The remedial action selected in the ROD signed September 27, 1991, for the Sola Optical Superfund site remains protective of human health and the environment.

IX Next Review

The next five-year review will be conducted in Fiscal Year 2005.

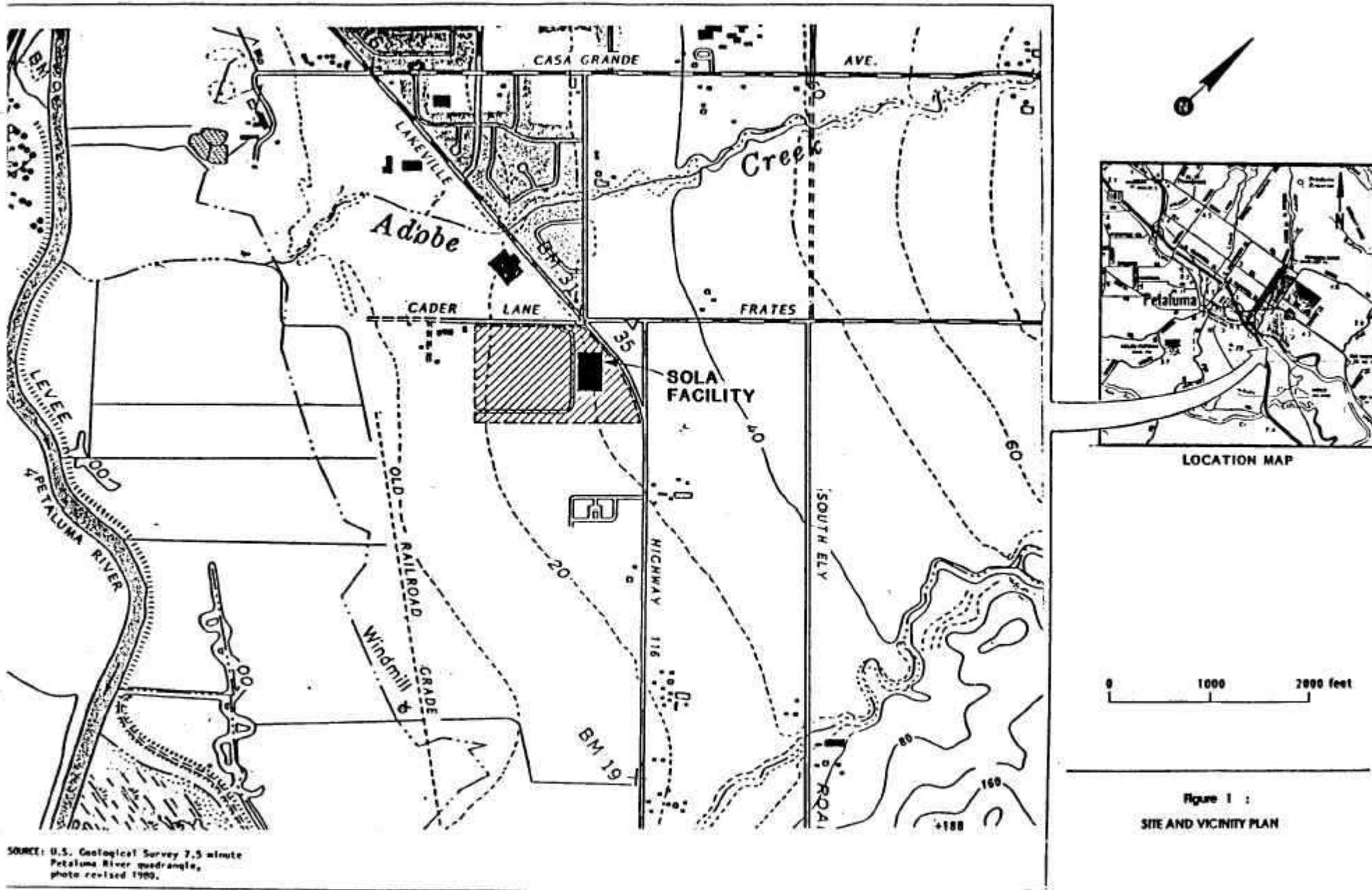
X Implementation Requirements

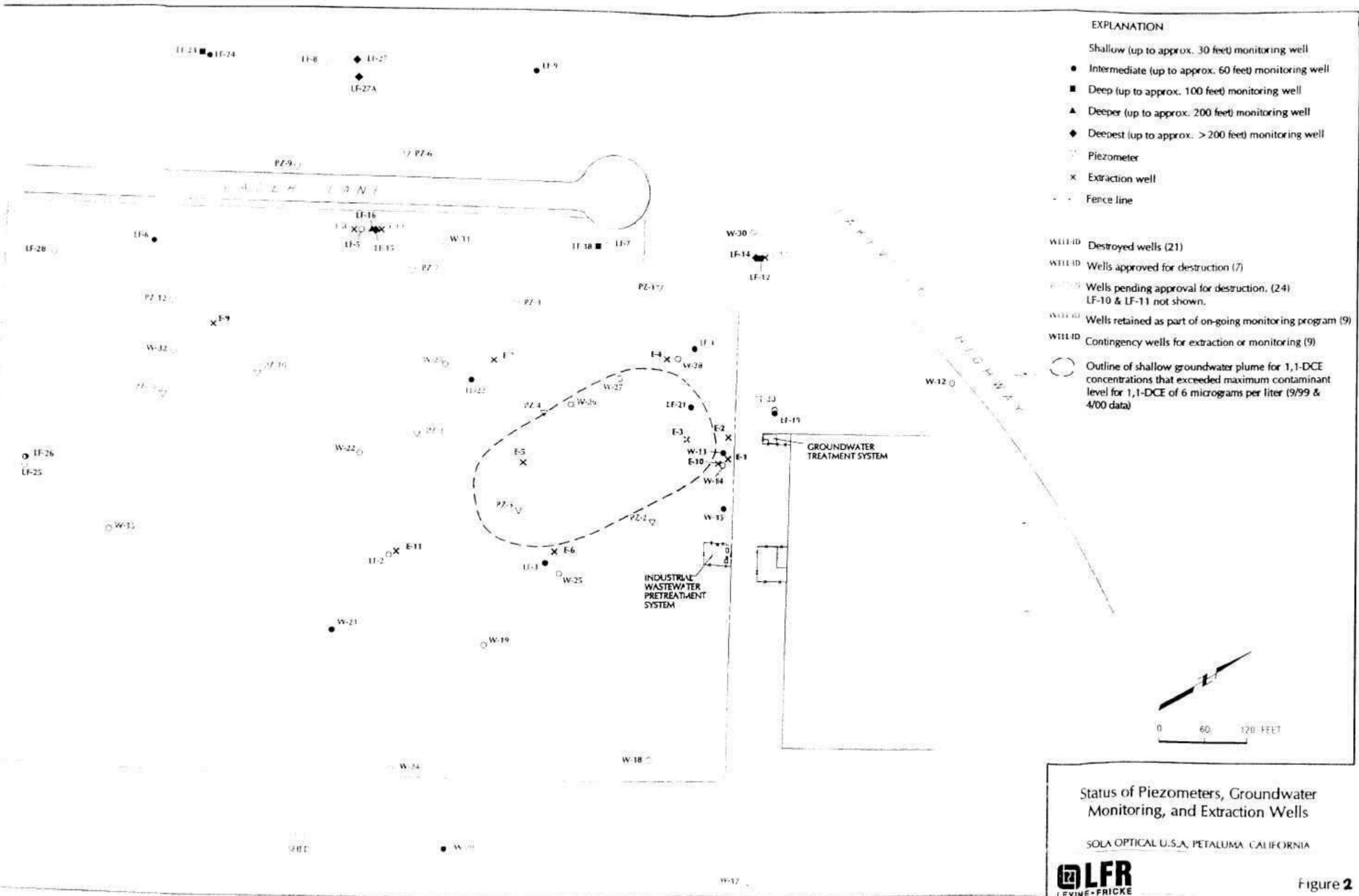
There are no implementation requirements or changes to the O&M plan needed at this site.

Approved by: Keith Takata
Keith Takata, Director
Superfund Division

Date: 9-29-00

FIGURE #1





Status of Piezometers, Groundwater Monitoring, and Extraction Wells

SOLA OPTICAL U.S.A., PETALUMA, CALIFORNIA



Figure 2