

**FIVE-YEAR REVIEW REPORT**

**LORENTZ BARREL AND DRUM  
SAN JOSE, CALIFORNIA**

Prepared by:

U.S. Environmental Agency, Region 9  
75 Hawthorne Street  
San Francisco, CA 94105

## **TABLE OF CONTENTS**

### **1.0 INTRODUCTION**

### **2.0 SITE CHRONOLOGY**

### **3.0 BACKGROUND**

- 3.1 Site Location
- 3.2 Site History
- 3.3 Physical Characteristics
- 3.4 Land and Resource Use
- 3.5 Contaminants of Concern
- 3.6 Response Actions
- 3.7 Summary of Enforcement Actions

### **4.0 REMEDIAL ACTIONS**

- 4.1 Operable Unit 1 - Soil Vapor Extraction System and Containment Cap
  - 4.1.1 Remedy Selection
  - 4.1.2 Remedy Implementation
  - 4.1.3 System Operations/ Operation and Maintenance (O&M)
- 4.2 Operable Unit 2 - Groundwater
  - 4.2.1 Remedy Selection
  - 4.2.2 Remedy Implementation
  - 4.2.3 System Operations/ Operation and Maintenance (O&M)

### **5.0 FIVE-YEAR REVIEW FINDINGS**

- 5.1 Five-Year Review Process
- 5.2 Interviews
- 5.3 Site Inspection
- 5.4 Risk Information Review
- 5.5 Risk Recalculation/ Assessment
- 5.6 Data Review

**6.0 ASSESSMENT**

6.1 Conditions External to the Remedy

6.2 Remedy Implementation and System Operations

6.3 Risk Information

**7.0 DEFICIENCIES**

**8.0 RECOMMENDATIONS AND REQUIRED ACTIONS**

**9.0 PROTECTIVENESS STATEMENTS**

**10.0 FUTURE FIVE-YEAR REVIEWS**

## 1.0 INTRODUCTION

This report is the initial Five-Year Review of Remedial Actions for the Lorentz Barrel and Drum Superfund site located in San Jose, California. The remedial actions identified in the Record of Decision for the site included removing principal threat hazardous residues and liquids, encapsulating non-mobile contaminated soils on-site, treating soils contaminated with volatile organics with a Soil Vapor Extraction (SVE) system, and pumping and treating contaminated groundwater.

The purpose of five-year reviews is to determine whether the remedy at a site is 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 reports identify deficiencies found during the review, if any, and identify recommendations to address them.

This review is required by statute. Statutory review are required for sites where the selected remedy does not allow unlimited use and unrestricted exposure after the Record of Decision (ROD) clean-up actions are completed and the clean-up goals have been met. The selected soil remedy for the site includes a containment cap, which will not allow for unlimited use of the site in the future, even though the completion of the remedial action satisfies the clean-up goals described in the ROD. EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121(c) states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

In addition, the NCP Section 300.430 (f) (4) (ii) of the Code of Federal Regulations 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 initiation of the selected remedial action.

The purpose and focus of five-year reviews are further defined in United States Environmental Protection Agency (USEPA) Office of Solid Waste and Emergency Response (OSWER) Directives 9355.7-02 (USEPA, 1991), 9355.7-02A (USEPA, 1994), and 9355.7-03A (USEPA, 1995).

## **2.0 SITE CHRONOLOGY**

- 1984 EPA completed a Preliminary Assessment and Site Investigation and proposed the Lorentz Barrel and Drum site as a candidate for the National Priorities List (NPL).
- 1987 The Lorentz Barrel and Drum facility was permanently closed. EPA assumed the lead responsibility for studying and remediating the site.
- 1988 Engineering Evaluation/ Cost Analysis and Record of Decision (ROD) for OU 2. The OU 2 ROD focused on the contaminated shallow groundwater.
- 1989 Final listing on NPL.
- 1990 Remedial Investigation Report, Ebasco (Contractor to Lorentz site owner).
- 1990 Remedial Investigation/ Feasibility Study Report, EPA.
- 1992 Risk Assessment 1, groundwater, EPA.
- Risk Assessment 2, soil investigation at Recycled Fibers/ Pacific Sandblasting facility (property is adjacent to the site and was previously owner by Lorentz).
- Risk Assessment 3, additional soil investigation.
- Risk Assessment 4, identify and study vertical conduits on-site, EPA.
- 1993 Risk Assessment 5, characterization of on-site soils displaced during construction of the shallow groundwater pump and treat system, EPA.
- 1993 Record of Decision for OU 1. This ROD focused on the contaminated on-site soils.
- 1998 Completion of all remedial action construction for site (Preliminary Construction Complete Report. September 1998).

## **3.0 BACKGROUND**

### **3.1 Site Location**

The Lorentz Barrel and Drum site is located at the intersection of Alma Avenue and 10th Street in San Jose, California. The site and adjacent properties are zoned for commercial and industrial use, as is most of the area within a one mile radius of the site. The adjoining properties to the south and to the east are used for industrial activities and the properties to the north and

west are used for recreation. The nearest residential use is San Jose State University student housing, which is approximately 700 feet to the north. Single family residential housing is located 1,100 feet to the north of the site. Approximately 3,000 people are estimated to live within a one mile radius of the site.

### **3.2 Site History**

The original Lorentz Barrel and Drum property covered 10.5 acres of land in San Jose, California. A 3.78-acre area at the southern boundary of the original property was never significantly involved in the drum recycling operations and changed ownership shortly after recycling operations began in 1947. The Superfund site is considered to be the remaining 5.25 acres of land and the contaminated groundwater plume that extends to the north. The site was listed on the National Priorities List (NPL) in 1989.

The drum recycling facility accepted over 2 million drums from more than 3,000 parties until it was closed by a court action brought by the California Department of Health Services (DHS) in July 1987. The facility received drums that contained aqueous wastes, organic solvents, acids, oxidizers, and oils. The drums were reconditioned through a variety of methods such as: caustic and acid washing, incineration, blasting with steel shot, and steam cleaning. The residues and cleaning materials were dumped into sumps and basins on-site which drained into the site soils and in the local storm sewer. The drums were then resealed and repainted with substances such as phenolic epoxy resins, rust inhibitors and lead based paints. The drums were then either returned to the original owner or sold.

### **3.3 Physical Characteristics**

The subsurface sediments at the site are composed of alternating layers of granular and fine-grained cohesive soil. There are four predominantly granular water-bearing or potential water-bearing subsurface zones below the site. These zones have been designated with respect to increasing depth below ground surface (bgs) as Zone A, Zone B, Zone C, and Zone D. Each of these zones is separated by layers of fine-grained cohesive soil that function as aquitards. These zones are described below:

<b>Zone A 20 ft. bgs</b>	<b>Material: sand, silty sand</b>
	<b>Lenses: silt, clayey silt, silty clay</b>

Soil borings indicate that this zone is normally dry, however, the zone occasionally has seasonal perched groundwater. The clay/ silty clay aquitard under Zone A is from 2 to 7 feet thick and soil boring logs indicate there may be local discontinuities near or under the site that connect Zone A soils to the underlying Zone B soils. The SVE system operates within this zone.

**Zone B 25-35 ft. bgs**      **Material: sand, silty sand**  
**Lenses: silt, clayey silt, silty clay**

Zone B is a semi-confined aquifer, and contains the uppermost water-bearing soils under the site. Zone B has been identified in the 1993 ROD as the shallow groundwater aquifer, and the zone containing the VOC contaminant plume. An approximately 35 foot-thick aquitard of very stiff clay/silty clay lies underneath Zone B and it is found at about 35 to 70 feet bgs.

**Zone C 70- 90 ft. bgs**      **Material: sand, silty sand**  
**Lenses: silt, clayey silt, silty clay**

A portion of the deep aquifer groundwater monitoring wells are located in this zone. No contamination has been found in this zone to date. Underneath Zone C lies an approximately 40 foot-thick aquitard which is in turn underlain by a 50 foot thick granular unit.

**Zone D 230- 1,000 ft. bgs**      **Material: sand, silty sand**  
**Lenses: silt, clayey silt, silty clay**

Zone D is the regional lower aquifer which is used as a drinking water source. This zone is about 50 feet thick and contains the remaining deep aquifer groundwater monitoring wells. No contamination from the site has been found to date in this zone.

### **3.4 Land and Resource Use**

The site is located at the edge of a large area zoned and used for heavy industry. The existing businesses to the south and the east of the site include a paper recycling facility, vehicle repair shops, metal plating and painting shops, a concrete mixing plant, and other similar types of industry. University recreation fields, a sports stadium, and an ice skating rink are to the north and west of the site. Student housing is located 700 feet north of the site. No land uses near the site have changed since the remedial actions were selected for the site.

### **3.5 Contaminants of Concern**

The following chemical contaminants have been detected in the soil: volatile and semivolatile organic compounds, pesticides, herbicides, polychlorinated biphenyls (PCBs), and inorganic compounds such as heavy metals. In addition, volatile and semi-volatile organic compounds have been found in the groundwater.

The shallow groundwater pump and treat system is removing and treating the following contaminants: vinyl chloride, 1,1-dichloroethene (1,1-DCE), cis-1,2 dichloroethene (cis-1,2-DCE), 1,1-dichloroethane (1,1-DCA), 1,1,1-trichloroethane (TCA), 1,2-dichloroethane (1,2-

DCA), trichloroethene (TCE), 1,2-dichloropropane (1,2-DCPA), and tetrachloroethene (PCE).

The primary organic compounds found in the vadose zone on-site are phenol, pentachlorophenol, and phenanthrene. In addition, low concentrations of vinyl chloride were found during the SVE system shutdown. The non-mobile contaminants found in the soil are: arsenic, chromium, lead, PCBs, 2,3,7,8-TCDD, Aldrin, Chlordane, 4,4-DDD, 4,4-DDE, 4,4-DDT, Dieldrin, and Endosulfan.

### **3.6 Response Actions**

- 1968 San Jose Industrial Waste Inspector finds contaminated water flowing from a storm sewer line into Coyote Creek. The contaminated water is traced back to the Lorentz Barrel and Drum facility.
- 1982 DHS conducted an on-site soil contamination study resulting in a Remedial Action Order in 1987.
- 1987 EPA initiated an Emergency Response Action (ERA) for the shallow groundwater plume. This effort was later designated as the Shallow Groundwater Operable Unit 2 (OU-2).
- 1987 DHS and EPA initiated two Expedited Response Actions (ERAS). Under these ERAs, DHS excavated contaminated soils and EPA sampled and removed some of the contaminated drums from the site. In addition, EPA drained liquids from on-site storage tanks and treated and disposed of the liquids off-site.
- 1988 EPA and DHS completed removal of 3,000 cubic yards of highly contaminated soils from the northern portion of the site, as well as over 26,000 drums containing hazardous and other wastes.
- 1988 EPA installed a temporary cap over the most contaminated portions of the site to prevent dermal exposure with contaminated surface soils.
- 1992 EPA conducts an on-site investigation to locate and remove vertical conduits on the site. No vertical conduits are found.
- 1992- EPA constructed deep aquifer groundwater monitoring wells and initiated a quarterly  
1993 monitoring program of the on-site and off-site monitoring wells.
- 1993 Installation of the deep aquifer monitoring wells by EPA to support OU 2.
- 1994 Shallow groundwater pump and treat system constructed and operated by PRP group in accordance with Consent Decree (CD) 1.

- 1994 Under the Administrative Order on Consent (AOC) 92-29, a PRP group completed the following work at the site: removal and disposal of contaminated buildings, sumps, and drums, pave the site with a temporary asphaltic material.
- 1996 EPA removed the remaining structures from the site; a warehouse, several previously unidentified sumps, the remaining building foundations, and the remaining horizontal conduits. The site was repaved with a temporary asphaltic material.
- 1998 Explanation of Significance Differences (ESD) OU 2. The UV/ Ox system was replaced with GAC as the selected remedy for the shallow groundwater. The GAC treatment was found to be as effective in treating the volatile and semi-volatile organic compounds and operation and maintenance costs were significantly reduced.
- 1998 ESD OU 1. The OU 1 ROD permitted the removal of soils from the site which contained over 50 ppb PCBs from the site. During the construction of the containment cap, it was necessary to remove 900 cubic yards of debris and excess soil which had been stockpiled during earlier remedial actions. The material was found to have less than 50 ppb PCBs, therefore, the ESD was required.
- 1998 The remaining OU 1 construction activities, installation of the SVE system and the containment cap are completed on-site.

### **3.7 Summary of Enforcement Actions**

- 1980 The California Division of Occupational Safety and Health Administration (OSHA) cites the Lorentz Barrel and Drum company with seven violations of state safety regulations. OSHA informed the Department of Health Services (DHS) of the violations and of the potential for hazardous materials and waste releases at the site.
- 1982 The Regional Water Quality Control Board (RWQCB) conducted a groundwater contamination study resulting in Cleanup and Abatement Order No. 86-001.
- 1984 The City of San Jose and the Santa Clara Water Pollution Control District cited the facility for violations and issued a cease and desist order for discharge into the sanitary sewer.
- 1985 DHS cited the Lorentz Barrel and Drum facility with 14 violations of the California Administrative Code and Federal Regulations for improper handling and storage of hazardous wastes. The Santa Clara County District Attorney obtained a Temporary Restraining Order to close down operations at the facility. Mr. Ernest Lorentz resumed operation of the facility 3 months later.

- 1987 The Lorentz Barrel and Drum facility was permanently closed.
- 1990 EPA and 11 PRPs (the Lorentz Shallow Groundwater Task Force) signed a Consent Decree (CD) requiring the PRPs to design, build, operate, and maintain a shallow groundwater extraction and treatment system as required in the OU-2 ROD.
- 1992 Under AOC 92-29, 7 PRPs agreed to remove contaminated buildings, sumps, and drums and to install a temporary cap on the site.
- 1995 EPA entered into de minimis settlements with 88 PRPs under AOC 95-01.
- 1996 EPA entered into de minimis settlements with 60 PRPs under AOC 96-01.
- 1997 EPA entered into de minimis settlements with 42 PRPs under AOC 97-10.

EPA has planned a future enforcement action against the remaining major and non-settling de minimis contributors to the site. The intention of the enforcement action will be to recover outstanding past costs incurred by EPA and the State of California to clean-up the site and for future oversight costs.

## **4.0 REMEDIAL ACTIONS**

### **4.1 Operable Unit 1 - Soil Vapor Extraction System and Containment Cap**

#### **4.1.1 Remedy Selection**

On August 26, 1993, EPA signed the ROD for OU-1. The stated objective in the ROD is to protect human health and the environment from all remaining releases or threats of releases of hazardous substances that were not addressed by previous or current cleanup actions at the site. The principal threat considered in the ROD is soil contaminated with VOCs and hazardous inorganic materials. The primary cleanup goal of the SVE system identified in the ROD is to protect the shallow groundwater from further degradation by the highly mobile VOCs. The cleanup standard selected in the ROD is 1 ppm total VOCs. The primary cleanup goal of the containment cap is to prevent exposure to the soils contaminated with non-mobile compounds such as: PCBs, pesticides, herbicides, and metals. In addition, the selected remedy in the ROD addresses: groundwater in deeper aquifers, vadose zone soil gas near residences located above the shallow groundwater contaminant plume, vertical and horizontal conduits, structures and debris, incinerator ash residues and other hazardous materials accepted at the site.

Seven remedial alternatives were developed in the Feasibility Study to address remedial action objectives for the site and EPA selected the following remedial activities for the site:

- remediation of hazardous residues and soils through limited removal of liquid and sludge materials in sumps and basins;
- remediation of stockpiled soil containing PCBs greater than 50 ppm;
- construct an asphaltic concrete cap;
- construct and operate an SVE system;
- remove structures, and vertical and horizontal conduits;
- conduct a soil gas assessment in the residential areas above the shallow groundwater plume; and,
- assess and monitor the deep aquifer groundwater.

#### **4.1.2 Remedy Implementation**

- hazardous residues were removed from the sumps and basins on the site by EPA and DHS in 1987. In addition, drums with hazardous residues were removed from the site in 1987 and 1988 by EPA and DHS;
- highly contaminated soils containing PCBs greater than 50 ppm and other contaminants, were removed and disposed of off-site in 1988 by EPA and DHS;
- EPA completed construction of the asphaltic concrete cap in September 1998;
- EPA completed construction of the SVE system in September 1998. The SVE system includes 7 vapor extraction wells, air and groundwater pumps, vapor phase granulated carbon units (GAC), and liquid phase GAC units;
- A PRP group completed the removal and off-site disposal of the structures, vertical and horizontal conduits, and remaining drums on site in 1994;
- An initial off-site soil gas survey was conducted by a contractor for Lorentz in 1987. The survey found that contaminated soil vapor had migrated down gradient of the site with the shallow groundwater plume. EPA expanded the area to be further studied in the OU 1 ROD and a subsequent soil gas assessment in the residential areas above the

shallow groundwater plume was conducted by an EPA contractor in 1996. The survey found that the contaminated soil vapor had not migrated to the residential areas near the site which satisfied the ROD objectives; and,

- An EPA contractor began semi-annual groundwater monitoring of the deep aquifer on and off-site in 1990. Monitoring will continue until EPA confirms that the on-site VOC contamination in the soil has been remediated to the remedial goals identified in the OU 1 ROD, and groundwater remedial action objectives are achieved. No contamination from the site has been detected in the deep aquifer to date.

#### **4.1.3 System Operations/ Operation and Maintenance (O&M)**

The SVE system started extracting contaminants from the soil in September 1998 and operated effectively for 8 months. Due to a change in EPA contract support, the system was shut-down temporarily and EPA entered into an Interagency Agreement with the Corps of Engineers (COE) to resume work at the site. As of this date, the COE has initiated technical work at the site and has scheduled SVE system start-up in December 2000. The SVE system is expected to reach remediation goals in three years.

The containment cap and security fencing were completed in September 1998 and are in good condition. No repair or maintenance are necessary at this time.

## **4.2 Operable Unit 2 - Shallow Groundwater**

### **4.2.1 Remedy Selection**

The objective for the OU 2 remedy is to clean-up the contamination in the groundwater and to prevent the plume from migrating towards Coyote Creek to the north and to the municipal water supply located in the deep aquifer underneath the site. To accomplish these goals, the OU 2 ROD selected a containment remedy consisting of a groundwater extraction system, ultraviolet/ oxidation (UV/Ox) treatment, and disposal of treated water to the storm sewer. The cleanup goals in the ROD are to “substantially reduce or eliminate all groundwater contamination from the shallow groundwater”. EPA and the PRP group have agreed that the shallow groundwater cleanup activities at the site will continue until the contaminants of concern identified in the ROD are reduced to non-detect levels. EPA and the PRP are currently using established federal and state drinking water sampling methods and detection limits as the basis for evaluating the sampling information.

The OU 2 ROD also contained provisions for remediating PCB and nickel in the groundwater if these compounds were found. The subsequent remedial investigation did not find PCBs in either the shallow groundwater or deep aquifer during the sampling events. Nickel was

not found above the background level in either the shallow groundwater or deep aquifer. Based on these results, the final Remedial Investigation Report, dated July 1990, concluded that no further remedial action was required for either PCBs or nickel in either the shallow groundwater or deep aquifer. The remedial design for the groundwater treatment system was approved by EPA in July 1991.

#### **4.2.2 Remedy Implementation**

The construction of the remedy by the PRPs' contractor began with the excavation of a shallow area near Alma Street for the treatment facility foundation. The concrete foundation was completed and a pre-engineered steel treatment building was constructed after installation of the treatment equipment. During this time, the groundwater wells were drilled and the pneumatic pumps, controllers, and piping to the treatment plant were installed. Construction of the treatment system was completed, and was inspected and accepted by EPA in March 1992. The system has been in operation since that time.

The extraction system includes 18, 4 inch cased groundwater extraction wells. Groundwater is extracted by pneumatic extraction pumps which are powered by a timed compressed air system. The groundwater is pumped to the site through 2 inch lines at a continuous flow of 1 gpm. The original design selected for the groundwater treatment was an ultraviolet/oxidation (UV/Ox) unit. This selection was based on the levels of vinyl chloride initially found in the groundwater samples. During operation, a GAC unit was added to the treatment process due to a lack of efficiency of the UV/Ox system. Due to the low volume of flow, the groundwater is collected in a small tank within the treatment facility and is sent to the UV/Ox and GAC treatment in timed batches. The treated water is disposed of off-site to the storm sewer and the GAC units are reconditioned off-site in accordance with State and Federal regulations. In addition to the extraction system, 11 piezometers are used to monitor the groundwater levels in the area.

#### **4.2.3 System Operations/ Operation and Maintenance (O&M)**

The intent of the OU 2 ROD was to prevent groundwater contamination from migrating further from the site. To achieve compliance with the OU 2 ROD, the PRP group designed and constructed an extraction well field which has successfully contained the plume and prevented further migration to the north and to the deep aquifer. Given the extensive existing extraction well network, EPA anticipates that completion of the groundwater remedial action (whether restoration or containment) can be implemented without further construction.

During operation of the facility, the PRPs found that the UV/Ox lamps had a tendency to develop scaling and that the vinyl chloride could be treated to the ROD remediation goals through the GAC unit alone. In July 1997, the PRPs conducted a performance evaluation and found that

no combination of pH adjustment, peroxide addition, lamp maintenance, or number of lamps used in the UV/Ox unit proved more cost effective or efficient in removing volatile and semi-volatile organic compounds than use of the GAC system alone. Following review of this information, EPA and the California Department of Toxic Substances (DTSC) concluded that use of GAC to treat the groundwater would meet the cleanup goals for the site and would significantly reduce operation and maintenance costs. The change in treatment from UV/Ox to GAC was authorized by EPA in an ESD dated April 1998.

The PRP group has periodically shut down portions of the system due to minor equipment malfunctions and routine maintenance. One extraction well (EX-13) has not been in operation since 1993 due to flooding of the well box by the nearby irrigation system. Disconnection of this extraction well has not impacted the effectiveness of the remedy.

## **5.0 FIVE-YEAR REVIEW FINDINGS**

### **5.1 Five-Year Review Process**

This five year review consisted of the following activities: a review of relevant documents, discussions with operation and maintenance contractors, and a site inspection. A copy of this completed report is available in the information repository. Notice of the completion of this report has also been announced in the local newspaper.

### **5.2 Interviews**

EPA contacted interested State of California other interested local agencies to discuss remedial activities at the site. No adverse comments were made.

### **5.3 Site Inspection**

EPA made a site inspection on September 13, 2000 and found that the containment cap was in good condition. No cracking or settlement was found in any of the cap components: the asphaltic concrete cap, concrete curbs and gutters, or the retaining walls. The SVE system components were inspected and found to be in good repair. Due to the temporary shut-down of the system, the granulated carbon units are not on-site. However, these units have been procured by the COE and are scheduled to be installed in late October 2000.

During the inspection, EPA also inspected the groundwater pump and treat system and found that it was operating as designed. The treatment facility building and components were in good repair.

## **5.4 Risk Information Review**

Since the remedies were selected, several toxicity values and exposure parameters used to calculate risk have changed. However, these changes in risk information do not affect the protectiveness of the remedy and no changes to the promulgated cleanup goals are required.

## **5.5 Risk Recalculation/ Assessment**

No risk recalculations are required.

## **5.6 Data Review**

The shallow groundwater pump and treat system processes about 4 million gallons of contaminated groundwater per year and has treated about 24 million gallons to date. The total mass of VOCs removed to date is about 60 pounds. During the first month of operation, the SVE removed 200 pounds of VOCs from the soil and removed an average of 0.68 lbs/day during routine operation.

## **6.0 ASSESSMENT**

### **6.1 Conditions External to the Remedy**

To assess the remedy adequately, the five following questions are generally considered:

- Has the land use or expected land use on or near the site changed?

*No, the adjacent land uses have not changed, the zoning for the site has not changed, and the proposed future uses for the site (either heavy industrial or parking) are compatible with the implemented remedial actions at the site.*

- Have any human health or ecological exposure pathways changed or been newly identified?

*No, new contaminants, sources, or exposure pathways were identified during this five-year review.*

- Are there new contaminants or contaminant sources?

*No, the contaminant removal rate in the groundwater is consistent with expectations and the contaminant removal rate of the SVE during the period of operation was consistent with expectations.*

- Are there unanticipated toxic byproducts to the remedy not previously addressed by the ROD?

*No new contaminants were found during the five-year review period.*

- Have hydrologic/ hydrogeologic site conditions changed?

*No, the groundwater levels and direction of flow have remained consistent.*

## **6.2 Remedy Implementation and System Operations/ O&M**

All remedial construction work has been completed at the site in accordance with the decision documents and it was found that the Field Sampling Plans, the Health and Safety Plan, and other technical documents are appropriate to the current on-site work and have been properly implemented to protect workers. In addition, site security remains effective in deterring unauthorized access to the site.

Under the ROD for OU 1, long term maintenance of the cap will be required as a key element of the ultimate success of the remedy and will be implemented through institutional controls. At a minimum, EPA will require periodic visual monitoring of the cap and associated retaining wall and will impose a maintenance schedule for repair and resurfacing of the asphaltic cap.

The fundamental requirement of the OU 2 ROD is an agreement that the PRP group maintain and operate the groundwater treatment to not only contain the leading edge of the plume, but to cleanup the groundwater to the standards set forth in the ROD. As such, a date of completion is not known, however, it is reasonable to assume that implementation of the OU 1 remedy to remove the VOCs remaining on-site will reduce contaminant loading into the shallow groundwater aquifer and reduce the time required to complete the groundwater cleanup.

## **6.3 Risk Information**

The cleanup goals established for the site are not based on ARARs and no new ARARs have been promulgated for the site. The shallow groundwater cleanup goals in the OU 2 ROD require EPA to “substantially reduce or eliminate all contamination from the shallow groundwater”. To date, the contaminants of concern in the groundwater have remained consistent, but remain present above the detection limit. The treatment has been very effective in removing the contaminants prior to discharge and as a result, the effluent levels have remained consistently below the limits established in the discharge permit (NPDES permit).

In accordance with the cleanup strategy described in the OU 1 ROD for the site, the SVE system will assist the groundwater pump and treat system in reaching the cleanup goals for the shallow groundwater. The primary function of the SVE is to reduce the VOCs remaining on-site and to prevent additional contamination from migrating into the shallow groundwater. The selected remedy in the OU 1 ROD established the cleanup goal for the SVE as 1 ppm total VOCs. Future five-year reviews will evaluate the effectiveness of this cleanup strategy.

The containment cap has effectively mitigated the potential soil exposure pathway at the site. The cap is in good condition and the site is accessed only by EPA, PRP, and support contractors during remedial action related activities (i.e. replacing GAC units, sampling). In the event a new owner assumes responsibility for the site, EPA intends to impose institutional controls and to enter into a Prospective Purchaser Agreement which will require the owner to maintain the cap at all times.

## **7.0 DEFICIENCIES**

During the five-year review it was determined that the temporary shut-down of the SVE system is a deficiency. However, action to resume operation of the system has been initiated and full operation is scheduled for December 2000. During this shut-down period, the levels of contaminants in the groundwater remained constant and the containment cap was in place. Therefore, this deficiency did not result in a finding of not protective.

## **8.0 RECOMMENDATIONS AND REQUIRED ACTIONS**

All of the remedial construction at the site has been completed and the future work at the site consists primarily of maintaining and operating the SVE and the groundwater pump and treat system. In addition, the containment cap will require periodic paving. Given the urban location of the site, EPA will install a security camera system which can be monitored from the Region 9 office. The system will be used by EPA and the COE to monitor unauthorized access to the site.

EPA is currently working with two interested parties who are actively pursuing ownership of the property. EPA will enter into a Prospective Purchaser Agreement with the successful party which will require the new owner to: maintain the containment cap, retaining walls, and fencing, and to provide site security. In exchange EPA will provide protection from enforcement related to the contamination at the site.

## 9.0 PROTECTIVENESS STATEMENTS

The remedial actions selected and implemented at the Lorentz Barrel and Drum site remain protective of public health and the environment, however, the actions to date do not fully meet the objectives of the OU 1 or OU 2 RODs. By continuing the planned actions discussed in Section 4, Technology Review/ Performance of Remedy, the EPA will fully meet the objectives discussed in both the OU 1 and OU 2 RODs. Subsequent five-year reviews will evaluate the success of this future work.

## 10.0 FUTURE FIVE-YEAR REVIEWS

The next five-year review will be written within five years from the approval date of this review.

Approved by:

  
\_\_\_\_\_  
Keith Takata, Director  
Superfund Division

  
\_\_\_\_\_  
Date