

# DEFENSE DISTRIBUTION DEPOT SAN JOAQUIN, CALIFORNIA



## DEFENSE DISTRIBUTION DEPOT SAN JOAQUIN – TRACY SITE 2011 EXPLANATION OF SIGNIFICANT DIFFERENCES TO THE 1998 RECORD OF DECISION

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## LIST OF ABBREVIATIONS AND ACRONYMS

ACL	aquifer cleanup level
AFB	Air Force Base
bgs	below ground surface
BHC	hexachlorocyclohexane
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	chemical of concern
CPT	cone penetrometer test
CVRWQCB	Central Valley Regional Water Quality Control Board
DCE	1,1 – dichloroethene
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DLA	Defense Logistics Agency
DSERTS	Defense Site Environmental Reporting and Tracking System
DTSC	California Department of Toxic Substances Control
ECC	Environmental Chemical Corporation
ESD	Explanation of Significant Difference
EU	Exposure Unit
FFA	Federal Facilities Agreement
FS	feasibility study
IDW	investigative derived waste
IMP	Installation Master Plan
IWPL	industrial waste pipeline
LUC	land use control
MCL	maximum contaminant level
MCPA	2-methyl-4-chlorophenoxyacetic acid
mg/kg	milligrams per kilogram
NPL	National Priorities List
OU 1	Operable Unit No. 1
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyls
PCE	tetrachloroethene
PCP	pentachlorophenol
ppbv	parts per billion by volume
RAO	remedial action objective
RI	remedial investigation

## LIST OF ABBREVIATIONS AND ACRONYMS (CONTINUED)

ROD	Record of Decision
RPM	Remedial Program Manager
RSL	regional screening level
RTE	rare, threatened and endangered
Shaw	Shaw Environmental, Inc.
STOP	SVE Termination and Optimization Protocol
SVE	soil vapor extraction
SVOC	semi-volatile organic compound
SWMU	solid waste management unit
TCA	1,1,2 trichloroethane
TCE	trichloroethene
TPH	total petroleum hydrocarbons
Tracy Site	Defense Distribution Depot San Joaquin California, Tracy Site
URS	URS Group, Inc.
US	United States
USACE	United States Army Corps of Engineers
USATHAMA	US Army Toxic and Hazardous Materials Agency
USDA	United States Department of Agriculture
USFS	United States Forestry Services
U.S. EPA	United States Environmental Protection Agency
UST	underground storage tank
VMP	vapor monitoring point
VOC	volatile organic compound
µg/kg	micrograms per kilogram
µg/L	micrograms per liter

## **1.0 INTRODUCTION AND STATEMENT OF PURPOSE**

On behalf of the Defense Logistics Agency (DLA), HDR has prepared this Explanation of Significant Differences (ESD) to document significant differences to the *DDJC-Tracy Site-Wide Comprehensive Record of Decision* (1998 ROD) (Radian International, 1998) for the Defense Distribution Depot San Joaquin California, Tracy Site (Tracy Site). Previous Response to Comments on the Draft ESD are presented in Appendix A. The significant differences presented in this ESD include:

1. Modification of the remedial action objectives (RAOs) and the 1998 ROD specified criteria used to determine when vadose zone cleanup has been achieved at Area 1/Building 237, solid waste management unit (SWMU) 1/Area 2, Area 3, and SWMU 20;
2. 1998 ROD selected remedies at Area 1/Building 237, SWMU 1/Area 2, and Area 3 will incorporate new or modify existing land use controls (LUCs);
3. 1998 ROD selected remedy at SWMU 20 will incorporate soil vapor extraction (SVE) with LUCs; and
4. The SVE Termination and Optimization Protocol (STOP), a recognized and accepted procedure that is consistent with the intent of the 1998 ROD to evaluate SVE operations with respect to contaminant impacts to groundwater above the aquifer cleanup levels (ACLs).

### **1.1 Tracy Site Location**

The Tracy Site is located in an unincorporated area of San Joaquin County, 1.5 miles southeast of Tracy, California. It is approximately 20 miles southwest of Stockton, California, and 60 miles east of San Francisco, California (Figure 1-1).

### **1.2 Facility Description**

The Tracy Site began functioning as a depot in 1942. The DLA has operated the Tracy Site since 1963 as a storage and distribution depot for the United States (U.S.) military services in the western U.S. and the Pacific region. The Tracy Site Depot covers a 448-acre triangular parcel. The DLA also operates approximately 460 acres of agricultural land to the north of the facility referred to as the Tracy Site Annex. The Tracy Site Depot and Annex are depicted on Figure 1-2.

The topography at Tracy Site generally slopes downward to the north-northwest. Chrisman Road borders the west edge of the facility, Banta Road borders the east, and Eleventh Street borders the north. About 75 percent of the Tracy Site Depot is covered with buildings (primarily warehouses), asphalt, or concrete. Numerous smaller buildings in the northwest corner of the Tracy Site Depot house administration and operations.

This ESD focuses on Area 1/Building 237, SWMU 1/Area 2, Area 3, and SWMU 20, located centrally in the northern portion of the Tracy Site Depot (Figure 1-3). The general site descriptions are presented in Table 1-1.

### **1.3 History of Site Wide Remedial Activities**

In early 1980, a records search by the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) identified SWMUs at the Tracy Site with contaminants that could migrate to locations outside of the Tracy Site boundary. The records search concluded that waste disposal practices between 1940 and the

mid-1970s, including the use of burning to dispose of wastes, operation of underground sumps/tanks, and use of unlined drainage and sewage leaching ponds probably were responsible for the reported contamination (USATHAMA, 1980).

In May 1984, the Central Valley Regional Water Quality Control Board (CVRWQCB) was advised that tetrachloroethene (PCE) and trichloroethene (TCE) were detected in groundwater above the California drinking water primary Maximum Contaminant Level (MCL) of 5 micrograms per liter ( $\mu\text{g/L}$ ). Based on these detections, an investigation was performed in 1985 to identify potential sources of the groundwater contamination and to evaluate whether compounds have migrated beyond the base boundary. This investigation included collection of soil gas samples, installation of additional groundwater monitoring wells, and groundwater sampling from the existing and newly installed groundwater monitoring wells. This investigation identified three principal areas of soil gas contamination (Areas 1, 2, and 3) and three additional areas of contamination (Areas 4, 5, and 6), with TCE and/or PCE being the major volatile contaminants in all six areas (Radian International, 1986).

Based on the results from the 1985 hydrogeological investigation, a remedial investigation and feasibility study (RI/FS) was conducted. This RI/FS included additional soil gas sampling, sample collection from privately owned wells, sample collection from soil borings, installation of additional groundwater monitoring wells, and groundwater sample collection from the newly installed and existing monitoring wells. In 1992, as a result of the RI/FS, the Operable Unit 1 (OU 1) plume was identified as an area of contaminated groundwater emanating from the Tracy Site. Chemicals of concern (COCs) were identified to be volatile organic compounds (VOCs), pesticides, and potentially metals.

In 1991, the Tracy Site was listed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) as a Superfund site. On 27 June 1991, the DLA, the U.S. Environmental Protection Agency (U.S. EPA) Region 9, the CVRWQCB and the California Department of Toxic Substances Control (DTSC) signed a Federal Facilities Agreement (FFA) for the Tracy Site. This FFA has enforceable schedules; it ensures that environmental impacts are thoroughly investigated and that appropriate cleanup actions are taken to protect human health, welfare, and the environment. Consistent with the requirements of the FFA, the U.S. EPA, DTSC, and the CVRWQCB provide regulatory oversight, review, and comment on all investigative and cleanup work at the Tracy Site.

In August 1993, the final OU 1 Record of Decision (1993 ROD) (Woodward Clyde, 1993) was signed. The 1993 ROD stated that the OU 1 remedial action would address “the principal threat posed by the (groundwater contaminant) plume by prioritizing action at OU 1 over any additional cleanup associated with other potential sources of contamination at the depot”. As the 1993 ROD describes, the selected remedy was to extract, treat, and inject the contaminated groundwater. The 1993 ROD also set ACL of 5  $\mu\text{g/L}$  for PCE and TCE and 6  $\mu\text{g/L}$  for 1,1-dichloroethene (DCE). The 1993 ROD stated that the additional chemicals of concern detected in the OU 1 plume will be characterized further in a subsequent RI/FS.

In December 1995, the *OU 1 Explanation of Significant Differences* (OU 1 ESD) was submitted (Montgomery Watson, 1995). This ESD adjusted the effluent treatment standards and added dispersion to the remedy selected in the 1993 ROD for the Banta Road Plume. From 1993 to 1995 an RI/FS was conducted at the Tracy Site and documented the results in the *Comprehensive Remedial Investigation/Feasibility Study Report* (Comprehensive RI/FS) (Montgomery Watson, 1996a). The Comprehensive RI/FS reevaluated and reaffirmed the 1993 ROD and OU 1 ESD had addressed all areas that were not addressed as part of the RI/FS. The Comprehensive RI/FS report includes an evaluation of possible remedies for the sites identified as posing a threat to human health or the environment.

The results from the Comprehensive RI/FS were used to help develop the 1998 ROD (Radian International, 1998). The 1998 ROD was prepared to address sites that were not addressed in the 1993 ROD and serves as the Final Remedial Action plan for the Tracy Site. The 1998 ROD includes a comprehensive evaluation of all groundwater issues, addresses all sites with soil contamination, includes a baseline risk assessment (BRA), and established cleanup standards to protect background groundwater quality. The 1998 ROD modified the remedy for OU 1 groundwater and addressed all known areas of soil contamination at the Tracy Site.

Subsequent to publication of the 1998 ROD, two ESDs and one ROD Amendment were completed that modified the selected remedies. The most recent being the *2004 Explanation of Significant Differences to the Site-Wide Comprehensive Record of Decision DDJC – Tracy* (2004 ESD) (URS, 2004), which modified the vadose zone remedy at SWMU 20 from SVE to LUCs, in addition to changes at other sites. Table 1-2 presents a summary of the Tracy Site decision documents.

#### **1.4 Explanation of Significant Differences**

This ESD will modify the 1998 ROD, 2001 ESD and 2004 ESD as follows:

1. Modify the RAOs presented in Sections 7.4.1 and 7.5.5.1 of the 1998 ROD to include protectiveness of human health and the environment.
2. Modify vadose zone cleanup criteria presented in Sections 9.6.5, 9.6.6, 9.7.5.10, and 9.7.5.11 of the 1998 ROD to determine when SVE operations can be discontinued and to evaluate human health risks from the vadose zone after the SVE operations have been discontinued.
3. Modify the 1998 ROD selected remedy (SVE) at Area 1/Building 237 to include LUCs to mitigate risks to human health and the environment.
4. Modify the 2004 ESD LUCs for SWMU 1/Area 2 to address the supplemented RAO, which is the protection of human health and the environment.
5. Modify the 1998 ROD selected remedy (SVE) for Area 3 to also include LUCs to mitigate risks to human health and the environment.
6. Modify the 2004 ESD LUCs for SWMU 20 to incorporate SVE as a remedy and to address the supplemented RAO, which is the protection of human health and the environment.

#### **1.5 Land Use Controls**

This ESD adds LUCs to the remedy for Area 1/Building 237, SWMU 1/Area 2, Area 3, and SWMU 20 sites. Intrusion of vapors originating from VOCs in subsurface media (soil or groundwater) into building interiors potentially utilized by workers or residents is an exposure pathway that was not addressed in the BRA. Evolving awareness of the potential for health risks from inhalation of VOCs and changes in inhalation slope factors has raised concerns about risks to occupants of buildings constructed atop contaminated soil and groundwater. Given that the current and anticipated future land use at the Tracy Site is industrial, residual VOC soil vapor concentrations, which are not overlain by any buildings, do not pose an unacceptable risk to human health. However, when the selected remedy allows contaminants to be left in place at levels that do not allow for unlimited use and unrestricted exposure (e.g., residential use), LUCs are applied to ensure the selected remedies are protective of human health and the environment. The residual VOC soil vapor concentrations at Area 1/Building 237, SWMU 1/Area 2, Area 3, and SWMU 20 sites do not allow for unlimited use and unrestricted exposure; thus, LUCs are

necessary to protect human health from the potential risk associated with inhalation of VOCs via the vapor intrusion pathway.

The objective of the LUCs at Area 1/Building 237, SWMU 1/Area 2, Area 3, and SWMU 20 sites is to protect human health in accordance with CERCLA by limiting human exposure to VOCs through the vapor intrusion pathway. The LUC objective for these sites will be achieved by:

- Modifying the *Defense Distribution Depot San Joaquin Real Property Master Plan Digest* to prohibit development for uses such as schools, child care facilities, playgrounds, and housing.
- Posting appropriate signage at the sites indicating areas of restricted land use.
- Reviewing proposed construction projects to ensure that they are consistent with the LUC objective, and the Sharpe/Tracy Site Waste Management Plan.
- Establishing environmental restrictions at the time of real property transfer in order to publicly record LUCs.

DLA will implement, monitor, maintain, and enforce the LUCs as follows:

- The *Defense Distribution Depot San Joaquin Real Property Master Plan Digest* will be modified to include maps showing the locations of the sites with LUCs. The Addendum to the Real Property Master Plan Digest (Appendix C of this ESD) describes the procedures that will be used to ensure that the sites with LUCs are prohibited from development for uses such as schools, child care facilities, playgrounds, and housing and that signs indicating areas of restricted land use are maintained. The Addendum also refers to the DLA Installation Support at San Joaquin Environmental Office Program Manager if more information is needed. DLA will notify EPA, DTSC, and RWQCB in advance of any changes to internal procedures that affect the LUCs.
- A DLA Installation Support at San Joaquin Environmental Office Program Manager will review all proposed construction projects at the Tracy Site and issue a record of environmental consideration (REC). If any component of a proposed project is inconsistent with the LUC objectives, the requester will be required to modify the project plans to be consistent with the LUCs. In addition, excavation and disposal of any soil associated with the sites, including waste characterization, will be conducted in accordance with the Sharpe/Tracy Site Waste Management Plan.
- DLA will address any activity that is inconsistent with the LUC objective or use restriction, or any other action that may interfere with the effectiveness of the LUCs, as soon as practicable. In no case will the process be initiated later than 10 days after the date DLA becomes aware of the inconsistency.
- DLA will notify EPA, DTSC, and RWQCB as soon as practicable, but no later than 10 days after discovery of any activity that is inconsistent with the LUC objective or use restriction, or any other action that may interfere with the effectiveness of the LUCs. Within 10 days of sending the initial notification related to the inconsistency, DLA will provide notification explaining how the inconsistency was or will be addressed.
- DLA will notify EPA, DTSC, and RWQCB at least 45 days in advance of any proposed land use change that is inconsistent with the LUC objective, any anticipated action that may disrupt or



interfere with the effectiveness of the LUCs, any action that might alter or negate the need for the LUCs, or any anticipated transfer of the property subject to the LUCs.

- DLA will maintain administrative controls (e.g., review of proposed construction projects) while the LUCs are in place. The LUCs will be maintained at the sites until concentrations of hazardous substances in the soil are at such levels that allow for unlimited use and unrestricted exposure. For example, if VOC soil vapor concentrations reported from a future investigation allow for unlimited use and unrestricted exposure (i.e., concentrations do not pose an unacceptable risk to human health associated with inhalation of VOCs through the vapor intrusion pathway), the LUCs will no longer be needed, and a memorandum to the site file will be prepared to terminate the LUCs. DLA will not modify or terminate the LUCs, implement actions, or modify land use without approval from EPA, DTSC, and RWQCB. DLA will seek prior concurrence before any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for the LUCs.
- Monitoring of the environmental use restrictions and controls will be conducted annually by DLA. The monitoring results will be included in the Federal Facility Agreement (FFA) Annual Monitoring Report and provided to EPA, DTSC, and RWQCB. The Annual Monitoring Reports will be used in preparation of the five-year reviews to evaluate the effectiveness of the remedy. The Annual Monitoring Report, submitted to the regulatory agencies by DLA, will evaluate the status of the LUCs and how any LUC deficiencies or inconsistent uses have been addressed. The annual evaluation will address whether the use restrictions and controls referenced above were communicated in the deed(s) if a parcel including one of the sites was sold or transferred, whether the owners and state and local agencies were notified of the use restrictions and controls affecting the property, and whether use of the property has conformed to such restrictions and controls.
- DLA will notify EPA, DTSC, and RWQCB at least six months prior to any transfer or sale of any property subject to the LUCs so that the agencies can be involved in discussions to ensure that appropriate provisions are included in the transfer terms or conveyance documents to maintain effective LUCs. If it is not possible for the facility to notify the agencies at least six months prior to any transfer or sale, then DLA will notify the agencies as soon as possible but no later than 60 days prior to transfer or sale of any property subject to LUCs. In addition to these land transfer notice and discussion provisions, DLA further agrees to provide the agencies with similar notice, within the same timeframes, for federal-to-federal transfers of property. DLA will provide a copy of the executed deed or transfer assembly to the agencies.

DLA is responsible for implementing, monitoring, maintaining, reporting on, and enforcing the identified LUCs. Although DLA may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, DLA will retain ultimate responsibility for remedy integrity. If DLA determines that it cannot meet specific LUC requirements, it is understood that the remedy may be reconsidered and that additional measures may be required to ensure the protection of human health.

Any future land use changes for property associated with the sites requires site characterization (prior data may be used) and, at a minimum, an environmental assessment of the property in accordance with the applicable United States Department of Defense (DoD) and EPA regulations in place at the time of the change. Many decisions documented in the 1998 ROD were based on current land use (industrial). In general, a change in land use must be evaluated to ensure that contamination left in place will not pose an unacceptable risk to human health under the new exposure scenario.

Nonclosure transfers of DoD property are guided by community input on land use, as provided for by the local government land use planning agency. In the event that no community land use plan is available at the time of property transfer, DoD will consider a range of reasonably anticipated future land uses in the transfer process. These assumptions allow the DoD (in conjunction with regulatory agencies) to determine the need for the LUCs. Environmental process requirements and restrictions (including LUCs) at installations subject to transfer are described in Title 42 United States Code §9620(h) [CERCLA §120.9(h)]. This statute establishes hazardous substance notification and deed content requirements. Title 40 Code of Federal Regulations (CFR) §373 et seq. establishes the regulatory notification and reporting requirements. DoD policy, as set forth in the Base Redevelopment and Realignment Manual (DoD, 2006), currently requires documenting the environmental condition of the property and a finding of suitability to transfer (FOST) prior to the transfer of properties subject to the NCP. In accordance with Title 22 California Code of Regulations (CCR) §67391.1(e)(1), DTSC cannot consider property owned by the federal government to be suitable for transfer to nonfederal entities where hazardous wastes/constituents/substances remain at levels that are not suitable for unrestricted land use unless appropriate land use covenants have been executed and recorded with the county of record.

If the depot is closed, DLA will implement the appropriate regulatory process and actions (e.g., legally enforceable restrictions) to ensure continued protection of human health. In addition, notification of appropriate regulatory agencies will occur at the initiation of the process

## **1.6 Support Agency Comments**

In early 2010, the DLA determined that the changes represented in this ESD did not fundamentally alter the remedial actions presented in the 1998 ROD and proposed documenting these changes in an ESD at a remedial program manager (RPM) meeting. On 2 September 2010, the DLA, U.S. EPA and the DTSC participated in a teleconference to discuss the content of this ESD.

On 4 March 2011, the DLA, U.S. EPA and the CVRWQCB met to discuss the content of this ESD. At this meeting, it was agreed that this ESD would specifically incorporate the topics presented in Section 1.4 above.

## **1.7 Statutory Determinations**

The modified remedies discussed in this ESD satisfies the requirements of CERCLA §121.

## **1.8 Public Notification Compliance**

Consistent with the requirements of 40 Code of Federal Regulations (CFR) §300.435, this ESD and supporting information will be made available to the public in the administrative record and information repository. A notice summarizing the draft final ESD, including reasons for the differences, was published in the following publications: Tracy Press, Manteca Bulletin, and in Vida en el Valle (Spanish language) and included in the administrative record. No public comments on the draft final ESD were received.



**Table 1-1. Summary of Tracy Site Decision Documents**

Document	Description
<i>OU 1, Record of Decision, Defense Distribution Region West-Tracy, California.</i> Final. August (Woodward-Clyde, 1993)	<ul style="list-style-type: none"> <li>- Focused 1993 ROD addressing groundwater concerns at the Tracy Site.</li> <li>- Superseded by the 1998 ROD.</li> </ul>
<i>OU 1 Explanation of Significant Difference, Defense Distribution Region West - Tracy, California</i> (Montgomery Watson, 1995)	<ul style="list-style-type: none"> <li>- Included a combination of air stripping technology and dispersion at the Tracy Site.</li> </ul>
<i>DDJC-Tracy Site-Wide Comprehensive Record of Decision.</i> Final. Prepared for the US Army Corps of Engineers, Huntsville Alabama. Final. April (Radian International, 1998)	<ul style="list-style-type: none"> <li>- Modified the remedy for OU 1 groundwater.</li> <li>- Identified remedies for all soil sites.</li> </ul>
<i>Explanation of Significant Differences to the Selected Remedies in the ROD for SWMUs 2, 3, 7, and 33, Building 30 Drum Storage Area, and the Northern Depot Soils Area.</i> Final. Prepared for the U.S. Army Corps of Engineers, Huntsville, Alabama. July (URS, 2001)	<ul style="list-style-type: none"> <li>- Revised cleanup standards for SWMUs 2 and 3 on the basis of the results from additional risk assessment.</li> <li>- Corrected cleanup standards for the Northern Depot Soils Area (DSERTS 67). Also modified requirements for the cover and added institutional controls.</li> <li>- Clarified institutional controls for SWMU 7, SWMU 33, and the Building 30 Drum Storage Area. Also clarified the institutional control requirements at all sites with soil contamination in the event of a change in land use.</li> </ul>
<i>Amendment to the Site-Wide Comprehensive Record of Decision.</i> Final. Prepared for the U.S. Army Corps of Engineers, Huntsville, Alabama. December (URS, 2003)	<ul style="list-style-type: none"> <li>- Revised cleanup standards for the SWMU 4 on the basis of the results from additional risk assessment. Required land use controls including annual reporting and modification of the installation master plan.</li> <li>- Added option for overland flow discharge of treated groundwater to supplement the remedy for OU 1 groundwater.</li> <li>- Addressed DSERTS 72, a new site discovered after completion of the 1998 ROD. Required land use controls including annual reporting and modification of the institutional master plan.</li> </ul>
<i>2004 Explanation of Significant Differences to the Site-Wide Comprehensive Record of Decision,</i> Prepared for the U.S. Army Corps of Engineers, Huntsville, Alabama, September (URS, 2004)	<ul style="list-style-type: none"> <li>- Implemented land use controls at SWMU 6 and SWMU 20.</li> <li>- Revised soil cleanup standards for DDT and Dieldrin to 103 µg/kg and 5 µg/kg, respectively.</li> <li>- Implemented supplemental land use controls at DSERTS 67.</li> <li>- Removed SVE as the remedy for SWMU 20.</li> </ul>

Notes:

DDJC	=	Defense Distribution Depot Joaquin California
DDT	=	dichlorodiphenyltrichloroethane
DSERTS	=	Defense Site Environmental Reporting and Tracking System
µg/kg	=	micrograms per kilogram
OU	=	Operable Unit
ROD	=	Record of Decision
SWMU	=	Solid Waste Management Unit
SVE	=	soil vapor extraction
Tracy Site	=	Defense Distribution Depot San Joaquin - Tracy Site
URS	=	URS Group, Inc

**Table 1-2. General Site Information**

Site	Potential Contaminant Source / Historical Site Use	Identified Contaminants	Risk Associated with Contaminant Concentrations	ROD Specified Response Action	Supplemental Response Actions Presented in the 2004 ESD	Response Actions Presented in this ESD
Area 1/ Building 237	Former Solvent Storage Area - previously used for cleaning asphalt application tools and equipment.	PCE, TCE	Groundwater Quality Impacts and Human Health and the Environment	SVE	NA	Addition of Land Use Controls
SWMU 1/ Area 2	Old Sewage Lagoon and Former Drum Storage Area -This area was used as a drum storage area from 1957 through 1984. Chemicals in drums possibly leaked or were discharged accidentally.	PCE, TCE	Groundwater Quality Impacts and Human Health and the Environment	SVE	NA	Update Current Land Use Controls
Area 3	Drum Storage Area - Former drum storage area. Some drums may have leaked or spills may have occurred.	PCE, TCE	Groundwater Quality Impacts and Human Health and the Environment	SVE	NA	Addition of Land Use Controls
SWMU 20	Aboveground Solvent Tank and Building 26 Recoup Operations - A 500-gallon aboveground TCE degreasing unit was located inside Building 10. Building 10 was constructed in 1950. According to warehouse plans, several cleaning facilities were used between 1950 and 1974.	TCE, TPHD, PAHs, PCBs, Aluminum	Groundwater Quality Impacts and Human Health and the Environment	SVE	Removed SVE Remedy and Developed Land Use Controls	Addition of SVE and Updated Land Use Controls

Notes:

ESD = Explanation of Significant Difference  
 NA = Not Applicable  
 PAH = polycyclic aromatic hydrocarbon  
 PCB = polychlorinated biphenyls  
 PCE = tetrachloroethene  
 ROD = Record of Decision

SVE = Soil Vapor Extraction  
 SWMU = Solid Waste Management Unit  
 TCE = trichloroethene  
 TPHD = total petroleum hydrocarbons in the diesel range

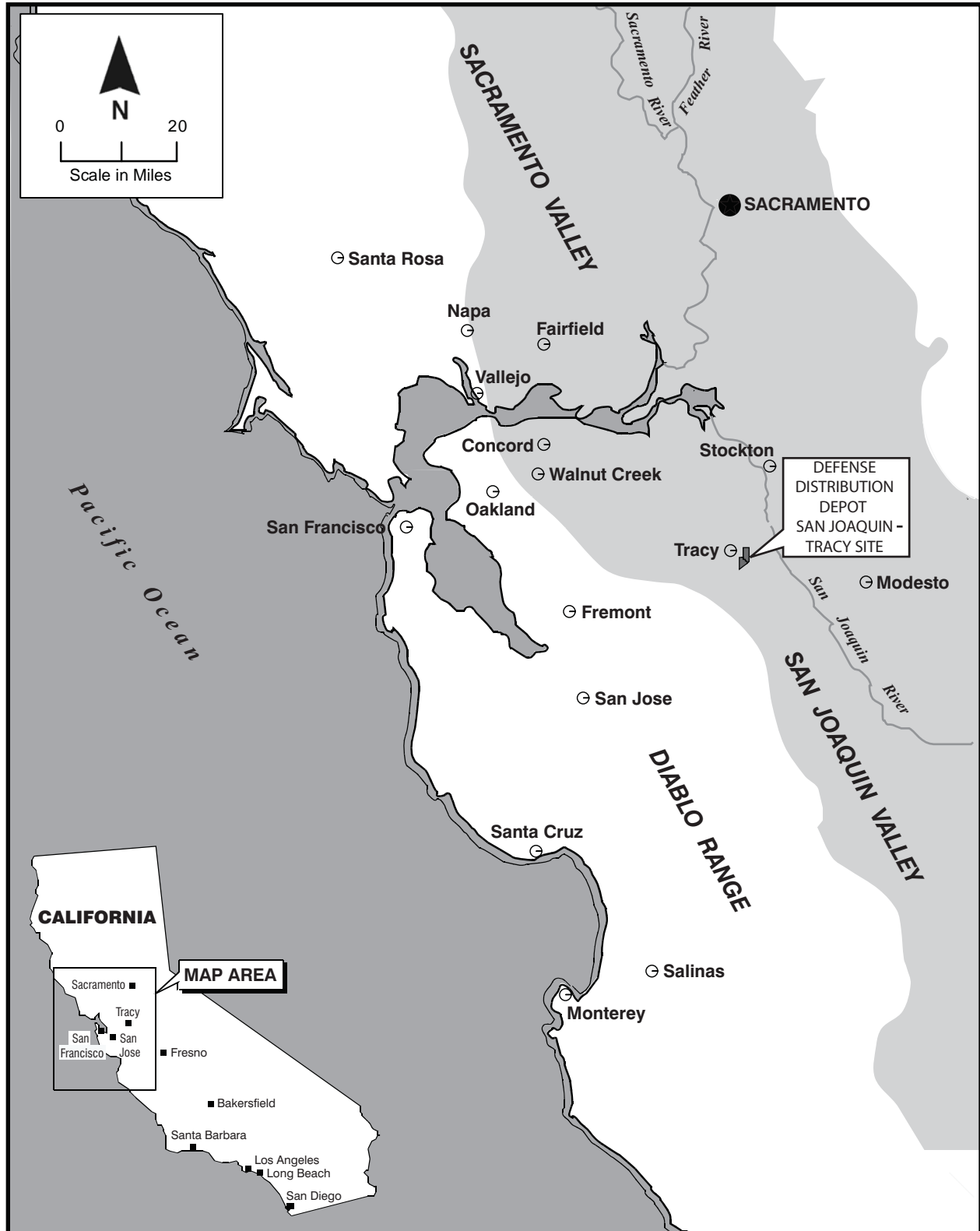
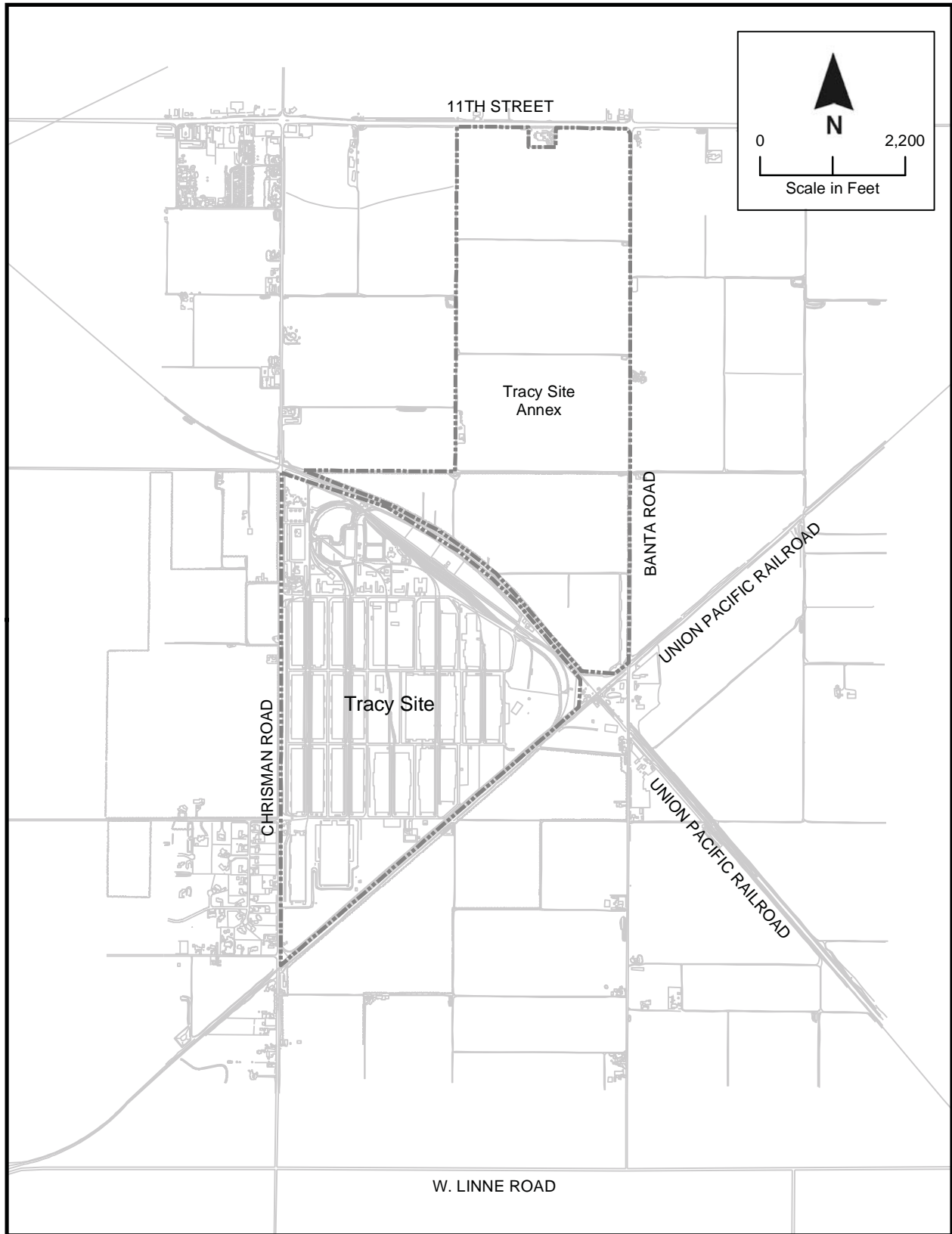
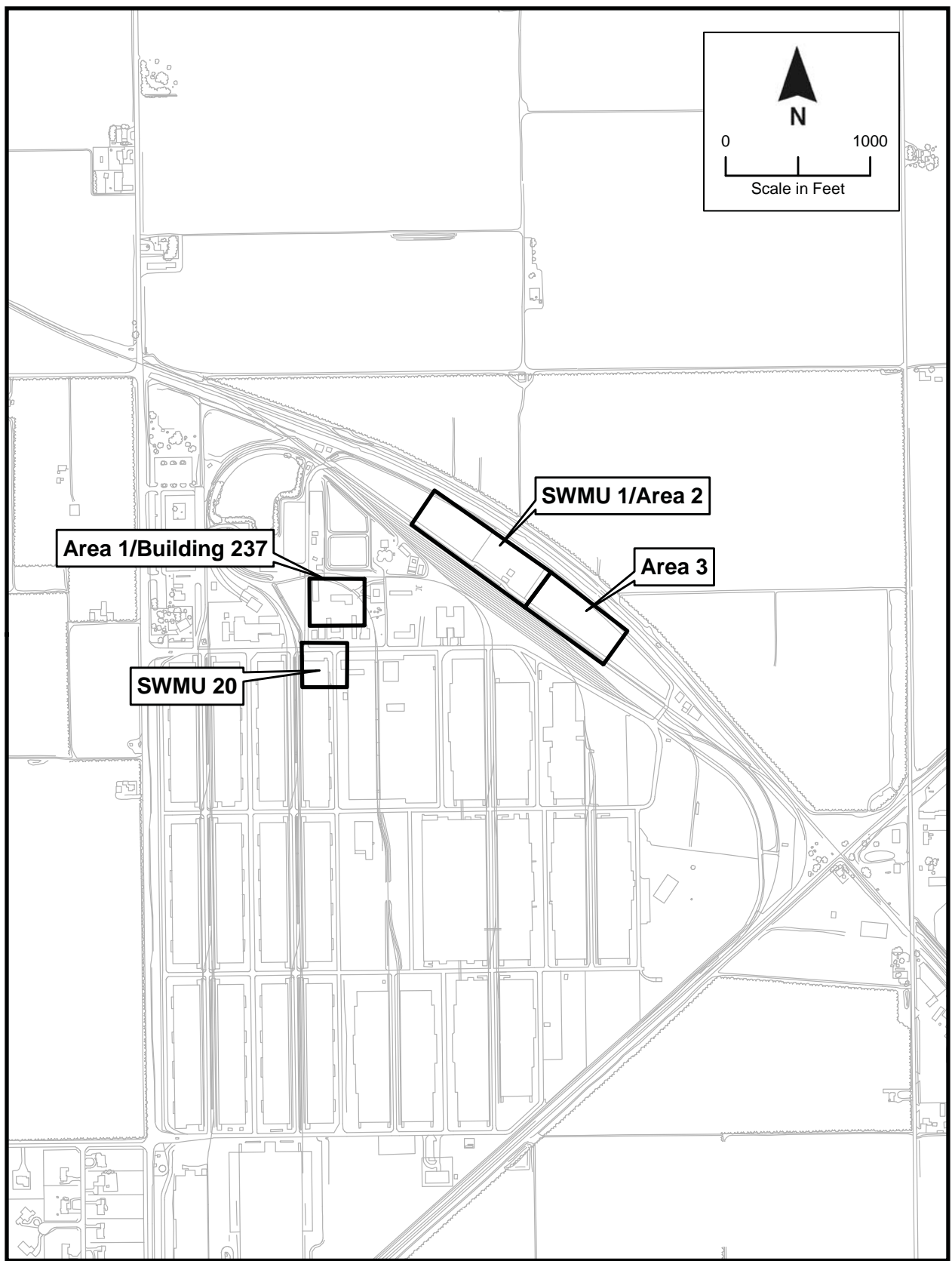


Figure 1-1. Location Map - Tracy Site



**Figure 1-2. Site Vicinity Map, Tracy Site**



**Figure 1-3. Location of SWMU 20, Area 1/Building 237, SWMU 1/Area 2, and Area 3 - Tracy Site**

## **2.0 MODIFICATION OF THE 1998 ROD RAOs AND VADOSE ZONE CLEANUP STANDARDS**

This section presents the basis and description of the modifications to the 1998 ROD RAOs and the vadose zone cleanup standards. For comparison, the current 1998 ROD sections and the proposed modifications to those sections are presented side-by-side in Table 2-1. The proposed RAO modifications include the addition of protectiveness of human health and the environment. The proposed modifications to the vadose zone cleanup standards include the replacement of the vadose zone cleanup goal with the termination of the SVE operations and the evaluation of risks to human health and the environment.

### **2.1 1998 ROD Cleanup Standard for PCE and TCE**

The 1998 ROD specified cleanup standards for PCE and TCE concentrations in soil gas are 5.4 µg/L (780 parts per billion by volume [ppbv]) and 1.9 µg/L (350 ppbv), respectively. The cleanup standards for PCE and TCE were derived using Henry's Law for the equilibrium relationship for a chemical existing in liquid and gas phases in contact with each other. Therefore, the 1998 ROD specified cleanup standard is based on the concentration of PCE and TCE in soil gas that is in equilibrium with a PCE and TCE concentration of 5 µg/L in groundwater. The cleanup standard set for PCE and TCE is protective for groundwater, at the MCL, at the interface between soil gas in contact with the groundwater surface. The calculations using Henry's Law resulting in the cleanup standards for PCE and TCE are presented in Appendix P of the *Comprehensive Remedial Investigation/Feasibility Study Report* (Montgomery Watson, 1996a).

### **2.2 Basis for the Change**

In 1996, a BRA was performed to evaluate whether chemical concentrations in soil pose a threat to human, plant, and animal health or pose a threat to background groundwater quality. The BRA concluded that chemicals do not present a risk to human, plant or animal health, but do present a threat to background groundwater quality. The BRA did not model human health risks associated with vapor intrusion pathways. Based on soil lithology and depths to groundwater, calculations were performed to estimate chemical concentrations, referred to as cleanup standards, which could remain in the vadose zone while not degrading background groundwater quality (Montgomery Watson, 1996b).

The RAOs presented in the 1998 ROD were developed to be protective of background groundwater quality. Table 2-1 presents both the existing and the proposed modifications to the 1998 ROD RAOs. The proposed modified RAOs include protectiveness of human health and the environment.

As presented in Table 2-1, the 1998 ROD states that the vadose zone cleanup can be achieved at Area 1/Building 237, SWMU 1/Area 2, Area 3, and SWMU 20 when all three of the cleanup criteria are achieved. The DLA deems that the vadose zone will not be considered cleaned unless the selected remedies are protective of human health and the environment. This ESD revises the 1998 ROD Sections 9.6.5 and 9.7.5.10 from "*The vadose zone cleanup will be achieved when:*" to "The SVE system operations will be discontinued when:" (Table 2-1).

As described below, this ESD will change the word "and" to the word "or" after item #1 in Sections 9.6.5 and 9.7.5.10 of the 1998 ROD so that if either item #1 alone is achieved or when item #2 and item #3 are demonstrated, the SVE remedy at Area 1/Building 237, SWMU 1/Area 2, Area 3, and SWMU 20 can be considered complete. The basis for the proposed changes are:

1. SVE remedy completion item #1 requires that the most recent concentrations of TCE and/or PCE in soil gas are equal to or below the cleanup standards presented in the 1998 ROD. Once item #1

has been achieved, TCE and/or PCE can no longer significantly degrade background groundwater quality above the ACL. Therefore, completion of item #2 and item #3 is not necessary.

2. If item #1 has not been met, then completion of both item #2 and item #3 are required to discontinue SVE system operations . Item #2 will be completed prior to performing item #3. . Item #2 will require optimizing the SVE system operations and performing an evaluation of the cumulative mass removed from SVE system operation to determine if asymptotic conditions exist. Once it is demonstrated that asymptotic conditions exist, rebound samples will be collected. If rebound concentrations are less than the 1998 ROD cleanup goals, the SVE system operations will be discontinued as described under item #1 above. If the rebound concentrations exceed the cleanup goals then item #3 will be performed.
3. If item 2 is met and Item #3 can be met by demonstrating that the remaining TCE and/or PCE concentrations in soil gas can no longer cause leachate concentrations to exceed their respective ACLs, then SVE system operations will be discontinued.
4. The 1998 ROD selected remedy of SVE at subject sites was only designated for groundwater protection.

## **2.3 Description of Significant Differences**

### **2.3.1 Modified 1998 ROD RAOs**

The intent of the 1998 ROD was to prevent degradation of background groundwater quality. The modified RAOs, presented below, include the statement “Will be protective of human health and the environment”. This ESD proposes to change Sections 7.4.1 and 7.5.5.1 of the 1998 ROD with the following:

#### **Section 7.4.1 Remedial Action Objectives:**

- Will be protective of human health and the environment.
- Will prevent the migration of the following VOCs in soil that could cause groundwater contamination:
  - SWMU 1/Area 2 – PCE and TCE;
  - Area 1 Building 237 – PCE and TCE; and
  - Area 3 – PCE and TCE.

#### **Section 7.5.5.1 Remedial Action Objectives. The RAOs for SWMU 20:**

- Will be protective of human health and the environment.
- Will prevent the migration of the following COCs in the soil that could cause groundwater contamination that exceeds appropriate regulatory standards and health based concentrations:
  - VOCs (TCE, ethylbenzene, and xylenes);
  - Semi-volatile organic compounds (SVOCs) (diethylphthalate, 2,4-dinitrophenol, pentachlorophenol [PCP], and 2,4,6-trichlorophenol);



- Pesticides and herbicides (dieldrin, methiocarb, 2-methyl-4-chlorophenoxyacetic acid [MCPA], and linuron); and
- Petroleum hydrocarbon (diesel).

### **2.3.2 Modified 1998 ROD Selected Remedy Decision Standards**

Completion of item #1 alone or item #2 can be demonstrated will satisfy the RAOs for the SVE selected remedy. Sections 9.6.5, 9.6.6, 9.7.5.10, and 9.7.5.11 of the 1998 ROD will be replaced with the following:

**Section 9.6.5** The SVE system operations will be discontinued when:

1. The most recent concentrations of TCE and PCE present in soil gas are equal to or less than the cleanup standard. If the cleanup standard is met then no additional evaluations will be necessary;  
  
or
2. When the cumulative mass removed by the SVE system has reached asymptotic levels after performing SVE system operation optimization, with rebound concentrations remaining above the cleanup standards; and
3. It is demonstrated that the remaining TCE and PCE can no longer cause leachate concentrations to exceed the aquifer cleanup standards.

**Section 9.6.6** The risk to human health from current levels of TCE and PCE in the soil is within the acceptable range for the current and anticipated future industrial use of the site, but not for unrestricted use (e.g., residential use). Therefore LUCs are in place that limit possible exposure. After SVE operations have been discontinued, in accordance with the groundwater protection standards above, the human health risk from remaining TCE and PCE present in the vadose zone will be evaluated. The acceptable human health risk range is  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$  for cancer risks, with a non-cancer hazard index of less than 1. The acceptable risk and hazard estimates and the achievement of the RAOs shall be used as requirements to establish no further action. If the no further action requirements are not met for an unrestricted reuse scenario, LUCs will be retained to protect human health and the environment. If it can be later demonstrated that the no further action requirements for an unrestricted reuse scenario have been achieved, then the LUCs will be removed or modified using a Memo to File decision document.

Sections 9.7.5.10 and 9.7.5.11 of the 1998 ROD will be replaced with the following:

**Section 9.7.5.10** The SVE system operations will be discontinued when:

1. The most recent concentrations of TCE present in soil gas are equal to or less than the cleanup standard. If the cleanup standard is met then no additional evaluations will be necessary; or
2. The cumulative mass removed from SVE system operation has reached asymptotic levels after performing SVE system operation optimization, with rebound concentrations remaining above the cleanup standards; and
3. It is demonstrated that the remaining TCE can no longer cause leachate concentrations to exceed the aquifer cleanup standards.



**Section 9.7.5.11** The risk to human health from current levels of TCE and PCE in the soil is within the acceptable range for the current and anticipated future industrial use of the site, but not for unrestricted use (e.g., residential use). Therefore LUCs are in place that limit possible exposure. After SVE operations have been discontinued, in accordance with the groundwater protection standards above, the human health risk from remaining TCE and PCE present in the vadose zone will be evaluated. The acceptable human health risk range is  $1 \times 10^{-4}$  to  $1 \times 10^{-6}$  for cancer risks, with a non-cancer hazard index of less than 1. The acceptable risk and hazard estimates and the achievement of the RAOs shall be used as requirements to establish no further action. If the no further action requirements are not met for an unrestricted reuse scenario, LUCs will be retained to protect human health and the environment. If it can be later demonstrated that the no further action requirements for an unrestricted reuse scenario have been achieved, then the LUCs will be removed or modified using a Memo to File decision document.

**Table 2-1. Proposed Modifications to the 1998 ROD - Tracy Site**

Existing 1998 ROD	Proposed Modifications
<p><b>Section 7.4.1 Remedial Action Objectives:</b></p> <p><i>Prevent the migration of the following VOCs in soil that could cause groundwater contamination:</i></p> <ul style="list-style-type: none"> <li>- SWMU 1/Area 2 – PCE and TCE;</li> <li>- Area 1/Building 237 – PCE and TCE; and</li> <li>- Area 3 – PCE and TCE.</li> </ul> <p><i>To reach this RAO, site-specific soil cleanup levels were developed that are protective of the background groundwater quality.</i></p>	<p><b>Section 7.4.1 Remedial Action Objectives:</b></p> <ul style="list-style-type: none"> <li>• Will be protective of human health and the environment.</li> <li>• Prevent the migration of the following VOCs in soil that could cause groundwater contamination:                             <ul style="list-style-type: none"> <li>- SWMU 1/Area 2 – PCE and TCE;</li> <li>- Area 1/Building 237 – PCE and TCE; and</li> <li>- Area 3 – PCE and TCE.</li> </ul> </li> </ul>
<p><b>Section 7.5.5.1 Remedial Action Objectives. The RAO for SWMU 20:</b></p> <ul style="list-style-type: none"> <li>• <i>Prevent the migration of the following COCs in the soil that could cause groundwater contamination that exceeds appropriate regulatory standards and health based concentrations:</i> <ul style="list-style-type: none"> <li>- VOCs (TCE, ethylbenzene, and xylenes);</li> <li>- Semi-volatile organic compounds (SVOCs) (diethylphthalate, 2,4-dinitrophenol, pentachlorophenol [PCP], and 2,4,6-trichlorophenol);</li> <li>- Pesticides and herbicides (dieldrin, methiocarb, 2-methyl-4-chlorophenoxyacetic acid [MCPA], and linuron); and</li> <li>- Petroleum hydrocarbon (diesel).</li> </ul> </li> </ul>	<p><b>Section 7.5.5.1 Remedial Action Objectives. The RAOs for SWMU 20:</b></p> <ul style="list-style-type: none"> <li>• Will be protective of human health and the environment.</li> <li>• Prevent the migration of the following COCs in the soil that could cause groundwater contamination that exceeds appropriate regulatory standards and health based concentrations:                             <ul style="list-style-type: none"> <li>- VOCs (TCE, ethylbenzene, and xylenes);</li> <li>- Semi-volatile organic compounds (SVOCs) (diethylphthalate, 2,4-dinitrophenol, pentachlorophenol [PCP], and 2,4,6-trichlorophenol);</li> <li>- Pesticides and herbicides (dieldrin, methiocarb, 2-methyl-4-chlorophenoxyacetic acid [MCPA], and linuron); and</li> <li>- Petroleum hydrocarbon (diesel).</li> </ul> </li> </ul>

**Table 2-1. (Continued)**

<b>Existing 1998 ROD</b>	<b>Proposed Modifications</b>
<p><b>Section 9.6.5</b> <i>The vadose zone cleanup will be achieved when:</i></p> <ol style="list-style-type: none"> <li>1. <i>The concentrations of PCE and TCE present in soil gas are equal to or less than the cleanup standard;</i></li> <li>2. <i>It is demonstrated that the remaining TCE and PCE can no longer cause leachate concentrations to exceed the aquifer cleanup standards; and</i></li> <li>3. <i>TCE and PCE have been removed to the extent technically and economically feasible. This evaluation will include, at a minimum, the following factors:</i> <ol style="list-style-type: none"> <li>a. <i>The total cost and duration of continued operation of the SVE system until aquifer cleanup standards are met.</i></li> <li>b. <i>The total cost and duration of continued groundwater treatment to meet aquifer cleanup standards.</i></li> <li>c. <i>The incremental cost (cost benefit) of continued operation of the SVE system on the basis of a cost per pound of contaminant removal if the underlying groundwater has not attained aquifer cleanup standards.</i></li> </ol> </li> </ol>	<p><b>Section 9.6.5</b> The SVE system operations will be discontinued when:</p> <ol style="list-style-type: none"> <li>1. The most recent concentrations of TCE and PCE present in soil gas are equal to or less than the cleanup standard. If the cleanup standard is met then no additional evaluations will be necessary; or</li> <li>2. The cumulative mass removed from SVE system operation has reached asymptotic levels after performing SVE system operation optimization, with rebound concentrations remaining above the cleanup standards; and</li> <li>3. It is demonstrated that the remaining TCE and PCE can no longer cause leachate concentrations to exceed the aquifer cleanup standards.</li> </ol>

**Table 2-1. (Continued)**

Existing 1998 ROD	Proposed Modifications
<p><b>Section 9.6.6</b> <i>The signatory parties to the ROD will jointly decide when the cleanup of volatile organic COCs in the vadose zone has been achieved and when the SVE system will be shut off permanently. The evaluation of technical and economical feasibility that will serve as the basis for this decision will be a primary document.</i></p>	<p><b>Section 9.6.6</b> The risk to human health from current levels of TCE and PCE in the soil is within the acceptable range for the current and anticipated future industrial use of the site, but not for unrestricted use (e.g., residential use). Therefore LUCs are in place that limit possible exposure. After SVE operations have been discontinued, in accordance with the groundwater protection standards above, the human health risk from remaining TCE and PCE present in the vadose zone will be evaluated. The acceptable human health risk range is <math>1 \times 10^{-4}</math> to <math>1 \times 10^{-6}</math> for cancer risks, with a non-cancer hazard index of less than 1. The acceptable risk and hazard estimates and the achievement of the RAOs shall be used as requirements to establish no further action. If the no further action requirements are not met for an unrestricted reuse scenario, LUCs will be retained to protect human health and the environment. If it can be later demonstrated that the no further action requirements for an unrestricted reuse scenario have been achieved, then the LUCs will be removed or modified using a Memo to File decision document.</p>
<p><b>Section 9.7.5.10</b> <i>The vadose zone cleanup will be achieved when:</i></p> <ol style="list-style-type: none"> <li>1. <i>The concentrations of TCE present in soil gas are equal to or less than the cleanup standard;</i></li> <li>2. <i>It is demonstrated that the remaining TCE can no longer cause leachate concentrations to exceed the aquifer cleanup standards; and</i></li> <li>3. <i>TCE has been removed to the extent technically and economically feasible. This evaluation will include, at a minimum, the following factors:</i> <ol style="list-style-type: none"> <li>a. <i>The total cost and duration of continued operation of the SVE system until aquifer cleanup standards are met.</i></li> <li>b. <i>The total cost and duration of continued groundwater treatment to meet aquifer cleanup standards.</i></li> <li>c. <i>The incremental cost (cost benefit) of continued operation of the SVE system on the basis of a cost per pound of contaminant removal if the underlying groundwater has not attained aquifer cleanup standards.</i></li> </ol> </li> </ol>	<p><b>Section 9.7.5.10</b> The SVE system operations will be discontinued when:</p> <ol style="list-style-type: none"> <li>1. The most recent concentrations of TCE present in soil gas are equal to or less than the cleanup standard. If the cleanup standard is met then no additional evaluations will be necessary; or</li> <li>2. The cumulative mass removed from SVE system operation has reached asymptotic levels after performing SVE system operation optimization, with rebound concentrations remaining above the cleanup standards; and</li> <li>3. It is demonstrated that the remaining TCE can no longer cause leachate concentrations to exceed the aquifer cleanup standards.</li> </ol>

**Table 2-1. (Continued)**

Existing 1998 ROD	Proposed Modifications
<p><b>Section 9.7.5.11</b> <i>The signatory parties to the ROD will jointly decide when the cleanup of volatile organic COCs in the vadose zone has been achieved and when the SVE system will be shut off permanently. The evaluation of technical and economical feasibility that will serve as the basis for this decision will be a primary document.</i></p>	<p><b>Section 9.7.5.11</b> The risk to human health from current levels of TCE and PCE in the soil is within the acceptable range for the current and anticipated future industrial use of the site, but not for unrestricted use (e.g., residential use). Therefore LUCs are in place that limit possible exposure. After SVE operations have been discontinued, in accordance with the groundwater protection standards above, the human health risk from remaining TCE and PCE present in the vadose zone will be evaluated. The acceptable human health risk range is <math>1 \times 10^{-4}</math> to <math>1 \times 10^{-6}</math> for cancer risks, with a non-cancer hazard index of less than 1. The acceptable risk and hazard estimates and the achievement of the RAOs shall be used as requirements to establish no further action. If the no further action requirements are not met for an unrestricted reuse scenario, LUCs will be retained to protect human health and the environment. If it can be later demonstrated that the no further action requirements for an unrestricted reuse scenario have been achieved, then the LUCs will be removed or modified using a Memo to File decision document.</p>

Notes:

COC = chemical of concern	RAO = remedial action objective	SWMU = solid waste management unit
LUC = land use control	ROD = record of decision	TCE = trichloroethene
MCPA = 2-methyl-4-chlorophenoxyacetic acid	SVE = soil vapor extraction	TPH = total petroleum hydrocarbons
PCE = tetrachloroethene	SVOC = semi-volatile organic compound	VOC = volatile organic compound
PCP = pentachlorophenol	Tracy Site = Defense Distribution Depot San Joaquin - Tracy Site	

### **3.0 INCORPORATE LAND USE CONTROLS REMEDY AT AREA 1/BUILDING 237**

This section presents a description of the Area 1/Building 237 site, identifies sources of contamination, the chronology of investigation and remediation activities, and summarizes the human health risk from exposure to subsurface contaminants of concern. This section also describes the addition of LUCs to the site remedy and the basis for this change.

#### **3.1 Introduction**

Soil and soil gas contamination at Area 1/Building 237 are the result of past releases to the environment from mission-related activities at the Tracy Site. From 2000 to 2010 SVE was employed intermittently to remediate soil and soil gas. Although the SVE remedy has met the RAO for groundwater protection, residual soil gas concentrations may pose human health risks to occupants of future buildings on the Area 1/Building 237 site. LUCs will be implemented to mitigate risks associated with human health and the environment.

##### **3.1.1 Site Location**

The Area 1/Building 237 site is located in the North-central portion of the Tracy Site (Figure 1-3). Site features include Building 237 located in the central portion of Area 1/Building 237 site, the industrial waste pipeline (IWPL) (known as SWMU 33) is located west of Building 237, an arcuate-shaped abandoned rail spur located to the north and east, and a relatively large open paved area located south of Building 237. Building 237 consists of a metal frame structure on a concrete slab floor and foundation with a footprint of approximately 45-70 feet wide and 150 feet long. The remaining surface of Area 1 is currently covered with asphalt surrounding Building 237 and a small area of gravel associated with the abandoned railroad spur located north of Building 237. Site features are identified on Figure 3-1.

##### **3.1.2 Potential Sources**

In the 1996 RI/FS, and subsequently in the 1998 ROD, the site was evaluated because groundwater was impacted with PCE and TCE as a result of past activities. A description of the potential contaminant sources at Area 1/Building 237 are summarized below and a history of remedial investigations and remedial actions are presented in Table 3-1:

- Site is close to SWMU 33, the abandoned IWPL.
- Building 237 was formerly used for cleaning asphalt tools and equipment.
- Solvents were formerly used and/or stored in this area.

##### **3.1.3 Land Use**

The Area 1/Building 237 site is primarily paved with asphalt and covered by buildings. Review of historical aerial photographs and facility maps show that the Area 1/Building 237 site was part of a fenced compound bounded by West Street, the railroad tracks and by Ennis Street. In 1969, Building 237 was reportedly constructed. However, prior to its construction, several buildings and sheds were located at this site as follows:

- Former Building 228 was a small paint shed used for storing paint and painting tools. It was located northwest of the existing Building 231 and was demolished in the late 1980's.

- Former Building 234 (reportedly demolished prior to 1975) was located approximately 50 feet to the south of the current Building 237 location
- Former Building 236, which was in operation prior to May 1956, was located immediately west of the existing Building 237. This building was demolished prior to 1975.
- Several small sheds were located immediately north and along the east side of the existing Building 237. These sheds were removed with the construction of Building 237.

Building 238 was constructed between 1968 and 1975. This is the entomology building which had been and is currently used for pesticide mixing and storage. The IWPL (SWMU 33) transects the Area 1/Building 237 site. In 1972, the IWPL was constructed by interconnecting existing pipelines and storm drain lines and discharged into the industrial waste ponds located to the north. VOC and pesticides releases are associated with the IWPL.

A portion of Building 237 is currently used as a stock room to store various parts, small power tools, and supplies related to Tracy Site operations. Since 1978 the interior west side of Building 237 has been used as the Tracy Site carpentry and paint shop. The exterior area adjacent to the north and west of the building are currently used for storing equipment (pipe rods, barricades, sand bags, signs, electric motors, and other miscellaneous equipment). In 1996, it was reported that the Area 1/Building 237 site was used for cleaning of asphaltting tools and equipment and solvents had historically been used and/or stored around Building 237 (Montgomery Watson, 1996a).

Building 220 houses water treatment equipment and Building 221 is used for water storage. Building 231 serves as occupational therapy center with associated offices, Building 232 provides office space, and the existing Building 236 (west of Building 237) is an open-air structure used as covered storage for heavy equipment.

### **3.2 CERCLA History at Area 1/Building 237**

In 1972, the IWPL (SWMU 33) was constructed by interconnecting existing pipelines and storm drain lines. The IWPL connected Building 238 to the northeast of Area 1/Building 237 site, former Warehouse 10, Buildings 221 and 228 located southwest of the Area 1/Building 237 site, and Building 236. The IWPL discharged into the industrial waste ponds located just north of the site. In 1991, as part of the SWMU 33 IWPL investigation, soil samples were collected at various locations along the IWPL. The results of the IWPL investigation indicated that pesticides were detected at several locations. The IWPL is located to the southwest, west, north and northeast of the site.

In 1992, a Phase I and II RI was conducted at Building 236 to assess the presence or absence of contamination associated with solvent storage activities and the IWPL. Building 236 is located directly west of Building 237. The results of the investigations indicated that there had not been a release of contaminants associated with the solvent storage activities and that no further action was required at Building 236 (Montgomery Watson, 1996a).

In 1996, Area 1/Building 237 was evaluated in the BRA as part of Exposure Unit (EU) 8, a larger area containing several other sites. The calculated cancer risk for the construction worker at EU 8 was  $5 \times 10^{-6}$  and the calculated hazard index was 0.3. The BRA concluded that because Area 1/Building 237 does not substantially contribute to the potential risks at EU 8 that the actual cancer risk associated with this site is expected to be less than  $1 \times 10^{-6}$  (Montgomery Watson, 1996b). The BRA evaluated exposure pathways (not including indoor air quality) that could be detrimental to human health and the environment.



The 1998 ROD designated SVE as the remedy at Area 1/Building 237 to be protective of potential and continued groundwater impacts from TCE and PCE. The cleanup standards, based on impacts to groundwater, for TCE and PCE were 350 ppbv and 780 ppbv, respectively.

In 1998, soil gas samples were collected from 15 cone penetrometer test (CPT) locations at depths typically between 5 and 15 feet below ground surface (bgs). Laboratory analysis indicated concentrations exceeding the 1998 ROD cleanup standard for TCE and PCE. TCE concentrations ranged from below detection limits to 15,000 ppbv, whereas PCE concentrations ranged from below detection limits to 10,000 ppbv (Radian International, 1998).

Also in 1998, as part of an SVE pilot study, one vapor extraction well (VE0002) and four vapor monitoring wells (VM0005, VM0006, VM0007, and VM0008) were installed north of Building 237. An investigation derived waste (IDW) composite sample collected after the installation of these wells had hazardous concentrations of pesticides. It was concluded at that time that the detections were de minimis and that an additional investigation was not warranted (URS, 2000).

In 2000, the 1998 ROD selected remedy (SVE) was installed. From 2000 to 2005, the SVE system operated intermittently.

In 2008, a soil gas and groundwater CPT investigation and a soil gas vapor monitoring and extraction well sampling event were conducted at select locations. The results of the investigation and sampling event indicated that groundwater has not been impacted by VOCs above the ACL, and that soil gas exceeded the 1998 ROD cleanup standard at several locations. Because Area 1/Building 237 had several locations with PCE concentrations in excess of the cleanup standards in the vadose zone, a full STOP analysis was not performed for this area. Instead, to quantify the vadose zone leachate concentration, only VLEACH modeling was performed. Vadose zone modeling suggested that remaining soil gas concentrations will allow leachate concentrations above the ACLs, which could have a negative impact on groundwater quality (URS, 2009a). Based on the vadose zone modeling results from the 2008 investigation it was determined that SVE enhancement by pneumatic fracturing of the subsurface soil would assist in the removal of residual TCE and PCE mass.

In February 2009, the pneumatic fracturing was performed and the SVE system was operated at VE0047, VE0048, and VE0049 for a duration of 4 weeks.

In June 2009, the full scale pneumatic fracturing was performed and the SVE system was operated intermittently between June and September 2009. During the installation of vapor monitoring and vapor extraction wells, as part of a SVE enhancement program north of Building 237, a strong chemical odor was noted in the soil cuttings from one of the new vapor extraction wells. The results from this IDW sampling indicated that several pesticides were detected above the U.S. EPA Regional Screening Levels (RSLs). In September 2009, the SVE system was shutdown due to PCE and TCE concentrations below the 1998 ROD cleanup standards.

In October 2009, hand auger sampling was conducted in the vicinity of VE0002, VE0051, VM0005, VM0006, VM0007, and VM0008. The results indicated that several pesticides exceeded the residential RSLs for soil. The hand auger and vapor well and locations are presented on Figure 3-2.

Between 30 November and 2 December 2009, soil gas samples were collected from each existing vapor extraction well, vapor monitor well, and air injection well located at the site (URS, 2010). In addition, one soil gas and one groundwater sample was collected at monitoring well LM192AU. The soil gas samples were analyzed by U.S. EPA Method TO-15 and the groundwater sample was analyzed by U.S.



EPA Method 8260B. The results indicated that soil gas concentrations for PCE and TCE were greater than the soil gas cleanup standards at several wells sampled (Table 3-2 and Figure 3-1).

In January 2010, modeling was performed on the soil gas samples collected in late 2009 to assess the potential for residual PCE and TCE concentration in soil to impact the groundwater. The modeling results indicated that the TCE leachate concentrations were not predicted to exceed the groundwater ACLs (5 µg/L). For the northern area, PCE in the vadose zone is also not expected to produce leachate concentrations greater than the ACL. However, for the southern area, modeling predicted PCE leachate concentrations slightly greater than the ACL. Using the sampling results, the predicted PCE leachate concentration starts at a maximum of 5.1 µg/L and declines with time (URS, 2010). Based on the results of the modeling, the SVE system was shut down.

In February 2011, a shallow soil and groundwater RI was conducted at the site to determine the extent of pesticide impacts. The results of this investigation indicate that pesticide impacts are present in the shallow soil, but that groundwater collected from on-site as well as off-site, down gradient monitoring wells were not impacted.

In April 2011, a supplemental RI was conducted to determine the lateral extent of pesticide impacts to shallow soils at Area 1 / Building 237. The data collected during the supplemental RI is currently being evaluated and will be presented in an Engineering Evaluation / Cost Analysis report.

### **3.3 Potential Site Risk**

#### **3.3.1 Human Health**

The 1996 BRA did not evaluate human health risks associated with vapor intrusion. Thus, the results of soil gas samples collected in November and December 2009 were used to evaluate risk associated with the vapor intrusion pathway. The soil gas results were compared to U.S. EPA industrial screening level for shallow soil gas in commercial/industrial land use for PCE and TCE. The U.S. EPA industrial screening level for PCE and TCE in ambient air in a commercial/industrial setting is 0.31 ppbv and 1.135 ppbv, respectively. Based on the U.S. EPA's generic screening attenuation factor for soil greater than 5 feet bgs (a dimensionless value of 0.01 [U.S. EPA, 2002]), the soil gas screening levels for PCE and TCE are 31 ppbv and 113.5 ppbv, respectively. 29 of the 35 soil gas samples collected for PCE and four soil gas samples collected for TCE exceeded the U.S. EPA screening level concentrations for commercial/industrial land use (Figure 3-1).

Although the results of soil gas samples collected in 2009 indicate that PCE and TCE are detected in soil gas at concentrations in excess of the U.S. EPA screening level, the exceedence does not indicate that adverse impacts to human health are occurring or will occur, but suggests that further evaluation of the potential human health concerns is warranted (U.S. EPA, 2002).

In the spring of 2011, the DLA further evaluated the potential human health concerns associated with vapor intrusion to indoor air. In March and May 2011, indoor air samples were collected from Buildings 237 and 231, respectively. The indoor air sample locations for Building 231 are shown on Figure 3-3. As presented on Table 3-4, chlorinated solvents were detected in the indoor air samples collected from Building 231, but at concentrations less than U.S. EPA industrial screening levels. The results from the Building 237 indoor air sampling, as presented in Appendix B, indicate that chlorinated solvents were not detected above laboratory reporting limits. Additionally, Building 220 (an above ground water storage tank) and Building 236 (an open air structure used to store equipment) were not evaluated because they are unoccupied structures.

### **3.3.2 Ecological**

In 1999, a planning level biological inventory was conducted at the Tracy Site, including the Annex property. The assessment was completed under an interagency agreement between the United States Department of Agriculture (USDA) Forest Service and the Army Environmental Center. The findings from this study pertaining to ecological receptors are presented below:

- There have been reported sightings of foxes, rabbits, ground squirrels, hawks, and various birds and waterfowl. However, due to extensive agricultural and industrial activity, no known suitable habitat exists to support a viable population of animal species, despite incidental use by some wildlife.
- A search of the California Natural Diversity Database for rare, threatened and endangered (RTE) species revealed six plant species with some degree of rarity that are known to occur in the area. Although there are potential suitable habitat conditions for RTE botanical species, none were found in the installation. Although suitable habitat exists for three federally-listed RTE terrestrial species, none were found and there are no records of any RTE species within a two-mile radius of the installation (U.S. Army Corps of Engineers [USACE] and U.S. Forestry Service [USFS], 1999).

In 2010, burrowing owls were observed on the Annex portion of the Tracy Site. However, because the ground surface at Area 1/Building 237 has been covered as part of industrial activities, no known suitable habitat exists to support a viable population of burrowing owls at Area 1/Building 237.

Available data do not indicate the presence of any ecological receptors at this site. Therefore, there are no discernable, measurable or potential adverse effects to ecological receptors from chemicals in soil at this site.

### **3.4 Current Remedy at Area 1/Building 237**

In the 1998 ROD, the remedy selected for Area 1/Building 237 was SVE (Radian International, 1998). From 2000 to 2005 and February through September 2009, the SVE system was operated intermittently until concentrations were reduced to a level that warranted evaluation.

In January 2010, DLA requested discontinuation of the SVE system. The SVE system was shut down based on the VLEACH modeling results which suggested a low potential for groundwater impact.

### **3.5 Additional Proposed Remedy at Area 1/Building 237**

The LUC implementation details, as specified in the *Sample Federal Facility Land Use Control ROD Checklist with Suggested Language* (EPA, 2006), are presented in Section 1.5 of this ESD. A site specific description of the proposed LUCs is presented in Table 3-3 and the LUC boundary is shown on Figure 3-4. The proposed site specific LUC followed the LUC procedures outlined in the 2001 ESD (URS, 2001). The LUC boundary was defined by the estimated contours of the U.S. EPA industrial soil gas screening levels for PCE and TCE.

### **3.6 Basis for the Change at Area 1/Building 237**

The following represent the basis for the change to incorporate LUCs at Area 1/Building 237 as a remedy to mitigate risks to human health and the environment from potential vapor intrusion pathways:

- SVE system modeling suggests SVE operations have mitigated future groundwater impacts above the ACLs; and
- On 09 March 2011 indoor air samples were collected at Building 237 by the Tracy Site industrial hygienist. The results of the indoor air sampling at Building 237, presented in Appendix B, indicate that PCE and TCE were not detected.
- On 26 May 2011 indoor air sampling was completed at Building 231. Based on these sampling results, indoor air at Building 231 contains chlorinated solvents at concentrations less than U.S. EPA industrial screening levels. Table 3-4 presents the results.

### **3.7 Description of Significant Differences**

Although the groundwater is no longer threatened and the concentrations of PCE and TCE in indoor air indicate it is not necessary to take remedial action to respond to any current risk to human health, the soil gas levels of PCE and TCE exceed U.S. EPA soil gas screening level concentrations for commercial/industrial land use. Therefore, the potential for human health risks does not allow for unrestricted use of the site. The proposed LUCs, presented in Table 3-3 and shown on Figure 3-4, will minimize potential human health risk to occupants of future buildings via the indoor air pathway until which time it can be determined that the potential risk from soil gas is below the U.S. EPA soil gas screening level concentrations for PCE and TCE, allowing for unrestricted use.

**Table 3-1. Historical Investigations and Remedial Actions, Area 1/Building 237**

Year	Activity/Event
1987	Soil gas investigation completed. Monitoring well LM061AU installed.
Early 1990s	Phase I and Phase II RIs conducted.
1994	Monitoring well LM137A installed.
1996	Area 1/Building 237 RI results published in <i>DDRW-Tracy California, Comprehensive Remedial Investigation/Feasibility Study. Volumes I, II and III</i> (Montgomery Watson, 1996a). PCE determined to have been released in Site soils and poses a threat to groundwater.
1998	Area 1/Building 237 pilot SVE system installed; SVE operations begin. DDT is detected in an IDW composite soil sample collected from several vapor extraction, monitoring wells pipe trenches.
2000 – 2005	Area 1/Building 237 SVE operations (various operational increments).
2008	CPT investigation conducted to determine residual VOC mass in the vadose zone and impacts to groundwater beneath the residual sources. Additional SVE treatment recommended.
January 2009	Groundwater monitoring well LM192AU was installed north of Building 237 to evaluate the potential VOC contaminant impacts to groundwater. VOCs have not been detected above their respective ACLs at this location. Pesticides were sampled and detected in May and July 2010. Pesticides were sampled most recently in February 2011 and the results were non-detect.
Spring 2009	Pneumatic fracturing conducted north of Building 237 and installation of additional SVE and VMP wells as part of enhanced SVE operations. IDW soil sample results indicate elevated concentrations DDT, DDE, and BHC. SVE operations enhanced with pneumatic fracturing begin.
September 2009	The SVE system is shut down for a rebound evaluation.
October 2009	Hand-auger soil investigation conducted in the vicinity of VE0051, VM005, VM006, VM007, and VM008 to 5 feet bgs. Several pesticides detected above residential RSLs.
January 2010	The SVE operation was discontinued based on the vadose zone modeling results.
July 2010	Groundwater samples collected from LM192AU and nearby wells (EW012AU, LM061AU and LM137A) were analyzed for organochlorine pesticides. DDT was detected in a sample from LM192AU slightly above the 1998 ROD-specified concentrations requiring evaluation (i.e. 0.234 µg/L compared to 0.1 µg/L). The other samples were non-detect for pesticides.
February 2011	A remedial investigation was conducted across Area 1 to investigate the presence of pesticides in the shallow soil and groundwater. The results to be published under a separate document (Summer 2011).
March 2011	Indoor air sampling conducted at Building 237. The results for chlorinated solvents were non-detect. (EA, 2011, attached in Appendix C).
May 2011	Indoor air sampling conducted at Building 231. The results for chlorinated solvents were less than the U.S. EPA industrial screening levels.

Notes:

ACL	= aquifer cleanup level	RI	= remedial investigation
bgs	= below ground surface	ROD	= record of decision
BHC	= hexachlorocyclohexane	RPM	= Remedial Project Manager
CPT	= cone penetrometer test	RSL	= Regional Screening Levels
DDE	= dichlorodiphenyldichloroethylene	SVE	= soil vapor extraction
DDT	= dichlorodiphenyltrichloroethane	Tracy Site	= Defense Distribution Depot San Joaquin - Tracy Site
IDW	= Investigation Derived Waste	VOC	= volatile organic compound
PCE	= tetrachloroethene	VMP	= vapor monitoring point

**Table 3-2. TCE and PCE Concentrations in Soil Gas,  
 2009 Investigation, Area 1/Building 237**

Sample Location	Sample Date	Depth (ft bgs)	VOCs (Method SW 8260B) (ppbv)	
			TCE	PCE
AIW-001	11/30/2009	5-13	20	150
AIW-002	11/30/2009	4-9	4.7	140
AIW-003	11/30/2009	4-9	0	9.8
AIW-004	11/30/2009	5-13	0	180
AIW2-001	11/30/2009	5-13	0	27
AIW2-002	11/30/2009	5-13	0	27
LM192AU	12/1/2009	10-24.5	68	240
VE0002	12/1/2009	5-13	46	86
VE0004	12/1/2009	5-13	0	8.4
VE0005	12/1/2009	5-13	0	6.0
VE0006	12/2/2009	5-13	40	35
VE0007	12/2/2009	5-13	250	220
VE0008	12/2/2009	5-13	270	84
VE0009	12/28/2009	5-13	81	710
VE0010	12/2/2009	5-13	19	21
VE0047	11/30/2009	NA	28	210
VE0048	11/30/2009	NA	0	100
VE0049	11/30/2009	NA	14	1200
VE0050	12/1/2009	NA	0	49
VE0051	12/1/2009	NA	22	190
VE0052	12/1/2009	NA	8.3	160
VE0053	12/1/2009	NA	22	220
VM0005	11/30/2009	5-13	66	120
VM0006	11/30/2009	5-13	47	110
VM0007	11/30/2009	5-13	32	120
VM0008	11/30/2009	5-13	11	170
VM0013	12/1/2009	5-13	8.4	63
VM0014D	12/1/2009	11-13	46	86
VM0014S	12/1/2009	5-7	14	30
VM0015	12/2/2009	5-13	60	140
VM0016	11/30/2009	5-13	7.7	91
VM0016	11/30/2009	5-13	7.3	90
VM0017	12/28/2009	5-13	98	700
VM0018	12/2/2009	5-13	170	160
VM0019	12/2/2009	5-13	570	380
VM0020D	12/28/2009	11-13	38	940
VM0020S	12/28/2009	5-7	23	820

Notes:

- ft bgs = feet below ground surface
- NA = data not available
- PCE = tetrachloroethene
- ppbv = parts per billion by volume
- TCE = trichloroethene
- Tracy Site = Defense Distribution Depot San Joaquin - Tracy Site
- VOC = volatile organic compound

**Table 3-3. Proposed Land Use Controls, Area 1/Building 237**

<b>COCs</b>	<b>Land Use Controls</b>	<b>Purpose of Controls</b>	<b>Duration</b>	<b>Actions to Date</b>
PCE TCE	<ul style="list-style-type: none"> <li>Clearly posted signage detailing the LUC and notification procedures for any construction activities or land use changes.</li> <li>Maintain administrative controls (i.e., new provisions stated in the IMP and changes to the notification procedures).</li> <li>Perform annual site inspection and review to ensure compliance with controls and to correct any deficiencies in the existing asphalt pavement/building foundation cover or notification procedure.</li> <li>Follow defined procedures in the event of a change in land use. Site specific procedures will be determined by the Environmental Office, DLA Installation Support at San Joaquin. The procedures include, but are not limited to: PPE of the industrial/construction worker, disposition of contaminated soils encountered during subsurface construction activities, and restoration of the LUC and/or surface condition following construction activities.</li> <li>All future buildings to be constructed with engineered controls specifically designed to prevent the migration of soil gas to indoor air.</li> </ul>	<ul style="list-style-type: none"> <li>Prohibit residential, day care, play area, or school use.</li> <li>Maintain existing surface to minimize infiltration of runoff that could encourage contaminant migration from the vadose zone.</li> <li>Mitigate intrusion of PCE and TCE from vadose zone to indoor air.</li> <li>Protect construction worker from exposure to COCs in soil.</li> </ul>	<ul style="list-style-type: none"> <li>Land use controls will be maintained until the concentrations of hazardous substances in the soil are at levels that allow for unrestricted reuse and exposure.</li> <li>Land use controls will be maintained until it has been demonstrated that vadose zone soil concentrations do not pose a threat to the groundwater quality.</li> </ul>	SVE remedy complete.

Notes:

- COC = chemical of concern
- DLA = Defense Logistics Agency
- IMP = Installation Master Plan
- LUC = land use control
- PCE = tetrachloroethene
- PPE = personal protective equipment
- SVE = soil vapor extraction
- TCE = trichloroethene

**Table 3-4. Building 231 Air Sample Analytical Results**

	Vinyl Chloride	trans-1,2-Dichloroethene	cis-1,2-Dichloroethene	Trichloroethene	Tetra-chloroethene	1,1,1-Trichloroethane	1,2-Dichloroethane
U.S. EPA Industrial RSLs	1.1	65.58	NE	1.14	0.31	4031.63	0.12
Sample IDs	Sample Results in ppbv						
Ambient-5-26-11	<0.012	<0.0075	<0.0075	<0.0055	<0.0044	<0.0055	<b>0.013</b>
TR-5-26-11	<0.014	<0.0093	<0.0093	<0.0068	<b>0.018</b>	<0.0067	<b>0.021</b>
MW-5-26-11	<0.014	<0.0090	<0.0090	<b>0.0077</b>	<b>0.021</b>	<0.0066	<b>0.028</b>
RA-5-26-11	<0.012	<0.0076	<0.0076	<b>0.0079</b>	<b>0.036</b>	<b>0.0056</b>	<b>0.047</b>
VM0019	<1.8	<1.1	<1.1	<b>360 D</b>	<b>270 D</b>	<b>1.2</b>	<1.1
VM0020S	<4.3	<2.8	<2.8	<b>18</b>	<b>730 D</b>	<b>12</b>	<2.7

Notes:

Samples collected on 5/26/11.

Bold values indicate detections.

D = The reported result is from a dilution

NE = Not Established

ppbv = parts per billion by volume

RSLs = EPA Region 9 Regional Screening Level for commercial/industrial land use area

U.S. EPA= United States Environmental Protection Agency

< = Less than reporting limit





DEFENSE LOGISTICS AGENCY  
DLA INSTALLATION SUPPORT AT SAN JOAQUIN  
P.O. BOX 960001  
STOCKTON, CALIFORNIA 95296-0001

21 September 2011

U.S. Environmental Protection Agency, Region 9  
ATTN: Mr. Phillip Ramsey (SFD-8)  
75 Hawthorne Street  
San Francisco, CA 94105-3901

**SUBJECT: FINAL – 2011 Explanation of Significant Differences to the 1998 Record of Decision  
Defense Distribution Depot San Joaquin – Tracy Site**

Dear Mr. Ramsey:

The DLA Installation Support at San Joaquin is pleased to submit the Final *2011 Explanation of Significant Differences to the 1998 Record of Decision*. This document presents changes to the remedies and/or modifies closure requirements at four soil sites located at the Defense Distribution San Joaquin – Tracy Site, as originally documented in the *1998 DDJC-Tracy Site-Wide Comprehensive Record of Decision*.

On 01 June 2011, a meeting between DLA and the regulatory agencies was held to discuss the DLA Tracy Site *Draft Final 2011 Explanation of Significant Differences* (ESD) document and to define a path forward to finalize the document. Discussions were focused on the U.S. EPA's five major comments as presented in an e-mail from Phillip Ramsey dated 27 May 2011. The 01 June 2011 meeting notes are provided as part of the response to comments.

If you have any questions regarding this report, please call me at (209) 839-4065.

Sincerely,

A handwritten signature in blue ink that reads "Maurice Benson".

MAURICE BENSON  
Remedial Project Manager

Enclosure

cc:  
Mr. James Brownell, RWQCB  
Mr. Chris Sherman, DTSC  
Ms. Nanette Werner, DLA  
Mr. Charlie O'Neill, HDR  
Administrative Record