SECOND FIVE-YEAR REVIEW REPORT

FOR THE
SOLA OPTICAL USA, INC.
SUPERFUND SITE
SONOMA COUNTY, CALIFORNIA

September 2005

U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105

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Date

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Acronyms & Abbreviations

µg/L	micrograms per liter
ARARs	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
CCR	California Code of Regulations
CDHS	California Department of Health Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	constituents of concern
COR	close out report
1,1-DCA	1,1-dichloroethane
1,2-DCA	1,2-dichloroethane
1,1-DCE	1,1-dichloroethene
EPA	United States Environmental Protection Agency
FS	Feasibility Study
GWET	groundwater extraction and treatment
LFR	Levine Fricke
MCL	maximum contaminant level
MCL	maximum contaminant level
mg/L	milligrams per liter
MNA	monitored natural attenuation
msl	mean sea level
ND	non-detect; not detected
NCP	National Contingency Plan
NPL	National Priority List
O&M	operation and maintenance
ppb	parts per billion
ppm	parts per million
PRP	potentially responsible party

RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RNM	RNM Cader, L.L.C.
ROD	Record of Decision
SFRWQCB	Regional Water Quality Control Board, San Francisco Region
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
Sola	Sola Optical USA, Inc.
TBC	to be considered
1,1,1-TCA	1,1,1-trichloroethane
1,1,1-TCE	1,1,1-trichloroethene
TCE	trichloroethene
UST	underground storage tank
VOC	volatile organic compound

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name: Sola Optical USA, Inc. Superfund Site

EPA ID: J8 **CERCLIS ID :** CAD981171523

Region: IX **State:** CA **City/County:** Petaluma / Sonoma County

SITE STATUS

NPL status: ■ Final ☐Deleted ☐Other (specify) _____

Remediation status (choose all that apply): ☐Operating ■Complete

Multiple OUs? ☐YES ■NO **Construction completion date:** August 4, 1992

Has site been put into reuse? ■ YES ☐NO

REVIEW STATUS

Reviewing agency: ■EPA ☐State ☐Tribe ☐Other Federal Agency _____

Author name: Dante Rodriguez

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

Review period: March 16 – September 30, 2005

Date(s) of site inspection: May 5, 2005

Type of review: ☐Statutory

■Policy ☐Post-SARA ☐Pre-SARA ☐NPL-Removal only

☐Non-NPL Remedial Action Site ☐NPL State/Tribe-lead

■Regional Discretion

Review number: ☐ 1 (first) ■ 2 (second) ☐ 3 (third) ☐ Other (specify)

Triggering action:

☐ Actual RA On-site Construction at OU __

☐ Actual RA

■ Previous Five-Year Review Report 2000

☐ Construction Completion

☐ Other (specify) _____

Triggering action date: September 2000

Due date (five years after triggering action date): September 2005

Issues and Recommendations:

Issue #1

The concentration of 1,1-dichloroethane (1,1-DCA) in one well continues to exceed the clean-up standard (MCL) of 5 µg/L. It is estimated that this remaining contamination covers, at the most, one half acre of the shallow aquifer. The data shows the concentrations in this well (W-27) are fluctuating between about 15 and 20 µg/L. The most recent samplings (November 2004 and May 2005) both showed the concentration to be 20 µg/L. Whereas it was expected that Monitored Natural Attenuation (MNA) would decrease the concentrations of 1,1-DCA in this well to below the MCL by 2006, it does not appear that the standard will be achieved in that timeframe. Contingency wells described in the April 2001 report "Evaluation of Natural Attenuation as a Remedy to Meet Remedial Action Objectives" (LFR 2001) were to be used for expanded groundwater monitoring if needed, to determine the final success of MNA. However, the eight contingency wells are not available because they have been abandoned.

Recommendation

A continuing review of the MNA performance data should be conducted, including assessing possible enhancements to the MNA system to reduce contaminant levels to achieve the clean-up standard. At a minimum, additional monitoring and reporting is recommended in 2006, including assessing the adequacy of the existing monitoring well network. If any additional monitoring wells are needed, they should be installed.

Issue #2

Monitored Natural Attenuation (MNA) has been proposed and implemented as an interim measure at the site, but the ROD has not been amended yet to reflect the use of MNA to achieve the remaining clean-up needed.

Recommendation

After assessing possible enhancements to the MNA system, prepare a ROD Amendment or Explanation of Significant Differences (ESD) to reflect any remedy changes. A ROD Amendment process would include an opportunity for public review and comment, whereas an ESD would

not necessitate it.

Issue #3

The ROD did not include institutional controls, and contamination still exists in the groundwater above the level that would allow for unrestricted use. Currently, no drinking water wells are installed within the area of contamination. Existing governmental controls consist of County well permitting procedures that involve checking environmental databases for contaminated sites and coordinating with the San Francisco Regional Water Quality Control Board (SFRWQCB). There are also County regulations that require wells to be sealed for the top 50 feet. There is new commercial construction on the portion of the Site where the non-compliant groundwater exists.

Recommendation

Identify and select in a ROD Amendment or ESD, institutional controls to limit use of groundwater at the site until clean-up goals are achieved. The ROD Amendment process should include assessing the adequacy of the existing governmental controls. The ROD amendment would need to specify the types of institutional controls being selected, and whether the clean-up standards are appropriate for current land-use zoning. Evaluate the potential for the current commercial development to result in exposure to the remaining contamination and reflect those findings in the institutional controls that are selected. Implement and monitor the selected institutional controls.

Executive Summary

The U.S. Environmental Protection Agency (EPA) has completed this second five-year review of the remedial action at the former Sola Optical USA, Inc. (Sola) Facility (the Site), located in Petaluma, California, in Sonoma County. In September 2000, the first five–year review, a "policy review," was completed by the EPA. A "policy review" is one that is performed for sites where remedial action is still ongoing, but where residual waste will not remain above clean-up levels and no land-use restrictions will be needed after the clean-up is completed (OSWER) Directive 9355.7-02A (EPA 2000). This second five-year review, triggered by the first, is also a policy review. The five–year review evaluates whether the remedial measures implemented at the Site are protective of human health and the environment.

The Site is located at 1500 Cader Lane, west of the Lakeville Highway intersection with Interstate Highway 101. The facility is on the southeastern edge of the city of Petaluma. Sola Optical manufactured ophthalmic lenses from 1978 through 2001. The facility was comprised of one manufacturing building and an adjoining administration office building. The manufacturing process involved the injection of a catalyzed, thermosetting resin into a cavity between polished glass molds. The mold assembly was then placed in an air oven to cure the resin. The assembly was removed from the oven and subsequently put through a cleaning process before the production was repeated. Six 1,000-gallon underground storage tanks (USTs) were located behind the north corner of the manufacturing building. The tanks were used to store solvents such as 1,1,1-trichloroethane (1,1,1-TCA), acetone and methanol.

In 1985, Sola had the tanks and surrounding soil removed. Confirmation samples analyzed for selected volatile organic compounds (VOCs) revealed the presence of acetone, ranging from 1.1 to 54 mg/kg and 1,1-dichloroethene (1,1-DCE) detected at 0.010 mg/kg. Sola removed some additional soil from one side of the tank excavation, but confirmatory sampling showed that some contamination still remained on that side of the excavation. No further soil was removed. Later, comprehensive soil and soil gas sampling was conducted for the remedial investigation, under EPA oversight, and a risk assessment was performed. EPA determined that no further action was needed for the soils.

Groundwater at the site was demonstrated to be contaminated by 1,1,1-TCA; 1,1-dichloroethene (1,1-DCE); 1,1-dichloroethane (1,1-DCA); and methylene chloride. Active groundwater extraction and treatment remediation occurred at this site for 8 years, from 1988 to 1997, in accordance with the 1991 Record of Decision (ROD). In 1997, the groundwater extraction system was shut down, and the rebound of contaminant concentrations was monitored for six months. During this time, no rebound was observed to occur. In 2002, Sola presented information supporting the technical feasibility of using MNA to complete the site remediation. EPA evaluated information presented by Sola in support of MNA and concluded that using MNA to meet remedial action objectives at the site was possible, and that EPA will amend the decision document to reflect this change. The groundwater treatment system was dismantled in 2002.

This second five-year review has determined the following:

- The remedy at the Sola site currently protects human health and the environment because the groundwater contamination has been reduced below drinking water standards in all but a very limited area around one well, and there is no exposure pathway to the remaining groundwater contamination. However, in order for the remedy to be protective in the long-term, EPA must identify institutional controls that prevent use of groundwater that exceeds the clean-up standard, select them in a decision document, and implement and monitor them. The groundwater clean-up standard (e.g., the ARAR) for 1,1-DCA must eventually be attained in well W-27.
- The groundwater clean-up standard has been attained for all chemicals in all locations except 1,1-DCA in well W-27. VOCs may have been held in the fine-grained sediments beneath the site and are slowly releasing back into the groundwater.
- The performance of the MNA system should continue to be monitored and assessed. Possible enhancements to the MNA system should be assessed, to address the area that remains above the clean-up standard. The revised remedial components must be reflected in a decision document. The adequacy of the existing monitoring well network should be assessed, and if new monitoring wells are needed, they should be installed.
- No institutional controls were ever identified or selected in a decision document, and contaminant concentrations in the groundwater remain above the clean-up goal for 1,1-DCA at one well. Some form of institutional control is needed at this site.
- There are no changes in the current regulations for the constituent of concern at the Site, and the Applicable or Relevant and Appropriate Requirements (ARARs) established in the 1991 ROD do not require revision to ensure the protectiveness of current remedial actions or to comply with state or federal requirements.

1.0 Introduction

The U.S. Environmental Protection Agency (EPA) conducted the second five-year review of the remedial action implemented at the Sola Optical USA, Inc. (Sola) Superfund Site ("the Site"). The August 1992 Preliminary Close-Out Report (PCOR) triggered the first five-year review in 2000 (EPA 2000). This document is the second five-year review conducted for this site, triggered by the first review (August 14, 2000). The Site is located in the City of Petaluma in Sonoma County, California (Figure 1-1). This report documents the results of the second five-year review. This report has been prepared in accordance with EPA's guidance document, *Comprehensive Five-Year Review Guidance* (EPA 2001).

The five-year review process evaluates whether the remedial measures implemented at the Site are 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 deficiencies found during the review and provide recommendations for addressing these deficiencies.

By statute, EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121(c), as amended, 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 5 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.

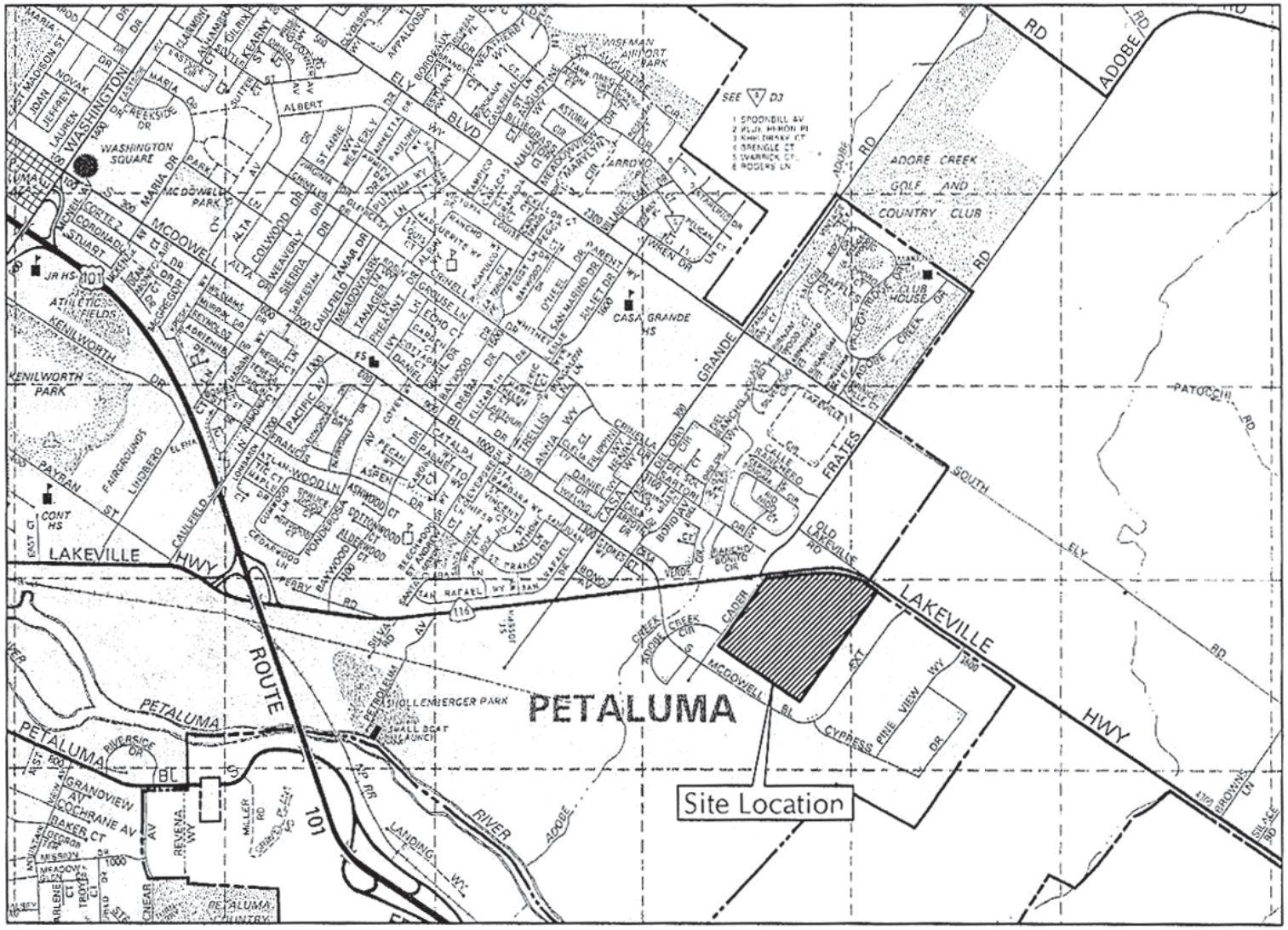
The NCP part 300.430(f)(4)(ii) of the Code of Federal Regulations (CFR) states:

> 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.

Consequently, this five-year review is considered a "policy" review because clean-up levels have not yet been achieved, and until they are, hazardous substances, pollutants, or contaminants remain at the Site above target clean-up levels that allow for unrestricted use and unlimited exposure.

This report is organized into sections that describe the history and setting of the Site, remedial action decisions and implementation, and an evaluation of remedial actions. These sections are:

- Section 2.0 - Chronology of Site events
- Section 3.0 – Site background including land and resource use, the physical setting, the history of operations, the initial investigation and response, and the basis for taking action
- Section 4.0 - The remedial action selection and implementation
- Section 5.0 - Progress since the last five-year review
- Section 6.0 - The five-year review data findings
- Section 7.0 - Technical assessment of the remedial action implemented at the Site
- Section 8.0 - Issues and recommendations for the Site
- Section 9.0 - Protectiveness statement
- Section 10.0 - List of works cited in this document



0 1,100 2,200 FEET

Source: LFR, 2005.

FIGURE 1-1
SITE VICINITY MAP
SOLA OPTICAL USA, INC.
SECOND FIVE-YEAR REVIEW REPORT
SONOMA COUNTY, CA

CH2MHILL

327990.FR.01_Figure 1-1 Site Vicinity Map_8/2/05_ez_sfo

2.0 Site Chronology

Table 2-1 provides a chronology of events at the Site.

TABLE 2-1
Chronology of Site Events
Sola Optical USA, Inc. Second Five-Year Review Report
Sonoma County, CA

Date	Event
1978-2001	Sola operates as ophthalmic manufacturing facility.
1978-1985	Six 1,000-gallon underground storage tanks (USTs) are used to store 1,1,1-TCA, acetone and methanol
1982	VOCs are detected in shallow groundwater in immediate vicinity of USTs.
1983	The Regional Water Quality Control Board, San Francisco Region (SFRWQCB) orders a groundwater investigation.
July 1985	Sola removes six 1,000-gallon USTs.
July 1986	Sola conducts soil gas and soil boring investigation. Maximum detection of 150 mg/L 1,1,1-TCA in soil gas.
November 1986	Trace concentrations of VOCs are detected in City of Petaluma Station 5 municipal water supply well, located approximately 300 feet downgradient of the site.
April 1987	SFRWQCB issues Site Clean Up Order (docket # 87-038) requiring Sola to construct a groundwater extraction and treatment system
May 1987	SFRWQCB refers site to EPA for inclusion on the National Priorities List (NPL)
May 1987	EPA Special Notice Letter proposes additional Remedial Investigation (RI) activities and preparation of a Feasibility Study (FS) for the Site.
October 1987	Sola installs a groundwater extraction and treatment (GWET) system. Fully operational by August 1988.
June 1988	City of Petaluma ceases operation of Station 5 well
October 1989	Sola and City of Petaluma enter written agreement to cease operations at Station 5 well until such pumping would no longer have the potential to impede any remedial measures at the site.
October 1989	EPA issues administrative order (docket # 89-22) for RI/FS; additional soil and soil gas sampling conducted under EPA oversight.
February 1990	NPL listing
April 1990	Use of Stero's private water supply well discontinues; Sola removes pumping system and agrees to pay for municipal water supply.
October 1990	Sola abandons Crandell's private water supply well and agrees to pay for municipal water supply.
December 1990	Sola submits RI

TABLE 2-1
Chronology of Site Events
Sola Optical USA, Inc. Second Five-Year Review Report
Sonoma County, CA

Date	Event
June 1991	Sola submits FS with detailed evaluation of enhancements to current GWET remedy, i.e., installing 2 additional shallow extraction wells and converting 2 deep monitoring wells into extraction wells.
September 1991	ROD issued, selecting expansion and continued operation of the existing groundwater extraction and treatment system, with off-site disposal of treated effluent. Concludes that soils do not pose unacceptable risk.
January 1992	EPA issues Administrative Order (docket # 92-07) for Remedial Design/Remedial Action.
February 1992	Remedial Design/Remedial Action Work Plan submitted to EPA. Specified enhanced GWET system.
July 1992	Enhanced extraction system started. This included two new shallow monitoring wells and the conversion of two deep monitoring wells into monitoring wells.
August 1992	Construction complete and interim closeout report signed: 8 extraction wells, liquid phase carbon treatment.
January 1993	Public Health Assessment Report concludes no apparent public health hazard at Site because contaminated groundwater is not currently a source of drinking water. Future exposures were considered unlikely if the groundwater extraction system reduces concentrations to levels below health concerns.
November 1996	Sola submits request for a Technical Impracticability Waiver because maximum contaminant levels (MCLs) had not been achieved throughout the site with active groundwater extraction after 8 years of pumping.
March 1997	EPA stated that a TI waiver could not be determined without additional information, including turning off the extraction wells and treatment system for two quarters and evaluating potential rebound during quarterly monitoring for six months. GWET shut down at this time.
November 1997	No rebound noted during end of 6-month test period. Sola abandons 17 groundwater monitoring wells and 4 piezometers that have been at non-detect (ND) levels or below the MCLs and decreases monitoring frequency from quarterly to semiannual.
September 2000	First five-year review and site inspection
April-May 2001	Abandonment of 34 monitoring, extraction and piezometers at site (W-13, W-15, W-19, W-20, W-21, W-23, W-26, W-28, W-33, LF-3, LF-4, LF-5, LF-6, LF-10, LF-11, LF-12, LF-14, LF-15, LF-16, LF-18, LF-19, LF-20, LF-21, LF-22, PZ-2, PZ-4, PZ-5, PZ-8, PZ-10, PZ-11, E-8, E-9, E-12, E-13)
April 2001	Four additional extraction wells are decommissioned.
	Extraction wells E-5, E-6-, E-7, and E-11 were decommissioned in preparation for proposed development of adjacent property (pumps pulled, and wellhead piping).
November 6, 2001 to January 13, 2002	Dismantling of GWET system accomplished. Extraction wells E-1, E-2, E-3, E-4 and E-10 were also decommissioned at this time.
May 2001	MW-19 destroyed to accommodate site development. E-7 added to monitoring program as a replacement well
September 2002	EPA requests a work plan to implement MNA at site.

TABLE 2-1
Chronology of Site Events
Sola Optical USA, Inc. Second Five-Year Review Report
Sonoma County, CA

Date	Event
October 2002	Sola submits Work Plan to Implement MNA (LFR 2002b). Also submitted request to abandon and destroy six former monitoring and extraction wells.
December 2002	EPA approves the MNA Evaluation Report/Work Plan. Groundwater monitoring plan further modified in January 2003.
April 2004	Six groundwater monitoring and former extraction wells located at the Site were abandoned (W-14, LF-25, LF-26, E-6, E-10, E-11), under Destruction permit # 4245, County of Sonoma Department of Health Services
On-going	Semi-annual and annual groundwater monitoring of five remaining shallow groundwater wells. Monitoring reports are generated every other year (i.e., 2001, 2003, and 2005). The next monitoring report is due in May-June 2007.

3.0 Site Background

3.1 Land and Resource Use

The Sola Site property is a 35-acre site zoned for industrial use. Land-use in the surrounding area is industrial, commercial, residential, and undeveloped land. The property adjacent to Sola to the west is owned by an entity called "Stero Company," a manufacturer of dishwashers. There is undeveloped land to the north of Sola, and there are residential subdivisions to the northwest, approximately 300 feet away. To the east of the Sola property is office space occupied by Fireman's Fund Insurance, The Russ Company, and Tegal Corporation. See Figure 1-1 for reference (EPA 2005).

Approximately eleven acres (889,060 square feet) in the southwest portion of the Site, that were previously undeveloped, were purchased by RNM Cader, L.L.C. (RNM) on September 15th, 2000. The buyer agreed to pay all costs related to the ongoing investigations and obtain any licenses or permits required by federal, state, or local law in order to complete any tests or inspections on the property. RNM also agreed under contract to fill and compact any holes and provide Sola with written notice at least five days in advance, detailing the scope of any testing, to obtain Sola's approval. Upon approval from the EPA, Sola is obligated to remove or relocate monitoring wells that conflict with the site plan for RNM's planned development (RNM and Sola 2000). The remaining 24 acres of the Sola Site property, including the buildings, was also recently sold to a different entity. Sola Optical, Inc. no longer owns any of the Site.

3.1.1 Local Water Use

The City of Petaluma uses the unconfined aquifer in the area as a drinking water source. In the vicinity of the Sola facility, one active City of Petaluma municipal water supply well ((Station #5, screened from 180 to 512 feet below ground surface (ft bgs)) and two private wells (Stero industrial well and Crandell resident well) were previously used for private and municipal supply. In addition, there is one City of Petaluma well (screened from 60 to 280 ft bgs) that was installed at the Site but never used. In 1989, Sola entered into a written agreement with the City of Petaluma whereby the city agreed to discontinue using the Station #5 well and would not use the other on-site municipal well, in order to ensure that Sola's groundwater clean-up operation (at that time being groundwater extraction and ex-situ treatment) would not be disrupted by local pumping effects. The unused City of Petaluma well was reportedly destroyed in 2001 (LFR 2001). Sola has also reportedly reached an agreement with the City to abandon and replace the Station #5 well (LFR 2001). The two private wells (Stero and Crandell wells) were shut down in 1990, and Sola paid for their connection to the City of Petaluma municipal supply. The Crandell well was permanently abandoned, and the Stero well had its pumping apparatus on the Stero well was dismantled (EPA 2005).

3.2 Physical Setting

The Site is located in Sonoma County, in the southeastern edge of the city of Petaluma, California. The Site is located just west of Lakeville Highway's intersection with Interstate Highway 101, as shown in Figure 1-1. Adobe Creek lies .3 mile to the west of the Site and flows into the Petaluma River one mile from the Site. The Site is essentially flat, and consists of a manufacturing building and an adjoining administration office building. The underground storage tanks (USTs) were formerly located behind the north corner of the manufacturing part of the facility. The Site is currently used by at least two different companies that access the main facility building and the loading docks. The Site is fenced on the northern and eastern edges of property. The auxiliary 11 acres of the property to the northwest, now owned by RNM, is planned for commercial development (EPA 2005).

3.2.1 Geology/Hydrogeology

The topography of the area, including the Sola Site, gently slopes at a rate of 50 feet per mile from low hills in the east towards the Petaluma River, located approximately one mile southwest of the Sola building. Adobe Creek is located 1,500 feet west of the Sola building. Adobe Creek intermittently flows in a north–south direction.

Sola's geologic investigations found that the depositional sediments at the Site consist of a complex sequence of interbedded clays, silts, and sands, with lesser amounts of gravel. The shallow sediments represent a complex sequence of alluvial deposits. At depths of approximately 80–100 ft bgs, thicker clay intervals were encountered, which appear to be relatively continuous over distances of hundreds of feet. Interbedded within these clay intervals are silt, sand, and gravel intervals of various thicknesses. These deeper sediments probably represent complex depositional environments that involve both alluvial and estuarine deposition (LFR 1989).

Groundwater in the shallow sediments is generally encountered at depths of 9 to 12 ft bgs. The aquifer is unconfined and the groundwater flows in a south/southwest direction towards the Petaluma River, the most likely point of discharge. Natural recharge occurs at the base of the foothills to the north/northeast. The shallow aquifer is unconfined and occurs to approximately 30 feet mean sea level (ft msl) and has been classified by EPA as a Class IIa drinking water source aquifer. Below the shallow aquifer is the intermediate aquifer, located from approximately 30 to 60 ft msl. The deep aquifer is from approximately 60 to 100 ft msl, the deeper aquifer from approximately 100 to 200 ft msl, and the deepest aquifer is greater than 200 ft msl (LFR 1990).

Figure 3-1 shows the geologic cross-section locations from the 1988 LFR report *Results of Hydraulic Testing of Sediments in the Vicinity of the Sola Optical USA, Inc. Facility* (LFR 1988). Figure 3-2 is a representative cross-section, section E – E'. Eleven wells are shown on the cross-section, three of which are screened over the shallow interval, four screened over the intermediate interval, one screened over the deep interval, two screened over the deeper interval, and one screened over the deepest interval. For example, LF-20 is screened from 13.25 to 24 ft msl over a gravel and sandy section of the geology. LF-4 is screened from 35 to 39.5 ft msl (the intermediate interval), LF-14 is screened over a deep interval of sandy gravel to clayey sand (78.5 to 89 ft msl), LF-13 is screened over sandy gravel in the deeper aquifer

from 150.5 to 161 ft msl, and LF-12 is screened over the deepest aquifer of sandy gravel from 211.75 to 233 ft msl.

3.3 History of Operations

Sola manufactured ophthalmic lenses from 1978 through 2001. The facility was comprised of one manufacturing building and an adjoining administration office building. The manufacturing process involved the injection of a catalyzed, thermosetting resin into a cavity between polished glass molds. The mold assembly was then placed in an air oven to cure the resin. The assembly was removed from the oven and subsequently put through a cleaning process before the production was repeated. Six 1,000-gallon USTs were located behind the rear north corner of the manufacturing part of the facility. The tanks were used to store solvents such as 1,1,1-trichloroethane (1,1,1-TCA), acetone and methanol. See Figure 3-3 for a layout of the former USTs.

3.4 Initial Investigations and Response Actions

In May 1982, Sola found low concentrations of volatile organic compound (VOC) contamination in the groundwater beneath the Sola property, near the six USTs. In 1983, the Regional Water Quality Control Board, San Francisco Region (SFRWQCB), directed Sola to investigate the groundwater contamination at the Site. Sola identified the following chemicals in the groundwater: 1,1–dichloroethane (1,1–DCA), 1,1–dichloroethene (1,1–DCE), methylene chloride, and 1,1,1–TCA. As explained below, it was concluded that these VOCs appeared to have originated from the former tank backfill material and adjacent soils.

In July of 1985, Sola independently (without being required by the government) excavated and removed the six USTs. When the tanks were removed, there were no signs of leakage on the tanks themselves. However, observations of the tank fill pipes and surrounding backfill showed staining on the pipes and in the adjacent backfill (LFR 1990). It was concluded that the groundwater contamination might be from accidental spillages near or leakage from the fill pipes.

The tank removal included excavation of gravel backfill materials and 3-5 ft of native soil from the sides and bottom of the excavation pit, followed by 22 confirmation samples. The confirmation sampling identified the presence of three contaminants: acetone, 1,1-DCE, and trans-1,2-DCE. Concentrations of acetone were detected in 10 out of 22 samples, ranging from 1.1 mg/kg to 54 mg/kg, concentrations of 1,1-DCE were found at 0.010 mg/kg, and trans-1,2-DCE was found at 0.005 mg/kg. Based on these findings, an additional two feet of soil from the eastern wall of the former tank area was excavated. Further confirmation sampling demonstrated the continued presence of VOCs. Acetone was found in all three of the samples, ranging from 70-200 mg/kg, and other chemicals were also detected, but in smaller concentrations (CH2M HILL 1991). No additional excavation was performed (EPA 2005).

In July 1986, Sola independently conducted a soil gas investigation. Soil gas samples were collected from 40 locations, ranging from 3 to 5 ft bgs, to determine the VOC migration in shallow groundwater and to select locations for groundwater monitoring and extraction wells (CH2M HILL 1991). The samples were analyzed and the following chemicals were

detected at the following maximum concentrations: chloroform (0.8 µg/L), carbon tetrachloride (0.002 µg/L), 1,1-DCA (130 µg/L), 1,1-DCE (8 µg/L), PCE (25 µg/L) and 1,1,1-TCA (250 µg/L). Maximum concentrations were found approximately 70 feet downgradient from the location of the former USTs (CH2M HILL 1991).

In 1987, the SFRWQCB issued a clean-up order to Sola. Pursuant to that order, Sola constructed and began operating a groundwater extraction and treatment system. Treated groundwater was discharged into the Adobe Creek just northwest of the Site under a National Pollution Discharge Elimination System Permit from the SFRWQCB. The extraction system operated from 1988 through 1997. The site was placed on the National Priorities List in 1988.

In October 1989, Sola signed an Administrative Consent Order (docket #89–22) with EPA whereby they agreed to conduct a Remedial Investigation/Feasibility Study (RI/FS). The RI included sampling of soil, soil gas, and groundwater for selected VOCs. The RI Report, summarizing the activities and findings, was submitted to EPA by Sola on December 3, 1990 (LFR 1990). EPA completed a risk assessment in April 1991. The FS was submitted to EPA by Sola on June 10, 1991 (LFR 1991).

One component of the RI was the further investigation of soil and soil gas contamination. In April 1990, EPA required Sola to collect and analyze samples of sub-surface soils and soil gases. The soil was sampled from six borings obtained near the location of the former storage tanks. The highest concentration found in the soil samples was 51 µg/kg of 1,1–DCE. EPA required Sola to use a contaminant transport model to determine whether the contaminated soil would further contaminate the groundwater. The results of the model indicated that these soils did not pose a principal threat of further contaminating the groundwater.

The soil gas sampling consisted of forty soil-gas samples, taken at depths ranging from 2 to 9 ft bgs. The chemicals selected for testing were those previously detected in soils near the UST location. No other point sources besides the former USTs were identified (EPA 1993). The chemicals detected and their maximum concentrations were as follows: acetone (0.1 µg/L), 1,1-DCA (12 µg/L), 1,1-DCE (68 µg/L), Freon 113 (0.6 µg/L), PCE (0.06 µg/L), 1,1,1-TCA (4 µg/L) and TCE (0.1 µg/L). Ten out of the twelve chemicals of potential concern were detected in the soil gas. However, the risk of adverse health effects from exposure to soil gas in the air was determined to be $9x10^{-6}$ for carcinogenic health risk, and it was determined that there were no adverse health effects expected from non-carcinogenic risks, as estimated by the Hazard Index. The soil gas investigation found that the lateral and vertical distribution of VOCs, and the magnitude of VOC concentrations detected in soil gas, did not indicate the presence of a principal threat in soil.

Another component of the RI, the groundwater investigation, focused on assessing the extent of contamination outside the capture zone of the groundwater extraction system, which had been in operation since August 1988. For this investigation, Sola installed and sampled eight additional groundwater monitoring wells. These new wells (named LF-21 through LF–28) were installed to confirm the downgradient lateral and vertical extent of VOC–contaminated groundwater, and to evaluate the distribution of VOC–contaminated groundwater in the deep sediment intervals tapped by the City's municipal Station #5 well. Samples from these, and the previously existing monitoring wells, found that the VOC–

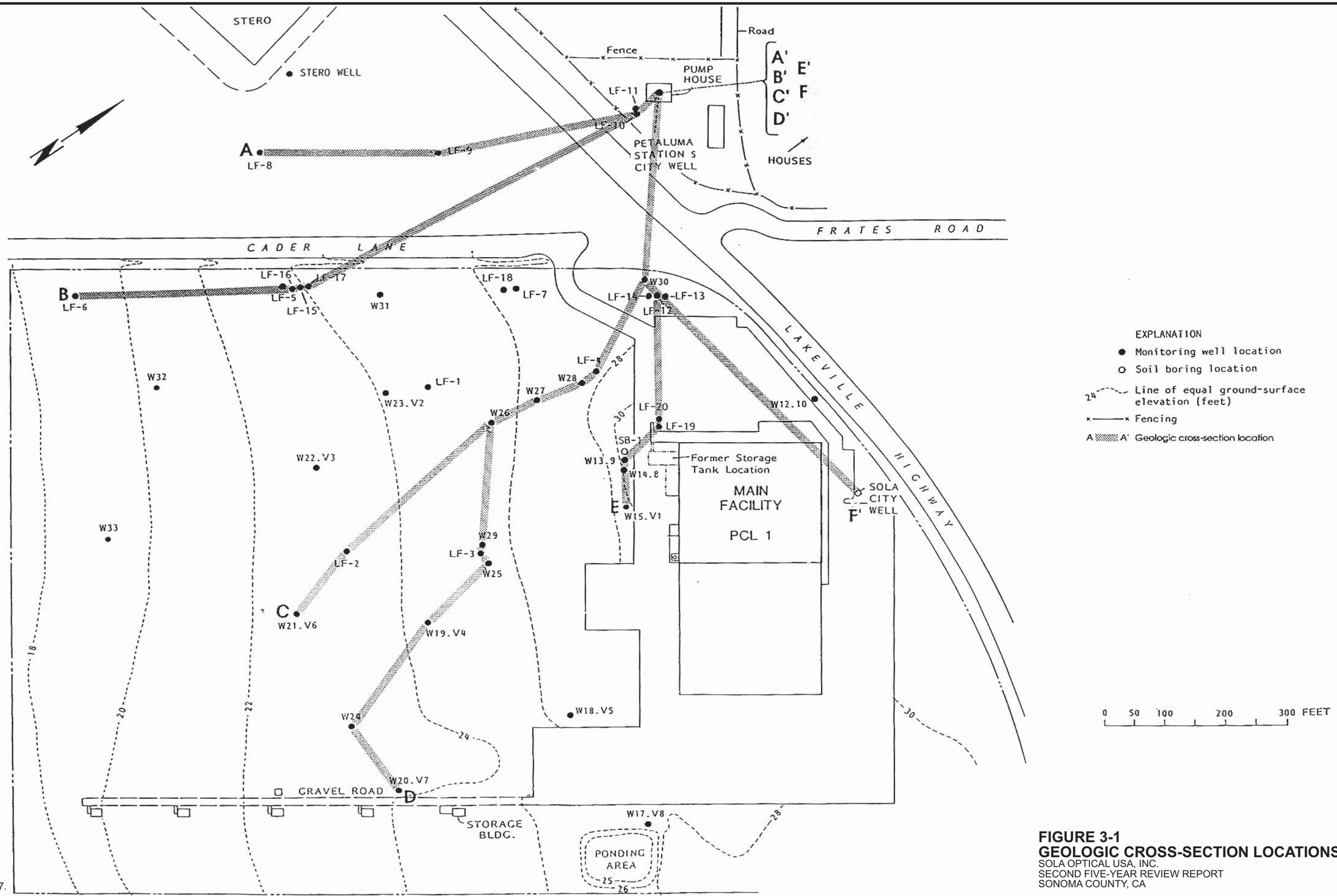
contaminated groundwater extended from behind the Sola building (former location of the underground tanks) to the southwest corner of the Sola property. The investigation also confirmed that the VOC contamination in the groundwater (at concentrations above clean-up standards) was largely limited to the Sola property. Samples from the wells located on the downgradient edge of the Sola property (W-33, LF–25, LF–26, and LF–28) indicated that the lateral extent of the VOC contamination was confined within the Sola property.

The primary VOCs detected in the groundwater samples were 1,1–DCA; 1,1–DCE; Freon 113; and 1,1,1–TCA. The highest concentrations of these primary VOCs were detected in samples from shallow well W-14, located downgradient of the former storage tanks area with 0.6 ppm of 1,1-DCA in 1986 and 3.3 ppm of 1,1-DCE concentration in 1987 (LFR 1996b).

For the 1991 ROD, the Proposed Plan described five alternative remedies. The selected remedy called for the construction and operation of two additional shallow extraction wells, and the conversion of two deep monitoring wells (LF-13 and LF-17) into extraction wells. The enhanced groundwater extraction and treatment system was expected to restore the shallow groundwater to clean-up standards in 15-20 years. The system's deep extraction wells were needed to prevent further migration of contaminants into the deeper portion of the aquifer. The remedy included constructing a carbon filtration system at the facility, to treat the extracted groundwater. The treated water was then discharged off-site to Adobe Creek. The chosen remedy was estimated to have a capital cost of approximately $123,000 and an annual O&M cost of $169,000 (EPA 1991 and EPA 2005).

3.5 Basis for Taking Action

The basis for taking action at the Sola Site was the release of hazardous substances into the environment and the fact that the Site posed, or potentially posed, a threat to human health and the environment via the groundwater. Twelve chemicals of potential concern were identified in the 1991 ROD. Contamination was found in the soil (acetone ranging up to 54 ppm and 1,1-DCE at 0.051 ppm), and in the groundwater (primarily 1,1-DCA, 1,1-DCE, 1,1,1-TCA, and Freon 113). The highest contaminant concentrations found in the groundwater were for 1,1-DCE (3300 µg/L), collected from a shallow well (W-14) located downgradient of the former storage tank area. The wells on the downgradient edge of the Sola property indicated that the lateral extent of the VOC contamination within the Sola property was at or below the clean-up standards (EPA 1991).



Source: LFR, 1987.

FIGURE 3-1
GEOLOGIC CROSS-SECTION LOCATIONS
SOLA OPTICAL USA, INC.
SECOND FIVE-YEAR REVIEW REPORT
SONOMA COUNTY, CA

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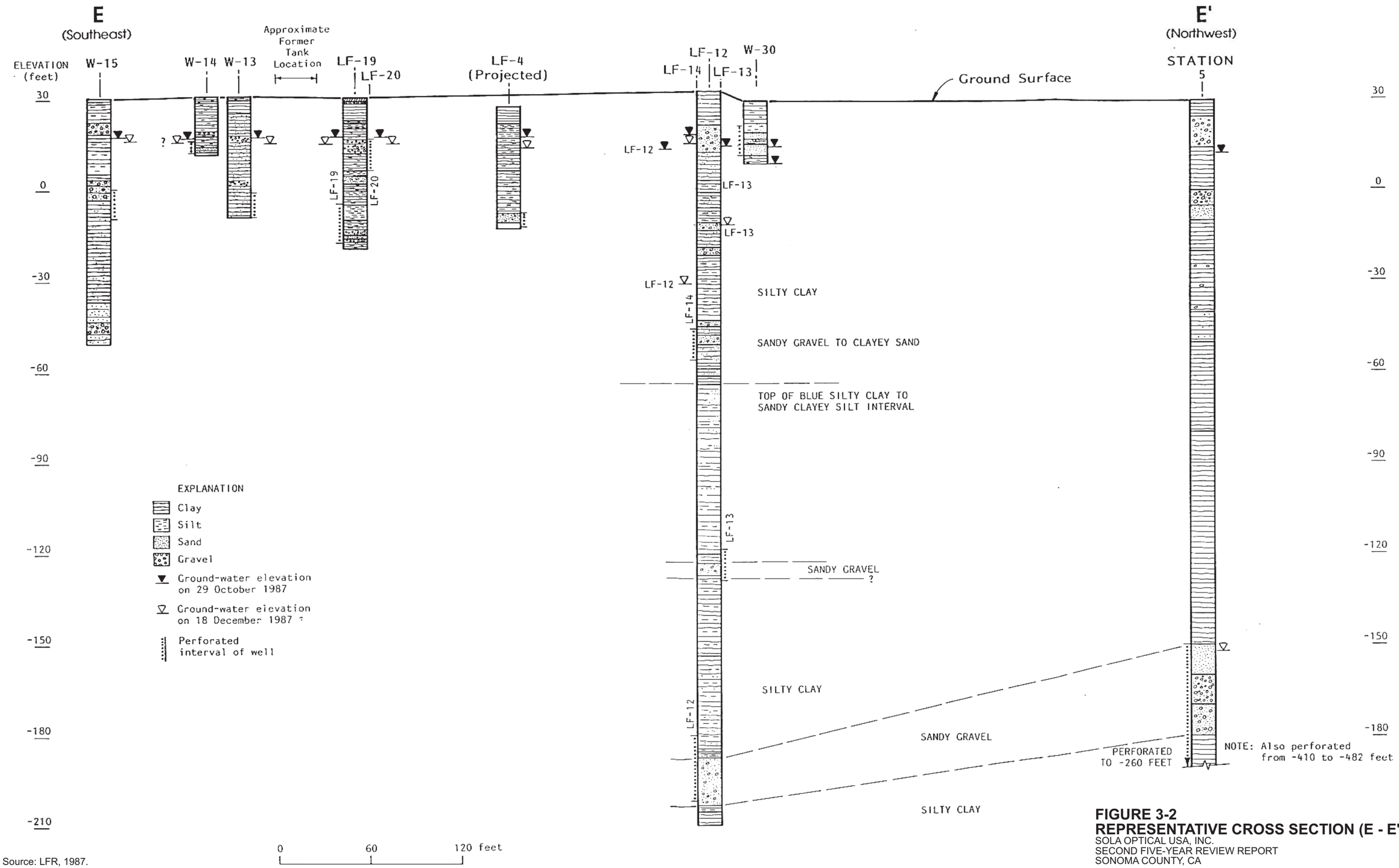
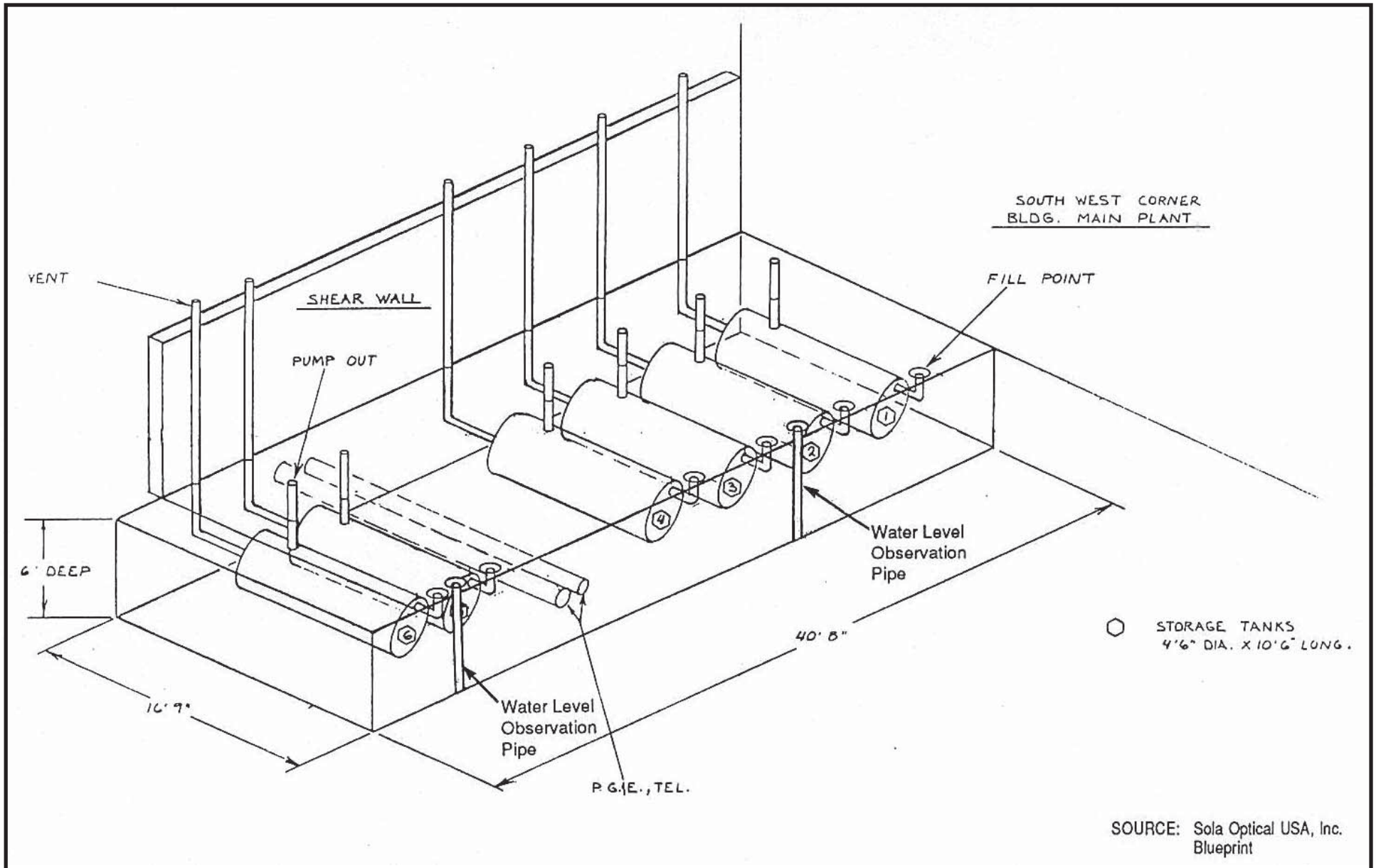


Source: LFR, 1987.

FIGURE 3-2
REPRESENTATIVE CROSS SECTION (E - E')
SOLA OPTICAL USA, INC.
SECOND FIVE-YEAR REVIEW REPORT
SONOMA COUNTY, CA

CH2MHILL



SOURCE: Sola Optical USA, Inc. Blueprint

FIGURE 3-3
LAYOUT OF FORMER UNDERGROUND STORAGE TANKS
SOLA OPTICAL USA, INC.
SECOND FIVE-YEAR REVIEW REPORT
SONOMA COUNTY, CA

Source: LFR, 1989.

CH2MHILL

4.0 Remedial Actions

This section summarizes the remedial actions selected, remedy implementation, and operation and maintenance (O&M) of remedial systems.

4.1 Selection

The ROD for the Site was signed on September 27, 1991. The ROD stated that releases of hazardous substances from the Site presented the potential for an imminent and substantial endangerment to public health, welfare and the environment. The interim pumping and treatment of groundwater and removal of the USTs, that occurred before the ROD was issued, had reduced the risks at the Site, but the ROD stated that groundwater beneath the Site still exceeded drinking water standards and warranted further remedial action.

As stated in the ROD, the selected remedy was intended to reduce the present and future on-site risk to human health and the environment to a $1x10^{-4}$ (1 in 10,000) cancer risk for 1,1-DCE, and to restore the groundwater to full beneficial use, which for this site is drinking water. More specifically, the objectives for the remedial action at the Site were to clean-up the groundwater to state or federally promulgated drinking water standards.

This was to be achieved by implementing the remedy with the following components:

- Groundwater monitoring to assure capture of contaminated groundwater and to demonstrate restoration of groundwater to clean-up standards throughout the aquifer
- Operation of eight existing extraction wells
- Construction and operation of two additional shallow extraction wells
- Conversion of two existing monitoring wells to deep extraction wells
- Construction and operation of additional piping for new and converted wells
- On-site treatment and discharge off-site or discharge to the City of Petaluma sewage treatment system

The enhanced groundwater extraction system began operating in 1992.

The ROD selected MCLs as applicable or relevant and appropriate requirements (ARARs) for groundwater. The applicable drinking water standards and the MCLs listed in the ROD are shown in Table 4-1.

The ROD did not include any institutional controls as part of the remedy.

TABLE 4-1
ROD-Specified MCLs and Drinking Water Standards
Sola Optical USA, Inc. Second Five-Year Review Report
Sonoma County, CA

Chemical	Drinking Water Standard (parts per billion)		Remedial Action Objective (parts per billion)
	State	Federal	
1,1-DCE	6	7	6
1,1-DCA	5	NA	5
1,1,1-TCA	200	200	200
Freon 113	1,200	1,200	1,200

In 1997, the groundwater extraction system was turned off and potential rebound was evaluated. After two years, the groundwater extraction system was decommissioned and 17 monitoring wells and 4 piezometers were abandoned. Groundwater monitoring data during this time appeared to support the conclusion that monitored natural attenuation (MNA) could be effectively used at the Site. Well E-5 was showing concentrations of 1,1-DCE above the MCL until 2004, when it dropped below and has been consistently under the MCL. W-27 is the only well that is still showing concentrations above the MCL for any contaminant. The MNA study by Levine Fricke predicted that W-27 would decrease to below the MCL by 2006 (LFR 2002). This appears unlikely to occur. At a minimum, continued monitoring of W-27 will be necessary to assess trends and determine how the ROD objectives of a restored aquifer can be achieved.

4.2 Implementation

The following section outlines groundwater remedial actions implemented in compliance with the ROD and the subsequent MNA workplan.

The 1991 ROD specified that groundwater clean-up would achieve concentrations at or below MCLs or other health-based standards, as well as a 10^{-4} risk level to the Site boundary.

The initial remedial action for groundwater was the implementation of an enhanced groundwater extraction treatment system. Sola had been operating a pump and treat system per a 1987 SFRWQCB Clean-up Order (#87-038). The groundwater extraction treatment system (GWET) was designed to remove VOCs at an average flow of 40 gpm. The extracted groundwater flowed through two main treatment system units. The groundwater flow was controlled automatically through a series of level controls. The groundwater was ultimately pumped from an equalization tank through the carbon absorption vessels and the final effluent pH was controlled by an in-line pH meter. Figure 4-1, the as-built for the extraction and treatment system, shows the layout of the conveyance piping and the treatment system. The system discharged the treated groundwater into Adobe Creek under NPDES permit No. CA 0029386. In 1990, Sola installed nine additional monitoring wells and through monitoring, confirmed that the VOC-contaminated groundwater with concentrations about the MCLs was largely limited to the Sola property

(EPA 1991). Table 4-2 provides information about the thirteen extraction wells, including the well screen interval, the date completed, and the date destroyed (where applicable).

TABLE 4-2
Extraction Well Information
Sola Optical USA, Inc. Second Five-Year Review Report
Sonoma County, CA

Well No.	Well Screen Interval (ft msl)	Date Completed	Date Destroyed
E-1	10-28	02/11/88	N/A
E-2	10.5-29.5	02/11/88	N/A
E-3	9-29	11/23/87	N/A
E-4	9-29	11/18/87	N/A
E-5	8.5-28.5	01/22/87	N/A
E-6	23-38	01/27/86	04/08/2004
E-7	19.5-28.9	09/11/86	N/A
E-8	14-49	01/20/88	04/16-20/2001
E-9	14.5-49	01/21/87	04/16-20/2001
E-10	8-25	04/21/92	04/06/2004
E-11	8.5-34.5	04/20/92	04/08/2004
E-12	67.5-78	1992[1]	04/16-20/2001
E-13	150.5-161	1992[2]	04/16-20/2001

Source: From Table 1A of Appendix A of LFR 2005 Report.
[1] E-12 was created in August/September 1992 by converting an existing monitoring well.
[2] E-13 was created in September/December 1992 by converting an existing monitoring well.
N/A = not applicable

In 1996, Sola submitted a Request for a Technical Impracticability Waiver (TI waiver) (LFR 1996a). At that time, Sola had been operating the pump-and-treat system at the Site for eight years. Groundwater monitoring data indicated that, while the concentrations of VOCs in the groundwater had decreased substantially, 4 sampling wells stabilized at levels above the MCLs for 1,1-DCE (7.4 µg/L in W-24 to 33 µg/L in W-14) and 1,1-DCA (11 µg/L in E-10 to 88 µg/L in W-140 (LFR 1996a, LFR 2001). Therefore, Sola requested that EPA grant a TI waiver for clean-up standards set for 1,1-DCA and 1,1-DCE in groundwater at the Site. In addition, Sola proposed that data indicated natural attenuation was the primary mechanism in reducing the VOC concentrations in groundwater and in reducing the spatial extent of VOC-affected groundwater above the clean-up standard (LFR 1996a).

In March 1997, EPA stated the agency did not have enough information to determine whether to grant a TI waiver, and requested further data be submitted, including turning off the extraction pumps for one quarter, performing quarterly monitoring, and then leaving the pumps off for a second quarter. EPA stated that if the contaminant levels were to rise,

Sola could resume pumping and see how long it would take to reach asymptotic levels again.

In 1997, groundwater monitoring was changed to a semi-annual basis and 17 groundwater monitoring wells and 4 piezometers were abandoned, since contamination had never been detected in these wells (or was detected below MCLs years ago) and these wells would not be needed for an MNA approach (EPA 1999).

After eight years of the GWET system operations, data for the Site indicated that concentrations of VOCs in the groundwater had decreased, but had stabilized (under pumping conditions) at levels above the MCLs for 1,1-DCE and 1,1-DCA. The stable 1,1-DCE concentration levels above the MCL (6 µg/L) were found in four wells ranging from 7.4 µg/L in W-24 to 33 µg/L in W-14. Similarly, four wells exceeded the MCL for 1,1-DCA (5 µg/L), ranging from 11 µg/L in E-10 to 88 µg/L in W-140 (LFR 2001). In 2002, Sola submitted a workplan report to EPA for evaluating the effectiveness of MNA. Figure 4-2 describes the processes involved in MNA. Monitored Natural Attenuation was evaluated for the Site because (LFR 2001):

- The source of the VOCs in the groundwater had been removed;
- The extent of VOC-affected groundwater was limited to shallow saturated sediments and was stable at approximately 350 feet downgradient of the source area;
- The low VOC concentrations in the groundwater did not pose a current threat to surface water or human receptors (because the existing supply wells were not being used);
- The tanks originally contained 1,1-TCA; 1,1-DCE and 1,1-DCA are degradation products of 1,1-TCA, indicating that some reductive dechlorination was occurring naturally;
- Current conditions indicated that concentrations of VOCs in groundwater had reached or were very close to reaching Remedial Action Objectives for the Site; and
- Alternative technologies to reduce the already low concentrations of VOCs that remained in two of the monitoring wells (E-5 and W-25) to below MCLs were limited.

In an EPA letter dated September 20, 2002, EPA agreed to allow Sola to use MNA at the Site and stated they would amend the current ROD. EPA stated that Sola must continue to monitor the groundwater until all contaminants are below the MCLs for at least two years. However, EPA has not yet selected MNA as the site remedy; any substantive change to the 1991 ROD must be reflected in a decision document.

Sola conducted groundwater monitoring during 2003, 2004 and 2005. Annual monitoring events took place in October 2003 and November 2004 and semiannual events took place in May 2004 and May 2005. The remaining wells were sampled and analyzed for VOCs by EPA Method 8260.

4.2.1 Institutional Controls

Institutional controls (ICs) are non-engineering methods by which access to contaminated environmental media is restricted.

EPA completed a public health risk assessment (HRA) in 1991 that recommended implementing ICs to prevent future use of VOC-affected water-bearing zones for drinking water supplies (EPA 1991). At the time of the HRA, there were four deep groundwater supply wells located in the Site vicinity, that could have been used for water supply: the Stero well, the Crandell well, the Station #5 well and the City of Petaluma well. VOCs had not been detected in any of these wells at concentrations exceeding the MCLs. Nevertheless, Sola implemented the following measures to prevent any possible future contamination of these wells that could result from migration of the site contaminants into the deeper aquifer zones that these water-supply wells (LFR 2001):

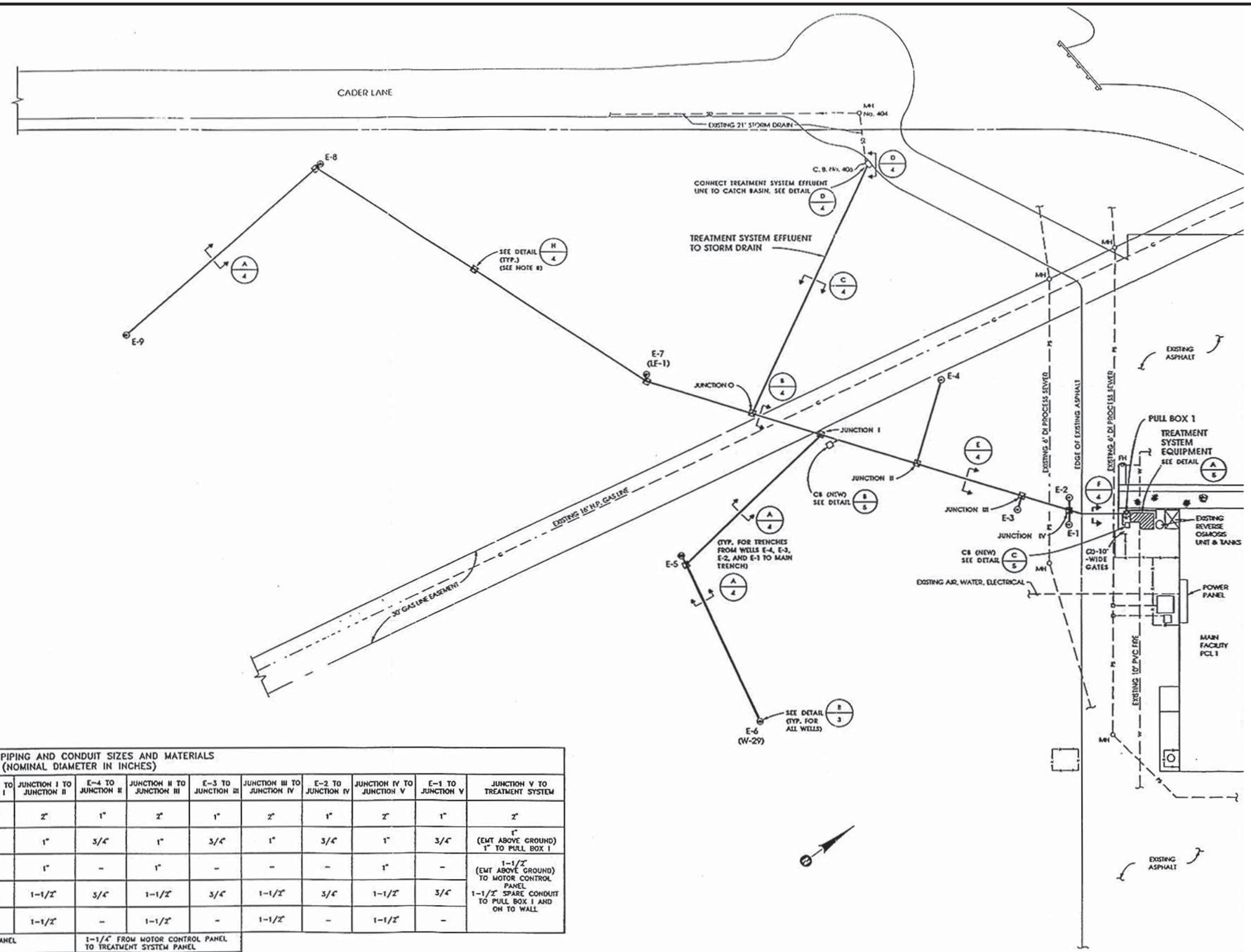
- Crandell Well (approximately 1,500 southwest and downgradient of the Site) was abandoned and the residence was serviced by the City of Petaluma water supply.
- Stero Well (approximately 1,000 west and downgradient of the Site) was shut down and water supply was serviced by City of Petaluma.
- Station #5 Well was abandoned and replaced with another comparable water supply well off-site.
- City of Petaluma Well was first part of an agreement with the City of Petaluma to stop operating until it was determined that the well would not have any affect on the ongoing remedial actions at the Site. (In 2001, the City of Petaluma indicated the well had been destroyed.)

In the 1991 ROD, institutional controls are not included as part of the remedy. The actions taken in response to the HRA, as described above, are functional as de facto institutional controls, but have not been selected in a ROD amendment.

The Site is located in an area of mixed land uses (industrial, commercial, residential), and the future use, on which modeling for the RI/FS was based, was for residential development (CH2M HILL 1991). No land, groundwater, or other resource restrictions have been put in place, based on the rationale that the Site will be cleaned up to federal and state groundwater standards, and the groundwater will be available in the future for domestic purposes.

UTILITY NOTES

1. LOCATIONS SHOWN FOR EXISTING UTILITIES ARE APPROXIMATE ONLY AND HAVE BEEN BASED UPON RECORD INFORMATION AVAILABLE. THE ENGINEER MAKES NO CLAIM AS TO THE ACCURACY OF THESE LOCATIONS.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE AND/OR LOCATION OF ALL UNDERGROUND UTILITY MAINS AND LATERALS (SERVICE CONNECTIONS) PRIOR TO COMMENCEMENT OF CONSTRUCTION.
3. THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT (USA) OR OTHER UTILITY LOCATOR SERVICE AS REQUIRED TO PROVIDE LOCATIONS FOR ALL UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. THE CONTRACTOR SHALL ENDEAVOR TO AVOID ALL UTILITIES AND PROVIDE ADEQUATE CLEARANCE TO AVOID DISTURBANCE OF SUCH UTILITIES.
5. ALL ALIGNMENTS, OFFSETS, AND GRADES SHALL BE VERIFIED BY THE CONTRACTOR IN THE FIELD. IF FIELD ADJUSTMENTS ARE REQUIRED, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER BEFORE PROCEEDING WITH ANY ALTERATION TO THE LOCATIONS AS SHOWN.
6. THE CONTRACTOR SHALL PROVIDE ALL STAKING AS NECESSARY TO ADEQUATELY CONTROL THE LINE AND GRADE OF TRENCHES AND STRUCTURES.
7. ALL TRENCHING SHALL BE BARRICADED, DELINEATED, COVERED WITH TEMPORARY STEEL PLATES, OR OTHERWISE PROTECTED FROM TRAFFIC, AS NECESSARY, BY THE CONTRACTOR.
8. THE NUMBER OF ELECTRICAL PULL BOXES SHOWN IS THE MINIMUM REQUIRED. THE CONTRACTOR SHALL ADD MORE PULL BOXES, AS NECESSARY, TO MEET CODE REQUIREMENTS AND TO ALLOW FOR EASIER INSTALLATION OF ELECTRICAL WIRE.



EXPLANATION

⊖	EXTRACTION WELL
⊠	ELECTRICAL PULL BOX
———	UTILITY/DISCHARGE TRENCH
—x—x—	FENCE
MH	MANHOLE
CB	CATCHBASIN
FH	FIRE HYDRANT
EMT	ELECTRICAL METALLIC TUBING
—SD—	EXISTING STORM DRAIN
—PS—	EXISTING PROCESS SEWER
—W—	EXISTING WATER LINE(S)
—G—	EXISTING GAS LINE(S)
—E—	EXISTING ELECTRICAL LINE(S)

NOTE:
ALL PIPE AND CONDUIT MATERIAL IS SCH.80 PVC EXCEPT WHERE NOTED.

TABLE 1 : PIPING AND CONDUIT SIZES AND MATERIALS (NOMINAL DIAMETER IN INCHES)

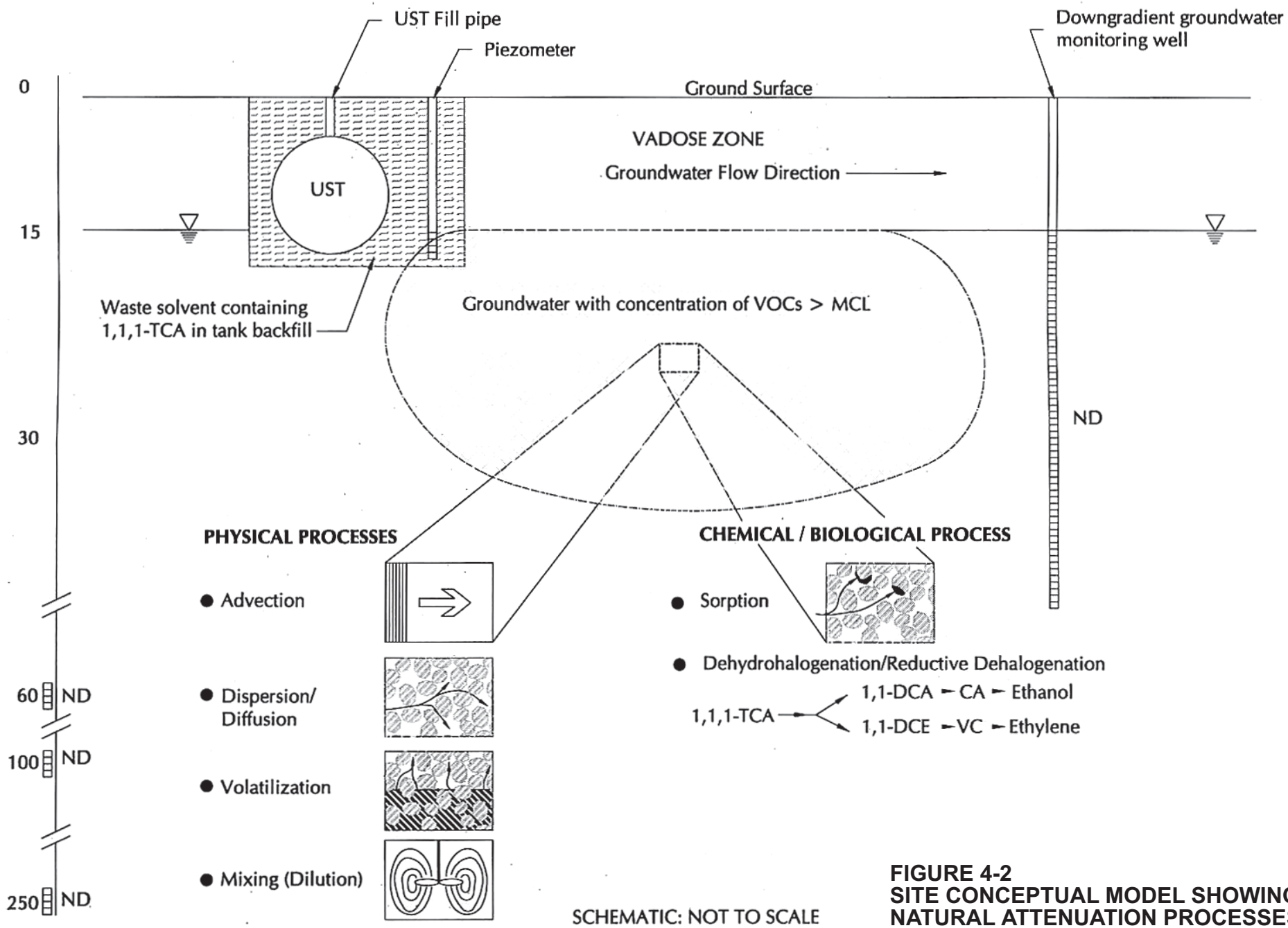
	E-9 TO E-8	E-8 TO E-7	E-7 TO JUNCTION O	E-6 TO E-5	E-5 TO JUNCTION I	JUNCTION O TO JUNCTION I	JUNCTION I TO JUNCTION II	E-4 TO JUNCTION II	JUNCTION II TO JUNCTION III	E-3 TO JUNCTION III	JUNCTION III TO JUNCTION IV	E-2 TO JUNCTION IV	JUNCTION IV TO JUNCTION V	E-1 TO JUNCTION V	JUNCTION V TO TREATMENT SYSTEM
INFLUENT WATER PIPE	1-1/2"	1-1/2"	1-1/2"	1"	1-1/2"	1-1/2"	2"	1"	2"	1"	2"	1"	2"	1"	2"
ELECTRICAL CONDUIT FOR CONTROL CABLES	3/4"	3/4"	1"	3/4"	3/4"	1"	1"	3/4"	1"	3/4"	1"	3/4"	1"	3/4"	1" (EMT ABOVE GROUND) 1" TO PULL BOX 1
EMPTY CONDUIT FOR SPARE CONTROL CABLES	–	–	–	–	–	1"	1"	–	1"	–	–	–	1"	–	1-1/2" (EMT ABOVE GROUND) TO MOTOR CONTROL PANEL 1-1/2" SPARE CONDUIT TO PULL BOX 1 AND ON TO WALL
ELECTRICAL CONDUIT FOR POWER CABLES	1-1/4"	1-1/2"	1-1/2"	1"	1"	1-1/2"	1-1/2"	3/4"	1-1/2"	3/4"	1-1/2"	3/4"	1-1/2"	3/4"	
EMPTY CONDUIT FOR SPARE POWER CABLES	–	–	–	–	–	1-1/2"	1-1/2"	–	1-1/2"	–	1-1/2"	–	1-1/2"	–	
ELECTRICAL CONDUIT FOR SERVICE TO TREATMENT SYSTEM	2" (EMT ABOVE GROUND) FROM EXISTING POWER PANEL TO TREATMENT SYSTEM LOAD CENTER							1-1/4" FROM MOTOR CONTROL PANEL TO TREATMENT SYSTEM PANEL							
EFFLUENT WATER PIPE	2-1/2" FROM TREATMENT SYSTEM TO CATCH BASIN NO. 406														
CORRUGATED POLYETHYLENE DRAIN PIPE	140' OF 4" PERFORATED PIPE WITH NYLON FILTER WRAP 110' OF 4" SOLID PIPE (SEE DETAIL A SHEET 5 OF 10)														

Source: LFR, 1991.

FIGURE 4-1
LAYOUT OF EXTRACTION AND TREATMENT SYSTEM
SOLA OPTICAL USA, INC.
SECOND FIVE-YEAR REVIEW REPORT
SONOMA COUNTY, CA

CH2MHILL

327990.FR.01_Figure 4-1 Layout of Extraction and Treatment System_8/2/05_ez_sfo



Source: LFR, 2001.

FIGURE 4-2
SITE CONCEPTUAL MODEL SHOWING NATURAL ATTENUATION PROCESSES
SOLA OPTICAL USA, INC.
SECOND FIVE-YEAR REVIEW REPORT
SONOMA COUNTY, CA

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5.0 Progress Since the Last Review

The first five-year review for this Site, completed in September 2000, stated that the remedial action selected in the 1991 ROD was protective of human health and the environment. No recommendations were made in the first five-year review. The conclusions from the 2000 review were:

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 clean-up objectives remain protective of human health and the environment; and
5. There are no new ARARs which would make the remedial action insufficient (EPA 2000).

At that time, Sola was in the process of evaluating the natural attenuation process at the Site and had indicated it would submit a report to the EPA. EPA stated that if clean-up goals could be met through natural attenuation, it would consider issuing an amendment to the 1991 ROD or an Explanation of Significant Differences. As stated previously, Sola submitted the *Work Plan to Implement Monitored Natural Attenuation as a Remedial Measure at the Former Sola Optical U.S.A. Facility, 1500 Cader Lane, Petaluma, California* (LFR 2002b) in October 2002. EPA approved the program in December 2002. Since that time, Sola has conducted annual and semiannual groundwater monitoring events to assess the efficacy of MNA at the Site. EPA's current plan is to include MNA as a component of the remedy in a revised decision document. The decision to use MNA, or any other means of achieving the 1991 ROD groundwater remediation goals, will be made at that time.

6.0 Five-Year Review Data Findings

The following sections discuss the five-year review data gathering process and findings.

6.1 Overview

This second five-year review for the Sola Site was led by Dante Rodriguez, the EPA Remedial Project Manager for the Site. EPA received technical support from CH2M HILL.

The five-year review consisted of a review of relevant documents and a regulatory review. Appendix A presents the list of works reviewed. A Site inspection was performed on May 5, 2005. The inspection checklist is found in Appendix B and photographs from the inspection are presented in Appendix C. No interviews were conducted as part of this review beyond the Site visit with LFR on May 5, 2005. Following the release of this document, EPA will produce and distribute a fact sheet to the community near the Site. The fact sheet will summarize the findings of the five-year review and instructions on how to access a copy of the review. The report will also be placed in the local information repository near the Site.

6.2 Documents Review

As part of this second five-year review process, documents were chosen for review focusing primarily on actions that have occurred during the past five years, but ranged in publication date from 1989 to the present. Appendix A provides a list of the reviewed documents.

6.3 Data Review

The following sections describe the findings from the periodic monitoring and reporting.

6.3.1 Performance Monitoring Program

The 1991 ROD requires groundwater monitoring to assure the capture of contaminated groundwater and to demonstrate restoration of groundwater to clean-up standards throughout the aquifer.

To document the on-going monitoring, LFR currently submits groundwater monitoring reports on behalf of Sola. Over the last five years, three reports have been submitted. A report was submitted in April of 2000 which covers October 1997 to October 1999. Another report was submitted in May 2003, which covers January 2000 to April 2003. Finally, a report was submitted in June 2005 which covers May 2003 through May 2005 monitoring and additional Site activities. Table 6-1 summarizes the monitoring schedule during the past five years as stated in the groundwater monitoring reports. In 2000, nine wells were monitored for both groundwater elevation and VOC analysis. In 2005, ten wells were monitored for groundwater elevation and four wells for VOCs. Four shallow wells are currently monitored for VOCs.

TABLE 6-1
Groundwater Elevation and VOC Monitoring Over the Past Five Years
Sola Optical USA, Inc. Second Five-Year Review Report
Sonoma County, CA

Date	Monitoring Wells													
	W-14	W-19	W-22	W-25	W-27	LF-2	LF-25	LF-26	E-1	E-2	E-3	E-4	E-5	E-7
04/12/2000	●○	●○	●○	●○	●○	●○	●○	●○					●○	
09/08/2000	●○	●○	●○	●○	●○	●○	●○	●○					●○	
04/02/2001	●○	●○	●○	●○	●○	●○	●○	●○					●○	
10/01/2001	●○		●○	●○	●○	●○	●○	●○					●○	
04/01/2002	●○		●○	●○	●○	●○	●○	●○					●○	
10/01/2002	●○		●○	●○	●○	●○	●○	●○					●○	
04/08/2003	●		●	●○	●○	●	●				●○		●○	●
10/22/2003[1]	●		●○	●○	●○	●○					●○		●○	●○
5/17/2004			●○	●○	●○	●○			●	●	●○	●	●○	●○
11/16/2004[2]			●○	●○	●○	●○			●	●	●○	●	●○	●○
05/03/2005			●	●○	●○	●			●	●	●○	●	●○	●

Notes:
[1]VOCs were actually collected on October 23rd, groundwater elevation on October 22.
[2]VOCs were collected on November 17th, groundwater elevation on November 16th.
Legend:

- ● Groundwater Elevation
- ○ VOCs

During the last five years, numerous monitoring and extraction wells have been abandoned, in accordance with State well decommissioning requirements. Figure 6-1 shows the status of the Site in relation to the number and location of monitoring wells in 2000. Figure 6-2 shows the status of the monitoring wells in 2005. No intermediate or deep wells remain; the remaining wells are shallow. Some extraction wells may be available for sampling if needed, as some of these wells are only dismantled, and not abandoned.

6.3.2 Elevation and Flow Directions

Groundwater at the Site is encountered at approximately 9 to 15 ft bgs. The horizontal component of groundwater flow at the Site is to the southwest towards the Petaluma River. The local effect of Adobe Creek to the northwest of the Site is not documented based on Site water level data. The vertical component of groundwater flow is reported to be predominantly upwards in the upper 80 feet of saturated sediments, and downwards at depths below 100 feet (LFR 1996a).

In the past five years, no pumping has occurred at the Site. Groundwater elevations at the Site have not changed significantly. In April of 2000, as shown on Figure 6-3, groundwater levels across the Site ranged from approximately 21 ft msl at the northern section of the Site,

to 17 ft msl at the center of the Site, to approximately 14 ft msl at the southern section of the Site. In May 2005, as shown on Figure 6-4, similar contours existed over the northern and central portion of the Site. Data were not available for the southern portion of the Site.

Groundwater flow was generally to the south/southwest in 2000 and remains so in 2005.

6.3.3 Shallow Aquifer

There are four wells in the shallow aquifer that are currently monitored for VOCs. Constituents detected in the shallow aquifer in the past included PCE, TCE, 1,1-DCA, 1,2-DCA, chloroform, 1,1-DCE, 1,1,1-TCA, 1,1,2-TCA, methylene chloride, Freon 11, and Freon 113 (EPA 1991). In the most recent sampling event, May 2005, only 1 well, W-27, showed concentrations (20 µg/L) of a contaminant (1,1-DCA) above its MCL (5 µg/L).

Table 6-2 shows the maximum concentrations of 1,1-DCE, 1,1-DCA, and 1,1,1-TCA over the past five years as well as for 1986 and 1997. Data from 1986 were analyzed because they are the oldest available data and they represent the original conditions of the Site, before pump and treat began in 1988. The 1997 data were analyzed because it was the year that the groundwater extraction system was shut down. Data from fifty shallow wells were available. Wells considered shallow were those screened within the approximate interval of 0-30 ft msl (LFR 1990). These consist of DH2, E1 through E11, LF-1, LF-2, LF-5, LF-7, LF-8, LF-11, LF-20, LF-25, LF-28, PZ-1 through PZ-12, W-12, W-14, W-17, W-18, W-19, and W-22 through W-33. Wells E-6, E-8, and E-9 were included as both shallow and intermediate because they are screened over both intervals (23-38, 14-49, and 14.5-49 ft msl respectively). Information about well screening intervals was available in Table 1A of Appendix A of the 2005 LFR Groundwater Monitoring Report (LFR 2005).

TABLE 6-2
Shallow Aquifer Maximum Groundwater Concentrations of 1,1-DCE, 1,1-DCA, and 1,1,1-TCA
Sola Optical USA, Inc. Second Five-Year Review Report
Sonoma County, CA

	Contaminant (Well Where Detected) (µg/L)		
Year	**1,1-DCE**	**1,1-DCA**	**1,1,1-TCA**
1986	3300 (W-14)	680 (W-14)	1700 (W-14)
1997	30 (LF-2)	61 (LF-2)	0.8 (E-2 & E-11)
2000	12 (E-5)	20 (W-27)	ND
2001	13 (E-5)	18 (W-27)	ND
2002	9.3 (E-5)	15 (W-27)	ND
2003	7.2 (E-5)	21 (W-27)	ND
2004	5.1 (E-5)	20 (W-27)	ND
2005	3.8 (W-27)	20 (W-27)	ND

Data Source: Table 1A of Appendix A of the 2005 Groundwater Monitoring Report

The concentrations of all three chemicals show a dramatic decline from high initial concentrations in 1986 to low concentrations or non-detect by 2000 and onward. The maximum concentration was often recorded at W-27, which is located less than 300 ft from the former UST location. Concentrations of the above compounds in W-27 were non-detect in 1986. The concentrations fluctuated and then 1,1-DCA continued to stay above the MCL through 2005, except for an occasional dip in concentration. Well W-27 is located hydraulically downgradient from the former VOC source. Advective transport from the source represents a potential influx of mass into the groundwater near this well (LFR 2002a). Extraction well E-5, also downgradient from the UST, was often the location of the maximum concentration of 1,1-DCE.

The contaminant plumes for 1,1-DCE, 1,1-DCA, and 1,1,1-TCA from 1990, 2000, and 2005 were compared. Data from 1990 were included in the analysis because in 1990 the pump and treat operations were in their early stage of operation and therefore contamination was fairly high and data available. The 2000 plumes were analyzed because they represent the situation five years ago. The groundwater extraction had been terminated two years earlier and therefore MNA was occurring. The 2005 plumes were evaluated because they represent the most recent data available.

1,1-DCE

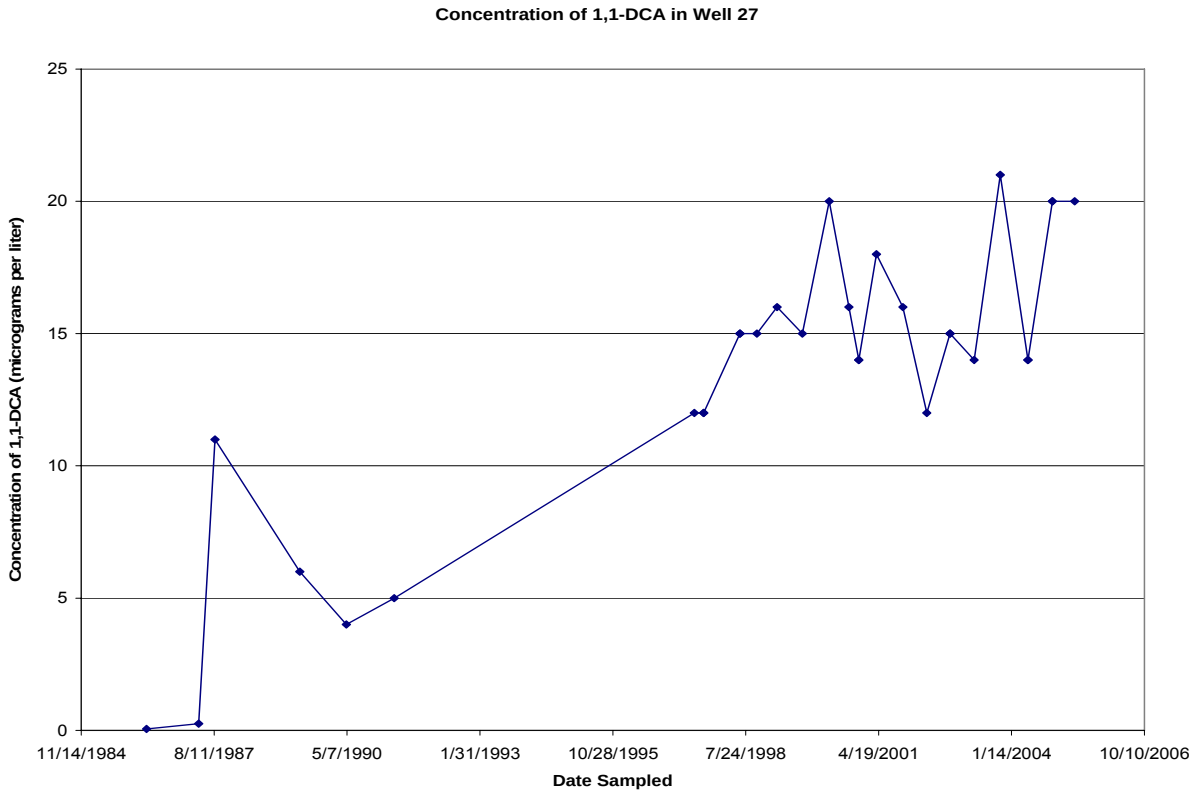
The contamination of 1,1-DCE in shallow groundwater in 1990 (see Figure 6-5) extended from the northern section of the Site (E-1) to the southern section (beyond LF-2 and E-11). It extended as far west as PZ-4 and as far east as W-25. By 2000, the DCE plume had shrunk to roughly half its 1990 size (Figure 6-6). By 2005, the DCE concentration had decreased below the MCL in all locations (Figure 6-9).

1,1-DCA

The contamination of 1,1-DCA in shallow groundwater in 1990 (see Figure 6-7) had extended from E-1 in the north to E-5 in the south; to W-28 in the west and nearly to PZ-2 in the east. By 2000, the 1,1-DCA plume had decreased significantly, especially the southern portion of the plume (Figure 6-8). In 2005, 1,1-DCA had decreased to below the MCL in every well except well W-27, with hits of 20 µg/L (Figure 6-9).

Well W-27, located hydraulically downgradient from the location of the former storage tanks, experienced an increase in VOC concentrations from 1997 to 1998. This occurrence was to be expected due to the advective transport of the VOCs downgradient from the source. According to the addendum to the Monitored Natural Attenuation Evaluation Report (LFR 2002a), the expectation for the future was that the concentrations of VOCs in W-27 would remain near 2002 levels until the mass flux from the former upgradient source stops. However, it is important to note that the VOCs were predicted to remain above the MCL for 5 days to 1.7 years after the flux stops. The MNA report estimated that in 2006, W-27 will reach its MCL for 1,1-DCA; however, data indicate uncertain lag times between historical concentration peaks that might alter the results. Graph 6-1 shows that the data appear to be variable in the past five years, with a few drops and rises of over 5 µg/L over the course of recent semi-annual monitoring events. Monitoring until W-26 reaches the MCL for 1,1-DCA is necessary, as it is a requirement of the remedy (LFR 2002a).

GRAPH 6-1
Concentration of 1,1-DCA in W-27 from 1986 to 2005



Data Source: Table 1A of Appendix A of the 2005 Groundwater Monitoring Report (LFR 2005)

1,1,1- TCA

The contaminant 1,1,1-TCA was detected as high as 1,700 µg/L at W-14 in 1986. Concentrations of 1,1,1-TCA rapidly decreased from 1986 to the present, and no-detection has occurred in the past five years in shallow wells.

Other Contaminants/VOCs

Only VOCs have been monitored at the Site. In the 1991 ROD, twelve chemicals of potential concern were listed. Of these twelve chemicals, only four VOCs were part of continued sampling and remediation goals (1,1,-DCE; 1,1-DCA; 1,1,1-TCA; and Freon 113). While other contaminants such as acetone and methylene chloride were initially detected, their concentrations were below their MCLs. Groundwater was continuously analyzed and data reported for 1,2-DCA, TCE, and Freon 113, but most often these constituents were non-detect in all of the wells. In the past five years, there has only been one detection of 1,2-DCA (.5 µg/L), at W-33 in May 2001. There have been no detections of TCE or Freon 113 in the past five years. When Freon 113 was detected in the past, it was well below its MCL of 1,200 µg/L (EPA 1991).

6.3.4 Intermediate Aquifer

Intermediate wells consist of those screened approximately within the interval of 30 to 60 ft msl (LFR 1990). No intermediate wells exist anymore, as they have all been decommissioned and destroyed. Constituents detected in the intermediate aquifer in the past, at concentrations above their MCL, include 1,1-DCA, 1,1-DCE, 1,1,1-TCA, and TCE (EPA 1993). Well LF-26 was the last intermediate well to be destroyed (April 2004). Groundwater concentrations at LF-26 had decreased below the MCLs for all chemicals of concern by 1996 and remained below until it was destroyed. Concentrations of 1,1-DCE in the well had reached the MCL in 1996, 1,1-DCA had reached the MCL in 1991, and 1,1,1-TCA had always been under the MCL since the sampling began in 1990.

Seventeen intermediate wells were analyzed, as summarized in Table 6-3. Intermediate wells with available data include E-6, E-8, E-9, LF-10, LF-19, LF-21, LF-22, LF-23, LF-26, LF-3, LF-4, LF-6, LF-9, W-13, W-15, W-20, and W-21. As stated in the shallow aquifer analysis, E-6, E-8, and E-9 were included as both shallow and intermediate because they are screened over both intervals (23- 38, 14- 49, and 14.5- 49 ft msl respectively). Of the seventeen wells, two were destroyed in 1999, thirteen in 2001, and two in 2004. Table 6-3 shows the maximum concentrations of 1,1-DCE, 1,1-DCA, and 1,1,1-TCA over the past five years in the intermediate aquifer, as well as in 1986 and 1997. As stated in the shallow aquifer analysis, the 1986 data were examined because they represent pre-remediation site conditions. The year 1997 represents the end of the groundwater extraction and treatment. The past five years are reviewed for the sake of this five-year review. No data were available for 2003, 2004, and 2005, as no monitoring was conducted during that time.

TABLE 6-3
Intermediate Aquifer Maximum Groundwater Concentrations of 1,1-DCE, 1,1-DCA, and 1,1,1-TCA in Select Years
Sola Optical USA, Inc. Second Five-Year Review Report
Sonoma County, CA

Year	Contaminant (Well Where Detected) (µg/L)		
	1,1-DCE	**1,1-DCA**	**1,1,1-TCA**
1986	4 (LF-3)	ND	11 (LF-3)
1997	4.2 (LF-26)	1.4 (E-6)	0.6 (LF-26)
2000	3.2 (LF-26)	1.0 (LF-26)	ND
2001	2.6 (LF-26)	1 (LF-26)	ND
2002	2.3 (LF-26)	0.9 (LF-26)	ND
2003	N/A	N/A	N/A
2004	N/A	N/A	N/A
2005	N/A	N/A	N/A

Data Source: Table 1A of Appendix A of the 2005 Groundwater Monitoring Program

Well LF-26 often recorded the highest concentration of the intermediate wells. It was also one of the wells furthest from the location of the former storage tanks. Concentrations of 1,1-DCE in LF-26 were initially detected in 1990, at lower levels than in later years. Likewise, 1,1-DCA in LF-26 was initially not detected, then it was detected in 1994 and 1995, and then undetected again thereafter. Concentrations of 1,1,1-TCA followed this pattern as well, whereby it was initially not detected, then detected in 1990, followed by a concentration decline thereafter. The concentration trends in the last five years indicate successful remediation, as the concentrations have declined to low or non-detect levels for all three chemicals, at well LF-26 and at all the other intermediate wells too.

The contaminant plumes in the intermediate aquifer were evaluated. The evaluation compared 1,1-DCE and 1,1-DCA contaminant plumes from 1990 to the most recent plume data. The evaluation showed that in 1990, 1,1-DCE was detected above its MCL in one well, LF-22, at a concentration of 20 µg/L (Figure 6-10). By 1996, 1,1-DCE concentrations were shown to be below the MCL at all sampling locations (Figure 6-11). The evaluation of 1,1-DCA showed that in 1990, it was detected at or above the MCL in one location, LF-26, at a concentration of 5 µg/L (Figure 6-10). In 1995, it was shown to be below the MCL at all sampling locations (Figure 6-12).

6.3.5 Deep Aquifers

The aquifer zone within the approximate interval of 60 to 100 ft msl was referred to as the "deep aquifer" (LFR 1990). There were 5 wells screened in the deep aquifer zone: E-12, LF-14, LF-17, LF-18, and LF-24. One of those wells was decommissioned and destroyed in 1999 and four in 2001. The aquifer zone within the approximate interval of 100 to 200 ft msl was referred to as the "deeper aquifer", and there were three wells screened in that zone: E-13, LF-13, and LF-16. All three were decommissioned and destroyed in 2001. The aquifer zone deeper than 200 ft msl, the "deepest aquifer," had four wells screened within (LFR 1990), well LF-12 (destroyed in 2001), LF-15 (destroyed in 2001), LF-27 (destroyed in 1999), and LF-27a (destroyed in 1999).

Table 6-4 shows the maximum concentrations of 1,1-DCE, 1,1-DCA, and 1,1,1-TCA in the deep aquifer zone, from 1987 until well decommissionings. The only contaminant detections occurred in LF-17, which was converted into extraction well E-12 in 1992. Well LF-17 is located at the edge of Cader Lane, hundreds of feet west and cross-gradient of the former storage tanks location. Concentrations of 1,1-DCE and 1,1,1-TCA in the well initially fluctuated, but then decreased steadily until no longer detected. Concentrations of 1,1-DCA were low to non-detect throughout the sampling. The last samples from any deep aquifer wells were taken in 1998.

Table 6-5 shows the maximum concentrations of the chemicals of concern in the deeper and deepest aquifer zones. The maximum concentration was usually recorded at well E-13 or LF-13. Concentrations of 1,1,1-DCE and 1,1,1-TCA fluctuated until they decreased to non-detect by 1998. Concentrations of 1,1-DCA remained low throughout the sampling.

TABLE 6-4
Deep Aquifer Maximum Groundwater Concentrations of 1,1-DCE, 1,1-DCA, and 1,1,1-TCA
Sola Optical USA, Inc. Second Five-Year Review Report
Sonoma County, CA

	Contaminant (Well Where Detected) (µg/L)		
Year	**1,1-DCE**	**1,1-DCA**	**1,1,1-TCA**
1987	8 (LF-17)	ND	7 (LF-17)
1988	12 (LF-17)	1 (LF-17)	11 (LF-17)
1989	20 (LF-17)	ND	8 (LF-17)
1990	25 (LF-17)	2 (LF-17)	11 (LF-17)
1991	17 (LF-17)	1 (LF-17)	6 (LF-17)
1992	11 (E-12)	2 (E-12)	5 (E-12)
1993	7 (E-12)	1(E-12)	2 (E-12)
1994	3 (E-12)	ND	0.8 (E-12)
1995	4 (E-12)	ND	0.5 (E-12)
1996	3.4 (E-12)	ND	ND
1997	1.7 (E-12)	ND	ND
1998	ND	ND	ND

Data Source: Table 1A of Appendix A of the 2005 Groundwater Monitoring Program

The contaminant plumes in the deep and deeper aquifers were evaluated. The evaluation compared 1,1-DCE and 1,1-DCA contaminant plumes from 1990 (Figure 6-13) to the most recent plume data, which was from 1997 (Figures 6-14 and 6-15). The evaluation showed that in 1990, 1,1-DCE was detected in two wells, LF-13 at 7 µg/L and LF-17 at 19 µg/L. By 1997, it was detected in only one well, E-12 at 1.7 µg/L. The evaluation of 1,1-DCA showed that in 1990, 1,1-DCA was not detected above the MCL and has not been detected in any well since.

VOC Mass Removal

It was estimated that 11 pounds of VOCs were removed by the GWET system between 1990 and 1996. The peak of mass removal occurred in 1989, when between 3 and 3.5 pounds of VOCs were removed. A sharp decline was observed over the next two years but mass removal again had another smaller peak in 1992, when between 1.5 and 2 pounds were removed. Between 1992 and 1996, removal again decreased dramatically and hovered at less than 0.5 pounds removed per year. It was concluded that the GWET system functioned primarily as hydraulic control (LFR 1996b).

TABLE 6-5
Deeper and Deepest Aquifer Maximum Groundwater Concentrations of 1,1-DCE, 1,1-DCA, and 1,1,1-TCA
Sola Optical USA, Inc. Second Five-Year Review Report
Sonoma County, CA

	Contaminant (Well Where Detected) (µg/L)		
Date	**1,1-DCE**	**1,1-DCA**	**1,1,1-TCA**
1987	11 (LF-13)	0.8 (LF-13)	8 (LF-13)
1988	9 (LF-13)	1 (LF-12)	7 (LF-13)
1989	23 (LF-13)	0.5 (LF-13)	8 (LF-13)
1990	26 (LF-13)	1 (LF-13)	11 (LF-13)
1991	4 (LF-13)	ND	0.5 (LF-13)
1992	13 (LF-13)	0.7 (LF-13)	4 (LF-13)
1993	2 (E-13)	ND	0.5 (E-13)
1994	2 (E-13)	0.7 (LF-12)	ND
1995	1 (E-13)	ND	ND
1996	0.6 (E-13)	ND	ND
1997	ND	ND	ND
1998	ND	ND	ND

Data Source: Table 1A of Appendix A of the 2005 Groundwater Monitoring Program

Influent

Influent to the GWET was analyzed for concentrations of 1,1-DCE, 1,1-DCA, and 1,1,1-TCA during GWET operations. The results show a peak in influent concentrations for all three VOCs in 1992; the approximate maximum influent concentrations for the VOCs was 34 µg/L of 1,1-DCE, 22 µg/L of 1,1-DCA, and 4 µg/L of 1,1,1-TCA. In the subsequent years, until the system shutdown, all three VOC influent concentrations fluctuated until all decreased to less than 5 µg/L (LFR 1996b).

Emerging Constituents of Concern

No emerging COCs have been identified at the Site.

6.3.6 System Operation and Maintenance

Semi-annual monitoring and reporting has been the only activity occurring at the Site since 1998.

Costs

The ROD stated that the capital costs for the remedy would be approximately $123,000, with an annual O&M of $169,000. Therefore, at the time of the ROD, the total net present value was estimated to be just over two million dollars. The actual costs, according to the first

five-year review, were about half of the estimated costs. Annual O&M costs were approximately $40,000-$50,000 per year when the system was fully operational and extracting groundwater from 13 wells (EPA 2000). LFR reported recently in a phone conversation that the annual costs are approximately $20,000/year for the semi-annual groundwater monitoring (CH2M HILL 2005a).

6.4 Site Inspection

Representatives of EPA, Levine Fricke, Sola and CH2M HILL participated in a site inspection on May 5, 2005. The inspection included a Site walk and tour of the recently sold adjacent property. A summary of the inspection is presented below. The Site inspection checklist and photos are provided in Appendices B and C, respectively.

The inspection observed that the Site consists of two land parcels: (1) the actual facility property, and (2) an adjacent open field, currently under development. Both parcels were originally owned by Sola, but both have been sold to other entities. The first property, the actual facility property, consists of the original manufacturing building, an adjoining administration office building, and a parking lot surrounding the buildings. The facility is currently utilized by a number of tenants for a variety of commercial uses, including a poultry company. The former USTs were located behind the north corner of the facility. The groundwater extraction system had been located adjacent to these former USTs, but is no longer present. The facility property is not fenced. There are no signs on the property indicating it is a Superfund Site. The groundwater monitoring wells on the facility property, including E-3, were accessible and viewed during the inspection, as they are located within the paved parking lot.

The second property is adjacent to the first, and consists of an 11-acre, open, flat field that is currently being developed for commercial use. The remaining groundwater plume underlies this open field. This parcel of land was sold by Sola to RNM Cader L.L.P. in 2000. The developers are currently grading the parcel. The entire property is securely fenced, with an access point in the northeast corner. The entire fence-line was intact at the time of the inspection. Along the northern road of the RNM parcel are signs advertising the redevelopment. The wells that remain in the RNM parcel were only viewed from the fence line. Appendix C contains photographs from the May 2005 Site inspection.

6.5 Interviews and Community Outreach

No interviews were conducted as part of this five-year review.

Community outreach activities planned for this five-year review are limited to a public notice and fact sheet being issued upon completion of the review. This Site has garnered very minimal public interest, even when the contamination levels at the Site were high. The public meeting held for the proposed plan (for the only Record of Decision) had very low attendance.