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DLA DISTRIBUTION SAN JOAQUIN, CALIFORNIA

DEFENSE DISTRIBUTION DEPOT SAN JOAQUIN – TRACY SITE
SECOND FIVE-YEAR REVIEW REPORT

FINAL

Prepared by:

URS Group, Inc.
2870 Gateway Oaks Drive, Suite 150
Sacramento, California 95833

Prepared for:

U.S. Army Corps of Engineers, Tulsa District
CESWT-EC-EE
1645 S. 101st East Avenue
Tulsa, Oklahoma 74128-4609
Contract W912BV-10-D-2004, Task Order 006

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Second Five-Year Review Report, Tracy Site
Regulatory Concurrence

This report has been prepared in accordance with U.S. EPA OSWER Directive 9355.7-03B-P. The undersigned concur with the findings and protectiveness determination presented in this Second Five-Year Review Report.

_____

Lawrence R. Tatman Date
Site Director
DLA Installation Support at San Joaquin
Defense Logistics Agency

_____

Phillip R. Dawson Date
Staff Director
DLA Installation Support Environmental Management
Defense Logistics Agency

_____

Michael Montgomery Date
Assistant Director
Federal Facilities and Site Cleanup Branch
Region 9
U.S. Environmental Protection Agency

_____

Allen Wolfenden Date
Performance Manager
Brownsfield and Environmental Restoration
Sacramento Cleanup Branch
Department of Toxic Substances Control
California Environmental Protection Agency

_____

Pamela Creedon
Executive Officer Date
Central Valley Region
Regional Water Quality Control Board
California Environmental Protection Agency

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LIST OF ABBREVIATIONS AND ACRONYMS

AB	aggregate base
ACL	aquifer cleanup level
AIW	air inlet well
ARAR	applicable or relevant and appropriate requirement
AWQC	ambient water quality criteria
bgs	below ground surface
BHC	benzene hexachloride
Cal/EPA	California Environmental Protection Agency
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CD	chimney drain
CFR	Code of Federal Regulations
CHHSL	California human health screening level
COC	contaminant of concern
COPC	chemical of potential concern
CPT	cone penetrometer test
CSM	conceptual site model
DCE	dichloroethene
DDC	Defense Distribution Center
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethene
DDRW	Defense Distribution Region West
DDT	dichlorodiphenyltrichloroethane
DDX	DDD, DDE, and DDT combined
DI WET	deionized water waste extraction test
DLA	Defense Logistics Agency
DoD	United States Department of Defense
DSERTS	Defense Site Environmental Reporting and Tracking System
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EPA	United States Environmental Protection Agency
ESD	explanation of significant difference
EU	exposure unit
FFA	federal facility agreement
FS	feasibility study
gpm	gallons per minute
GWTP	groundwater treatment plant
IDW	investigation-derived waste
IG	infiltration gallery
IMP	installation master plan

LIST OF ABBREVIATIONS AND ACRONYMS (Continued)

IRM	interim remedial measure
IRP	Installation Restoration Program
J&E	Johnson and Ettinger
LGAC	liquid–phase granular activated carbon
MCL	maximum contaminant level
MCPA	4-chloro-o-tolyoxyacetic acid
mg/kg	milligrams per kilogram
msl	mean sea level
NCP	National Hazardous Substances and Oil Pollution Contingency Plan
NFRAP	no further response action plan
NPL	National Priorities List
NWC	northwest(ern) corner
O&M	operation and maintenance
OC	organochlorine
OEHHA	Office of Environmental Health Hazard Assessment
OP	organophosphorus
OU	operable unit
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyls
PCE	tetrachloroethene
PEL	personal exposure limit
POW	prisoner of war
ppbv	parts per billion by volume
PRG	preliminary remediation goal
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
ROD	record of decision
RPM	remedial project manager
RPMPD	real property master plan digest
RSL	regional screening level
RWQCB	Regional Water Quality Control Board
RWQCB−CV	Regional Water Quality Control Board−Central Valley Region
SCADA	Supervisory Control and Data Acquisition
SESOIL	seasonal soil compartment modeling
SJCEHD	San Joaquin County Environmental Health Division
SSL	sanitary sewage lagoon
STOP	SVE termination and optimization procedure
SVE	soil vapor extraction
SVOC	semivolatile organic compound
SWMU	solid waste management unit

LIST OF ABBREVIATIONS AND ACRONYMS (Continued)

TBC	to be considered
TCE	trichloroethene
TPH	total petroleum hydrocarbons
TPHD	total petroleum hydrocarbons−diesel range
TPHG	total petroleum hydrocarbons−gasoline range
TPHMO	total petroleum hydrocarbons−motor oil range
URS	URS Group, Inc.
USACE	United States Army Corps of Engineers
USATHMA	United States Army Toxic and Hazardous Materials Agency
UST	underground storage tank
VEW	vapor extraction well
VGAC	vapor-phase granular activated carbon
VOC	volatile organic compound
WDR	waste discharge requirement
µg/kg	microgram per kilogram
µg/L	microgram per liter
$\mu g/m^3$	microgram per cubic meter
2,4-D	dichlorophenoxy acetic acid
2,4,5-T	trichlorophenoxy acetic acid

Five-Year Review Summary Form
(Statutory Review)

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: Tracy Defense Depot (U.S. Army)		
EPA ID *(from WasteLAN)*: CA4971520834		
Region: 9	**State: CA**	**City/County: Tracy / San Joaquin**
SITE STATUS		
NPL status: Final Deleted Other (specify)		
Remediation status (choose all that apply): **Under Construction Operating** Complete		
Multiple OUs?* Yes **No**	**Construction completion date: PCOR scheduled for 30 September 2012**	
Has site been put into reuse? YES **NO**		
REVIEW STATUS		
Lead agency: EPA State Tribe Other Federal Agency **Defense Logistics Agency**		
Author name: Maurice Benson		
Author title: Remedial Project Manager	**Author affiliation: DLA Installation Support At San Joaquin**	
Review period: ** June 2005 through May 2010		
Date(s) of site inspection: 16 July 2010		
Type of review: **Post-SARA** Pre-SARA NPL-Removal only Non-NPL Remedial Action Site NPL State/Tribe-lead Regional Discretion		
Review number: 1 (first) **2 (second)** 3 (third) Other (specify) _____		
Triggering action: Actual RA Onsite Construction at OU #____ Actual RA Start at OU #____ Construction Completion **Previous Five-Year Review Report** Other (specify)		
Triggering action date *(from WasteLAN)*: 09 / 23 / 05		
Due date *(five years after triggering action date)*: 09/ 23/ 10		

*["OU" refers to operable unit.]

****[Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]**

Five-Year Review Summary Form (cont'd.)

Issues and Recommendations/Follow-Up Actions:

Groundwater Sites

The following major issue and recommendation/follow-up action for groundwater will be tracked by the United States Environmental Protection Agency (EPA) in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) five-year review module. Other major issues and recommendations/follow-up actions for groundwater identified in the draft and draft final versions of this second five-year review were completed prior to the final submittal of this document and do not require tracking by EPA. Section 5.0 in this document presents the status of those issues and recommendations/follow-up actions, as well as other minor ones.

Banta Road Plume. The remedy for the portion of the trichloroethene (TCE) plume east of Banta Road is dispersion with metabolism and volatilization processes. Recent investigation results indicate the plume extends more than 1,500 feet east of Banta Road. There are no monitoring wells to provide data to determine whether the plume is attenuating or migrating toward residential supply wells.

Recommendation/Follow-Up Action: Install two monitoring wells in the Upper Hydrologic Zone northeast of the Banta Road plume to determine whether the plume is naturally attenuating or migrating toward residential water supply wells. Installation of the wells is planned for 2012, and will be documented in the 2012 Annual Monitoring Report (December 2012).

SVE and Non-SVE Soil Sites

Major issues and recommendations/follow-up actions for the soil vapor extraction (SVE) and non-SVE soil sites identified in the draft and draft final versions of this second five-year review were completed prior to the final submittal of this document and do not require tracking by EPA in the CERCLIS five-year review module. Sections 6.0 through 21.0 in this document present the status of those issues and recommendations/follow-up actions, as well as other minor ones.

Protectiveness Statements:

Groundwater Sites. The remedy for OU 1 is protective of human health and the environment in the short term. Contaminant plumes are present in groundwater. However, exposure pathways that could result in unacceptable risks are being controlled by institutional controls on groundwater beneath federal government property. Groundwater containing TCE has reached a drinking water well that is treated with LGAC and monitored quarterly. To assure long-term protectiveness, monitoring wells that can demonstrate containment by natural attenuation will be installed and included in the groundwater monitoring program. The remedy for the northwestern corner (NWC) Groundwater Operable Unit will address dieldrin–contaminated groundwater that could pose health risks if it was being used.

SVE Sites. Currently, Tracy Site decision documents identify SVE remedies for three sites: Area 1/ Building 237, SWMU 1/Area 2, and Area 3. The remedy at Area 1/Building 237 is protective of human health and the environment in the short term, but long-term protectiveness must be confirmed by evaluation of the vapor intrusion pathway. In addition, investigation of a potential pesticide source area at the site may result in the need to modify the remedy or establish land use controls in that area to protect human health and the environment.

The remedy at SWMU 1/Area 2 is protective of human health and the environment because land use controls are in place and are effective. The remedy at Area 3 is protective of human health and the environment and does not include land use controls.

Soil Sites. Remedies at the following 11 sites are protective of human health and the environment because land use controls are in place and are effective:

- SWMUs 2 and 3
- SWMU 4
- SWMU 6
- SWMU 7
- SWMU 24
- SWMU 33
- DSERTS 67
- Building 30 Drum Storage Area
- DSERTS 72
- Eastern Depot Soils Area
- Southern Depot Soils Area

The remedies at SWMU 8, SWMU 27, and the Day Care Center are protective of human health and the environment, and land use controls are not required at these sites.

The remedy at SWMU 20 is expected to be protective of human health and the environment upon implementation of the SVE remedial action, construction of the asphalt parking lot in 2010, and continued implementation and monitoring of land use controls.

ES.0 EXECUTIVE SUMMARY

This is the second five-year review report for remedial actions performed at the Defense Distribution Depot San Joaquin–Tracy Site (Tracy Site) pursuant to the Operable Unit (OU) 1 (contaminated groundwater) and site-wide records of decision (RODs) as modified by an amendment and three explanations of significant differences (ESDs). The RODs and ESDs are as follows:

Operable Unit 1

- *Operable Unit No. 1, Record of Decision, DDRW-Tracy, California* (Woodward-Clyde Consultants, 1993), herein referred to as the OU 1 ROD. This ROD documented the groundwater extraction, air stripping, and on-site discharge remedy for trichloroethene (TCE), tetrachloroethene (PCE), and 1,1-dichloroethene (DCE) in groundwater.

- *DDRW-Tracy, Operable Unit 1 Explanation of Significant Difference* (Montgomery Watson, 1996a), herein referred to as the 1996 ESD. The remedy for OU 1 was modified adding dispersion as a remedy for removing volatile organic compounds (VOCs) from groundwater in the portion of the contaminant of concern (COC) plumes east of Banta Road.

Site-Wide

- *DDJC-Tracy Site-Wide Comprehensive Record of Decision* (Radian International, 1998a), herein referred to as the Site-Wide Comprehensive ROD. This ROD established soil vapor extraction (SVE), bioventing, excavation, and land use control remedies for sites at which soil was contaminated with VOCs, semivolatile organic compounds (SVOCs), pesticides, and metals. It also confirmed the remedy for VOCs in groundwater, established a cleanup level for dieldrin in groundwater, and included wellhead carbon treatment to remove dieldrin from groundwater.

- *DDJC-Tracy 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* (URS Group, Inc. [URS], 2001a), herein referred to as the 2001 ESD. Land use controls were added in the 2001 ESD because the Site-Wide Comprehensive ROD did not address future land use for eight sites. Changes or clarifications to the remedies at solid waste management units (SWMUs) 2 and 3, 7, 33, and Defense Site Environmental Reporting and Tracking System (DSERTS) 67 were also documented in the 2001 ESD.

- *DDJC-Tracy Amendment to the Site-Wide Comprehensive Record of Decision* (URS, 2003), herein referred to as the Site-Wide Comprehensive ROD Amendment. This amendment modified the remedy for pesticides, lead, and selenium in soil at SWMU 4 after a site-specific evaluation of ecological risk was performed. The amendment modified the discharge option for treated groundwater to include overland flow, and it added a new site, DSERTS 72, that was identified after the Site-Wide Comprehensive ROD was signed.

- *DDJC-Tracy 2004 Explanation of Significant Differences to the Site-Wide Comprehensive Record of Decision* (URS, 2004a), herein referred to as the 2004 ESD. This ESD amended requirements for pre-existing land use controls and added land use controls for OU 1, SWMU 6, and SWMU 20. Changes to the remedies at SWMUs 6, 8, and 20 and DSERTS 67 were also documented in the 2004 ESD.

This review evaluates the performance of remedial actions conducted during the second five-year review period, as well as actions taken in response to recommendations made in the first five-year review, to determine whether the remedial actions are protective of human health and the environment. This second

five-year review covers the period from June 2005 through May 2010 and complies with the Comprehensive Environmental Response, Compensation, and Liability Act as amended, the National Hazardous Substances and Oil Pollution Plan, and the United States Environmental Protection Agency (EPA) *Comprehensive Five-Year Review Guidance* (EPA, 2001).

ES.1 Progress Since First Five-Year Review

ES.1.1 Groundwater Sites

Components of the OU 1 remedy (groundwater extraction and treatment) were fully implemented prior to the period of this second five-year review. Actions have been taken to improve the performance of the OU 1 remedy and to address recommendations in the first five-year review. Those actions include:

- Shutdown of a groundwater treatment plant
- Installation of inline carbon systems for dieldrin treatment
- Shutdown of unnecessary groundwater extraction wells
- Installation and destruction of groundwater monitoring wells
- Development of a three-dimensional groundwater model
- Evaluation of natural attenuation
- Groundwater remedy enhancement investigation
- Implementation of land use controls

A feasibility study (FS) evaluated remedial alternatives for the dieldrin plume in the northwestern corner (NWC dieldrin plume) of the depot. A recommended remedy (groundwater extraction and treatment) was negotiated with regulatory agencies in early 2010, and a proposed plan is in preparation. A draft ROD for the NWC Groundwater OU is expected to be distributed by the end of 2010 following completion of the proposed plan and public review period.

ES.1.2 SVE Sites

Since the last five-year review, optimization activities have been performed at three SVE sites: Area 1/Building 237, SWMU 1/Area 2, and Area 3. Activities at these sites included the installation of air inlet wells in high-concentration areas and pulsing the SVE systems. Soil vapor sampling results indicated residual PCE contamination beneath Area 1/Building 237 at concentrations greater than 10,000 parts per billion by volume. An optimization effort to pneumatically fracture the vadose zone to increase its permeability and the effectiveness of the SVE system was performed at Area 1/Building 237. The optimized system operated in 2009 until cleanup standards were met. Vadose zone migration modeling and SVE termination and optimization procedure (STOP) evaluations were performed for Area 1/ Building 237, SWMU 1/Area 2, and Area 3 that estimated residual vadose zone mass in Area 1/ Building 237, SWMU 1/Area 2, and Area 3 will not increase groundwater remediation cost or treatment time. The SVE sites are currently recommended for no further action by DLA Installation Support at San Joaquin, pending an ESD of the Site-Wide Comprehensive ROD that will (1) revise the terminology in Sections 9.6.5 and 9.7.5.10 of the ROD by deleting the “and” at the end of the second vadose zone cleanup achievement item and adding an “or” after the first and second vadose zone cleanup achievement

items and (2) incorporate the SVE Termination or Optimization Process (STOP) protocol as a basis for closing SVE sites at the Tracy Site.

ES.1.3 Soil Sites

Remedial actions for most soil sites were completed prior to this five-year review period; remaining activities include monitoring land use controls and/or groundwater monitoring. Other activities performed at soil sites during this five-year review period are described here.

SWMU 20. The 2004 ESD states that additional actions or continued land use controls would be evaluated if Building 10 and/or Building 26 were demolished in the future. Because DLA Installation Support at San Joaquin planned to demolish Building 10 in 2009, an investigation to characterize the extent of remaining contamination at SWMU 20 was conducted in 2008. Approximately 18,000 cubic yards of subsurface material were estimated to contain TCE at concentrations greater than the soil vapor cleanup standard established in the Site-Wide Comprehensive ROD. DLA is preparing for November 2010 submittal, a draft ESD to the Site-Wide Comprehensive ROD to document that SVE enhanced with pneumatic fracturing will be the selected remedy for SWMU 20.

DSERTS 67. The first five-year review noted that a drainage way was eroding a portion of the cover. In 2007, repairs to the drainage and cover at DSERTS 67 were completed. The drainage improvements included installing a culvert and a sump with a sump pump to transfer water from the site to the drainage ditch to prevent ponding and erosion. An asphalt apron was also installed around each drain inlet to minimize the flow of road debris into the culvert and sump. The asphalt road, which was severely deteriorated along the northern boundary of the cap, was reconstructed and sloped to allow water to drain from the cap across the road into the existing drainage ditch.

SWMU 7, SWMU 33, DSERTS 67, and Building 30 Drum Storage Area. The first five-year review recommended replacing missing or damaged land use control warning signs at these sites. In 2007, the warning signs were replaced with sturdier materials and higher quality graphics to withstand outdoor conditions. The new signs also provide additional information including contact information and site maps.

ES.2 Issues of Second Five-Year Review

ES.2.1 Groundwater Sites

The following major issue for groundwater will be tracked by EPA in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) five-year review module.

Banta Road Plume. In 2010, TCE concentrations in the plume ranged from 5 to 14 μg/L. Most of the Banta Road plume is now east of Banta Road. The remedy for that portion of the plume is dispersion with metabolism and volatilization processes in accordance with the 1996 ESD. Recent cone penetrometer test investigation results indicate the plume extends more than 1,500 feet east of Banta Road. There are no monitoring wells to provide data to determine whether the plume is attenuating or migrating toward residential supply wells; therefore, long-term protectiveness of the remedy for the plume east of Banta Road is uncertain.

The other major issues for groundwater identified in the draft and draft final versions of this second five-year review that do not require tracking by EPA because they were addressed prior to the final submittal of this document are:

NWC Dieldrin Plume. No remedy is currently in place for the NWC dieldrin plume (highest concentration 0.25 μg/L); however, a preferred remedy, developed during the dispute resolution process, was agreed upon by DLA, EPA, and the State of California. The NWC Groundwater OU should be established in a ROD to address the NWC dieldrin plume. The remedy consisting of extraction, treatment for dieldrin, and percolation of the treated effluent for three years is expected to be implemented within the next year.

Groundwater Treatment Plant 2 (GWTP2) Operation and Maintenance (O&M) Manual. Three inline liquid-phase granular activated carbon (LGAC) units were installed at dieldrin extraction wells because GWTP1, where dieldrin-contaminated groundwater had been treated, was taken out of service. After groundwater passes through the LGAC units, it is conveyed to and treated at GWTP2 and then discharged. In addition, an LGAC unit is installed at a residential well on private property east of Banta Road. The O&M manual does not include information on the O&M of the inline LGAC units or the conveyance lines to GWTP2, nor does it include information on the inline LGAC unit on the off-depot private well.

Minor issues for groundwater include:

SWMU 20 Plume. In 2009, the SWMU 20 plume had the highest TCE concentrations (104 μg/L) in groundwater beneath the Tracy Site. Prior to 2009, there was little evidence that TCE concentrations exceeding 100 μg/L were present in groundwater beneath the area. TCE concentrations at two monitoring wells downgradient of SWMU 20 have been less than the aquifer cleanup level (ACL) since they were installed in 1993 and 2002, respectively. Furthermore, TCE concentrations at EW011AU, an extraction well only 120 feet north of the SWMU 20 plume, have been less than the ACL since 2001. The plume appears to be stable or migrating at a very slow rate, even under the influence of an extraction well. The potential for this plume to migrate cannot be determined with the existing monitoring wells.

DDT Detection. During SVE remedy enhancement activities at the Area 1/Building 237 site in 2009, dichlorodiphenyltrichloroethane (DDT), dichlorodiphenyldichloroethene (DDE), and lindane were detected in investigation-derived waste at concentrations exceeding levels protective of human health and the environment. Subsequently, groundwater samples were collected at the site (LM192AU), and the highest concentrations were DDT at 0.234 μg/L, DDE at 0.0681 μg/L, and dichlorodiphenyldichloro-ethane (DDD) at 0.0711 μg/L. The DDT concentration equals the EPA regional screening level for tap water. The extent of these pesticide concentrations in groundwater is not known.

Natural Attenuation. The declining VOC concentrations in several portions of the OU 1 plume may be due not only to extraction of VOCs by the pump-and-treat remedy but also to natural attenuation processes, including adsorption, dispersion, and volatilization. The potential exists that the TCE and PCE plumes will continue to be reduced in size without extraction. Groundwater modeling results indicate that groundwater concentrations in most plumes (excluding the SWMU 20 plume) would decrease to less than ACLs within 12 years with no extraction. Evidence for natural attenuation through biodegradation or reductive dechlorination processes was evaluated; geochemical data supporting those processes were not found.

Area 3 TCE Plume. Although the plume is within the capture zone of EW046AU, concentrations of TCE and PCE in groundwater at the extraction well are less than ACLs, which could make it a candidate for shut down. However, the plume (concentrations: 5 to 25 μg/L TCE and 5 to 5.7 μg/L PCE) would not be in a capture zone if EW046AU was shut down in a rebound evaluation. If EW046AU is considered for shut down, monitoring of the Area 3 TCE plume must continue to assure it does not migrate downgradient.

SWMU 8. The Site-Wide Comprehensive ROD requires installation of two pesticide extraction wells at SWMU 8 because dieldrin, chlordane, DDD, DDE, and DDT had been detected in groundwater downgradient from the site during the remedial investigation. However, after the Site-Wide Comprehensive ROD was signed, chlordane, DDE, and DDT were detected only once at concentrations exceeding the site-specific concentrations requiring evaluation, and dieldrin never exceeded the site-specific concentration requiring evaluation. Therefore, a consensus decision among remedial project managers was reached that the two extraction wells were no longer necessary. This decision has not been fully documented.

1,1-Dichloroethene (DCE). An ACL of 6.0 µg/L was established for 1,1-DCE in the OU 1 ROD and that ACL was maintained in the Site-Wide Comprehensive ROD. Concentrations of 1,1-DCE have not exceeded the ACL in any sample collected at the Tracy Site since 1997, and 1,1-DCE has not been detected in any groundwater sample from the site since the third quarter of 2004. These results indicate that 1,1-DCE is no longer a COC for groundwater at the Tracy Site.

ROD Monitoring Requirements. The monitoring required is incomplete for TCE at LM056C, LM067B, LM151B, LM156A, and LM157A and for dieldrin at LM028A and LM094AU because detections of those contaminants exceeded the groundwater concentrations requiring evaluation specified in the Site-Wide Comprehensive ROD. Monitoring of these wells will continue until requirements are met.

ES.2.2 SVE Sites

Major issues for the SVE sites identified in the draft and draft final versions of this second five-year review that do not require tracking by EPA because they were addressed prior to the final submittal of this document include:

STOP Evaluation. No further action has been recommended at all three SVE sites. The STOP evaluations completed for Area 1/Building 237, SWMU 1/Area 2, and Area 3 and VLEACH modeling results indicate that the functional components of requirements for vadose zone cleanup cited in Section 9.6.5 of the Site-Wide Comprehensive ROD have been met. Regulatory acceptance of the STOP evaluation through a decision document is necessary to permanently terminate SVE at these sites.

Vapor Intrusion Pathway. Inhalation of VOCs in indoor air was not evaluated at Area 1/Building 237 in the baseline risk assessment. The PCE contamination in soil may extend under the northern side of Building 237. The potential exists for PCE vapors in the soil to migrate vertically into Building 237, which is occupied by employees every work day.

Pesticides. Concentrations of pesticides in excess of the hazardous criteria for disposal were detected in IDW generated from the installation of an SVE well (VE0051) during the remedy enhancement activities completed in June 2009 at Area 1/Building 237. DDT was detected at a concentration of 21,000 µg/kg; DDE was detected at a concentration of 5,700 µg/kg; and gamma-BHC at a concentration of 4,700 µg/kg. Pesticide contamination was confirmed during an October 2009 limited hand auger effort. The current remedy for Area 1/Building 237 is not appropriate for the treatment of pesticides detected in soils.

Minor issues for the SVE sites include:

Land Use Controls. During the second five-year review site inspection, it was determined that land use control warning signs were not present at SWMU 1/Area 2.

ROD Monitoring Requirements. The required monitoring is incomplete for PCE at LM030AUA and LM137A; TCE at LM041B; and PCE and TCE at LM032AU LM094AU because detections of those

contaminants exceeded the groundwater concentrations requiring evaluation specified in the Site-Wide Comprehensive ROD. Monitoring of these wells will continue until requirements are met.

ES.2.3 Soil Sites

Major issues for the non-SVE soil sites identified in the draft and draft final versions of this second five-year review that do not require tracking by EPA because they were addressed prior to the final submittal of this document include:

SWMU 20. Soil at SWMU 20 was not covered at the time of the site inspection. Temporary fencing has been erected around the site, preventing unauthorized access to the exposed soil. TCE was detected at concentrations above the soil vapor cleanup standard in the vadose zone beneath the former location of Building 10. SVE was deleted from the SWMU 20 remedy in the 2004 ESD.

Minor issues for the non-SVE soil sites are presented in Table ES-1.

ES.3 Recommendations and Follow-Up Actions

ES.3.1 Groundwater Sites

The following recommendation and follow-up action is intended to address a major issue for groundwater and will be tracked by EPA in the CERCLIS five-year review module.

- Install two monitoring wells in the Upper Hydrologic Zone northeast of the Banta Road plume to determine whether the plume is naturally attenuating or migrating toward residential water supply wells. Installation of these wells is planned for 2012; their installation will be documented in the 2012 Annual Monitoring Report (December 2012).

Other recommendations/follow-up actions intended to address major issues for groundwater identified in the draft and draft final versions of this second five-year review that do not require tracking by EPA because they have already been completed include:

- Prepare a proposed plan identifying the preferred remedy (groundwater extraction from four wells, LGAC treatment, and on-site discharge for three years) and establish the NWC Groundwater OU. After reviewing public comments, prepare a NWC Groundwater OU ROD and implement the selected remedy.

  Status: The preferred remedy was documented in a proposed plan that was made available for public comment in October 2010 and presented at a public meeting in November 2010. The NWC Groundwater OU was established in the *Record of Decision, Remedy for Northwestern Corner Groundwater Operable Unit* (URS, 2011), which was finalized with signatures in October 2011. The remedy has been implemented, and operation of the extraction wells began on 4 January 2012.

- Update the O&M manual to include information needed for O&M of the inline LGAC units.

  Status: The *Addendum to the Groundwater Treatment Plant 2 Operations and Maintenance Manual, Liquid-Phase Granular Activated Carbon Systems Operations and Maintenance, Defense Distribution Depot San Joaquin–Tracy Site* (HDR, 2012a) was submitted on 25 April 2012.

Recommendations intended to address minor issues for groundwater include:

- Install a monitoring well in the Upper Hydrologic Zone within the footprint of the SWMU 20 plume in the approximate former location of LM193AU and install a downgradient monitoring well in the Middle Hydrologic Zone between the new Upper Hydrologic Zone well and EW011AU, the nearest operating extraction well.

  Status: Monitoring well LM196AU was installed in December 2010 in the approximate former location of LM193AU but with a screen interval deeper than LM193AU had; LM197B was installed in the Middle Hydrologic Zone in November 2010, downgradient from LM196AU (HDR, 2012b).

- Collect groundwater samples at the time soil samples are collected at the Area 1/Building 237 site to delineate pesticides in soil. Sample monitoring wells upgradient and downgradient from LM192AU for DDT, DDD, and DDE to estimate the extent of a potential pesticide plume; determine whether the plume is migrating, and, if necessary, study the feasibility of remediation.

  Status: On 8 February 2011, groundwater samples were collected at LM192AU and LM133AU, which is upgradient from LM192AU. A HydroPunch groundwater sample was also collected at a soil boring downgradient from LM192AU. Pesticides were not detected at either well or in the HydroPunch sample (HDR, 2012c). Based on these results, the conclusion stated in the *Area 1/ Building 237 Engineering Evaluation/Cost Analysis Defense Distribution Depot San Joaquin – Tracy Site* is that there is no impact to groundwater from the pesticides detected in the soil around Building 237 (HDR, 2012c).

- Continue to evaluate natural attenuation potential for TCE and PCE plumes on the Tracy Site.

- Prior to shutting down EW046AU, re-evaluate the TCE groundwater contamination detected in the 2008 HydroPunch investigation beneath Area 3.

  Status: Installation of a monitoring well between the Area 3 TCE plume and EW046AU was recommended in the *Well Monitoring Program 2010 Annual Report* (HDR, 2011a).

- Delete the extraction remedy for SWMU 8 in a decision document.

- In the same decision document that modifies the groundwater remedy for SWMU 8, provide the arguments supporting removal of 1,1-DCE from the list of groundwater COCs.

- Continue monitoring groundwater at LM056C, LM067B, LM151B, LM156A, and LM157A for TCE and LM028A and LM094AU for dieldrin until ROD monitoring requirements are met.

  Status: Through the 2011 monitoring period, LM056C, LM067B, LM151B, LM156A, and LM157A (TCE) and LM028A (dieldrin) have not yet met ROD monitoring requirements and are continuing to be monitored (HDR, 2012b). LM094AU met the ROD monitoring requirement for dieldrin in 2010, and sampling was discontinued at this well starting in 2011 (HDR, 2011a).

ES.3.2 SVE Sites

Recommendations/follow-up actions intended to address major issues for the SVE sites identified in the draft and draft final versions of this second five-year review that do not require tracking by EPA because they have already been completed include:

- If the signatory parties of the Site-Wide Comprehensive ROD are in agreement, codify the STOP evaluation process for SVE sites at the Tracy Site in an ESD.

Status: The STOP evaluation process for SVE sites was codified for the Tracy Site in the *2011 Explanation of Significant Differences to the 1998 Record of Decision* (HDR, 2011b).

- Because PCE contamination in soil may extend under Building 237, notify workers in Building 237 of the potential for vapor intrusion, and evaluate the vapor intrusion pathway.

  Status: In March 2011, warning signs were posted on or adjacent to the north and south side entrances to Building 237. In addition, three indoor air samples were collected at Building 237. Chlorinated VOCs were not detected (EA, 2011).

- Delineate the extent of pesticide contamination in soil and groundwater at the Area 1/Building 237 site to determine the appropriate remedy to assure protection of human health and the environment.

  Status: In February and April 2011, soil and groundwater sampling was conducted at Area 1/ Building 237 to assess the lateral and vertical extent of pesticides in soil and groundwater beneath the site. Pesticides were detected at concentrations greater than residential and industrial regional screening levels (RSLs) in shallow soil (up to 5 feet bgs) at several locations around and to the north of Building 237. There were no concentrations of pesticides detected greater than industrial or residential RSLs in samples collected from 10 feet bgs or deeper. Using the data collected during the 2011 investigations, a streamlined risk evaluation was performed, and based on the results, a limited soil removal action sufficient to reduce site risk to industrial use standards was recommended in the *Area 1/Building 237 Engineering Evaluation/Cost Analysis Defense Distribution Depot San Joaquin – Tracy Site* (HDR, 2012c).

Recommendations intended to address minor issues for the SVE sites include:

- Install land use control warning signs at SWMU 1/Area 2.

- Continue monitoring groundwater at LM030AUA and LM137A for PCE; LM041B for TCE; and LM032AU for PCE and TCE until ROD monitoring requirements are met.

  Status: Through the 2011 monitoring period, LM030AUA (PCE) and LM041B (TCE) have not yet met ROD monitoring requirements and will continue to be monitored (HDR, 2012b). LM137A met the ROD monitoring requirement for PCE in 2011 but will continue to be monitored as a guard well (HDR, 2012b). For LM032AU, the ROD monitoring requirement for PCE has been met but not for TCE, therefore, the well will continue to be monitored (HDR, 2012b).

ES.3.3 Soil Sites

Recommendations/follow-up actions intended to address major issues for the non-SVE soil sites identified in the draft and draft final versions of this second five-year review that do not require tracking by EPA because they have already been completed include:

- An asphalt parking lot that will cover SWMU 20 is planned for construction in 2010. Add SVE as the remedy for SMWU 20 in an ESD, and implement SVE at SWMU 20. At the completion of the SVE remedial action, evaluate whether land use controls are needed.

  Status: An asphalt parking lot was constructed in the area of SWMU 20 in late 2010. SVE was added to the SWMU 20 remedy in the *2011 Explanation of Significant Differences to the 1998 Record of Decision, Defense Distribution Depot San Joaquin – Tracy Site* (HDR, 2011b). The SVE system was installed between June and October 2011, and operations began on 24 October 2011 (HDR, 2012d).

Table ES-1 presents recommendations intended to address minor issues for the non-SVE soil sites.

ES.4 Protectiveness Statements

ES.4.1 Groundwater Sites

The remedy for OU 1 is protective of human health and the environment in the short term. Contaminant plumes are present in groundwater. However, exposure pathways that could result in unacceptable risks are being controlled by institutional controls on groundwater beneath federal government property. Groundwater containing TCE has reached a drinking water well that is treated with LGAC and monitored quarterly. To assure long-term protectiveness, monitoring wells that can demonstrate containment by natural attenuation will be installed and included in the groundwater monitoring program. The remedy for the NWC Groundwater Operable Unit will address dieldrin–contaminated groundwater that could pose health risks if it was being used.

ES.4.2 SVE Sites

The remedy at Area 1/Building 237 is protective of human health and the environment in the short term, but long-term protectiveness must be confirmed by evaluation of the vapor intrusion pathway. In addition, investigation of a potential pesticide source area at the site may result in the need to modify the remedy or establish land use controls in that area to protect human health and the environment.

The remedy at SWMU 1/Area 2 is protective of human health and the environment because land use controls are in place and are effective.

The remedy at Area 3 is protective of human health and the environment and does not include land use controls.

ES.4.3 Soil Sites

Remedies at the following 11 sites are protective of human health and the environment because land use controls are in place and are effective:

- SWMUs 2 and 3
- SWMU 4
- SWMU 6
- SWMU 7
- SWMU 24
- SWMU 33
- DSERTS 67
- Building 30 Drum Storage Area
- DSERTS 72

- Eastern Depot Soils Area
- Southern Depot Soils Area

The remedies at SWMU 8, SWMU 27, and the Day Care Center are protective of human health and the environment, and land use controls are not required at these sites.

The remedy at SWMU 20 is expected to be protective of human health and the environment upon implementation of the SVE remedial action, construction of the asphalt parking lot in 2010, and continued implementation and monitoring of land use controls.

Table ES-1. Minor Issues and Recommendations and Follow-Up Actions for Soil Sites, Tracy Site

Site Name	Issues	Recommendations and Follow-Up Actions
SWMUs 2 and 3	• No land use control warning signs are installed at the site. • Performing the monitoring required in the Site-Wide Comprehensive ROD for dieldrin at LM003AA.	• Install land use control warning signs. • Continue sampling groundwater at LM003AA for dieldrin because dieldrin was detected at concentrations exceeding its ROD-specified concentration requiring evaluation. **Status:** Through the 2011 monitoring period, LM003AA has not yet met the ROD monitoring requirement for dieldrin and will continue to be monitored (HDR, 2012b).
SWMU 4	• No land use control warning signs are installed at the site. • The detection limits for the method used by the laboratory to analyze stormwater samples for DDT and dieldrin are greater than the stormwater discharge standards required by the Site-Wide Comprehensive ROD. • Performing the monitoring required in the Site-Wide Comprehensive ROD for 2,4-D at LM027AUA.	• Install land use control warning signs. • Use EPA Method 8081A to achieve lower detection limits for discharge samples. **Status:** Detection limits for DDT and dieldrin were lowered starting in 2012 without changing the analytical method (EPA Method 608) being used. • Continue sampling groundwater at LM027AUA for 2,4-D until the ROD monitoring requirement of sufficient analyses is met. **Status:** LM027AUA met the ROD monitoring requirement for 2,4-D in 2011, and sampling will be discontinued at this well starting in 2012 (HDR, 2012b).
SWMU 6	• No land use control warning signs are installed at the site. • Performing the monitoring required in the Site-Wide Comprehensive ROD for PCE at LM017AA.	• Install land use control warning signs. • Continue sampling groundwater at LM017AA for PCE until the ROD monitoring requirement of sufficient analyses is met. **Status:** LM017AA met the ROD monitoring requirement for PCE in 2010, and sampling was discontinued at this well in 2011 (HDR, 2011a).
SWMU 7	• No issues are identified for SWMU 7.	• No recommendations are identified for SWMU 7.
SWMU 8	• Performing the monitoring required in the Site-Wide Comprehensive ROD for TPHD at LM119A or chlordane, 2,4-D, and MCPA at LM168AU.	• Continue sampling groundwater at LM119A for TPHD and LM168AU for chlordane, 2,4-D, and MCPA until the ROD monitoring requirement of sufficient analyses is met. **Status:** LM119A and LM169AU met the ROD monitoring requirements in 2011, and sampling will be discontinued at these wells starting in 2012 (HDR, 2012b).

Table ES-1. (Continued)

Site Name	Issues	Recommendations and Follow-Up Actions
SWMU 20[a]	• No land use control warning signs are installed at the site. • Performing the monitoring required in the Site-Wide Comprehensive ROD for TCE, PCE, diethylphthalate, 2,4-dinitrophenol, pentachlorophenol, 2,4,6-trichlorophenol, methiocarb, and linuron at LM175AU or for PCE at LM115AU.	• Install land use control warning signs. • Continue sampling groundwater at LM175AU for TCE, PCE, diethylphthalate, 2,4-dinitrophenol, pentachlorophenol, 2,4,6-trichlorophenol, methiocarb, and linuron and at LM115AU for PCE until the ROD monitoring requirement of sufficient analyses is met. **Status:** Through the 2011 monitoring period, LM175AU has not yet met ROD monitoring requirements and will continue to be monitored (HDR, 2012b). LM115AU met the ROD monitoring requirement for PCE in 2010 but will continue to be monitored as a guard well for SWMU 20 (HDR, 2011a).
SWMU 24	• No land use control warning signs are installed at the site. • Residual contaminant concentrations nearby and below Building 247 have not been reduced to the ROD cleanup standards. • Performing the monitoring required in the Site-Wide Comprehensive ROD for 2-butanone, 2-hexanone, 4-methyl-2-pentanone, 2, 4-dimethylphenol, fluoranthene, 2-methylnaphthalene, 4-methylphenol, naphthalene, phenol, pyrene, TPHG, and TPHD at LM116A or 2-butanone, 2-hexanone, 4-methyl-2-pentanone, TPHG, and TPHD at LM118AU.	• Install land use control warning signs. • Consider remediation with SVE, bioventing, or soil excavation and removal if Building 247 is demolished, though there are no plans for the demolition of the building at this time. • Continue sampling groundwater at LM116A for 2-butanone, 2-hexanone, 4-methyl-2-pentanone, 2, 4-dimethylphenol, fluoranthene, 2-methylnaphthalene, 4-methylphenol, naphthalene, phenol, pyrene, TPHG, and TPHD and at LM118AU for 2-butanone, 2-hexanone, 4-methyl-2-pentanone, TPHG, and TPHD until ROD monitoring requirement of sufficient analyses is met. **Status:** LM116A and LM118AU met the ROD monitoring requirement in 2011, and sampling will be discontinued at these wells starting in 2012 (HDR, 2012b).
SWMU 27	• Performing the monitoring required in the Site-Wide Comprehensive ROD for TPHMO at LM117A.	• Sample groundwater at LM117A for TPHMO until ROD monitoring requirement of sufficient analyses is met. **Status:** Through the 2011 monitoring period, LM117A has not yet met the ROD monitoring requirement for TPHMO and will continue to be monitored (HDR, 2012b).
SWMU 33	• The land use control warning sign that was on Building 10 was removed when the building was demolished.	• Replace the land use control warning sign that was on Building 10.

Table ES-1. (Continued)

Site Name	Issues	Recommendations and Follow-Up Actions
DSERTS 67	• The western portion of the site is no longer covered with grass to prevent erosion and dust generation, as required by the 2004 ESD.	• Re-cover this portion of the site (with grass, gravel, asphalt, etc.) to minimize dust generation and potential exposure to airborne dust.
Building 30 Drum Storage Area	• No issues are identified for Building 30 Drum Storage Area.	• No recommendations are identified for Building 30 Drum Storage Area.
DSERTS 72	• No land use control warning signs are installed at the site.	• Install land use control warning signs.
Eastern Depot Soils Area	• No land use control warning signs are installed at the site.	• Install land use control warning signs.
Southern Depot Soils Area	• No land use control warning signs are installed at the site.	• Install land use control warning signs.
Day Care Center	• No issues are identified for the Day Care Center.	• No recommendations are identified for the Day Care Center.

[a] Major issues and recommendations/follow-up actions for SWMU 20 are presented in Sections ES.2.3 and ES.3.3, respectively.

DDT = dichlorodiphenyltrichloroethane
DLA = Defense Logistics Agency
DSERTS = Defense Site Environmental Reporting and Tracking System
EPA = United States Environmental Protection Agency
ESD = explanation of significant differences
MCPA = 4-chloro-o-tolyoxyacetic acid
PCE = tetrachloroethene
ROD = record of decision
RPMPD = real property master plan digest
SVE = soil vapor extraction
SWMU = solid waste management unit
TCE = trichloroethene
TPHD = total petroleum hydrocarbons as diesel
TPHG = total petroleum hydrocarbons as gasoline
TPHMO = total petroleum hydrocarbons as motor oil
2,4-D = dichlorophenoxy acetic acid

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1.0 INTRODUCTION

This is the second five-year review report for remedial actions performed at the Defense Distribution Depot San Joaquin California, Tracy Site (Tracy Site) pursuant to the Operable Unit (OU) 1 (contaminated groundwater) and site-wide records of decision (RODs) as modified by an amendment and three explanations of significant differences (ESDs). The RODs and ESDs are as follows:

Operable Unit 1

- *Operable Unit No. 1, Record of Decision, DDRW-Tracy, California* (Woodward-Clyde Consultants, 1993), herein referred to as the OU 1 ROD. This ROD documented the groundwater extraction, air stripping, and on-site discharge remedy for trichloroethene (TCE), tetrachloroethene (PCE), and 1,1-dichloroethene (DCE) in groundwater.

- *DDRW-Tracy, Operable Unit 1 Explanation of Significant Difference* (Montgomery Watson, 1996a), herein referred to as the 1996 ESD. The remedy for OU 1 was modified adding dispersion as a remedy for removing volatile organic compounds (VOCs) from groundwater in the portion of the contaminant of concern (COC) plumes east of Banta Road.

Site-Wide

- *DDJC-Tracy Site-Wide Comprehensive Record of Decision* (Radian International, 1998a), herein referred to as the Site-Wide Comprehensive ROD. This ROD established soil vapor extraction (SVE), bioventing, excavation, and land use control remedies for sites at which soil was contaminated with VOCs, semivolatile organic compounds (SVOCs), pesticides, and metals. It also confirmed the remedy for VOCs in groundwater, established a cleanup level for dieldrin in groundwater, and included wellhead carbon treatment to remove dieldrin from groundwater.

- *DDJC-Tracy 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* (URS Group, Inc. [URS], 2001a), herein referred to as the 2001 ESD. Land use controls were added in the 2001 ESD because the Site-Wide Comprehensive ROD did not address future land use for eight sites. Changes or clarifications to the remedies at solid waste management units (SWMUs) 2 and 3, 7, 33, and Defense Site Environmental Reporting and Tracking System (DSERTS) 67 were also documented in the 2001 ESD.

- *DDJC-Tracy Amendment to the Site-Wide Comprehensive Record of Decision* (URS, 2003), herein referred to as the Site-Wide Comprehensive ROD Amendment. This amendment modified the remedy for pesticides, lead, and selenium in soil at SWMU 4 after a site-specific evaluation of ecological risk was performed. The amendment modified the discharge option for treated groundwater to include overland flow, and it added a new site, DSERTS 72, that was identified after the Site-Wide Comprehensive ROD was signed.

- *DDJC-Tracy 2004 Explanation of Significant Differences to the Site-Wide Comprehensive Record of Decision* (URS, 2004a), herein referred to as the 2004 ESD. This ESD amended requirements for pre-existing land use controls and added land use controls for OU 1, SWMU 6, and SWMU 20. Changes to the remedies at SWMUs 6, 8, and 20 and DSERTS 67 were also documented in the 2004 ESD.

The first five-year review covered the period from November 1998 through May 2005. This second five-year review covers the period from June 2005 through May 2010. Five-year reviews of remedial actions at the Tracy Site are required under the Comprehensive Environmental Response, Compensation, and

Liability Act (CERCLA) because hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.[1]

The purpose of a five-year review is to determine whether the remedial response actions are protective of human health and the environment and, as necessary, to provide recommendations for attaining and/or maintaining sustainable protection. As this is the second five-year review of remedial actions at the Tracy Site, this review evaluated changes in remedy implementation during this five-year period and actions taken in response to recommendations in *DDJC-Tracy Five-Year Review Report* (URS, 2005a), herein referred to as the First Five-Year Review Report. The First Five-Year Review Report for the Tracy Site can be viewed at http://www.epa.gov/superfund/sites/fiveyear.

Executive Order 12580 delegates review responsibility to Federal facilities that control the sole source of the release. This five-year review for the Tracy Site was conducted by the DLA Installation Support at San Joaquin using URS under contract to the Air Force Center for Engineering and the Environment. This report will become part of the Administrative Record for the Tracy Site.

The Defense Logistics Agency (DLA) is responsible for managing regional and local environmental programs at the Tracy Site, including the Installation Restoration Program (IRP). The IRP at the Tracy Site is managed in accordance with a Federal Facility Agreement (FFA) developed specifically for the Tracy Site. The 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. As described in the FFA, authority for IRP decision making rests with a team of Remedial Project Managers (RPMs) from DLA Installation Support at San Joaquin; the United States Environmental Protection Agency, Region 9 (EPA); and the California Environmental Protection Agency (Cal/EPA), including the Department of Toxic Substances Control (DTSC) and the Regional Water Quality Control Board–Central Valley Region (RWQCB–CV). DLA is the lead agency responsible for funding and implementing remedial actions. EPA provides final approval for decisions regarding remedial actions taken at the Tracy Site. EPA, DTSC, and RWQCB also provide regulatory oversight, including technical support, review, and comment on all investigative and remedial work at the Tracy Site.

DLA is providing this five-year review report in accordance with CERCLA §121 and the National Hazardous Substances and Oil Pollution Contingency Plan (NCP). CERCLA §121 states:

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

[1] Underground storage tanks (USTs) containing petroleum only are exempt from the CERCLA process (see CERCLA §101[14]) and are not discussed in this five-year review other than the following summary. The Tracy Site's UST Program was initiated in 1988, when the installation first began to remove or decommission (close in place) its existing USTs and sumps. Past investigations and remedial activities at UST sites at the Tracy Site have been overseen by San Joaquin County Environmental Health Division (SJCEHD) or the Regional Water Quality Control Board (RWQCB). Thirty-three UST sites have been identified at the Tracy Site. Of these, 4 sites were transferred to the installation's CERCLA Program; 16 sites were granted closure by either the SJCEHD or the RWQCB; and 13 sites were recommended for investigation and/or corrective action. The closure process has been completed for 11 of the 13 UST Program sites recommended for investigation and/or corrective action (RWQCB, 2004). UST sites 13 and 25 are the only UST sites at the Tracy Site not yet granted closure.

EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) §300.430(f)(4)(ii) states:

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

This second five-year review was prepared using the guidelines provided in the *Comprehensive Five-Year Review Guidance* (EPA, 2001). The trigger for this review is the signing of the First Five-Year Review Report. EPA signed the First Five-Year Review Report for the Tracy Site on 23 September 2005. This second review was initiated in June 2010 and spans the five-year period between June 2005 and May 2010. This five-year review addresses the IRP sites at the Tracy Site that trigger a statutory review or a policy review. Five-year statutory reviews are required by statute for all sites for which 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. Policy reviews are conducted for sites that, upon completion of remedial action, will allow unlimited use and unrestricted exposure, but that will require at least five years to attain the cleanup levels specified in the ROD. The five-year review is the same, however, regardless of whether it is required by statute or identified in EPA guidance as a site to be reviewed as a matter of policy. The Tracy Site IRP sites for which a five-year review is required are listed in Table 1-1. These sites and current (through third quarter 2009) groundwater plumes are shown on Figure 1-1; plumes, sites, and groundwater well locations are shown on Plate 1.

Table 1-1. Installation Restoration Program Sites Requiring a Five-Year Review, Tracy Site

Groundwater Sites	Description
DSERTS 31 – **OU 1**	TCE and PCE plumes in groundwater, on and off the depot, emanating from multiple sites on the Tracy Site.
DSERTS 71 – OU 1	Dieldrin plume in groundwater, on and off the depot, emanating from the SSLs on the Tracy Site. Referred to as the **SSL dieldrin plume**, it also contains VOC contamination.
DSERTS 74	Dieldrin plume in groundwater, on and off depot, emanating from the northwestern corner of the Tracy Site. Referred to as the **NWC dieldrin plume,** it does not contain VOCs. A remedy has been recommended for this plume but has not yet been constructed.
SVE Sites	
DSERTS 1 (SWMU 1)	Area 2 and Old Sewage Lagoon. Referred to as **SWMU 1/Area 2**.
DSERTS 66	**Area 1/Building 237**.
DSERTS 68	**Area 3**, Drum Storage Area.
Soil Sites	
DSERTS 2/3 **(SWMUs 2 and 3)**	SSLs (SWMU 2) and Industrial Waste Lagoons (SWMU 3).
DSERTS 4 **(SWMU 4)**	Stormwater Detention Pond.
DSERTS 6 **(SWMU 6)**	Building 28 Sump and UST 21.
DSERTS 7 **(SWMU 7)**	Burn Pit No. 1 (Pits A-G).
DSERTS 8 **(SWMU 8)**	Burn Pit No. 2.
DSERTS 20 **(SWMU 20)**	Aboveground Abandoned Solvent Tank/Building 26 Recoup Operations, Area 1 **Building 10**, and UST 13.
DSERTS 24 **(SWMU 24)**	Contaminated Area 1, Building 247 Petroleum Laboratory, and UST 31 (petroleum waste oil tank).

Table 1-1. (Continued)

Soil Sites (continued)	
DSERTS 27 **(SWMU 27)**	Contaminated Area 4, Building 206 Roundhouse Sump.
DSERTS 65 **(SWMU 33)**	Industrial Waste Pipeline – Southern and Eastern Segments.
DSERTS 67	Northern Depot Soils Area.
DSERTS 69	**Building 30**, **Drum Storage Area** (Consolidated Subsistence Facility).
DSERTS 72	Pesticide Spill Area.
No DSERTS or SWMU number	**Eastern Depot Soils Area**.
No DSERTS or SWMU number	**Southern Depot Soils Area**.
No DSERTS or SWMU number	**Day Care Center.**

Bold type indicates the site name used in this five-year review report.

DSERTS	=	Defense Site Environmental Reporting and Tracking System	SVE	=	soil vapor extraction
NWC	=	northwestern corner	SWMU	=	solid waste management unit
OU	=	operable unit	TCE	=	trichloroethene
PCE	=	tetrachloroethene	VOC	=	volatile organic compound
SSL	=	sanitary sewage lagoon	UST	=	underground storage tank

This report was developed using the *Comprehensive Five-Year Review Guidance* (EPA, 2001); however, the suggested content for Sections 4.0 through 11.0, as identified in the EPA guidance, is provided under separate tab (Sections 5.0 through 21.0) for each specific site to consolidate the information related to a specific site into one section. This was also the approach taken in the first five-year review. The remainder of this report is organized as follows.

Section 2.0 Chronology: Lists significant events related to the contamination and remediation history of the Tracy Site.

Section 3.0 Background: Provides a succinct description of site characteristics. The purpose of this section is to identify the threat posed to the public and environment at the time of the ROD so that the performance of the remedy can be easily compared with the site conditions the remedy is intended to address.

Section 4.0 Five-Year Review Process: Provides an overview of activities performed during the five-year review (e.g., site inspections, interviews, and document reviews).

Sections 5.0 through 21.0 These sections cover the following topics for each site reviewed:

> **Remedial Action** – Provides a concise description of implementation history and the current status of the remedy.
>
> **Progress Since Last Review** – Restates the recommendation(s) from the first five-year review, and discusses actions taken or relevant events that have occurred since.
>
> **Five-Year Review Process** – Provides site-specific results of site inspections, site interviews, and documents reviewed, as appropriate. Photographs taken during the site inspections are included at the end of each section.

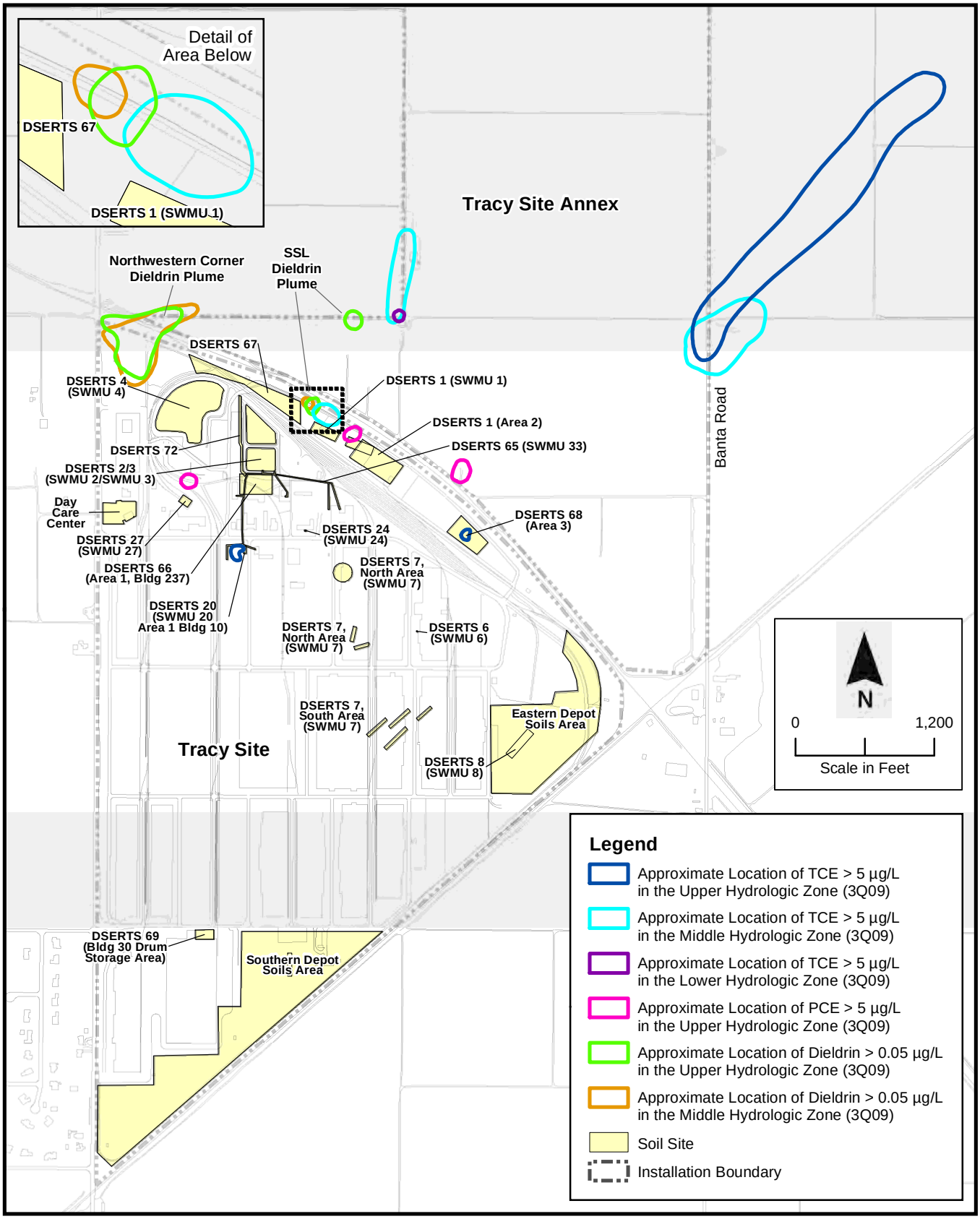

Figure 1-1. Soil Sites and Groundwater Plumes, Tracy Site

Technical Assessment – Provides answers to the three questions required for the assessment (i.e., Question A: Is the remedy functioning as intended by the decision documents? Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of remedy selection still valid? Question C: Has any other information come to light that could call into question the protectiveness of the remedy?).

Issues – Identifies issues related to current site operations, conditions, or activities, noting which issues, if any, prevent the remedy from being protective, currently or in the future.

Recommendations – Specifies required and suggested improvements to current site operations, activities, remedies, or conditions for those issues that affect current and/or future protectiveness.

Protectiveness Statement – Provides a protectiveness statement for each OU or site at which a remedial action has begun.

Next Five-Year Review: Identifies the need and time frame for the next five-year review.

Section 22.0 References: Provides reference information for sources cited in the report.

The report is supplemented with the following appendices:

Appendix A: Conceptual Site Model

Appendix B: Interview Records

Appendix C: Site Inspection Forms

Appendix D: Risk and Hazard Estimates for the Vapor Intrusion Pathway

Appendix E: Regulatory Agency Comments and Responses to Comments

2.0 CHRONOLOGY

Significant events and dates related to the initial discovery of contamination and implementation of site-wide remedies at the Tracy Site are listed in Table 2-1.

Table 2-1. Chronology of Site Events, Tracy Site

1980	Soil and groundwater contamination initially discovered
1984	Concentrations of solvents in groundwater exceeding state action levels reported to State of California
1986	Initial RI started
1990	OU 1 IRM system constructed
1990	Tracy Site added to NPL by EPA
1990	WDR Order No. 90-275 adopted by RWQCB
1991	FFA signed by DLA, EPA, RWQCB, and DTSC
1991	Operation of OU 1 IRM system started
1991	Soil removal action at Building 30 Drum Storage Area and Building 201 completed
1992	Off-site plume migration beneath annex property confirmed
1992	OU 1 RI/FS completed
1992	OU 1 proposed plan released to public
1992	TRC charter created; first TRC meeting conducted
1992	IRM treatment system repaired, tested, and operated
1993	OU 1 ROD signed by DLA, EPA, DTSC, and RWQCB
1993	FFA amended
1993	Annex property purchased
1994	Comprehensive RI/FS Phase I site characterization completed
1994	OU 1 GWTP1 full-scale design prepared
1995	Operation of OU 1 GWTP1 started
1995	Agricultural wells decommissioned
1995	Environmental baseline study for OU 1 easements conducted
1995	Time-critical removal action at day care center conducted
1996	OU 1 ESD signed by DLA, EPA, DTSC, and RWQCB
1996	EE/CA for non-time critical removal action at SWMUs 2, 3, and 33 completed
1996	WDR Order No. 96-022 adopted by RWQCB
1996	Day care center closure report completed
1996	OU 1 remedial action design report and analysis completed
1996	Comprehensive RI/FS completed
1996	Comprehensive Site-Wide Proposed Plan released to public
1997	GWTP2 design prepared
1997	100% design for removal action at SWMUs 2, 3, and 33 completed
1997	Removal action for SWMU 33 conducted
1998	WDR Order No. 98-053 adopted by RWQCB
1998	Site-Wide Comprehensive ROD signed by DLA, EPA, DTSC, and RWQCB
1998	Operation of GWTP2 started
1998	Removal action for SWMUs 2 and 3 conducted
1999	Remedial design work plan completed
1999	Remedial actions at SWMUs 4, 6, 20, 27 conducted
1999	Warning signs for LUCs at SWMUs 7, 33, and 67 and Building 30 Drum Storage Area installed

Table 2-1. (Continued)

1999	Overland flow pilot-scale study on annex property conducted
2000	100% SVE/bioventing systems design prepared
2000	RAR for LUCs at SWMUs 7 and 33, Building 30 Drum Storage Area, and DSERTS 67 completed
2000	SVE remedy installed at SWMU 1/Area 2, Area 1/Building 237, and Area 3
2000	Bioventing remedy installed at SWMU 24
2000	Operation of SVE at SWMU 1/Area 2, Area 1/Building 237, and Area 3 started
2000	Operation of bioventing system at SWMU 24 started
2001	Overland flow full-scale study on annex property conducted
2001	No Further Response Action Planned for DSERTS 72 completed
2001	ESD to the Site-Wide Comprehensive ROD signed by DLA, EPA, DTSC, and RWQCB
2001	OU 1 interim RAR completed
2002	Aggregate base at DSERTS 67 installed
2002	100% design for OU 1 pesticide remedial design completed
2002	Remedial action at SWMU 8 conducted
2002	RAR for SWMUs 2, 3, and 33 completed
2003	GWTP1 air stripper replaced with GAC system
2003	Operation of pesticide extraction wells in the sanitary sewage lagoon plume started
2003	Amendment to the Site-Wide Comprehensive ROD signed by DLA, EPA, DTSC, and RWQCB
2003	Bioventing at SWMU 24 terminated
2003	RAR for SWMU 27 completed
2004	RAR for SWMU 8 completed
2004	RAR for SWMUs 4, 6, and 20 completed
2004	RAR DSERTS 67 completed
2004	ESD to the Site-Wide Comprehensive ROD signed by EPA, DTSC, and RWQCB
2005	SVE tested at SWMU 24
2005	First five-year review signed by DLA, EPA, DTSC, and RWQCB
2006	GWTP1 shut down and inline liquid-phase GAC units installed at pesticide extraction wells
2006	Characterization of NWC dieldrin plume and natural attenuation study conducted
2007	Warning signs for LUCs at SWMUs 7, 33, and 67 and Building 30 Drum Storage Area replaced
2007	Swale/drainage repair at DSERTS 67 completed
2008	Remedy enhancement investigation at Area 1/Building 237, SWMU 1/Area 2, and Area 3 conducted
2008	Response completion plan prepared
2008	Focused extraction at four groundwater monitoring wells conducted
2008	SWMU 20 investigation conducted
2008	Dieldrin mass removal pump test in the NWC conducted
2009	Draft final NWC dieldrin plume FS submitted
2009	Formal dispute of draft final NWC dieldrin plume FS invoked
2009	Groundwater remedy enhancement investigation conducted
2009	No further action at SWMU 1/Area 2 and Area 3 recommended
2009	Pneumatic fracturing implemented at Area 1/Building 237 and SVE restarted
2009	SWMU 20 FS completed
2009	Draft Off-Depot Private Water Supply Well Contingency Plan submitted
2010	No further action at Area 1/Building 237 recommended
2010	Formal dispute resolved and NWC dieldrin plume FS completed

Table 2-1. (Continued)

DLA	=	Defense Logistics Agency	NPL	=	National Priorities List
DSERTS	=	Defense Site Environmental Reporting and Tracking System	NWC	=	northwestern corner
DTSC	=	Department of Toxic Substances Control	OU	=	operable unit
EE/CA	=	engineering evaluation/cost analysis	RAR	=	remedial action report
EPA	=	United States Environmental Protection Agency	RI	=	remedial investigation
ESD	=	explanation of significant differences	ROD	=	record of decision
FFA	=	federal facility agreement	RWQCB	=	Regional Water Quality Control Board
FS	=	feasibility study			
GAC	=	granular activated carbon	SVE	=	soil vapor extraction
GWTP	=	groundwater treatment plant	SWMU	=	solid waste management unit
IRM	=	interim remedial measure	TRC	=	technical review committee
LUC	=	land use control	WDR	=	waste discharge requirement

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3.0 BACKGROUND

The Tracy Site is a distribution depot operated by DLA to supply military services with the equipment needed to fulfill their missions. The activities that resulted in contamination at the facility and the physical characteristics that influence contaminant behavior and remediation are described in this section. The initial response actions taken prior to signing of the RODs are also described, as are the results of risk evaluations. Integration of this information into a conceptual site model (CSM) is important for an overall understanding of the site and for determining whether collection of additional information is necessary for a remedy. A CSM also provides an understanding of contaminant problems addressed by response actions and the current and future protectiveness of the response actions. This section provides an overview of the Tracy Site CSM; the CSM in Appendix A provides the same information plus additional detail on the site history and land use, environmental setting, nature and extent of contaminants of concern (COCs), groundwater modeling predictions, and receptor exposure analysis.

3.1 Physical Characteristics

The Tracy Site is located in California's San Joaquin Valley (Figure 3-1). The installation lies in San Joaquin County, approximately 1.5 miles southeast and outside the city limits of the City of Tracy, a community that was incorporated in 1910 (Figure 3-2). The area surrounding the City of Tracy is used primarily for agriculture. Unincorporated areas of San Joaquin County, the unincorporated community of Banta, and other rural neighborhoods are within a 3-mile radius of the Tracy Site. Nearby large urban communities include the City of Stockton, approximately 15 miles to the northeast, and the City of Modesto, approximately 25 miles southeast of the depot.

The operating depot portion of the Tracy Site covers a 448-acre triangular parcel, and the annex purchased in 1993 consists of 460 acres of agricultural land north of the operating depot (Figure 3-3). The ground surface at the Tracy Site ranges in elevation from 110 feet above mean sea level (msl) on the southwest to 45 feet above msl on the northeast. Chrisman Road borders the western edge of the installation, Banta Road borders the east, and Eleventh Street borders the north. At the eastern corner of the depot, two major railroad lines intersect. A Union Pacific track parallels the northern boundary of the operating portion of the site, and a second Union Pacific track parallels the southeastern boundary (Figures 3-2 and 3-3). About 75 percent of the operating portion of the depot is covered with buildings (primarily warehouses), asphalt, or concrete. Numerous smaller buildings in the northwestern corner of the depot house administration and operations. In addition, a day care center, recreational facilities, and other facility infrastructures are located at the depot. The only landscaped area is in the northwestern corner, near Building 100. All other unpaved surfaces contain weeds and grass, which historically have been removed regularly with herbicides (types and quantities were not recorded) and/or by grading.

3.1.1 Surface Water Hydrology

The Tracy Site is located on the distal portion of an alluvial fan sloping northeasterly from the Diablo Range that lies west and southwest of the depot. The principal drainages are Tom Paine Slough north of the depot, Corral Hollow Creek south of the depot, and the San Joaquin River east of the depot. Stormwater runoff from within the depot is collected in drains that lead to the unlined stormwater detention pond located in the northwestern portion of the depot (see Figure 5-1). Beneath the unlined pond, water infiltrates and migrates toward the water table. If the stormwater detention pond levels are too high, then stormwater can be discharged off depot. Wastewater from the depot is treated at the depot's wastewater treatment plant prior to discharge to the unlined sanitary sewage lagoons in the northern portion of the depot, southeast of the stormwater detention pond.

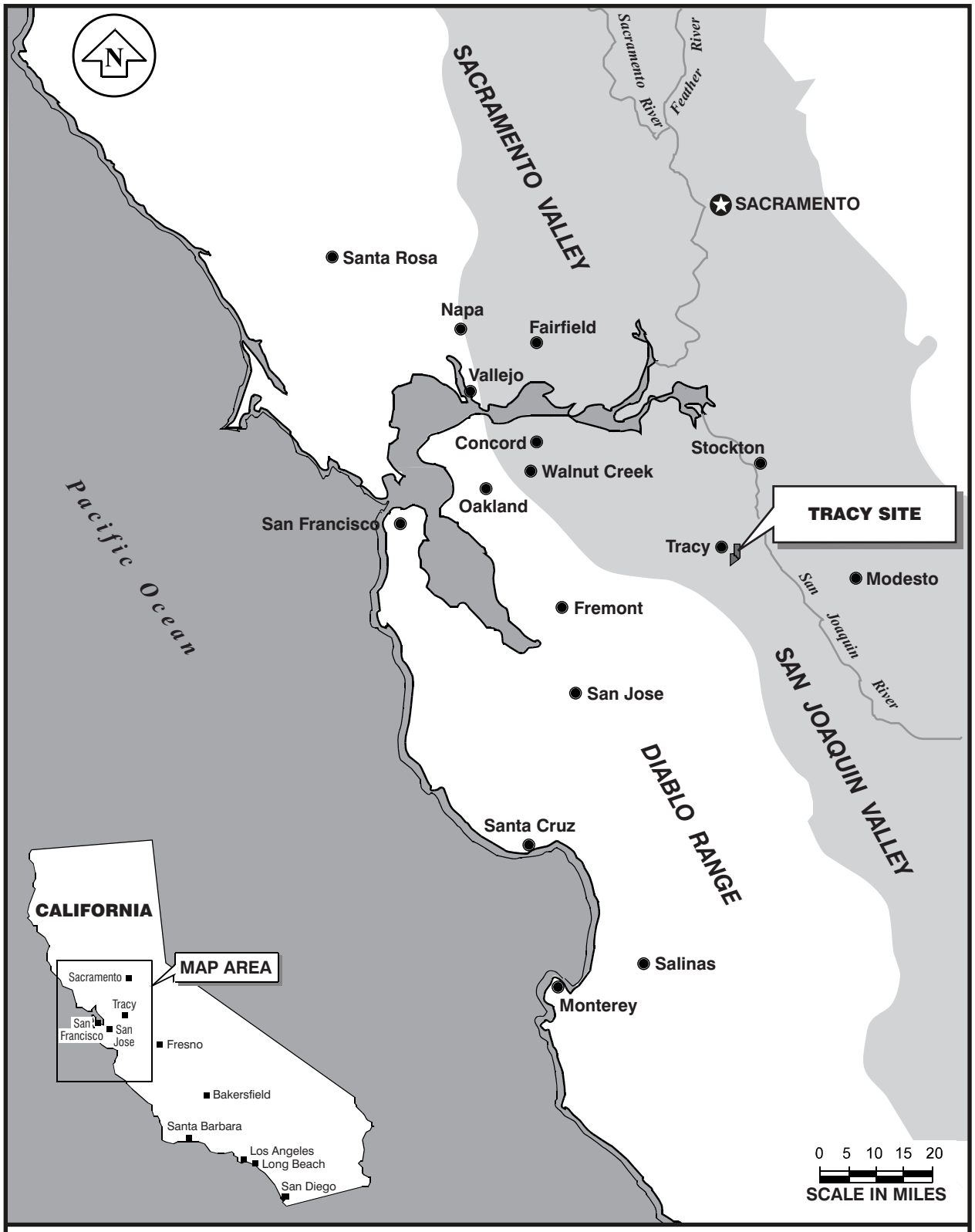

Figure 3-1. Location of Tracy Site

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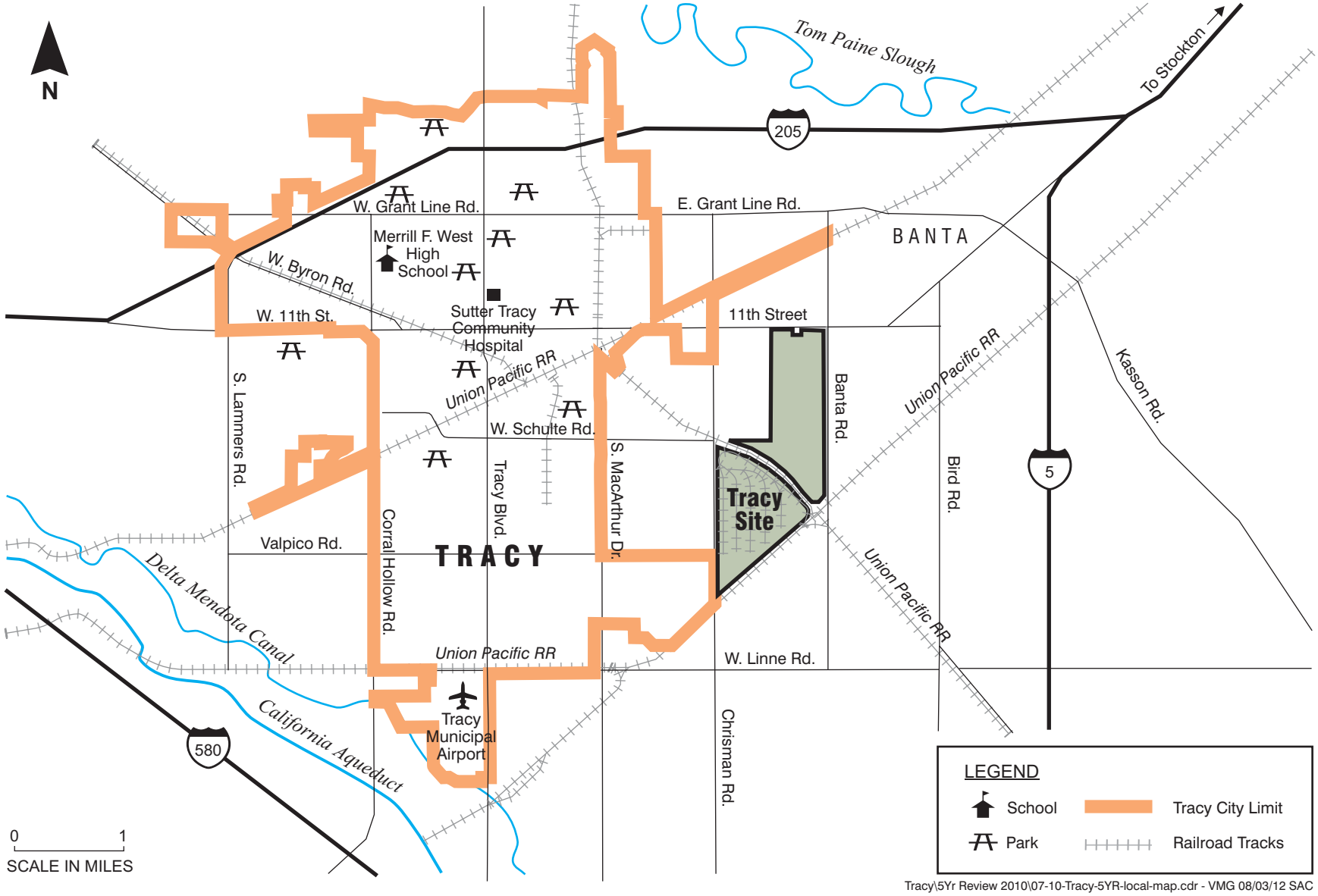

Figure 3-2. Site Location and Local Area, Tracy Site

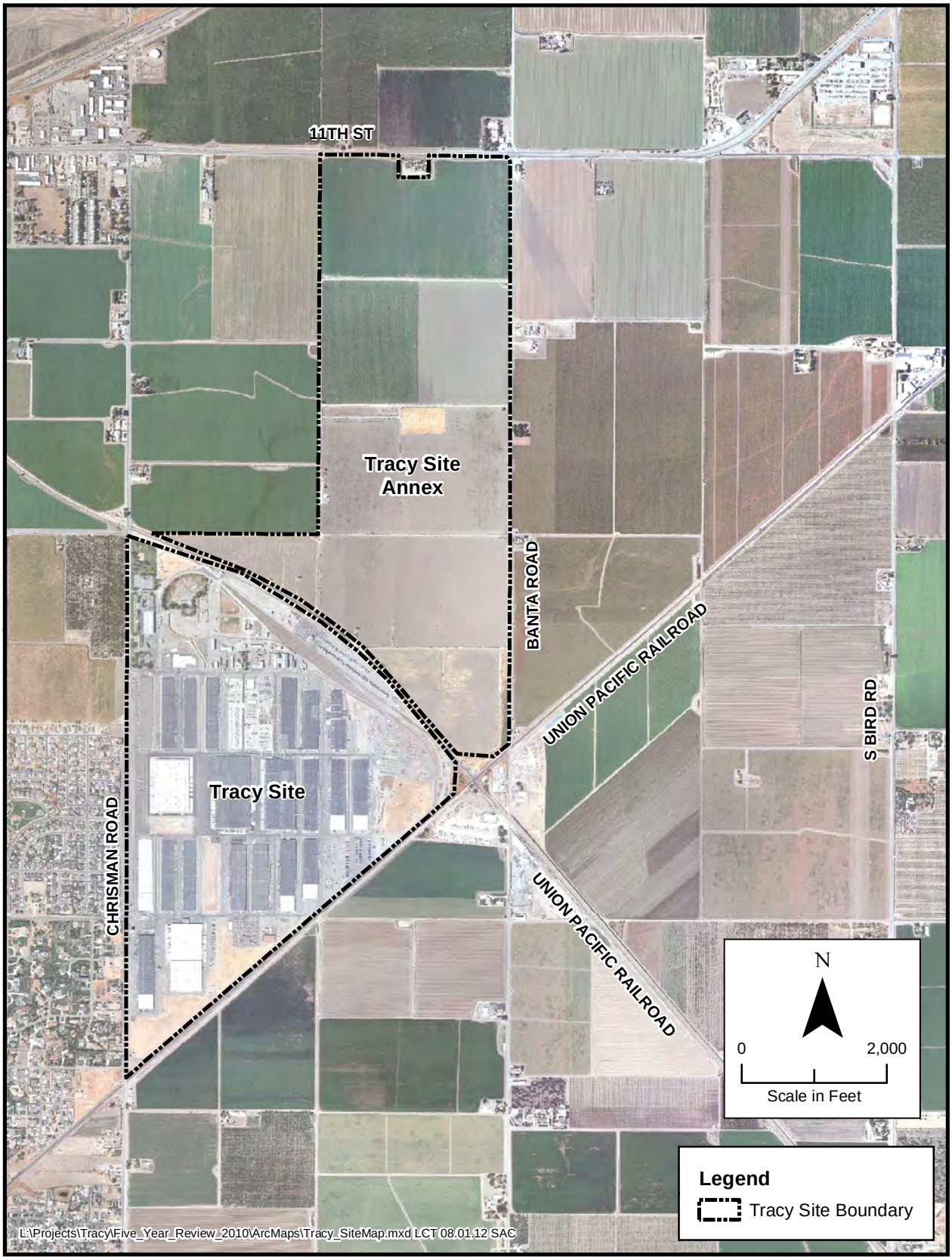

Figure 3-3. Site Map, Tracy Site

Most of the groundwater extracted and treated at the two Groundwater Treatment Plants (GWTPs) was discharged to the subsurface at infiltration galleries (IGs) 1 through 9 (IG1 located on depot; IGs 2-9 located off depot) and the chimney drain (CD) on the depot until 2001, when much of the flow from one plant was diverted to discharge into the overland flow plots on the annex (see Figure 5-1). IGs designed to accept the effluent could not accept all of the discharge; therefore, the IGs were rehabilitated. By 2005, most of the treated water from both GWTPs was again being discharged to the IGs. The overland flow areas have not been used for discharge since 2006. Discharge to IG1 and the CD on the active depot was discontinued in June 2009. Therefore, all treated groundwater is now discharged to IG2 through IG6.

The orchards and agricultural farmland on the annex and surrounding area are primarily watered by flood irrigation. Unlined ditches between farm fields and roads convey stormwater runoff and irrigation drainage to local percolation swales.

3.1.2 Regional Geology

The Tracy Site is located within the Tracy Subbasin of the San Joaquin Valley Basin. Figure 3-4 shows the stratigraphic and hydrostratigraphic nomenclature in use at the installation. This figure also provides the approximate depths of the regional stratigraphy and other relevant zones.

At the Tracy Site, the geological deposits from the surface to a depth of 20 to 30 feet below ground surface (bgs) originated from materials eroded from the Diablo Range and carried east by streams or winds. These deposits are named the Younger Alluvium. Silt and clay layers occur most frequently in the Younger Alluvium. The shallow subsurface deposits are difficult to distinguish from the underlying deposits of Older Alluvium and the Upper Tulare Member of the Tulare Formation. The Tulare Formation, divided into Upper, Middle, and Lower Members, consists of poorly sorted, discontinuous deposits of clay, silt, sand, and gravel (California Department of Water Resources [DWR], 2006). However, in the vicinity of the installation, only the Upper Member has been described during fieldwork associated with remedial investigation/feasibility study (RI/FS) activities. One braided stream channel in the Older Alluvium or Upper Tulare has been identified from boring logs (Montgomery Watson, 1996b). The stream channel deposited approximately northeasterly across the depot and the annex.

The Upper and Lower Members are transmissive zones in the Tulare Aquifer that are important to the water supply in the San Joaquin Valley. The Middle Tulare is the poorly transmissive Corcoran Clay Member, which is estimated to be 80 to 100 feet thick. The upper surface of the Corcoran Clay Member occurs at an approximate depth of 220 feet bgs at the Tracy Site. Sedimentary deposits of the Lower Tulare Member have not been encountered in soil borings or wells at the depot. However, the top of the Middle Tulare Member may have been penetrated in the boring drilled for extraction well EW030C in 1996.

3.1.3 Site Geology and Groundwater Hydrology

The geology of subsurface deposits to a depth of approximately 211 feet bgs at the depot has been compiled from data collected during monitoring well logging, cone penetrometer testing (CPT) logs, time-domain electromagnetic surveys, evaluation of agricultural well logs, and logging of extraction well and piezometer borings. Data collection has focused on geology in the Upper Tulare Member and the overlying alluvial deposits; therefore, no additional information on the Corcoran Clay and Lower Tulare Member is presented in this description. Surface soils are loams to sandy loams that have been disturbed by agricultural development followed by industrial development.

For the purpose of environmental investigations at the Tracy Site, the Upper Tulare Member and overlying alluvial deposits have been divided informally into four geologic units designated the Above

Age	Stratigraphic Units		Description	Regional Hydrostratigraphic Zones	Geologic Horizon Description	Depth Below Surface (ft) (top of zone)	Hydrogeologic Zone and Well Designations
Quaternary (Pleistocene and Holocene)	Younger Alluvium	Gravel quarry spoils and disturbed ground.	Gravel and sand.	Vadose Zone	Unconsolidated alluvial deposits in discontinuous layers and lenses; 5 to 12 feet thick sand layers; local stream deposits.	0	Unsaturated
		Levee deposits.	Unconsolidated sand, silt, and gravel.				
		Holocene fan and terrace deposits.	Unconsolidated clay, sand, and gravel.				
	Older Alluvium	Alluvial and fluvial deposits	Interbedded gravel, sand, silt, and clay.	Water table occurs in this unit; however, it is not hydraulically distinguishable from the Tulare Aquifer.	Unconsolidated alluvial deposits in discontinuous layers and lenses; 5 to 12 feet thick sand layers; local stream deposits.	25-35	Above Upper
					Unconsolidated alluvial deposits in discontinuous layers and lenses; 5 to 12 feet thick sand layers; local stream deposits.	35-55	Upper
Tertiary & Quaternary (Pliocene and Pleistocene)	Tulare Aquifer	Upper Tulare Member	Same as above.	Upper Tulare Aquifer— Upper waterbearing zone; contains water under semiconfined and unconfined conditions.	Unconsolidated alluvial deposits in discontinuous layers and lenses; 5 to 12 feet thick sand layers; local stream deposits.	55-65	Middle
					Semi-consolidated sand, silt, and clay layers in discontinuous layers and lenses; 5 to 12 feet thick sand layers.	90-100	Lower
					Semi-consolidated sand, silt, and clay layers in discontinuous layers and lenses; 5 to 12 feet thick sand layers.	170-~220	Below Lower
		Corcoran Clay Member	Sandy clay, silty clay, silt, and clay interbedded with fine-grained sand. Deposited in a lacustrine environment.	Regional confining layer between the upper and lower waterbearing zones.	Corcoran Clay equivalent found at 220 feet below ground surface at the depot (approximately 80 to 100 feet thick).	~220	None
		Lower Tulare Member	Lenticular and interfingering beds of gravel, sand, and clay. Deposited in alluvial and fluvial environments.	Lower Tulare Aquifer—Lower waterbearing zone; contains freshwater under confined conditions to an estimated depth of 1,600 feet.	Lower Tulare	300-320	None

NOTE: All depths and thicknesses are approximate. Source: Modified from Hotchkiss and Balding, 1971, Bertoldi, et al, 1991

Figure 3-4. Stratigraphic and Hydrostratigraphic Nomenclature, Tracy Site

Tracy\5Yr Review 2010\07-10-Tracy-5YR-hydro-table.cdr - VMG 08/03/12 SAC

Upper, Upper, Middle, and Lower Geologic Horizons (Woodward-Clyde Consultants, 1993; Montgomery Watson, 1995a). The Lower Geologic Horizon also includes a Below-Lower Geologic Horizon that is located beneath the annex. The depth, thickness, and lithology of the geologic horizons vary across the depot and the annex. With the exception of the Above Upper Geologic Horizon, the horizons consist of sand, silty sand, clayey sand, and gravel separated by silt and clay.

The depth to groundwater ranges from greater than 40 feet in the southern portion of the depot to approximately 10 feet in the northeastern portion of the annex. Groundwater beneath the depot and annex is generally unconfined. Approximate depths and saturated thicknesses of the Hydrogeologic horizons beneath the southern and northern portions of the Tracy Site are as follows:

Upper Hydrologic Zone (Above Upper Geologic Horizon and Upper Geologic Horizon)	
Southern portion of depot Depth range: 0 to 65 feet bgs Saturated thickness: 30 feet	Northern portion of depot Depth range: 0 to 50 feet bgs Saturated thickness: 25 feet
Middle Hydrologic Zone (Middle Geologic Horizon)	
Southern portion of depot Depth range: 65 to 120 feet bgs Saturated thickness: 55 feet	Northern portion of depot Depth range: 55 to 100 feet bgs Saturated thickness: 45 feet
Lower Hydrologic Zone (Lower Geologic Horizon and Below-Lower Geologic Horizon)	
Southern portion of depot Depth range: 120 to 165 feet bgs Saturated thickness: 45 feet	Northern portion of depot Depth range: 100 to 195 feet bgs Saturated thickness: 95 feet

Historically, groundwater flow in the vicinity of the Tracy Site has generally been to the northeast. Currently, groundwater flow is generally north-northwest to northeast at the Tracy Site with local variations caused by groundwater extraction (pumping) and infiltration. Vertical gradients are generally downward from the Upper to Middle Hydrologic Zones and generally neutral between the Middle and Lower Hydrologic Zones.

Annual peak groundwater elevations occur during the third quarter of each year. This peak occurs six to seven months after peak rainfall months. The data suggest that the rise in water levels occurs approximately 18 months after rainfall levels increased. Examples of this are the August 2007 water elevations in all zones in all areas following a year (third quarter of 2006 to third quarter of 2007) of much lower total rainfall than in fourth quarter 2004 through second quarter 2006. The delay in water level response to rainfall may represent the time necessary for rainfall to percolate to groundwater.

3.2 Land and Resource Use

Prior to the construction of the Tracy Site, the historic land use was primarily agricultural (irrigated cropland and orchards and pasture for livestock grazing) and industrial (railroad transportation). During the 1870s, Southern Pacific Railroad founded the City of Tracy and developed it as a maintenance and supply facility for trains moving to and from the San Francisco Bay Area. In 1942, the Tracy Site originated as a “sub depot” of the United States Army’s Quartermaster Corps, Oakland Army Depot. In 1963, operational control of the site was transferred to DLA, though the Army retains ownership of the property. In 1990, a United States Department of Defense (DoD) reorganization placed all supply depots under DLA. As a result, the Tracy Site and its sister site (Sharpe) were consolidated under DLA’s Defense Distribution Region West (DDRW), which was headquartered at the Sharpe Site. In 1997, DDRW and Defense Distribution Region East were consolidated into Defense Distribution Center (DDC), headquartered in New Cumberland, Pennsylvania, and the Tracy Site became known as Defense Distribution Depot San Joaquin California–Tracy Site.

The oldest buildings at the Tracy Site were built in 1942. During World War II there was a German prisoner of war (POW) camp in the southern corner of the depot, but only written records, including plan drawings, of this POW camp remain. No building or location at the site is being considered for the National Registry of Historic Sites.

Current supply activities at the Tracy Site include storage, handling, preservation, packaging, and shipment of food, medical, construction, clothing, electronic, industrial, and general supplies and equipment to military services within the western United States and throughout the Pacific region. Purchase of the annex assured that the land would not be developed and that residences or water users could not be affected by contamination. Owning the property also simplified the process of installing extraction and treatment facilities.

The Tracy Site depot land is designated as a public facility in the *City of Tracy General Plan* and, as of 2010, is outside of the City of Tracy's sphere of influence (City of Tracy, 2010). Three water supply wells in the southern portion of the depot provide all potable water, process water, and fire suppression water for the Tracy Site.

The area surrounding the Tracy Site comprises mixed-use light industrial, agricultural, and residential areas (City of Tracy, 2010). At the eastern corner of the depot, two major Union Pacific railroad lines intersect; small parcels to the south and east of the railroad intersection are designated for industrial or commercial use. Other areas outside of the City of Tracy sphere of influence include agricultural land consisting of orchards and row crops. These agricultural lands lie to the north (including the annex), east, and south of the depot; scattered rural single-family residences are also present in these areas. To the west of the depot and within the City of Tracy limits are single-family residences in a low-density residential development. To the northwest of the depot and within the City of Tracy sphere of influence is an area designated for urban reserve.

The unincorporated areas of Tracy, the unincorporated community of Banta, and other rural neighborhoods are within a 3-mile radius of the Tracy Site. In each of these areas, private water supply wells provide drinking water. The installation of future water supply wells is governed by San Joaquin County Ordinance Code Section 9-1115. The community of Banta, 2 miles northeast of the depot, includes an elementary school, about 30 residences, and commercial and industrial businesses. Another rural residential development (Stoneridge) 2.5 miles northeast of the depot contains 60 residences.

3.3 History of Contamination

Past depot mission activities that resulted in environmental contamination included vehicle maintenance, material stockpiling, drum storage, waste disposal, and wastewater management. Prior to the mid-1970s, many wastes were disposed of on site in accordance with standard industrial practices commonly in use at that time, such as burning, surface disposal, and burial. Identified disposal sites include burn pits, medical supplies burial, construction materials burial, pesticide waste disposal trenches, lube/oil dumps, battery acid sumps, maintenance areas, fuel storage tanks, and other hazardous waste disposal.

Releases of chemicals and hydrocarbon fuels have contaminated depot soils and groundwater with degreasing solvents, heavy metals, pesticides, and petroleum-based oils and lubricants. Contaminants entered groundwater by dissolution in percolating water and volatilization into soil gas that migrated through soil pores to the water table.

3.4 Initial Responses

Environmental studies have been underway at the Tracy Site since 1980 when soil and groundwater contamination were first detected. A records search performed by the United States Army Toxic and Hazardous Materials Agency (USATHAMA) first identified 25 waste sites (solid waste management units [SWMUs] 1 through 23, 2A, and 10A) that contained contaminants that could potentially have migrated to off-depot locations (USATHAMA, 1980). In 1985, six additional contaminant areas were identified (Areas 1 through 6). Additional SWMUs were identified in a Resource Conservation and Recovery Act (RCRA) assessment report (EPA, 1990).

Between 1986 and 1992, an initial RI was conducted at the Tracy Site. The results of the RI led to the Tracy Site being listed on CERCLA's National Priorities List (NPL) as a Superfund site in 1990. In 1991, DLA, EPA, DTSC, and RWQCB signed the FFA for the Tracy Site (DLA, 1991). The FFA has enforceable schedules and ensures that environmental impacts from past and present operations are thoroughly investigated and that appropriate cleanup actions are taken to protect human health, welfare, and the environment. The EPA, DTSC, and RWQCB provide regulatory oversight consisting of technical support, review, and comment on all investigative work and cleanup work at the Tracy Site.

3.4.1 Initial OU 1 Response Actions

An interim remedial measure (IRM) system was installed in 1990 for OU 1. The IRM consisted of a groundwater extraction system and an air stripper with vapor control that was put into operation to control migration of volatile organic compound (VOC)-contaminated groundwater, reduce VOC concentrations, and provide data to evaluate the effectiveness and potential use of the selected remedial technology for full-scale design. The system included six extraction wells, an air stripper with vapor-phase carbon absorbers, three injection wells, two piezometers, and 10 monitoring wells. The Well Monitoring Program's quarterly sampling was also initiated at this time.

The groundwater remedy selected in the OU 1 ROD is extraction and treatment of VOC-contaminated groundwater by air stripping, with treated groundwater being discharged to injection wells or surface impoundments (Woodward-Clyde Consultants, 1993). The IRM was incorporated into the OU 1 remedy, and the design of the full-scale OU 1 system was completed in April 1996. Construction of a second groundwater treatment plant, located in the annex, was completed and operation began in October 1998. The remedy selected in the Site-Wide Comprehensive ROD for dieldrin-contaminated groundwater related to SWMUs 2 and 3 is extraction and treatment with liquid-phase granular activated carbon (LGAC) (Radian International, 1998a).

3.4.2 Initial Site-Wide Response Actions

For some IRP sites, cleanup activities were conducted prior to a final remedial action being authorized by a signed ROD. At the Building 30 Drum Storage Area, soil and buried drums were excavated at the southern end of the site prior to the construction of the Consolidated Subsistence Facility in 1992 (TELIC, Engineering Corporation, 1991). In 1995, a time-critical removal action was conducted at the Day Care Center to reduce the potential cancer risk estimated as part of the baseline risk assessment (Radian Corporation, 1996a; Montgomery Watson, 1996b). Consequently, the Site-Wide Comprehensive ROD stated that no further action was required at the Day Care Center because no further threat to human health, ecological receptors, or background groundwater quality remained at the site (Radian International, 1998a). A non-time critical removal action was conducted between 1997 and 1998 at SWMUs 2, 3, and 33 to expedite cleanup because those sites posed a threat to groundwater quality (Montgomery Watson, 1996b; URS, 2002a). The final remedy and cleanup standards for SWMUs 2, 3, and 33 are documented in the Site-Wide Comprehensive ROD.

In 1998, the Site-Wide Comprehensive ROD was signed, designating 22 sites for no further action and selecting remedial actions for 15 soil sites. Remedial actions for three additional sites were selected in the Site-Wide Comprehensive ROD Amendment (one site) and the 2001 ESD (two sites). The selected remedial actions for each site requiring a five-year review are presented in their respective site-specific section of this report.

3.5 Basis for Taking Action

Environmental contaminants that require cleanup at the Tracy Site have been discovered in soil, sediment, surface water, and groundwater. A list of the COCs and the cleanup standards for each site requiring a five-year review are listed in the site-specific sections of this report. Cleanup standards were established to protect human health, ecological receptors, background groundwater quality, and beneficial uses. Cleanup standards protective of human health (industrial worker) are risk-based standards to reduce the incremental cancer risk at a site to 1×10^{-6}. Cleanup standards to protect ecological receptors were developed with input from EPA. Cleanup standards for groundwater are based on beneficial use limits (e.g., maximum contaminant levels [MCLs]), and cleanup standards for soil gas to protect background groundwater quality were developed through vadose zone modeling and equilibrium partitioning limits developed in the Comprehensive RI/FS. COCs and cleanup standards were established or modified in the various RODs and/or ESDs.

Exposure to significant concentrations of contaminants in soil, sediment, surface water, and/or groundwater is associated with unacceptable human health risks and/or ecological health risks. Cleanup has been required for contamination for which chemical concentrations exceed regulated thresholds or for which concentrations exceed management criteria developed or accepted by DLA and the regulatory agencies. The over-riding basis for taking action at the Tracy Site is protection of human health and the environment.

3.5.1 Basis for OU 1 ROD Action

Contaminant concentrations in groundwater beneath the Tracy Site exceed risk-based cleanup levels (Woodward-Clyde Consultants, 1992). The baseline risk assessment results indicated that health risks could result if on-depot concentrations of VOCs were to migrate to areas of the groundwater system used for domestic water supply and were subsequently ingested by off-depot residents. This prompted the remedial actions identified in the OU 1 ROD. The carcinogenic risk to human health calculated in the risk assessment resulted in the selection of aquifer cleanup levels (ACLs) for three VOC COCs (Woodward-Clyde Consultants, 1992). The ACLs for each COC are provided in Section 5.0. The ecological risk assessment concluded that the primary potential exposure pathway for plants and animals from OU 1 is through flood irrigation water supplied by the agricultural wells (Woodward-Clyde Consultants, 1992). This exposure pathway does not pose a potential existing or future risk to biota from the existing agricultural wells based on the assumptions and uncertainties presented in the baseline risk assessment. It should be noted that the agricultural wells on the annex were decommissioned between 1994 and 1995.

3.5.2 Basis for Site-Wide Comprehensive ROD Actions

As part of the Comprehensive RI/FS for the Tracy Site, a baseline risk assessment was conducted (Montgomery Watson, 1996b). The baseline risk assessment grouped the SWMUs, USTs, and soil contamination areas at the Tracy Site into 15 exposure units (EUs) based on location and similarities in contaminants and pathways. Also evaluated as three separate EUs were groundwater beneath the depot, the annex, and property east of the annex; dieldrin was added as a COC for OU 1.

Both existing and potential future risks (e.g., residential use) to human health were estimated. However, because there was little potential for the depot to become a residential development in the foreseeable future, potential future residents were evaluated solely to provide benchmarks for evaluating receptors with lower potential risk and to help DLA determine suitable uses for parcels of land on the active depot and annex. Consequently, the risks to potential future residents were not considered in determining whether remediation was necessary. The results of the baseline human health risk assessment are provided in detail in Appendix R of the Comprehensive RI/FS Report (Montgomery Watson, 1996b) and summarized in the sections of this report specifically addressing the sites requiring a five-year review.

The ecological risk assessment evaluated the actual or potential effects of a site on plants and animals (Montgomery Watson, 1996b). The objective of the ecological risk assessment was to estimate the chemical risks to wildlife on the site for those areas where wildlife habitat existed and contamination had been documented. The depot has very few areas suitable for wildlife habitat because of the industrial/ commercial land use at the facility. Approximately 75 percent of the depot is covered with buildings, roadways, and paved parking areas. No known rare or endangered species of wildlife have been documented at the depot, and no critical habitats or habitats of endangered species have been identified. There are no sensitive habitats, such as natural high quality wetlands, or aquatic or terrestrial natural areas that provide habitat for wildlife species on the depot. However, three on-depot areas, though they are man-made, can provide habitat to wildlife. The three areas include depot-wide surface soil, surface water and sediment in the SWMU 2 sewage waste lagoons, and surface water and sediment in the SWMU 4 stormwater detention pond. The results of the ecological risk assessment are provided in detail in Appendix R of the Comprehensive RI/FS Report (Montgomery Watson, 1996b) and summarized in the sections of this report specifically addressing the sites requiring a five-year review.

Most of the cleanup standards in the Site-Wide Comprehensive ROD correspond to concentrations protective of water quality. The cleanup standards for DDX (the sum of DDT + DDE + DDD), lead, and selenium at SWMUs 2 and 4 were risk-based standards to protect ecological receptors, but these standards were estimated using literature-derived values rather than site-specific bioaccumulation factors. The Site-Wide Comprehensive ROD acknowledged that the data available to develop cleanup standards were limited at the time of the Comprehensive RI/FS ecological risk assessment and that additional data would be collected to obtain site-specific bioaccumulation factors. Consequently, additional data were collected to further characterize the concentrations of chemicals of potential concern (COPCs) in sediment, provide site-specific data for characterizing the concentrations of COPCs in elements of the food-web (aquatic invertebrates, plants, and fish), and better evaluate the effects of COCs on ecological receptors. An updated ecological risk assessment was completed using the additional data collected at SWMUs 2 and 4 (URS, 2001a; 2001b), and cleanup standards were revised and/or deleted (URS, 2001a; 2003a). These modifications at SWMUs 2 and 4 are noted in the site-specific sections of this five-year review report.

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4.0 SUMMARY OF FIVE-YEAR REVIEW PROCESS

This section describes activities performed during this Tracy Site five-year review, including identifying the five-year review team, notifying the local community, reviewing relevant documents and data, inspecting current site conditions, and conducting interviews to assist in determining site status. Information about the five-year review process that applies to the Tracy Site in general is presented in this section. The summaries in Sections 5.0 through 21.0 provide site-specific information from site inspections.

4.1 Administrative Components

The Tracy Site five-year review team is composed of the following RPMs:

- Maurice Benson, DLA Installation Support at San Joaquin, Environmental Services Branch
- Phillip Ramsey, EPA (Region 9)
- Christopher Sherman, DTSC
- James Brownell, RWQCB (Central Valley Region)

Members of the review team were notified of the initiation of the second five-year review for the Tracy Site during the 17 June 2010 RPM monthly schedule teleconference. The schedule for this second five-year review is presented in Table 4-1.

Table 4-1. Second Five-Year Review Schedule, Tracy Site

		Draft			Draft Final			
Document Title	**Document Status**	**Submission Date**	**Review Period**	**Comments Due Date**	**Comment Resolution Period**	**Submission Date**	**Comment Due Date**	**Finalization Date**
Second Five-Year Review Report	Primary	30 Aug 10	60 days	29 Oct 10	60 days	27 Dec 10	26 Jan 11[a]	10 August 2012

[a] Extension of the review period requested by EPA. Comments on draft final document received on 6 February 2012.

4.2 Community Involvement and Notification

The DLA Installation Support at San Joaquin, Environmental Services Branch, has maintained an active community involvement program since the 1980s. Key components of this program include:

- Providing general information updates to the community through the distribution of the depot's *Environmental Update* fact sheets to a community mailing list that includes interested parties (approximately 200 addresses) and all mailing addresses within the postal zones surrounding the depot (more than 3,000 addresses).
- Notifying the community of program milestones and providing opportunities for public review and comment through public notices placed in local newspapers, as required by EPA guidance.

- Holding public meetings to present milestone documents and solicit public review and comment, as required.

- Providing informal program updates to community members through the Tracy Site Community Update Forum. To date, the Community Update Forum has held infrequent meetings.

In accordance with EPA guidance (2001), DLA will notify the community of the Tracy Site's second five-year review at both the beginning and the conclusion of the process.

A public notice was published on 15, 16, and 21 July 2010 in the *Stockton Record*, *Tracy Press*, *Manteca Bulletin*, and *Vida en el Valle* (a regional Spanish language newspaper). The notice provides an overview of the second five-year review process, outlines the five-year review schedule, and provides a list of contacts for community members who have questions or concerns.

As part of the second five-year review process, DLA solicited regional stakeholders for feedback regarding ongoing environmental restoration activities at the Tracy Site. Stakeholders asked to participate in interviews include a cross-section of community leaders, including representatives from local government, civic leaders, community members, and members of the business community. A summary of the interviews is provided in Section 4.6; interview records are provided in Appendix B.

A public notice will be published in the *Stockton Record*, *Tracy Press*, *Manteca Bulletin*, and *Vida en el Valle* to notify the community of the completion of the review process and finalization of the second five-year review report. This notice will briefly summarize the review, note how and where the public can view the report, and list points of contact for community members who would like to obtain more information or ask questions about the results of the second five-year review.

The final second five-year review report for the Tracy Site will be available for viewing by the public in the Administrative Record at the Information Repository located at the Tracy Site, Tracy, California.

4.3 Document Review

The five-year review process included a review of documents relevant to the Tracy Site IRP, including RODs, a ROD amendment, ESDs, and the First Five-Year Review Report, to identify a comprehensive set of current RAOs, cleanup levels, applicable or relevant and appropriate requirements (ARARs), and the recommendations from the First Five-Year Review Report. Documents relevant to the implementation and performance of the groundwater, soil gas, and soil remedies were also reviewed, including monthly performance monitoring reports and quarterly and annual Well Monitoring Program Reports, as well as various closure and remedial action reports. Documents relevant to the performance of the various treatment systems were reviewed to evaluate whether the systems are operating in accordance with their operation and maintenance (O&M) manuals. Finally, investigation and risk assessment documents were reviewed as needed. Documents that were consulted during the preparation of this report are listed in Tables 4-2a through 4-2f and included in the reference list in Section 22.0 of this report.

Table 4-2a. Documents Reviewed − Basis for the Response Action, Tracy Site

Installation-Wide
DDRW-Tracy Comprehensive Remedial Investigation/Feasibility Study (Montgomery Watson, 1996b)
DDJC-Tracy Site-Wide Comprehensive Record of Decision (Radian International, 1998a)
DDJC-Tracy 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 (URS, 2001a)

Table 4-2a. (Continued)

Installation-Wide (continued)
DDJC-Tracy Baseline Ecological Risk Assessment, Solid Waste Management Unit 4 (URS, 2001b)
DDJC-Tracy Amendment to the Sitewide Comprehensive Record of Decision (URS, 2003a)
DDJC-Tracy 2004 Explanation of Significant Differences to the Sitewide Comprehensive Record of Decision (URS, 2004a)
DDJC-Tracy Five-Year Review Report (URS, 2005a).
DDJC-Tracy Response Completion Plan (URS, 2008a).
DDJC-Tracy Solid Waste Management Unit 20 Feasibility Study (URS, 2009a).
Groundwater
Operable Unit No. 1, Record of Decision, DDRW-Tracy, California (Woodward-Clyde, 1993)
DDRW-Tracy, Operable Unit 1 Explanation of Significant Difference (Montgomery Watson, 1996a)
DDJC-Tracy Northwestern Corner Dieldrin Plume Feasibility Study Report (URS, 2010a)

DDJC = Defense Distribution Depot San Joaquin California
DDRW = Defense Distribution Region West
ROD = record of decision
URS = URS Group, Inc.

Table 4-2b. Documents Reviewed − Implementation of the Response, Tracy Site

Installation-Wide
DDJC Summary Master Plan (R&K Engineering, 2002)
DDJC Real Property Master Plan Digest (R&K Engineering, 2009)
Groundwater
OU 1 Groundwater Interim Remedial Action Report (URS, 2001c)
OU 1 Pesticide Remedial Design, 100% Submittal (URS, 2002b)
SVE Soil Sites
SVE Closure/Confirmation Sampling Results Technical Memorandum (URS, 2004b)
Biovent Area SVE Pilot Test Memorandum, B247, DDJC-Tracy (URS 2005b)
DDJC-Tracy Warehouse 10 Investigation Repot, Part 1−Summary Results (URS, 2009b)
Pneumatic Fracturing Enhancement to SVE at Area 1-Phase 1, DDJC-Tracy Technical Memorandum (URS, 2009c)
Pneumatic Fracturing Enhancement to SVE at Area 1-Phase 1, DDJC-Tracy, Summary of Phase I Field Activities (URS, 2009d)
Soil Sites
Child Care Facility Closure Report (Radian Corporation, 1996a)
Remedial Action Report for Institutional Controls at SWMUs 7 and 33, Building 30 Drum Storage Area, and the Northern Depot Soils Area (Radian International, 2000a)
No Further Response Action Planned for DSERTS 72 (URS, 2001d)
Remedial Action Report for Solid Waste Management Units 2, 3, and 33 (URS, 2002a)
Project Closeout Plan (Remedial Action Report), SWMU 27 Small Excavation Site, DDJC-Tracy Site, Tracy, California (Shaw Environmental, Inc., 2003)

Table 4-2b. (Continued)

Soil Sites (continued)
Project Closeout Plan (Remedial Action Report), SWMU 6 and 20 Small Excavation Sites and SWMU 4 Wet Season Controls, DDJC-Tracy Site, Tracy, California (Shaw Environmental, Inc., 2004a)
Project Closeout Plan (Remedial Action Report), SWMU 8 Large Excavation, DDJC-Tracy Site, Tracy, California (Shaw Environmental, Inc., 2004b)
Project Closeout Plan (Remedial Action Report), Northern Depot Area (DSERTS 67) Cover Installation, DDJC-Tracy Site, Tracy, California (Shaw Environmental, Inc., 2004c)

DDJC = Defense Distribution Depot San Joaquin California
OU = operable unit
SVE = soil vapor extraction
SWMU = solid waste management unit
URS = URS Group, Inc.

Table 4-2c. Documents Reviewed − Remedy Performance, Tracy Site

Groundwater
3-D Groundwater Model Technical Evaluation (Montgomery Watson, 1995b)
Results of the CPT Groundwater Investigation, DDJC-Tracy, Northwest Corner Dieldrin Plume (URS, 2005c)
Three-Dimensional Groundwater Model Report (URS, 2007a)
DDJC-Tracy Focused Groundwater Extraction Test Work Plan (URS, 2008b)
DDJC-Tracy, Focused Extraction and Aquifer Test Memorandum (URS, 2008c)
DDJC-Tracy Well Monitoring Program Annual Monitoring Reports (URS, 2006a, 2007b, 2008d, and 2009e) (HDR | e^2M, 2010a)
Groundwater Treatment Plant Monthly Performance Monitoring Reports (URS, 2005d, 2006b, 2007c, 2008e, and 2009f) (HDR | e^2M, 2009 and 2010b)
Groundwater Remedy Enhancement Summary Report (URS, 2009g)
SVE Soil Sites
Defense Logistics Agency Enterprise Support San Joaquin California, Tracy Site, CPT Effort to Support Remedy Enhancement Decisions at SVE Site (URS, 2008f)
Sampling Effort to Support NFA Decisions at Area/Building 237 SVE Site, DDJC-Tracy (URS, 2009h)
DDJC-Tracy Remedy Enhancement Decisions at SVE Sites Area 1/Building 237, SWMU 1/Area2, and Area 3 (URS, 2009i)
Results from Sampling Effort to Support NFA Decisions at Area/Building 237 SVE Site, DDJC-Tracy (URS, 2010b)
Well Monitoring Program Annual Monitoring Reports contain SVE remediation and operations information.
Soil Sites
Well Monitoring Program Annual Monitoring Reports contain annual site inspection information for land use control sites.

DDJC = Defense Distribution Depot San Joaquin California
OU = operable unit
SVE = soil vapor extraction
URS = URS Group, Inc.

Table 4-2d. Documents Reviewed − Operation and Maintenance, Tracy Site
Operation and Maintenance Manual, Groundwater Treatment Plant 1 (Tetra Tech, 2005)
Operations and Maintenance Manual, Groundwater Treatment Plant 2 (URS, 2006c)
Well Monitoring Reports contain operations information for groundwater and soil vapor extraction and treatment systems.
DDJC = Defense Distribution Depot San Joaquin California URS = URS Group, Inc.

Table 4-2e. Documents Reviewed − Legal Documentation, Tracy Site
Federal Facility Agreement for DDRW-Tracy (DLA, 1991).
Order No. 99-053. Waste Discharge Requirements for DDJC-Tracy. California (RWQCB-CV, 1998)
DDJC = Defense Distribution Depot San Joaquin California DDRW = Defense Distribution Region West DLA = Defense Logistics Agency ROD = record of decision RWQCB-CV = Regional Water Quality Control Board−Central Valley Region URS = URS Group, Inc.

Table 4-2f. Documents Reviewed − Community Involvement, Tracy Site
Community Relations Plan, DDJC-Tracy (URS, 2008g).
DDJC = Defense Distribution Depot San Joaquin California URS = URS Group, Inc.

4.4 Data Review

In general, data reviewed for the technical assessment in this second five-year review include those data presented and evaluated in the monthly performance monitoring reports for OU 1 and the quarterly and annual Well Monitoring Program Reports for OU 1, the SVE sites, and annual inspections of soil sites with land use controls, which are cited throughout this document, where appropriate. For groundwater remedy performance assessments, hydraulic and analytical data reviewed include groundwater level changes, gradients, flow directions, capture zones, groundwater quality data, including trends, mass removal data, and effluent compliance data. For SVE remedy performance assessments, data reviewed include analytical concentration data from both field measurements and laboratory analysis of vapor samples, extraction and emission rate data, mass removal data, compliance data, and operational data (e.g., uptime, electrical usage, and destruction rate efficiency). For the soil (non-SVE) remedy performance assessments, data reviewed include groundwater and stormwater data, compliance data, and site inspection reports.

The site-specific summaries in Sections 5.0 through 21.0 indicate the nature of and deficiencies, if any, in the data reviewed.

4.5 Site Inspection and Land Use Control Management

DLA Installation Support at San Joaquin and URS inspected OU 1 and the soil remedial action sites on 16 July 2010. Representatives from the EPA, DTSC, RWQCB, and HDR | e^2M also participated in the inspections.

Site inspections are conducted to provide information about a site's status and to visually confirm and document the conditions of the remedy, the site, and the surrounding area. At the Tracy Site, this included the groundwater extraction and treatment system for OU 1, soil sites with land use controls, soil sites without land use controls, the Day Care Center, and the SVE sites. For all sites, site inspection forms were completed and photographs were taken to show the current site conditions.

Land use controls are managed by DLA Installation Support at San Joaquin, including the Environmental Services Branch and the Master Planner. Land use control procedures for the Tracy Site were developed to be consistent with the 2003 Department of Defense – EPA guidance *Principles and Procedures for Specifying, Monitoring and Enforcement of Land Use Controls and Other Post-ROD Actions*. The Federal Facilities Land Use Control ROD Checklist (EPA, 2006) was used during this five-year review to confirm the land use control procedures are consistent with the referenced 2003 guidance. Appendix F of the 2004 ESD is the *Appendix to the Installation Master Plan*, which documents land use control requirements and procedures for the Tracy Site. The appendix provides a description of each site with land use controls and a figure showing the extent of the land use controls. In addition, the appendix describes agency notification requirements, maintenance and reporting requirements, and land use change requirements for the Tracy Site. This appendix has been incorporated into the Real Property Master Plan Digest (RPMPD) (formerly the Installation Master Plan) for the Tracy Site.

The following issues were identified during site inspections. The RPMs requested that warning signs be posted for all land use control sites if signs had not been posted prior to the inspection. Construction activities were being performed at SWMU 20 (parking lot) and the Southern Depot Soils Area (security truck entrance) at the time of the inspections. The RPMs were previously notified of these activities in accordance with the appendix to the RPMPD. It was also observed that the western portion of DSERTS 67 was not covered with grass to reduce dust generation as required by the 2004 ESD.

The site-specific summaries in Sections 5.0 through 21.0 describe findings, if any, from the site inspections. Site inspection forms are provided in Appendix C; photographs taken during the site inspections are included at the end of each site-specific section.

4.6 Interviews

As part of the Tracy Site five-year review process, a series of interviews were conducted to evaluate opinions and concerns regarding environmental restoration activities at the Tracy Site. The interview process included two components – interviews with community members and interviews with O&M representatives, including the RPMs and O&M contractor for the Tracy Site. The Office of Command Affairs conducted the interview surveys via phone and e-mail. Of the 22 individuals asked to participate in the interview process, 10 responded either by phone or e-mail.

Five of the 12 community representatives who were contacted participated in the five-year review interview process. All interviews were conducted via telephone. The interviewees included representatives from local government, the local school district and from the business community with most having been involved with the community for over 20 years.

Generally, the interviewees had limited knowledge of the ongoing environmental restoration activities taking place at the Tracy Site. One interviewee had knowledge of the groundwater contamination but had limited knowledge of the cleanup efforts. All interviewees expressed their appreciation of the cleanup activities that are being conducted.

Three of the five interviewees felt that they were not well informed about the environmental restoration activities being conducted at the Tracy Site and suggested that DLA Installation Support at San Joaquin conduct more regular community update meetings. Interviewees who represented local government indicated that they had received no complaints or concerns from members of the public regarding activities at the Tracy Site.

Five of the 10 O&M representatives who were contacted for an interview participated: the RPMs for DLA Installation Support at San Joaquin, DTSC, and RWQCB-CV; the O&M project manager; and the O&M GWTP supervisor. In general, the overall impression of the remedies selected for the Tracy Site's IRP is favorable. At the time of the survey, all respondents felt the groundwater remedy was functioning as expected, although some concern was expressed regarding the effectiveness and cost of the pump-and-treat process. The greatest concerns regarding the groundwater remedy included changes in regulatory requirements over time, the cost of replacing aging infrastructure, the low rate of mass removal, the potential for overlooking persistent sources, and protection of the aquifer.

The responses to the five-year review interviews will be taken into account as DLA Installation Support at San Joaquin moves forward with the public outreach program and continues its environmental restoration activities at the Tracy Site. Copies of the interview records are included as Appendix B.

The site-specific summaries in Sections 5.0 through 21.0 describe concerns, if any, identified in the interviews.

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5.0 GROUNDWATER: OU 1 AND NWC DIELDRIN PLUME

OU 1 was defined in the ROD as the contaminated groundwater plumes, on and off the depot, that are emanating from the Tracy Site. OU 1 was identified primarily by concentrations of PCE and TCE. Dieldrin has been detected at some wells in PCE and TCE plumes and was added as a groundwater COC in the Site-Wide Comprehensive ROD. Dieldrin also occurs with no PCE or TCE beneath the northwestern corner (NWC) of the Tracy Site. However, the dieldrin contamination in the NWC is not identified in either ROD; remedy selection was in progress in 2010.

5.1 Remedial Action

5.1.1 Remedy Selection

Following are the RAOs for OU 1 groundwater identified in the OU 1 ROD:

- Remediate hot spots (i.e., the portions of plumes with the highest concentrations of VOCs and dieldrin in groundwater).
- Minimize contaminant transport off depot.
- Remediate TCE, PCE, and 1,1-dichloroethene (1,1-DCE) to cleanup standards consistent with Federal MCLs or the California MCL (for 1,1-DCE).

Following are the RAOs for dieldrin in groundwater added in the Site-Wide Comprehensive ROD:

- Remediate hot spots (i.e., areas with the highest concentrations of dieldrin in groundwater).
- Minimize contaminant transport off depot.
- Minimize dieldrin migration and remediate to the ACL of 0.05 microgram per liter (μg/L) based on a California action level (a chemical-specific performance standard).

The OU 1 ROD was signed in 1993 and established ACLs for PCE, TCE, and 1,1-DCE. In 1998, the Site-Wide Comprehensive ROD added dieldrin as a COC for groundwater and established an ACL for it.

Remedy Description

The selected remedy for OU 1 includes extraction wells, ex situ treatment using air stripping to remove volatile COCs, and infiltration of treated groundwater. The remedy also required a blind flange in the discharge piping from GWTP1 to eliminate discharge to the stormwater detention pond. When GWTP1 was operating, discharge to on-depot wastewater evaporation/percolation ponds was allowed in cases of emergency. GWTP1 was dismantled in 2006; however, the manifold can still be used to discharge treated groundwater.

The remedy for OU 1 was modified with the 1996 ESD, which added dispersion with metabolism and volatilization processes as a remedy for removing VOCs from groundwater in the portion of the COC plumes east of Banta Road. Dispersion is one of several natural attenuation mechanisms that are likely to be active in the Tracy Site VOC plumes.

The remedy selected for dieldrin in the Site-Wide Comprehensive ROD is groundwater extraction and treatment in the following areas:

- Two existing extraction wells at SWMUs 2 and 3 (EW002AU and EW005AUA)
- One additional extraction well at SWMUs 2 and 3 (EW042AU)
- Two extraction wells at SWMU 8
- At least four extraction wells on the annex (EW040AU, EW041AU, EW044AU, EW047AU, and EW048AU)

LGAC is the treatment method selected in the Site-Wide Comprehensive ROD to remove dieldrin, VOCs, and semivolatile organic compounds (SVOCs)/pesticides from specific areas with possible dieldrin contamination.

The dieldrin extraction wells were not installed at SWMU 8 because dieldrin was not detected in groundwater at the monitoring well downgradient from the site. The Site-Wide Comprehensive ROD figure of the four wells proposed for the annex had them located in the sanitary sewage lagoon (SSL) plume. No wells were proposed in the NWC of the depot because the dieldrin plume there had not yet been identified.

To complete construction of the remedy, additional extraction wells, GWTP2 (with a treatment capacity of 800 gallons per minute [gpm]), and nine IGs were constructed between 1995 and 1998. In a short period of time, it became apparent that the IGs could not accept all of the discharge water from GWTP2. Overland flow (surface discharge) was determined to be a viable alternative to the inadequate IGs. In 2003, the Site-Wide Comprehensive ROD Amendment modified the OU 1 remedy to allow the use of overland flow as a supplemental discharge option. Two overland flow plots were constructed and used for discharge from 2001 to 2005.

Land use controls were added to the OU 1 remedy in the 2004 ESD. When properly enforced, the land use controls prevent exposure to contaminated groundwater on the depot and annex. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

A remedy for the NWC dieldrin plume had not been constructed at the time this report was written. A ROD was in preparation in 2010 to select the remedy.

Cleanup Standards

Attainment of background levels for the COCs was determined in the OU 1 ROD to be technically and economically infeasible; therefore, groundwater cleanup standards greater than background could be established for the Tracy Site groundwater remedy. Federal or State MCLs were selected for the volatile COCs, and the cleanup standard for dieldrin was based on the California action level that existed at the time. ACLs for OU 1 groundwater are provided in Table 5-1.

Table 5-1. Aquifer Cleanup Levels for OU 1, Tracy Site

Analyte	(μg/L)	Basis
1,1-DCE	6.0	California MCL
PCE	5.0	Federal MCL
TCE	5.0	Federal MCL
Dieldrin	0.05	California Action Level

DCE = dichloroethene; PCE = tetrachloroethene
MCL = maximum contaminant level; TCE = trichloroethene
OU = operable unit; μg/L = micrograms per liter

Cleanup standards for the NWC dieldrin plume had not been codified in a decision document at the time this report was written.

Treated Groundwater Discharge Standards

During the second five-year review period, effluent discharge sample results were compared to waste discharge permit criteria established in RWQCB-CV Order Number 98-053. The effluent treatment standards are provided in Table 5-2.

Table 5-2. Effluent Treatment Standards, Tracy Site

Analyte	Treated Effluent Monthly Median (μg/L)	Treated Effluent Daily Maximum (μg/L)
Carbon tetrachloride	0.5	0.5
Chloroform	0.5	5.0
Chromium (total)	<50	50
1,1-DCE	0.5	5.0
PCE	0.5	5.0
TCE	0.5	5.0
Dieldrin	<0.05	0.1
4,4-DDD	0.15	1.0
4,4-DDE	0.1	1.0
4,4-DDT	0.1	1.0
Chlordane	0.104	0.25
Monuron	1.0	2.0
Diuron	1.0	2.0
Total VOCs	1.0	5.0
pH	Not established	6.5 – 8.5

DCE = dichloroethene
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenydichloroethene
DDT = dichlorodiphenyltrichloroethane
PCE = tetrachloroethene
TCE = trichloroethene
VOC = volatile organic compound
μg/L = micrograms per liter

5.1.2 Remedy Implementation

During the period of this second five-year review, the components of the OU 1 remedy were fully implemented. However, there have been modifications to the systems. Table 5-3 summarizes the remedy status for OU 1.

Groundwater extraction and treatment at GWTP1 began in 1992 using an air stripper system. The air stripper was replaced with an LGAC system in 2003. The LGAC unit is designed to treat up to 500 gpm of pesticide- and VOC-contaminated groundwater. Treated water was discharged to IG1, the CD, and the southern IGs. Contaminant plumes were being reduced in size, and the treatment capacity of GWTP1 was not needed after 2005. GWTP1 was taken out of service 16 January 2006. IG1 and the CD have not been used for discharge since July 2009. Figure 5-1 shows the current and former locations of the treatment plants, extraction wells, IGs, and the overland flow area.

Table 5-3. OU 1 Remedy Status, Tracy Site

Remedy Component	Status
Groundwater Extraction and Treatment	Remedial action in operation.
Dispersion East of Banta Road	Remedial action in operation.
Land Use Controls • Prevent domestic use of contaminated groundwater (untreated) • Protect infrastructure associated with OU 1 groundwater monitoring, extraction, treatment, and disposal • Establish notification procedure for construction activities or land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures) • Perform annual review to ensure compliance with controls and to correct any deficiencies in the notification procedure • Follow defined procedures in the event of a change in land use	Remedial action in place.

OU = operable unit
RPMPD = real property master plan digest

Groundwater extraction and treatment at GWTP2 began in 1998. GWTP2 is designed to treat up to 800 gpm of VOC-contaminated groundwater in a packed media air stripping tower. In March 2010, an average of 329 gpm were being treated.

The overland flow area consisted of an 8.8-acre land area divided into two plots where treated water was discharged at the surface and allowed to infiltrate and evaporate (Figure 5-1). Discharge to the overland flow plots began in January 2001 to compensate for low infiltration rates at IG2 through IG9; the plots were not needed after September 2005 because of reduced groundwater extraction and the successful rehabilitation of the IGs. All treated water from GWTP2 is discharged to the southern IGs (IG2 through IG6); the northern IGs (IG7 through IG9) are no longer used for discharge.

Three inline LGAC treatment systems remove dieldrin from groundwater. System 1 treats groundwater from EW040AU, EW047AU, and EW048AU. System 2 treats groundwater from EW028B and EW044AU. System 3 treats groundwater from EW042AU.

Land use controls established in the 2004 ESD are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. The results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

No on-depot water supply wells are pumping water from OU 1. The appendix to the RPMPD included in the 2004 ESD clarified land use controls for groundwater areas impacted by volatile COCs or dieldrin contamination. Groundwater plumes beyond the depot boundaries have been identified with TCE concentrations above the ACL and carbon tetrachloride that did not originate from the Tracy Site at concentrations above the MCL. The only off-depot potable well (PW001) at which TCE concentrations have exceeded the ACL has been equipped with LGAC for treatment at the point of use.

The remedial action for NWC dieldrin plume had not been implemented between 2005 and 2010, the period of this five-year review.

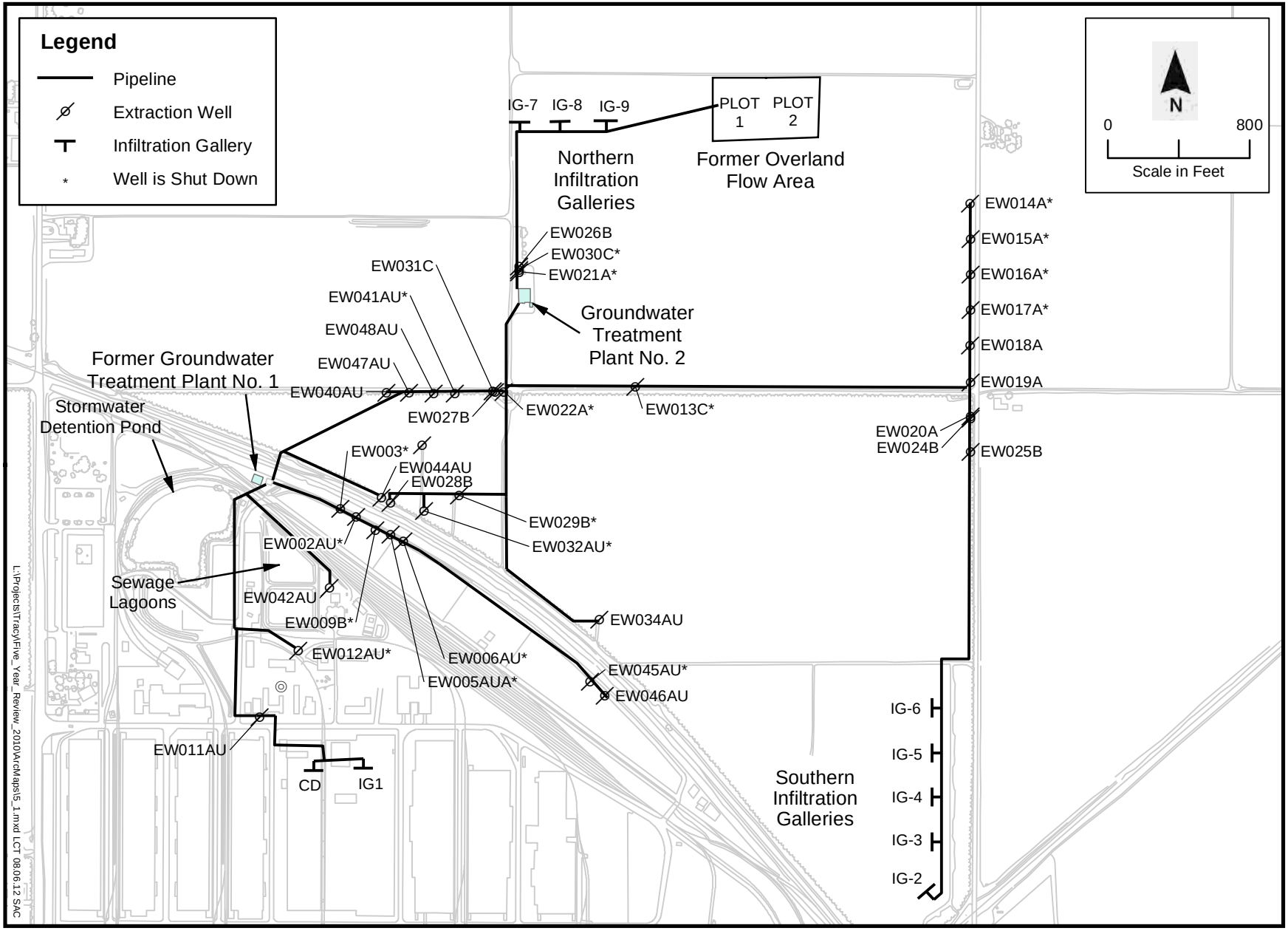

Figure 5-1. Locations of Extraction Wells, Infiltration Galleries, and Overland Flow Area, Tracy Site

5.1.3 System O&M

Extraction Wells

Extraction wells generally have operated 24 hours per day, 7 days per week, except when shut down for maintenance or when concentrations decrease to less than ACLs in groundwater. All communications and Supervisory Control and Data Acquisition (SCADA) functions at the GWTPs operated properly during the period being reviewed.

Since the first five-rear review, six extraction wells have been permanently taken out of service. Each well was shut down because concentrations in the last three samples collected at the well were less than 0.8 times any ACL and the well's hydraulic influence was not needed for plume capture. An extraction well decision logic was established in May 2004 for the Tracy Site; it is used once per year in the evaluation of each extraction well's mass removal performance. The purpose of the logic is to optimize the efficiency of the remedy by reducing the number of gallons of groundwater pumped per pound of contaminant removed. Extraction wells were not returned to service if the concentrations in well samples did not rebound to concentrations greater than any of the ACLs. In addition to the six shutdown wells, three other wells were not being operated at the time of this report: EW002AU, EW021A, and EW041AU were being monitored for potential rebound of COC concentrations. Of the 25 extraction wells installed in the Upper Zone to address the capture of TCE or dieldrin plumes, 11 were operating in the first quarter of 2010. Of the 10 extraction wells installed in the Middle Zone to capture TCE plumes, six were in operation in the second quarter of 2010. Only one of the three extraction wells screened in the Lower Zone to capture TCE plumes was operating in the second quarter of 2010. Table 5-4 summarizes OU 1 extraction wells that have been shut down and those that continue to operate.

Table 5-4. Extraction Well Operational Status[a] 2010, Tracy Site

Operating Wells[b]		
EW002AU[c] (9 February 2009)	EW027B	EW048AU[d]
EW009B[c] (9 February 2009)	EW028B[e]	EW056A[f] (13 October 2008)
EW011AU[g]	EW031C	
EW018A	EW034AU	
EW019A	EW040AU[d]	
EW020A	EW041AU[c] (9 February 2009)	
EW021A[j]	EW042AU[h]	
EW024B	EW044AU[i]	
EW025B	EW046AU	
EW026B	EW047AU[d]	
Wells Shut Down (Date of Shutdown[a])		
EW003A (12 May 2005)	EW014A (7 March 2008)	EW029B (12 May 2005)
EW005AUA (12 May 2004)	EW015A (28 January 2004)	EW030C (12 May 2004)
EW006AU (8 June 2004)	EW016A (28 January 2004)	EW032AU (12 May 2004)
EW012AU (11 March 2008)	EW017A (28 January 2004)	EW045AU (11 March 2008)
EW013C (12 May 2004)	EW022A (13 May 2005)	EW055B[f] (13 October 2008)

Table 5-4. (Continued)

[a] Since May 2004, all extraction wells are evaluated annually based on the decision logic for extraction well operation. Wells that were shut down had concentrations below the ACLs established in the ROD, and were not needed to maintain plume capture. Shutdown wells are monitored according to the decision logic for at least three years after shutdown, and sampling is only eliminated once rebound is considered unlikely to occur.

[b] Wells are considered "operating" if online during the 2009 monitoring period (October 2008 to September 2009).

[c] EW002AU, EW009B, and EW041AU were shut down on 9 February 2009 as recommended in the *DDJC-Tracy Well Monitoring Program 2008 Annual Monitoring Report* (URS, 2009e) because the contaminant concentrations are below the ACLs. These wells may be restarted if concentrations rebound.

[d] ROD-required pesticide treatment well; LGAC treatment began on 14 June 2006.

[e] Voluntary pesticide treatment well; LGAC treatment began on 27 February 2007.

[f] Temporary dieldrin extraction well. Dieldrin mass removal pump test was conducted from 9 September to 13 October 2008. Future operation of EW056A has not been decided.

[g] EW0011AU operated for only part of the 2009 monitoring period. The well was shut down on 11 March 2008 based on the extraction well decision logic. It was restarted on 15 July 2009 to evaluate potential capture downgradient of the SWMU 20 plume.

[h] ROD-required pesticide treatment well; began LGAC treatment on 16 April 2008.

[i] EW044AU was connected to the EW028B LGAC system in March 2008 for possible pre-treatment of dieldrin. However, dieldrin concentrations decreased to below the ACL in 2008 and no pre-treatment of groundwater occurred. Dieldrin concentrations were below the ACL in 2009; because the dieldrin concentration was detected at 0.045J µg/L just below the ACL in 1Q09, the extraction well was reconnected to the LGAC system on 29 April 2009.

[j] EW021A was shut down February 2010 based on the extraction well decision logic and is being monitored for rebound.

ACL = aquifer cleanup level
LGAC = liquid-phase granular activated carbon
ROD = record of decision
SWMU = solid waste management unit
1Q09 = first quarter of 2009
µg/L = micrograms per liter

Modified from HDR | e^2M, 2010a

Treatment Systems

The total volume of water treated on the Tracy Site from 2005 through the third quarter of 2009 was approximately 1.1 billion gallons. Approximately 2.5 billion gallons were treated between 1998 and the third quarter of 2009 (Table 5-5). All annual data reported in Table 5-5 are calculated for the period from 1 October of the preceding year through 30 September of the year shown at the top of the column.

The effort to increase the efficiency of COC removal is reflected in the steady decrease in volume to mass ratio (Table 5-5). Removal efficiency was increased even though the mass removed decreased 38 percent from 2005 through 2009. However, total costs of O&M were somewhat lower in 2009 than they had been in 2005, and the annual cost to remove a pound of contaminants increased 30 percent during the period reviewed. The increase in cost per pound removed and decrease in the mass removed is partially caused by the generally downward trend in TCE and PCE concentrations in the groundwater pumped from extraction wells. Increases in the average concentration of TCE and dieldrin at extraction wells from 2008 to 2009 is the result of a continuing effort to optimize the number of extraction wells operating while maintaining plume capture.

The influent contaminant concentrations at GWTP2 have been within the acceptable range for technical effectiveness of the air stripper. The removal efficiency for the GWTP2 air stripper was greater than or equal to 98.6 percent for the 2009 monitoring period (HDR | e^2M, 2010a).

Table 5-5. Summary of Groundwater Extraction and Treatment System Performance for the 2005 to 2009 Monitoring Years, Tracy Site

Treatment System Parameter	Total 2005	Total 2006	Total 2007 [a]	Total 2008 [a]	Total 2009[a]	Cumulative to Date (1996–September 2009)
Total Mass Removed (lbs)	20.30	15.64 (23% decrease from 2005)	11.04[b] (29% decrease from 2006 total mass removed)	10.12[b] (8% decrease from 2007 total mass removed)	12.55[b] (24% increase from 2008 total mass removed)	207[c]
Volume-to-Mass Ratio (gal/lb extracted)	14,599	12,857 (12% decrease from2005)	23,065,193 (57% increase from 2006)	18,886,541 (18% decrease from 2007)	13,895,318 (26% decrease from 2008)	NA
Cost per Pound of Mass Removed[d,e] ($/lb)	$60,676	$63,357 (4.5% increase from 2005)	71,327 (21% decrease from 2006)	78,740 (10% increase from 2007)	$78,844 (less than 1% increase from 2008)	$63,437[f]
O&M Costs[e] ($)	1,231,725	990,910 (20% decrease from 2005)	786,735 (13% decrease from 2006)	796,850 (1% increase from 2007)	$989,498 (24% increase from 2008)	$13,137,710
Average/Maximum Influent TCE Concentration at GWTP2 (µg/L)	GWTP1 5.05/6.9 GWTP2 6.95/8.7	GWTP1 2.84/3.5 GWTP2 5.71/9.2	3.36/5.0	3.63/5.1	4.01/5.7	NA
Average/Maximum Influent PCE Concentration at GWTP2 (µg/L)	GWTP1 2.33/4.6 GWTP2 3.01/4.3	GWTP1 2.25/2.8 GWTP2 2.73/4.0	1.74/2.6	2.0/2.7	1.93/2.7	NA
Average/Maximum Influent Dieldrin Concentration at the Pesticide Wells (µg/L)	0.036/0.082	0.030/0.036	0.03/10.04	0.065/0.22	0.099/0.11	NA
Total Volume Treated (gallons)	296,377,000	186,497,000 (37% decrease from 2005)	254,049,075 (36% increase from 2006)	188,676,545 (26% decrease from 2007)	174,386,244 (8% decrease from 2008)	2,483,971,864[g]
Average Monthly Volume Treated (gal)	26,698,000	15,541,000	21,171,000	15,723,045	14,532,187	NC
Average Volume Treated (gpm)[h]	564	355	484	359	336	NC

Table 5-5. (Continued)

[a] GWTP1 was shut down permanently on 16 January 2006, and extraction wells were connected to GWTP2.
[b] Includes mass extracted by inline LGAC systems.
[c] Total mass removed includes the original IRM GWTP and GWTP1.
[d] Average cost per pound = cost/mass removed.
[e] Cost includes GWTP O&M contractor costs, supporting performance monitoring costs, and Well Monitoring Program costs.
[f] This is the cumulative cost/cumulative mass extracted.
[g] Volume of groundwater treated is based on available flow data from 1998 through 2009.
[h] Calculated using total volume treated divided by 365 days/year, 24 hours/day, and 60 minutes/hour.

gal = gallons
gal/lb = gallons per pound
gpm = gallons per minute
GWTP = groundwater treatment plant
IRM = interim remediation measure
lbs = pounds
LGAC = liquid-phase granular activated carbon
NA = not applicable
NC = not calculated
O&M = operation and maintenance
PCE = tetrachloroethene
TCE = trichloroethene
$/lb = cost per pound
µg/L = micrograms per liter

The effectiveness of treatment plants is also based on their ability to meet discharge requirements. RWQCB Order No. 98-053 established the Tracy Site groundwater treatment system effluent limits (waste discharge requirements [WDRs]) for discharge to injection wells, IGs, the stormwater detention pond, and sewage lagoons. By agreement with RWQCB, these limits also apply to discharge to the overland flow plots. During the 2005 to 2010 review period, WDRs for specific VOC compounds, pesticides, and metals were met. The only measurements out of compliance during the five-year period were four pH measurements that exceeded the upper end of the range (6.5 to 8.5) in 2007, 2008, and 2009 and two exceedances of the monthly median for total VOCs in effluent. The two VOC exceedances (in August and October 2008) were caused by the presence of acetone. Acetone was not detected in the influent from extraction wells, and it is a compound that is used in analytical laboratories. Therefore, the total VOC exceedances did not occur because of treatment plant deficiencies. The pH range exceedances are not considered an indication of a treatment plant deficiency because they occurred in only one or two of 52 weekly readings in a year that all monthly median pH measurements were within the daily criterion range.

GWTP2 is operating well below its design hydraulic loading capacity because extraction wells have been shut down and are no longer required for the groundwater remedial action. As COC concentrations in groundwater continue to decrease at extraction wells, additional wells are expected to be shut down and hydraulic loading capacity will continue to decrease. In 2009, the air stripper system for GWTP2 was estimated to be operating at 29 to 58 percent of its design capacity with an average flow rate of approximately 336 gpm (i.e., 42 percent of the design flow rate) (HDR |e^{2}M, 2010a).

Since they were installed, the removal efficiencies of the inline LGAC wellhead systems have been 100 percent for pesticides with the exception of a temporary breakthrough at the wellhead carbon system that accepts groundwater from EW040AU, EW047AU, and EW048AU. After the breakthrough, carbon in all three of the inline LGAC systems was replaced.

An LGAC system was installed at a residential well located on private property east of Banta Road. Water samples are collected of the influent to and the effluent from the LGAC system once each quarter. Sampling results indicate that residents are not consuming contaminated groundwater. Carbon in the LGAC system was replaced two times between 2005 and 2010 when there was breakthrough in the LGAC.

5.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

5.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement from the First Five-Year Review Report states: *The remedy for OU 1 groundwater is protective of human health and the environment, or is expected to be protective upon completion; in the interim, exposure pathways that could result in unacceptable risks are being controlled. Groundwater having VOC concentrations exceeding the ACLs that has reached drinking water wells is treated with LGAC and monitored quarterly. Groundwater on depot does not impact any drinking water supply wells.*

There have been no changes in short-term protectiveness since the last five-year review. However, there are uncertainties regarding long-term protectiveness in two plume areas. The northeastern portion of the Banta Road TCE plume is not being captured by any extraction well, and in several locations, concentrations exceed MCLs for drinking water. Dispersion (natural attenuation) with metabolism and

volatilization processes was the selected remedy for this portion of the plume. There are no monitoring wells to evaluate the leading edge of the plume. The second plume area with protectiveness uncertainties is the NWC dieldrin plume. There is potential that the plume could be drawn into a potable water supply well in the future unless actions are taken to reduce the volume of contamination and/or assure no water supply wells are constructed in or near the plume.

5.2.2 Status of Recommendations from First Five-Year Review

Table 5-6 summarizes recommendations and actions taken by DLA for the groundwater remedy.

5.2.3 Attainment of Remedial Action Monitoring Requirements

The Site-Wide Comprehensive ROD identifies site-specific water quality criteria to protect the beneficial uses of groundwater. If any of the water quality criteria are exceeded, the appropriateness of the selected remedy is evaluated in Well Monitoring Program Annual Monitoring Reports. In addition, the Site-Wide Comprehensive ROD indicates that the Well Monitoring Program will undergo an annual review to ensure that well locations, monitoring frequency, water level measurements, and analytes are optimized for the long term. Table 9-1 in the Site-Wide Comprehensive ROD lists the selected remedies for OU 1 and the SWMUs, and Table 9-2 lists the wells and rationale, including compounds to be monitored, to evaluate the performance of the selected remedies.

Groundwater monitoring to evaluate the effectiveness of the remedial actions has been ongoing since the Site-Wide Comprehensive ROD was signed in 1998. According to the Site-Wide Comprehensive ROD, wells at sites that do not have waste remaining in place are required to be monitored no less than three years after soil and groundwater cleanup standards have been attained. For sites that do have waste in place, wells will be monitored until an acceptable rationale (e.g., data from the Well Monitoring Program) demonstrates that there is no further threat to groundwater quality. The number of samples necessary to meet the requirements in the Site-Wide Comprehensive ROD was not specified.

The number of wells identified in the Site-Wide Comprehensive ROD for monitoring can be reduced because of the substantial history and comprehensive nature of the sampling program. For OU 1, many monitoring wells have been sampled since the late 1980s or early 1990s (prior to the signing of the Site-Wide Comprehensive ROD), and concentrations of the COCs have either never exceeded ACLs or never been detected. At most of the other OU 1 wells, VOC COC concentrations have decreased to less than ACLs.

A thorough review of all sampling to attain the requirements in the ROD was performed and presented in the *Well Monitoring Program 2008 Annual Monitoring Report* (URS, 2009e). The evaluation concluded that ROD sampling requirements had been met for most of the wells identified in the OU 1 ROD for monitoring. However, several wells identified for monitoring at specific soil cleanup sites did not have sufficient sampling to demonstrate that ROD requirements had been met; these monitoring requirements are addressed in site-specific sections of this report. Table 5-7 presents the OU 1 wells at which all ROD monitoring requirement have been met. Most of these wells will no longer be sampled.

For OU 1 wells at which the ROD monitoring requirements have been met, no additional monitoring will be conducted unless the well is needed by the Well Monitoring Program for other purposes (e.g., downgradient guard well). The OU 1 monitoring wells that must continue to be monitored because of COC concentrations are as follows: LM056C, LM067B, LM151B, LM156A, and LM157A require sampling for VOCs; LM028A and LM094AU require sampling for dieldrin.

Table 5-6. Status of Recommendations from or Actions Taken since Last Five-Year Review, Tracy Site

Recommendation/Action	Action Taken and Result	Date Completed
Recommendation or Issue In First Five-Year Review		
Shut down extraction wells EW003A, EW021A, EW022A, EW029B, and EW031C to improve efficiency of groundwater extraction and treatment. Concentrations less than ACLs.	Four were shut down. EW021A not shut down until 2010. EW031C restarted because of concentration rebound. Result: Improved efficiency in treatment; less groundwater removed per pound of COCs.	Wells were shut down in May 2005. EW031C restarted in 2006.
Install nested piezometers near extraction wells EW024B and EW025B to assess plume capture along Banta Road.	LM184A, LM185B, LM186A and LM187B installed. Result: Water elevations help to identify hydraulic depression.	Installed February 2006.
Further evaluate hexavalent chromium and 1,4-dioxane upon receipt of guidance from the State on emerging chemicals.	No further evaluation performed. State did not provide sampling guidance to DLA.	Not applicable
Update O&M manuals for GWTP1 and GWTP2.	GWTP1 O&M manual updated. (Plant shut down January 2006.) GWTP2 O&M manual updated except for conveyance lines from LGAC units to GWTP2.	September 2005 February 2006
Self-reporting of institutional controls status to be included in Well Monitoring Program Annual Monitoring Report.	Reporting begun in *Well Monitoring Program 2005 Annual Monitoring Report* and continues to the present.	2006 to present
Evaluate Middle Hydrologic Zone capture at Banta Road. (Same as piezometers for EW024B and EW025B above.)	Four piezometers (LM184A, LM185B, LM186A, and LM187B) installed and monitored. Result: Water elevations help identify hydraulic depression.	February 2006
Evaluate overland flow impact on plume migration.	Not performed. Use of the overland flow plots was terminated, making evaluation unnecessary.	September 2005
Develop and implement groundwater fate-and-transport model.	Developed and implemented with regulatory agency concurrence. Report was completed. Result: Predictive modeling of plume capture and time to cleanup plumes to ACLs.	October 2007
Investigate dieldrin groundwater contamination in NWC.	CPT/HydroPunch investigation report completed. Extraction and monitoring wells for mass removal test installed. Mass removal testing. Result: Dieldrin plume defined, potential for mass removal estimated, and a proposed plan recommending a remedy will be prepared.	2005 2008 2008

Table 5-6. (Continued)

Recommendation/Action	Action Taken and Result	Date Completed
Recommendation or Issue In First Five-Year Review (continued)		
Evaluate natural attenuation in Central and NWC dieldrin plumes.	Investigation report completed. Result: Evidence of adsorption, dilution, and dispersion mechanisms retarding dieldrin.	2007
Evaluate natural attenuation of VOCs in groundwater	Sampling and analysis evaluation in Well Monitoring Program Annual Monitoring Reports. Result: Evidence of adsorption, dilution, and dispersion retarding TCE and PCE; no evidence of biodegradation.	March 2008 to July 2009 May 2009 and May 2010
Evaluate dieldrin treatment process	Change to inline LGAC at select wellheads evaluated and recommended in memorandum recommending shutdown of GWTP1. Result: Installation of inline carbon systems No. 1 at EW040AU, EW047AU, and EW048AU, No. 2 at EW028B, and No. 3 at EW042AU.	2005
Recommendation or Issue Identified by DLA after First Five-Year Review		
Focused extraction testing. (Pumping at four monitoring wells to remove VOC mass where there were higher TCE or PCE concentrations than in other parts of the plume.)	Pumping, sampling, and analyses. Result: None of the tested wells achieved higher mass removal rates than nearby extraction wells. Additional focused extraction at monitoring wells was not recommended.	2008
Groundwater remedy enhancement investigation (CPT/HydroPunch investigation of plumes on the annex and private property east of Banta Road)	Sampling, analysis, and reporting on 28 sampling locations. Result: Banta Road TCE plume defined on the south, east, west, and north and vertically. Small TCE plume on the annex better defined on north and east.	2008 to 2009

ACL = aquifer cleanup level
COC = contaminant of concern
CPT = cone penetrometer test
DLA = Defense Logistics Agency
GWTP = groundwater treatment plant
LGAC = liquid phase granular activated carbon
NWC = northwestern corner
O&M = operation and maintenance
PCE = tetrachloroethene
TCE = trichloroethene
VOC = volatile organic compound

Table 5-7. Wells at Which all ROD Monitoring Requirements Have Been Satisfied, Tracy Site

Well	Site	Monitored Compounds
LM025AUA	OU 1	TCE, PCE, and 1,1-DCE
LM055B	OU 1	TCE, PCE, and 1,1-DCE
LM058AU	OU 1	TCE, PCE, and 1,1-DCE
LM063A[a]	OU 1	TCE, PCE, and 1,1-DCE
LM064B[a]	OU 1	TCE, PCE, and 1,1-DCE
LM065C[a]	OU 1	TCE, PCE, and 1,1-DCE
LM066A	OU 1	TCE, PCE, and 1,1-DCE
LM070C[a]	OU 1	TCE, PCE, and 1,1-DCE
LM076A	OU 1	TCE, PCE, and 1,1-DCE
LM077A	OU 1	TCE, PCE, and 1,1-DCE
LM081C	OU 1	TCE, PCE, and 1,1-DCE
LM083A[a]	OU 1	TCE, PCE, and 1,1-DCE
LM084B[a]	OU 1	TCE, PCE, and 1,1-DCE
LM089C	OU 1	TCE, PCE, and 1,1-DCE
LM093AU/LM175AU	OU 1	TCE, PCE, and 1,1-DCE
LM143AU	OU 1	TCE, PCE, and 1,1-DCE
LM145AU	OU 1	TCE, PCE, and 1,1-DCE
LM146A	OU 1	TCE, PCE, and 1,1-DCE
LM148C	OU 1	TCE, PCE, and 1,1-DCE
LM150A[a]	OU 1	TCE, PCE, and 1,1-DCE
LM152A[a]	OU 1	TCE, PCE, and 1,1-DCE
LM153B[a]	OU 1	TCE, PCE, and 1,1-DCE
LM154A[a]	OU 1	TCE, PCE, and 1,1-DCE
LM155B[a]	OU 1	TCE, PCE, and 1,1-DCE
LM158B[a]	OU 1	TCE, PCE, and 1,1-DCE
LM162A	OU 1	TCE, PCE, and 1,1-DCE
LM165A	OU 1	TCE, PCE, and 1,1-DCE
LM053A[a]	OU 1	Dieldrin
LM101A	OU 1	Dieldrin

[a] ROD monitoring requirements have been met; well needed by Well Monitoring Program for other monitoring purposes.

DCE = dichloroethene
OU = operable unit
PCE = tetrachloroethene
ROD = record of decision
TCE = trichloroethene

5.3 Five-Year Review Process

The OU 1 remediation systems were visited by the RPMs from DLA Installation Support at San Joaquin, EPA, DTSC, and the RWQCB-CV on 16 July 2010. Mr. Paul Marsden with HDR | e^2M, the Site Operations Manager for GWTP2, was interviewed, and he provided a tour of the facilities. Extraction wells and IG1 through IG9 were also visited.

On-site documents and records were reviewed. The O&M manual for GWTP2 was readily available. The O&M manual for GWTP2 was updated in February 2006; however, the updated manual does not include information on the conveyances for groundwater from the three inline carbon units. The site-specific health and safety plan and Occupational Safety and Health Administration training records were available and in order.

During the tour of the OU 1 remediation systems, burrowing owls were observed on the annex near an extraction and several monitoring wells. Burrowing owls had not been seen at the Tracy Site before.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

5.4 Technical Assessment

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

Yes, the OU 1 remedy is functioning as intended by the OU 1 ROD as modified by the 1996 ESD, the Site-Wide Comprehensive ROD, Site-Wide Comprehensive ROD Amendments, and the 2004 ESD.

The current approach to meeting RAOs is to use groundwater extraction to remove COC mass from groundwater to the extent practicable to meet ACLs and to control migration of groundwater with COC concentrations greater than ACLs. To determine whether the remedy is meeting the RAOs, migration control for three groundwater plumes was evaluated. The plumes consisted of TCE concentrations greater than 5 μg/L (the TCE ACL), PCE concentrations greater than 5 μg/L (the PCE ACL), and dieldrin concentrations greater than 0.05 μg/L (the dieldrin ACL) in the SSL plume. In the 2009 monitoring period, progress was made toward meeting the RAOs set forth in the OU 1 ROD. Most groundwater plumes were being contained and VOC mass was being removed, as described below.

COC Plume Containment. A plume is contained when its migration is under control. A summary of the interpreted capture and containment of plumes is provided in Table 5-8; the contents of the table are based on conclusions in the *Well Monitoring Program 2009 Annual Monitoring Report* (HDR | e^2M, 2010a). Full plume containment through engineered hydraulic capture and natural attenuation processes is suggested by the stability in concentrations at the downgradient edge of the plumes and the shrinkage of plumes with concentrations that exceed ACLs. The widespread decreases in VOC concentrations causing plumes to shrink between extraction well locations provide empirical evidence that natural attenuation mechanisms are active. A systematic capture zone analysis was conducted using converging lines of evidence to interpret the capture zone extent of operating extraction wells. The lines of evidence included potentiometric surface maps, associated interpretation of flow directions, and gradients and particle tracking using the current groundwater flow model. The potentiometric surface contour maps for the Upper, Middle, and Lower Zones were developed using ArcInfo 9.3 software and adjusted based on the empirical data using professional judgment. Figures 5-2, 5-3, and 5-4 show the third quarter 2009 interpreted capture zones for the aggregate of the 2009 operating extraction wells in the Upper, Middle, and Lower Zones, respectively, using averaged annual flow rates for each extraction well. In the downgradient direction from every extraction well or group of wells, there is a series of points at which a groundwater molecule cannot travel to the extraction well and cannot be carried downgradient and away from the extraction wells. Those points (stagnation points) reflect the downgradient extent of capture for the given extraction wells. Both potentiometric surface and particle path lines of evidence were used to

Table 5-8. 2009 Capture Zone and Containment Summary, Tracy Site

Geographic Area	Hydrologic Zone	Capture/Containment Status	Lines of Evidence
Banta Road TCE Plume	Upper	TCE plume: plume west of Banta Road is migrating into capture zone of EW019A and EW020A. The plume east of Banta Road can be allowed to naturally attenuate.	Potentiometric contours; most particle pathlines. All monitoring and extraction wells north of EW019A have concentrations less than ACLs. Capture of plume east of Banta Road not required by ROD.
Area 3 TCE/PCE Plume	Upper	TCE plume: only remaining plume greater than ACL, beneath Area 3, will migrate into capture zone of EW046AU. PCE Plume: migrating into capture zone of EW034AU.	Potentiometric contours and particle pathlines indicate migration toward EW034AU or EW046AU.
North Central PCE Plume	Upper	PCE plumes: plume at LM030AUA will migrate into capture zone of EW044AU.	Potentiometric contours and particle pathlines indicate migration toward EW044AU.
Western PCE Plume	Upper	PCE plume: Capture of plume at LM024A nearest operational extraction well (EW042AU) is uncertain. However, plume has decreased in size since 2005 and shows no evidence of migration downgradient.	Potentiometric contours; particle pathlines. For LM024AU, the PCE plume is not detected in downgradient wells, modeling indicates attainment of ACL within five years at this location and, statistical analyses indicate a declining trend for PCE at the well.
SWMU 20 TCE Plume	Upper	TCE plume: recently identified in CPT/HydroPunch investigation; plume may migrate very slowly to recently restarted EW011A.	Potentiometric contours. Plume migration expected to be attenuated by fine-grained deposits between plume and EW011A.
Banta Road TCE Plume	Middle	TCE plume: most of plume west of Banta Road is migrating into capture zone of EW024B and EW025B. The plume east of Banta Road is being allowed to naturally attenuate.	Potentiometric contours; particle pathlines. No monitoring wells, except LM151B north or northeast of EW024B or EW025B have concentrations greater than ACLs. Capture of plume east of Banta Road not required by ROD.
North Central TCE Plume	Middle	TCE plumes: plume at EW009B can be captured by the well if it is restarted and northern plume is in capture zone of EW026B and EW027B.	Potentiometric contours; particle pathlines.
North Central TCE Plume	Lower	TCE plume: small plume is in the capture zone of EW031C.	Potentiometric contours; particle pathlines.
SSL Dieldrin Plumes	Upper	North plume: in capture zone of EW048AU. Small south plumes: in capture zone of EW044AU.	Potentiometric contours; particle pathlines.

Table 5-8. (Continued)

Geographic Area	Hydrologic Zone	Capture/Containment Status	Lines of Evidence
SSL Dieldrin Plume	Middle	At least 75% of plume in capture zone of EW028B. Remainder would migrate downgradient into capture zone of EW027B or EW026B.	Potentiometric contours; particle pathlines.
NWC Dieldrin Plume	Upper and Middle	No capture. No extraction wells operating	

ACL = aquifer cleanup level
CPT = cone penetrometer test
NWC = northwestern corner
PCE = tetrachloroethene
ROD = record of decision
SSL = sanitary sewage lagoon
SWMU = solid waste management unit
TCE = trichloroethene
VOC = volatile organic compound
% = percent

Source: *DDJC-Tracy Well Monitoring Program 2009 Annual Monitoring Report* (HDR | e^2M, 2010a).

establish the interpreted capture zones for the reporting period. Estimated capture zones are based on the aggregate of all operating extraction wells some of which may be extracting from another hydrologic zone. Additional detail on the interpretation of capture zones can be found in the *Well Monitoring Program 2009 Annual Monitoring Report* (fourth quarter of 2008 through third quarter of 2009) (HDR | e^2M, 2010a).

Progress Toward Attaining ACLs. Using analytical data collected in the third quarter of 2009 (during the annual sampling event that provides the most comprehensive data), the extents of the TCE, PCE, and dieldrin plumes exceeding their respective ACLs were interpreted for the Upper, Middle, and Lower Hydrologic Zones (as shown on Figures 5-2, 5-3, and 5-4). The interpreted COC concentration isopleths for each of the three zones (Upper, Middle, and Lower) estimate the location of the TCE, PCE, and/or dieldrin concentrations greater than or equal to the ACLs in groundwater at the screen intervals for the wells. In 2005, nine extraction wells had TCE concentrations exceeding the ACL of 5 μg/L and the maximum concentration in any plume being actively extracted was 33 μg/L (URS, 2007b). By 2009, only seven extraction wells (EW009B, EW019A, EW024B, EW025B, EW026B, EW027B, and EW034AU) had TCE concentrations greater than or equal to the ACL, and the maximum concentration in a plume being extracted was 10.8 μg/L. A higher concentration of approximately 104 μg/L is now known to be present in a small plume beneath SWMU 20; no extraction well has been actively extracting that plume. In 2005, four extraction wells had concentrations of dieldrin exceeding the ACL of 0.05 μg/L, and the maximum concentration was 0.15 μg/L (URS, 2006a). By 2009, two extraction wells (EW041AU and EW048AU) had dieldrin concentrations exceeding the ACL of 0.05 μg/L, and the maximum concentration was 0.0647 μg/L (HDR | e^2M, 2010a).

Containment of plumes by the remedy has resulted in reduced plume areas since the first five-year review was completed. Figures 5-5, 5-6, and 5-7 contrast sizes and shapes for three years (2005, 2007, and 2009) of composite TCE, PCE, and dieldrin plumes, respectively, since the first five-year review. It is evident from the figures that TCE and PCE plumes on the depot and annex have decreased with the exception of SWMU 20 and the Area 3 plumes, which were identified with HydroPunch data in 2008 (URS, 2009b; 2009i). The TCE plume east of Banta Road has changed shape, but not its areal extent. HydroPunch data were interpreted to draw the plume between well locations. The SSL dieldrin plume also steadily decreased in area from 2005 to 2009 (Figure 5-7). The interpreted shape of the NWC dieldrin plume has increased as HydroPunch data were collected in two events since 2005 with the intent of defining the plume extent (URS, 2005c; 2010a).

Land Use Controls. Land use controls were established for groundwater in the 2004 ESD. The following summarize how the land use controls have operated in the period from 2005 to 2010.

- Domestic use of untreated contaminated groundwater has not been allowed on the Tracy Site.
- Infrastructure associated with OU 1 groundwater monitoring, extraction, treatment, and disposal is inspected annually to assure it is protected.
- A notification procedure for construction activities or land use changes is included as an appendix to the RPMPD.
- Administrative controls have been maintained.
- A review is performed each year of the components of the groundwater remedy and the area of the plumes to ensure compliance with controls and to correct any deficiencies in the notification procedure.

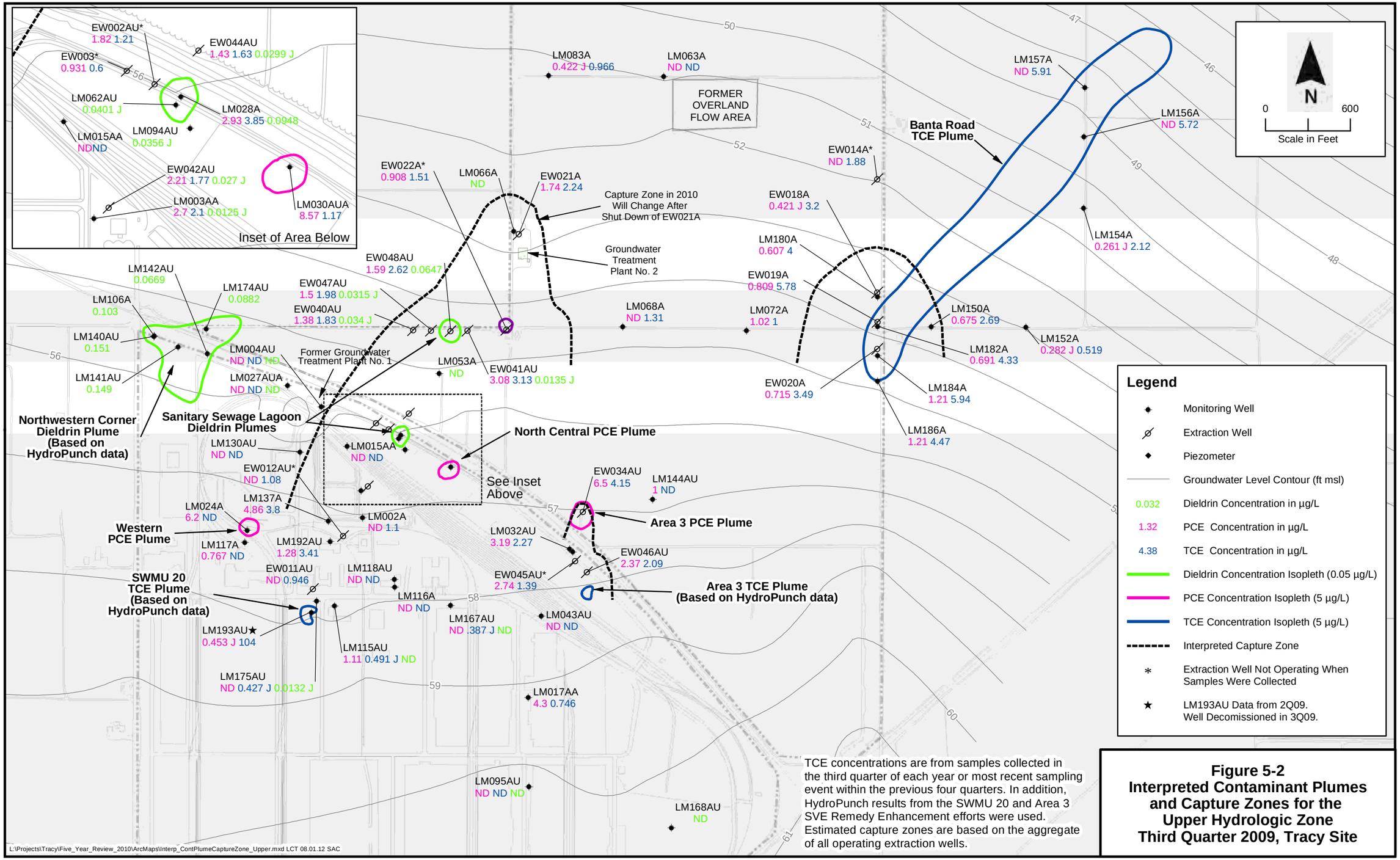

Figure 5-2
Interpreted Contaminant Plumes and Capture Zones for the Upper Hydrologic Zone Third Quarter 2009, Tracy Site

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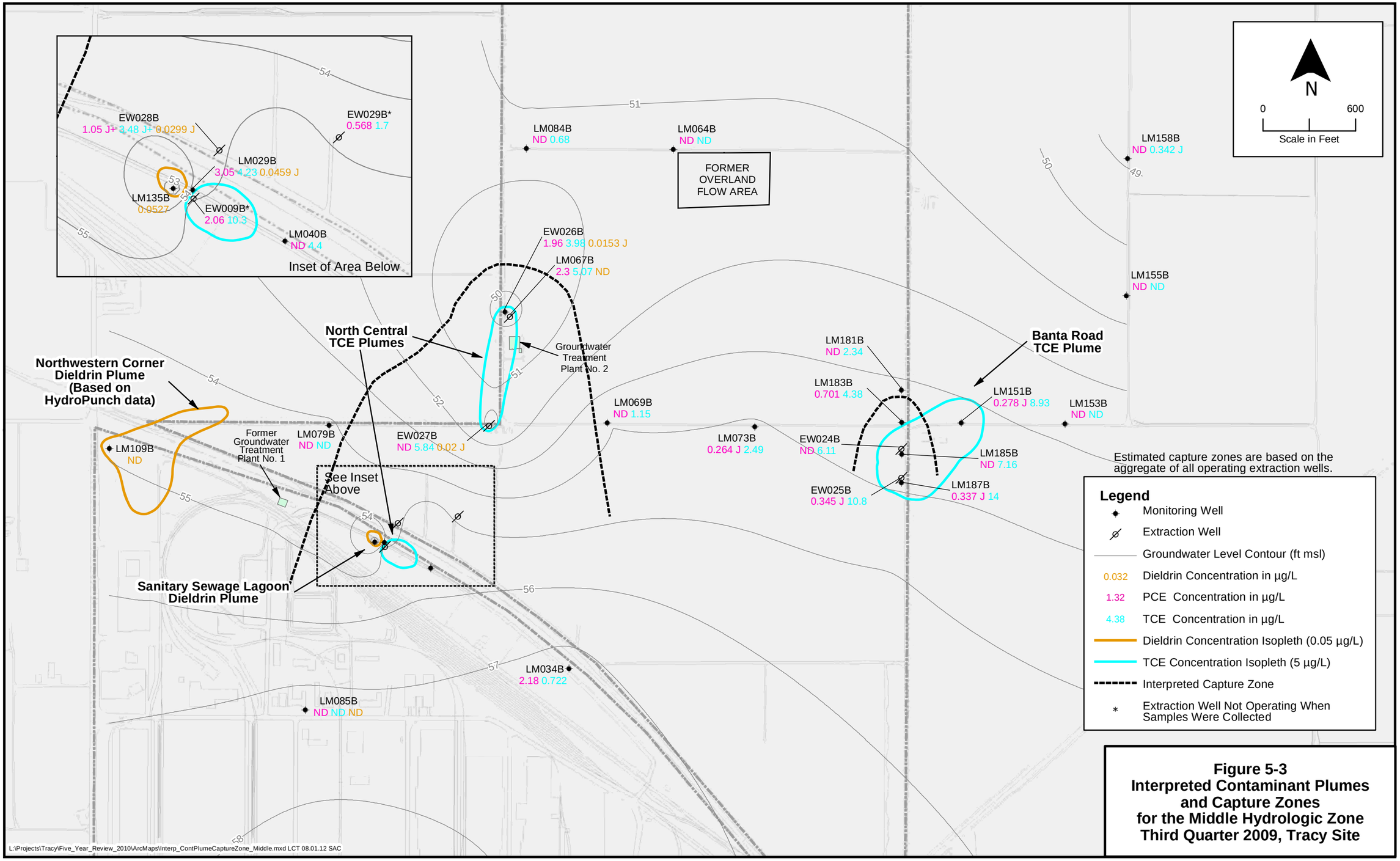

Figure 5-3
Interpreted Contaminant Plumes and Capture Zones for the Middle Hydrologic Zone Third Quarter 2009, Tracy Site

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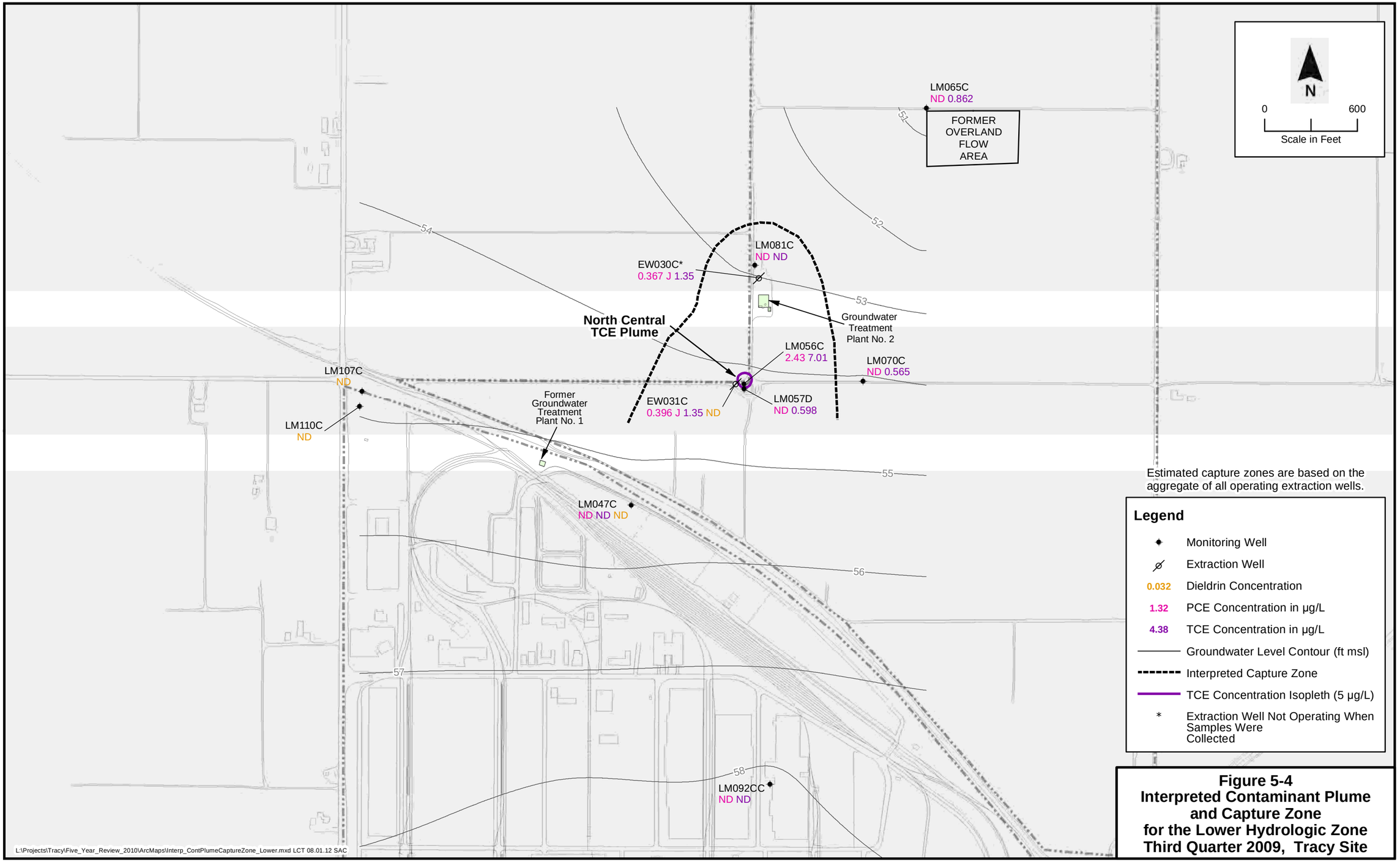

Figure 5-4
Interpreted Contaminant Plume and Capture Zone for the Lower Hydrologic Zone Third Quarter 2009, Tracy Site

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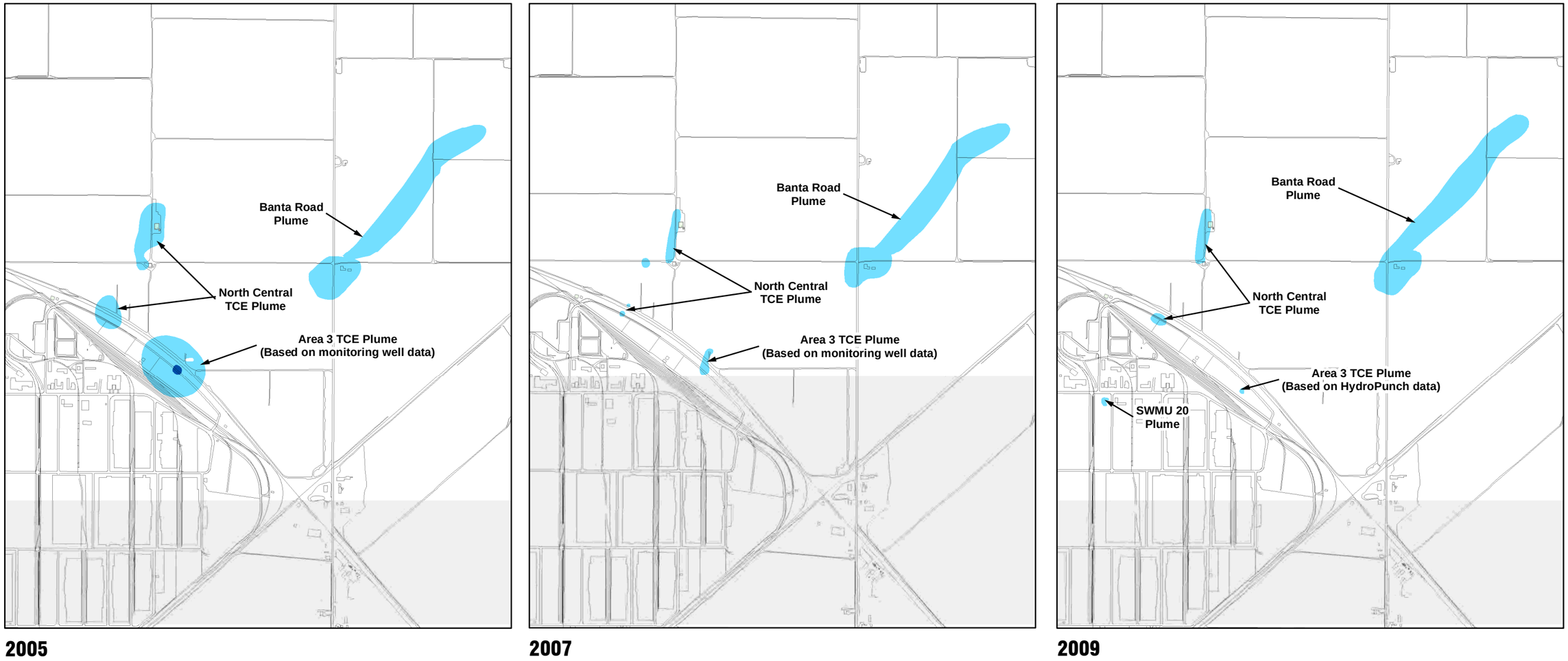

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TCE concentrations in micrograms per liter (µg/L)

TCE concentrations are from samples collected in the third quarter of each year or most recent sampling event within the previous four quarters.

Figure 5-5
Comparison Map - TCE All Zones
2005, 2007, and 2009
Tracy Site

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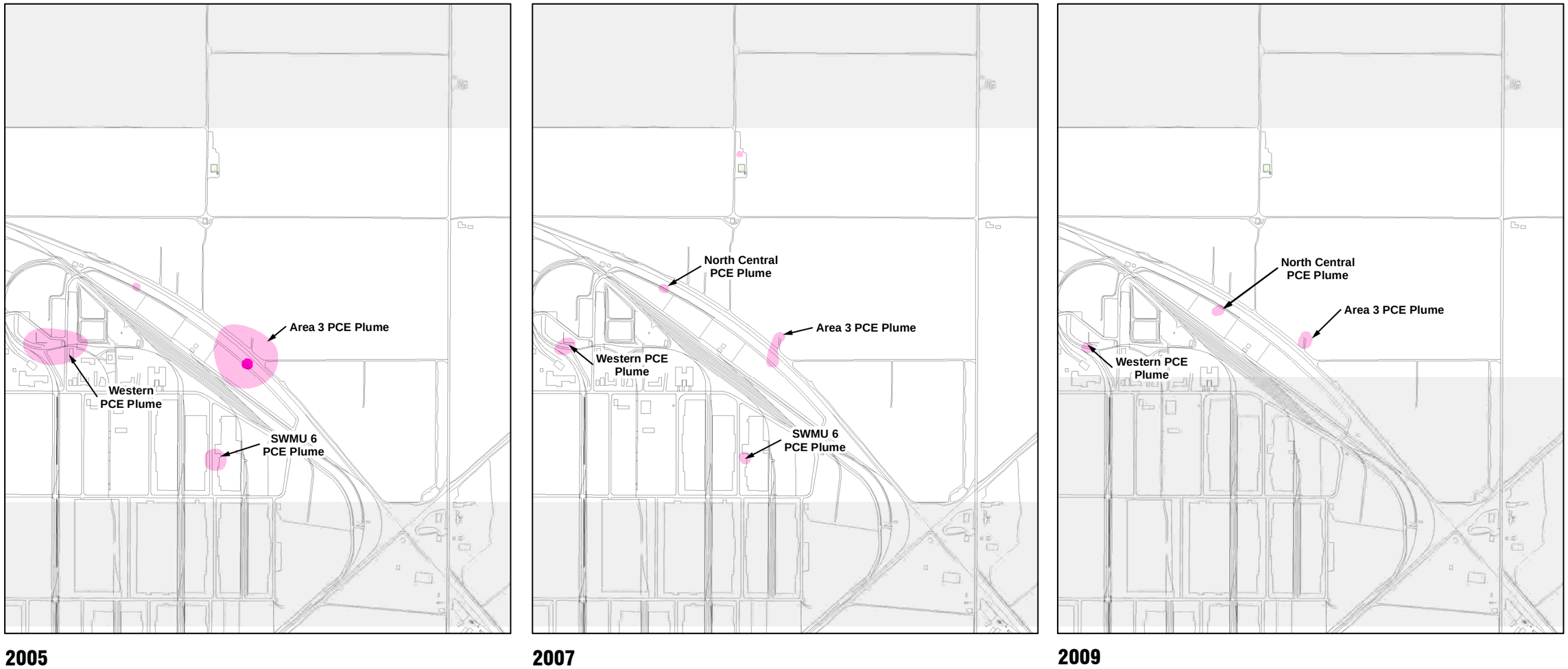

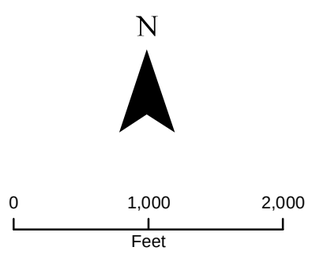

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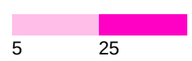

PCE concentrations in micrograms per liter (µg/L)

PCE concentrations are from samples collected in the third quarter of each year or most recent sampling event within the previous four quarters.

Figure 5-6
Comparison Map - PCE All Zones
2005, 2007, and 2009
Tracy Site

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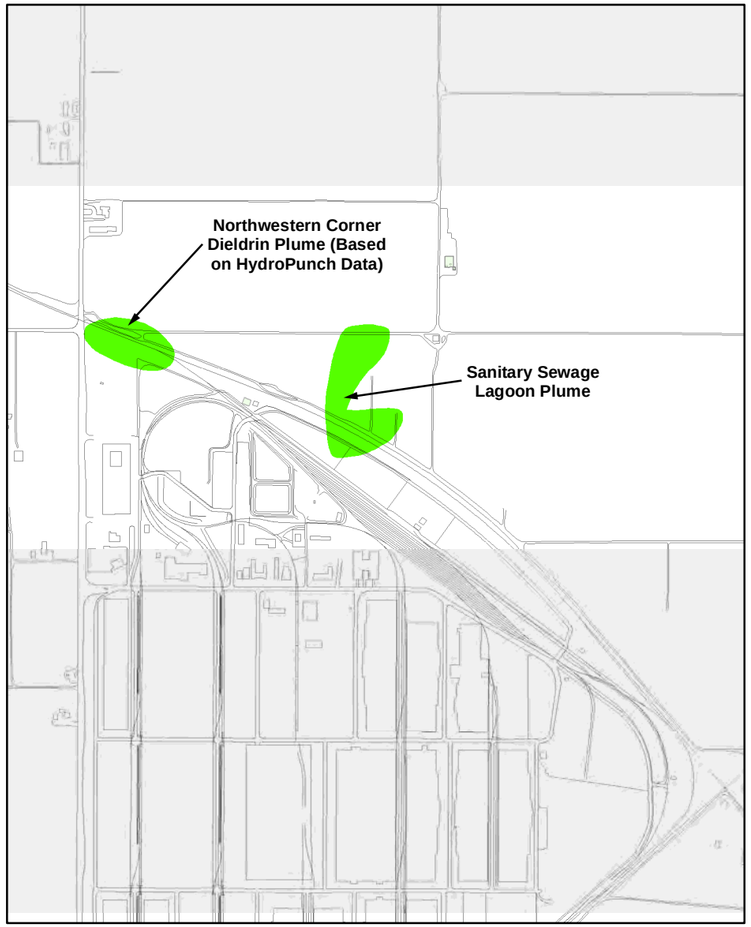
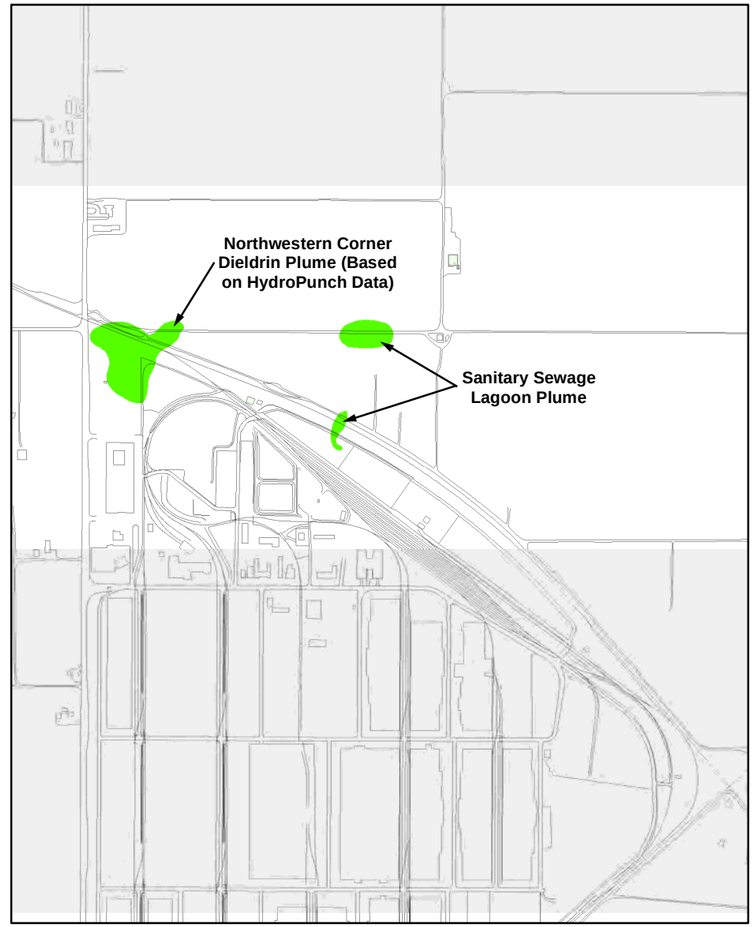
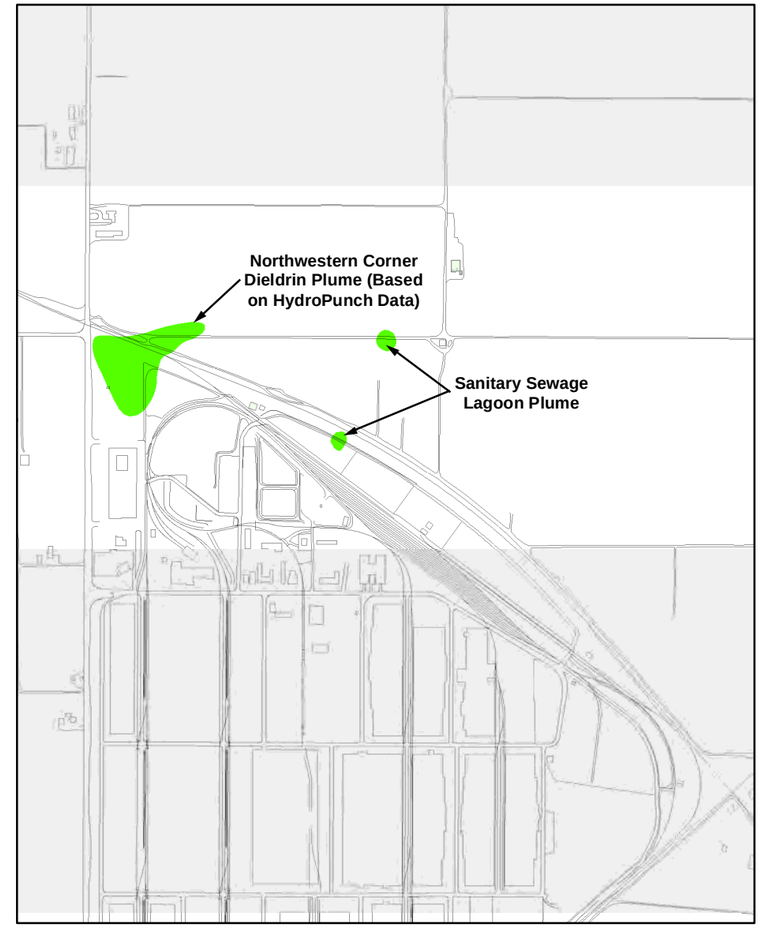


2005



2007



2009

N

0 1,000 2,000
Feet

L:\Projects\Tracy\Five_Year_Review_2010\ArcMaps\5_7.mxd LCT 08.01.12 SAC

0.05

Dieldrin concentrations in micrograms per liter (µg/L)

The Sanitary Sewage Lagoon plume shape is based on data from samples collected in the third quarter of each year or most recent sampling event within the previous four quarters. The Northwestern Corner Dieldrin plume shape is based on HydroPunch samples from 2004 to 2008.

Figure 5-7
Comparison Map - Dieldrin
Upper and Middle Zones
2005, 2007, and 2009
Tracy Site

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- Proper procedures were followed in the only case of a change in land use that could have affected groundwater. Building 10 at SWMU 20 was demolished in 2008. The potential impacts of demolition on the groundwater plume under the building were considered prior to demolition. An investigation of soil vapor and groundwater contamination was conducted and a monitoring well (LM193AU) was installed. It was necessary to decommission LM193AU; however, DLA plans to replace the well.

Land use controls are in place and effective. The Master Planner for the depot indicated a familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. No issues with the management of land use controls for OU 1 have been identified in the annual reviews.

5.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Yes, exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection are still valid.

The original assumptions regarding current and future land and groundwater uses and COCs were re-evaluated to determine whether they are still valid, and whether any physical features (or understanding of physical site conditions) have changed (e.g., changes in anticipated direction or rate of contaminant migration). There are no newly-promulgated standards that call into question the protectiveness of the groundwater remedy. No toxic byproducts of the groundwater remedy have been identified during the review period.

Physical conditions on the Tracy Site, including the general groundwater flow direction across the site, have remained largely the same since 2005. There has been demolition of Building 10 (in SWMU 20) over a groundwater plume; however, asphalt will be emplaced over the SWMU 20 plume area assuring the plume will not be affected by additional infiltration. Changes in groundwater flow have been modified only near extraction well and infiltration locations because wells have been shut down and/or restarted in optimization efforts.

Changes in Standards and TBCs (to be considered [TBC] criteria). The OU 1 ROD and Site-Wide Comprehensive ROD identify chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for OU 1.

Chemical-Specific ARARs. The OU 1 remedial goals (ACLs) were initially established through available environmental or health-based standards. These standards were presented as ARARs in the OU 1 ROD. Where ARARs were not sufficiently protective, the human health risk assessment, regulatory agencies' recommendations, and TBCs were used to establish cleanup levels. For example, the ACL for dieldrin in OU 1, based on California Department of Health Services action level of 0.05 μg/L that existed in 1998, is a TBC. Cal/EPA no longer establishes action levels for drinking water. The OU 1 ROD established ACLs as cleanup standards for three VOCs (1,1-DCE, PCE, and TCE) that are chemical-specific ARARs based on California or Federal MCLs. TCE was the primary COC because it was the most frequently detected and at the highest concentrations; its chemical-specific ARAR is the California and Federal MCL of 5 μg/L, which has not been changed since the first five-year review. The California MCL of 6 μg/L for 1,1-DCE has not been changed since the first five-year review, nor has the Federal and California MCL of 5 μg/L for PCE.

Action- and Location-Specific ARARs. Action-specific ARARs are usually technology- or activity-based requirements, while location-specific ARARs are restrictions placed on the chemical contaminant or the

remedial activities based on the site's geographic or ecological features. The action-specific ARARs for OU 1 stated in Tables 10.2-1 and 10.2-2 of the OU 1 ROD and in Table 10-3 of the Site-Wide Comprehensive ROD are still valid. Portions of Title 22 California Code of Regulations (CCR) Section 67391.1 (State land use covenant) also apply to OU 1; however, no depot property was transferred during the period of this five-year review. The location-specific ARAR for OU 1 is the Endangered Species Act. However, no known endangered species have been observed at the depot.

Expected Progress Toward Meeting RAOs. The following summarizes progress toward meeting RAOs for VOCs and dieldrin since the first five-year review.

- Progress was made toward remediating the hot spots that were known at the time of the OU 1 ROD; concentrations of COCs in most plumes decreased. However, the recent identification of the SWMU 20 plume and Area 3 plume indicates that there are two hot spots in which progress may not have been made.

- Contaminant transport off depot has been minimized because the extraction wells have been effective in reducing the plumes from the Tracy Site.

- TCE, PCE, 1,1-DCE, and dieldrin remediation toward cleanup standards continued in most of the VOC and SSL dieldrin plumes.

Changes in Exposure Pathways. There have been no changes in exposure pathways for contaminants in groundwater since the first five-year review. The vapor intrusion pathway for occupied structures identified in the first five-year review is re-evaluated in Section 6.4.3 of this document. In addition, the potential vapor intrusion pathway at Building 237 is evaluated in Section 5.4.3.

Changes in Land Use. Since the first five-year review, there have been no changes in land use that affect the groundwater remedy.

Contaminants or Contaminant Sources. No new contaminants or contaminant sources were identified in groundwater since the first five-year review.

Remedy Byproducts. There has been no change in byproducts of the remedy since the first five-year review. VOCs stripped from groundwater are released to the air. Dieldrin is stripped from carbon, which is properly disposed.

5.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Yes, information has come to light that could call into question the protectiveness of the remedy.

Vapor Intrusion Potential—On Depot. The potential for the rise of TCE or PCE vapors from groundwater through soil gas into residences or work spaces was considered for the first five-year review and this second five-year review. However, TCE and PCE groundwater plumes with concentrations of 5 to 104 μg/L underlie storage areas (Area 3), parking lots (formerly northern portion of Building 10), and agricultural fields but no occupied depot buildings. The potential rise of VOC vapors into open spaces is unlikely to pose health risks because the VOC vapors rise into the air and are diluted quickly. DLA has no plans to build work spaces or residences over the groundwater plumes in the shallowest groundwater in the Upper Hydrologic Zone.

Vapor Intrusion Potential—Off Depot. At the time of the first five-year review, groundwater containing VOCs was known to be present under one private property (the residence east of Banta Road). A quantitative assessment of the potential human health risk from the vapor intrusion pathway was provided in the first five-year review and used the maximum detected concentrations of VOCs collected from groundwater at two locations near the residence. This analysis demonstrated that the cumulative cancer risks and noncancer health hazards were de minimis (inconsequential; i.e., below the lower limit of the EPA's risk management range: a cancer risk estimate of 1×10^{-6} or a noncancer hazard index of 1.0). Near the residence, groundwater well locations LM182A and LM150A were sampled in the third quarter of 2009 (HDR | e^2M, 2010a), and soil gas sampling locations CP0914 and CP0915 were sampled in 2008 (URS, 2009g). Groundwater samples contained 4.33 µg/L TCE at LM182A and 2.69 µg/L at LM150A. Soil gas samples were collected from depths of 7 to 8 feet bgs and from 15 to 16 feet bgs. The analytical methods for evaluating soil gas included a suite of 62 chemical analytes but only four analytes were detected above the lower analytical limits. The maximum detected concentrations of the four analytes in soil gas were: 120 parts per billion by volume (ppbv) ethylbenzene, 320 ppbv m- and p-xylenes ("mixed xylenes"), 89 ppbv o-xylene, and 3,800 ppbv toluene; all four analytes were detected at location CP0914; however, only toluene was detected (in only the 15 to 16 feet bgs sample) at location CP0915 (URS, 2009g). None of these compounds have been identified in the Banta Road TCE plume that originated from the Tracy Site; therefore, their presence in soil gas at these locations cannot be attributed to volatilization from the groundwater plume.

In accordance with EPA guidance on evaluating the vapor intrusion pathway (EPA, 2002), a Tier 1 primary screening of these data indicates that a potentially complete exposure pathway is present and therefore warrants continued evaluation. Tier 2 secondary screening of the groundwater data involves comparison of site concentrations to generic target concentrations, and if the generic target concentrations are exceeded, to then assess soil gas data. The generic target concentration of TCE in groundwater is approximately 3 µg/L, which is exceeded by the concentration detected at well LM182A. Tier 2 secondary screening of these soil gas data first involves the comparison to generic target soil gas concentrations. Target soil gas concentrations are computed by dividing an agency-approved health-protective concentration of a chemical in indoor air (e.g., EPA's regional screening levels (RSLs) for ambient air [EPA, 2010]) by the EPA-recommended generic attenuation factor ("alpha" or α; EPA, 2002) for soil gas samples collected at depths of 5 feet or greater below a building's foundation. The RSLs are 0.97 micrograms per cubic meter (µg/m^3) ethylbenzene, 100 µg/m^3 for mixed xylenes, 730 µg/m^3 for o-xylene, and 5,200 µg/m^3 for toluene, and the generic attenuation factor is a dimensionless value of 0.01. Should the site's soil gas concentrations exceed the generic target concentration, then (per EPA, 2002) a semi-site-specific target concentration can be derived based on an alpha that considers soil type and depth of sampling; for these relatively shallow (≥7 feet bgs) samples, the semi-site-specific alpha is a value of 0.002. The results of these screening analyses are provided in Table 5-9. Concentrations of mixed xylenes, o-xylene, and toluene were all less than their corresponding generic target concentrations, indicating an inconsequential exposure pathway. The maximum concentration of ethylbenzene at location CP0914 slightly exceeds the semi-site-specific target concentration, indicating a potentially complete vapor intrusion pathway.

Additional vapor intrusion screening values are available from Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA); California Human Health Screening Levels (CHHSLs) for volatile chemicals below buildings constructed without engineered fill below sub-slab gravel (OEHHA, 2005) are provided in Table 5-9. At the time of CHHSL publication, OEHHA had postponed the development of a CHHSL for ethylbenzene due to a pending reassessment of ethylbenzene toxicity. Since publication of the CHHSL report, the OEHHA has developed a toxicity value for the inhalation carcinogenicity of

Table 5-9. Vapor Intrusion Screening of Concentrations of VOCs Detected in Off-Depot Soil Gas, Tracy Site

Location	Analyte	Molecular Weight (grams/mole)	Maximum Detected Concentration (ppbv)	Maximum Detected Concentration (µg/m³)[a]	EPA Ambient Air RSL[b] (µg/m³)	EPA Target Concentrations[c]: Generic Attenuation Factor (α = 0.01) (µg/m³)	EPA Target Concentrations[c]: Semi-Site-Specific Attenuation Factor (α= 0.002) (µg/m³)	Cal/EPA CHHSLs[d]: Residential Land Use (µg/m³)
CP0914	Ethylbenzene	108.17	120	520	0.97	97	485	423
	mixed Xylenes	108.17	320	1,400	100	10,000	Site Concentration < Generic Target	140,000
	o-Xylene	108.17	89	390	730	73,000	Site Concentration < Generic Target	140,000
	Toluene	92.14	210	790	5,200	520,000	Site Concentration < Generic Target	320,000
CP0915	Toluene	92.14	3,800	14,300	5,200	520,000	Site Concentration < Generic Target	320,000

[a] At standard temperature (25°C=298°K) and pressure (1 atmosphere [atm]):

$$C_{soil\ gas} = C_{(soil\ gas)v} \times CF_v \times MW \times \frac{1\ atm}{R \times 298°K}$$

$$Target\ Concentration = \frac{RSL}{\alpha}$$

where:

Description	Variable	Value	Units
Soil gas concentration	$C_{soil\ gas}$	site-specific	µg/m³
Volumetric soil gas concentration	$C_{(soil\ gas)v}$	site-specific	ppbv (=nL/L)
Conversion factor - volume	CF_v	1E-03	(µL/nL)•(L/µL)•(µg/g)
Molecular weight	MW	chemical-specific	g/mole
Universal gas constant	R	8.205746E-05	(atm•m³)/(mole•°K)

[b] EPA (2010)
[c] EPA (2002)
[d] OEHHA (2005), and refer to text regarding ethylbenzene.

Cal/EPA = California Environmental Protection Agency
CHHSL = California human health screening level
EPA = United States Environmental Protection Agency
ppbv = parts per billion by volume
RSL = regional screening level
VOC = volatile organic compound
µg/m³ = micrograms per cubic meter

ethylbenzene (2.5×10^{-6} µg/m^3). Using the identical mathematical process used to derive the published CHHSLs for the xylenes and for toluene, a corresponding ad hoc CHHSL for ethylbenzene is calculated to be 423 µg/m^3. The maximum detected concentration of ethylbenzene in off-depot soil gas is slightly greater than the ad hoc CHHSL. The differences between the RSL-based and CHHSL screening concentrations for ethylbenzene are due to differences in interpretation of appropriate alpha values by the Federal and State agencies, as both groups utilize the same toxicity value (the OEHHA value) in their respective computations.

A supplemental vapor intrusion analysis to address potential cumulative effects (i.e., cancer or noncancer effects resulting from predicted exposures to multiple chemicals) was accomplished using the DTSC's modified version of EPA's "Johnson and Ettinger" (J&E) model of vapor intrusion (DTSC, 2009). Location- and depth-specific maximum concentrations of detected chemicals were the only user-supplied inputs to the DTSC's J&E model; electronic copies of the data input and results worksheets are provided in Appendix D. Ethylbenzene was the only carcinogenic VOC detected in these samples, so the risk estimates are solely the result of the ethylbenzene concentrations; all four detected VOCs can have noncarcinogenic effects, and the noncancer hazard index is a summation of individual hazard quotients from each detected compound. The risk from ethylbenzene in soil gas at 7 to 8 feet bgs in location CP0914 was 3.4×10^{-7} and the cumulative hazard was 0.011; the risk from the 15 to 16 feet bgs sample at location CP0914 was 4.6×10^{-8} and the cumulative hazard was 0.0025. Toluene was the only VOC detected at location CP0915, at 15 to 16 feet bgs, and the noncancer hazard quotient was 0.017. All of these estimates are de minimis, below the lower limits of the EPA's and Cal/EPA's risk management range (a cancer risk estimate of 1×10^{-6}, or a noncancer hazard index of 1.0). As previously described, there were 62 potential analytes but only four were detected. To ensure that analytical methods were sufficiently sensitive for human health risk assessment, the analytical detection limits for all 62 compounds were evaluated in the DTSC's J&E model (also in Appendix D). All individual detection limit concentrations produced risk estimates less than 1×10^{-6}, indicating that methods were sufficiently sensitive and capable of detecting potentially harmful low-level concentrations of multiple VOCs, but none were detected.

Collectively, most results indicate de minimis concentrations of VOCs in the subsurface of off-depot property: maximum detected concentrations of mixed xylenes, o-xylene, and toluene are below EPA generic target concentrations and Cal/EPA CHHSLs; however, the maximum detected concentration of ethylbenzene is slightly greater than the Cal/EPA CHHSL and EPA semi-site-specific target concentration. EPA (2002; p. 21) states "[the semi-site-specific screening] uses attenuation factors (based on a generally conservative use of the Johnson-Ettinger mathematical model)" and given this, the slight exceedance of the detected concentration (520 µg/m^3) compared to the target concentration (485 µg/m^3) is likely to also be inconsequential; similar health-protective assumptions are integrated within the computational model to derive the CHHSLs (e.g., assuming that the subsurface is the most-transmissive soil type: sand). Cumulative analyses (Appendix D) using Cal/EPA methods slightly different from the RSL-based or CHHSL derivations indicate that risk estimates for ethylbenzene are inconsequential.

Dieldrin. Investigations of the NWC dieldrin plume have indicated that it is small in areal extent and depth. The plume has not moved more than a few hundred feet in any direction from injection wells that caused the plume in the period from 1992 through 1995 because of high adsorption potential and the fine-grained nature of deposits in the Upper and Middle Hydrologic Zones (URS, 2010b). Even though the dieldrin contamination has not migrated toward water supply wells, dieldrin concentrations could pose human health risks to persons who may use the groundwater in the future. The dieldrin-contaminated groundwater is not being pumped to the surface at this time; therefore, there is no complete exposure pathway. Action will be undertaken by DLA to assure there is no exposure pathway in the future.

Area 3 TCE Plume. A plume of TCE in groundwater was identified and defined by HydroPunch sampling during sampling of Area 3 in 2008 (URS, 2009i). There are no monitoring wells located in the Area 3 plume; it is defined only by HydroPunch data. The nearest extraction well, EW046AU, is within 200 feet downgradient from the plume. Data collected in 2009 indicate that the Area 3 plume is within the capture zone of EW046AU and that the plume will be remediated by the well (HDR|e^2M, 2010a).

Banta Road Plume. The portion of the Banta Road plume that extends east of Banta Road contains concentrations of TCE that exceed the ACL of 5 µg/L. Much of this portion of the plume is beyond the capture zones of extraction wells. It is likely that the plume will naturally attenuate before the concentrations reach any water supply wells downgradient; however, there are no monitoring wells downgradient of the leading edge of the plume to assure it is not continuing to migrate. Monitoring wells will be constructed by DLA to add the assurance that the remedy for the plume east of Banta Road will remain protective in the long term.

Ecological. Burrowing owls were identified on the annex during the site inspection for this five-year review. Prior to 2010, there were no sightings of burrowing owls anywhere on the Tracy Site. A burrowing owl survey will be performed in 2011 to determine the size of the population and their locations at the Tracy Site. No other potential ecological concerns have come to light during the second five-year review period that could call into question the protectiveness of the groundwater remedy. There have been no impacts to the groundwater remedial action due to natural disasters during this time period.

5.5 Issues

The following major issue for groundwater has been identified since the first five-year review was performed and will be tracked by EPA in the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) five-year review module.

Banta Road Plume. In 2010, TCE concentrations in the plume averaged from 5 to 14 µg/L. Most of the Banta Road plume is now east of Banta Road. The remedy for that portion of the plume is dispersion with metabolism and volatilization processes in accordance with the 1996 ESD. Recent CPT investigation results indicate the plume extends more than 1,500 feet east of Banta Road. There are no monitoring wells to provide data to determine whether the plume is attenuating or migrating toward residential supply wells; therefore, long-term protectiveness of the remedy for the plume east of Banta Road is uncertain.

The other major issues for groundwater identified in the draft and draft final versions of this second five-year review that do not require tracking by EPA because they were addressed prior to the final submittal of this document are:

NWC Dieldrin Plume. No remedy is currently in place for the NWC dieldrin plume (highest concentration 0.25 µg/L); however, a preferred remedy, developed during the dispute resolution process, was agreed upon by DLA, EPA, and the State of California. The NWC Groundwater OU should be established in a ROD to address the NWC dieldrin plume. The remedy consisting of extraction, treatment for dieldrin, and percolation of the treated effluent for three years is expected to be implemented within the next year. The effectiveness of the remedial action will be assessed in the third five-year review.

GWTP2 O&M Manual. Three inline LGAC units were installed at dieldrin extraction wells because GWTP1, where dieldrin contaminated groundwater had been treated, was taken out of service. After groundwater passes through the LGAC units, it is conveyed to and treated at GWTP2 and then discharged. In addition, an LGAC unit is installed at a residential well on private property east of Banta Road. The O&M manual does not include information on the O&M of the inline LGAC units or the

conveyance lines to GWTP2, nor does it include information on the inline LGAC unit on the off-depot private well.

Minor issues for groundwater include:

SWMU 20 Plume. In 2009, the SWMU 20 plume had the highest TCE concentrations (104 µg/L) in groundwater beneath the Tracy Site (HDR| e^2M, 2010a). Prior to 2009, there was little evidence that concentrations exceeding 100 µg/L were present in groundwater beneath the area. TCE concentrations at two monitoring wells (LM129A and LM175AU) downgradient of SWMU 20 have been less than the ACL since they were installed in 1993 and 2002, respectively. Furthermore, TCE concentrations at EW011AU, an extraction well only 120 feet north of the SWMU 20 plume, have been less than the ACL since 2001. The plume appears to be stable or migrating at a very slow rate, even under the influence of an extraction well. The potential for this plume to migrate cannot be determined with the existing monitoring wells.

DDT Detection. During SVE remedy enhancement activities at the Area 1/Building 237 site in 2009, DDT, DDE, and lindane were detected in investigation-derived waste (IDW) at concentrations exceeding levels protective of human health and the environment. Subsequently, groundwater samples were collected at the site (LM192AU), and the highest concentrations were DDT at 0.234 µg/L, DDE at 0.0681 µg/L, and DDD at 0.0711 µg/L. The DDT concentration equals the EPA RSL for tap water. The extent of these pesticide concentrations in groundwater is not known.

Natural Attenuation. The declining VOC concentrations in several portions of the OU 1 plume may be due not only to extraction of VOCs by the pump-and-treat remedy but also to natural attenuation processes, including adsorption, dispersion, and volatilization. The potential exists that the TCE and PCE plumes will continue to be reduced in size without extraction. Groundwater modeling results indicate that groundwater concentrations in most plumes (excluding the SWMU 20 plume) would decrease to less than ACLs within 12 years with no extraction (HDR | e^2M, 2010a). Evidence for natural attenuation through biodegradation or reductive dechlorination processes was evaluated; geochemical data supporting those processes were not found (HDR | e^2M, 2010a).

Area 3 TCE Plume. Although the plume is within the capture zone of EW046AU, concentrations of TCE and PCE in groundwater at the extraction well are less than ACLs, which could make it a candidate for shut down. However, the plume (concentrations: 5 to 25 µg/L TCE and 5 to 5.7 µg/L PCE) would not be in a capture zone if EW046AU was shut down in a rebound evaluation. If EW046AU is considered for shut down, monitoring of the Area 3 TCE plume must continue to assure it does not migrate downgradient.

SWMU 8. The Site-Wide Comprehensive ROD requires installation of two pesticide extraction wells at SWMU 8 because dieldrin, chlordane, DDD, DDE, and DDT had been detected in groundwater downgradient from the site during the RI (Montgomery Watson, 1996b). However, after the Site-Wide Comprehensive ROD was signed, chlordane, DDE, and DDT were detected only once at concentrations exceeding the site-specific concentrations requiring evaluation (see Section 11.0), and dieldrin never exceeded the site-specific concentration requiring evaluation. Therefore, a consensus decision among RPMs was reached that the two extraction wells were no longer necessary. This decision has not been fully documented.

Absence of 1,1-DCE Detections. In the OU 1 ROD, an ACL of 6.0 µg/L was established for 1,1-DCE, and that ACL was maintained in the Site-Wide Comprehensive ROD. Concentrations of 1,1-DCE have not exceeded the ACL in any sample collected at the Tracy Site since 1997, and 1,1-DCE has not been detected in any groundwater sample from the site since the third quarter of 2004. Under anaerobic

conditions in groundwater, 1,1-DCE may be produced by anaerobic biodegradation of TCE (Wiedemeier et al, 1998). However, the absence of 1,1-DCE detections and the absence of anaerobic conditions in groundwater at the Tracy Site indicate that the 1,1-DCE is unlikely to be generated by anaerobic biodegradation of TCE in the future (HDR | e^2M, 2010a). These results indicate that 1,1-DCE is no longer a COC for groundwater at the Tracy Site.

ROD Monitoring Requirements. The monitoring required is incomplete for TCE at LM056C, LM067B, LM151B, LM156A, and LM157A and for dieldrin at LM028A and LM094AU because detections of those contaminants exceeded the groundwater concentrations requiring evaluation specified in the Site-Wide Comprehensive ROD. Monitoring of these wells will continue until requirements are met.

5.6 Recommendations

The following recommendation and follow-up action is intended to address a major issue identified in the technical assessment for OU 1 and will be tracked by EPA in the CERCLIS five-year review module.

- Install two monitoring wells in the Upper Hydrologic Zone northeast of the Banta Road plume to determine whether the plume is naturally attenuating or migrating toward residential water supply wells. Installation of these wells is planned for 2012, and will be documented in the 2012 Annual Monitoring Report (December 2012).

Other recommendations/follow-up actions intended to address major issues for groundwater identified in the draft and draft final versions of this second five-year review that do not require tracking by EPA because they have already been completed include:

- Prepare a proposed plan identifying the preferred remedy (groundwater extraction from four wells, LGAC treatment, and on-site discharge for three years) and establish the NWC Groundwater OU. After reviewing public comments, prepare a NWC Groundwater OU Record of Decision and implement the selected remedy.

  Status: The preferred remedy was documented in a proposed plan that was made available for public comment in October 2010 and presented at a public meeting in November 2010. The NWC Groundwater OU was established in the *Record of Decision, Remedy for Northwestern Corner Groundwater Operable Unit* (URS, 2011), which was finalized with signatures in October 2011. The remedy has been implemented, and operation of the extraction wells began on 4 January 2012.

- Update the O&M manual to include information needed for O&M of the inline LGAC units.

  Status: The *Addendum to the Groundwater Treatment Plant 2 Operations and Maintenance Manual, Liquid-Phase Granular Activated Carbon Systems Operations and Maintenance, Defense Distribution Depot San Joaquin–Tracy Site* (HDR, 2012a) was submitted on 25 April 2012.

Recommendations intended to address minor issues for groundwater include:

- Install a monitoring well in the Upper Hydrologic Zone within the footprint of the SWMU 20 plume in the approximate former location of LM193AU and install a downgradient monitoring well in the Middle Hydrologic Zone between the new Upper Hydrologic Zone well and EW011AU, the nearest operating extraction well.

  Status: Monitoring well LM196AU was installed in December 2010 in the approximate former location of LM193AU but with a screen interval deeper than LM193AU had; LM197B was installed

within the Middle Hydrologic Zone in November 2010, downgradient from LM196AU (HDR, 2012b).

- Collect groundwater samples at the time soil samples are collected at the Area 1/Building 237 site to delineate pesticides in soil. Sample monitoring wells upgradient and downgradient from LM192AU for DDT, DDD, and DDE to estimate the extent of the potential pesticide plume; determine if the plume is migrating, and, if necessary, study the feasibility of remediation.

  Status: On 8 February 2011, groundwater samples were collected at LM192AU and LM133AU, which is upgradient from LM192AU. A HydroPunch groundwater sample was also collected at a soil boring downgradient from LM192AU. Pesticides were not detected at either well or in the HydroPunch sample (HDR, 2012c). Based on these results, the conclusion stated in the *Area 1/ Building 237 Engineering Evaluation/Cost Analysis Defense Distribution Depot San Joaquin – Tracy Site* is that there is no impact to groundwater from the pesticides detected in the soil around Building 237 (HDR, 2012c).

- Continue to evaluate natural attenuation potential for TCE and PCE plumes on the Tracy Site.

- Prior to shutting down EW046AU, the TCE groundwater contamination detected in the 2008 HydroPunch investigation beneath Area 3 should be re-evaluated.

  Status: Installation of a monitoring well between the Area 3 TCE plume and EW046AU was recommended in the *Well Monitoring Program 2010 Annual Report* (HDR, 2011a).

- Delete the extraction remedy for SWMU 8 in a decision document. The Site-Wide Comprehensive ROD called for two extraction wells that were never installed because dieldrin was not detected in groundwater at monitoring wells downgradient from the site.

- In the same decision document that modifies the groundwater remedy for SWMU 8, prepare the arguments supporting the removal of 1,1-DCE from the list of groundwater COCs.

- Continue monitoring groundwater at LM056C, LM067B, LM151B, LM156A, and LM157A for TCE and LM028A and LM094AU for dieldrin until ROD monitoring requirements are met.

  Status: Through the 2011 monitoring period, LM056C, LM067B, LM151B, LM156A, and LM157A (TCE) and LM028A (dieldrin) have not yet met ROD monitoring requirements and are continuing to be monitored (HDR, 2012b). LM094AU met the ROD monitoring requirement for dieldrin in 2010, and sampling was discontinued at this well starting in 2011 (HDR, 2011a).

5.7 Protectiveness Statement

The remedy for OU 1 is protective of human health and the environment in the short term. Contaminant plumes are present in groundwater. However, exposure pathways that could result in unacceptable risks are being controlled by institutional controls on groundwater beneath federal government property. Groundwater containing TCE has reached a drinking water well that is treated with LGAC and monitored quarterly. To assure long-term protectiveness, monitoring wells that can demonstrate containment by natural attenuation will be installed and included in the groundwater monitoring program. The remedy for the NWC Groundwater Operable Unit will address dieldrin–contaminated groundwater that could pose health risks if it was being used.

5.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

Photo 1. OU 1 Inline Granular Activated Carbon Unit, Tracy Site

Photo 2. OU 1 Groundwater Treatment Plant 2, Tracy Site

Photo 3. NWC, Tracy Site

Photo 4. NWC, Tracy Site

6.0 SOIL VAPOR EXTRACTION SITES

6.1 Remedial Action

6.1.1 Remedy Selection

SVE is the remedy selected in the Site-Wide Comprehensive ROD for the following three sites (also known as Group A sites).

- SWMU 1/Area 2 (PCE and TCE), formerly the site of a sewage lagoon and drum storage area
- Area 1/Building 237 (PCE), formerly used for solvent storage
- Area 3 (PCE and TCE), formerly used as a drum storage site

These SVE sites are located in the north-central portion of the depot (Plate 1).

The RAO for the SVE sites is to prevent migration of VOCs (PCE and TCE) in soil that could cause groundwater contamination at concentrations exceeding the ACLs for those contaminants.

To achieve this RAO, soil gas cleanup standards were developed for TCE and PCE (Table 6-1). These concentrations represent calculated concentrations of TCE and PCE in soil gas that are in equilibrium with groundwater that has TCE and PCE concentrations at their respective ACLs; the concentrations are assumed to be protective of groundwater quality.

Table 6-1. Cleanup Standards for SVE Sites, Tracy Site

Analyte	(ppbv)
PCE	780
TCE	350

PCE = tetrachloroethene
ppbv = parts per billion by volume
SVE = soil vapor extraction
TCE = trichloroethene

Section 9.6.5 of the Site-Wide Comprehensive ROD includes the following requirements to demonstrate vadose zone cleanup:

1. The concentrations of PCE and TCE present in soil gas are equal to or less than the soil gas cleanup standard.
2. It is demonstrated that the remaining TCE and PCE can no longer cause leachate concentrations to exceed the ACLs.
3. TCE and PCE have been removed to the extent technically and economically feasible. This evaluation will include, at a minimum, the following factors:
    a. The total cost and duration of continued operation of the SVE system until ACLs are met.
    b. The total cost and duration of continued groundwater treatment to meet ACLs without continued SVE operation.

c. 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 ACLs.

Polychlorinated biphenyls (PCBs) (Arochlor 1260) were detected at a concentration of 140 milligrams per kilogram (mg/kg) at 14.5 feet bgs in boring SB145 at SWMU 1/Area 2. The Site-Wide Comprehensive ROD determined that, though excavation and disposal is technically feasible, the cost required to remediate the small area of PCB-contaminated soil at SWMU 1/Area 2 is not considered justified, given the relatively low level of contamination and the detection of PCBs in only one soil sample.

The selected remedy for each SVE site included an SVE system, a treatment pad, and piping to connect the wells to a mobile blower system. The Site-Wide Comprehensive ROD also requires vapor-phase granular activated carbon (VGAC) for treatment before discharge to the atmosphere.

In the 2001 ESD, an additional RAO was added for SWMU 1/Area 2 because the baseline risk assessment concluded that residual polycyclic aromatic hydrocarbon (PAH) and beryllium contamination at the site is acceptable for the current land use (industrial) but not acceptable under a future residential land use scenario. The additional RAO for SWMU 1/Area 2 is:

- Prohibit residential, day care, play area, or school use.

Because the Site-Wide Comprehensive ROD does not address future land use for SWMU 1/Area 2, land use controls were added in the 2001 ESD and modified in the 2004 ESD to address potential health risks in the event of a land use change. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD. The other two SVE sites do not require land use controls.

The Site-Wide Comprehensive ROD also requires groundwater sampling for VOCs as part of the Well Monitoring Program to evaluate the effectiveness of the selected remedy. Table 6-2 provides a comparison of the monitoring results for the ROD-specified wells to groundwater concentrations requiring evaluation in the Site-Wide Comprehensive ROD.

Table 6-2. Comparison of Groundwater Monitoring Results to ROD Concentrations Requiring Evaluation at SVE Sites, Tracy Site

		Most Recent Exceedance of Concentrations Requiring Evaluation - 2005–2010 (µg/L)		
Analyte	**Groundwater Concentration Requiring Evaluation (µg/L)**	**SWMU 1/Area 2 (LM030AUA, LM040B/LM041B, and LM094AU)**	**Area 1/Building 237 (LM061AU and LM137A)**	**Area 3 (LM032AU)**
TCE	5	None	None	5.79 (LM032AU in 3Q07)
PCE	5	8.57 (LM030AUA in 3Q09)	5.22 (LM137A in 3Q08)	10.1 (LM032AU in 1Q08)
1,1-DCE	6	None	None	None

DCE = dichloroethene
PCE = tetrachloroethene
ROD = record of decision
SVE = soil vapor extraction
TCE = trichloroethene
µg/L = micrograms per liter
3Q07 = third quarter 2007 (quarter, year)

6.1.2 Remedy Implementation

Table 6-3 summarizes the status of the remedial actions at the SVE sites.

Table 6-3. SVE Sites Remedy Status, Tracy Site

Remedy Component	Status
Soil Vapor Extraction	Response complete pending agency approval.
ROD Groundwater Monitoring Requirements for SVE Sites	Remedial action in operation.
Land Use Controls for SWMU 1/Area 2 • Establish notification procedure for land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures) • Perform annual review to ensure compliance with controls and to correct any deficiencies in the notification procedure • Follow defined procedures in the event of a change in land use • Sample and properly dispose of soil generated from any future excavation activities	Remedial action in place.

RPMPD = real property master plan digest
SVE = soil vapor extraction
SWMU = solid waste management unit

The SVE systems at the Tracy Site were installed in 2000 in accordance with design documents. SVE proveout operations began at the three SVE sites in November 2000. Currently, there is one 10-horse-power, skid-mounted SVE unit located at Area 1/Building 237. SVE operations at SWMU 1/Area 2 and Area 3 were terminated in 2007.

The Site-Wide Comprehensive ROD established site-specific requirements for selected wells and contaminants (see Table 6-2) to determine the effectiveness of the selected remedy on water quality. Sampling for these requirements was implemented in the third quarter of 1998 and analytical results are reported in Well Monitoring Program Annual Monitoring Reports.

Land use controls established in the 2001 ESD and modified by the 2004 ESD are in place at SWMU 1/Area 2; the site is inspected annually to evaluate effectiveness of the land use controls. The results of annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

6.1.3 System O&M

During the period of this five-year review, SVE operations at SWMU 1/Area 2 and Area 3 were performed intermittently from 2005 to 2007. Based on 2008 sampling results and model predictions, SVE operations have not been restarted since 2007 at these two sites.

At Area 1/Building 237, SVE operations were performed in 2005; however, based on 2008 sampling results, residual PCE contamination (greater than 10,000 ppbv) still remained at this site. SVE remedy enhancement measures, pneumatic fracturing and the installation of high-volume SVE wells, were implemented at Area 1/Building 237 in 2009. This optimized system began operation in January 2009 and was shut down in August 2009 based on sampling results.

During the period of this five-year review, the SVE systems were operated according to procedures described in the *DDJC-Tracy Bioventing/Soil Vapor Extraction Sites, Remedial Design Report* (Radian International, 2000b) as modified by *Soil Vapor Extraction Optimization Work Plan* (URS, 2003b). The objective of the operational strategy under both plans was to operate the SVE systems to maximize mass removal, minimize operation time, and provide a consistent approach for the operation of each SVE system. The following operational data were collected for each site to confirm that the systems were meeting the remediation objectives: flow measurements at the system inlet and wells, including differential pressure, static pressure, and temperature of the extracted vapor; analytical samples at the wells and system inlet; and various system measurements to ensure operational efficiencies. The data were periodically evaluated to determine the system performance and reported in Well Monitoring Program Quarterly and Annual Monitoring Reports and in *Remedy Enhancement Decisions at SVE Sites Area 1/Building 237, SWMU 1/Area 2, and Area 3 Report* (URS, 2009i).

SVE system costs during the period of this five-year review are summarized in Table 6-4. SVE costs include continued SVE operations and installation of air inlet wells (AIWs), vapor extraction wells (VEWs), well vaults, soil gas conveyance pipelines above ground, and one groundwater monitoring well. SVE costs also include two phases of pneumatic fracturing at Area 1/Building 237 for remedy enhancement. Reporting costs include quarterly SVE operational summaries over a five-year period and development of the following documents:

- *DDJC-Tracy Remedy Enhancement Decisions at SVE Sites Area 1/Building 237, SWMU 1/Area 2, and Area 2* (URS, 2009i)
- *Pneumatic Fracturing Enhancement to SVE at Area 1-Phase 1, DDJC-Tracy Technical Memorandum* (URS, 2009c)
- *Pneumatic Fracturing Enhancement to SVE at Area 1-Phase 1, DDJC-Tracy, Summary of Phase I Field Activities* (URS, 2009d)
- *Work Plan for Remedy Enhancement Using Pneumatic Fracturing at SVE Site Area 1/Building 237, DDJC-Tracy* (URS, 2009j)
- *Sampling Effort to Support NFA Decisions at Area 1/Building 237 SVE Site, DDJC-Tracy* (URS, 2009h)
- *Results from Sampling Effort to Support NFA Decisions at Area 1/Building 237 SVE Site, DDJC-Tracy* (URS, 2010b)

Table 6-4. O&M Costs for SVE Sites (June 2005 through May 2010), Tracy Site

Activity	Total
Continued SVE Operations	$244,500
SVE Remedy Enhancement	$325,500
Total Cost	**$570,000**

O&M = operation and maintenance
SVE = soil vapor extraction

6.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

6.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at SWMU 1/ Area 2, Area 1/Building 237, and Area 3 is expected to be protective of human health and the environment upon completion. In the interim, exposure pathways that could result in unacceptable risks are being controlled.*

6.2.2 Status of Recommendations from First Five-Year Review

Following is the recommendation presented in the First Five-Year Review Report and its status.

Recommendation: *DDJC will continue to optimize the SVE systems to address residual contamination at the Group A sites until an evaluation consistent with paragraph 9.6.5 of the ROD (Radian International, 1998a) indicates that TCE and PCE have been removed to the extent that is technically and economically feasible.*

Status: Since the last five-year review, optimization activities have been performed at all three SVE sites. Activities included the installation of AIWs in high-concentration areas and pulsing the SVE systems. In addition, the vadose zone beneath Area 1/Building 237 was pneumatically fractured to increase its permeability and the effectiveness of the SVE system. VLEACH modeling and SVE termination and optimization procedure (STOP) evaluation results performed for SWMU 1/Area 2 and Area 3 indicate that residual mass in the vadose zone is not predicted to result in leachate concentrations of PCE or TCE that exceed the ACL of either compound and that PCE would only slightly exceed the ACL at Area 1/Building 237. The estimated residual vadose zone mass in Area 1/Building 237, SWMU 1/Area 2, and Area 3 will not increase groundwater remediation cost or treatment time. The SVE sites are currently recommended for no further action by DLA Installation Support at San Joaquin, pending an ESD of the Site-Wide Comprehensive ROD that will (1) revise the terminology in Sections 9.6.5 and 9.7.5.10 of the ROD by deleting the “and” at the end of the second vadose zone cleanup achievement item and adding an “or” after the first and second vadose zone cleanup achievement items and (2) incorporate the STOP protocol as a basis for closing SVE sites at the Tracy Site.

6.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the SVE sites on 16 July 2010. Representatives from EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspections. The site inspection forms are provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

Expansion of the SVE system as a result of the remedy enhancement activities is the only change to Area 1/Building 237 since the first five-year review. The only changes to SWMU 1/Area 2 since the first five-year review are the improvement of a perimeter road and repair of stormwater runoff drainage swales associated with nearby DSERTS 67. Land use has not changed since the first five-year review, and land use controls are in place at SWMU 1/Area 2. Representatives from the regulatory agencies noted that no land use control warning signs are installed at SWMU 1/Area 2. No changes to Area 3 were observed during this site inspection.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for SWMU 1/Area 2 and that it was accessible.

Operational data and analytical results were examined for this five-year review and are discussed in the technical assessment. SVE operations and mass removal rates are documented in Well Monitoring Program Quarterly and Annual Monitoring Reports.

6.4 Technical Assessment

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

Yes, the remedies for the SVE sites are functioning as intended by the Site-Wide Comprehensive ROD as modified by the 2001 and 2004 ESDs.

SVE Activities. In 2005, SVE pulsing operations were performed at shallow AIWs at each of the SVE sites. Pulsing operations occurred until influent SVE concentrations indicated that all COC concentrations were consistently less than cleanup standards. The SVE systems were then shut down for a year. Pulsing operations were started again in December 2006 at SWMU 1/Area 2 and Area 3. During that time, the AIWs were open to the atmosphere for passive venting. All AIWs currently remain open.

The SVE systems were shut down in July 2007 and a round of closure sampling was completed in August 2007 that indicated the initial extent of COCs in soil gas had been significantly reduced at all SVE sites but that pockets of residual COC mass persisted at each site.

A comprehensive round of soil gas samples was collected from existing vapor wells in the first quarter of 2008 to determine areas and specific depths of residual TCE and PCE. Results of this round of vapor well sampling indicated that elevated concentrations of COCs remained in soil gas at each of the sites and the existing SVE monitoring well array could not define the extent of the concentrated contaminant residual mass. A CPT investigation that included soil gas and groundwater sampling was completed at each of the sites in March 2008 to determine the extent and estimate the volume of soil containing residual COC concentrations; determine whether COCs were sorbed to soil within the residual mass areas; identify inorganic constituents and other soil and groundwater parameters that could affect in situ remedy enhancement options; and determine COC concentrations in groundwater as an indication of residual COC concentration mass in the vadose zone.

Results of the CPT investigation indicated that Area 1/Building 237 had concentrations of PCE greater than 10,000 ppbv at two depths in two locations and SWMU 1/Area 2 and Area 3 had minimal mass of PCE or TCE remaining. VLEACH vadose zone soil vapor migration modeling predicted that concentrations of PCE in the residual mass could delay achieving completion of the remedial action for Area 1/Building 237 because groundwater would continue to be impacted by PCE in soil vapor (URS, 2009i). STOP evaluations performed for SWMU 1/Area 2 and Area 3 indicated SVE should be terminated at those areas because residual mass in the vadose zone is not predicted to result in leachate concentrations of PCE or TCE that exceed the ACL for either compound. It was also predicted that the estimated residual vadose zone mass in SWMU 1/Area 2 and Area 3 will not increase groundwater remediation cost or treatment time (URS, 2009i).

As a result of the residual contamination at Area 1/Building 237, DLA Installation Support at San Joaquin decided to enhance SVE at that site. In early 2009, SVE remedy enhancement measures (including pneumatic fracturing of the dense, low-permeability clay layers in the residual contaminant mass, installation of high-volume vapor extraction wells, and SVE) were undertaken at Area 1/Building 237.

Initial results of the remedy enhancements indicated that these measures were effective, and the enhancement area was expanded in June 2009 to affect all soils at the site with residual PCE concentrations greater than 10,000 ppbv. The enhanced SVE system at Area 1/Building 237 was operated until late August 2009. The vadose zone at Area 1/Building 237 was then allowed to equilibrate for a period of approximately 12 weeks, and samples from all Area 1/Building 237 vapor monitoring wells, VEWs, and AIWs were collected in early December 2009.

Vadose zone soil vapor migration modeling based on the December 2009 sample results predicted that TCE leachate concentrations will not exceed the groundwater ACL at Area 1/Building 237 if TCE soil vapor concentrations are not further reduced. Modeling also predicted that PCE in leachate from the southern portion of the site would start at a maximum concentration of 5.1 µg/L, slightly greater than the ACL for PCE (5.0 µg/L), and decrease with time if PCE soil vapor concentrations are not further reduced (URS, 2010b).

SWMU 1/Area 2. Results from the March 2008 CPT investigation provided data to complete the STOP evaluation in January 2009. The STOP evaluation concluded that SVE should be terminated at SWMU 1/Area 2 because residual mass in the vadose zone was not predicted to result in leachate concentrations of PCE or TCE that exceed their respective ACLs. In addition, the estimated vadose zone VOC mass will not increase the groundwater remediation cost or duration of treatment. DLA Installation Support at San Joaquin has recommended SMWU 1/Area 2 for no further action of the SVE remedy. There are no protectiveness issues related to the implementation and completion of the SVE remedial action at SWMU 1/Area 2.

Area 1/Building 237. SVE remedy enhancement (optimization) measures, including pneumatic fracturing and installation of high-volume SVE wells, were completed in 2009 at Area 1/Building 237. The enhanced SVE system was operated until late August 2009. Confirmation sampling completed in December 2009 provided data to complete VLEACH modeling. Modeling results predict that TCE leachate concentrations will slightly exceed the groundwater ACL at Area 1/Building 237 if current TCE soil vapor concentrations remain at current post-SVE levels. Modeling also predicts that leachate from the southern portion of the site may reach a maximum concentration of 5.1 µg/L, slightly greater than the ACL for PCE (5.0 µg/L), and decrease with time if PCE soil vapor concentrations are not further reduced. DLA Installation Support at San Joaquin has recommended Area 1/Building 237 for no further action of the SVE remedy. There are no protectiveness issues related to the implementation and completion of the SVE remedial action at Area 1/Building 237; however, there may be a vapor intrusion issue at Building 237. In addition, elevated pesticide concentrations were detected in soil IDW samples collected during well installation for the optimized SVE system at the site. Those results were confirmed in soil samples collected at the site. The results are discussed in Section 6.4.3.

Area 3. Results from the March 2008 CPT investigation at Area 3 provided data to complete the STOP evaluation in January 2009. The STOP evaluation concluded that SVE should be terminated at Area 3 because residual mass in the vadose zone was not predicted to result in leachate concentrations of PCE or TCE that exceed their respective ACLs. In addition, the estimated vadose zone VOC mass will not increase the groundwater remediation cost or duration of treatment. Area 3 is recommended by DLA Installation Support at San Joaquin for no further action of the SVE remedy. There are no protectiveness issues related to the implementation and completion of the SVE remedial action at Area 3.

Groundwater Monitoring. Well Monitoring Program Reports for the years 2005 through 2010 were reviewed to evaluate the likelihood of residual contamination impacting groundwater quality at the SVE sites. A comparison of the data to the groundwater concentrations requiring evaluation, equivalent to the ACLs for the SVE sites, is provided in Table 6-2. At SWMU 1/Area 2, PCE (LM030AUA) was the only COC detected at concentrations exceeding the ACL; however, concentrations have been decreasing over

time. At Area 1/Building 237, PCE (LM137A) was the only COC detected at concentrations exceeding the ACL and has only exceeded the ACL twice during the past five years. At Area 3, TCE and PCE were detected at concentrations exceeding the ACL during the past five years; however, both contaminants have shown decreasing trends over time.

Land Use Controls. Land use controls are in place and effective for SWMU 1/Area 2. The Master Planner for the depot indicated a familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. No issues have been identified during the annual inspections at SWMU 1/Area 2. During the second five-year review site inspection, representatives of the regulatory agencies noted that land use control warning signs are not installed at the site.

6.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs are still valid for SVE sites.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for the SVE sites.

Chemical-Specific ARARs. The Site-Wide Comprehensive ROD identifies chemical-specific criteria TBC based on maintaining groundwater at the RWQCB's Water Quality Goals. ROD-specified soil gas cleanup standards for TCE and PCE at the SVE sites were calculated from soil gas concentrations in equilibrium with groundwater that has concentrations equal to the MCLs for TCE (5 µg/L) and PCE (5 µg/L). Because there have been no changes to the MCLs (or ACLs) for TCE and PCE, the cleanup levels continue to be protective of groundwater. Cleanup standards were not established for PAHs or beryllium in soil at SWMU 1/Area 2.

Action-Specific ARARs. The action-specific ARARs for the SVE sites are stated in Table 10-3 of the Site-Wide Comprehensive ROD. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to SWMU 1/Area 2; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARAR for the SVE sites is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the sites. In addition, land use controls are in place to protect human health and the environment at SWMU 1/Area 2.

Changes in Exposure Pathways. Exposure assumptions used in the baseline risk assessment (Montgomery Watson, 1996b) did not include inhalation of VOCs in indoor air at Area 1/Building 237. Results of the March 2008 CPT investigation at Area 1/Building 237 suggested that the 780 ppbv PCE concentration contour for soil contamination may extend under a portion of the northern side of Building 237 (Figure 6-1). The enhanced SVE measures performed in 2009 may have remediated any potential contamination under Building 237. However, the potential for completion of the vapor intrusion exposure pathway from VOC-contaminated soil may exist within Building 237. An evaluation of the vapor intrusion pathway is necessary to determine whether PCE contamination in the vadose zone may affect the protectiveness of the remedy.

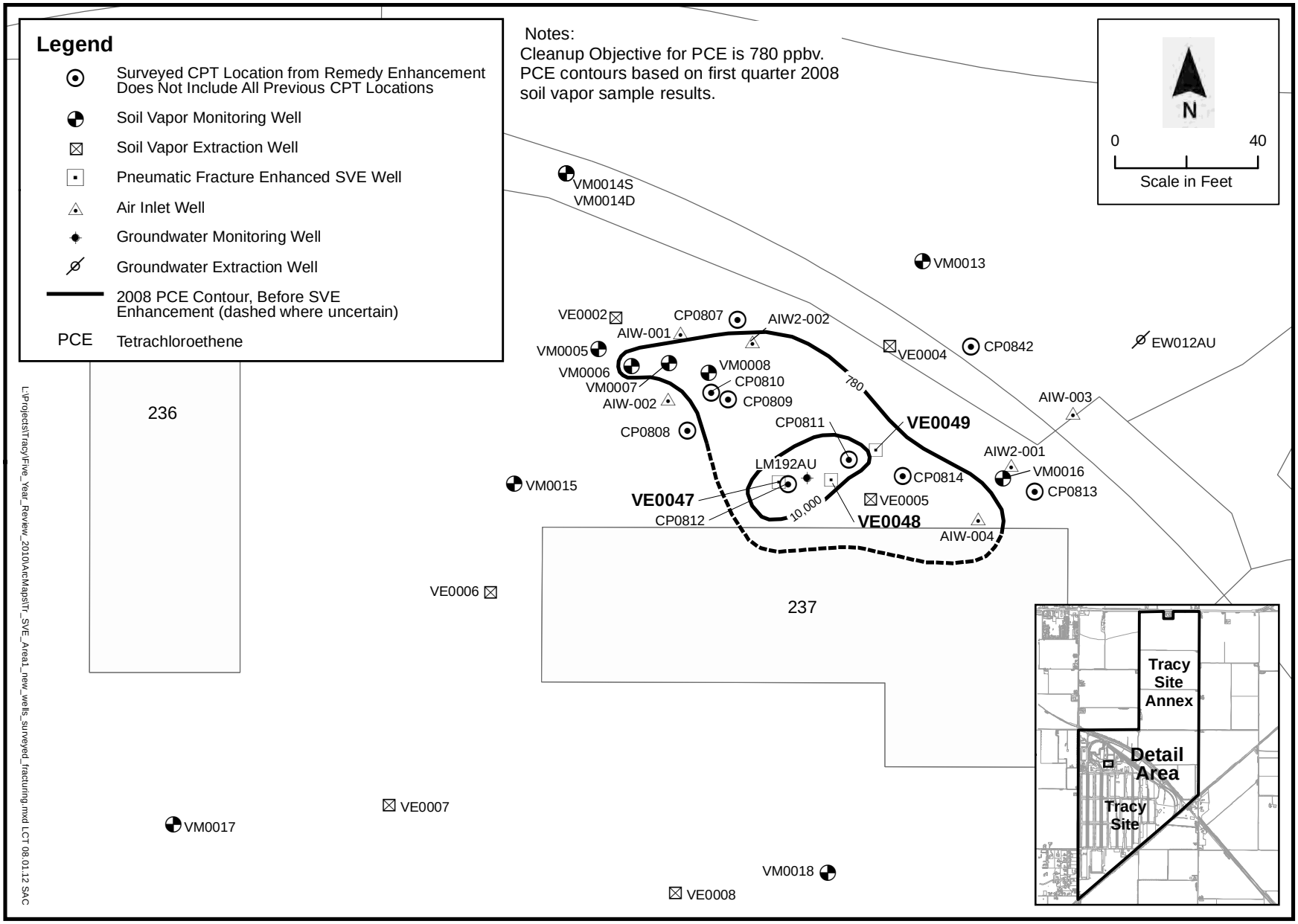

Figure 6-1. 2008 PCE Concentrations (Pre-SVE), Area 1/Building 237, Tracy Site

Changes in Toxicity and Other Contaminant Characteristics. The baseline risk assessment characterized the cancer risks and noncancer health hazards of the COCs (TCE and PCE) and others via ingestion, inhalation, and dermal contact. The inhalation and oral carcinogenicity factors for TCE and the inhalation carcinogenicity factor for PCE are less stringent at the time of this second five-year review than as used in the baseline risk assessment. The oral carcinogenicity of PCE is currently considered to be more potent than as assessed in the baseline risk assessment. Inhalation noncancer toxicity factors for TCE and PCE are less stringent today than as assessed in the baseline risk assessment. There was no change in the oral noncancer toxicity value for PCE, but there is no current value for oral noncancer toxicity of TCE, although a toxicity factor was used in the baseline risk assessment. The multiple differences in toxicity factors between those used in the baseline risk assessment and those available at the time of this second five-year review would produce different risk and hazard estimates, but would unlikely change the remedy selected in the Site-Wide Comprehensive ROD for the SVE sites.

Changes in Risk Assessment Methods. The baseline risk assessment utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes; at the time of this second five-year review, this is a practice no longer supported by the EPA. There are current agency-published inhalation noncancer toxicity values for TCE and PCE, but these are less stringent than those extrapolated values used in the baseline risk assessment. Consequently, inhalation noncancer hazards for TCE, PCE, and other chemicals are overstated in the baseline risk assessment relative to current methods. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. The soil gas cleanup standards for COCs were developed to protect the beneficial uses of groundwater. STOP evaluation procedures and VLEACH modeling have been used to demonstrate that remediation has been performed to the extent that the residual contaminant mass in the vadose zone is not predicted to result in leachate concentrations of PCE or TCE that exceed their respective ACLs at SWMU 1/Area 2 and Area 3 and only slightly exceed (5.1 µg/L) the PCE ACL (5.0 µg/L) at Area 1/Building 237. Therefore, the estimated remaining residual vadose zone COC mass will not increase groundwater remediation cost or treatment time. No supplemental land use controls at the SVE sites would be beneficial to groundwater quality.

The remedy for the SVE sites is protective of human health and the environment with the inclusion of land use controls for SWMU 1/Area 2. The RAO prohibiting residential-type uses (e.g., day care, houses) is being met.

6.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Yes, information has come to light that could call into question the protectiveness of the remedy.

Vapor Intrusion Pathway. The exposure assumptions used in the baseline risk assessment did not include inhalation of VOCs in indoor air at Area 1/Building 237. Due to concentrations of PCE that may exist beneath Building 237, there is the potential for the completion of the vapor intrusion pathway within the building.

Pesticides. Concentrations of pesticides in excess of the hazardous criteria for disposal were detected in IDW generated from the installation of an SVE well (VE0051) during the remedy enhancement activities

completed in June 2009 at the Area 1/Building 237 site. DDT was detected at a concentration of 21 mg/kg; DDE was detected at a concentration of 5.7 mg/kg; and gamma-BHC at a concentration of 4.7 mg/kg. Pesticide contamination was confirmed during an October 2009 limited hand auger effort. Although these pesticides are not readily mobile and would appear to be confined to the upper 20 feet in the immediate area around VE0051 (50-foot by 75-foot area), the current remedy (SVE) is not a suitable treatment method for chlorinated pesticide remediation. In addition, during the second quarter of 2010, groundwater samples from LM192AU (approximately 20 feet northwest of VE0051) contained concentrations of DDT (0.247 µg/L), DDD (0.0710 µg/L), DDE (0.0688 µg/L), and dieldrin (0.0271 µg/L).

6.5 Issues

Major issues for the SVE sites identified in the draft and draft final versions of this second five-year review that do not require tracking by EPA because they were addressed prior to the final submittal of this document include:

- **STOP Evaluation**. No further action has been recommended at all three SVE sites. The STOP evaluations completed for Area 1/Building 237, SWMU 1/Area 2, and Area 3 and VLEACH modeling results completed for Area 1/Building 237 indicate that the functional components of requirements for vadose zone cleanup cited in Section 9.6.5 of the Site-Wide Comprehensive ROD have been met. Regulatory acceptance of the STOP evaluation through a decision document is necessary to permanently terminate SVE at these sites.

- **Vapor Intrusion Pathway**. Inhalation of VOCs in indoor air was not evaluated at Area 1/ Building 237 in the baseline risk assessment. PCE contamination in soil may extend under the northern side of Building 237. The potential exists for PCE vapors in the soil to migrate vertically into Building 237, which is occupied by employees every work day.

- **Pesticides**. Concentrations of pesticides in excess of the hazardous criteria for disposal were detected in IDW generated from the installation of an SVE well (VE0051) during the remedy enhancement activities completed in June 2009 at Area 1/Building 237. DDT was detected at a concentration of 21,000 µg/kg; DDE was detected at a concentration of 5,700 µg/kg; and gamma-BHC at a concentration of 4,700 µg/kg. Pesticide contamination was confirmed during an October 2009 limited hand auger effort. The current remedy for Area 1/Building 237 is not appropriate for the treatment of pesticides detected in soils.

Minor issues for the SVE sites include:

- **Land Use Controls**. During the second five-year review site inspection, it was determined that land use control warning signs were not present at SWMU 1/Area 2.

- **ROD Monitoring Requirements.** The required monitoring is incomplete for PCE at LM030AUA and LM137A; TCE at LM041B; and PCE and TCE at LM032AU because detections of those contaminants exceeded the groundwater concentrations requiring evaluation specified in the Site-Wide Comprehensive ROD. Monitoring of these wells will continue until requirements are met.

6.6 Recommendations

Recommendations/follow-up actions intended to address major issues for the SVE sites identified in the draft and draft final versions of this second five-year review that do not require tracking by EPA because they have already been completed include:

- If the signatory parties of the Site-Wide Comprehensive ROD are in agreement, incorporation of the STOP evaluation process for SVE sites at the Tracy Site should be codified in an ESD document.

  Status: The STOP evaluation process for SVE sites was codified for the Tracy Site in the *2011 Explanation of Significant Differences to the 1998 Record of Decision* (HDR, 2011b).

- Because PCE contamination in soil may extend under Building 237, notify workers in Building 237 of the potential for vapor intrusion, and evaluate the vapor intrusion pathway.

  Status: In March 2011, warning signs were posted on or adjacent to the north and south side entrances to Building 237. In addition, three indoor air samples were collected at Building 237. Chlorinated VOCs were not detected (EA, 2011).

- Delineate the extent of pesticide contamination in soil and groundwater at the Area 1/Building 237 site to determine the appropriate remedy to assure protection of human health and the environment.

  Status: In February and April 2011, soil and groundwater sampling was conducted at Area 1/ Building 237 to assess the lateral and vertical extent of pesticides in soil and groundwater beneath the site. Pesticides were detected at concentrations greater than residential and industrial RSLs in shallow soil (up to 5 feet bgs) at several locations around and to the north of Building 237. There were no concentrations of pesticides detected greater than industrial or residential RSLs in samples collected from 10 feet bgs or deeper. Using the data collected during the 2011 investigations, a streamlined risk evaluation was performed, and based on the results, a limited soil removal action sufficient to reduce site risk to industrial use standards was recommended in the *Area 1/Building 237 Engineering Evaluation/Cost Analysis Defense Distribution Depot San Joaquin – Tracy Site* (HDR, 2012c).

Recommendations intended to address minor issues for the SVE sites include:

- Install land use control warning signs at SWMU 1/Area 2.

- Continue monitoring groundwater in accordance with the Site-Wide Comprehensive ROD. Continue monitoring groundwater at LM030AUA and LM137A for PCE; LM041B for TCE; and LM032AU for PCE and TCE until ROD monitoring requirements are met.

  Status: Through the 2011 monitoring period, LM030AUA (PCE) and LM041B (TCE) have not yet met ROD monitoring requirements and will continue to be monitored (HDR, 2012b). LM137A met the ROD monitoring requirement for PCE in 2011 but will continue to be monitored as a guard well (HDR, 2012b). For LM032AU, the ROD monitoring requirement for PCE has been met but not for TCE, therefore, the well will continue to be monitored (HDR, 2012b).

6.7 Protectiveness Statement

The remedy at Area 1/Building 237 is protective of human health and the environment in the short term, but long-term protectiveness must be confirmed by evaluation of the vapor intrusion pathway. In addition, investigation of a potential pesticide source area at the site may result in the need to modify the remedy or establish land use controls in that area to protect human health and the environment.

The remedy at SWMU 1/Area 2 is protective of human health and the environment because land use controls are in place and are effective.

The remedy at Area 3 is protective of human health and the environment and does not include land use controls.

6.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

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Photo 1. SWMU 1/Area 2, Tracy Site

Photo 2. SWMU 1/Area 2, Tracy Site

Photo 1. Area 1/Building 237, Tracy Site

Photo 1. Area 3, Tracy Site

Photo 2. Area 3, Tracy Site

7.0 SWMU 2 AND SWMU 3 – SEWAGE AND INDUSTRIAL WASTE LAGOONS

7.1 Remedial Action

7.1.1 Remedy Selection

SWMU 2 (sewage lagoons) and SWMU 3 (industrial lagoons) are in the northern part of the depot, west of and adjacent to the sewage treatment plant (Plate 1). The industrial waste lagoons were lined prior to their removal in 1997. The area previously occupied by the industrial waste lagoons has been incorporated into the southern sewage lagoon. The Tracy Site wastewater treatment plant discharges treated water to the sewage lagoons.

In 1996, an engineering evaluation/cost analysis was performed to evaluate alternatives and select a non-time critical removal action for SWMUs 2 and 3 (Radian Corporation, 1996b). The removal action was completed between 1997 and 1998 and was adopted as the selected remedy in the Site-Wide Comprehensive ROD. Following the removal action, the remedy was modified by the 2001 ESD and later in the 2004 ESD with the addition of land use controls. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

The RAOs for SWMUs 2 and 3 are:

- Prevent the migration of dieldrin, DDT, DDD, DDE, di-n-butylphthalate, and bis(2-ethylhexyl) phthalate in post-removal-action soil that could cause groundwater contamination to exceed appropriate regulatory standards and health-based concentrations.
- Prohibit residential, day care, play area, or school use.
- Prevent unprotected exposure of construction workers to contaminated soil.

Cleanup standards were developed with vadose zone migration modeling; the purpose of these standards is to eliminate potential threats to background groundwater quality at this site and to protect human health and ecological receptors. The cleanup standards to protect background groundwater quality are consistent with RWQCB's Water Quality Goals. The cleanup standards were initially presented in the action memorandum for SWMUs 2, 3, and 33 (Radian Corporation, 1996b) and then modified in the Site-Wide Comprehensive ROD. Table 7-1 provides the cleanup standards for SWMUs 2 and 3.

Table 7-1. Cleanup Standards for SWMUs 2 and 3, Tracy Site

Analyte	(μg/kg)
Selenium	616
Lead	28,300
Dieldrin	370
4-4´-DDD	1,600
4-4´-DDE	1,800
4-4´-DDT	1,700
Total DDX	241[a]
Aldrin	3
Chlordane	10
Diuron	260
Endrin	3

Table 7-1. (Continued)

Analyte	(µg/kg)
Lindane (Gamma-BHC)	1.7
Monuron	260
2,4-D	47
Heptachlor epoxide	1.5
2,4-Dimethylphenol	330
4-Methylphenol	330
Bis(2-ethylhexyl)phthalate[b]	330
di-n-butylphthalate[b]	330

[a] The cleanup standard for total DDX was deleted in the 2001 ESD.
[b] SWMU 2 standard only.

BHC = benzene hexachloride
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethene
DDT = dichlorodiphenyltrichloroethane
DDX = DDD, DDE, and DDT combined
ESD = explanation of significant differences
SWMU = solid waste management unit
µg/kg = micrograms per kilogram
2,4-D = dichlorophenoxy acetic acid

The cleanup standards for total DDX, lead, and selenium were risk-based standards to protect ecological receptors. These standards were identified as preliminary standards in the Site-Wide Comprehensive ROD because they were estimated using literature values rather than site-specific bioaccumulation factors. Data collected during subsequent investigations led to a revision of the baseline ecological risk assessment for SWMUs 2 and 3 and deletion of the cleanup standard for total DDX (URS, 2001a).

The Site-Wide Comprehensive ROD requires groundwater monitoring of SVOCs, pesticides, and herbicides as part of the Well Monitoring Program to evaluate the effectiveness of the selected remedy. Table 7-2 provides a comparison of monitoring results from ROD-specified wells to the groundwater concentrations requiring evaluation.

Table 7-2. Comparison of Groundwater Monitoring Results to ROD Concentrations Requiring Evaluation at SWMUs 2 and 3 (LM003AA and LM015AA), Tracy Site

Analyte	Groundwater Concentration Requiring Evaluation (µg/L)	Most Recent Exceedance of Concentration Requiring Evaluation 2005–2010 (µg/L)
bis(2-Ethylhexyl)phthalate[a]	10	Not Analyzed
2,4-Dimethylphenol[a]	140	Not Analyzed
Di-n-butylphthalate[a]	700	Not Analyzed
4-Methylphenol[a]	10	Not Analyzed
Aldrin	0.05	None
Chlordane	0.1	None
4-4´-DDD	0.15	None
4-4´-DDE	0.1	None
4-4´-DDT	0.1	None
Dieldrin	0.05	0.125 J (LM003AA) in 3Q09

Table 7-2. (Continued)

Analyte	Groundwater Concentration Requiring Evaluation (µg/L)	Most Recent Exceedance of Concentration Requiring Evaluation 2005–2010 (µg/L)
Endrin	2	None
Lindane (Gamma-BHC)	0.03	None
Diuron[a]	14	Not Analyzed
Monuron[a]	1.0	Not Analyzed
2,4-D[a]	70	Not Analyzed
Heptachlor epoxide	0.01	None

[a] ROD monitoring requirements for these analytes were met prior to the period of the second five-year review.

BHC = benzene hexachloride
DDD = dichlordiphenyldichloroethane
DDE = dichlorodiphenyldichloroethene
DDT = dichlorodiphenyltrichloroethane
J = estimated concentration
ROD = record of decision
µg/L = micrograms per liter
2,4-D = dichlorophenoxy acetic acid
3Q09 = third quarter 2009

7.1.2 Remedy Implementation

Table 7-3 summarizes the remedy status for SWMUs 2 and 3.

Table 7-3. SWMUs 2 and 3 Remedy Status, Tracy Site

Remedy Component	Status
Excavation	Response complete.
ROD Groundwater Monitoring Requirements	Remedial action in operation.
Land Use Controls • Implement notification procedure for construction activities or land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures) • Perform annual review to ensure compliance with controls and to correct any deficiencies in the notification procedure • Follow defined procedures in the event of a change in land use • Sample and properly dispose of soil generated from any future excavation activities.	Remedial action in place.

RPMPD = real property master plan digest
SWMU = solid waste management unit

Remedial actions for SWMUs 2 and 3 are described in the *Remedial Action Report for Solid Waste Management Units 2, 3, and 33* (URS, 2002a). The remedial efforts at SWMUs 2 and 3 began on 15 September 1997 and were completed on 12 June 1998. First, the dried sludge that remained in industrial waste lagoons was scraped and consolidated. Then the liners from both lagoons were cut and removed. The cut sections of liners were placed into a 20-cubic-yard roll-off bin and managed as RCRA hazardous waste. The removal of the liner from the industrial waste lagoons was completed on 19 September 1997.

Excavation of the south sewage lagoon and industrial waste lagoons began on 22 September 1997. The inner berms that separated the industrial waste lagoons from the south sewage lagoon were excavated first. After the inner berms were removed, the inside slope of the outer berm and the floor of the lagoon were excavated. Four pesticide “pockets” were then excavated. The excavation of the initial cuts specified in the excavation plans for the south lagoon was completed on 10 October 1997. Soil excavated from the south lagoon was stockpiled in the north lagoon. The stockpiles contained approximately 100 tons of soil and were covered with plastic sheeting to suppress dust. The total quantity of soil excavated from the south lagoon was 7,344 cubic yards.

During excavation of the south lagoon, an asbestos drainpipe and concrete drainpipe were encountered on the west side of the lagoon, just beneath the surface of the original grade. Triad Environmental of Martinez, California, was contracted to remove all asbestos encountered at the site. Both pipes were removed and disposed of on 4 October 1997.

Excavation work on the north sewage lagoon began on 11 October 1997. The inside slopes of the outer berms of the north sewage lagoon were excavated first, followed by excavation of two known pesticide “pockets.” After the soil stockpiles placed on the north sewage lagoon floor had been fully characterized and removed, the floor was excavated. The initially planned excavation of the north sewage lagoon was completed on 23 October 1997. Soil excavated from the north lagoon was stockpiled in an area just northeast of this lagoon. The stockpiles contained approximately 100 tons of soil and were covered with plastic sheets to suppress dust. The total quantity of soil excavated from the north sewage lagoon was 3,163 cubic yards.

Most of the confirmation samples taken after the initial excavation were found to have soil concentrations that exceeded the cleanup standards specified in the action memorandum. Additional excavation was performed to remove soil with concentrations exceeding cleanup standards. After the second round of excavation had been completed, 13 of the 139 confirmation samples were found to have COC concentrations in excess of the modified cleanup standards specified in the Site-Wide Comprehensive ROD. Additional soil was excavated from the locations where these 13 samples were collected. The total quantity of soil removed from the sewage and industrial waste lagoons as part of the additional excavations was 1,280 cubic yards.

At the conclusion of the excavation, after fill and grading activities were completed, Radian International collected soil samples for the analysis of lead and selenium to support a re-evaluation of the ecological risk assessment. The confirmation sample results for lead and selenium were below their respective cleanup standards. Following completion of the removal action, all cleanup standards presented in the Site-Wide Comprehensive ROD, as modified by the 2001 ESD, were attained and wastes were disposed at the appropriate designated disposal facilities, based on their characterization results.

The Site-Wide Comprehensive ROD established site-specific requirements for selected wells and contaminants (see Table 7-2) to determine the effectiveness of the selected remedy on water quality. Sampling for these requirements was implemented in the third quarter of 1998 and analytical results are reported in Well Monitoring Program Annual Monitoring Reports.

Land use controls established in the 2001 ESD and modified by the 2004 ESD are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. The results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

7.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year-Review Report.

7.2.1 Protectiveness Statements from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states*: The remedy at SWMU 2/3 is expected to be protective of human health and the environment. The potential for the release of contaminants to groundwater from soil left in place is being evaluated in the annual well water monitoring program for DDJC-Tracy.*

7.2.2 Status of Recommendations from First Five-Year Review

Following are recommendations presented in the First Five-Year Review Report and their status.

Recommendation: *The effectiveness of the remedial action and land use should continue to be assessed in the Annual Monitoring Report and evaluated in the next five-year review. Annual review of land use was not required until the 2004 ESD.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports.

Recommendation: *No modification of the groundwater monitoring program is recommended at this time. Reductions in the frequency of monitoring should be evaluated in future Annual Monitoring Reports if the contaminant concentrations remain below reportable limits as they were in 2004 (historically, contaminants have been reported at LM003AA and LM015AA).*

Status: Reductions and increases in frequency of monitoring are evaluated in Well Monitoring Program Annual Monitoring Reports. Site-Wide Comprehensive ROD monitoring requirements have been met for LM015AA, and sampling was discontinued in 2007 (URS, 2008d). Annual monitoring at LM003AA for dieldrin will continue, as ROD monitoring requirements have not been met.

7.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspection. The SWMUs 2 and 3 site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

No significant issues were identified during the site inspection. Land use has not changed. Representatives of the regulatory agencies noted that land use control warning signs are not installed at SWMUs 2 and 3.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

7.4 Technical Assessment

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

Yes, the remedy for SWMUs 2 and 3 is functioning as intended by the Site-Wide Comprehensive ROD as modified by the 2001 and 2004 ESDs.

Well Monitoring Program Reports for the years 2005 through 2010 were reviewed to evaluate the likelihood of residual contamination impacting groundwater quality. The data are summarized in Table 7-2. Several exceedances of dieldrin occurred at well LM003AA (located on the east side of the lagoons) during the past five years. LM003AA will continue to be sampled yearly for organochlorine (OC) pesticides. ROD monitoring requirements have been met for LM015AA (located on the north side of the lagoons), so this well is no longer recommended for sampling under the Well Monitoring Program. Reductions or increases in the frequency of monitoring will continue to be evaluated in future Well Monitoring Program Annual Monitoring Reports.

Land use controls are in place and effective. The Master Planner for the depot indicated a familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. No issues have been identified during the annual inspections. During the second five-year review site inspection, representatives of the regulatory agencies noted that land use control warning signs are not installed at SWMU 2 or 3.

7.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs are still valid for SWMUs 2 and 3.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for SWMUs 2 and 3.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil (there are, however, chemical-specific ARARs for waste disposal). The Site-Wide Comprehensive ROD identifies several chemical-specific criteria TBC for SWMUs 2 and 3 based on maintaining groundwater quality at or below the RWQCB's Water Quality Goals. Other cleanup standards (lead, selenium, and total DDX) were risk-based standards to protect ecological receptors. Because the cleanup standards were estimated using literature values, additional investigations were conducted to collect site-specific data. The baseline ecological risk assessment was revised and the cleanup standard for total DDX was deleted in the 2001 ESD.

Cleanup standards at this site have been met. However, because residual soil contamination exceeds concentrations that would allow for unlimited use and unrestricted exposure, land use controls are required at this site.

Action-Specific ARARs. The action-specific ARARs for SWMUs 2 and 3 stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to SWMUs 2 and 3; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARAR for SWMUs 2 and SWMU 3 is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site. In addition, land use controls are in place to protect human health and the environment.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. The baseline risk assessment, 2001 ESD, and 2004 ESD characterized potential threats to human health, the environment, and groundwater for a variety of chemicals. Collectively, these documents identify selenium, lead[2], several pesticides (dieldrin, DDD, DDE, DDT, aldrin, chlordane, diuron, endrin, lindane, monuron, dichlorophenoxy acetic acid [2,4-D], heptachlor epoxide), and SVOCs (2,4-dimethylphenol, 4-methylphenol, bis(2-ethylhexyl)phthalate [SWMU 2 only], and di-n-butylphthalate [SWMU 2 only]) as COCs. Table 7-4 indicates that all toxicity values for these compounds are either unchanged or are less stringent at the time of this second five-year review than at the time of the baseline risk assessment. Based on these differences, the risk and hazard estimates are overstated for DDD and dieldrin in the baseline risk assessment relative to current methods.

Table 7-4. Qualitative Comparison of Toxicity Values between the ROD and Present Day, SWMUs 2 and 3, Tracy Site

Analyte	Noncancer Inhalation	Noncancer Oral	Cancer Inhalation	Cancer Oral
2,4-D	No current value	No change	No toxicity values	No toxicity values
2,4-Dimethylphenol	No current value	No change	No toxicity values	No toxicity values
4,4'-DDD	No current value	No current value	No change	No change
4,4'-DDE	No current value	No current value	No change	No change
4,4'-DDT	No current value	No change	No change	No change
4-Methylphenol	Less stringent now	No change	No toxicity values	No toxicity values
Aldrin	No current value	No change	No change	No change
bis(2-Ethylhexyl) phthalate	No current value	No change	Less stringent now	Less stringent now
Chlordane	Less stringent now	Less stringent now	Less stringent now	No change
Dieldrin	No current value	No change	No change	No change
di-n-Butyl Phthalate	No current value	No change	No toxicity values	No toxicity values
Diuron	No current value	No change	No toxicity values	No toxicity values
Endrin	No current value	No change	No toxicity values	No toxicity values
Heptachlor Epoxide	No current value	No change	Less stringent now	Less stringent now
Lindane	No current value	No change	No change	Less stringent now
Monuron	No current value	No current value	No toxicity values	No toxicity values
Selenium	No former value	No change	No toxicity values	No toxicity values

"No current value" means that the ROD quantitatively evaluated this compound, but there is no current agency-published value; hence, the ROD overstates risk and hazard estimates compared to present-day.

"No toxicity values" means no agency-published values are available or the chemical is not classified as a carcinogen.

DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethene
DDT = dichlorodiphenyltrichloroethane
ROD = record of decision
SWMU = solid waste management unit
2,4-D = 2,4-dichlorophenoxyacetic acid

[2] Risk assessment of lead, using present-day methods, is based on characterizing blood-lead levels and is a process distinct and separate from quantitative risk assessment of the other chemicals.

Changes in Risk Assessment Methods. The baseline risk assessment utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes; at the time of this second five-year review, this is a practice no longer supported by the EPA. Consequently, inhalation noncancer hazards for all chemicals are overstated in the baseline risk assessment relative to current methods. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. The remedy is expected to meet the RAOs. Continued monitoring for dieldrin in groundwater is needed to ensure the cleanup is adequate. Potential impacts to groundwater quality from dieldrin will continue to be assessed through the Well Monitoring Program. Land use controls are in place and continue to meet RAOs.

7.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has been identified since the first five-year review that could call into question the protectiveness of the remedy for SWMUs 2 and 3.

7.5 Issues

Minor issues for SWMUs 2 and 3 include:

- During the second five-year review site inspection, representatives of the regulatory agencies noted that land use control warning signs are not installed at SWMUs 2 and 3.
- ROD monitoring requirements have not been met for dieldrin at LM003AA.

7.6 Recommendations

Recommendations intended to address minor issues for SWMUs 2 and 3 include:

- Install land use control warning signs.
- Continue monitoring groundwater at LM003AA for dieldrin until ROD monitoring requirements are met.

  Status: Through the 2011 monitoring period, LM003AA has not yet met the ROD monitoring requirement for dieldrin and will continue to be monitored (HDR, 2012b).

7.7 Protectiveness Statement

The remedy at SWMUs 2 and 3 is protective of human health and environment because land use controls are in place and are effective.

7.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

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Photo 1. SWMUs 2 and 3, Tracy Site

Photo 2. SWMUs 2 and 3, Tracy Site

8.0 SWMU 4 – STORMWATER DETENTION POND

8.1 Remedial Action

8.1.1 Remedy Selection

SWMU 4 is an unlined stormwater detention pond in the northwestern portion of the depot (Plate 1). Stormwater has been discharged to the detention pond since 1971 through a network of underground storm drains and open surface drainage ditches. The detention pond is bounded by earthen berms approximately 6 feet high and approximately 6 feet below grade. The stormwater detention pond receives runoff through inlets in the southern and northeastern portions of the pond. The pond reportedly received rinse water from former paint stripping, degreasing, and steam-cleaning operations. Selenium, lead, DDT, DDE, and DDD were found in pond sediment and were identified as COCs in the Site-Wide Comprehensive ROD. The site was identified as potential habitat for wildlife in the baseline ecological risk assessment (Montgomery Watson, 1996b).

Some of the water in the pond can be discharged to the West Side Irrigation Ditch during the wet season if the pond is more than half full. During the summer, the water in the pond percolates or evaporates, and the pond usually dries up completely. The pond sediment was last scraped in 2008.

The RAOs described in the Site-Wide Comprehensive ROD for SWMU 4 are:

- Prevent the release of COCs (DDT and dieldrin) from sediments that would cause surface water concentrations to exceed Federal freshwater chronic ambient water quality criteria (AWQC) for the protection of aquatic life.
- Prevent ecological receptors from being exposed to COCs (DDT, lead, and PCBs) in surface water above aquatic standards.
- Prevent ecological receptors from being exposed to COCs in sediment.

The Site-Wide Comprehensive ROD identifies the remedy at SWMU 4 as including limited excavation and disposal, construction of an overflow weir and sediment trap, and evaluation of stormwater discharge. However, the Site-Wide Comprehensive ROD also identifies uncertainties (data gaps) in the ecological risk assessment. Subsequent investigations to address those data gaps resulted in the development of a revised baseline risk assessment (URS, 2001b), and the remedy was modified in the Site-Wide Comprehensive ROD Amendment. The ROD amendment eliminated the cleanup standards for SWMU 4 and deleted excavation from the remedy. The remedy was again modified in the 2001 and 2004 ESDs with the addition of land use controls and the RAO of prohibiting residential, day care, play area, or school use. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

The remedy for SWMU 4 includes the following elements:

- Continued groundwater monitoring.
- Land use controls.
- Installation of an overflow weir to prevent potentially contaminated sediment from being discharged from the pond.
- Installation of a sediment trap. (Note: the overflow weir was designed to enable the pond to function as a sediment trap.)

- Stormwater monitoring to ensure the overflow weir and sediment trap are effective.

The Site-Wide Comprehensive ROD requires groundwater monitoring for SVOCs, pesticides, and herbicides as part of the Well Monitoring Program to evaluate the effectiveness of the selected remedy. Table 8-1 provides a comparison of monitoring results from ROD-specified wells to the groundwater concentrations requiring evaluation identified in the Site-Wide Comprehensive ROD.

Table 8-1. Comparison of Groundwater Monitoring Results to ROD Concentrations Requiring Evaluation at SWMU 4 (LM004AU and LM027AUA), Tracy Site

Analyte	Groundwater Concentration Requiring Evaluation (µg/L)	Most Recent Exceedance of Concentration Requiring Evaluation 2005–2010 (µg/L)
bis(2-Ethylhexyl)phthalate	10	None
Carbaryl	60	None
Carbofuran	18	None
Chlordane	0.1	None
2,4-D	70	None
Dieldrin	0.05	None
Fluoranthene	280	None
Phenanthrene	10	None
Pyrene	210	None

µg/L = micrograms per liter
2,4-D = dichlorophenoxy acetic acid

The risk to human health was considered acceptable under the depot worker and construction worker scenarios. Paragraphs 9.7.1.9 and 9.7.1.10 of the Site-Wide Comprehensive ROD indicate that cleanup standards to protect groundwater quality were not necessary for SWMU 4.

The Site-Wide Comprehensive ROD established stormwater discharge standards to evaluate whether contaminants are being discharged from the pond. The standards are 0.1 µg/L for DDT and 0.05 µg/L for dieldrin.

8.1.2 Remedy Implementation

Table 8-2 summarizes the remedy status for SWMU 4.

Table 8-2. SWMU 4 Remedy Status, Tracy Site

Remedy Component	Status
Wet Season Controls[a]	Response complete.
ROD Groundwater Monitoring Requirements	Remedial action in operation.
Land Use Controls • Implement notification procedure for land use changes in the RPMPD. • Maintain administrative controls (i.e., RPMPD appendix and notification procedures). • Perform annual review to ensure compliance with controls and to correct any deficiencies in the notification procedure. • Follow defined procedures in the event of a change in land use. • Sample and properly dispose of soil generated from any future excavation activities.	Remedial action in place.

Table 8-2. (Continued)

[a] Installation of overflow weir.

RPMPD = real property master plan digest
SWMU = solid waste management unit

Construction of the overflow weir to prevent the discharge of potentially contaminated sediment from SWMU 4 is documented in the *Project Closeout Plan (Remedial Action Report): SWMU 6 and SWMU 20 Small Excavation Sites and SWMU 4 Wet Season Controls* (Shaw Environmental, 2004a). Remedial construction activities were performed from 28 June to 10 August 1999. Remedial activities included the following.

- Pumping water remaining in the drainage lagoon into the sewage lagoons in preparation for construction.
- Clearing and grubbing adjacent to the existing inlet structure. Approximately 9 cubic yards of soil were excavated during clearing activities and deposited into a single roll-off bin for off-site disposal.
- Retrofitting the existing concrete structure to raise the intake for the discharge pumps by approximately 2.5 feet to reduce the likelihood of contaminated sediment being discharged from the bottom of the pond.
- Placing riprap material around the overflow weir to reduce erosion.

Approximately 14 tons of soil removed during the modifications to the outlet structure were disposed of at the Allied Waste Companies Forward Landfill in Manteca, California.

The Site-Wide Comprehensive ROD established site-specific requirements for selected wells and contaminants (see Table 8-2) to determine the effectiveness of the selected remedy on water quality. Sampling for these requirements was implemented in the third quarter of 1998 and analytical results are reported in Well Monitoring Program Annual Monitoring Reports.

Land use controls established in the 2001 ESD and modified by the 2004 ESD are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. The results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

8.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

8.2.1 Protectiveness Statements from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at SWMU 4 is expected to be protective of human health and the environment. The potential for the release of potentially contaminated sediment is being evaluated in the storm water monitoring program for DDJC-Tracy.*

8.2.2 Status of Recommendations from First Five-Year Review

Following are the recommendations presented in the First Five-Year Review Report and their status.

Recommendation: *Sampling for the contaminants identified in the ROD for the evaluation of groundwater impacts should be deferred until the next five-year evaluation. It is recommended that two quarters of data be obtained in 2009 to support the next five-year review*.

Status: Groundwater samples were collected from LM004AU and LM027AUA and analyzed for the SWMU 4 contaminants identified in the Site-Wide Comprehensive ROD during first and third quarters of 2009. The contaminants were not detected in samples from either quarter.

Recommendation: *A supplemental review of the effectiveness of this erosion control measure was performed on 18 August 2005. The rip-rap was in good condition at the time of the inspection.*

Status: No additional action was recommended. The rip-rap is inspected annually.

Recommendation: *Self-monitoring of land use performance will be included in the annual report. Annual review of land use was not required until the 2004 ESD.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports.

8.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB, and HDR | e^2M participated in the inspection. The SWMU 4 site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

No significant issues were identified during the site inspection. Land use has not changed. The weir was in good condition and did not have any accumulation of sediment. Some trash was piled next to the weir. Representatives of the regulatory agencies noted that land use control warning signs are not installed at SWMU 4.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

8.4 Technical Assessment

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

Yes, the remedy for SWMU 4 is functioning as intended by the Site-Wide Comprehensive ROD as modified by the Site-Wide Comprehensive ROD Amendment and 2001 and 2004 ESDs.

Well Monitoring Program Reports for the years 2005 through 2010 were reviewed to evaluate the likelihood of residual contamination impacting groundwater quality. The data are summarized in Table 8-2. No exceedances of groundwater concentrations requiring evaluation occurred and all sample results in the past five years were less than detection limits at LM004AU and LM027AUA. To date, for

the contaminants identified in the Site-Wide Comprehensive ROD as potential threats to groundwater quality, there has been no evidence of migration to the underlying groundwater.

The weir and sediment trap were installed and groundwater and stormwater monitoring is being conducted.

DLA Installation Support at San Joaquin samples the discharge from the stormwater detention pond as part of its stormwater pollution prevention program, to comply with the requirements of California's General Permit for Industrial Activities to discharge stormwater. Monitoring results for 2006 through 2010 are provided in Table 8-3. All stormwater sample results for DDT and dieldrin were less than detection limits. Detection limits for the method used by the laboratory that analyzed the samples, however, were greater than stormwater discharge standards. The detection limit for DDT ranged from 0.5 to 2.5 µg/L and for dieldrin ranged from 0.1 to 0.5 µg/L. Analytical method detection limits meeting the DDT and dieldrin stormwater discharge standards could be achieved using EPA Method 8081A for DDT and dieldrin.

Table 8-3. SWMU 4 Discharge Analytical Results, Tracy Site

Analyte	4/3/2006	10/12/2007	1/4/2008	11/05/2008	10/13/2009	1/19/2010
Pesticides and PCBs	ND	ND	ND	ND	ND	ND

ND = not detected
PCB = polychlorinated biphenyls

Land use controls are in place and effective. The Master Planner for the depot indicated a familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. No issues have been identified during the annual inspections. During the second five-year review site inspection, some standing water was observed near the center of the pond, and representatives of the regulatory agencies noted that land use control warning signs are not installed at the site.

8.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs are still valid at SWMU 4.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for SWMU 4.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil, and no cleanup standards were established for SWMU 4.

The Federal freshwater chronic AWQC for protection of aquatic life are chemical-specific TBCs for surface water at SWMU 4. For SWMU 4, concentrations of DDT and dieldrin in samples collected from the discharge during this five-year period were either less than the stormwater discharge standards specified in the Site-Wide Comprehensive ROD (0.1 µg/L for DDT and 0.05 µg/L for dieldrin) or not detected; however, the detection limits for the method used to analyze samples for DDT and dieldrin were greater than the discharge standards.

Action-Specific ARARs. The action-specific ARARs for SWMU 4 stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid. Portions of Title 22 CCR Section 67391.1 (State land use covenant)

also apply to SWMU 4; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARARs include the California Fish and Game Code and the Endangered Species Act. However, no deleterious substances are being discharged to SWMU 4, and no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site. In addition, land use controls are in place to protect human health and the environment.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. Changes in toxicity or other contaminant characteristics were not reviewed because groundwater sample results for all COCs were less than detection limits. However, the Site-Wide Comprehensive ROD only addresses commercial/industrial land uses. If a land use change to a more sensitive land use were proposed for SWMU 4, then a quantitative risk assessment relying on then-current chemical data would become necessary.

Changes in Risk Assessment Methods. Changes in risk assessment methods were not reviewed because groundwater sample results for all COCs were less than detection limits. However, the Site-Wide Comprehensive ROD Amendment only addresses commercial/industrial land uses. If a land use change to a more sensitive land use is proposed for SWMU 4, then a quantitative risk assessment would become necessary, and would rely on then-current risk assessment methods.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. The remedy currently meets the RAOs based on installation of the overflow weir, groundwater sample results being less than detection limits in the past five years, and DDT and dieldrin not being detected in stormwater samples. However, further stormwater monitoring is needed to ensure the weir continues to be effective. Land use controls are in place and continue to meet RAOs.

8.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light that could call into question the protectiveness of the remedy.

8.5 Issues

Minor issues for SWMU 4 include:

- During the second five-year review site inspection, representatives of the regulatory agencies noted that land use control warning signs are not installed at the site.
- The detection limits for the method used by the laboratory to analyze stormwater samples for DDT and dieldrin are greater than the stormwater discharge standards required by the Site-Wide Comprehensive ROD.
- ROD monitoring requirements have not been met for 2,4-D at LM027AUA.

8.6 Recommendations

Recommendations intended to address minor issues for SWMU 4 include:

- Install land use control warning signs.
- Use EPA Method 8081A to achieve lower detection limits for discharge samples, because currently used detection limits are greater than stormwater discharge standards.

  Status: Detection limits for DDT and dieldrin were lowered starting in 2012 without changing the analytical method (EPA Method 608) being used.

- Continue monitoring groundwater at LM027AUA for 2,4-D until ROD monitoring requirements are met.

  Status: LM027AUA met the ROD monitoring requirement for 2,4-D in 2011, and sampling will be discontinued at this well starting in 2012 (HDR, 2012b).

8.7 Protectiveness Statement

The remedy at SWMU 4 is protective of human health and the environment because land use controls are in place and are effective.

8.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

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Photo 1. SWMU 4, Tracy Site

Photo 2. SWMU 4, Tracy Site

Photo 3. SWMU 4, Overflow Weir, Tracy Site

9.0 SWMU 6 – BUILDING 28 SUMP

9.1 Remedial Action

9.1.1 Remedy Selection

SWMU 6 consisted of a 250-gallon concrete sump on the western side of Building 28 (Plate 1); this building was used to repackage materials from damaged containers. Wastes from this recoup operation were collected in the concrete sump, pumped into 55-gallon drums, and then removed to a Class I or other disposal site. The sump was removed in 1977. RI soil sample results indicated that pesticide and herbicide contamination in the soil was limited to the area immediately adjacent to the sump excavation and from depths below the sump excavation to directly above the water table. The baseline risk assessment results showed potential human health risks less than 1×10^{-6} (current depot worker scenario) and no ecological risks at SWMU 6. Vadose zone migration modeling results indicated that pesticides (dicamba, dieldrin, endrin, heptachlor, trichlorophenoxy acetic acid [2,4,5-T], and lindane) could introduce constituents to the groundwater at concentrations greater than those detected in background conditions.

The selected remedy in the Site-Wide Comprehensive ROD includes excavating approximately 100 cubic yards of soil contaminated with pesticides from SWMU 6. The ROD estimated that approximately 60 cubic yards of soil would be transported to a Class I or Class II off-site disposal facility, depending on the level of contamination. Clean soil imported from off site was to be used to backfill the excavated areas. The 2004 ESD added land use controls to the selected remedy for SWMU 6 to address the risk from residual contamination under the construction and residential-use scenarios. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

The RAOs for SWMU 6 are:

- Prevent the migration of pesticides (dicamba, dieldrin, endrin, heptachlor, lindane, and 2,4,5-T) in soil that could cause groundwater contamination.
- Prevent unprotected exposure of construction workers to contaminated soil.
- Prohibit residential, day care, play area, or school use.

Cleanup standards for SWMU 6 were developed using results of vadose zone migration modeling (Montgomery Watson, 1996b), which indicated contaminant concentrations in soil that pose potential threats to background groundwater quality at this site. The cleanup standards were developed to protect background groundwater quality to levels consistent with the RWQCB's Water Quality Goals. The cleanup standards are provided in Table 9-1.

Table 9-1. Cleanup Standards for SWMU 6, Tracy Site

Analyte	(µg/kg)
Dicamba	10
Dieldrin	3
Endrin	3
Heptachlor	1.5
Lindane	5[a]
2,4,5-T	13[a]

[a] Cleanup standard as modified by 2004 ESD (URS, 2004a).

ESD = explanation of significant difference
SWMU = solid waste management unit
µg/kg = micrograms per kilogram
2,4,5-T = trichlorophenoxy acetic acid

The Site-Wide Comprehensive ROD also requires groundwater monitoring for SVOCs, pesticides, and herbicides as part of the Well Monitoring Program to evaluate the effectiveness of the selected remedy. Table 9-2 provides a comparison of monitoring results from ROD-specified wells to groundwater concentrations requiring evaluation identified in the Site-Wide Comprehensive ROD.

Table 9-2. Comparison of Groundwater Monitoring Results to ROD Concentrations Requiring Evaluation at SWMU 6 (LM017AA), Tracy Site

Analyte	Groundwater Concentration Requiring Evaluation (µg/L)	Most Recent Exceedance of Concentration Requiring Evaluation 2005–2010 (µg/L)
Dieldrin	0.05	None
Dicamba	210	None
Endrin	2	None
Heptachlor	0.01	None
Lindane	0.03	None
2,4,5-T	70	None

ROD = record of decision
SVOC = semivolatile organic compound
µg/L = micrograms per liter
2,4,5-T = trichlorophenoxy acetic acid

9.1.2 Remedy Implementation

Table 9-3 summarizes the remedy status for SWMU 6.

Table 9-3. SWMU 6 Remedy Status, Tracy Site

Remedy Component	Status
Excavation	Response complete.
ROD Groundwater Monitoring Requirements	Remedial action in operation.
Land Use Controls • Implement notification procedure for construction activities or land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures) • Perform annual review to ensure compliance with controls and to correct any deficiencies in the notification procedure • Follow defined procedures in the event of a change in land use • Sample and properly dispose of soil generated from any future excavation	Remedial action in place.

ROD = record of decision
RPMPD = real property master plan digest
SWMU = solid waste management unit

Excavation activities at SWMU 6 began on 22 June 1999 within the proposed excavation footprint (10 feet by 15 feet). The bottom of the initial excavation was 18 feet bgs, as required by the Site-Wide

Comprehensive ROD. Following completion of this excavation, six initial soil samples were collected, including one from each of the four excavation sidewalls and two from the excavation bottom (Shaw Environmental, 2004a).

Analytical results for three of the initial confirmation samples showed concentrations of COCs exceeding ROD-specified cleanup standards. Based on these initial sampling results, additional contaminated soil was removed from the northern bottom and southern sidewall of the excavation. Additional excavation was not conducted for the western sidewall at location DP0038 because an in-service, 48-inch storm drain line is adjacent to the excavation. All excavation and confirmation soil sampling activities were completed on 15 July 1999. The final excavation depth was approximately 19 feet bgs. Backfilling of the excavation and waste off-hauling were completed on 9 September 1999, and the surface was restored to its pre-construction condition, including asphalt paving. Approximately 245 cubic yards of soil (more than double the volume anticipated in the ROD) were excavated, transported, and disposed of off site at a Class II disposal facility (Shaw Environmental, 2004a).

Analytical results for the final round of confirmation sampling (step-out sampling) showed that residual contamination remains in the eastern and western sidewalls of the southern portion of the over-excavation at sample locations DP0093 and DP0094. No additional excavation could be conducted because of the proximity to Building 28 to the east and the 48-inch storm drain line to the west (Shaw Environmental, 2004a).

Cleanup standards for lindane and 2,4,5-T as modified in the 2004 ESD were met; however, dieldrin concentrations (the maximum residual concentration is 160 micrograms per liter [μg/kg]) remaining in the vicinity of the storm drain line and under Building 28 may pose a risk to construction workers or future residents. The 2004 ESD added land use controls to address this risk. The land use controls are provided in Table 9-3.

The Site-Wide Comprehensive ROD established site-specific requirements for selected wells and contaminants (see Table 9-2) to determine the effectiveness of the selected remedy on water quality. Sampling for these requirements was implemented in the third quarter of 1998 and analytical results are reported in Well Monitoring Program Annual Monitoring Reports.

Land use controls established in the 2001 ESD and modified by the 2004 ESD are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. The results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

9.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

9.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at SWMU 6 (including the identified land use controls) is protective of human health and the environment.*

9.2.2 Status of Recommendations from First Five-Year Review

Following are recommendations presented in the First Five-Year Review Report and their status.

Recommendation: *Sampling for contaminants identified in the ROD for the evaluation of groundwater impacts should be continued at the current frequency to identify any contamination that may have been released as a result of the recent excavation. Annual sampling and analysis using SW8151 should be performed as well. No VOCs have been reported to date, and it is recommended that sampling for VOCs be deleted.*

Status: During the period of this five-year review, sampling for pesticides at LM017AA was conducted yearly through 2007. Sampling and analysis using Method SW8151 (herbicides) was conducted in the first and third quarters of 2009. Sample results for all COCs were less than detection limits. Sampling and analysis for VOCs has continued at LM017AA because PCE was detected at concentrations greater than the ACL. ROD monitoring requirements have been met for pesticides and herbicides at SWMU 6.

Recommendation: *Self-monitoring of land use performance will be included in the annual report. Annual review of land use was not required until the 2004 ESD.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports.

9.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB, and HDR | e^2M participated in the inspection. The SWMU 6 site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

No significant issues were identified during the site inspection. Land use has not changed. Representatives from the regulatory agencies noted that land use control signs are not installed at SWMU 6.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

9.4 Technical Assessment

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

Yes, the remedy for SWMU 6 is functioning as intended by the Site-Wide Comprehensive ROD as modified by the 2004 ESD.

Well Monitoring Program Reports for the years 2005 through 2010 were reviewed to evaluate the likelihood of residual contamination impacting groundwater quality. The data are summarized in Table 9-2. Sample results for all COCs were less than detection limits. The ROD monitoring requirements for SWMU 6 have been met.

Land use controls are in place and effective. The Master Planner for the depot indicated a familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. No issues have been identified during the annual inspections. During the second five-year review site inspection,

representatives of the regulatory agencies noted that land use control warning signs are not installed at the site.

9.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs are still valid for SWMU 6.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for SWMU 6.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil (there are, however, chemical-specific ARARs for waste disposal). The Site-Wide Comprehensive ROD identifies chemical-specific criteria TBC based on maintaining groundwater quality at or below the RWQCB's Water Quality Goals. Cleanup standards modified in the 2004 ESD for lindane and 2,4,5-T are also based on protection of groundwater quality.

With the exception of dieldrin, cleanup standards at SWMU 6 were met. The maximum residual dieldrin concentration in soil following excavation was 160 µg/kg, which exceeded the EPA preliminary remediation goal (PRG) (now termed RSL) for industrial use of 110 µg/kg. Therefore, land use controls were added to the SWMU 6 remedy to protect construction workers and prohibit residential-type (e.g., day care, houses) uses (URS, 2004a).

Action-Specific ARARs. The action-specific ARARs for SWMU 6 stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to SWMU 6; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARAR for SWMU 6 is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site. In addition, land use controls are in place to protect human health and the environment.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. Changes in toxicity or other contaminant characteristics were not reviewed because groundwater sample results for all COCs were less than detection limits. However, the Site-Wide Comprehensive ROD as modified by the 2004 ESD identifies several pesticides and other compounds as COCs at residual concentrations that preclude unrestricted land use at this site and necessitate a limitation to commercial/industrial land uses. If a land use change to a more sensitive land use is proposed for SWMU 6, then a quantitative risk assessment relying on then-current chemical data would become necessary.

Changes in Risk Assessment Methods. Changes in risk assessment methods were not reviewed because groundwater sample results for all COCs were less than detection limits. However, the Site-Wide Comprehensive ROD as modified by the 2004 ESD identifies several pesticides and other compounds as COCs at residual concentrations that preclude unrestricted land use at this site and necessitate a limitation to commercial/industrial land uses. If a land use change to a more sensitive land use is proposed for

SWMU 6, then a quantitative risk assessment would become necessary and would rely on then-current risk assessment methods.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. The remedy meets the RAOs because sample results for contaminant concentrations in the groundwater have been less than detection limits. Land use controls are in place and continue to meet RAOs.

9.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light that could call into question the protectiveness of the remedy at SWMU 6.

9.5 Issues

Minor issues for SWMU 6 include:

- During the second five-year review site inspection, representatives of the regulatory agencies noted that land use control warning signs are not installed at the site.
- ROD monitoring requirements have not been met for PCE at LM017AA.

9.6 Recommendations

Recommendations intended to address minor issues for SWMU 6 include:

- Install land use control warning signs.
- Continue monitoring groundwater at LM017AA for PCE until ROD monitoring requirements are met.

  Status: LM017AA met the ROD monitoring requirement for PCE in 2010, and sampling was discontinued at this well in 2011 (HDR, 2011a).

9.7 Protectiveness Statement

The remedy at SWMU 6 is protective of human health and the environment because land use controls are in place and are effective.

9.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

Photo 1. SWMU 6, Tracy Site

Photo 2. SWMU 6, Tracy Site

10.0 SWMU 7 – BURN PIT NO. 1

10.1 Remedial Action

10.1.1 Remedy Selection

SWMU 7 consists of seven reported pits that were operated before the construction of Buildings 15, 19, and 21 (Plate 1). The pits were used for the disposal of medical supplies, narcotics, general pharmaceuticals, radiological supplies, and electron tubes. The pits may have been as deep as 16 feet; ashes were removed and transported to off-site landfills during the later years of operation (Woodward-Clyde Consultants, 1992).

Baseline risk assessment results indicated no potential risks to human or ecological receptors. Vadose zone modeling results indicate that total petroleum hydrocarbons–diesel range (TPHD) in Pit D, VOCs in Pit F, SVOCs in Pit C, and pesticides and herbicides (2,4-D, linuron, dieldrin, and simazine) detected in SWMU 7 soils may pose a threat to background groundwater quality.

The remedy selected in the Site-Wide Comprehensive ROD and modified by the 2001 and 2004 ESDs for SWMU 7 is the implementation of land use controls at the site. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

The pits are currently covered by buildings, and groundwater contamination is not present beneath the site. By covering portions of the former pits, the building foundations mitigate groundwater threats by reducing rainwater infiltration.

The RAOs for SWMU 7 are:

- Maintain existing cover to minimize infiltration of runoff that could encourage the following COCs to migrate from the vadose zone:
  - Pesticides and herbicides (2,4-D, linuron, dieldrin, and simazine)
  - SVOC (bis[2-ethylhexyl]phthalate)
  - VOCs (1,2-DCE and TCE)
  - TPHD
- Prohibit residential, day care, play area, or school use.
- Prevent unprotected exposure of construction workers to contaminated soil.

Cleanup standards for SWMU 7 were developed using results from vadose zone migration modeling (Montgomery Watson, 1996b), which indicated contaminant concentrations in soil that posed potential threats to background groundwater quality at this site. The cleanup standards were developed to protect background groundwater quality to levels consistent with the RWQCB's Water Quality Goals and Tri-Regional Board Guidelines. The cleanup standards are provided in Table 10-1.

Table 10-1. Cleanup Standards for SWMU 7, Tracy Site

Analyte	(µg/kg)
1,2-Dichloroethene (Pit F)	10
Trichloroethene (Pit F)	5
bis(2-Ethylhexyl)phthalate (Pit C)	330
2,4-D	25
Dieldrin (Pit C and D)	3

Table 10-1. (Continued)

Analyte	(μg/kg)
Linuron (Pit C and D)	200
Simazine (Pit D)	10
TPHD (Pit D)	100,000

SWMU = solid waste management unit
TPHD = total petroleum hydrocarbons as diesel
μg/kg = micrograms per kilogram
2,4-D = dichlorophenoxy acetic acid

The Site-Wide Comprehensive ROD also requires installation of two new wells (LM166AU and LM167AU) as part of the selected remedy: one well to monitor SVOCs and both wells to monitor organophosphorus (OP) pesticides, OC pesticides, chlorinated herbicides, dioxins/furans (only for one year), and carbamate/urea pesticides. Sampling of LM095AU also was continued as part of the selected remedy. Groundwater monitoring for SVOCs, pesticides, and herbicides is performed as part of the Well Monitoring Program to evaluate the effectiveness of the selected remedy. Table 10-2 provides a comparison of monitoring results from ROD-specified wells to groundwater concentrations requiring evaluation identified in the Site-Wide Comprehensive ROD.

Table 10-2. Comparison of Groundwater Monitoring Results to ROD Concentrations Requiring Evaluation at SWMU 7 (LM095AU, LM166AU[a], and LM167AU), Tracy Site

Analyte	Groundwater Concentration Requiring Evaluation (μg/L)	Most Recent Exceedance of Concentration Requiring Evaluation 2005–2010 (μg/L)
1,2-Dichloroethene (Pit F)	6	None
Trichloroethene (Pit F)	2.3	None
Bis(2-ethylhexyl)phthalate (Pit C)	10	None
Linuron	2	None
2,4-D	70	None
Simazine	4	None
Dieldrin (Pit C and D)	0.05	None
TPHD	100	None
Total dioxins/furans	0.01	None

[a] LM166AU was decommissioned in 2006.
TPHD = total petroleum hydrocarbons as diesel
μg/L = micrograms per liter
2,4-D = dichlorophenoxy acetic acid

10.1.2 Remedy Implementation

Table 10-3 summarizes the remedy status for SWMU 7.

Table 10-3. SWMU 7 Remedy Status, Tracy Site

Remedy Component	Status
ROD Groundwater Monitoring Requirements	Response complete.
Land Use Controls • Implement notification procedure for construction activities or land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures), existing structures, and pavement • Perform annual site inspection and review to ensure compliance with controls and to correct any deficiencies in the existing cover or notification procedure • Follow defined procedures in the event of a change in land use • Install warning signs • Ensure controls are restored following construction activities • Sample and properly dispose of soil generated from any future excavation activities	Remedial action in place.

ROD = record of decision
RPMPD = real property master plan digest
SWMU = solid waste management unit

The two additional monitoring wells (LM166AU and LM167AU) required by the Site-Wide Comprehensive ROD were installed in February 1998, as documented in the *Remedial Action Report for Institutional Controls at SWMU 7, SWMU 33, Building 30 Drum Storage Area, and Northern Depot Soils Area at DDJC-Tracy* (Radian International, 2000a). Six warning signs were posted at Buildings 15, 19, and 21. The *Addendum to Future Development Report* (Radian International, 1998b) initially documented land use controls for the site. Land use controls were further modified in the 2001 and 2004 ESDs. In addition, the 2004 ESD contains an appendix to be included in the RPMPD that documents the land use controls.

The Site-Wide Comprehensive ROD established site-specific requirements for selected wells and contaminants (see Table 10-2) to determine the effectiveness of the selected remedy on water quality. Sampling for these requirements was implemented in the third quarter of 1998 and analytical results are reported in Well Monitoring Program Annual Monitoring Reports.

Land use controls established in the 2001 ESD and modified by the 2004 ESD are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. Results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

10.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

10.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at SWMU 7 (including the identified land use controls) is protective of human health and the environment.*

10.2.2 Status of Recommendations from First Five-Year Review

Following are the recommendations presented in the First Five-Year Review Report and their status.

Recommendation: *Missing or damaged signs should be replaced/repaired as appropriate. It is further recommended that security bolts be used to mount the signs to prevent their removal in the future.*

Status: In 2007, the warning signs were replaced with sturdier materials and higher quality graphics to withstand outdoor conditions. These new signs also provided additional information including contact information and site maps. The remedy for SWMU 7 was found to be fully implemented during the December 2007 annual inspection for compliance with the land use controls established in the Site-Wide Comprehensive ROD and modified for this site in the 2001 and 2004 ESDs (URS, 2008d). However, one sign had been vandalized and a recommendation for its replacement was included in the *Well Monitoring Program 2007 Annual Monitoring Report* (URS, 2008d). The vandalized sign was replaced in 2007. The *Well Monitoring Program 2008 Annual Monitoring Report* (URS, 2009e) and *Well Monitoring Program 2009 Annual Monitoring Report* (HDR | e^2M, 2010a) indicate all signs were in good condition.

Recommendation: *Sampling for the contaminants identified in the ROD for the evaluation of groundwater impacts should be deferred until the next five-year evaluation. It is recommended that two quarters of data be obtained in 2009 to support the next five-year review.*

Status: Two quarters of sampling in 2009 for SVOCs, pesticides, dioxins/furans, herbicides, VOCs, and TPHD were completed at LM095AU and LM167AU, as recommended in the First Five-Year Review Report. Results indicated that all monitoring requirements have been met for those two wells except for bis(2-ethylhexyl)phthalate at LM167AU. This contaminant was detected above the concentration requiring evaluation in the first quarter of 2009 duplicate sample; it was not, however, detected in the normal sample. The detection has been attributed to laboratory contamination.

Samples could not be collected from LM166AU because the well was decommissioned in 2006 due to construction activities in the area. ROD monitoring requirements had not been met at LM166AU for bis(2-ethylhexyl)phthalate because concentrations of this COC were exceeded within the three years prior to the well's destruction in 2006. However, since bis(2-ethylhexyl)phthalate concentrations detected in samples from LM166AU could reasonably be attributed to typical laboratory contamination and had only been detected in 4 of 20 samples collected from that well, the ROD monitoring requirements are considered met for LM166AU.

Recommendation: *Self-monitoring of land use status will be included in the annual report. Annual review of land use was not required until the 2004 ESD.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports.

10.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB, and HDR | e^2M participated in the inspection. The SWMU 7 site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

No significant issues were identified during the site inspection. Land use has not changed.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

10.4 Technical Assessment

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

Yes, the remedy for SWMU 7 is functioning as intended by the Site-Wide Comprehensive ROD as modified by the 2001 and 2004 ESDs.

Well Monitoring Program Reports for the years 2005 through 2010 were reviewed to evaluate the likelihood of residual contamination impacting groundwater quality. The data are summarized in Table 10-2. No COCs were detected exceeding the concentrations requiring evaluation during the review period. All ROD monitoring requirements for SWMU 7 have been met.

Land use controls are in place and effective. The Master Planner for the depot indicated his familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. Issues with the land use control warning signs that were identified during the period of the second five-year review have been addressed (see Section 10.2.2). No issues were identified during the second five-year review site inspection.

10.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs are still valid for SWMU 7.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for SWMU 7.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil (there are, however, chemical-specific ARARs for waste disposal). The Site-Wide Comprehensive ROD identifies chemical-specific criteria TBC based on maintaining groundwater quality at or below the RWQCB's Water Quality Goals. The allowable levels of TPH in soil are based on Tri-Regional Board Guidelines. These guidelines do not constitute final cleanup goals, but rather target levels that should prevent existing TPH soil contamination from becoming a source of petroleum hydrocarbons to groundwater. Cleanup standards have not been met at SWMU 7, and residual soil contamination exceeds concentrations that would allow for unlimited use and unrestricted exposure. Therefore, land use controls are required at this site to protect groundwater quality and human health.

Action-Specific ARARs. The action-specific ARARs for SWMU 7 stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to SWMU 7; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARAR for SWMU 7 is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site. In addition, land use controls are in place to protect human health and the environment.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. The baseline risk assessment characterized the cancer risks and noncancer health hazards of a variety of chemicals via ingestion, inhalation, and dermal contact. The baseline risk assessment concluded that there were no chemicals of concern for protection of human health or the environment, only for groundwater at SWMU 7. However, land use controls have been implemented to protect human health, the environment, and groundwater. If a change to a more sensitive land use were proposed for SWMU 7, then a quantitative risk assessment relying on then-current chemical data would be necessary.

Changes in Risk Assessment Methods. The baseline risk assessment utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes; at the time of this second five-year review, this is a practice no longer supported by the EPA. Consequently, inhalation noncancer hazards for DDD and dieldrin, and other chemicals, are overstated in the baseline risk assessment relative to current methods. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value. If a land use change is proposed for SWMU 7, then a quantitative risk assessment would become necessary and would rely on then-current risk assessment methods.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. Land use controls are in place and continue to meet RAOs.

10.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light since the first five-year review that could call into question the protectiveness of the remedy for SWMU 7.

10.5 Issues

No issues are identified for SWMU 7.

10.6 Recommendations

No recommendations are identified for SWMU 7.

10.7 Protectiveness Statement

The remedy at SWMU 7 is protective of human health and the environment because land use controls are in place and are effective.

10.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

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Photo 1. SWMU 7 North Area (Building 15), Tracy Site

Photo 2. SWMU 7 North Area (Building 15), Tracy Site

Photo 3. SWMU 7 South Area (Building 19), Tracy Site

Photo 4. SWMU 7 South Area (Building 21), Tracy Site

Photo 5. SWMU 7 South Area (Building 19), Tracy Site

11.0 SWMU 8 – BURN PIT NO. 2

11.1 Remedial Action

11.1.1 Remedy Selection

SWMU 8 is a former burn pit located in the eastern portion of the depot. The pit was approximately 16 feet deep, 250 feet long, and 30 feet wide (Plate 1). Phthalates, PAHs, pesticides, petroleum hydrocarbons, dioxin/furans, and metals were released to the soil from disposal activities associated with SWMU 8. In general, the elevated concentrations of these constituents were limited to the middle fill horizon (starting at approximately 4 feet bgs) and the lower fill horizon (down to groundwater) of the central and northern portions of the pit.

The baseline risk assessment indicated that OC pesticides detected in soil at SWMU 8 during the RI posed excess cancer risk greater than 1×10^{-6} and a hazard index greater than 1 for future construction workers (Montgomery Watson, 1996b). Vadose zone migration modeling results prior to remediation at SWMU 8 indicated that SVOCs, pesticides/herbicides, and petroleum hydrocarbons detected in deep soils could migrate to groundwater and potentially threaten background groundwater quality.

SWMU 8 was considered a potential source area of dieldrin contamination in groundwater, although this assumption was based on modeling and was unproven in groundwater data.

The remedy selected in the Site-Wide Comprehensive ROD and modified by the 2004 ESD for SWMU 8 is excavation and disposal. The RAOs for SWMU 8 are:

- Prevent future construction workers from being exposed to the following COCs in the soil that would cause an excess cancer risk greater than 1×10^{-6} or a hazard index greater than 1.0:
  - Pesticides (total DDX and dieldrin)
- Prevent migration of the following COCs in the soil that could cause groundwater contamination:
  - SVOCs (diethylphthalate, bis[2-ethylhexyl]phthalate, 2,4-dinitrotoluene, and naphthalene)
  - Pesticides and herbicides (chlordane, 2,4-D, DDT, DDD, dieldrin, lindane, linuron, 2-(4-chloro-2-methylphenoxy) acetic acid [MCPA], and simazine)
  - Petroleum hydrocarbons (diesel, motor oil, and gasoline)

Cleanup standards for SWMU 8 were developed using risk-based concentrations and the results of vadose zone migration modeling (Montgomery Watson, 1996b). The cleanup standards developed to protect background groundwater quality are consistent with the RWQCB's Water Quality Goals and Tri-Regional Board Guidelines. The cleanup standards for dieldrin and DDT were modified in the 2004 ESD. The cleanup standards are provided in Table 11-1.

The selected remedy is excavation of approximately 8,000 cubic yards (10,400 tons) of contaminated soil and debris from the burn pit. The remedy included excavation to the approximate depth of the water table. The Site-Wide Comprehensive ROD estimated that 3,400 tons of contaminated soil would require disposal at a Class I disposal facility and 2,400 tons of debris (concrete, wood, etc.) would be disposed of at a Class III facility. Clean soil imported from off site was used to backfill the excavated areas.

Table 11-1. Cleanup Standards for SWMU 8, Tracy Site

Analyte	(µg/kg)
Total chlordane	10
2,4-D	25
4,4´-DDD	81
4,4´-DDT	47[a]
Total DDX	30,000
Dieldrin	4[a]
Lindane	1.7
Linuron	200
MCPA	5,000
Simazine	10
bis(2-Ethylhexyl)phthalate	330
Diethylphthalate	330
2,4-Dinitrotoluene	330
Naphthalene	330
TPHG	1,000
TPHD	10,000
TPHMO	10,000

[a] Cleanup standard modified in the 2004 ESD (URS, 2004a).

DDD = dichlorodiphenyldichloroethane
DDT = dichlorodiphenyltrichloroethane
DDX = combined total of DDD, DDE, and DDT
ESD = explanation of significant difference
MCPA = 2-(4-chloro-2-methylphenoxy) acetic acid
SWMU = solid waste management unit
TPHD = total petroleum hydrocarbons as diesel
TPHG = total petroleum hydrocarbons as gasoline
TPHMO = total petroleum hydrocarbons as motor oil
µg/kg = micrograms per kilogram
2,4-D = 2,4-dichlorophenoxy acetic acid

The Site-Wide Comprehensive ROD also requires the installation of one new monitoring well. The new well (LM168AU) and two existing wells (LM097AUA and LM119A) near the site were specified in the Site-Wide Comprehensive ROD for monitoring OC pesticides over four quarters. The Site-Wide Comprehensive ROD also requires using the new monitoring well to monitor for dioxins/furans semiannually for one year. Groundwater sampling for SVOCs, TPH, pesticides, and herbicides is also required by the Site-Wide Comprehensive ROD to evaluate the effectiveness of the selected remedy. Table 11-2 provides a comparison of monitoring results for the ROD-specified wells to groundwater concentrations requiring evaluation in the Site-Wide Comprehensive ROD.

The selected remedy was designed to remove contaminated soils that contribute to a cancer risk in excess of 1×10^{-6}. The remedy also was anticipated to reduce the hazard index at this site to approximately 8 following remediation; however, this objective reflects the presence of manganese (upper confidence limit is 630 mg/kg), which does not exceed the background threshold concentration (805 mg/kg).

Table 11-2. Comparison of Groundwater Monitoring Results to ROD Concentrations Requiring Evaluation at SWMU 8 (LM097AUA, LM119A, LM168AU, and LM178AU), Tracy Site

Analyte	Groundwater Concentration Requiring Evaluation (µg/L)	Most Recent Exceedance of Concentration Requiring Evaluation 2005–2010 (µg/L)
bis(2-Ethylhexyl)phthalate	10	None
Diethylphthalate	5,600	None
2,4-Dinitrotoluene	10	None
Naphthalene	20	None
Chlordane	0.1	0.11 (LM168AU in 1Q07)
2,4-D	70	None
4,4´-DDD	0.15	None
4,4´-DDE	0.1	None
4,4´-DDT	0.1	None
Dieldrin	0.05	None
Lindane	0.03	None
Linuron	2	None
MCPA	380	None
Simazine	4	None
Total dioxins/furans	0.01	None
TPHG	50	None
TPHD	100	None
TPHMO	100	None

DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethene
DDT = dichlorodiphenyltrichloroethane
MCPA = 2-(4-chloro-2-methylphenoxy) acetic acid
TPHD = total petroleum hydrocarbons as diesel
TPHG = total petroleum hydrocarbons as gasoline
TPHMO = total petroleum hydrocarbons as motor oil
µg/L = micrograms per liter
1Q07 = first quarter 2007
2,4-D = dichlorophenoxy acetic acid

11.1.2 Remedy Implementation

Table 11-3 summarizes the remedy status for SWMU 8.

Table 11-3. SWMU 8 Remedy Status, Tracy Site

Remedy Component	Status
Excavation	Response complete.
ROD Groundwater Monitoring Requirements	Remedial action in operation.

ROD = record of decision
SWMU = solid waste management unit

Mobilization for remedial activities at SWMU 8 occurred on 23 September 2002 with excavation commencing on 8 October 2002. Based on the design data collection effort performed at SWMU 8, the area of the excavation was extended approximately 20 feet to the southeast because chlordane and

dieldrin were detected outside of the ROD-specified excavation boundary. The base excavation and initial over-excavation were completed between 8 October 2002 and 14 November 2002, respectively. The depth along the center of the excavation was approximately 20 feet bgs, which was below the seasonal high level for groundwater at this site.

Initial confirmation sample results from the sidewalls and bases (benches and bottom) of the excavation indicated that additional excavation was needed to remove soil with contaminants exceeding the cleanup standards. Fourteen step-out excavations were performed, and confirmation soil samples were collected following the completion of each step-out. Additional excavation was not performed at sample locations with contamination exceeding cleanup standards at depths below the groundwater table, in accordance with the ROD.

All excavation and confirmation sampling activities were completed on 21 November 2002. Backfilling of the excavation and waste disposal activities were completed on 18 December 2002. Over 17,000 cubic yards of material were excavated, transported, and disposed of off site (Shaw Environmental, 2004b).

Installation of the ROD-specified new monitoring well (LM168AU) was completed downgradient from the excavation in November 1997. A second monitoring well (LM178AU) was installed in February 2003. LM097AU, which was destroyed because of its location within the excavation area, was replaced with LM097AUA in February 2003.

The Site-Wide Comprehensive ROD established site-specific requirements for selected wells and contaminants (see Table 11-2) to determine the effectiveness of the selected remedy on water quality. Sampling for these requirements was implemented in the third quarter of 1998 and analytical results are reported in Well Monitoring Program Annual Monitoring Reports.

11.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

11.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at SWMU 8 is protective of human health and the environment.*

11.2.2 Status of Recommendations from First Five-Year Review

Following is the recommendation presented in the First Five-Year Review Report and its status.

Recommendation: *Continue downgradient monitoring at LM178AU and LM119A for residual dieldrin and DDT to ensure residual soil contamination following excavation does not impact groundwater quality. Monitoring of LM019A (being abandoned) should be discontinued. Provided that sampling results from LM168AU during the 3Q05 monitoring event show similar results, when compared to the 3Q04 groundwater results, no further monitoring will be recommended at LM168AU.*

Status: Groundwater results from the ROD-specified wells at SWMU 8 indicate that only chlordane, detected at a concentration of 0.11 µg/L at LM168AU in 2007, exceeded the groundwater concentration requiring evaluation during the period of this five-year review. Sampling and analysis for chlordane should continue until requirements are met.

11.3 Five-Year Review Process

The site was visited on 16 July 2010 by representatives of DLA Installation Support at San Joaquin, EPA, DTSC, and RWQCB-CV. There are no land use restrictions for SWMU 8. The SWMU 8 site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

11.4 Technical Assessment

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

Yes, the remedy at SWMU 8 is functioning as intended by the Site-Wide Comprehensive ROD as modified by the 2004 ESD.

Well Monitoring Program Reports for the years 2005 through 2010 were reviewed to evaluate the likelihood of residual contamination impacting groundwater quality. The data are summarized in Table 11-2. A concentration of 0.11 µg/L of chlordane was reported at LM168AU during the first quarter 2007 sampling event. No other analytes were reported.

With the exception of chlordane, no analytes have been detected at concentrations that exceed the concentrations requiring evaluation for the contaminants identified in the Site-Wide Comprehensive ROD as potential threats to groundwater quality.

11.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs are still valid for SWMU 8.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for SWMU 8.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil (there are, however, chemical-specific ARARs for waste disposal). The Site-Wide Comprehensive ROD identifies chemical-specific criteria TBC based on maintaining groundwater quality at or below the RWQCB's Water Quality Goals. There are also some guidelines for allowable levels of TPH in soil that are based on recommendations from the combined efforts of Tri-Regional Board Guidelines. These guidelines do not constitute final cleanup goals, but rather target levels that should prevent existing TPH soil contamination from becoming a source of constituents to groundwater. For total DDX and dieldrin, cleanup standards correspond to risk-based concentrations that would reduce the cancer risk to less than 1×10^{-6} for the construction worker.

In the 2004 ESD, the cleanup standards for dieldrin and DDT were modified but remain protective of human health, the environment, and groundwater quality (URS, 2004a). The maximum residual dieldrin and DDT concentrations in soil following excavation were less than EPA PRGs (now termed RSLs) for both industrial and residential uses, and deionized water waste extraction test (DI WET) analysis and vadose zone modeling results indicated that the residual contamination does not pose a threat to groundwater quality.

Action-Specific ARARs. The action-specific ARARs for SWMU 8 stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid.

Location-Specific ARARs. The location-specific ARAR for SWMU 8 is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. The baseline risk assessment and 2004 ESD characterized threats to human health, the environment, and groundwater for a variety of chemicals, with pesticides (chlordane, 2,4-D, DDD, DDT, dieldrin, lindane, linuron, MCPA, and simazine), SVOCs [bis(2-ethylhexyl)phthalate, diethylphthalate, 2,4-dinitrotoluene), naphthalene, and total petroleum hydrocarbons[3] (as gasoline, as diesel, and as motor oil) identified as chemicals of concern. Table 11-4 indicates the qualitative differences between toxicity values in the Site-Wide Comprehensive ROD and what would be utilized at the time of this second five-year review, should quantitative risk assessment be necessary:

Table 11-4. Qualitative Comparison of Toxicity Values Between the ROD and Present Day, SWMU 8, Tracy Site

Analyte	Noncancer Inhalation	Noncancer Oral	Cancer Inhalation	Cancer Oral
2,4-D	No current value	No change	No toxicity value	No toxicity value
2,4-Dinitrotoluene	No current value	No change	No former value	No former value
4,4'-DDD	No current value	No current value	No change	No change
4,4'-DDT	No current value	No change	No change	No change
bis(2-Ethylhexyl) phthalate	No current value	No change	Less stringent now	Less stringent now
Chlordane	Less stringent now	Less stringent now	Less stringent now	No change
Dieldrin	No current value	No change	No change	No change
Diethylphthalate	No current value	No change	No toxicity value	No toxicity value
Diuron	No current value	No change	No toxicity value	No toxicity value
Lindane	No current value	No change	No change	less stringent now
Linuron	No current value	No change	No toxicity value	No toxicity value
MCPA	No current value	No change	No toxicity value	No toxicity value
Naphthalene	More stringent now	More stringent now	No former value	No toxicity value
Simazine	No current value	No change	No former value	No toxicity value

"No current value" means that the ROD quantitatively evaluated this compound, but there is no current agency-published value; hence, the ROD overstates risk and hazard estimates compared to present-day.

"No former value" means that the ROD did not quantitatively evaluate this compound, but there is a current agency-published value; hence, the ROD understates risk and hazard estimates compared to present day.

"No toxicity values" means no agency-published values are available or the chemical is not classified as a carcinogen.

DDD = dichlorodiphenyldichloroethane
DDT = dichlorodiphenyltrichloroethane
MCPA = 2-(chloro-2-methylphenoxy)acetic acid
ROD = record of decision
SWMU = solid waste management unit
2,4-D = dichlorophenoxyacetic acid

[3] Petroleum hydrocarbons are complex mixtures and are not part of the quantitative risk assessment; however, critical individual constituents such as benzene, toluene, ethylbenzene, and xylenes, are evaluated in quantitative risk assessment.

Changes in Risk Assessment Methods. The baseline risk assessment utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes; at the time of this second five-year review, this is a practice no longer supported by the EPA. Consequently, inhalation noncancer hazards for all chemicals are overstated in the baseline risk assessment relative to current methods. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. The 2004 ESD included an evaluation of potential risks to human health and potential impacts to groundwater quality for the residual contamination at the site. There are no completed pathways for exposure to ecological receptors. Residual concentrations for contaminants were reduced below the risk-based cleanup limits established in the Site-Wide Comprehensive ROD as modified by the 2004 ESD. At the time of the remedial action, residual concentrations were compared to EPA Region 9 PRGs (now termed RSLs) for industrial and residential use and were less than those values, as well. The DI WET analysis, seasonal soil compartment modeling (SESOIL), and VLEACH modeling performed with results of soil samples collected at the site indicated that the residual contamination does not pose a threat to groundwater quality. The cleanup standards and RAOs are, therefore, considered protective of human health and the environment.

11.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light since the first five-year review that could call into question the protectiveness of the remedy for SWMU 8.

11.5 Issues

Minor issues for SWMU 8 include:

- ROD monitoring requirements have not been met for TPHD at LM119A or chlordane, 2,4-D, and MCPA at LM168AU.

11.6 Recommendations

Recommendations intended to address minor issues for SWMU 8 include:

- Continue monitoring groundwater at LM119A for TPHD and LM168AU for chlordane, 2,4-D, and MCPA until ROD monitoring requirements are met.

  Status: LM119A and LM169AU met the ROD monitoring requirements in 2011, and sampling will be discontinued at these wells starting in 2012 (HDR, 2012b).

11.7 Protectiveness Statement

The remedy at SWMU 8 is protective of human health and the environment, and land use controls are not required at this site.

11.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

Photo 1. SWMU 8, Tracy Site

12.0 SWMU 20 – ABOVEGROUND SOLVENT TANK/BUILDING 26 RECOUP OPERATIONS AND AREA 1 BUILDING 10

12.1 Remedial Action

12.1.1 Remedy Selection

SWMU 20 is located in the central portion of the depot (Plate 1). SWMU 20 included a floor drain at Building 26, an aboveground solvent tank in Building 10, a 4-foot by 5-foot sump (at Manhole W-1) outside of the northwestern corner of Building 10, and a 2-foot by 3-foot sump (at Manhole W-3) outside of the northeastern corner of Building 10. A spray paint booth and cleaning operations were reportedly connected to Manhole W-1 of the industrial wastewater pipeline (SWMU 33). SWMU 20 also included a contaminated soil area just east of Building 10. VOCs and SVOCs were detected in sludges collected from the two sumps and the floor drain. Contamination also was found in soil samples collected beneath these features. UST Site 13 is close to SWMU 20 and reportedly contained a 2,000-gallon No. 2 fuel oil tank, which was removed in 1987. Building 10 was demolished in 2009 and will be replaced by a paved parking lot in 2010.

The remedy selected by the Site-Wide Comprehensive ROD includes the excavation and disposal of the two sumps and the underlying soil (at Manholes W-1 and W-3) in the vicinity of Building 10 and the floor drain at Building 26. The ROD also states that an SVE system to address TCE contamination would be installed east of Building 10 after excavation. The 2004 ESD modified the remedy with the deletion of SVE and addition of land use controls. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

The RAOs for SWMU 20 are:

- Prohibit residential, day care, play area, or school use.
- 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)
  - SVOCs (diethylphthalate, 2,4-dinitrophenol, pentachlorophenol, and 2,4,6-trichlorophenol)
  - Pesticides and herbicides (dieldrin, methiocarb, MCPA, and linuron)
  - TPHD

The Site-Wide Comprehensive ROD also provides soil cleanup standards to protect background groundwater quality that are consistent with the RWQCB's Water Quality Goals and the Tri-Regional Board Guidelines. The ROD cleanup standards for soil and soil gas are provided in Table 12-1.

The ROD requires groundwater sampling for VOCs, SVOCs, pesticides, and herbicides as part of the Well Monitoring Program to evaluate the effectiveness of the selected remedy. Table 12-2 provides a comparison of monitoring results from ROD-specified wells to groundwater concentrations requiring evaluation identified in the Site-Wide Comprehensive ROD.

Table 12-1. Cleanup Standards for SWMU 20, Tracy Site

Analyte	Standard
Soil	**(µg/kg)**
Trichloroethene	5
Ethylbenzene	5
Xylenes	5
Diethylphthalate	330
2,4-Dinitrophenol	830
Pentachlorophenol	830
2,4,6-Trichlorophenol	330
Dieldrin	2
Methiocarb	500
Linuron	200
MCPA	5,000
TPHD	10,000
Soil Gas	**(ppbv)**
TCE	350

MCPA = 2-(4-chloro-2-methylphenoxy) acetic acid
ppbv = parts per billion by volume
SWMU = solid waste management unit
TCE = trichloroethene
TPHD = total petroleum hydrocarbons as diesel
µg/kg = micrograms per kilogram

Table 12-2. Comparison of Groundwater Monitoring Results to ROD Concentrations Requiring Evaluation at SWMU 20 (LM085B, LM175AU [replaced LM093AU], and LM115AU), Tracy Site

Analyte	Groundwater Concentration Requiring Evaluation (µg/L)	Most Recent Exceedance of Concentration Requiring Evaluation 2005–2010 (µg/L)
Ethylbenzene	29	None
Xylenes	17	None
Trichloroethene	2.3	3.5 (LM175AU in 2Q08)
Tetrachloroethene	2	4.77 (LM175AU in 2Q08) 2.25 (LM115AU in 1Q09)
Diethylphthalate	5,600	None
2,4-Dinitrophenol	50	None
Pentachlorophenol	50	None
2,4,6-Trichlorophenol	10	None
Dieldrin	0.05	None
Methiocarb	5	None
MCPA	380	None
Linuron	2	None
TPHD	100	None

MCPA = 2-(4-chloro-2-methylphenoxy) acetic acid
SWMU = solid waste management unit
TPHD = total petroleum hydrocarbons as diesel
µg/L = micrograms per liter
2Q08 = second quarter 2008 (quarter/year)

12.1.2 Remedy Implementation

Table 12-3 summarizes the remedy status for SWMU 20.

Table 12-3. SWMU 20 Remedy Status, Tracy Site

Remedy Component	Status
Excavation	Response complete.
ROD Groundwater Monitoring Requirements	Remedial action in operation.
Land Use Controls • Implement notification procedure for construction activities or land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures) and existing structures • Perform annual site reviews to ensure compliance with controls and to correct any deficiencies in the existing cover or notification procedure • Follow defined procedures in the event of a change in land use • Ensure controls are restored following construction activities • Sample and properly dispose of soil generated from any future excavation activities	Remedial action in place.
Soil Vapor Extraction	Remedial design in progress.

ROD = record of decision
RPMPD = real property master plan digest
SWMU = solid waste management unit

Excavations at SWMU 20 completed in 1997 and 1999 on the north side of the building exterior removed approximately 330 cubic yards of contaminated soil. Residual contamination at SWMU 20 includes TPH and TCE under Building 10 and potentially in the vicinity of 5th Street between Building 10 and Building 26. Due to the greater extent of the excavation than originally designed and the residual TPH concentrations, a decision was made that SVE would not be effective at SWMU 20 as originally selected in the Site-Wide Comprehensive ROD. In addition, TCE was not detected in soil gas samples collected in 2004 at locations east of Building 10 where TCE was reported in soil gas during the RI. In the 2004 ESD, SVE was deleted from the remedy, and land use controls were added to the remedy for the residual contamination. The land use controls were added to address potential future risk under the residential-use scenario that was not accounted for in the ROD. Land use controls also were designed to address soil contamination under the foundation of Building 10. The land use controls requirements are provided in Table 12-3.

The 2004 ESD states that additional actions or continued land use controls would be evaluated at some point in the future should Building 10 and/or Building 26 be demolished. Subsequent to the completion of the excavations, DLA Installation Support at San Joaquin made plans to demolish Building 10. Prior to the demolition of Building 10, a 2008 investigation characterized the extent of remaining contamination at SWMU 20. The investigation estimated that approximately 18,000 cubic yards of subsurface material contain TCE at concentrations greater than the cleanup standard established in the Site-Wide Comprehensive ROD. Based on the data collected during this investigation, an FS was prepared to evaluate remedial alternatives for the residual contamination beneath Building 10. The FS identifies SVE enhanced with pneumatic fracturing as the preferred remedy to address the residual contamination at SWMU 20 (URS, 2009a). DLA is preparing for November 2010 submittal, a draft ESD to the Site-Wide

Comprehensive ROD to document that SVE enhanced with pneumatic fracturing will be the selected remedy for SWMU 20.

The Site-Wide Comprehensive ROD established site-specific requirements for selected wells and contaminants (see Table 12-2) to determine the effectiveness of the selected remedy on water quality. Sampling for these requirements was implemented in the third quarter of 1998 and analytical results are reported in Well Monitoring Program Annual Monitoring Reports.

Land use controls established in the 2004 ESD are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. The results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

12.1.3 System O&M

O&M activities and costs for the SVE system that is planned for installation in 2010 at SWMU 20 will be discussed in the third five-year review.

12.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

12.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at SWMU 20 is protective of human health and the environment.*

12.2.2 Status of Recommendations from First Five-Year Review

Following are the recommendations presented in the First Five-Year Review Report and their status.

Recommendation: *Because of residual contamination at Building 10, annual monitoring for TPHD and VOCs should be continued. Pesticides have not been reported in LM085B, LM175AU, or LM115AU to date; however, two quarters of monitoring data for pesticides should be collected in 2009 to support the next five-year review.*

Status: Total petroleum hydrocarbons−gasoline range (TPHG) and TPHD were not detected in groundwater samples collected from LM085B, LM115AU, and LM175AU during the first and third quarter of 2009. During the 2008 investigation activities at SWMU 20, 25 groundwater samples were analyzed for TPHD and total petroleum hydrocarbons−motor oil range (TPHMO) and only one sample had TPHD or TPHMO detected. TPHD was detected at a concentration of 786 µg/L and TPHMO at 826 µg/L at a boring south of SWMU 20 (URS, 2009a).

PCE was detected above the concentration requiring evaluation at LM175AU in 2008 and at LM115AU in 2009. TCE was detected in samples collected from LM115AU and LM175AU in 2009 but below concentrations requiring evaluation. However, TCE was detected above the concentration requiring evaluation in LM175AU in 2008.

Pesticides were not detected in samples collected from LM085B or LM115AU in 2009, but dieldrin was detected in LM175AU at a concentration of 0.0132 µg/L in the third quarter 2009 sampling event. The dieldrin concentration is below the concentration requiring evaluation for SWMU 20.

Recommendation: *Self-reporting of land use status will be included in the annual report. Annual review of land use was not required until the 2004 ESD.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports.

12.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspection. The SWMU 20 site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

The site is currently under construction. Building 10 and its foundation were demolished in 2009, leaving the soil exposed. DLA Installation Support at San Joaquin's construction of a parking lot over the SWMU 20 area is expected to be completed in 2010. Approximately 3 feet of soil will have to be removed to bring the site to street level. That soil has been profiled and will be properly disposed. Currently, the site is surrounded by a chain link fence.

Representatives from the regulatory agencies noted that land use control warning signs are not installed at SWMU 20.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

Soil, soil gas, and groundwater data were collected as part of the December 2007 United States Army Corps of Engineers (USACE) investigation beneath Building 10 and along portions of the former industrial wastewater pipeline, and results are reported in the *Building 10 Industrial Waste Pipeline Inspection and Sampling Report of Findings* report (USACE, 2008). Additional sampling was conducted at locations inside the northern half of Building 10 and from locations north of the building in April, May, and November 2008; results are reported in *DDJC-Tracy Warehouse 10 Investigation Report, Part 1: Summary of Results* (URS, 2009b).

The 2008 investigations confirmed and delineated residual TCE contamination in soil, soil vapor, and groundwater beneath and north of Building 10 prior to its demolition. Maximum TCE concentrations in soil, soil vapor, and groundwater were 0.054 mg/kg, 15,000 ppbv, and 32.8 µg/L, respectively.

12.4 Technical Assessment

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

Yes, the remedy for SWMU 20 is functioning as intended by the Site-Wide Comprehensive ROD as modified by the 2004 ESD; however, Building 10 has been demolished and the remedy requires modification.

An RAO identified in the Site-Wide Comprehensive ROD is to prevent the migration of the COCs (VOCs, SVOCs, pesticides, herbicides, and TPHD) in soil that could cause groundwater contamination that exceeds appropriate regulatory standards and health-based concentrations. Well Monitoring Program Reports for the years 2005 through 2010 were reviewed to evaluate the likelihood of residual

contamination impacting groundwater quality. The data are summarized in Table 12-2. With the exception of TCE and PCE, COCs were not detected in groundwater. TCE and/or PCE concentrations exceeded groundwater concentrations requiring evaluation at LM175AU and LM115AU, but the concentrations were less than OU 1 ACLs.

Subsequent to completion of remedial excavations at SWMU 20, DLA Installation Support at San Joaquin made plans to demolish Building 10 and replace it with a smaller building. In December 2007, the USACE conducted an investigation beneath Building 10 and along portions of the former industrial wastewater pipeline to evaluate potential risks to construction workers and evaluate debris disposal options. Eight soil borings were completed inside the building, and samples were collected at depths from 4 to 5 feet below the surface of the building floor. Two soil samples were collected adjacent to the former industrial wastewater pipeline on the west side of the building. Five soil samples collected near the former solvent tank and floor drains contained TCE at concentrations ranging from 28 to 260 µg/kg. Pesticides and motor oil were also detected in one of the soil samples collected near the floor grate. The USACE investigation results are reported in *Building 10 Industrial Waste Pipeline Inspection and Sampling Report of Findings* (USACE, 2008).

Based on the results of the December 2007 investigation, DLA Installation Support at San Joaquin completed additional sampling of soil, soil gas, and groundwater from locations inside the northern half of Building 10 and from locations outside the northeastern corner of the building in April and May 2008. Groundwater samples were also collected from locations outside the northwestern corner of the building in November 2008. Findings from the 2008 field investigation indicate the presence of TCE in the soil, soil vapor, and groundwater beneath the northeastern portion of Building 10 and surrounding areas to the north and east. It is estimated that approximately 18,000 cubic yards of subsurface material contain TCE at concentrations greater than the ROD-established cleanup standard. In addition, TPHD and PCE were detected in soil samples collected east of Building 10 and near SWMU 23 (across 5th Street), approximately 100 feet east of Building 10. Results of the 2008 investigation are reported in *DDJC-Tracy Warehouse 10 Investigation Report, Part 1: Summary of Results* (URS, 2009b).

The 2008 investigation results indicate that an aboveground TCE tank that was located inside Building 10 was the source for the TCE in soil, soil vapor, and groundwater at SWMU 20. The tank was removed prior to April 1992 and is no longer an active source. The portion of the industrial wastewater pipeline servicing the tank has been grouted and is no longer considered an active source.

The concentrations of TCE that remain in soil and soil gas at SWMU 20 and the demolition of Building 10 prompted an FS evaluation of remedial alternatives.

Currently, no O&M activities and no costs are associated with the planned SVE remedy. This information, along with the performance of the remedy, will be evaluated in the third five-year review following implementation of SVE.

The Master Planner for the depot indicated a familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. The issue of Building 10 demolition was noted during the 2009 annual inspection and 2010 five-year review inspection. The land use controls were effective in preventing exposure during the demolition of Building 10. Regulatory agencies and construction workers were notified prior to the demolition of Building 10. The construction of an asphalt parking lot in conjunction with the installation of land use control warning signs will be effective in preventing future exposure at the former Building 10 area.

12.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs are still valid for SWMU 20.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for SWMU 20.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil (there are, however, chemical-specific ARARs for waste disposal). The Site-Wide Comprehensive ROD identifies chemical-specific TBC based on maintaining groundwater quality at or below the RWQCB's Water Quality Goals. The allowable levels of TPH in soil are based on Tri-Regional Board Guidelines. These guidelines do not constitute final cleanup goals, but rather target levels that should prevent existing TPH soil contamination from becoming a source of constituents to groundwater. In addition, the ROD-specified soil gas cleanup standard for TCE was calculated from soil gas concentrations in equilibrium with groundwater that has a concentration equal to the MCL for TCE (5 µg/L). Because there has been no change to the MCL (or ACL) for TCE, the cleanup level continues to be protective of groundwater.

Action-Specific ARARs. The action-specific ARARs for SWMU 20 stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to SWMU 20; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARARs for SWMU 20 is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for SWMU 20. In addition, land use controls are in place to protect human health and the environment.

Changes in Exposure Pathways. Building 10 has been removed, potentially creating a human health exposure pathway and a potential rainfall migration pathway to groundwater. However, land use controls should prevent human health exposure. Once the SVE system and the parking lot are installed, the potential for rainfall infiltration flushing contaminants to groundwater will be considerably reduced.

Changes in Toxicity and Other Contaminant Characteristics. The baseline risk assessment and 2004 ESD characterized threats to human health, the environment, and groundwater for a variety of chemicals, with 2,4,6-trichlorophenol, 2,4-dinitrotoluene, dieldrin, diethylphthalate, ethylbenzene, linuron, MCPA, methiocarb, pentachlorophenol, TCE, and xylenes identified as chemicals of concern; pentachlorophenol was not quantitatively evaluated in the baseline risk assessment. Table 12-4 indicates the qualitative differences between toxicity values in the Site-Wide Comprehensive ROD and what would be utilized at the time of this second five-year review, should quantitative risk assessment be necessary:

Table 12-4. Qualitative Comparison of Toxicity Values Between the ROD and Present Day, SWMU 20, Tracy Site

Analyte	Noncancer Inhalation	Noncancer Oral	Cancer Inhalation	Cancer Oral
2,4,6-Trichlorophenol	No current value	More stringent now	No change	No change
2,4-Dinitrotoluene	No current value	No change	No former value	No former value
Dieldrin	No current value	No change	No change	No change
Diethylphthalate	No current value	No change	No toxicity value	No toxicity value

Table 12-4. (Continued)

Analyte	Noncancer Inhalation	Noncancer Oral	Cancer Inhalation	Cancer Oral
Ethylbenzene	No change	No change	No former value	No former value
Linuron	No current value	No change	No toxicity value	No toxicity value
MCPA	No current value	No change	No toxicity value	No toxicity value
Methiocarb	No toxicity value	No toxicity value	No toxicity value	No toxicity value
Trichloroethene	Less stringent now	No current value	Less stringent now	Less stringent now
Xylenes	More stringent now	More stringent now	No toxicity value	No toxicity value

"No current value" means that the ROD quantitatively evaluated this compound, but there is no current agency-published value; hence, the ROD overstates risk and hazard estimates compared to present-day.

"No former value" means that the ROD did not quantitatively evaluate this compound, but there is a current agency-published value; hence, the ROD understates risk and hazard estimates compared to present-day.

"No toxicity values" means no agency-published values are available or the chemical is not classified as a carcinogen.

MCPA = 2-(4-chloro-2-methylphenoxy) acetic acid
ROD = record of decision
SWMU = solid waste management unit

Changes in Risk Assessment Methods. The baseline risk assessment utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes; at the time of this second five-year review, this is a practice no longer supported by the EPA. Consequently, inhalation noncancer hazards for all chemicals are overstated in the baseline risk assessment relative to current methods. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. The modified remedy for SWMU 20 is expected to meet the RAOs with the implementation of the SVE system. Land use controls are in place and continue to meet RAOs.

12.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Yes, additional investigation has been conducted which indicates residual contamination is present above cleanup levels in soil, soil gas, and groundwater. The planned SVE remedial action, once implemented, will remediate VOCs in soil and soil gas. Remediation of contaminated groundwater is being addressed as part of the OU 1 remedial action.

12.5 Issues

Major issues for SWMU 20 identified in the draft and draft final versions of this second five-year review that do not require tracking by EPA because they were addressed prior to the final submittal of this document include:

- Soil at SWMU 20 was not covered at the time of the site inspection. Temporary fencing has been erected around the site, preventing unauthorized access to the exposed soil.

- TCE was detected at concentrations above cleanup standards in the vadose zone beneath the former location of Building 10. An FS was completed, and SVE was recommended as the remedy to address TCE in the vadose zone. However, SVE, which was part of the Site-Wide Comprehensive ROD remedy for SWMU 20, had been deleted in the 2004 ESD.

Minor issues for SWMU 20 include:

- During the second five-year review site inspection, representatives of the regulatory agencies noted that no land use control warning signs are installed at SWMU 20.

- ROD monitoring requirements have not been met for TCE, PCE, diethylphthalate, 2,4-dinitrophenol, pentachlorophenol, 2,4,6-trichlorophenol, methiocarb, and linuron at LM175AU or for PCE at LM115AU.

12.6 Recommendations

Recommendations/follow-up actions intended to address major issues for SWMU 20 identified in the draft and draft final versions of this second five-year that do not require tracking by EPA because they have already been completed include:

- An asphalt parking lot that will cover SWMU 20 is planned for construction in 2010.

  Status: An asphalt parking lot was constructed in the area of SWMU 20 in late 2010.

- Add SVE as the remedy to SMWU 20 in an ESD, and implement SVE at SWMU 20. At the completion of the SVE remedial action, review the necessity of land use controls.

  Status: SVE was added to the SWMU 20 remedy in the *2011 Explanation of Significant Differences to the 1998 Record of Decision, Defense Distribution Depot San Joaquin – Tracy Site* (HDR, 2011b). The SVE system was installed between June and October 2011, and operations began on 24 October 2011 (HDR, 2012d).

Recommendations intended to address minor issues for SWMU 20 include:

- Install land use control warning signs.

- Continue monitoring groundwater at LM175AU for TCE, PCE, diethylphthalate, 2,4-dinitrophenol, pentachlorophenol, 2,4,6-trichlorophenol, methiocarb, and linuron and at LM115AU for PCE until ROD monitoring requirements are met.

  Status: Through the 2011 monitoring period, LM175AU has not yet met ROD monitoring requirements and will continue to be monitored (HDR, 2012b). LM115AU met the ROD monitoring requirement for PCE in 2010 but will continue to be monitored as a guard well for SWMU 20 (HDR, 2011a).

12.7 Protectiveness Statement

The remedy at SWMU 20 is expected to be protective of human health and the environment upon implementation of the SVE remedial action, construction of the asphalt parking lot in 2010, and continued implementation and monitoring of land use controls.

12.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

Photo 1. SWMU 20, Tracy Site

Photo 2. SWMU 20, Tracy Site

13.0 SWMU 24 – PETROLEUM WASTE OIL TANK

13.1 Remedial Action

13.1.1 Remedy Selection

SWMU 24 is the site of a former 500-gallon UST (UST 31) that was used to store petroleum wastes from materials testing in Building 247 from 1961 to 1988. SWMU 24 is located in the central portion of the depot (Plate 1). The UST was removed in 1988, and visibly contaminated soil from the excavation was disposed of off site. Xylenes, 2-butanone, 4-methyl-2-pentanone, petroleum hydrocarbons, and other organic compounds were detected in soils in the vicinity of the tank excavation.

Baseline risk assessment results indicate that there is a potential health threat to future depot workers or residents at SWMU 24 (Montgomery Watson, 1996b). The hazard index for depot workers associated with indoor air is presently estimated at 0.7; however, if a building with poor ventilation were constructed over the contamination, the hazard index could exceed 1.0. Vadose zone migration modeling performed prior to remediation for SWMU 24 predicted that VOCs, SVOCs, petroleum hydrocarbons, PCBs, and pesticides pose a threat to background water quality. Also, TPHG and TPHD levels in the soil were above the Tri-Regional Board Guidelines of 1 mg/kg and 10 mg/kg, respectively, for TPH within 5 feet of groundwater.

The selected remedy in the Site-Wide Comprehensive ROD for SWMU 24 is bioventing. The 2001 ESD as modified by the 2004 ESD added land use controls to address the potential risk under the residential-use scenario in the event of a land use change. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

The RAOs for SWMU 24 are:

- Prohibit residential, day care, play area, or school use.
- Prevent future depot workers from being exposed to toluene in the soil that would cause a hazard index greater than 1.0.
- 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 (acetone, 2-butanone, ethylbenzene, 2-hexanone, 4-methyl-2-pentanone, toluene, and xylenes)
  - SVOCs (2,4-dimethylphenol, fluoranthene, 2-methylnaphthalene, 4-methylphenol, naphthalene, phenanthrene, phenol, and pyrene)
  - PCBs (Arochlor 1260)
  - Pesticides (carbofuran, lindane, phorate, and ronnel)
  - TPHD and TPHG

Cleanup standards for SWMU 24 were developed using results from vadose zone migration modeling (Montgomery Watson, 1996b). The cleanup standards developed to protect background groundwater quality are consistent with the RWQCB's Water Quality Goals and the Tri-Regional Board Guidelines. The cleanup standards are provided in Table 13-1.

Table 13-1. Cleanup Standards for SWMU 24, Tracy Site

Analyte	Standard
Soil	**(µg/kg)**
Acetone	10
2-Butanone	10
Ethylbenzene	10
2-Hexanone	10
4-Methyl-2-pentanone	10
Toluene	5
Xylenes	5
2,4-Dimethylphenol	330
Fluoranthene	330
2-Methylnaphthalene	330
4-Methylphenol	330
Naphthalene	330
Phenanthrene	330
Phenol	330
Pyrene	330
Carbofuran	500
Lindane	1.7
Phorate	20
Ronnel	35
Arochlor 1260	30
TPHG	1,000
TPHD	10,000
Soil Gas	**(ppbv)**
TCE	350
PCE	780

PCE = tetrachloroethene
ppbv = parts per billion by volume
SWMU = solid waste management unit
TCE = trichloroethene
TPHD = total petroleum hydrocarbons as diesel
TPHG = total petroleum hydrocarbons as gasoline
µg/kg = micrograms per kilogram

The Site-Wide Comprehensive ROD anticipated that bioventing would biodegrade the COCs that pose the greatest threat to groundwater. Therefore, the recommended alternative would reduce the potential for migration of soil constituents to the groundwater and would be protective of beneficial uses. PCBs and pesticides would not be fully remediated during bioventing treatment because these compounds are not amenable to aerobic biodegradation. Removing PCBs and pesticides through excavation beside and beneath Building 247 was considered cost prohibitive and the threat to groundwater posed by PCBs and pesticides was considered low because of their lower mobility, relative to the other COCs in soil. Pesticide detections were infrequent, and none of the pesticides or PCBs detected in soil have been detected in groundwater near the site.

The Site-Wide Comprehensive ROD required groundwater monitoring for PCBs and pesticides to assess the remaining threat to groundwater. Soil gas action levels also were established in the Site-Wide Comprehensive ROD in the event that chlorinated hydrocarbons were detected at the site (Table 13-1).

The Site-Wide Comprehensive ROD required groundwater sampling at LM116A and LM118AU for VOCs, SVOCs, PCBs, pesticides, and herbicides as part of the Well Monitoring Program to evaluate the

effectiveness of the selected remedy. The selected remedy for SWMU 24 also included quarterly monitoring of well LM118A for TPHG and TPHD for at least three quarters. The purpose of this monitoring is to assess the natural attenuation of petroleum hydrocarbons in the groundwater. Table 13-2 provides a comparison of monitoring results from ROD-specified wells to groundwater concentrations requiring evaluation identified in the Site-Ride Comprehensive ROD.

Table 13-2. Comparison of Groundwater Monitoring Results to ROD Concentrations Requiring Evaluation of SWMU 24 (LM116A and LM118AU), Tracy Site

Analyte	Groundwater Concentration Requiring Evaluation (μg/L)	Most Recent Exceedance of Concentration Requiring Evaluation 2005–2010 (μg/L)
Acetone	700	None
2-Butanone	4,200	None
Ethylbenzene	29	None
2-Hexanone	10	None
4-Methyl-2-Pentanone	40	None
Toluene	42	None
Xylenes	17	None
Trichloroethene	2.3	None
Tetrachloroethene	2	None
TPHG	50	None
TPHD	100	None
Fluoranthene	280	None
2-Methylnaphthalene	10	None
4-Methylphenol	10	None
2,4-Dimethylphenol	140	None
Naphthalene	20	None
Phenol	4,200	None
Pyrene	210	None
PCB (Arochlor 1260)[a]	0.5	Not analyzed
Carbofuran[a]	18	Not analyzed
Lindane[a]	0.03	Not analyzed
Phorate[a]	0.5	Not analyzed
Ronnel[a]	0.5	Not analyzed

[a] ROD monitoring requirements for these analytes were met prior to the period of the second five-year review.

PCB = polychlorinated biphenyls
ROD = record of decision
SWMU = solid waste management unit
TPHD = total petroleum hydrocarbon as diesel
TPHG = total petroleum hydrocarbon as gasoline
μg/L = micrograms per liter

13.1.2 Remedy Implementation

Table 13-3 summarizes the remedy status for SWMU 24.

Table 13-3. SWMU 24 Remedy Status, Tracy Site

Remedy Component	Status
Bioventing	Remedial action discontinued.
ROD Groundwater Monitoring Requirements	Remedial action in operation.
Land Use Controls • Implement notification procedure for land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures) • Perform annual review to ensure compliance with controls and to correct any deficiencies in the notification procedure • Follow defined procedures in the event of a change in land use • Sample and properly dispose of soil generated from any future excavation activities	Remedial action in place.

ROD = record of decision
RPMPD = real property master plan digest
SWMU = solid waste management unit

The bioventing system at SWMU 24, located on the southern side of Building 247, was brought on line in December 2000.

In October 2003, monitoring data indicated that bioventing had reduced TPH contamination at SWMU 24, so the system was taken off line. Closure/confirmation sampling was performed in December 2003, and sample results at only one of the four soil boring locations were below the ROD cleanup standards. The highest TPH concentrations were on the southern side of Building 247 (URS, 2004b).

During the presentation of the closure sampling results at the February 2004 RPM meeting, DTSC requested that indoor air monitoring be conducted in Building 247. The air sampling was conducted in June 2004 after approval of a sampling work plan. The sampling results indicated that indoor air quality was generally consistent with the activities conducted within the building, and that contaminants present were well below permissible exposure limits (PELs) for worker exposure.

In addition, the RWQCB-CV requested that SVE be attempted to address the residual TPH contamination on the southern side of Building 247. An SVE pilot test was conducted in January 2005. The results memorandum concluded that the use of SVE to remediate the remaining TPHG and VOC mass in the vicinity of Building 247 was not expected to be effective and that other remedial technologies were not expected to be implementable because of low SVE extraction rates and the majority of the contamination being present under the concrete slab floor of Building 247 (URS, 2005b).

The Site-Wide Comprehensive ROD established site-specific requirements for selected wells and contaminants (see Table 13-2) to determine the effectiveness of the selected remedy on water quality. Sampling for these requirements was implemented in the third quarter of 1998 and analytical results are reported in Well Monitoring Program Annual Monitoring Reports.

Land use controls established in the 2001 ESD and modified by the 2004 ESD are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. The results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

13.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

13.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at SWMU 24 is expected to be protective of human health and the environment upon completion; in the interim, exposure pathways that could result in unacceptable risks are being controlled.*

13.2.2 Status of Recommendations from First Five-Year Review

Following are the recommendations presented in the First Five-Year Review Report and their status.

Recommendation: *Based on historical bioventing data and the SVE pilot test, no further remedial action is recommended for SWMU 24 at this time. Remediation with SVE, bioventing, or soil excavation and removal should be considered when the building is removed, though there are no plans for removal at this time.*

Status: Building 247 has not been removed and there are no plans for removal at this time.

Recommendation: *An updated water quality site assessment should be performed to determine the concentrations of residual contaminants and whether they pose a threat to groundwater quality. If a threat to groundwater quality is identified, the land use controls should be amended to require maintenance of the existing pavement and building, to minimize the likelihood of percolation through the zone of soil contamination. If additional water quality site assessment indicates that the treated soil no longer poses a threat to water quality, then the cleanup standards can be adjusted in an ESD, and the existing land use controls imposed to prevent residential development will be sufficient for the site.*

Status: Results from groundwater samples collected at LM116A and LM118AU for all COCs have been less than detection limits in the past five years. An assessment of groundwater conditions beneath Building 247 should be made if the building is ever demolished.

Recommendation: *Self-monitoring of land use status will be included in the annual report. Annual review of land use was not required until the 2004 ESD.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports.

13.3 Five-Year Review Process

DLA Installation at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspection. The SWMU 24 site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

No significant issues were identified during the site inspection. Land use has not changed. Representatives from the regulatory agencies noted that land use control warning signs are not installed at SWMU 24.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

13.4 Technical Assessment

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

Yes, the remedy for SWMU 24 is functioning as intended by the Site-Wide Comprehensive ROD as modified by the 2001 and 2004 ESDs.

While bioventing was effective at reducing TPH and VOC concentrations, it was not successful at reducing TPH contamination to the cleanup standards.

Well Monitoring Program Reports for the years 2005 through 2010 were reviewed to evaluate the likelihood of residual contamination impacting groundwater quality. The data are summarized in Table 13-2. Groundwater sample results for all COCs were less than detection limits in the past five years.

The following three VOCs, 2-butanone, 2-hexanone, and 4-methyl-2-pentanone, are required to be monitored at LM116A and LM118AU. These two wells were sampled for VOCs during the past five years; however, the above-mentioned VOCs were not analyzed at LM118AU and were analyzed only once at LM116A.

Land uses controls are in place and effective. The Master Planner for the depot indicated a familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. No issues have been identified during the annual inspections. During the second five-year review site inspection, representatives of the regulatory agencies noted that land use control warning signs are not installed at SWMU 24.

13.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, RAOs used at the time of the remedy still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs are still valid for SWMU 24.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for SWMU 24.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil that is left in place (there are, however, chemical-specific ARARs for waste disposal). The Site-Wide Comprehensive ROD identifies chemical-specific criteria TBC based on maintaining groundwater quality at or below the RWQCB's Water Quality Goals. The allowable levels of TPH in soil are based on the Tri-Regional Board Guidelines. These guidelines do not constitute final cleanup goals, but rather target levels that should prevent existing TPH soil contamination from becoming a source of constituents to groundwater.

Cleanup standards have not been met at SWMU 24, and residual soil contamination exceeds concentrations that would allow for unlimited use and unrestricted exposure. Therefore, land use controls are required at this site to protect groundwater quality and human health.

Action-Specific ARARs. The action-specific ARARs for SWMU 24 stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to SWMU 24; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARARs for SWMU 24 is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site. In addition, land use controls are in place to protect human health and the environment.

Changes in Exposure Pathways. The potential for a vapor intrusion pathway exists; however, air sampling conducted in June 2004 indicated that indoor air quality was consistent with the activities conducted within the building and that contaminants present were well below PELs for worker exposure.

Changes in Toxicity and Other Contaminant Characteristics. The baseline risk assessment and 2004 ESD characterized threats to human health, the environment, and groundwater for a variety of chemicals, with 2,4-dimethylphenol, 2-butanone, 2-hexanone, 2-methylnaphthalene, 4-methyl-2-pentanone, 4-methylphenol, acetone, Arochlor 1260, carbofuran, ethylbenzene, fluoranthene, lindane, naphthalene, phenanthrene, phenol, phorate, pyrene, ronnel, toluene, total petroleum hydrocarbons (as diesel and as gasoline), and xylenes identified as chemicals of concern. Table 13-4 indicates the qualitative differences between toxicity values in the Site-Wide Comprehensive ROD and what would be utilized at the time of this second five-year review, should quantitative risk assessment be necessary:

Table 13-4. Qualitative Comparison of Toxicity Values Between the ROD and Present Day, SWMU 24, Tracy Site

Analyte	Noncancer Inhalation	Noncancer Oral	Cancer Inhalation	Cancer Oral
2,4-Dimethylphenol	No current value	No change	No toxicity values	No toxicity values
2-Butanone	Less stringent now	No change	No toxicity values	No toxicity values
2-Hexanone	More stringent now	More stringent now	No toxicity values	No toxicity values
2-Methylnaphthalene	No current value	More stringent now	No toxicity values	No toxicity values
4-Methyl-2-pentanone	Less stringent now	No change	No toxicity values	No toxicity values
4-Methylphenol	Less stringent now	No change	No toxicity values	No toxicity values
Acetone	Less stringent now	Less stringent now	No toxicity values	No toxicity values
Arochlor 1260	No current value	No current value	Less stringent now	Less stringent now
Carbofuran	No current value	No change	No toxicity values	No toxicity values
Ethylbenzene	No change	No change	No former value	No former value
Fluoranthene	No current value	No change	No toxicity values	No toxicity values
Lindane	No current value	No change	No change	Less stringent now
Naphthalene	More stringent now	More stringent now	No former value	No toxicity values
Phenanthrene	No current value	No change	No toxicity values	No toxicity values
Phenol	More stringent now	More stringent now	No toxicity values	No toxicity values
Phorate	No current value	No change	No toxicity values	No toxicity values
Pyrene	No current value	No change	No toxicity values	No toxicity values
Ronnel	No current value	Less stringent now	No toxicity values	No toxicity values
Toluene	Less stringent now	More stringent now	No toxicity values	No toxicity values
Xylenes	More stringent now	More stringent now	No toxicity values	No toxicity values

Table 13-4. (Continued)

"No current value" means that the ROD quantitatively evaluated this compound, but there is no current agency-published value; hence, the ROD overstates risk and hazard estimates compared to present-day.

"No former value" means that the ROD did not quantitatively evaluate this compound, but there is a current agency-published value; hence, the ROD understates risk and hazard estimates compared to present-day.

"No toxicity values" means no agency-published values are available or the chemical is not classified as a carcinogen.

ROD = record of decision
SWMU = solid waste management unit

Changes in Risk Assessment Methods. The baseline risk assessment utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes; at the time of this second five-year review, this is a practice no longer supported by the EPA. Consequently, inhalation noncancer hazards for all chemicals are overstated in the baseline risk assessment relative to current methods. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. Land use controls are in place and continue to meet RAOs. There are no plans to demolish Building 247 in the next five years; however, if Building 247 is demolished, remediation may be necessary.

13.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light since the first five-year review that could call into question the protectiveness of the remedy for SWMU 24.

13.5 Issues

Minor issues for SWMU 24 include:

- During the second five-year review site inspection, representatives of the regulatory agencies noted that land use control warning signs are not installed at SWMU 24.
- Residual contaminant concentrations nearby and below Building 247 have not been reduced to the ROD cleanup standards.
- ROD monitoring requirements have not been met for 2-butanone, 2-hexanone, 4-methyl-2-pentanone, 2, 4-dimethylphenol, fluoranthene, 2-methylnaphthalene, 4-methylphenol, naphthalene, phenol, pyrene, TPHG, and TPHD at LM116A or 2-butanone, 2-hexanone, 4-methyl-2-pentanone, TPHG, and TPHD at LM118AU.

13.6 Recommendations

Recommendations intended to address minor issues for SWMU 24 include:

- Install land use control warning signs.

- Consider remediation with SVE, bioventing, or soil excavation and removal if Building 247 is demolished, though there are no plans for the demolition of the building at this time.

- Continue monitoring groundwater at LM116A for 2-butanone, 2-hexanone, 4-methyl-2-pentanone, 2, 4-dimethylphenol, fluoranthene, 2-methylnaphthalene, 4-methylphenol, naphthalene, phenol, pyrene, TPHG, and TPHD and at LM118AU for 2-butanone, 2-hexanone, 4-methyl-2-pentanone, TPHG, and TPHD until ROD monitoring requirements are met.

  Status: LM116A and LM118AU met the ROD monitoring requirement in 2011, and sampling will be discontinued at these wells starting in 2012 (HDR, 2012b).

13.7 Protectiveness Statement

The remedy at SWMU 24 is protective of human health and the environment because land use controls are in place and are effective.

13.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

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Photo 1. SWMU 24, Tracy Site

14.0 SWMU 27 – BUILDING 206 ROUNDHOUSE SUMP AND AREA 1 BUILDING 206

14.1 Remedial Action

14.1.1 Remedy Selection

SWMU 27 is located in the northwestern portion of the depot (Plate 1). Herbicides, SVOCs, PCBs, petroleum hydrocarbons, and metals were released to soils as a result of activities associated with SWMU 27. The distribution of these constituents was confined primarily to the area within Building 206, mainly around the former service pit, the former waste oil sump, and the former floor drain in Building 206. Building 206, which is part of SWMU 27, was demolished in April 1995. The locomotive pit, service pit, and sump were filled with concrete. Currently, the site is covered by asphalt that supports Building 201.

The remedy selected in the Site-Wide Comprehensive ROD for SWMU 27 is excavation and disposal. The RAOs for SWMU 27 are:

- Prevent future depot workers from being exposed to the following COCs in the soil that would cause an excess cancer risk greater than 1×10^{-6}:
  - PAHs (benzo[a]pyrene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, and indeno[1,2,3-cd]pyrene)
  - PCBs (Arochlor 1260)
- 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)
  - Herbicides (2,4-D, MCPA, and 2,4,5-T)
  - TPHMO

Results from the baseline risk assessment indicated a cancer risk greater than 1×10^{-6} for the depot worker and construction worker exposure scenarios. This cancer risk was calculated with the assumption of worker exposure to PAHs and PCBs (Arochlor 1260). The selected remedy (excavation and disposal) was designed to reduce these risks to 1×10^{-6} by excavating contaminated soils to the specified cleanup standards for total PAHs and Arochlor 1260. No ecological receptors were identified at SWMU 27. TCE, 2,4-D, MCPA, 2,4,5-T, and TPHMO are potential threats to groundwater quality.

Cleanup standards for SWMU 27 were developed using risk-based concentrations and the results of vadose zone migration modeling (Montgomery Watson, 1996b), which indicated the potential threats to background groundwater quality at this site. The cleanup standards developed to protect background groundwater quality are consistent with the RWQCB's Water Quality Goals and the Tri-Regional Board Guidelines. The cleanup standards are provided in Table 14-1.

The selected remedy in the Site-Wide Comprehensive ROD requires excavation of the former waste oil sump; excavating soil contaminated with PAHs, PCBs, petroleum hydrocarbons, and herbicides (2,4-D, MCPA, and 2,4,5-T) from beneath the railroad tracks; and excavating soil contaminated with MCPA (a herbicide) at the area of a suspected herbicide spill. The ROD estimated approximately 130 cubic yards (170 tons) of soil and concrete would be excavated and sent to an off-depot disposal facility. The ROD

Table 14-1. Cleanup Standards for SWMU 27, Tracy Site

Analyte	(µg/kg)
Benzo[a]pyrene	1,000
Total PAHs	15,000
Arochlor 1260	1,000
TCE	5
2,4-D	25
MCPA	5,000
2,4,5-T	5
TPHMO	10,000

MCPA = 2-(4-chloro-2-methylphenoxy) acetic acid
PAH = polycyclic aromatic hydrocarbon
SWMU = solid waste management unit
TCE = trichloroethene
TPHMO = total petroleum hydrocarbons as motor oil
µg/kg = micrograms per kilogram
2,4-D = dichlorophenoxy acetic acid
2,4,5-T = trichlorophenoxy acetic acid

requires the use of clean soil, imported from an off-depot source, for backfill to replace the excavated material. The former service pit was not recommended for excavation and disposal because contaminated sludge was previously removed from the pit and the pit was filled with concrete.

The Site-Wide Comprehensive ROD requires groundwater sampling for analysis of VOCs, SVOCs, and herbicides as part of the Well Monitoring Program to evaluate the effectiveness of the selected remedy. Table 14-2 provides a comparison to monitoring results from ROD-specified wells to groundwater concentrations requiring evaluation identified in the Site-Wide Comprehensive ROD.

Table 14-2. Comparison of Groundwater Monitoring Results to ROD Concentrations Requiring Evaluation at SWMU 27 (LM117A), Tracy Site

Analyte	Groundwater Concentration Requiring Evaluation (µg/L)	Most Recent Exceedance of Concentration Requiring Evaluation 2005–2010 (µg/L)
TCE	2.3	None
2,4-D[a]	70	Not analyzed
MCPA[a]	380	Not analyzed
2,4,5-T[a]	70	Not analyzed
TPHMO	100	None

[a] ROD monitoring requirements for these analytes were met prior to the period of the second five-year review.

MCPA = 2-(4-chloro-2-methylphenoxy) acetic acid
ROD = record of decision
TCE = trichloroethene
TPHMO = total petroleum hydrocarbons as motor oil
µg/L = micrograms per liter
2,4-D = dichlorophenoxy acetic acid
2,4,5-T = trichlorophenoxy acetic acid

14.1.2 Remedy Implementation

Table 14-3 summarizes the remedy status for SWMU 27.

Table 14-3. SWMU 27 Remedy Status, Tracy Site

Remedy Component	Status
Excavation	Response complete.
ROD Groundwater Monitoring Requirements	Remedial action in operation.

SWMU = solid waste management unit

Approximately 601 tons of THPD-contaminated soil were excavated from SWMU 27 and disposed of at Allied Waste Company's Forward Landfill in Manteca, California (Shaw Environmental, 2003). Remediation activities were performed between 21 June 1999 and 1 September 1999. Soil was excavated within the limits of the excavation footprint at the floor drain and locomotive pit locations to a depth of 5 feet bgs. The waste oil sump was excavated to a depth of approximately 19 feet bgs. Based on analytical results from confirmation samples, additional excavation was performed at the northern sidewall of the railroad track excavation and the western sidewall of the waste oil sump excavation. An exposed oil standpipe sump was discovered during the excavation. This sump was removed along with its associated piping. In addition to the soil transported to Forward Landfill, approximately 27 tons of petroleum-contaminated debris were transported to Kettleman Hills Landfill for disposal, and 40 gallons of waste oil from the oil standpipe sump were transported to Evergreen Oil in Newark, California, for recycling.

Soil containing TPH above the ROD-specified cleanup standard remained at one location. TPHMO was reported at 18 mg/kg, and the cleanup standard is 10 mg/kg. It was determined that this contamination was part of the groundwater petroleum plume associated with UST Site 7d, rather than SWMU 27. All other confirmation sampling results were below the ROD-specified cleanup standards.

The Site-Wide Comprehensive ROD established site-specific requirements for selected wells and contaminants (see Table 14-2) to determine the effectiveness of the selected remedy on water quality. Sampling for these requirements was implemented in the third quarter of 1998 and analytical results are reported in Well Monitoring Program Annual Monitoring Reports.

14.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

14.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at SWMU 27 is protective of human health and the environment.*

14.2.2 Status of Recommendations from First Five-Year Review

Following are the recommendations presented in the First Five-Year Review Report and their status:

Recommendation: *Further sampling can be deferred until the next five-year evaluation. It is recommended that two quarters of VOC and SVOC data be obtained from LM117A in 2009 to support the next five-year review.*

Status: Groundwater samples were collected from LM117A in the first and third quarters of 2009 and were analyzed for VOCs, SVOCs, and TPHMO. No analytes were detected.

14.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspection. The SWMU 27 site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

The review also included an evaluation of analytical results from LM117A (Table 14-2) for the 2005 to 2010 time period.

14.4 Technical Assessment

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

Yes, the remedy for SWMU 27 is functioning as intended by the Site-Wide Comprehensive ROD.

Well Monitoring Program Reports for the years 2005 through 2010 were reviewed to evaluate the likelihood of residual contamination impacting groundwater quality. The data are summarized in Table 14-2. None of the compounds identified in the ROD for evaluation have been detected to date.

Based on the information reviewed for this second five-year review, there is no evidence that the contaminants identified in the Site-Wide Comprehensive ROD as potential threats to groundwater quality are migrating to the underlying groundwater. Therefore, the remedial action is functioning as designed.

14.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAO used at the time of the remedy selection still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAO are still valid for SWMU 27.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for SWMU 27.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil (there are, however, chemical-specific ARARs for waste disposal). The Site-Wide Comprehensive ROD identifies chemical-specific criteria TBC based on maintaining groundwater quality at or below the RWQCB's Water Quality Goals. The allowable levels of TPH in soil are based on Tri-Regional Board Guidelines. These guidelines do not constitute final cleanup goals, but rather target levels that should prevent existing TPH soil contamination from becoming a source of constituents to groundwater. For benzo[a]pyrene, total PAHs, and Arochlor 1260, cleanup standards correspond to risk-based concentrations that would reduce the cancer risk to less than 1×10^{-6} for the depot and construction worker. Cleanup standards at this site have been met with the exception of one TPHMO result that was attributed to UST Site 7d.

Action-Specific ARARs. The action-specific ARARs for SWMU 27 stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid.

Location-Specific ARARs. The location-specific ARAR for SWMU 27 is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or newly promulgated standards or TBCs that affect the protectiveness of the remedy for SWMU 27.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. The baseline risk assessment characterized threats to human health, the environment, and groundwater for a variety of chemicals, with 2,4-D, 2,4,5-T, Arochlor 1260, benzo[a]pyrene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, indeno[1,2,3-cd]pyrene, MCPA, TCE, and total petroleum hydrocarbons identified as chemicals of concern; total petroleum hydrocarbons are a complex mixture that is not evaluated in quantitative risk assessment, although important individual constituents are evaluated (e.g., benzene, toluene, ethylbenzene, and xylenes). Table 14-4 indicates the qualitative differences between toxicity values in the ROD and what would be utilized at the time of this second five-year review, should quantitative risk assessment be necessary:

Table 14-4. Qualitative Comparison of Toxicity Values Between the ROD and Present Day, SWMU 27, Tracy Site

Analyte	Noncancer Inhalation	Noncancer Oral	Cancer Inhalation	Cancer Oral
2,4-D	No current value	No change	No toxicity values	No toxicity values
2,4,5-T	No current value	No change	No toxicity values	No toxicity values
Arochlor 1260	No current value	No current value	Less stringent now	Less stringent now
Benzo[a]anthracene	No current value	No current value	No change	No change
Benzo[a]pyrene	No current value	No current value	No change	No change
Benzo[b]fluoranthene	No current value	No current value	No change	No change
Benzo[k]fluoranthene	No current value	No current value	No change	No change
Indeno[1,2,3-cd]pyrene	No current value	No current value	No change	No change
MCPA	No current value	No change	No toxicity values	No toxicity values
TCE	Less stringent now	No current value	Less stringent now	Less stringent now

"No current value" means that the ROD quantitatively evaluated this compound, but there is no current agency-published value; hence, the ROD overstates risk and hazard estimates compared to present day.

"No toxicity values" means no agency-published values are available, or the chemical is not classified as a carcinogen.

MCPA = 2-(4-chloro-2-methylphenoxy) acetic acid
ROD = record of decision
SWMU = solid waste management unit
TCE = trichloroethene
2,4-D = dichlorophenoxyacetic acid
2,4,5-T = trichlorophenoxy acetic acid

Changes in Risk Assessment Methods. The baseline risk assessment utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes; at the time of this second five-year review, this is a practice no longer supported by the EPA. Consequently, inhalation noncancer hazards for all chemicals are overstated in the baseline risk assessment relative to current methods. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. The excavation at SWMU 27 remediated the site in accordance with the Site-Wide Comprehensive ROD requirements and the RAOs have been met. The remedy is expected to meet the RAOs. Continued monitoring for TPHMO in groundwater is needed to

ensure the cleanup is adequate. Potential impacts to groundwater quality from TPHMO will continue to be assessed through the Well Monitoring Program.

14.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

In reviewing confirmation sampling results, benzo[a] pyrene, a COC at SWMU 27, was detected in one sample at an estimated concentration of 120 µg/kg, which is less than the industrial use-based cleanup standard of 1,000 µg/kg established in the ROD and the EPA industrial soil RSL of 210 µg/kg but greater than the EPA residential soil RSL of 15 µg/kg. This detection was limited to one sidewall sample collected at a depth of two feet bgs; benzo[a] pyrene was not detected in nearby (less than 20 feet away) sidewall samples collected at similar depths or in a nearby (less than 20 feet away) sample collected from the bottom of the excavation at five feet bgs. The expected small volume of soil with a potentially higher risk from benzo[a]pyrene at one sample location does not warrant addition of residential land use controls at SWMU 27. Therefore, the remedy at SWMU 27 is protective of human health and the environment.

14.5 Issues

Minor issues for SWMU 27 include:

- ROD monitoring requirements have not been met for TPHMO at LM117A.

14.6 Recommendations

Recommendations intended to address minor issues for SWMU 27 include:

- Continue monitoring groundwater at LM117A for TPHMO until ROD monitoring requirements are met.

  Status: Through the 2011 monitoring period, LM117A has not yet met the ROD monitoring requirement for TPHMO and will continue to be monitored (HDR, 2012b).

14.7 Protectiveness Statement

The remedy at SWMU 27 is protective of human health and the environment, and land use controls are not required at this site.

14.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

Photo 1. SWMU 27, Tracy Site

Photo 2. SWMU 27, Tracy Site

15.0 SWMU 33 – INDUSTRIAL WASTE PIPELINE

15.1 Remedial Action

15.1.1 Remedy Selection

In 1972, an existing pipeline and a storm drain line were interconnected to form the industrial wastewater pipeline, which has been designated as SWMU 33 (Plate 1). The industrial wastewater pipeline is constructed of 4-inch to 7-inch diameter pipe of varying composition (transite, vitrified clay, polyvinyl chloride) and is buried to a depth of approximately 2 to 4 feet below grade. Eight manholes were located along the pipeline. The pipeline consists of two major segments referred to as the south industrial waste pipeline and the east industrial waste pipeline. The total length of the south industrial waste pipeline and its branches is approximately 1,200 lineal feet; the total length of the east industrial waste pipeline and its branches is also approximately 1,200 lineal feet. The industrial wastewater pipeline is no longer in use. A portion of the industrial wastewater pipeline is located under Building 10 (SWMU 20) and serviced a TCE tank located inside Building 10. The TCE tank was identified as the source for the TCE in soil, soil vapor, and groundwater at SWMU 20. The tank was removed prior to April 1992 and is no longer an active source. The portion of the IWPL servicing the tank has been grouted and is no longer considered an active source.

Baseline risk assessment results for SWMU 33 estimated the potential cancer risk to be 1×10^{-8} under the construction worker exposure scenario (Montgomery Watson, 1996b). The hazard index for the potential construction worker is estimated to be 0.0007. No ecological receptors were identified at SWMU 33. For the future residential land use scenario, the potential cancer risk was estimated to be 4×10^{-7} and the hazard index was 0.4.

The remedy selected in the Site-Wide Comprehensive ROD includes excavation of manhole(s) at Building 10, grouting of the piping connections to the industrial wastewater pipeline, and land use controls. Most of the industrial wastewater pipeline piping was left in place following grouting. Land use control requirements were modified in the 2001 and 2004 ESDs. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

The RAO for SWMU 33 is:

- Prevent the migration of the following COCs in the soil that could cause groundwater contamination to exceed appropriate regulatory standards and health-based concentrations:
  - Aldrin
  - Dieldrin
  - Diethylphthalate
  - Di-n-butylphthalate

The soil cleanup standards developed to protect background groundwater quality are consistent with RWQCB's Water Quality Goals and the Tri-Regional Board Guidelines. The cleanup standards are provided in Table 15-1.

Table 15-1. Cleanup Standards for SWMU 33, Tracy Site

Analyte	(μg/kg)
Xylenes	5
Diethylphthalate	330
Di-n-butylphthalate	330
Naphthalene	330
Aldrin	1.7
Carbaryl	400
Dieldrin	2
Methiocarb	500
TPHD	100,000

SWMU = solid waste management unit
TPHD = total petroleum hydrocarbons as diesel
μg/kg = micrograms per kilogram

The soil cleanup standard for TPHD was developed using the Tri-Regional Board Guidelines. The equilibrium partitioning limits developed in the RI/FS (Montgomery Watson, 1996b) provided conservative estimates of the soil concentrations required to protect background groundwater quality. These limits are the maximum concentration expected in vadose zone water and do not account for an expected decrease in concentration resulting from migration through less contaminated or clean soils to groundwater.

The Site-Wide Comprehensive ROD acknowledged that aldrin, dieldrin, diethylphthalate, and di-n-butylphthalate were left in place at SWMU 33 at concentrations above the cleanup standards; however, these contaminants are generally located below buildings or other paved areas, so the threat of migration to groundwater is considered low. Land use control requirements restrict actions that could disturb the subsurface or existing pavement and buildings, which could facilitate the migration of residual contamination to the underlying groundwater.

Groundwater sampling for VOCs, SVOCs, pesticides, and herbicides is required under the Well Monitoring Program. Table 15-2 provides a comparison of monitoring results for the ROD-specified wells to groundwater concentrations requiring evaluation in the Site-Wide Comprehensive ROD.

Table 15-2. Comparison of Groundwater Monitoring Results to ROD Concentrations Requiring Evaluation at SWMU 33 (LM002A and LM129A), Tracy Site

Analyte	Groundwater Concentration Requiring Evaluation (μg/L)	Most Recent Exceedance of Concentration Requiring Evaluation 2005–2010 (μg/L)
Xylenes	17	None
Diethylphthalate	5,600	None
Di-n-butylphthalate	700	None
Naphthalene	20	None
TPHD	100	None
Aldrin	0.05	None
Dieldrin	0.05	None
Carbaryl[a]	60	Not analyzed
Methiocarb[a]	5	Not analyzed

Table 15-2. (Continued)

[a] ROD monitoring requirements for these analytes were met prior to the period of the second five-year review.

ROD = record of decision
TPHD = total petroleum hydrocarbons as diesel
µg/L = micrograms per liter

15.1.2 Remedy Implementation

Table 15-3 summarizes the remedy status for SWMU 33.

Table 15-3. SWMU 33 Remedy Status, Tracy Site

Remedy Component	Status
Excavation	Response complete.
Pipe Grouting/Removal	Response complete.
Manhole Abandonment	Response complete.
ROD Groundwater Monitoring Requirements	Response complete.
Land Use Controls • Implement notification procedure for construction activities or land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures), existing structures, and pavement • Perform annual site inspection; review to ensure compliance with controls and to correct any deficiencies in the existing cover or notification procedure • Follow defined procedures in the event of a change in land use • Install warning signs • Ensure controls are restored following construction activities	Remedial action in place.

ROD = record of decision
RPMPD = real property master plan digest
SWMU = solid waste management unit

Remedial efforts (performed as a removal action) on the industrial wastewater pipeline began on 13 October 1997 and were completed on 19 December 1997. Remedial activities are documented in the *DDJC-Tracy Remedial Action Report for Solid Waste Management Units 2, 3, and 33* (URS, 2002a).

Implementation included the excavation of contaminated soil in the vicinity of RI soil borings SB464 and SB462. Following excavation of the contaminated soil, the pipe ends were plugged with an expandable plug and grouted.

Manhole W-3 was cleaned and demolished. Industrial wastewater pipeline sections of a vitrified clay pipe were cut and removed; personnel from Triad Environmental cut and removed sections of an asbestos pipe. Confirmation samples were collected from each side wall and the floor of the excavated area. The analytical results from the samples taken from Manhole W-3 were found to have concentrations of COCs below the cleanup standards.

Seven manholes along the industrial wastewater pipeline were cleaned and abandoned. After cleaning, it was found that the floor of Manhole W-5 had deteriorated, exposing the soil below. This manhole was excavated completely, and an additional 4 feet of soil was excavated based on confirmation sampling results. All pipes entering these manholes were plugged using expandable plugs. For Manhole W-5, the buried lines leading to this excavated manhole were plugged and grouted. Finally, concrete was poured into each manhole that was not removed to complete the abandonment. The work at all manholes except Manhole W-5 was completed on 25 November 1997. Manhole W-5 was backfilled, and the work was completed on 11 December 1997.

The remedial design required cutting, plugging, and grouting nine lateral junctions in the industrial wastewater pipeline. Triad Environmental cut and removed the four laterals made of asbestos pipe. Three vitrified clay laterals were then cut and removed. All remaining buried pipes were plugged, grouted, and filled. After excavating Manholes E-1 and E-2, Laterals 255-A, 255-B, and 255-C were to be plugged, grouted, and filled. However, Laterals 255-A and 255-B could not be located. Finally, asphalt was placed on top of all backfilled areas. The work on the laterals was completed on 19 December 1997.

Five floor drains linked to the industrial wastewater pipeline were grouted. Any remaining wastewater was first removed by pumping it to a portable Baker tank. Once all of the wastewater had been removed from the floor drains, the drains were grouted. The work on the floor drains was completed on 24 November 1997.

Wastes were disposed of at one of the following designated disposal facilities, based on waste characterization.

- CWM, Kettleman Hills facility at 35251 Old Skyline Road in Kettleman City, California. Hazardous waste, debris, and asbestos materials are accepted for landfill disposal by CWM.

- Forward Landfill, Inc., 9999 South Austin Road in Manteca, California. Forward Landfill, Inc., accepts nonhazardous waste soil and debris for landfill disposal.

Approximately 105 tons of contaminated soil and asbestos debris were disposed of at the Kettleman Hills facility. Approximately 45 tons of asphalt debris were disposed of at Forward Landfill, Inc.

The Site-Wide Comprehensive ROD established site-specific requirements for selected wells and contaminants (see Table 15-2) to determine the effectiveness of the selected remedy on water quality. Sampling for these requirements was implemented in the third quarter of 1998 and analytical results are reported in Well Monitoring Program Annual Monitoring Reports.

Land use controls established in the Site-Wide Comprehensive ROD and modified by the 2001 and 2004 ESDs are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. The results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

15.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

15.2.1 Protectiveness Statements from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at SWMU 33 is protective of human health and the environment.*

15.2.2 Status of Recommendations from First Five-Year Review

Following are the recommendations presented in the First Five-Year Review Report and their status.

Recommendation: *Land use controls should be maintained in accordance with the requirements of the 2004 ESD (URS Group, Inc., 2004a). Self-monitoring of land use status will be included in the annual report. Annual review of land use was not required until the 2004 ESD. SWMU 33 can be de-listed.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports. The site was not de-listed. There are no plans at this time to de-list individual sites.

Recommendation: *It is recommended that LM002A continue to be sampled for VOCs and OC pesticides; however, SVOCs have not been reported to date, and it is recommended that SVOC analysis be discontinued.*

Status: At LM002A, groundwater sampling for VOCs was conducted through the third quarter of 2005 and sampling for OC pesticides and SVOCs was conducted through the third quarter of 2007. VOCs, SVOCs, and OC pesticides were not detected in any samples collected during the period of this five-year review. ROD monitoring requirements at LM002A have been met for all COCs. LM002A is no longer recommended for sampling under the Well Monitoring Program.

15.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspection. The SWMU 33 site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

No significant issues were identified during the site inspection. Land use has not changed. One warning sign was missing that had been on Building 10 prior to it being demolished.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

Since the first five-year review, additional soil, soil gas, and groundwater investigations have been conducted in Building 10 near the industrial wastewater pipeline in preparation for the building's demolition. Results of these investigations are discussed in Section 12.0 of this document, and any required response is considered part of SWMU 20 rather than SWMU 33.

15.4 Technical Assessment

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

Yes, the remedy for SWMU 33 is functioning as intended by the Site-Wide Comprehensive ROD as modified by the 2001 and 2004 ESDs.

Well Monitoring Program Reports for the years 2005 through 2010 were reviewed to evaluate the likelihood of residual contamination impacting groundwater quality. These data are summarized in Table 15-2. Sample results for all COCs were less than detections limits. ROD monitoring requirements at LM002A and LM129A have been met and the wells are no longer recommended for sampling under the Well Monitoring Program.

Land use controls are in place and effective. The Master Planner for the depot indicated a familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. During the 2009 annual inspection and the 2010 five-year review inspection, it was noted that Building 10 was demolished, so the warning sign previously on the building was no longer present. Other signs were repaired or in good condition. It was recommended to consider temporary replacement of the Building 10 sign on a construction fence.

15.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs are still valid for SWMU 33.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for SWMU 33.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil (there are, however, chemical-specific ARARs for waste disposal). The Site-Wide Comprehensive ROD identifies chemical-specific criteria TBC based on maintaining groundwater at or below the RWQCB's Water Quality Goals. Allowable levels of TPH in soil are based on the Tri-Regional Board Guidelines. These guidelines do not constitute final cleanup goals, but rather target levels that should prevent existing TPH soil contamination from becoming a source of constituents to groundwater. Cleanup standards have not been met at SWMU 33; therefore, land use controls are required at this site to protect groundwater quality.

Action-Specific ARARs. The action-specific ARARs for SWMU 33 stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to SWMU 33; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARAR for SWMU 33 is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site. In addition, land use controls are in place to protect groundwater quality.

Changes in Exposure Pathways. No change in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. The baseline risk assessment characterized threats to human health, the environment, and groundwater for a variety of chemicals, with aldrin, carbaryl, dieldrin, diethylphthalate, di-n-butylphthalate, methiocarb, naphthalene, total petroleum hydrocarbons (as diesel), and xylenes identified as chemicals of concern; total petroleum hydrocarbons are a complex mixture that is not evaluated in quantitative risk assessment, although important individual constituents are evaluated (e.g., benzene, toluene, ethylbenzene, and xylenes). Table 15-4 indicates the qualitative differences between toxicity values in the Site-Wide Comprehensive ROD and what would be utilized at the time of this second five-year review, should quantitative risk assessment be necessary:

Table 15-4. Qualitative Comparison of Toxicity Values Between the ROD and Present Day, SWMU 33, Tracy Site

Analyte	Noncancer Inhalation	Noncancer Oral	Cancer Inhalation	Cancer Oral
Aldrin	No current value	No change	No change	No change
Carbaryl	No current value	No change	No toxicity values	No toxicity values
Dieldrin	No current value	No change	No change	No change
Diethylphthalate	No current value	No change	No toxicity values	No toxicity values
Di-n-butylphthalate	No current value	No change	No toxicity values	No toxicity values
Methiocarb	No toxicity values	No toxicity values	No toxicity values	No toxicity values
Naphthalene	More stringent now	More stringent now	No former value	No toxicity values
Xylenes	More stringent now	More stringent now	No toxicity values	No toxicity values

"No current value" means that the ROD quantitatively evaluated this compound, but there is no current agency-published value; hence, the ROD overstates risk and hazard estimates compared to present-day.

"No former value" means that the ROD did not quantitatively evaluate this compound, but there is a current agency-published value; hence, the ROD understates risk and hazard estimates compared to present-day.

"No toxicity values" means no agency-published values are available or the chemical is not classified as a carcinogen.

ROD = record of decision
SWMU = solid waste management unit

Changes in Risk Assessment Methods. The baseline risk assessment utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes; at the time of this second five-year review, this is a practice no longer supported by the EPA. Consequently, inhalation noncancer hazards for all chemicals are overstated in the baseline risk assessment relative to current methods. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy at SWMU 33.

Expected Progress Toward Meeting RAOs. The remedy meets the RAO because groundwater sample results have been less than detection limits and land use controls are in place and effective.

15.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light since the first five-year review that could call into question the protectiveness of the remedy for SWMU 33.

15.5 Issues

Minor issues for SWMU 33 include:

- The land use control warning sign that was on Building 10 was removed when the building was demolished.

15.6 Recommendations

Recommendations intended to address minor issues for SWMU 33 include:

- Replace the land use control warning sign that was on Building 10.

15.7 Protectiveness Statement

The remedy at SWMU 33 is protective of human health and the environment because land use controls are in place and are effective.

15.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

Photo 1. SWMU 33, Tracy Site

Photo 2. SWMU 33, Tracy Site

Photo 3. SWMU 33, Tracy Site

Photo 4. SWMU 33, Tracy Site

16.0 DSERTS 67 – NORTHERN DEPOT SOILS AREA

16.1 Remedial Action

16.1.1 Remedy Selection

DSERTS 67, also known as the Northern Depot Soils Area, is north of the storm drain and sewage lagoons (Plate 1). The site was reportedly used as a storage area for the National Stockpile of Strategic Metals. For a period of time from shortly after World War II until the 1980s, ferrous chromium ore was stored at this site. Manganese was also stored at the site from shortly after World War II until the 1970s. Lead ballast was stored at DSERTS 67 from 1980 to 1986.

The analytical results for surface and near-surface soil samples collected during the RI indicated that arsenic and manganese may be introduced into airborne particulate matter at levels that pose potential non-cancer risks to grader operators and construction workers.

The RAOs for DSERTS 67 are:

- Prohibit residential, day care, play area, or school use.
- Prevent future depot workers from being exposed to arsenic and manganese in the surface and near-surface soils that would cause a hazard index greater than 1.0.

The remedy selected in the Site-Wide Comprehensive ROD consists of installing an asphalt cover over the soils with concentrations of arsenic and manganese that pose potential health risks. The total area requiring the cover was estimated in the ROD to be 138,000 square feet. The cover was intended to provide a barrier to prevent grader operators or construction workers from coming into contact with surface soils potentially containing elevated levels of arsenic and manganese. The ROD requires the cover to be inspected annually to ensure the asphalt remains intact. The chosen remedy did not reduce the toxicity or volume of the arsenic or manganese, but it reduced their mobility in surface and near-surface soils.

Cleanup standards correspond to risk-based concentrations that reduce the hazard index to 1.0. The soil cleanup standards presented in the ROD, as modified by the 2001 ESD, are 48 mg/kg for arsenic and 812 mg/kg for manganese. The 2001 ESD also modified the remedy to an aggregate cover, rather than asphalt, as was specified in the ROD and added land use controls, including the addition of warning signs. The modified cleanup standards are provided in Table 16-1. The 2004 ESD clarified the land use control requirements for DSERTS 67, including monitoring to ensure that the appropriate land use controls are being implemented. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

Table 16-1. Cleanup Standards for DSERTS 67, Tracy Site

Analyte	(mg/kg)
Arsenic	48
Manganese	812

DSERTS = Defense Site Environmental Reporting and Tracking System
mg/kg = milligrams per kilogram

No threat to groundwater quality was identified for DSERTS 67; therefore, monitoring of wells for site-specific contaminants was not required.

16.1.2 Remedy Implementation

Table 16-2 summarizes the remedy status for DSERTS 67.

Table 16-2. DSERTS 67 Remedy Status, Tracy Site

Remedy Component	Status
Aggregate Cap	Response complete
Land Use Controls • Implement notification procedure for construction activities or land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures); existing structures; aggregate base, gravel, and asphalt covers; and vegetation. • Perform annual site inspection and review to ensure compliance with controls and to correct any deficiencies in the existing cover or notification procedure • Follow defined procedures in the event of a change in land use • Install warning signs • Ensure controls are restored following construction activities • Sample and properly dispose of soil generated from any future excavation activities	Remedial action in place

DSERTS = Defense Site Environmental Reporting and Tracking System
RPMPD = real property master plan digest

Between 8 April 2002 and 31 July 2002, construction activities were conducted to install the aggregate base (AB) cover in the southeastern portion of DSERTS 67 (Shaw Environmental, 2004c). The area of the AB cover measures 65,700 square feet.

Gravel previously installed over 16,400 square feet to the north of the AB cover is consistent with the 2001 ESD. Pre-existing asphalt covers an additional 5,200 square feet to the north of the AB cover. In addition, the GWTP1 facility covers an area of 2,000 square feet of DSERTS 67, preventing exposure to contaminated shallow surface and near-surface soils. The remaining 11,900 square feet is covered by soil supporting a dense growth of grass. Analyses of three design data collection effort samples collected within the grass area and one sample collected immediately north of the grass area indicated arsenic and manganese concentrations were less than the cleanup standards of 48 mg/kg and 812 mg/kg for arsenic and manganese, respectively (URS, 2001a). These findings were documented in the final project closeout plan (remedial action report) for DSERTS 67 (Shaw Environmental, 2004c); as a result, the grass area was not included in the area covered by the remedial action. The grass area is approximately 12 percent of the total area of DSERTS 67. Grading is restricted in the grass area and a warning sign has been installed to discourage dust-generating activities.

Land use controls established in the 2001 ESD and modified by the 2004 ESD are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. The results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

16.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

16.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at DSERTS 67 is protective of human health and the environment.*

16.2.2 Status of Recommendations from First Five-Year Review

Following is the recommendation presented in the First Five-Year Review Report and its status.

Recommendation: *Land use controls should be maintained in accordance with the requirements of the 2004 ESD (URS Group, Inc., 2004a). Self-monitoring of the land use status will be included in the annual report. Annual review of land use was not required until the 2004 ESD. A technical memorandum will be prepared in fall 2005 to address cap monitoring frequency and a solution for cap maintenance. After the deficient cover and missing signs are addressed, DSERTS 67 can be de-listed.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports. The first five-year review site inspection noted some deficiencies in the land use controls for DSERTS 67 related to missing signs and rainwater runoff drainage. The signs identifying DSERTS 67 as an area of restricted land use were replaced in February 2007 (URS, 2007d). In addition, repairs to the rainwater runoff swales and the roadway servicing the northern border of DSERTS 67 were completed in October 2007 (URS, 2008h). Those repairs were found to be in place and functioning during subsequent annual inspections. However, during the second five-year review inspection, it was observed that the western portion of the site was not covered with grass as required by the 2004 ESD. That portion of the site was predominantly bare soil. Without vegetation, exposure to airborne dust increases.

The site was not de-listed. There are no plans at this time to de-list individual sites.

16.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspection. The DSERTS 67 site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

The western portion of DSERTS 67 was not covered with grass to prevent erosion and dust generation as required by the 2004 ESD. No other issues were identified during the site inspections. Land use has not changed.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

16.4 Technical Assessment

16.4.1 Question A: Is the remedy functioning as intended by the decision document?

Yes, the remedy for DSERTS 67 is functioning as intended by the Site-Wide Comprehensive ROD as modified by the 2001 and 2004 ESDs.

In the first five-year review, it was noted that there was a drainage way that was eroding a portion of the cover. In 2007, construction activities were performed to repair the drainage and cover at DSERTS 67. The drainage improvements included installing a culvert and a sump with a sump pump to transfer water from the site to the drainage ditch to prevent ponding and erosion. An asphalt apron was also installed around each drain inlet to minimize the flow of road debris into the culvert and sump. The asphalt road, which was severely deteriorated along the northern boundary of the cap, was reconstructed and sloped to allow water to drain from the cap across the road into the existing drainage ditch.

During the second five-year review site inspection, the land use control signs were observed to be in good condition, and the rainwater runoff drainage swales were in appropriate working order. However, the western portion of the site was not covered with grass as required by the 2004 ESD (see Section 16.2.2).

16.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs are still valid for DSERTS 67.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for DSERTS 67.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil (there are, however, chemical-specific ARARs for waste disposal). The cleanup standards for arsenic and manganese correspond to risk-based concentrations that would reduce the hazard index to 1.0. Cleanup standards have not been met at DSERTS 67; therefore, land use controls are required at this site to protect human health.

Action-Specific ARARs. The action-specific ARARs for DSERTS 67 stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to DSERTS 67; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARAR for DSERTS 67 is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site. In addition, land use controls are in place to protect human health and the environment.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. The baseline risk assessment characterized the cancer risks and noncancer health hazards of the chemicals of interest (arsenic and manganese) and others via ingestion, inhalation, and dermal contact. Manganese is not recognized as a carcinogen, and there have been no changes in the oral cancer toxicity factor for arsenic. At the time of

this second five-year review, the inhalation cancer toxicity factor for arsenic is less stringent than that used in the baseline risk assessment. Consequently, cancer risk from exposure to arsenic is overstated in the baseline risk assessment, relative to current methods. For noncancer toxicity factors, the oral and inhalation toxicity factors for manganese are less stringent at the time of this second five-year review. Consequently, noncancer hazards from exposure to manganese are overstated in the baseline risk assessment, relative to current methods. The baseline risk assessment did not characterize the inhalation noncancer toxicity of arsenic, but there is a currently-available agency-published value. Consequently, noncancer hazards from exposure to arsenic are understated in the baseline risk assessment, relative to current methods.

Changes in Risk Assessment Methods. The baseline risk assessment utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes, for most of the organic chemicals (but not inorganic constituents). At the time of this second five-year review, this is a practice no longer supported by the EPA. Consequently, inhalation noncancer hazards for organic chemicals at DSERTS 67 are overstated in the baseline risk assessment relative to current methods. This, however, has no effect on the selected remedy for this site. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. Land use controls are in place and continue to meet RAOs.

16.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light since the first five-year review that could call into question the protectiveness of the remedy for DSERTS 67.

16.5 Issues

Minor issues for DSERTS 67 include:

- The western portion of the site is no longer covered with grass to prevent erosion and dust generation.

16.6 Recommendations

Recommendations intended to address minor issues for DSERTS 67 include:

- In accordance with the 2004 ESD, the vegetation that existed on the western portion of DSERTS 67 should have been maintained to prevent erosion and dust generation. However, very limited vegetation currently covers this area. It is recommended that this portion of the site be recovered (with grass, gravel, asphalt, etc.) to minimize generation of and potential exposure to airborne dust.

16.7 Protectiveness Statement

The remedy at DSERTS 67 is protective of human health and the environment because land use controls are in place and are effective.

16.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

Photo 1. DSERTS 67-Northern Depot Soils Area, Tracy Site

Photo 2. DSERTS 67-Northern Depot Soils Area, Tracy Site

Photo 3. DSERTS 67-Northern Depot Soils Area, Tracy Site

17.0 BUILDING 30 DRUM STORAGE AREA (DSERTS 69)

17.1 Remedial Action

17.1.1 Remedy Selection

Building 30 Drum Storage Area is in the southern portion of the depot, near the Consolidated Subsistence Facility (Plate 1). The original area of the site was much larger, but it is now partially covered by the Consolidated Subsistence Facility, which was constructed in 1992. During construction of the facility, buried drums were discovered in the vicinity of Building 30 Drum Storage Area. The site now encompasses a relatively small area between a forklift ramp and the central office on the northern side of the Consolidated Subsistence Facility. Bis(2-ethylhexyl)phthalate and di-n-butylphthalate were detected in several soil samples collected at the site. Benzyl alcohol and diethylphthalate were detected in one sample. Although phthalates are commonly introduced into environmental samples as part of laboratory analytical procedures, the distribution and magnitude of the concentrations indicate that these detected concentrations may be representative of site conditions.

Results of vadose zone migration modeling indicated there was a potential threat to background groundwater quality at this site (Montgomery Watson, 1996b). Groundwater data were not available for use as a basis for selecting the remedy at the time of the Site-Wide Comprehensive ROD.

The remedy selected in the Site-Wide Comprehensive ROD as modified by the 2001 and 2004 ESDs is the establishment of land use controls and installation of one groundwater monitoring well downgradient of the site. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

The RAO for Building 30 Drum Storage Area is:

- Prevent the migration of benzyl alcohol, bis(2-ethylhexyl)phthalate, diethylphthalate, and di-n-butylphthalate in soil that could cause groundwater contamination that exceeds appropriate regulatory standards and health-based concentrations.

Cleanup standards were developed using the results of vadose zone migration modeling, which indicated contaminant concentrations in soil that pose potential threats to background groundwater quality at the site. The cleanup standards were developed to protect background groundwater quality to levels consistent with RWQCB's Water Quality Goals.

The cleanup standards are provided in Table 17-1.

Table 17-1. Cleanup Standards for Building 30 Drum Storage Area, Tracy Site

Analyte	(µg/kg)
Benzyl Alcohol	330
Bis(2-ethylhexyl)phthalate	330
Diethylphthalate	330
di-n-Butylphthalate	330

µg/kg = micrograms per kilogram

The land use controls selected as the remedy include maintenance of the paved areas at the site to reduce infiltration and migration of contaminants to groundwater and installation of one monitoring well

(LM169A) downgradient from the site. Four rounds of groundwater sampling for pesticides analyses were agreed upon as a substitute for extending the RI.

Groundwater sampling for VOCs and SVOCs was required at LM169A by the Site-Wide Comprehensive ROD to evaluate the effectiveness of the selected remedy. Table 17-2 provides a comparison of monitoring results for the ROD-specified wells to groundwater concentrations requiring evaluation in the Site-Wide Comprehensive ROD.

Table 17-2. Comparison of Groundwater Monitoring Results to ROD Concentrations Requiring Evaluation at Building 30 Drum Storage Area (LM169A), Tracy Site

Analyte	Groundwater Concentration Requiring Evaluation (µg/L)	Most Recent Exceedance of Concentration Requiring Evaluation 2005–2010 (µg/L)
Benzyl alcohol[a]	10	Not analyzed
Bis(2-ethylhexyl)phthalate[a]	10	Not analyzed
Diethylphthalate[a]	5,600	Not analyzed
Di-n-butyl phthalate[a]	700	Not analyzed
TCE	2.3	None
PCE	2	None

[a] ROD monitoring requirements for these analytes were met prior to the period of the second five-year review.

PCE = tetrachloroethene
ROD = record of decision
TCE = trichloroethene
µg/L = micrograms per liter

Clarification of the land use control requirements for Building 30 Drum Storage Area was provided in the 2001 and 2004 ESDs.

17.1.2 Remedy Implementation

Table 17-3 summarizes the remedy status for Building 30 Drum Storage Area.

Table 17-3. Building 30 Drum Storage Area Remedy Status, Tracy Site

Remedy Component	Status
ROD Groundwater Monitoring Requirements	Response complete.
Land Use Controls • Implement notification procedure for construction activities or land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures), existing structures, and pavement • Perform annual site inspection and review to ensure compliance with controls and to correct any deficiencies in the existing cover or notification procedure • Follow defined procedures in the event of a change in land use • Install warning signs • Ensure controls are restored following construction activities • Sample and properly dispose of soil generated from any future excavation activities	Remedial action in place.

ROD = record of decision
RPMPD = real property master plan digest

The Site-Wide Comprehensive ROD established site-specific requirements for selected wells and contaminants (see Table 17-2) to determine the effectiveness of the selected remedy on water quality. Sampling for these requirements was implemented in the third quarter of 1998 and analytical results are reported in Well Monitoring Program Annual Monitoring Reports. Monitoring well LM169A was installed in November 1997 and has been monitored in accordance with the Site-Wide Comprehensive ROD requirements.

Land use controls established in the Site-Wide Comprehensive ROD and modified by the 2001 and 2004 ESDs are in place at the site. The site is inspected annually to evaluate the effectiveness of the land use controls, and the results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

17.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

17.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at the Building 30 Drum Storage Area is protective of human health and the environment.*

17.2.2 Status of Recommendations from First Five-Year Review

Following are the recommendations presented in the First Five-Year Review Report and their status.

Recommendation: *The land-use controls documented in the 2004 ESD should be maintained to protect the underlying groundwater from potential contaminant migration. Self-monitoring of land use status will be included in the annual report. Annual review of land use was not required until the 2004 ESD.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports.

Recommendation: *It is recommended that monitoring be discontinued at LM169A and that this site be de-listed.*

Status: Groundwater sampling at LM169A was discontinued after the third quarter of 2007. VOCs and SVOCs were never detected in samples collected from LM169A. The site was not de-listed. There are no plans at this time to de-list individual sites.

17.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspection. The Building 30 Drum Storage Area site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

No issues were identified during the annual site inspection. Land use has not changed.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

17.4 Technical Assessment

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

Yes, the remedy at Building 30 Drum Storage Area is functioning as intended by the Site-Wide Comprehensive ROD as modified by the 2001 and 2004 ESDs.

Well Monitoring Program Reports for the years 2005 through 2010 were reviewed to evaluate the likelihood of residual contamination impacting groundwater quality. The data are summarized in Table 17-2. Sampling results for all COCs were less than detection limits. ROD monitoring requirements at LM169A have been met, and the well is no longer recommended for sampling under the Well Monitoring Program.

Land use controls are in place and effective. The Master Planner for the depot indicated a familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. No issues have been identified during the annual inspections or during the second five-year review site inspection.

17.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Yes, the exposure assumptions, toxicity data, cleanup levels, and RAOs are still valid for Building 30 Drum Storage Area.

Changes in Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC for Building 30 Drum Storage Area.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil (there are, however, chemical-specific ARARs for waste disposal). The Site-Wide Comprehensive ROD identifies chemical-specific criteria TBC based on maintaining groundwater at or below the RWQCB's Water Quality Goals. Cleanup standards have not been met at Building 20 Drum Storage Area; therefore, land use controls are required at this site to protect groundwater quality.

Action-Specific ARARs. The action-specific ARARs for Building 30 Drum Storage Area stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to Building 30 Drum Storage Area; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARAR for the Building 30 Drum Storage Area is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site. In addition, land use controls are in place to protect groundwater quality.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. The baseline risk assessment characterized the cancer risks and noncancer health hazards of the chemicals of interest [bis(2-ethylhexyl)phthalate, diethylphthalate, and di-n-butylphthalate] and others via ingestion, inhalation, and dermal contact; benzyl alcohol was not evaluated in the quantitative assessment. Diethylphthalate and di-n-butylphthalate are not recognized as carcinogens. At the time of this second five-year review, the inhalation and oral cancer toxicity factors for bis(2-ethylhexyl)phthalate are less stringent than those used in the baseline risk assessment. Consequently, the cancer risk estimates for bis(2-ethylhexyl)phthalate are overstated in the baseline risk assessment, relative to current methods. There have been no changes in the oral noncancer toxicity factors for bis(2-ethylhexyl)phthalate, diethylphthalate, and di-n-butylphthalate. The baseline risk assessment utilized inhalation noncancer toxicity factors derived via extrapolation from oral noncancer toxicity values, however, there are no agency-published inhalation toxicity factors for bis(2-ethylhexyl)phthalate, diethylphthalate, and di-n-butylphthalate available at the time of this second five-year review (also refer to the discussion below concerning changes in risk assessment methods). Consequently, the inhalation noncancer hazard estimates are overstated for bis(2-ethylhexyl)phthalate, diethylphthalate, and di-n-butylphthalate in the baseline risk assessment, relative to current methods. An agency-published oral noncancer toxicity value is available at the time of this second five-year review, and noncancer health hazards from exposure to benzyl alcohol could be estimated, if needed.

Changes in Risk Assessment Methods. The baseline risk assessment utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes; at the time of this second five-year review, this is a practice no longer supported by the EPA. Consequently, inhalation noncancer hazards for bis(2-ethylhexyl)phthalate, diethylphthalate, and di-n-butylphthalate, and other chemicals, are overstated in the baseline risk assessment relative to current methods. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. The remedy meets the RAO because groundwater sample results have been less than detection limits and land use controls are in place and effective.

17.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light since the first five-year review that could call into question the protectiveness of the remedy for Building 30 Drum Storage Area.

17.5 Issues

No issues are identified for Building 30 Drum Storage Area.

17.6 Recommendations

No recommendations are identified for Building 30 Drum Storage Area.

17.7 Protectiveness Statement

The remedy at Building 30 Drum Storage Area is protective of human health and the environment because land use controls are in place and are effective.

17.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

Photo 1. Building 30 Drum Storage Area, Tracy Site

18.0 DSERTS 72 – NORTHERN DEPOT SOIL STOCKPILES

18.1 Remedial Action

18.1.1 Remedy Selection

DSERTS 72 is located west of SWMU 3 (Plate 1). Historically, residue from pesticide application trucks was discharged into the industrial waste lagoons (SWMU 3). The source of contaminants at DSERTS 72 is uncertain, but it is possible that some of the wash water used at SWMU 3 spilled onto the soil surrounding the lagoons. DSERTS 72 is not currently used.

During construction activities at SWMUs 2 and 3, a storm drain west of the SWMUs was inadvertently plugged. Heavy rains during the winter of 1998/1999 caused localized flooding at the Tracy Site, in part because of the plugged storm drain. DLA Installation Support at San Joaquin was directed to excavate and remove the pipeline from service and to redirect the stormwater to the stormwater detention pond (SWMU 4) (ICF Kaiser Engineers, Inc., 1999).

Between December 1998 and February 1999, a new storm drain and catch basin west of SWMUs 2 and 3 in DSERTS 72 was installed. Soil excavated during the installation was stockpiled, sampled, and classified for use as backfill or for off-site disposal.

Analytical results from the soil stockpiles indicated the presence of dieldrin, selenium, chlordane, endrin, DDD, DDE, DDT, and TPHMO. Based on these results, further sampling was warranted to determine the extent of contamination and the potential impact of the COCs to groundwater beneath DSERTS 72. In October 1999, March 2000, and January 2001, additional soil and groundwater samples were collected.

No further action was identified as the selected remedy for DSERTS 72 because there is no substantial existing or potential risk to human health or the environment. Total DDX and dieldrin were detected in one groundwater sample but not in the soil sample collected a short distance above that groundwater sample, indicating that DSERTS 72 is not a continuing source of pesticides migrating to groundwater. In addition, analyses were conducted on DI WET extracts from five soil samples to determine the amount of pesticides and TPHMO that could be dissolved in rainwater and migrate to groundwater. Pesticides and TPHMO were not detected in any of the DI WET extract samples, confirming that DSERTS 72 soil is not a current or future source of pesticide or TPHMO concentrations in groundwater. No habitat for ecological receptors was identified at the site.

The health risk assessment in the no further response action planned (NFRAP) document (URS, 2001d) used the light industrial worker and construction worker exposure scenarios, assuming that current and future land use for DSERTS 72 will remain industrial. The risk assessment concluded that there was not a risk to the health of industrial construction worker receptors. However, because the health risk assessment did not address the residential-use scenario, land use controls were established as the remedy for DSERTS 72 in the Site-Wide Comprehensive ROD Amendment as modified by the 2004 ESD. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

The RAO for DSERTS 72 is:

- Prohibit residential, day care, play area, or school use.

18.1.2 Remedy Implementation

Table 18-1 summarizes the remedy status for DSERTS 72.

Table 18-1. DSERTS 72 Remedy Status, Tracy Site

Remedy Component	Status
Land Use Controls • Implement notification procedure for land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures) • Perform annual review to ensure compliance with controls and to correct any deficiencies in the notification procedure • Follow defined procedures in the event of a change in land use • Sample and properly dispose of soil generated from any future excavation activities.	Remedial action in place.

DSERTS = Defense Site Environmental Reporting and Tracking System
RPMPD = real property master plan digest

Land use controls established in the Site-Wide Comprehensive ROD and modified by the 2004 ESD are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. The results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

18.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

18.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at DSERTS 72 is protective of human health and the environment.*

18.2.2 Status of Recommendations from First Five-Year Review

Following are the recommendations presented in the First Five-Year Review Report and their status.

Recommendation: *Land use controls should be maintained in accordance with the requirements of the 2004 ESD (URS Group, Inc., 2004a). Self- monitoring of land use status will be included in the annual report. Annual review of land use was not required until the 2004 ESD.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports.

Recommendation: *DSERTS 72 can be de-listed.*

Status: DSERTS 72 has not been de-listed. There are no plans at this time to de-list individual sites.

18.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspections. The DSERTS 72 site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

No significant issues were identified during the site inspection. Land use has not changed. Representatives from the regulatory agencies noted that land use control signs are not installed at DSERTS 72.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

18.4 Technical Assessment

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

Yes, the remedy for DSERTS 72 is functioning as intended by the Site-Wide Comprehensive ROD Amendment as modified by the 2004 ESD.

Land use controls are in place and effective. The Master Planner for the depot indicated familiarity with the appendix specifying land use control requirements, and he was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. No issues have been identified during the annual inspections. During the second five-year review site inspection, representatives of the regulatory agencies noted that land use control warning signs are not installed at the site.

18.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

Yes, the exposure assumptions, toxicity data and RAOs are still valid for DSERTS 72.

Changes to Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC that were identified for various soil contamination sites. Although no remedy was selected for DSERTS 72 in the Site-Wide Comprehensive ROD, a remedy for this site was established in the Site-Wide Comprehensive ROD Amendment. Action-specific and location-specific ARARs and TBCs for DSERTS 72 are assumed to be the same as those identified for non-SVE soil sites in the Site-Wide Comprehensive ROD.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil, and no cleanup standards were established for DSERTS 72.

Action-Specific ARARs. The action-specific ARARs for non-SVE soil sites stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid for DSERTS 72. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to this site; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARAR for DSERTS 72 is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site. In addition, land use controls are in place to protect human health and the environment.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. DSERTS 72 was identified as a site after the baseline risk assessment was conducted and after the Site-Wide Comprehensive ROD was signed. Subsequently, the risks to a commercial/industrial receptor from exposures to select pesticides of interest (DDD, DDE, DDT, and dieldrin) at DSERTS 72 were characterized (URS, 2001b). There have been no changes in the cancer toxicity factors, nor in the oral noncancer toxicity factors, for any of those compounds. The NFRAP utilized inhalation noncancer toxicity factors derived via extrapolation from oral noncancer toxicity values; however, there are no agency-published inhalation toxicity factors for these compounds available at the time of this second five-year review (also refer to the discussion below concerning changes in risk assessment methods). Consequently, the inhalation noncancer hazard estimates are overstated for DDD, DDE, DDT, and dieldrin in the NFRAP relative to current methods.

Changes in Risk Assessment Methods. The NFRAP utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes; at the time of this second five-year review, this practice is no longer supported by the EPA. Consequently, inhalation noncancer hazards for DDD, DDE, DDT, and dieldrin are overstated in the NFRAP relative to current methods. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy. Although no cleanup standards have been developed for DSERTS 72, land use controls are in place to protect human health and the environment.

Expected Progress Toward Meeting RAOs. Land use controls are in place and continue to meet the RAO.

18.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light since the first five-year review that could call into question the protectiveness of the remedy for DSERTS 72.

18.5 Issues

Minor issues for DSERTS 72 include:

- During the second five-year review site inspection, representatives of the regulatory agencies noted that land use control warning signs are not installed at DSERTS 72.

18.6 Recommendations

Recommendations intended to address minor issues for DSERTS 72 include:

- Install land use control warning signs.

18.7 Protectiveness Statement

The remedy at DSERTS 72 is protective of human health and the environment because land use controls are in place and are effective.

18.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

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Photo 1. DSERTS 72, Tracy Site

19.0 EASTERN DEPOT SOILS AREA

19.1 Remedial Action

19.1.1 Remedy Selection

The Eastern Depot Soils Area consists of non-vegetated areas on the eastern side of the depot historically used for grader-training exercises (Plate 1). These areas were sampled during the RI, and the baseline risk assessment concluded that the health risk in the Eastern Depot Soils Area was acceptable under the current industrial land use scenario but not under the potential future residential land use scenario (Montgomery Watson, 1996b).

The Site-Wide Comprehensive ROD does not address land use controls for the Eastern Depot Soils Area; however, land use controls were established as the remedy for this site in the 2001 ESD to address potential health risks in the event of a land use change. The land use controls were modified in the 2004 ESD. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

The RAO for the Eastern Depot Soils Area is:

- Prohibit residential, day care, play area, or school use.

The 2004 ESD identifies aluminum, arsenic, chlordane, dieldrin, DDX, and PCBs as COCs for the Eastern Depot Soils Area. However, no cleanup standards were established for these contaminants.

19.1.2 Remedy Implementation

Table 19-1 summarizes the remedy status for the Eastern Depot Soils Area.

Table 19-1. Eastern Depot Soils Area Remedy Status, Tracy Site

Remedy Component	Status
Land Use Controls • Implement notification procedure for land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures) • Perform annual review to ensure compliance with controls and to correct any deficiencies in the notification procedure • Follow defined procedures in the event of a change in land use • Sample and properly dispose of soil generated from any future excavation activities	Remedial action in place.

RPMPD = real property master plan digest

Land use controls established in the 2001 ESD and modified by the 2004 ESD are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. The results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

19.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

19.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at the Eastern Depot Soils Area (including the identified land use controls) is protective of human health and the environment.*

19.2.2 Status of Recommendations from First Five-Year Review

Following are the recommendations presented in the First Five-Year Review Report and their status.

Recommendation: *De-listing is recommended for the Eastern Depot Soils Area.*

Status: The Eastern Depot Soils Area was not de-listed. There are no plans at this time to de-list individual sites.

Recommendation: *Self-monitoring of land use status will be included in the annual report. Annual review of land use was not required until the 2004 ESD.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports.

19.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspection. The Eastern Depot Soils Area site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

No significant issues were identified during the site inspection. Land use has not changed. Representatives from the regulatory agencies noted that land use control warning signs are not installed at the Eastern Depot Soils Area.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

19.4 Technical Assessment

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

Yes, the remedy for the Eastern Depot Soils Area is functioning as intended by the 2001 and 2004 ESDs.

The 2001 ESD as modified by the 2004 ESD established land use controls as the remedy at the Eastern Depot Soils Area to address health risks under the future residential land use scenario to prevent human

health exposure to aluminum, arsenic, chlordane, dieldrin, DDX, and PCBs. No cleanup levels were developed for the Eastern Depot Soils Area.

Land use controls are in place and are effective. The Master Planner for the depot indicated a familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. During the 2009 inspection, it was noted that concrete crushing and recycling activities were occurring at the site. Since land use was still industrial, notification was not necessary. During the second five-year review site inspection, representatives of regulatory agencies noted that land use control warning signs are not installed at the Eastern Depot Soils Area.

19.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?

Yes, the exposure assumptions, toxicity data, and RAOs are still valid for the Eastern Depot Soils Area.

Changes to Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC that were identified for various soil contamination sites. Although no remedy was selected for the Eastern Depot Soils Area in the Site-Wide Comprehensive ROD, a remedy for this site was established in the 2001 ESD. Action-specific and location-specific ARARs and TBCs for the Eastern Depot Soils Area are assumed to be the same as those identified for non-SVE soil sites in the Site-Wide Comprehensive ROD.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil, and no cleanup standards were established for the Eastern Depot Soils Area.

Action-Specific ARARs. The action-specific ARARs for non-SVE soil sites stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid for the Eastern Depot Soils Area. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to this site; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARARs for the Eastern Depot Soils Area is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site. In addition, land use controls are in place to protect human health and the environment.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. Changes in toxicity and other contaminant characteristics were not reviewed because no cleanup standards were developed for the Eastern Depot Soils Area. However, the 2004 ESD identifies aluminum, arsenic, chlordane, dieldrin, DDX, and PCBs as chemicals of concern at this site. If land use changes are proposed for the Eastern Depot Soils Area and if a quantitative risk assessment becomes necessary, then the assessment would rely on then-current chemical data.

Changes in Risk Assessment Methods. Changes in risk assessment methods were not reviewed because no cleanup standards or RAOs were previously developed for the Eastern Depot Soils Area. If land use

changes are proposed for the Eastern Depot Soils Area and if a quantitative risk assessment becomes necessary, then the assessment would rely on then-current risk assessment methods.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy. Although no cleanup standards have been developed for the Eastern Depot Soils Area, land use controls are in place to protect human health and the environment.

Expected Progress Toward Meeting RAOs. Land use controls are in place and continue to meet the RAO.

19.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light since the first five-year review that could call into question the protectiveness of the remedy for the Eastern Depot Soils Area.

19.5 Issues

Minor issues for the Eastern Depot Soils Area include:

- During the second five-year review site inspection, representatives of the regulatory agencies noted that land use control warning signs are not installed at the Eastern Depot Soils Area.

19.6 Recommendations

Recommendations intended to address minor issues for the Eastern Depot Soils Area include:

- Install land use control warning signs.

19.7 Protectiveness Statement

The remedy at the Eastern Depot Soils Area is protective of human health and the environment because land use controls are in place and are effective.

19.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

Photo 1. Eastern Depot Soils Area, Tracy Site

Photo 2. Eastern Depot Soils Area, Tracy Site

20.0 SOUTHERN DEPOT SOILS AREA

20.1 Remedial Action

20.1.1 Remedy Selection

The Southern Depot Soils Area consists of non-vegetated areas at the southern end of the depot historically used for grader training exercises (Plate 1). The depot's truck gate and transport control facility, constructed on a portion of this site, is planned for completion in 2010. These areas were sampled during the RI, and the baseline risk assessment concluded that the health risk in the Southern Depot Soils Area was acceptable under the current industrial land use scenario but not under the potential future residential land use scenario (Montgomery Watson, 1996b).

The Site-Wide Comprehensive ROD does not address land use controls for the Southern Depot Soils Area; however, land use controls were established as the remedy for this site in the 2001 ESD to address potential health risks in the event of a land use change. The land use controls were modified in the 2004 ESD. DLA is responsible for implementing, monitoring, maintaining, and enforcing land use controls in accordance with the procedures and requirements documented in the appendix to the RPMPD.

The RAO for the Southern Depot Soils Area is:

- Prohibit residential, day care, play area, or school use.

The 2004 ESD identifies dieldrin as a COC for the Southern Depot Soils Area. However, no cleanup standard was established for this contaminant.

20.1.2 Remedy Implementation

Table 20-1 summarizes the remedy status for the Southern Depot Soils Area.

Table 20-1. Southern Depot Soils Area Remedy Status, Tracy Site

Remedy Component	Status
Land Use Controls • Implement notification procedure for land use changes in the RPMPD • Maintain administrative controls (i.e., RPMPD appendix and notification procedures) • Perform annual review to ensure compliance with controls and to correct any deficiencies in the notification procedure • Follow defined procedures in the event of a change in land use • Sample and properly dispose of soil generated from any future excavation activities	Remedial action in place.

RPMPD = real property master plan digest

Land use controls established in the 2001 ESD and modified by the 2004 ESD are in place at the site; the site is inspected annually to evaluate the effectiveness of the land use controls. The results of the annual inspections are presented in Well Monitoring Program Annual Monitoring Reports.

20.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

20.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy at the Southern Depot Soils Area (including the identified land use controls) is protective of human health and the environment.*

20.2.2 Status of Recommendations from First Five-Year Review

Following are the recommendations presented in the First Five-Year Review Report and their status.

Recommendation: *The Southern Depot Soils Area is recommended for de-listing.*

Status: The Southern Depot Soils Area was not de-listed. There are no plans at this time to de-list individual sites.

Recommendation: *Self-reporting of land use status will be included in the annual report. Annual review of the land use was not required until the 2004 ESD.*

Status: Ongoing. Annual inspections have been performed since the first five-year review to ensure land use controls are being maintained and enforced. Inspection results are documented in Well Monitoring Program Annual Monitoring Reports.

20.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspection. The Southern Depot Soils Area site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

A truck gate and transport control facility are being constructed over a portion of the Southern Depot Soils Area. DLA Installation Support at San Joaquin followed appropriate procedures in notifying the RPMs prior to construction. The land use will still be industrial. Representatives from the regulatory agencies noted that land use control warning signs are not installed at the Southern Depot Soils Area.

Mr. William Laws, Master Planner for the depot, was visited on 28 July 2010 to confirm that he understood the appendix to the RPMPD addressing land use controls for the site and that it was accessible.

20.4 Technical Assessment

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

Yes, the remedy for the Southern Depot Soils Area is functioning as intended by the 2001 and 2004 ESDs.

The 2001 ESD as modified by the 2004 ESD established land use controls as the remedy at the Southern Depot Soils Area to address health risks under the future residential land use scenario to prevent human health exposure to dieldrin. No cleanup levels were developed for the Southern Depot Soils Area.

Land use controls are in place and are effective. The Master Planner for the depot indicated a familiarity with the appendix to the RPMPD specifying land use control requirements and was able to access it readily. Annual inspections are conducted to ensure land use controls are being maintained and enforced; inspection results are reported in Well Monitoring Program Annual Monitoring Reports. During the 2009 and 2010 annual inspections, it was noted that a new truck gate and a transport control facility are being constructed through this area. During the second five-year review site inspection, DLA Installation Support at San Joaquin verified that notification procedures were properly followed. In addition, representatives of regulatory agencies noted that land use control warning signs are not installed at the Southern Depot Soils Area.

20.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?

Yes, the exposure assumptions, toxicity data, and RAOs are still valid for the Southern Depot Soils Area.

Changes to Standards and TBCs. The Site-Wide Comprehensive ROD identifies chemical-, action-, and location-specific ARARs and other guidance and/or goals TBC that were identified for various soil contamination sites. Although no remedy was selected for the Southern Depot Soils Area in the Site-Wide Comprehensive ROD, a remedy for this site was established in the 2001 ESD. Action-specific and location-specific ARARs and TBCs for the Southern Depot Soils Area are assumed to be the same as those identified for non-SVE soil sites in the Site-Wide Comprehensive ROD.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil, and no cleanup standards were established for the Southern Depot Soils Area.

Action-Specific ARARs. The action-specific ARARs for non-SVE soil sites stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid for the Southern Depot Soils Area. Portions of Title 22 CCR Section 67391.1 (State land use covenant) also apply to this site; however, no depot property was transferred during the period of this five-year review.

Location-Specific ARARs. The location-specific ARAR for the Southern Depot Soils Area is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site. In addition, land use controls are in place to protect human health and the environment.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. Changes in toxicity and other contaminant characteristics were not reviewed because no cleanup standards were developed for the Southern Depot Soils Area. However, the 2004 ESD identifies dieldrin as a chemical of concern at this site. If land use changes are proposed for the Southern Depot Soils Area and if a quantitative risk assessment becomes necessary, then the assessment would rely on then-current chemical data.

Changes in Risk Assessment Methods. Changes in risk assessment methods were not reviewed because no cleanup standards or RAOs were previously developed for the Southern Depot Soils Area. If land use

changes are proposed for the Southern Depot Soils Area and if a quantitative risk assessment becomes necessary, then the assessment would rely on then-current risk assessment methods.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy. Although no cleanup standards have been developed for the Southern Depot Soils Area, land use controls are in place to protect human health and the environment.

Expected Progress Toward Meeting RAOs. Land use controls are in place and continue to meet the RAO.

20.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light since the first five-year review that could call into question the protectiveness of the remedy for the Southern Depot Soils Area.

20.5 Issues

Minor issues for the Southern Depot Soils Area include:

- During the second five-year review site inspection, representatives of the regulatory agencies noted that land use control warning signs are not installed at the Southern Depot Soils Area.

20.6 Recommendations

Recommendations intended to address minor issues for the Southern Depot Soils Area include:

- Install land use control warning signs.

20.7 Protectiveness Statement

The remedy at the Southern Depot Soils Area is protective of human health and the environment because land use controls are in place and are effective.

20.8 Next Five-Year Review

The third five-year review for the Tracy Site will evaluate the remedy for the time period between 2010 and 2015.

Photo 1. Southern Depot Soils Area, Tracy Site

Photo 2. Southern Depot Soils Area, Tracy Site

21.0 DAY CARE CENTER

21.1 Remedial Action

The Day Care Center is located on the western depot boundary north of the main depot entrance on Chrisman Road (Plate 1). Soil samples were collected at the Day Care Center in 1994 as part of the RI. It was determined that DDD and dieldrin were present above their respective background threshold concentrations. Based on the analytical results from the RI, a potential cancer risk of 2×10^{-5} (primarily from dieldrin) and a hazard index of 0.3 were estimated for children attending the Day Care Center (Montgomery Watson, 1996b).

DLA Installation Support at San Joaquin initiated a time-critical removal action to reduce the potential cancer risk. Soil was excavated around pavement, buildings, and trees, and pea gravel was removed from the play area. The upper 12 inches of soil were excavated and backfilled with 12 inches of clean soil. Approximately 700 cubic yards of soil were excavated at the site. Approximately 500 cubic yards of excavated soil were disposed at Forward Landfill in Manteca, California. The remaining 200 cubic yards were disposed at East Carbon Development Corporation in Utah. Confirmatory wipe samples were collected from the playground equipment; all results were below method detection limits. The *Child Care Facility Closure Report* (Radian Corporation, 1996a) documents analytical results for the fill material used to backfill the excavation.

After the time-critical removal action was completed, the Site-Wide Comprehensive ROD identified the Day Care Center as a no further action site.

Table 21-1 summarizes the remedy status for the Day Care Center.

Table 21-1. Day Care Center Remedy Status, Tracy Site

Remedy Component	Status
Time-critical removal action conducted prior to Site-Wide Comprehensive ROD	Response complete.

ROD = record of decision

21.2 Progress Since Last Review

This section summarizes progress since the first five-year review; it includes the protectiveness statement and the status of recommendations and follow-up actions made in the First Five-Year Review Report.

21.2.1 Protectiveness Statement from First Five-Year Review

The protectiveness statement in the First Five-Year Review Report states: *The remedy is considered protective of human health and the environment because the exposure pathway has been eliminated.*

21.2.2 Status of Recommendations from First Five-Year Review

Following are the recommendations presented in the First Five-Year Review Report and their status:

Recommendation: *Remedial action has been completed at the Day Care Center. As part of the five-year review, the historical soil data were reviewed. Based on the data, land use controls are recommended.*

Land use control requirements will be documented in future revisions of the Installation Master Plan (IMP) in early 2006.

Status: Land use controls at the Day Care Center were not included in the RPMPD (formerly IMP). The site data were reviewed, and the determination was made that no significant residual contamination is present at the Day Care Center; EPA concurred with this determination. Therefore, the site is suitable for unrestricted use and land use controls are not needed at the Day Care Center (see Appendix E).

Recommendation: *Action items for the review include visual observation of the Day Care Center for evidence of excavation or other disruptions of the area backfilled with 12 inches of clean soil. The effectiveness of the land use implemented at the Day Care Center should be assessed under the next five-year review.*

Status: An inspection was performed as part of the second five-year review; no evidence of excavation or other disruption of the excavated areas backfilled with clean soil was observed at the site.

21.3 Five-Year Review Process

DLA Installation Support at San Joaquin and URS inspected the site on 16 July 2010. Representatives from the EPA, DTSC, RWQCB-CV, and HDR | e^2M participated in the inspection. The Day Care Center site inspection form is provided in Appendix C; photographs taken during the site inspection are included at the end of this section.

No significant issues were identified during the site inspection. There were no changes in land use and no signs of soil disturbance. Representatives of the regulatory agencies requested that warning signs be installed if land use controls are added to the remedy. EPA expressed concern of having land use controls at a day care facility. As noted in Section 21.2.2, the site data were reviewed, and the determination was made that the Day Care Center is suitable for unrestricted use; therefore, land use controls are not necessary (see Appendix E). In addition, the day care facility is scheduled to be moved to a new location on the depot in 2012.

21.4 Technical Assessment

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

Yes, the remedy for the Day Care Center is functioning as intended by the Site-Wide Comprehensive ROD.

An RAO was not identified in the Site-Wide Comprehensive ROD because a time-critical removal action reduced the incremental risk associated with soils remaining at the Day Care Center to less than 1×10^{-6} (Radian International, 1998a). This implies an RAO of preventing human exposure to unacceptable levels of pesticides (dieldrin and DDD) in the soil.

During the second five-year review site inspection, no disturbance of the areas backfilled with clean soil was observed. The exposure pathway is currently incomplete.

21.4.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?

Yes, the exposure assumptions, toxicity data, and RAOs are still valid for the Day Care Center.

Changes in Standards and TBCs. No ARARs or TBCs are specified in the Site-Wide Comprehensive ROD for the Day Care Center because the site was identified for no further action. Because subsurface soil contamination still exists at the site, it is assumed that the ARARs and TBCs for non-SVE soil sites apply to the Day Care Center.

Chemical-Specific ARARs. There are no numerical chemical-specific ARARs for soil (there are, however, chemical-specific ARARs for waste disposal). Risk-based cleanup standards for surface soil at this site have been met. No cleanup standards for subsurface soil were established for the Day Care Center.

Action-Specific ARARs. The action-specific ARARs for non-SVE soil sites stated in Table 10-3 of the Site-Wide Comprehensive ROD are still valid for subsurface soil at the Day Care Center.

Location-Specific ARARs. The location-specific ARAR for the Day Care Center is the Endangered Species Act. However, no endangered species have been observed at the depot.

There are no revised or recently promulgated standards or TBCs that affect the protectiveness of the remedy for the site.

Changes in Exposure Pathways. No changes in exposure pathways have been identified.

Changes in Toxicity and Other Contaminant Characteristics. The baseline risk assessment characterized the cancer risks and noncancer health hazards of the chemicals of interest (DDD and dieldrin) and others via ingestion, inhalation, and dermal contact. There have been no changes in the cancer toxicity factors, nor in the oral noncancer toxicity factors, for DDD and dieldrin. The baseline risk assessment utilized inhalation noncancer toxicity factors derived via extrapolation from oral noncancer toxicity values; however, there are no agency-published inhalation toxicity factors for DDD and dieldrin available at the time of this second five-year review (also refer to the discussion below concerning changes in risk assessment methods). Consequently, the inhalation noncancer hazard estimates are overstated for DDD and dieldrin in the baseline risk assessment relative to current methods.

Changes in Risk Assessment Methods. The baseline risk assessment utilized extrapolation of noncancer toxicity data between ingestion and inhalation routes; at the time of this second five-year review, this is a practice no longer supported by the EPA. Consequently, inhalation noncancer hazards for DDD and dieldrin, and other chemicals, are overstated in the baseline risk assessment relative to current methods. In addition, the general methods for estimating cancer risks and noncancer hazards via inhalation have changed since the first five-year review. The changes, however, are largely in computational method, and the resulting mathematical risk and hazard estimates would be generally similar in value.

No changes to the toxicity factors or risk assessment methods have been identified in this second five-year review that affect the protectiveness of the remedy.

Expected Progress Toward Meeting RAOs. The time-critical removal action at the Day Care Center reduced the incremental cancer risk to less than 1×10^{-6}; therefore, the site is protective of human health and the environment.

21.4.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has come to light since the first five-year review that could call into question the protectiveness of the remedy for the Day Care Center.

21.5 Issues

- No issues are identified for the Day Care Center.

21.6 Recommendations

- No recommendations are identified for the Day Care Center.

21.7 Protectiveness Statement

The remedy at the Day Care Center is protective of human health and the environment, and land use controls are not required at this site.

21.8 Next Five-Year Review

Because the Day Care Center is suitable for unlimited use and unrestricted exposure, it will not be evaluated in future five-year reviews for the Tracy Site.

Photo 1. Day Care Center, Tracy Site

Photo 2. Day Care Center, Tracy Site

Photo 3. Day Care Center, Tracy Site

Photo 4. Day Care Center, Tracy Site

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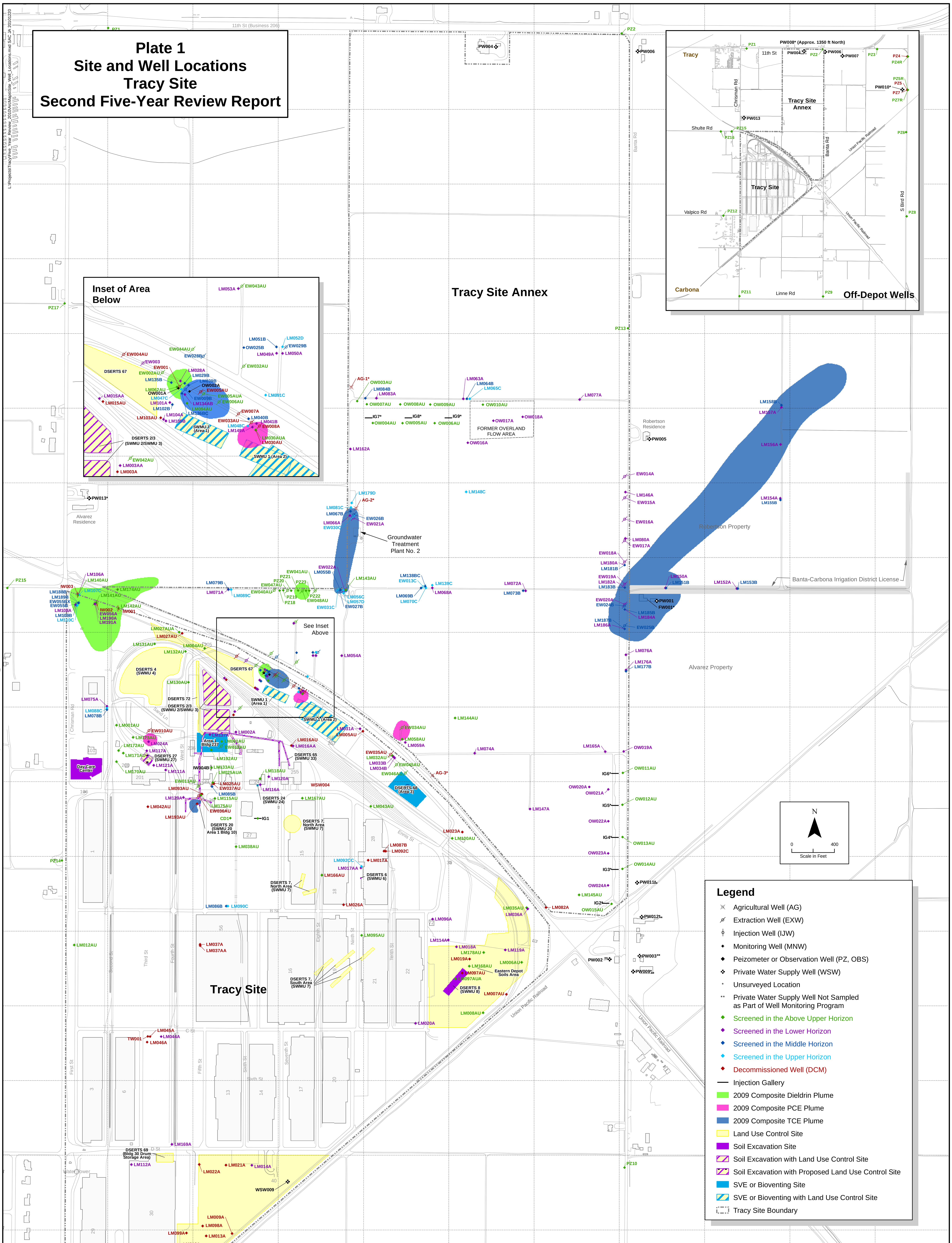
Plate 1
Site and Well Locations
Tracy Site
Second Five-Year Review Report



Well	Type	Location
AG-1*	DCM	D-6
AG-2*	DCM	D-8
AG-3*	DCM	E-11
CD1	PZ	C-12
EW001	DCM	C-10
EW002AU	EXW	C-10
EW003	EXW	C-10
EW004AU	DCM	C-10
EW005AU	DCM	C-10
EW005AUA	EXW	C-10
EW006AU	EXW	D-10
EW007A	DCM	D-10
EW008A	DCM	D-10
EW009B	EXW	C-10
EW010AU	DCM	B-11
EW011AU	EXW	C-12
EW012AU	EXW	C-11
EW013C	EXW	E-9
EW014A	EXW	H-7
EW015A	EXW	H-8
EW016A	EXW	H-8
EW017A	EXW	H-8
EW018A	EXW	H-9
EW019A	EXW	H-9
EW020A	EXW	H-9
EW021A	EXW	D-8
EW022A	EXW	D-9
EW024B	EXW	H-9
EW025B	EXW	H-9
EW026B	EXW	D-8
EW027B	EXW	D-9
EW028B	EXW	C-10
EW029B	EXW	D-10
EW030C	EXW	D-8
EW031C	EXW	D-9

Well	Type	Location
EW032AU	EXW	D-10
EW033AU	DCM	D-10
EW034AU	EXW	E-11
EW035AU	DCM	E-11
EW036AU	DCM	C-12
EW037AU	DCM	C-12
EW040AU	EXW	C-9
EW041AU	EXW	D-9
EW042AU	EXW	C-11
EW043AU	EXW	D-9
EW044AU	EXW	C-10
EW045AU	EXW	E-11
EW046AU	EXW	E-11
EW047AU	EXW	D-9
EW048AU	EXW	D-9
EW055B	EXW	A-9
EW055BX	EXW	A-9
EW056A	EXW	A-9
FW001*	OBS	H-9
IG1	IG	C-12
IG2*	IG	G-13
IG3*	IG	G-13
IG4*	IG	G-12
IG5*	IG	G-12
IG6*	IG	G-11
IG7*	IG	E-7
IG8*	IG	E-7
IG9*	IG	E-7
IW001	DCM	B-9
IW002	DCM	A-9
IW003	DCM	A-9
IW004B	IJW	C-11
LM001AU	MNW	B-11
LM002A	MNW	C-11
LM003A	DCM	C-11

Well	Type	Location
LM003AA	MNW	C-11
LM004AU	MNW	C-10
LM005AU	DCM	D-11
LM006AU	MNW	F-14
LM007AU	DCM	F-14
LM008AU	MNW	F-15
LM009A	DCM	C-18
LM010A	DCM	C-18
LM011A	DCM	A-18
LM012AU	MNW	A-14
LM013A	DCM	C-18
LM014A	MNW	C-17
LM015AA	MNW	C-10
LM015AU	DCM	C-10
LM016AA	MNW	D-11
LM016AU	DCM	D-11
LM017A	DCM	E-13
LM017AA	MNW	D-13
LM018A	MNW	F-14
LM019A	DCM	F-14
LM020A	MNW	E-15
LM021A	DCM	C-17
LM022A	DCM	C-17
LM023A	DCM	F-12
LM024A	MNW	B-11
LM025AU	DCM	C-12
LM025AUA	MNW	C-12
LM026A	DCM	D-13
LM027AU	DCM	B-10
LM027AUA	MNW	B-9
LM028A	MNW	C-10
LM029B	MNW	C-10
LM030AU	DCM	D-10
LM030AUA	MNW	D-10
LM031A	MNW	D-11

Well	Type	Location
LM032AU	MNW	E-11
LM033B	MNW	E-11
LM034B	MNW	E-11
LM035AU	MNW	F-13
LM036A	MNW	F-13
LM037A	DCM	C-14
LM037AA	DCM	C-14
LM038AU	MNW	C-12
LM039B	MNW	C-10
LM040B	MNW	D-10
LM041B	MNW	D-10
LM042AU	DCM	B-12
LM043AU	MNW	E-12
LM044A	PZ	B-15
LM045A	DCM	B-15
LM046A	DCM	B-15
LM047C	MNW	C-10
LM048C	MNW	D-10
LM049A	MNW	D-10
LM050A	MNW	D-10
LM051B	MNW	D-10
LM052D	MNW	D-10
LM053A	MNW	D-9
LM054A	MNW	D-10
LM055B	MNW	D-9
LM056C	MNW	D-9
LM057D	MNW	D-9
LM058AU	MNW	E-11
LM059A	MNW	E-11
LM061AU	MNW	C-11
LM062AU	MNW	C-10
LM063A	MNW	F-6
LM064B	MNW	F-6
LM065C	MNW	F-6
LM066A	MNW	D-8

Well	Type	Location
LM067B	MNW	D-8
LM068A	MNW	E-9
LM069B	MNW	E-9
LM070C	MNW	E-9
LM071A	MNW	C-9
LM072A	MNW	F-9
LM073B	MNW	F-9
LM074A	MNW	F-11
LM075A	MNW	A-10
LM076A	MNW	H-10
LM077A	MNW	G-6
LM078B	MNW	A-11
LM079B	MNW	C-9
LM080A	MNW	H-8
LM081C	MNW	D-8
LM082A	DCM	G-13
LM083A	MNW	E-6
LM084B	MNW	E-6
LM085B	MNW	C-12
LM086B	MNW	C-13
LM087B	DCM	E-12
LM088C	MNW	A-11
LM089C	MNW	C-9
LM090C	MNW	C-13
LM091C	MNW	D-10
LM092C	DCM	E-12
LM092CC	MNW	D-13
LM093AU	DCM	C-12
LM094AU	MNW	C-10
LM095AU	MNW	D-14
LM096A	MNW	E-13
LM097AU	DCM	F-14
LM097AUA	MNW	F-14
LM098A	DCM	C-17
LM099A	DCM	B-18

Well	Type	Location
LM100AU	MNW	F-12
LM101A	MNW	C-10
LM102B	MNW	C-10
LM103AU	DCM	C-10
LM104A	MNW	C-10
LM105B	MNW	C-10
LM106A	MNW	A-9
LM107C	MNW	A-9
LM108A	MNW	A-9
LM109B	MNW	A-9
LM110C	MNW	A-9
LM111A	MNW	B-11
LM112A	MNW	B-17
LM113A	DCM	B-18
LM114A	MNW	E-14
LM115AU	MNW	C-12
LM116A	MNW	C-12
LM117A	MNW	B-11
LM118AU	MNW	C-11
LM119A	MNW	F-14
LM120A	MNW	C-11
LM121A	MNW	B-11
LM122A	DCM	A-18
LM123B	DCM	A-18
LM124C	DCM	A-18
LM125A	MNW	A-19
LM126A	MNW	B-19
LM127B	MNW	B-19
LM128C	MNW	B-19
LM129A	MNW	B-12
LM130AU	MNW	B-10
LM131AU	PZ	B-10
LM132AU	PZ	B-10
LM133AU	PZ	C-11
LM134AB	MNW	C-10

Well	Type	Location
LM135B	MNW	C-10
LM136BC	MNW	C-10
LM137A	MNW	C-11
LM138BC	PZ	E-9
LM139C	PZ	E-9
LM140AU	MNW	A-9
LM141AU	MNW	A-9
LM142AU	MNW	B-9
LM143AU	MNW	D-9
LM144AU	MNW	F-11
LM145AU	MNW	G-13
LM146A	MNW	H-8
LM147A	MNW	F-12
LM148C	MNW	F-8
LM149A	MNW	D-10
LM150A	MNW	H-9
LM151B	MNW	H-9
LM152A	MNW	I-9
LM153B	MNW	I-9
LM154A	MNW	I-8
LM155B	MNW	I-8
LM156A	MNW	I-7
LM157A	MNW	I-6
LM158B	MNW	I-6
LM162A	MNW	D-7
LM165A	MNW	G-11
LM166AU	DCM	D-13
LM167AU	MNW	D-12
LM168AU	MNW	F-14
LM169A	MNW	B-16
LM170AU	MNW	B-11
LM171AU	MNW	B-11
LM172AU	MNW	B-11
LM173AU	MNW	B-11
LM174AU	MNW	B-9

Well	Type	Location
LM175AU	MNW	C-12
LM176A	MNW	H-10
LM177B	MNW	H-10
LM178AU	MNW	F-14
LM179D	MNW	D-8
LM180A	MNW	H-9
LM181B	MNW	H-9
LM182A	MNW	H-9
LM183B	MNW	H-9
LM184A	MNW	H-9
LM185B	MNW	H-9
LM186A	MNW	H-9
LM187B	MNW	H-9
LM188B	MNW	A-9
LM189B	MNW	A-9
LM190A	MNW	A-9
LM191A	MNW	A-9
LM192AU	MNW	C-11
LM193AU	DCM	C-12
OW001A	OBS	C-10
OW002A	OBS	C-10
OW003AU	OBS	D-6
OW004AU	OBS	E-7
OW005AU	OBS	E-7
OW006AU	OBS	E-7
OW007AU	OBS	E-6
OW008AU	OBS	E-6
OW009AU	OBS	E-6
OW010AU	OBS	F-6
OW011AU	OBS	H-11
OW012AU	OBS	H-12
OW013AU	OBS	H-12
OW014AU	OBS	H-13
OW015AU	OBS	G-13
OW016A	OBS	F-7

Well	Type	Location
OW017A	OBS	F-7
OW018A	OBS	F-7
OW019A	OBS	H-11
OW020A	OBS	G-12
OW021A	OBS	G-12
OW022A	OBS	G-12
OW023A	OBS	G-12
OW024A	OBS	G-13
OW025B	OBS	D-10
PW001	WSW	H-9
PW002	WSW	G-14
PW003	WSW	H-14
PW004	WSW	F-2
PW005	WSW	H-7
PW006	WSW	H-2
PW007	WSW	I-2
PW008*	WSW	11th St
PW009*	WSW	H-14
PW010*	WSW	S Bird Rd
PW011*	WSW	H-13
PW012*	WSW	H-13
PW013*	WSW	A-8
PZ1	PZ	B-1
PZ2	PZ	H-1
PZ3	PZ	11th St
PZ4	DCM	S Bird Rd
PZ4R	PZ	S Bird Rd
PZ5	DCM	S Bird Rd
PZ5R	PZ	S Bird Rd
PZ6	PZ	S Bird Rd
PZ7	DCM	S Bird Rd
PZ7R	PZ	S Bird Rd
PZ8	PZ	S Bird Rd
PZ9	PZ	Linne Rd
PZ10	PZ	H-17

Well	Type	Location
PZ11	PZ	Chrisman Rd
PZ12	PZ	Valpico Rd
PZ13	PZ	H-5
PZ14	PZ	A-13
PZ15	PZ	Shulte Rd
PZ16	PZ	Shulte Rd
PZ17	PZ	A-5
PZ18	PZ	D-9
PZ19	PZ	D-9
PZ20	PZ	D-9
PZ21	PZ	D-9
PZ22	PZ	D-9
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TW001	DCM	B-15
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APPENDIX A

Conceptual Site Model

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Abbreviations and Acronyms

ACL	aquifer cleanup level
AG	agricultural well
bgs	below ground surface
CCl_4	carbon tetrachloride
CD	chimney drain
$CHCl_3$	chloroform
COC	contaminant of concern
CPT	cone penetrometer test
CSM	conceptual site model
DDC	Defense Distribution Center
DDRE	Defense Distribution Region East
DDRW	Defense Distribution Region West
DLA	Defense Logistics Agency
DO	dissolved oxygen
DoD	United States Department of Defense
DTSC	California Department of Toxic Substances Control
FS	feasibility study
ft/ft	foot per foot
GWTP	groundwater treatment plant
IG	infiltration gallery
IRM	interim remedial measure
IW	injection well
mg/L	milligrams per liter
msl	mean sea level
mV	millivolt
NWC	northwestern corner
ORP	oxidation reduction potential
OU	operable unit
PCE	tetrachloroethene
POW	prisoner of war
RI	remedial investigation
SSL	sanitary sewage lagoon
STOP	SVE termination or optimization process
SVE	soil vapor extraction
SWMU	solid waste management unit

Abbreviations and Acronyms (Continued)

TCE	trichloroethene
TOC	total organic carbon
URS	URS Group, Inc.
VOC	volatile organic compound
µg/L	micrograms per liter
°F	degrees Fahrenheit

A.0 CONCEPTUAL SITE MODEL

Information collected during investigations and monitoring activities is used to characterize the physical, biological, and chemical environment at a site. Integration of this information into a conceptual site model (CSM) is important for an overall understanding of the site and for determining whether additional information needs to be collected. The CSM also provides an understanding of contaminant problems addressed by response actions, and the current and future protectiveness of the response actions. This CSM was compiled from information presented in the *DDJC-Tracy Response Completion Plan* (URS Group, Inc.[URS], 2008) and *DDJC-Tracy Well Monitoring Program 2009 Annual Monitoring Report* (HDR | e^2M, 2010) and other historical documents that can be reviewed in the Administrative Record.

Note: All figures are provided at the end of the appendix, after the text.

A1.0 Site History and Land Use

The Tracy Site comprises the depot and additional annex property. The 448-acre active depot portion of the installation forms a triangle: the western edge of the Tracy Site is oriented in a north-south direction extending approximately 1.4 miles long and bounded by Chrisman Road; each of the remaining two sides of the Tracy Site are approximately 1.2 miles in length and bounded by railroad tracks. The annex property (460 acres) is located to the north and northeast of the active installation.

A1.1 Historical Land Use

Prior to the construction of the depot, the historic land use was primarily agricultural (irrigated cropland and orchards and pasture for livestock grazing) and industrial (railroad transportation). During the 1870s, Southern Pacific Railroad founded the City of Tracy and developed it as a maintenance and supply facility for trains moving to and from the San Francisco Bay Area. In 1942, the Tracy Site originated as a "sub depot" of the United States Army's Quartermaster Corps, Oakland Army Depot. In 1963, operational control of the site was transferred from Defense Logistics Agency (DLA), though the Army retains ownership of the property. In 1990, a United States Department of Defense (DoD) reorganization placed all supply depots under operation of the DLA. The Tracy Site and its sister site (Sharpe) were consolidated, and Defense Distribution Region West (DDRW) was formed and headquartered at the Sharpe Site in 1990; DDRW oversaw DLA supply facilities throughout the western states. In 1997, DDRW and Defense Distribution Region East (DDRE) were consolidated into Defense Distribution Center (DDC), headquartered in New Cumberland, Pennsylvania.

The oldest buildings at the Tracy Site were built in 1942. During World War II there was a German prisoner of war (POW) camp in the southern corner of the depot, but only written records, including plan drawings, of this POW camp remain. No building or location at the site is being considered for the National Registry of Historic Sites.

Past depot mission activities that resulted in environmental contamination included vehicle maintenance, material stockpiling, drum storage, waste disposal, and wastewater management. Inadvertent releases of chemicals and hydrocarbon fuels have contaminated depot soils. Contaminants entered groundwater by dissolution in percolating water and volatilization into migrating soil gas through soil pores to the water table. The annex property was acquired in 1993 because groundwater contamination had migrated beneath this area.

A1.2 Current and Future Land Use

The current mission at the Tracy Site is to provide supplies, including military repair parts, clothing and textiles, medical supplies, and industrial and electronic components, to military customers throughout the United States and the world. Depot land is designated as a public facility in the *City of Tracy General Plan* (City of Tracy, 2010). Three water supply wells in the southern portion of the depot provide all potable water, process water, and fire suppression water for the Tracy Site.

The area surrounding the Tracy Site comprises mixed-use light industrial, agricultural, and residential areas. At the eastern corner of the depot, two major Union Pacific railroad lines intersect; small parcels to the south and east of the railroad intersection are designated for industrial use (City of Tracy, 2010). Areas outside of the City of Tracy sphere of influence include agricultural land consisting of orchards and row crops (County of San Joaquin, 2000). These agricultural lands lie to the north (including the annex property), east, and south of the depot; scattered rural single-family residences are also present in these areas. To the west of the depot in the City of Tracy are single-family residences in a low-density residential development (City of Tracy, 2010).

The unincorporated areas of Tracy, the unincorporated community of Banta, and other rural neighborhoods are within a 3-mile radius of the Tracy Site. In each of these areas, private water supply wells provide drinking water. The installation of future water supply wells is governed by San Joaquin County Ordinance Code Section 9-1115. The community of Banta, 2 miles northeast of the site, includes an elementary school, about 30 residences, and commercial and industrial businesses. Another rural residential development (Stoneridge) 2.5 miles northeast of the site contains 60 residences.

A2.0 Environmental Setting

A2.1 Physiography and Climate

The Tracy Site is located within the San Joaquin Valley west of the San Joaquin River (Figure A-1). The active installation and annex together encompass 908 acres. The ground surface ranges in elevation from 110 feet above mean sea level (msl) in the southwest portion of the installation to 45 feet above msl in the northeast portion of the annex.

The climate at the depot is characterized by dry, hot summers and wet, mild winters. Average summer temperatures range from 60 to 100 degrees Fahrenheit (°F), and average winter temperatures range from 30°F to 50°F. The majority of the precipitation occurs between December and April. Figure A-2 depicts annual precipitation amounts from 1973 through 2009 for the Tracy Carbona weather station (located 4.5 miles southwest of the Tracy Site). The average rainfall is 10.84 inches per year. In wetter years, as much as 21.47 inches of rain have fallen; in drier years, as little as 4.85 inches have fallen. No obvious increasing or decreasing rainfall trends are noted over the last 36 years.

A2.2 Hydrology

The Tracy Site is located on the distal portion of an alluvial fan sloping northeasterly from the Diablo Range that lies west and southwest of the depot. The principal drainages are Tom Paine Slough north of the depot, Corral Hollow Creek south of the depot, and the San Joaquin River east of the depot. Figure A-3 shows locations of stormwater, wastewater, and groundwater treatment facilities at the Tracy Site. Stormwater runoff from within the depot is collected in drains that lead to the unlined stormwater detention pond in the northwestern portion of the depot. Beneath the unlined pond, water infiltrates the ground surface and migrates toward the water table. If the water levels in the stormwater detention pond are too high, then stormwater can be discharged off site to the West Side Irrigation Ditch.

Wastewater from the depot is treated at the depot's wastewater treatment plant prior to discharge to the unlined sanitary sewage lagoons (SSLs) in the northern portion of the depot, just east of the stormwater detention pond.

Most of the extracted groundwater treated at the Tracy Site was discharged to infiltration galleries (IGs) and a chimney drain (CD) until 2001, when much of the flow was diverted to the overland flow plots on the annex property. IGs in the annex designed to accept the effluent could not accept all of the discharge; therefore, the IGs were rehabilitated. By 2005, most of the treated water from Groundwater Treatment Plant 2 (GWTP2) was again being discharged to IGs 1 through 6 . The overland flow areas have not been used for discharge since 2006, and discharge to IGs 7 through 9 on the annex has been minor. Discharge to IG 1 and the CD was discontinued in 2009.

The orchards and agricultural farmland on the annex and surrounding area are primarily watered by flood irrigation. Unlined ditches between farm fields and roads convey stormwater runoff and irrigation drainage to local percolation swales.

A2.3 Geology

The Tracy Site is located within the Tracy Subbasin of the San Joaquin Valley Basin. Figure A-4 provides the stratigraphic and hydrostratigraphic nomenclature in use at the depot. This figure also provides the approximate depths of the regional stratigraphy and other relevant aquifer zones. The vadose zone thickness ranges from over 40 feet in the southern portion of the depot to approximately 10 feet in the northeastern portion of the annex. Groundwater beneath the depot and annex properties is generally unconfined. Depth to groundwater is approximately 10 to 45 feet below ground surface (bgs).

At the Tracy Site, the lithological deposits from the surface to a depth of 20 to 30 feet originated from materials eroded from the Diablo Range and carried east by streams or winds. These deposits are named the Younger Alluvium. Silt and clay layers occur most frequently in the interval from the surface to 30 feet bgs. The shallow subsurface deposits are difficult to distinguish from the underlying deposits of Older Alluvium and the Upper Tulare Member of the Tulare Formation. The Tulare Formation, divided into Upper, Middle, and Lower Members, consists of poorly sorted, discontinuous deposits of clay, silt, sand, and gravel (California Department of Water Resources, 2006). However, in the vicinity of the depot, only the Upper Member has been described during fieldwork associated with remedial investigation/feasibility study (RI/FS) activities. One braided stream channel in the Older Alluvium or Upper Tulare trending approximately northeasterly across the depot and the annex has been identified from boring logs (Montgomery Watson, 1995a). The Upper and Lower Members are transmissive zones in the Tulare Aquifer that are important to the water supply in the San Joaquin Valley. The Middle Tulare is the very poorly transmissive Corcoran Clay Member, which is estimated to be 220 to 250 feet thick. The upper surface of the Corcoran Clay Member occurs at an approximate depth of 220 feet bgs at the Tracy Site.

For the purpose of environmental investigations at the Tracy Site, the Upper Tulare Member and overlying alluvial deposits have been divided into four geologic units designated "geologic horizons." Above Upper, Upper, Middle, and Lower (Woodward-Clyde, 1993; Montgomery Watson, 1995b). The Lower Geologic Horizon unit also includes the Below-Lower Geologic Horizon, that is identified beneath the annex portion of the depot. The depth, thickness, and lithology of the geologic horizons vary across the depot and the annex property. With the exception of the Above Upper Geologic Horizon, the horizons consist of sand, silty sand, clayey sand, and gravel layers separated by silt and clay layers. To help illustrate the geology, Figure A-5 shows the locations of monitoring and extraction wells and two geologic cross-sections. Cross-section A-A′ (Figure A-6) shows a northeast-southwest cross-section along the length of the depot and the annex; and cross-section B-B′ (Figure A-7) displays subsurface geology

along a northwest to southeast line along the northern boundary of the depot. These cross-sections show the monitoring and extraction well depths, screen intervals, and approximate groundwater elevations for third quarter 2007 in selected wells. The lithologies have been grouped into three general types (clays, silts, and sands/gravels) to highlight possible contaminant migration routes and allow for correlation among borings.

The Above Upper Geologic Horizon typically consists of fine-grained layers of clays, silts, silty sands, and clayey sands. Cross-section A-A′ (Figure A-6) shows sandy silts and silts in the southern portion of the depot that grade into clays and silty clays to the north. The Above Upper Geologic Horizon becomes thinner from south to north. The Above Upper Geologic Horizon in cross-section B-B′ (Figure A-7) shows clays and silts on the northwest and interbedded sands, silts, and clays on the southeast. The Above Upper Geologic Horizon becomes slightly thicker from southeast to northwest along the trace of the cross-section.

The Upper Geologic Horizon consists of silty and poorly graded sands and is interbedded with clay and silt layers from south to north (Figure A-6). In cross-section B-B′, the Upper Geologic Horizon consists of two gravel layers separated by clay at the northwestern corner (NWC) of the depot (Figure A-7). Near the former GWTP1 location (and the line where cross-section A-A′ intersects cross-section B-B′), the Upper Geologic Horizon gravel and sand layers are thicker, but are separated by a thicker clay lens. Southeast of former GWTP1, the Upper Geologic Horizon is dominated by well-graded to silty sands that represent a stream channel that trends northeast (at LM031A, Figure A-7). The sand layers are thinner, finer grained, and interbedded with clays to the southeast of the channel.

The Middle Geologic Horizon sand layers are consistent in thickness from south to north beneath the depot and the southern half of the annex (Figure A-6). From the NWC of the depot to the former location of GWTP1, the Middle Geologic Horizon sand thins and grades from gravel to silty and sandy clay (Figure A-7). East of former GWTP1, lithologic information for the Middle Horizon is sparse.

Among the four geologic horizons, the Lower Geologic Horizon may have the greatest thickness of sand and gravel beneath the southern and central portions of the depot; however, lithologic information for the horizon beneath the southwest portion is sparse (Figure A-6). The Lower Geologic Horizon sands become thinner, finer grained, and interbedded with clays from south to north. Cross-section B-B′ indicates that the Lower Geologic Horizon increases in thickness and becomes finer grained (grading into clayey sand) from northwest to southeast (Figure A-7).

Beneath the annex, a Below-Lower Geologic Horizon of 5 to 10 feet of poorly sorted gravel, clayey sand, and sand occurs stratigraphically just above the Corcoran Clay Member.

Approximate depths and saturated thicknesses of the geologic horizons beneath the southern and northern portions of the Tracy Site are as follows.

Above Upper and Upper Geologic Horizons

- Southern portion—Depth range: 0 to 65 feet bgs; saturated thickness: 30 feet.
- Northern portion—Depth range: 0 to 50 feet bgs; saturated thickness: 25 feet.

Middle and Lower Geologic Horizons

- Southern portion—Depth range: 65 to 165 feet bgs; thickness: 100 feet.
- Northern portion—Depth range: 55 to 195 feet bgs; thickness: 140 feet.

A2.4 Hydrogeology

To illustrate groundwater hydrology, the geologic horizons have been grouped into hydrologic zones as shown below.

Upper Hydrologic Zone

- Above Upper Geologic Horizon
- Upper Geologic Horizon

Middle Hydrologic Zone

- Middle Geologic Horizon

Lower Hydrologic Zone

- Lower Geologic Horizon
- Below-Lower Geologic Horizon

Groundwater Flow Direction and Gradients. Historically, groundwater flow in the vicinity of the Tracy Site has generally been to the northeast. Natural preferential flow pathways are present due to the alluvial geologic setting. Currently, groundwater flow is generally north-northwest to north-northeast at the Tracy Site with local variations caused by groundwater extraction and infiltration. Potentiometric surfaces measured during the third quarter of 2009 for the Upper, Middle, and Lower Hydrologic Zones are illustrated on Figures B-8, B-9, and B-10, respectively.

In the Upper Hydrologic Zone, groundwater flows north-northwest along the southern depot boundary and northwest to northeast throughout the rest of the depot; however, influences from groundwater extraction are present. From the northern end of the depot boundary, groundwater generally flows north-northeast, with local variations due to extraction well pumping in the annex.

Groundwater mounding and depressions are evident in the Upper Hydrologic Zone. Mounding on the eastern side of the depot originated from the southern IGs (Figure A-8). Groundwater depressions are present near operating extraction wells. Horizontal gradients across the depot vary from 0.0004 to 0.003 foot per foot (ft/ft) except near extraction wells.

In the Middle Hydrologic Zone, groundwater flows from the southern boundary of the depot north, toward the extraction wells on the western depot and toward the annex on the eastern depot; on the annex, groundwater flow is influenced by extraction wells on the west, east, and by the north-northeasterly regional gradient (Figure A-9). The magnitude of the horizontal gradients, 0.012 to 0.0029 ft/ft, is similar across the depot, except near extraction wells.

In the Lower Hydrologic Zone, groundwater flows north from the southern part of the depot toward the annex, under the influence of the natural regional hydraulic gradient (Figure A-10). No mounding or

depression is evident on the potentiometric surface maps. The magnitudes of the horizontal gradients range from 0.0013 to 0.0024 ft/ft across the depot.

Vertical groundwater gradients at the Tracy Site are generally downward from the Upper to Middle Zones and generally neutral between the Middle and Lower Zones.

A2.5 Geochemistry

Analyses of major cations and anions indicate that the groundwater type at the Tracy Site is calcium chloride. Total dissolved solids and higher concentrations of calcium and chloride in the Upper Hydrologic Zone indicate the influence of recharge from agricultural drainage. Total concentrations of ions, including calcium concentrations decrease with depth. Groundwater in the Lower Hydrologic Zone approaches sodium-chloride type, suggesting recharge occurs in an area that is less influenced by agricultural recharge (Montgomery Watson, 1995b).

Analytical data for samples from a limited natural attenuation study at the Tracy Site indicated that biodegradation of chlorinated compounds is not occurring (URS, 2000)[1]. The results of the limited natural attenuation study suggest that prevailing conditions in groundwater beneath the Tracy Site are characterized as:

- Moderately oxidizing (positive oxidation reduction potential [ORP] between +11 and +342 millivolts [mV]);
- Neutral (pH ranging from 6.9 to 7.9 standard units); and
- Weakly to strongly aerobic (dissolved oxygen [DO] concentrations ranging from 1.85 to 16.2 milligrams per liter [mg/L]; average DO is greater than 5 mg/L) (URS, 2000).

Ferrous iron was not reported in any sample. Total organic carbon (TOC) in groundwater was 1 to 11 mg/L and is likely to be low (less than 1%) in the aquifer matrix. Under most aquifer conditions, the oxidizing potential of groundwater tends to decrease as the residence time of the water (duration of contact with the aquifer material) increases. Longer residence times allow for progression of more chemical reactions with minerals in the aquifer. The oxidizing, aerobic condition of groundwater at the Tracy Site reflects infiltration of water from the ground surface as the predominant source of recharge. Therefore, groundwater in the two shallower hydrologic zones is less likely to have anaerobic conditions conducive to bacterial degradation of volatile organic compounds (VOCs).

Organic compounds (such as VOCs) tend to sorb preferentially to organic carbon and clay particles in the aquifer, and tend to be less mobile (more persistent) in parts of the aquifer where TOC concentrations are high and/or fine-grained materials are present. TOC, from either natural or anthropogenic sources, may also serve as substrate for bacteria that use organic compounds as either electron donors or acceptors in their metabolic reactions. In general, native TOC concentrations in the aquifer beneath the Tracy Site are expected to be low because of the deposition on an alluvial fan on which organic materials would be oxidized before they could be buried by fine-grained sediments that would preserve them. Exceptions occur in areas near leaking underground storage tanks providing petroleum hydrocarbon contamination in

[1] Natural attenuation refers to the observed reduction in contaminant concentrations as contaminants migrate from the source in environmental media. This reduction in concentration in groundwater is due primarily to a number of fate-and-transport processes, including simple dilution, dispersion, sorption, volatilization, and biotic and abiotic transformation. Naturally attenuating contaminant plumes can take a variety of forms; they might be expanding, stable, or shrinking, depending on the trends in the spatial variation of contaminant concentrations with time (Wiedemeier, et al., 1999).

shallow portions of the aquifer. The hydrostratigraphy at the Tracy Site is characterized by heterogeneous sedimentary deposits with interfingered sands and finer-grained silts and clays. Organic contaminant mass tends to sorb to aquifer particles in silt and clay units near release points, where its partitioning into the aqueous phase is diffusion-limited, and the mass is relatively inaccessible for recovery by groundwater extraction.

A3.0 Nature and Extent of COCs

This section describes the history of the COCs at the Tracy Site from their sources to their current distribution.

A3.1 COC Source Areas

Data from the RI/FS indicated that the sources of VOC plumes in groundwater are SWMUs 2/3, SWMU 6, SWMU 7, SWMU 8, SWMU 20, SWMU 33, Area 1/Building 237, SWMU 1/Area 2, and Area 3. Post-RI data collection indicates that residual VOC mass remains beneath three of these sites: Area 1/ Building 237, SWMU 1/Area 2, and Area 3, and potentially, a fourth, SWMU 20.

The sources of dieldrin identified in the RI/FS are SWMUs 2/3, SWMU 33, and SWMU 8 (Montgomery Watson, 1996). The dieldrin plume in groundwater from SWMUs 2/3 and SWMU 33 is designated the SSL dieldrin plume. Each of the SSL plume source areas has been remediated, and it is unlikely that any residual dieldrin mass in the vadose zone of the source areas has the potential to migrate to groundwater in the future. At SWMU 8, dieldrin has not been detected in groundwater collected from any of the wells associated with SWMU 8, with the exception of one detection that was less than the aquifer cleanup level (ACL) and was reported in 1994 prior to the soil excavation at SWMU 8. Dieldrin occurring in groundwater beneath the NWC, referred to as the NWC dieldrin plume, did not migrate from another source; rather, extracted groundwater that was treated for VOCs but not dieldrin was injected into the saturated zone using injection wells (IWs) IW001 through IW003 (URS, 2007a). There is no residual dieldrin mass in the vadose zone beneath the NWC. Figure A-11 depicts the probable contaminant of concern (COC) source areas and the groundwater plumes as defined with data collected through 2009.

A3.2 Groundwater Plumes

West Depot and North Depot VOC Plumes. A plume containing trichloroethene (TCE) and tetrachloroethene (PCE) originated at Building 10 (SWMU 20) and migrated northerly. During its migration, the plume commingled with COC plumes that entered groundwater from SWMU 33, Area 1/Building 237, SWMUs 2/3, and SWMU 1/Area 2 and passed beyond the depot boundary. Any soil contamination that may be present beneath the foundation of Building 10 (SWMU 20) has not been actively remediated, but a land use control limits exposure to subsurface contamination (URS, 2004). In 2009, Building 10 was razed, and a new building will be constructed over the southern portion of Building 10. SWMUs 2/3, and SWMU 33 have been remediated and are no longer sources of contamination. Area 1/Building 237 and SWMU 1/Area 2 have undergone remediation with soil vapor extraction (SVE). At Area 1/Building 237, pneumatic fracturing of fine-grained deposits and SVE were undertaken in 2009 to remove soil gas with TCE and PCE concentrations that were above cleanup standards. Concentrations of residual mass beneath SWMU 1/Building 237 SWMU 1/Area 2 have been reduced to concentrations that make this site a candidate for no further action (URS, 2008a; HDR | e^2M, 2010). An SVE termination or optimization process (STOP) review has been conducted for SWMU 1/ Building 237SWMU 1/Area 2 and the site has been recommended for closure.

Area 3 VOC Plumes. TCE entered groundwater at SWMU 6 and migrated northeasterly beneath Area 3 where the plume acquired some TCE and PCE mass from the soils in Area 3 before continuing to migrate

beyond the depot boundary. SWMU 6 has been remediated via excavation; Area 3 has undergone SVE for more than six years, with TCE and PCE concentrations reduced to concentrations that make the site a candidate for no further action. As with SWMU 1/Area 2, a STOP review has been conducted for Area 3 and site closure is recommended. A PCE plume originated at SWMU 8 and migrated northeasterly beyond the depot boundary. Remediation at SWMU 8 consisted of excavation of contaminated soil and debris. No residual VOC mass is known to exist at SWMU 8. No groundwater remedial actions have been conducted to remediate the East Depot VOC plumes originating from SWMUs 6 and 8, and concentrations are less than ACLs in the former plume from SWMU 8. The PCE plume at SWMU 6 is based on concentrations from one well that has a decreasing trend for PCE.

Banta Road VOC Plume. The source of the groundwater VOC plume along Banta Road and in off-depot wells east of Banta Road is not known. The plume containing TCE, PCE, carbon tetrachloride (CCl_4), and chloroform ($CHCl_3$) is more than 2,000 feet from potential source areas on the depot. No source area is known to contain residual mass of TCE and/or PCE with CCl_4. Data collected during the RI suggested that CCl_4 and $CHCl_3$, possibly a degradation product of CCl_4, were released from the Olin Chlor Alkali facility (formerly Pioneer Chemicals and All Pure Chemicals) located approximately 800 feet east of the easternmost point of the depot and east of Banta Road (Montgomery Watson, 1996). Recent data from monitoring at the Olin site confirm CCl_4 and $CHCl_3$ in groundwater; however, no TCE or PCE above reporting limits has been identified in groundwater samples from that site (SECOR, 2008).

SSL Dieldrin Plume. The SSL dieldrin plume has been attributed to the percolation of dieldrin-contaminated water from SWMU 3 (Industrial Waste Lagoons) that received discharge from SWMU 33 (Industrial waste pipeline). The source of pesticides, including dieldrin, in the lagoons was wastewater discharged into floor drains or washed into sumps and then transported via pipeline to the outfall at SWMU 3. Detection of dieldrin in soil samples along SWMU 33 and in lagoon sediments corroborates the source hypothesis. It is likely that dieldrin was discharged to the industrial waste pipeline or sanitary sewer system in the form of a liquid mixture ready for spraying. Pesticide mixtures typically contain solvents to improve the miscibility of nearly insoluble dieldrin with water. In travel through SWMU 33 and in the pond at SWMU 3, dieldrin was exposed to TCE and PCE, which would have increased its solubility. The solvents increased the mobility of dieldrin in percolating water and in groundwater.

SWMU 8 Plume. This burial pit area was considered a source of dieldrin and other contaminants because of concentrations detected in soil and groundwater during the RI (Montgomery Watson, 1996). However, dieldrin has not been detected in groundwater samples from this area at concentrations greater than the ACL; in fact, analytical results of groundwater samples collected from this area have not had dieldrin at concentrations above the detection limit since 1994. No extraction and treatment system was ever installed to remediate groundwater downgradient from SWMU 8. Any dieldrin that may have been present in groundwater decreased to non-detectable levels with no engineered remedy.

NWC Dieldrin Plume. After the RI (Montgomery Watson, 1996) and two post-ROD investigations (Rust, 1999; URS, 2007a), no surface source of dieldrin was identified for the NWC dieldrin plume. On the basis of multiple lines of evidence, the conclusion is that the source of dieldrin in the NWC plume was groundwater extracted at the Tracy Site, treated for TCE and PCE, and then injected into three IWs (IW001 through IW003) constructed as part of the interim remedial measure (IRM) for groundwater treatment. The IWs were designed to explore injection as a disposal option for treated groundwater. Each of the IWs was constructed with multiple screened intervals from 20 to 100 feet bgs. The initial capacity test determined that two of the injection wells, IW001 and IW003, were suitable for further prove-out testing, which was conducted from late 1994 through early 1995 by Montgomery Watson (Montgomery Watson, 1995c). Water delivered to IWs was effluent from the IRM air stripper system, which treated groundwater pumped from extraction wells located within the Tracy Site SSL dieldrin plume. Ground-water targeted for extraction was contaminated with VOCs and dieldrin. However, the extracted ground-

water was treated for VOCs only by air-stripping, and the effluent was discharged to the IWs. Dieldrin concentrations as great as 0.236 micrograms per liter (µg/L) were reported in effluent samples prior to the expansion of the IRM system (Montgomery Watson, 1995c). Groundwater injection into the three IWs in the NWC area was suspended as infeasible in 1995 because the wells could not accommodate a flow rate high enough to support full-scale Operable Unit (OU) 1 design (Montgomery Watson, 1995c). Dieldrin results for samples collected from NWC monitoring wells before and after injection confirm that dieldrin entered the groundwater system during the capacity testing period at concentration ranges similar to those observed during cone penetrometer test (CPT) sampling conducted in the area since 2004. Dieldrin was not detected in samples from monitoring wells in the area (including LM106A, LM109B, and LM107C, located near IW003) before the first injection testing period in November 1992. However, after November 1992, IRM effluent injection began and samples collected from all three of these monitoring wells contained dieldrin at concentrations ranging from 0.02 to 0.136 µg/L. Dieldrin-contaminated water injected into the saturated zone in the NWC area between 1992 and 1995 created a dieldrin plume, without solvents; the injection test effort had been reviewed and approved by regulatory agencies. Residual mass of dieldrin in the NWC in the saturated zone is adhering to very fine particles in the aquifer (URS, 2007a). Extraction testing demonstrated that some of the dieldrin can be removed by groundwater extraction (URS, 2010).

A3.3 Migration Pathway in Source Areas

After release of liquid wastes or wastewater containing dieldrin and solvents from Building 10 (SWMU 20), pipelines (SWMU 33), and lagoons (SWMUs 2/3), the contaminated water migrated vertically through the soil, entered groundwater, and began migrating northerly under the influence of the hydraulic gradient produced by agricultural well (AG) 2 located at the northern edge of GWTP2. In the NWC, groundwater treated for VOCs but not dieldrin was injected directly into the saturated zone at IW001, IW002, and IW003, where it migrated a few hundred feet under the hydraulic influence of injection.

Layers of clay, silt, silty clay, or clayey silt occur from the surface to at least 20 feet bgs in Area 1/Building 237, SWMU 2, SWMU 3, SWMU 6, SWMU 20, and SWMU 33 (VOC and dieldrin source areas). Across the Tracy Site, silt and clay layers named the Younger Alluvium occur most frequently in the interval from the surface to 30 feet bgs. Although they have low permeabilities, these deposits did not stop vertical migration of dieldrin, TCE, or PCE. Beneath the lagoons, sumps, and pipeline segments, or wastewater containing dissolved contaminants provided some degree of saturation in the soil as well as a vertical hydraulic gradient that moved contaminants through the vadose zone and into groundwater. Pockets of soil gas containing TCE and PCE beneath Area 1/Building 237 persist despite remedial actions (e.g., SVE and passive venting) over the past eight years, indicating that some residual contamination is likely adsorbed to the clay layers in the vadose zone. This residual mass may migrate at a very slow velocity to the groundwater surface.

Beneath Area 3, SWMU 1/Area 2, SWMU 7, and SWMU 8, VOCs and dieldrin entered fine-grained soils from surface spills (storage areas) or from the bottom of excavations (burn and waste burial pits). The saturated zone in each of the source areas begins at a depth of approximately 15 feet bgs, and even closer to the bottoms of the pits; migration of contaminants to groundwater occurred because distances were short, and gravity (on liquids) or soil vapor migration mechanisms provided the driving forces. Remedial actions conducted for eight years have reduced TCE and PCE contamination in soil gas in the vadose zone beneath SWMU 1/Area 2 and Area 3. Remaining mass is likely adsorbed to the fine-grained, low-permeability soils.

Beneath the NWC area, clay and silt layers are approximately 30 feet thick in the shallow saturated zone, greater than in the SSL dieldrin source area; however, dieldrin was injected directly through the clays and

silt layers via the conduits of IW001, IW002, and IW003. Each of the IWs was constructed with multiple screen intervals (between 20 feet bgs and 100 feet bgs) to distribute the VOC-treated effluent among the Upper, Middle, and Lower Horizons; three screens were installed in IW001 and IW002 and two in IW003.

A3.4 Migration Pathway in Groundwater

After penetrating the low permeability layers beneath the sources, percolating water containing dieldrin and VOCs from the SSL had access to higher permeability sands and gravels that are interbedded with clay and silt layers in the Upper Geologic Horizon. The sand and gravel layers represent braided stream channels, now filled with sand and, locally, gravels, trending northeasterly and topographically down the Corral Hollow fan across the depot and the annex (Figure A-12).

In spite of the interbedded and heterogeneous nature of the subsurface beneath the water table, hydraulic communication existed between the hydrologic zones, and therefore, groundwater and dissolved VOCs could migrate horizontally and vertically from depths of approximately 15 feet bgs (or the top of the saturated zone) to approximately 180 feet bgs, if a sufficient vertical hydraulic gradient was active. The West Depot, North Central, and SSL plumes containing TCE, PCE, and dieldrin were drawn northerly and vertically downward by the pumping of AG-2, which had a total depth of 607 feet bgs and unknown screen or perforated intervals (Montgomery Watson, 1995c). Until AG-2 was shut down in September 1993 (and decommissioned in 1994), the VOC plumes were drawn toward the well as a result of increased downward gradients from the Upper to Middle and the Middle to Lower Hydrologic Zones, and groundwater depressions extended more than 1,300 feet to the south from AG-2 in the Middle and Lower Hydrologic Zones. Although mixed with VOC contamination in groundwater at the SSL, dieldrin from the SSL source has never been detectable in groundwater collected from the Lower Hydrologic Zone.

The Area 3, SWMU, 6 and Banta Road VOC plumes also began a northerly migration after entering the saturated zone; however, the operation of AG-2 may not have had as strong a hydraulic influence on these plumes as it did on the West Depot VOC plume. The Area 3 and SWMU 6 plumes have not migrated as far to the north or as deep into the Middle and Lower Zones. The Banta Road VOC plume is now more than 2,000 feet east from the northern extent of the West Depot plume, where AG-2 was located, and has only moved vertically into the Middle Hydrologic Zone near private well PW001. The migration paths of VOCs may have been influenced by the distribution of sands in the Upper and Middle Hydrologic Zones (Figure A-13). Since the southern infiltration galleries began receiving treated groundwater, flow directions on the eastern portion of the annex have been more directly northerly than they were during the RI. The occurrence of TCE and CCl_4 at concentrations exceeding their ACLs is rare across much of the depot and annex. With no monitoring wells east of Banta Road and south of PW001, it is difficult to address the migration path of TCE and CCl_4 which occur together in the Banta Road plume.

The pumping of AG-2 had little, if any, impact on the movement of dieldrin in the NWC because the greatest volume of groundwater was injected from November 1994 to March 1995 after AG-2 had been permanently shut down. Dieldrin was delivered directly into the Upper, Middle, and Lower Hydrologic Zones by injection of VOC-treated groundwater. The greatest concentrations in the NWC plume have been in samples from Upper Hydrologic Zone wells (LM106A, LM141AU, and LM142AU) that were adjacent to IW001, IW002, or IW003. The NWC plume has migrated 100 to 200 feet southerly, or westerly, to LM106A and LM108B, in the Upper and Middle Hydrologic Zones, respectively, from either IW003 or IW002. Dieldrin is not present in the Lower Hydrologic Zone (URS, 2010 dieldrin FS). Concentrations of dieldrin have consistently been detected at LM106A, LM140AU, LM141AU, LM142AU, and LM174AU; however, concentrations in samples at three of the wells show decreasing trends with time (HDR | e^2m, 2010).

A3.5 Attenuation of Contaminants in Groundwater

Data from groundwater plume monitoring from 1994 to the present suggests that, in addition to groundwater extraction, natural attenuation mechanisms (dispersion, diffusion, dilution, abiotic degradation, volatilization, and/or sorption) are affecting VOC and dieldrin plumes. The extent of the West Depot VOC, East Depot VOC, and SSL dieldrin plumes have been reduced over a period of years in areas where extraction wells have operated as well as where no wells have operated. The original size of the Banta Road VOC plume and the NWC dieldrin plume are not known. Therefore, the probable reduction in extent cannot be determined.

TCE and PCE Attenuation. Both TCE and PCE are organic compounds susceptible to natural attenuation mechanisms in groundwater. Dispersion, adsorption to soil particles, dilution, volatilization, and abiotic degradation are mechanisms potentially affecting the lower concentration (i.e., 5 µg/L or less) TCE or PCE portions of the West Depot and East Depot plumes. TCE and PCE may degrade by step-wise dehalogenation through the action of anaerobic bacteria (Vogel and McCarty, 1985). However, over the last 10 years of monitoring at the Tracy Site, very little evidence of bacterial degradation of TCE and PCE has been found. Concentrations of breakdown products cis-1,2-dichloroethene and vinyl chloride were rarely identified above reporting levels in groundwater samples. Dispersion and adsorption are identified in the RI report as likely attenuation mechanisms for TCE and PCE (Montgomery Watson, 1996).

CCl_4 Attenuation. CCl_4 is susceptible to the same natural attenuation mechanisms as TCE and PCE. Under anaerobic conditions, CCl_4 will undergo step-wise dehalogenation by bacteria. CCl_4 will degrade to $CHCl_3$ which will degrade to methylene chloride, which will degrade to chloromethane, which will degrade to methane. Although CCl_4 is rarely detected in groundwater beneath the depot or annex, $CHCl_3$ was detected in samples from a number of wells in 2009; for example, see the distribution from third quarter 2009 in Figure A-14. Not all of the $CHCl_3$ may have originated from CCL_4 because $CHCl_3$ may also have been used as a solvent or created by chlorination of water. $CHCl_3$ detected in the Banta Road plume may be the result of CCl_4 degradation; that, however, has not been confirmed.

Dieldrin Attenuation. The findings reported in the *Dieldrin Natural Attenuation Investigation Results* (URS, 2007a) confirm that dieldrin is attenuated by natural mechanisms in groundwater beneath the Tracy Site and that the off-site extent of the plumes is contracting, predominantly as a result of the non-destructive mechanisms of sorption in deposits containing mostly clay or silt and dilution in zones of higher permeability. Data from monitoring wells in areas near the SSL and NWC dieldrin plumes show decreasing trends both within and outside of the influence of active groundwater remediation (URS, 2005). The SSL dieldrin plume contracted more than 1,000 feet between 1996 and 2002 prior to active remedial action, and data from a past CPT investigation verify that the SSL plume footprint is continuing to contract (URS, 2005). Data from several CPT investigations show that the dieldrin plume in the NWC area has been immobile since injection ceased (URS, 2007a; 2010). The effects of potential co-solvency in the SSL dieldrin plume may explain the greater-than-expected mobility of dieldrin and its longer plume footprint compared to the NWC area; co-solvency effects may also have contributed indirectly to a higher level of effectiveness in removing dieldrin by extraction in the SSL area than could otherwise have been expected. Data from past investigations do not suggest that destructive processes, such as biological degradation, are contributing to the attenuation of dieldrin in the saturated zone (URS, 2007a).

A4.0 Groundwater Modeling Predictions

The *Three-Dimensional Groundwater Model Report* documents the development and verification of the fate-and-transport model for groundwater beneath the Tracy Site (URS, 2007b). Regulatory agency personnel have accepted the model for use in simulating groundwater conditions and contaminant migration at the Tracy Site. The model was updated with 2009 hydrologic and contaminant data.

The Tracy Site groundwater model was used to predict TCE and PCE plume migration and the minimum time for those COCs to achieve their ROD-specified ACLs. Using the third quarter 2009 groundwater sampling event as the initial conditions, the model predicts that PCE and TCE concentrations will be equal or less than ACLs in an additional 3 and 7 years, respectively, if the groundwater extraction wells that were operating continue to operate at third quarter 2009 extraction rates (HDR/e2m, 2010). If all of the extraction wells were shut down, the model predicts PCE and TCE concentrations would reach ACLs in 4 and 12 years, respectively.

Dieldrin migration and required cleanup time was not simulated using the Tracy Site groundwater model. Transport characteristics of dieldrin indicate that it strongly sorbs to organic matter and clay minerals based on its large organic-carbon partitioning coefficient. Also, its solubility in water is very low. Because of these characteristics, there is too much uncertainty to predict dieldrin migration and attenuation.

A5.0 Receptor Exposure Analysis

A5.1 On Depot

Contaminants remain in soil, soil vapor, and groundwater beneath the depot, and therefore, the potential remains for workers or the public to be exposed to contaminants. However, the potential for exposure is limited by land use controls, the nature of contaminants, and artificial barriers.

Land use controls limit the disturbance of areas, buildings, and portions of buildings that include contaminants. These controls assure that the soils in land use control areas are not disturbed by construction, unless appropriate protection of workers and the public are in place. Permanent building foundations or asphalt are reasonable barriers to exposure of workers or the public to non-volatile contaminants in soil because the barriers eliminate the potential for a completed exposure pathway. Potential for exposure to contaminants in soil vapor is not removed by the presence of foundations or asphalt, but the potential may be significantly reduced.

Exposure to contaminated soil vapor could occur if a frequently occupied, enclosed workspace is in place over a plume of contaminated soil vapor. VOCs in soil vapor have the potential to migrate into work spaces through very small cracks and the edges of foundations. There is potential for increased carcinogenic risk to workers in one building at the Tracy Site because of exposure to soil vapor containing PCE or TCE that may intrude into the workspace. Concentrations of TCE and PCE detected in soil gas samples adjacent to Area 1/Building 237 may increase risk employees who work each workday for 10 or more years in one of those locations. At Area 1/ Building 237, an incremental risk from soil vapor intrusion will continue to be evaluated.

Exposure to contaminated groundwater is not occurring with the exception of the limited exposure of personnel who collect samples from monitoring and extraction wells and operate the groundwater treatment plant. All of these employees wear proper safety gear. No other depot workers or the public are exposed to any COCs in groundwater because there is no complete exposure pathway.

A5.2 Off Depot

The only contaminants beneath the off-depot areas of the Tracy Site and private parcels are VOCs and dieldrin that have been transported in groundwater. Steps have been taken to assure that no off-depot receptors are exposed to COCs.

There are no known VOC plumes in soil vapor in off-depot areas. However, VOCs may leave the upper groundwater surface and migrate toward the surface. In the open air, there is no risk to the public because any vapors rising from the groundwater surface would be reduced to very low concentrations by dispersion in soil and mixing with the atmosphere. The only occupied, enclosed space located where VOCs may migrate upward from the groundwater surface is the residence adjacent to PW001. The soil vapor intrusion model developed by Johnson and Ettinger (1991) and modified for California use by the California DTSC (2004) was used to determine whether there is unacceptable risk to occupants of the residence because of contaminants in the upper groundwater surface. The calculated cancer risk for that potential exposure was less than one chance in one million (See Section 5.4.3 of the main text of this report). Therefore, there is not an unacceptable risk, even though there is potential for exposure.

There is no potential for exposure to contaminants in groundwater because only two wells can remove groundwater from the Banta Road plume. At PW001, there is no exposure pathway because the groundwater produced by the well is treated with activated carbon before it can be used in the residence. At PW005, there is no exposure pathway because the occupants of the adjacent residence are supplied with bottled water.

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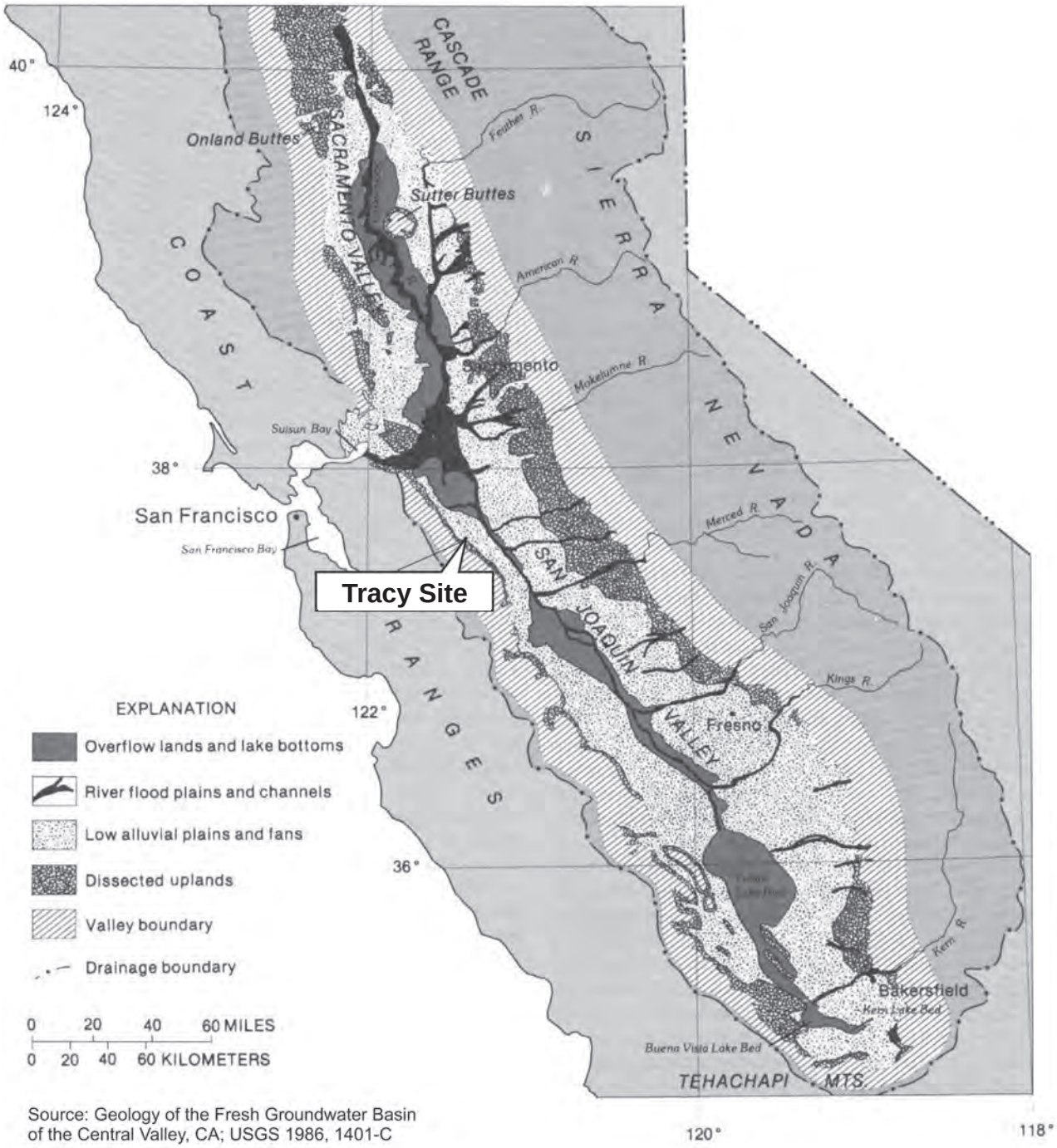
Figures



Source: Geology of the Fresh Groundwater Basin of the Central Valley, CA; USGS 1986, 1401-C

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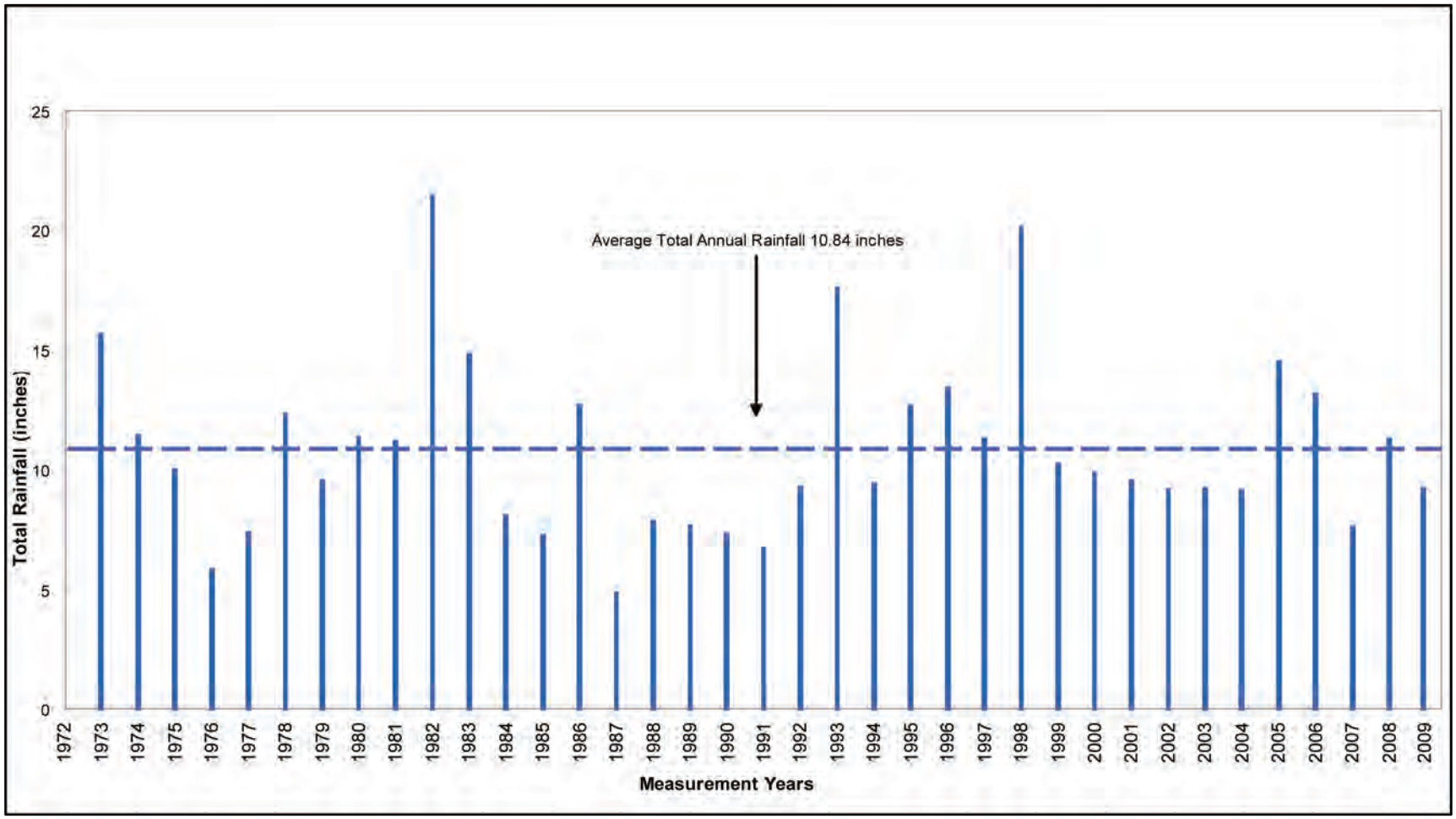
Figure A-1. Location of Tracy Site, Great Valley Province of California



Tracy\5 Yr Review\5YR-Tracy-Rainfall-Graph.indd - VMG 08/03/12

Figure A-2. Annual Rainfall Totals at Tracy Carbona Weather Station, Tracy, California

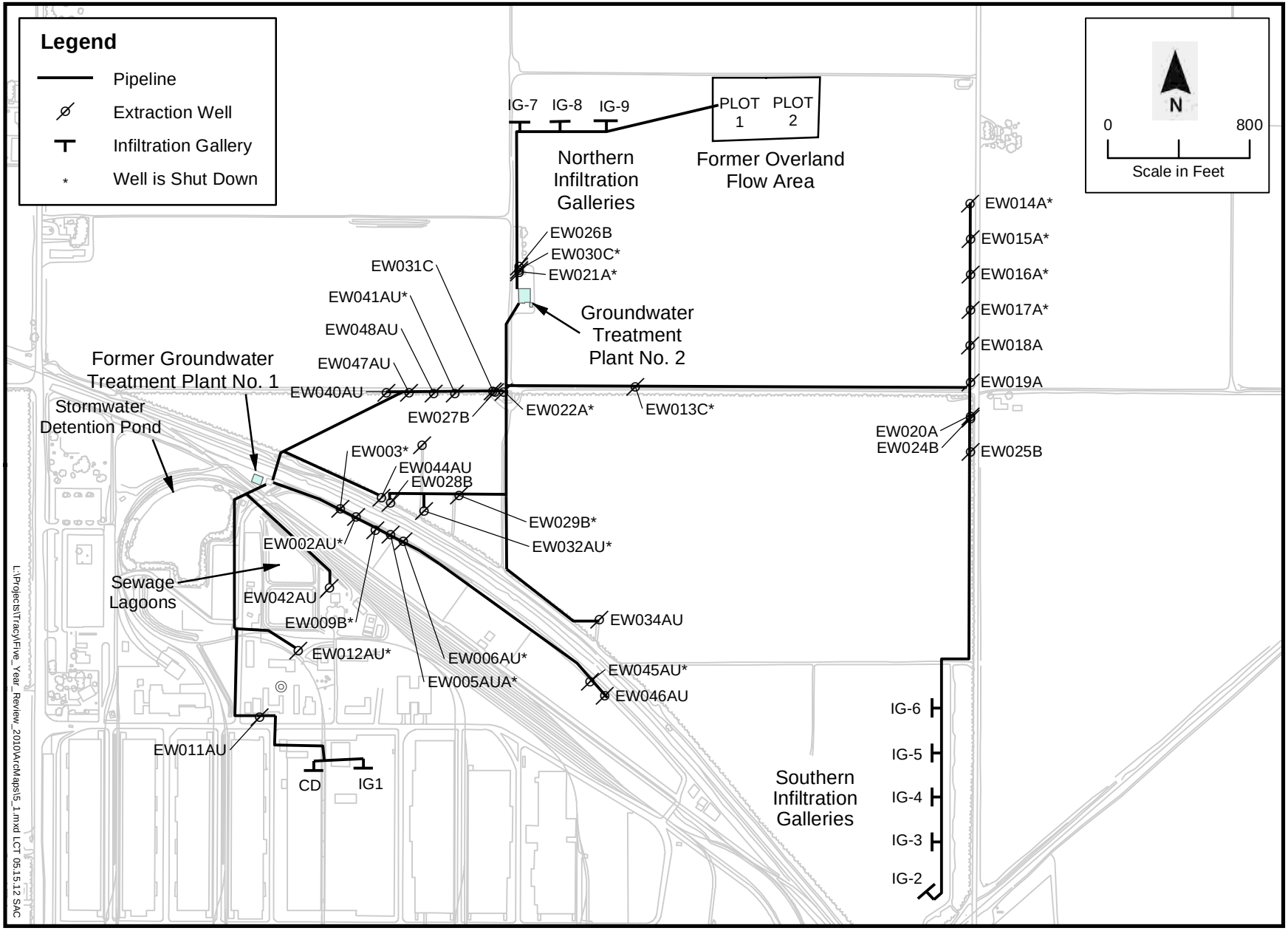


Figure A-3. Stormwater, Wastewater, and Groundwater Remediation Facilities, Tracy Site

Age	Stratigraphic Units		Description	Regional Hydrostratigraphic Zones	Geologic Horizon Description	Depth Below Surface (ft) (top of zone)	Geologic Horizon and Well Designations
Quaternary (Pleistocene and Holocene)	Younger Alluvium	Gravel quarry spoils and disturbed ground.	Gravel and sand.	Vadose Zone	Unconsolidated alluvial deposits in discontinuous layers and lenses; 5 to 12 feet thick sand layers; local stream deposits.	0	Unsaturated
		Levee deposits.	Unconsolidated sand, silt, and gravel.				
		Holocene fan and terrace deposits.	Unconsolidated clay, sand, and gravel.				
	Older Alluvium	Alluvial and fluvial deposits.	Interbedded gravel, sand, silt, and clay.	Water table occurs in this unit; however, it is not hydraulically distinguishable from the Tulare Aquifer.	Unconsolidated alluvial deposits in discontinuous layers and lenses; 5 to 12 feet thick sand layers; local stream deposits.	25-35	Above Upper
					Unconsolidated alluvial deposits in discontinuous layers and lenses; 5 to 12 feet thick sand layers; local stream deposits.	35-55	Upper
Tertiary & Quaternary (Pliocene and Pleistocene)	Tulare Aquifer	Upper Tulare Member.	Same as above.	Upper Tulare Aquifer—Upper waterbearing zone; contains water under semiconfined and unconfined conditions.	Unconsolidated alluvial deposits in discontinuous layers and lenses; 5 to 12 feet thick sand layers; local stream deposits.	55-65	Middle
					Semi-consolidated sand, silt, and clay layers in discontinuous layers and lenses; 5 to 12 feet thick sand layers.	90-100	Lower
					Semi-consolidated sand, silt, and clay layers in discontinuous layers and lenses; 5 to 12 feet thick sand layers.	170–220	Below Lower
		Corcoran Clay Member.	Sandy clay, silty clay, silt, and clay interbedded with fine-grained sand. Deposited in a lacustrine environment.	Regional confining layer between the upper and lower waterbearing zones.	Corcoran Clay equivalent found at 220 feet below ground surface at the depot (approximately 80 to 100 feet thick).	~220	None
		Lower Tulare Member.	Lenticular and interfingering beds of gravel, sand, and clay. Deposited in alluvial and fluvial environments.	Lower Tulare Aquifer—Lower waterbearing zone; contains freshwater under confined conditions to an estimated depth of 1,600 feet.	Lower Tulare.	300-320	None

NOTE: All depths and thicknesses are approximate. *Source: Modified From Hotchkiss and Balding, 1971, Bertoldi, et al. 1991*

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Figure A-4. Stratigraphic and Hydrostratigraphic Nomenclature, Tracy Site

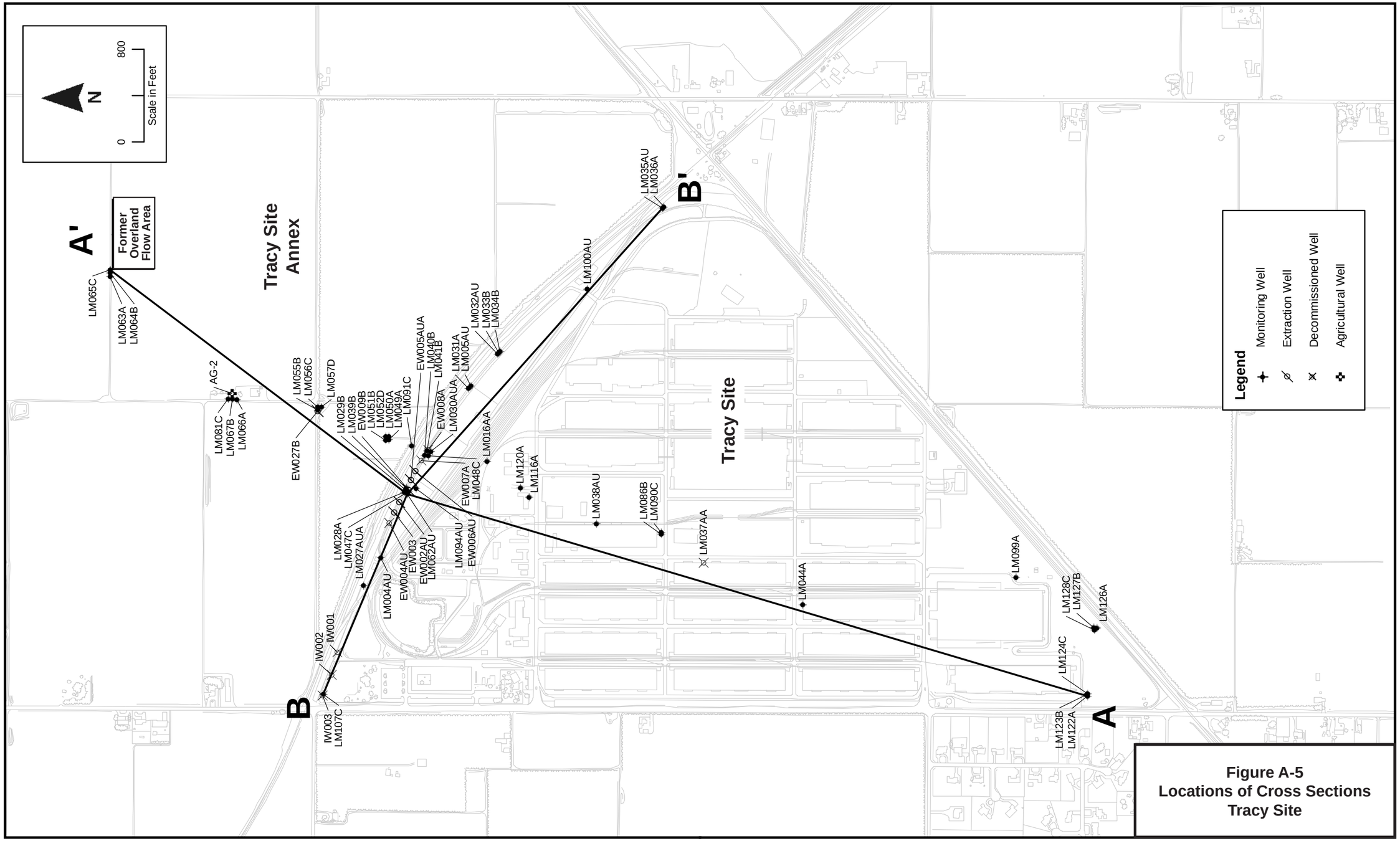


Figure A-5
Locations of Cross Sections
Tracy Site

Tracy\5 Yr Review\5YR-Tracy-Xsec-Locations.indd - VMG 08/03/12 SAC

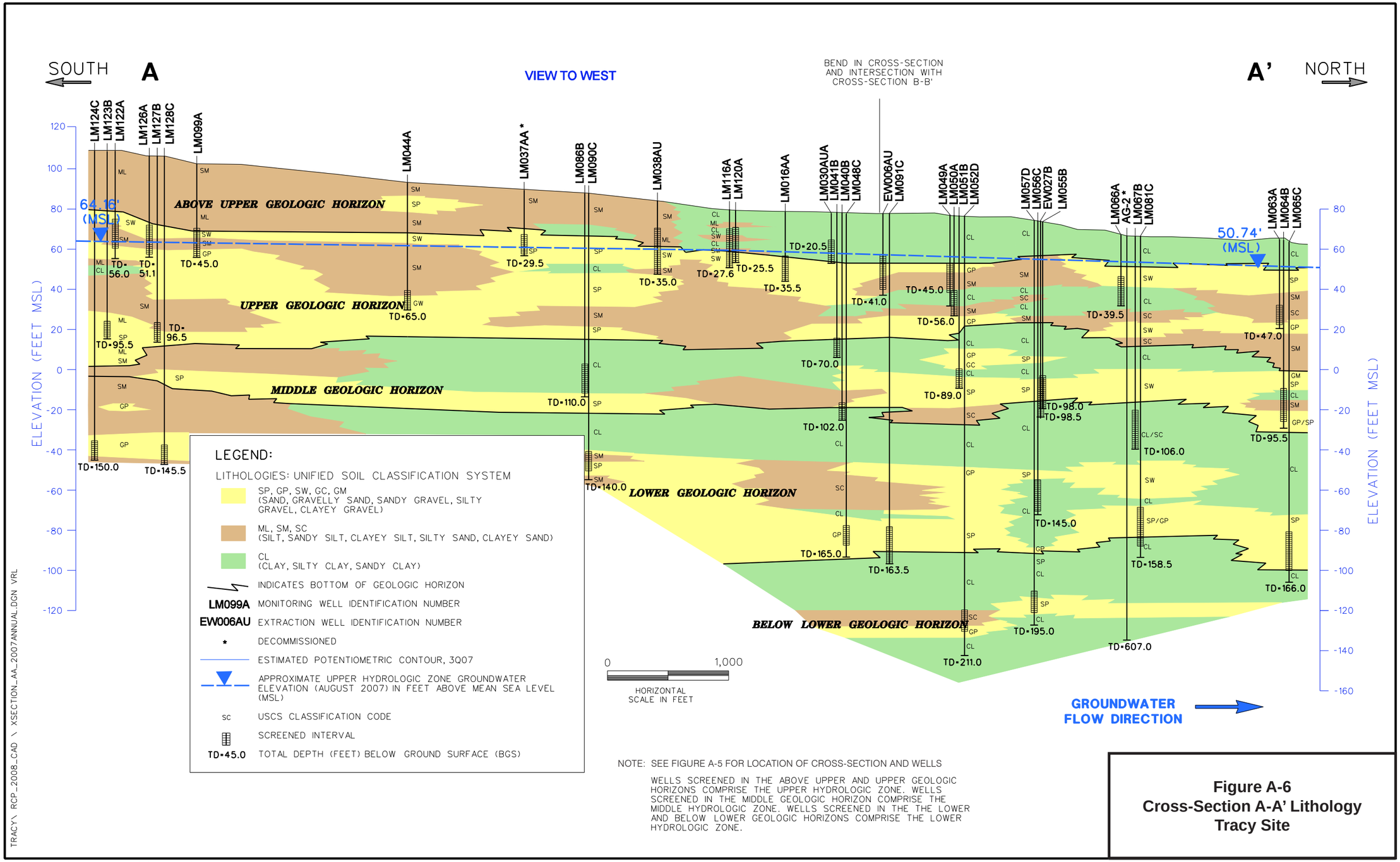
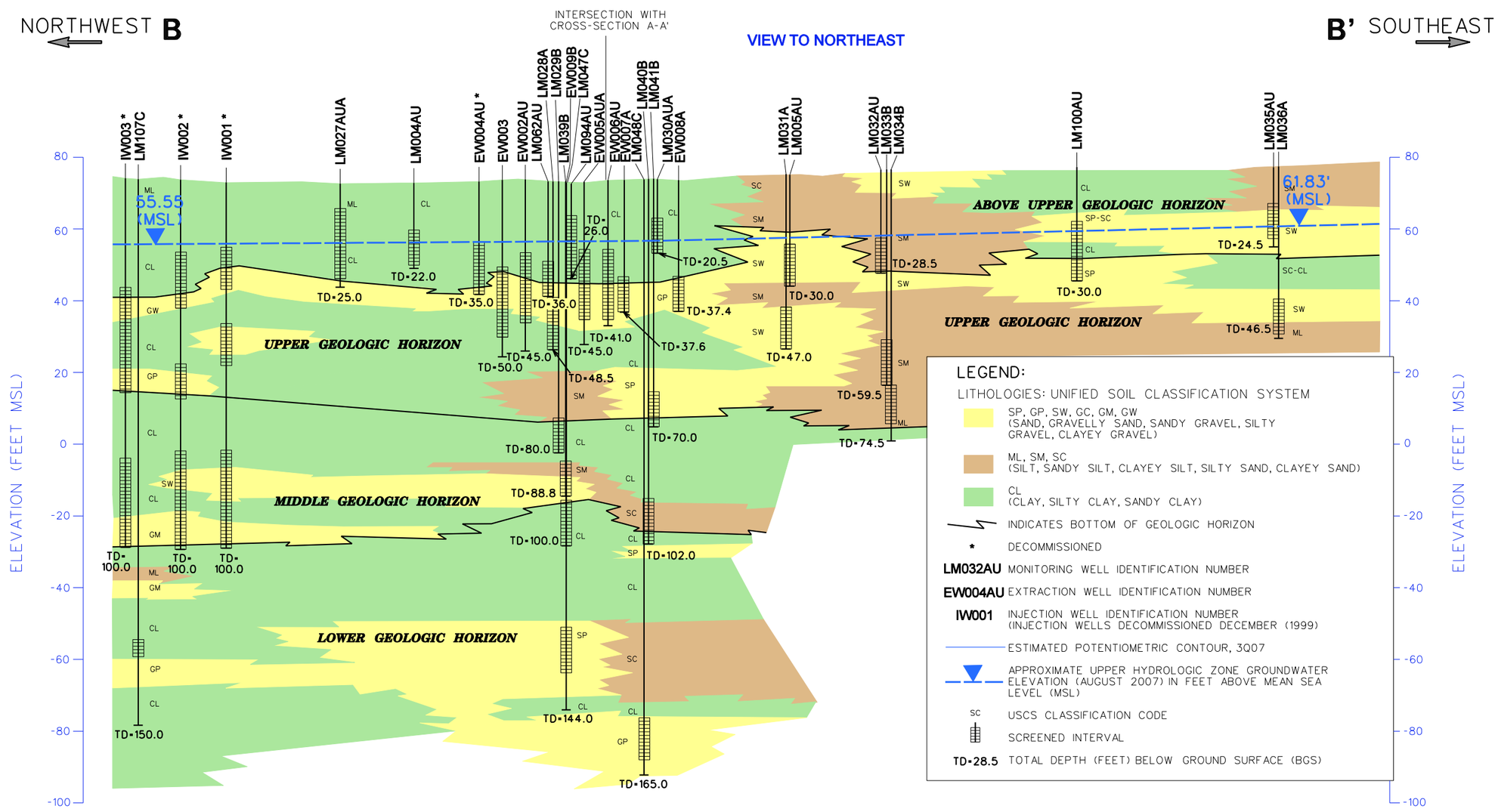


Figure A-6
Cross-Section A-A' Lithology
Tracy Site

Tracy\5 Yr Review\5YR-Tracy-Xsec-A.indd - VMG 08/03/12 SAC



NOTE: DETAILED LITHOLOGIC LOGS WERE NOT AVAILABLE FOR EXTRACTION AND INJECTION WELLS.

SEE FIGURE A-5 FOR LOCATION OF CROSS-SECTION AND WELLS

WELLS SCREENED IN THE ABOVE UPPER AND UPPER GEOLOGIC HORIZONS COMPRISE THE UPPER HYDROLOGIC ZONE. WELLS SCREENED IN THE MIDDLE GEOLOGIC HORIZON COMPRISE THE MIDDLE HYDROLOGIC ZONE. WELLS SCREENED IN THE LOWER AND BELOW LOWER GEOLOGIC HORIZONS COMPRISE THE LOWER HYDROLOGIC ZONE.

TRACY\ RCP_2008_CAD \ XSECTION_BB_2007ANNUAL_APPB.DGN VRL

Figure A-7
Cross-Section B-B' Lithology
Tracy Site

Tracy\5 Yr Review\5YR-Tracy-Xsec-B.indd - VMG 08/03/12 SAC

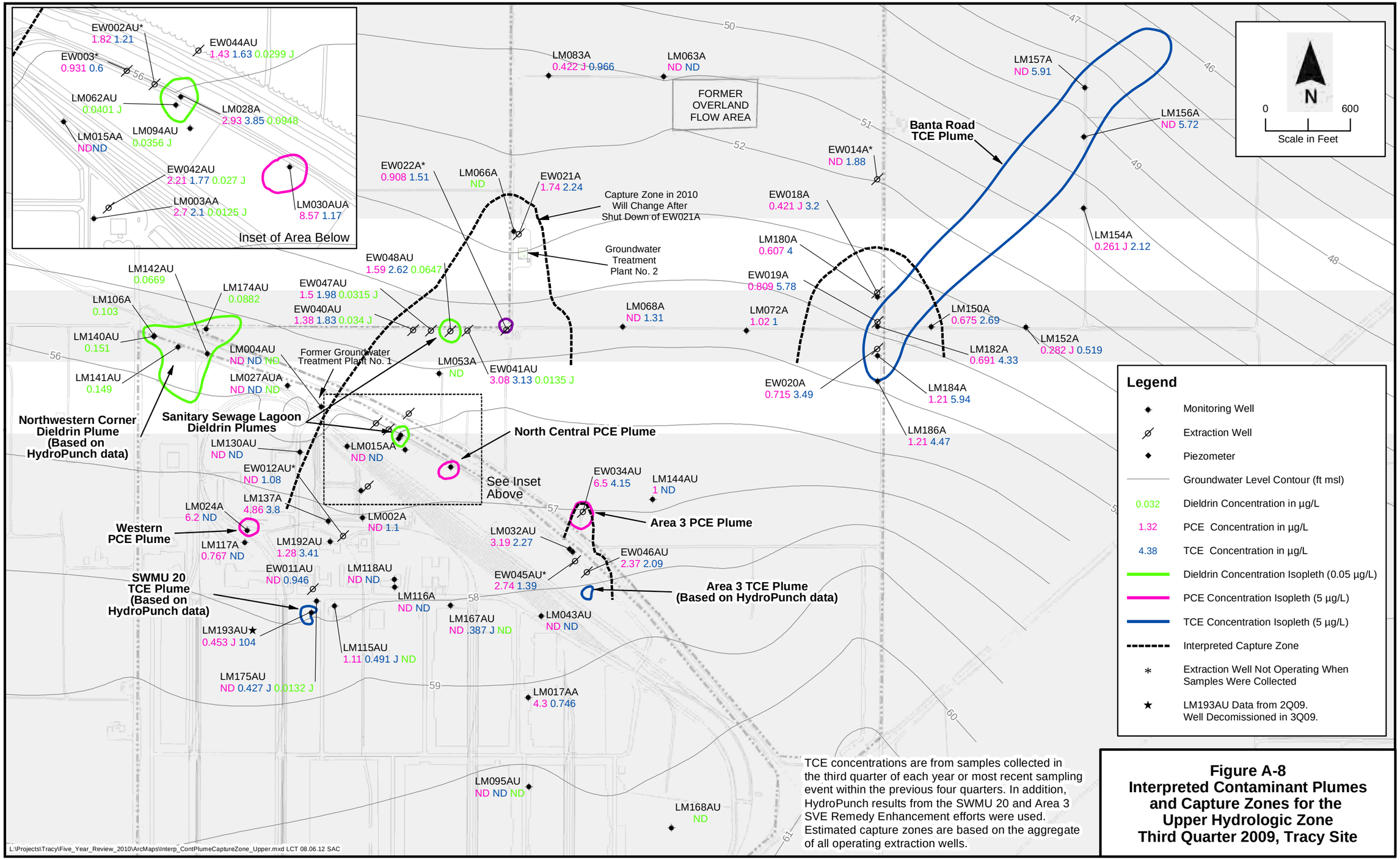


Figure A-8
Interpreted Contaminant Plumes and Capture Zones for the Upper Hydrologic Zone Third Quarter 2009, Tracy Site

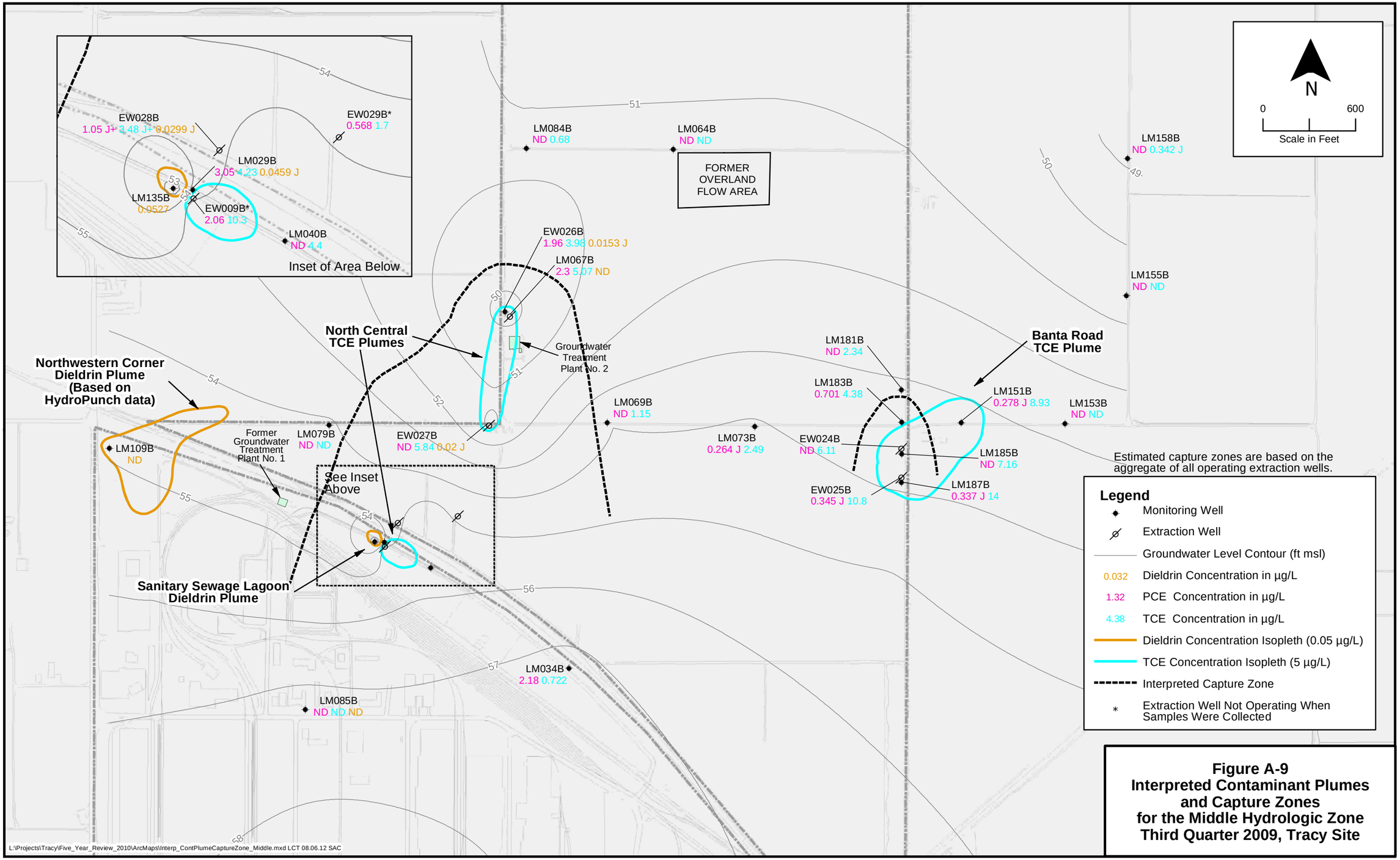


Figure A-9
Interpreted Contaminant Plumes and Capture Zones for the Middle Hydrologic Zone Third Quarter 2009, Tracy Site

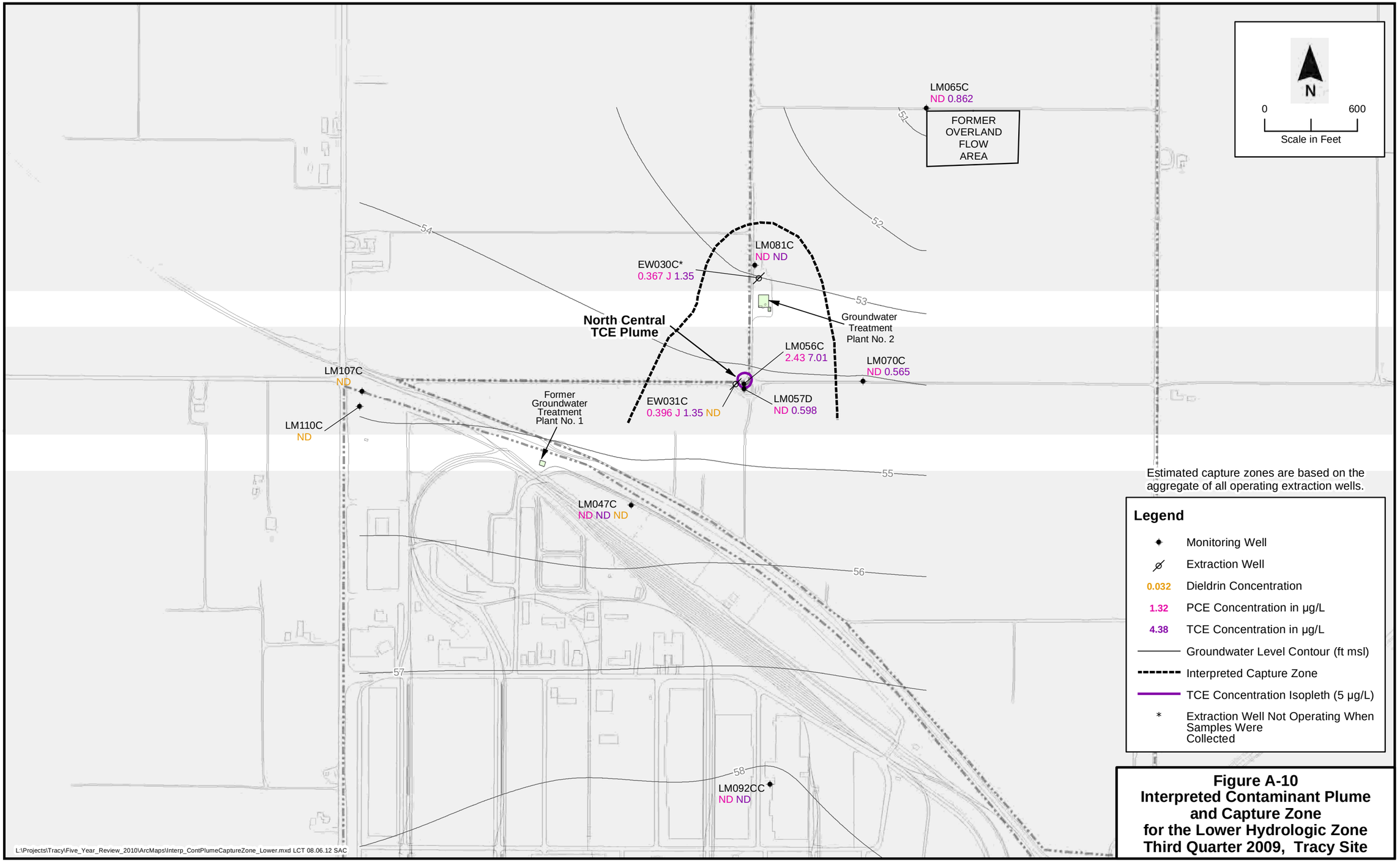


Figure A-10
Interpreted Contaminant Plume and Capture Zone for the Lower Hydrologic Zone Third Quarter 2009, Tracy Site

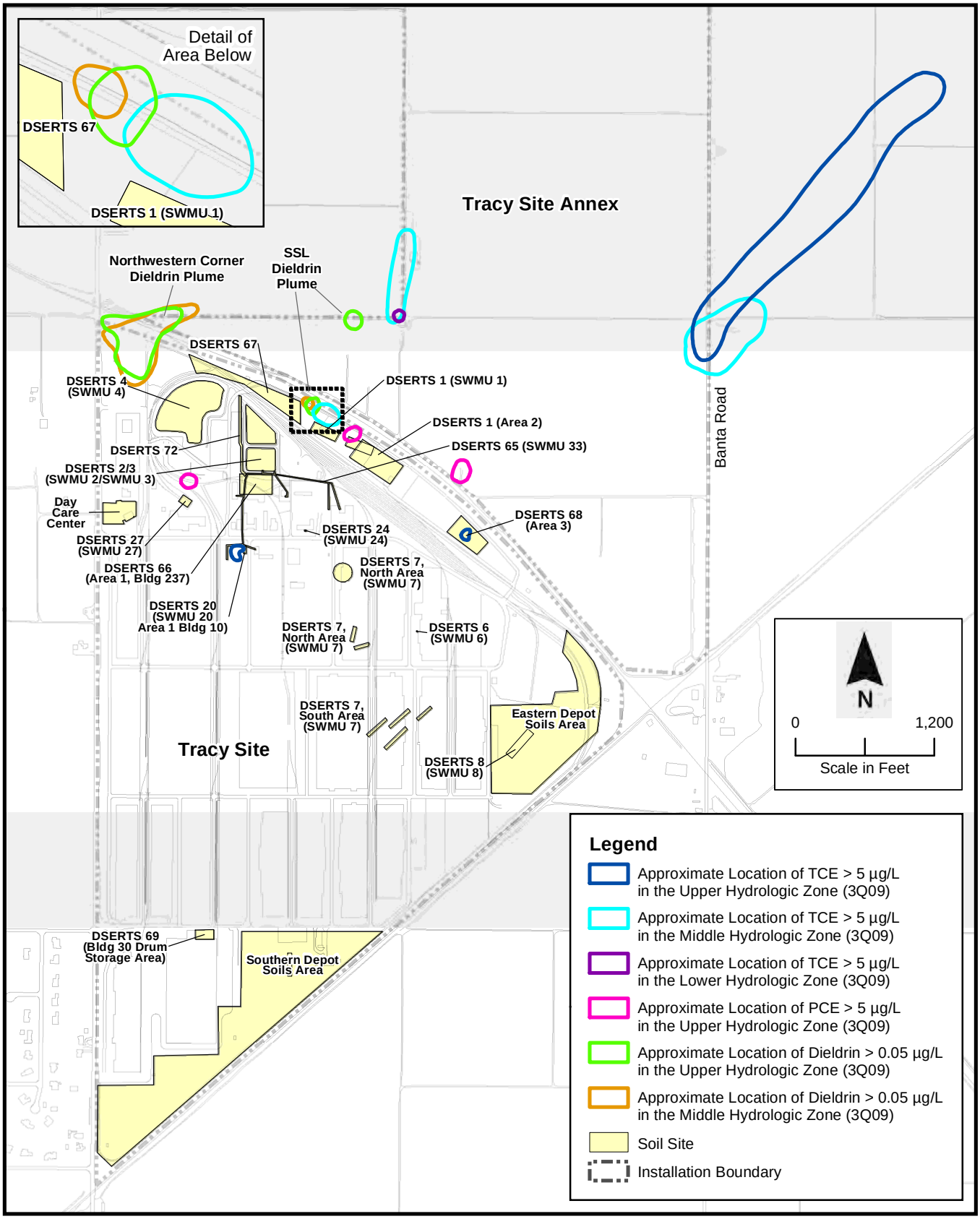


Figure A-11. Soil Sites and Groundwater Plumes, Tracy Site

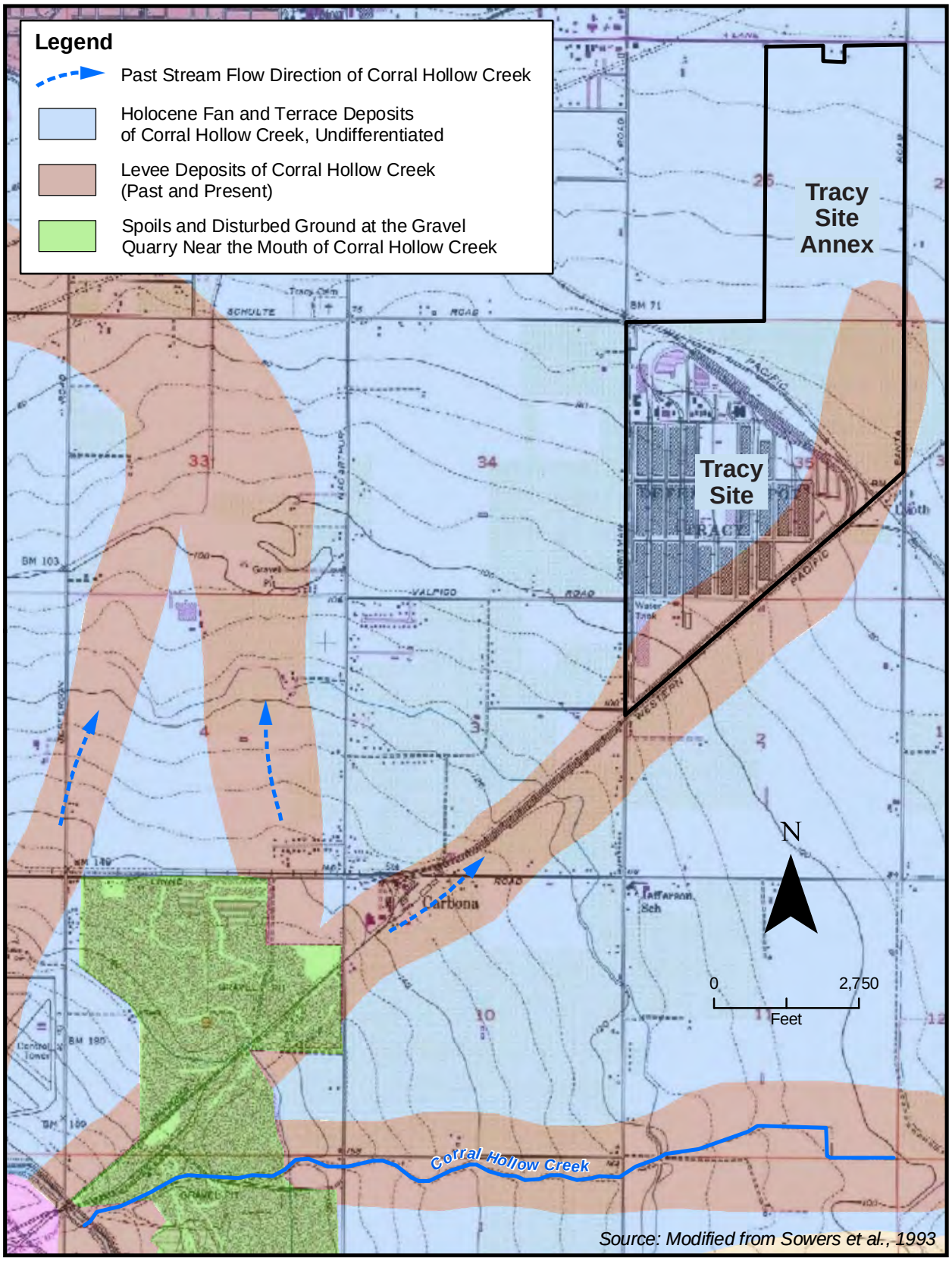
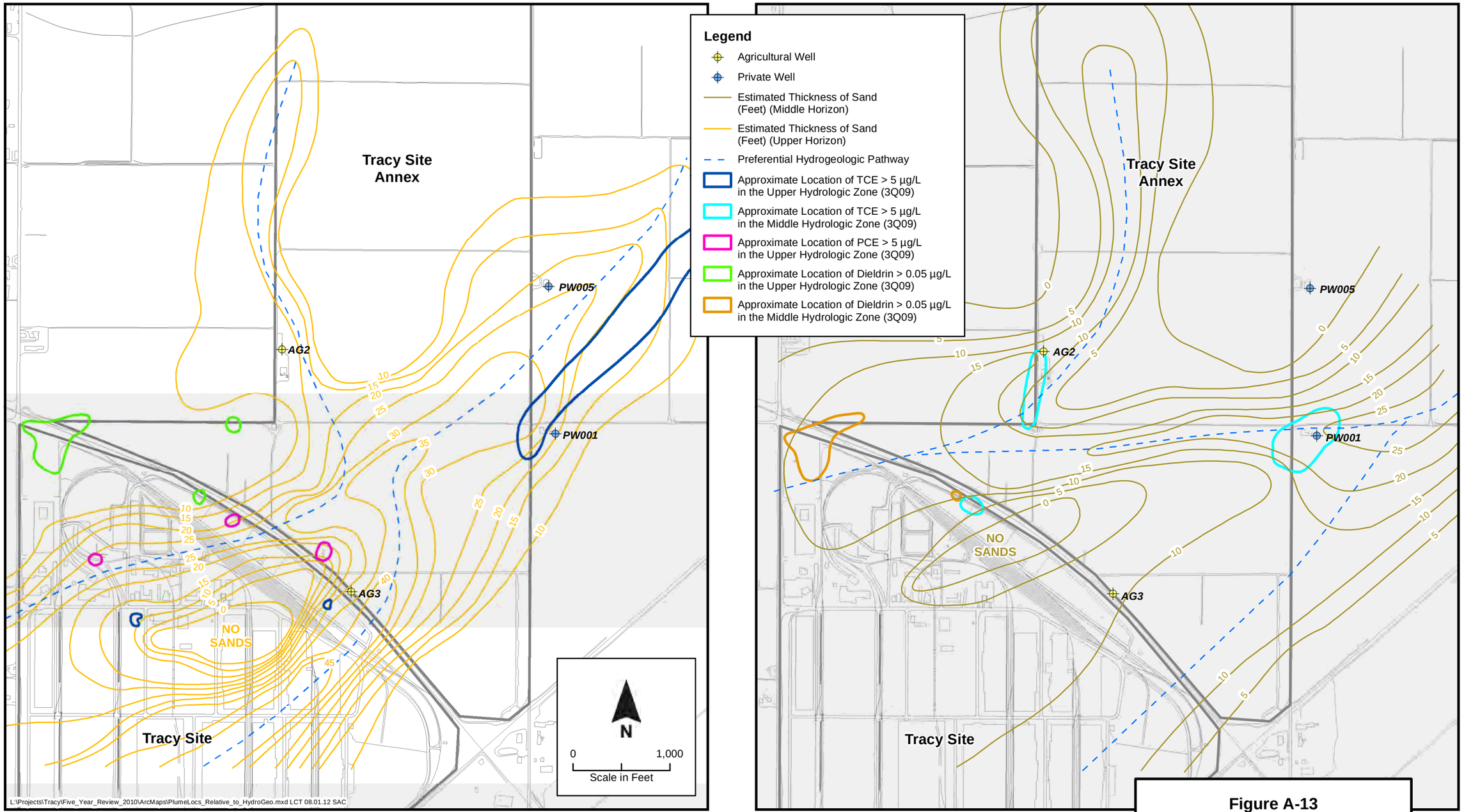


Figure A-12. Near Surface Geology Related to the Corral Hollow Fan, Tracy Site

Tracy\5 Yr Review\5YR-Tracy-Near-Surface-Geo-Map.indd - VMG 08/03/12 SAC



Upper Hydrologic Zone

Source: Montgomery Watson, 1996

Middle Hydrologic Zone

Figure A-13
Plume Locations Relative to Hydrolgeology, Tracy Site

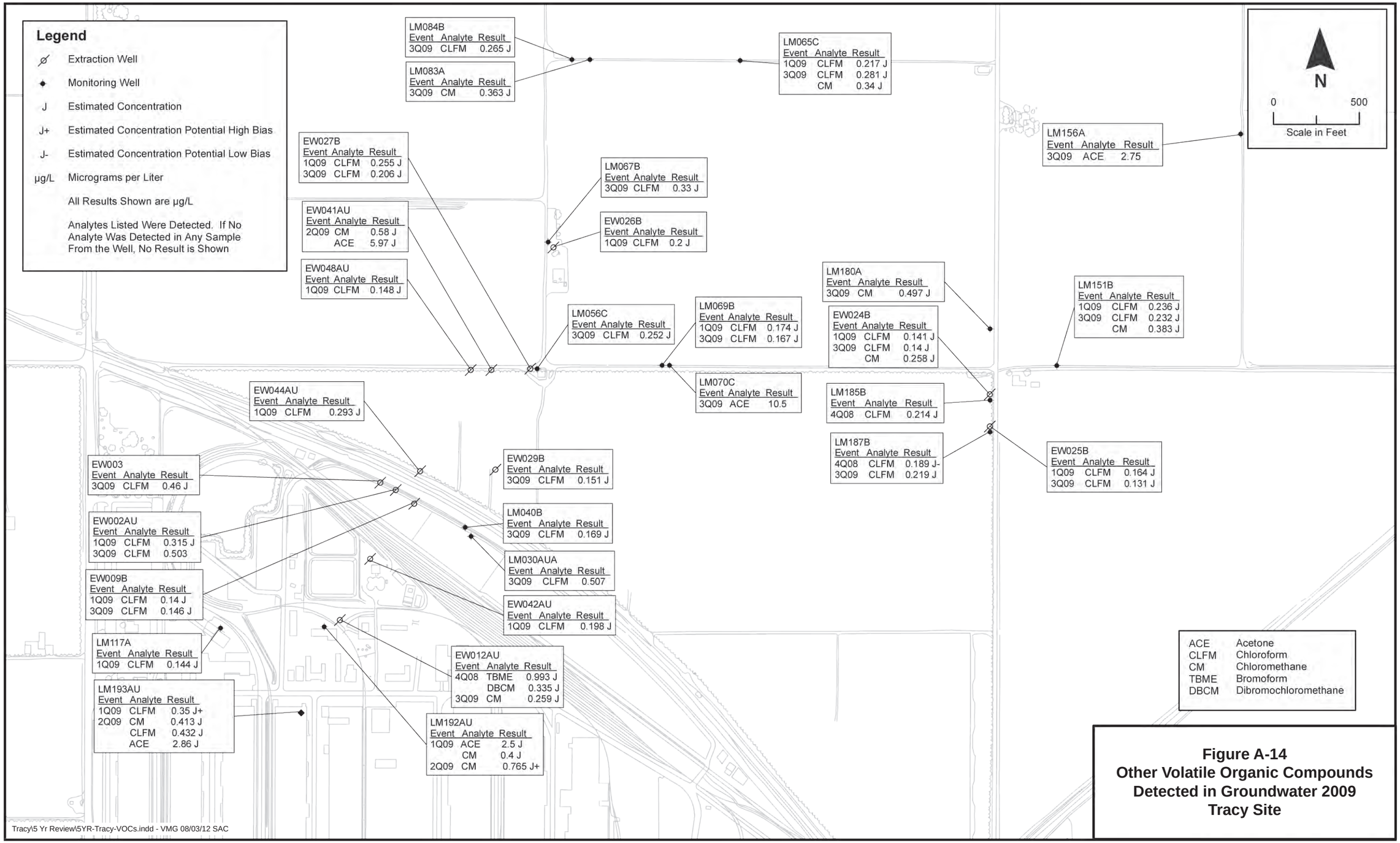


Figure A-14
Other Volatile Organic Compounds Detected in Groundwater 2009
Tracy Site

APPENDIX B

Interview Records

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy Site (DDJC-Tracy)	**EPA ID No.:CA4971520834**	
Subject: 2010 Five-Year Review Interview	**Time: N/A**	**Date: 8/19/2010**
Type: Telephone Visit **X** Other **Location of Visit:** N/A	**X** Incoming Outgoing	

Contact Made By:

Name: Kevin Spesert	**Title: Government Affairs Manager**	**Organization: URS Corporation**

Individual Contacted:

Name: Maurice Benson	**Title: Environmental Program Manager**	**Organization: Defense Distribution Depot San Joaquin (DDJC)**

Telephone No: **Fax No:** **E-Mail Address: Maurice.benson@dla.mil**	**Street Address:** **City, State, Zip:**

Interview Questions

1. **What is your overall impression of the remedies selected for DDJC-Sharpe's Installation Restoration Program (IRP) (e.g. Excavation, SVE, Groundwater Extraction and Treatment)?**

Generally, the selected remedies are appropriate and effective. However, it is a well-known fact that groundwater extraction i.e. "pump and treat" becomes less efficient and cost effective over time.

2. **Is the groundwater remedy functioning as expected? Do you have any concerns regarding the function of the remedies?**

The pump and treat system has become less efficient and cost effective as the cost per gram of contaminant has risen drastically over the years, and the control systems are generally obsolete but remain functional at this time.

3. **Have there been unexpected Operations and Maintenance (O&M) difficulties or costs at the site since startup or in the last five years?**

System scaling and the subsequent de-scaling was basically unexpected and adds to the operational costs.

4. **Has the site been in compliance with permitting and reporting requirements?**

The site has consistently been in compliance with permitting and reporting requirements.

5. **Do you have any comments, suggestions, or recommendations regarding the implementation of the IRP remedies or how the program has been conducted, in general?**

The program has been and continues to be operated in a conscientious and professional manner within the constraints of regulatory limitations and funding availability.

6. **Do you have any comments on the operation of the IRP remedies related to future effectiveness or optimization of operations?**

Obtaining regulatory concurrence with an extraction well rebound study could optimize the extraction system significantly.

7. **What is your single greatest concern regarding the ongoing performance of the IRP remedies?**

Equipment wear and tear, control obsolescence and performance inefficiency over time – specifically in terms of the pump and treat system.

8. **Does the monitoring data show any trends that contaminant levels are increasing or decreasing? Have any new or emerging Contaminants of Concern (COCs) been identified? If so, have they impacted the effectiveness of the remedies?**

In most cases, contaminant levels are decreasing as a result of source reduction, extraction and treatment, or natural attenuation. No new or emerging COCs have been identified.

.

9. **Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.**

The system/sampling efforts are optimized annually, with the concurrence of the regulatory agencies, in order to reduce costs and unnecessary or redundant efforts.

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy Site (DDJC-Tracy)	**EPA ID No.: CA4971520834**	
Subject: 2010 Five-Year Review Interview	**Time: N/A**	**Date: 8/10/2010**
Type: Telephone Visit **X** Other **Location of Visit:** N/A	**X** Incoming Outgoing	

Contact Made By:

Name: Kevin Spesert	**Title: Government Affairs Manager**	**Organization: URS Corporation**

Individual Contacted:

Name: John Clark	**Title: Project Engineer**	**Organization: URS Corporation**

Telephone No: (916) 679-2202 **Fax No:** **E-Mail Address: john_clark@urscorp.com**	**Street Address: 2870 Gateway Oaks Drive, Suite 150** **City, State, Zip: Sacramento, CA 95833**

Interview Questions

1. **What is your overall impression of the remedies selected for DDJC-Sharpe's Installation Restoration Program (IRP) (e.g. Excavation, SVE, Groundwater Extraction and Treatment)?**

I think the selected remedies are appropriate and making progress towards achieving the clean-up goals.

2. **Is the groundwater remedy functioning as expected? Do you have any concerns regarding the function of the remedies?**

I think the groundwater remedy is functioning as expected, and is making progress (albeit slowly) towards meeting clean-up goals. I am concerned that the dieldrin aquifer clean-up level for the OU1 plume may not be a realistic goal due to the low mobility of this contaminant

3. **Have there been unexpected Operations and Maintenance (O&M) difficulties or costs at the site since startup or in the last five years?**

I am not aware of any particular difficulties with the current OU1 remedy. Some higher than desired costs should be expected for continuing repair and replacement of aging equipment
.

4. **Has the site been in compliance with permitting and reporting requirements?**

Yes. I am not aware of any compliance problems

5. **Do you have any comments, suggestions, or recommendations regarding the implementation of the IRP remedies or how the program has been conducted, in general?**

No.

6. **Do you have any comments on the operation of the IRP remedies related to future effectiveness or optimization of operations?**

No.

7. **What is your single greatest concern regarding the ongoing performance of the IRP remedies?**

I am concerned that there does not appear to be a consensus on whether further action is needed for that part of the plume east on Banta Road; however, consensus may have been reached that I am not aware of. Natural attenuation would appear appropriate for this portion of the plume as it appears to have been stable for several years

.

8. **Does the monitoring data show any trends that contaminant levels are increasing or decreasing? Have any new or emerging Contaminants of Concern (COCs) been identified? If so, have they impacted the effectiveness of the remedies?**

Monitoring data show a slow, steadily decreasing trend or stable concentrations throughout the plume. I am not aware of any new or emerging COCs.

9. **Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.**

I feel that O&M of the OU1 remedy has been appropriately optimized to operate the minimum number of wells needed to continue reducing plume concentrations towards aquifer clean-up levels. I also feel that recent reductions in the sampling effort needed to monitor the OU1 plume have been appropriate.

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy Site (DDJC-Tracy)	**EPA ID No.: CA4971520834**	
Subject: 2010 Five-Year Review Interview	**Time: N/A**	**Date: 8/18/2010**
Type: Telephone Visit **X** Other **Location of Visit:** N/A	**X** Incoming Outgoing	

Contact Made By:

Name: Kevin Spesert	**Title: Government Affairs Manager**	**Organization: URS Corporation**

Individual Contacted:

Name: George Bradshaw	**Title: Operations Supervisor**	**Organization: URS Corporation**

Telephone No: **Fax No:** **E-Mail Address: geroge.bradshaw@urscorp.com**	**Street Address:** **City, State, Zip:**

Interview Questions

1. **What is your overall impression of the remedies selected for DDJC-Sharpe's Installation Restoration Program (IRP) (e.g. Excavation, SVE, Groundwater Extraction and Treatment)?**

As the Groundwater Treatment Plant operations supervisor for the past few years, I'll be speaking on behalf of the technologies in place. The treatment plants have ran well even though most of the components and control strategies have reached and even exceeded their life expectancies.

2. **Is the groundwater remedy functioning as expected? Do you have any concerns regarding the function of the remedies?**

There has been some difficulties in extraction well performance for capture. Well redevelopment has been on ongoing activity.

3. **Have there been unexpected Operations and Maintenance (O&M) difficulties or costs at the site since startup or in the last five years?**

Hard mineral scaling caused by the action of air stripping has been a constant problem. Sequestriants (water conditioning phosphates) are costly and injected at a given steady rate at the influent pipe. Certain sequestriant products have been poor performers causing scale to build in transfer and effluent pumps. Pumps have been rebuilt, replaced and stripper tower packing has been affected.

.

4. **Has the site been in compliance with permitting and reporting requirements?**

Yes. All plant treated discharge has been routinely sampled and analyzed for compliance. To my knowledge we have never been out of compliance

5. **Do you have any comments, suggestions, or recommendations regarding the implementation of the IRP remedies or how the program has been conducted, in general?**

The program has been conducted fine. We should be able to start upgrading operating software, control and communication strategies, SCADA and PC components

6. **Do you have any comments on the operation of the IRP remedies related to future effectiveness or optimization of operations?**

As the contamination levels decrease, air stripping may not be the most cost effective approach due to high maintenance issues with the hard water scaling. High volume activated carbon remediation could be a replacement technology consideration.

7. **What is your single greatest concern regarding the ongoing performance of the IRP remedies?**

There will come a time when the SCADA software or PC operating system will fail and restoration will not be an option due to obsolescence. New control structures will have to be designed.

8. **Does the monitoring data show any trends that contaminant levels are increasing or decreasing? Have any new or emerging Contaminants of Concern (COCs) been identified? If so, have they impacted the effectiveness of the remedies?**

I have no information on this.

9. **Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.**

O&M can never be fully optimized as new approaches, technologies and practices are learned and adopted over time. Efficiency has been an ever improving factor and should continue to improve over time.

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy Site (DDJC-Tracy)	**EPA ID No.:**	
Subject: 2010 Five-Year Review Interview	**Time: N/A**	**Date: 8/26/2010**
Type: Telephone Visit **X** Other **Location of Visit:** N/A	**X** Incoming Outgoing	

Contact Made By:

Name: Kevin Spesert	**Title: Government Affairs Manager**	**Organization: URS Corporation**

Individual Contacted:

Name: Charles O'Neill	**Title:**	**Organization: HDR/e2M**
Telephone No: **Fax No:** **E-Mail Address: charles.o'neill@hdrinc.com**	**Street Address:** **City, State, Zip:**	

Interview Questions

1. **What is your overall impression of the remedies selected for DDJC-Sharpe's Installation Restoration Program (IRP) (e.g. Excavation, SVE, Groundwater Extraction and Treatment)?**

Based upon the reduction of contaminant concentrations the appropriate remedies were selected. However, based upon the small and declining amount of mass removed each year by the groundwater pump and treat system, and because there are no unmitigated receptors, it is my impression that the pump and treat system's effectiveness is diminishing and that other less energy intensive remedies should be considered.

2. **Is the groundwater remedy functioning as expected? Do you have any concerns regarding the function of the remedies?**

Yes, the groundwater remedy is functioning as expected. I am concerned that the pump and treat system has out-performed its useful life as an effective remedy and that other less energy intensive remedies should be considered.

3. **Have there been unexpected Operations and Maintenance (O&M) difficulties or costs at the site since startup or in the last five years?**

No.

.

4. **Has the site been in compliance with permitting and reporting requirements?**

Yes.

5. **Do you have any comments, suggestions, or recommendations regarding the implementation of the IRP remedies or how the program has been conducted, in general?**

While effective, implementing remedy changes under the CERCLA process is slow. A more flexible process would likely result in cost savings to the government and taxpayer while at the same time protecting human health and the environment.

.

6. **Do you have any comments on the operation of the IRP remedies related to future effectiveness or optimization of operations?**

As shown by the declining mass of contaminants removed each year the effectiveness of the groundwater pump and treat system will continue to decline and the cost per pound of contaminants removed will continue to increase.

7. **What is your single greatest concern regarding the ongoing performance of the IRP remedies?**

The groundwater pump and treat system will continue to operate with diminishing benefit.

8. **Does the monitoring data show any trends that contaminant levels are increasing or decreasing? Have any new or emerging Contaminants of Concern (COCs) been identified? If so, have they impacted the effectiveness of the remedies?**

Overall, monitoring data shows decreasing contaminant concentrations.

9. **Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.**

Within the constraints of the ROD and the decision logic process charts, the O&M system has been optimized.

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy Site (DDJC-Tracy)	**EPA ID No.:**	
Subject: 2010 Five-Year Review Interview	**Time: N/A**	**Date: 8/26/2010**
Type: Telephone Visit **X** Other **Location of Visit:** N/A	**X** Incoming Outgoing	

Contact Made By:

Name: Kevin Spesert	**Title: Government Affairs Manager**	**Organization: URS Corporation**

Individual Contacted:

Name: Steven Herrera	**Title:**	**Organization: HDR/e2M**
Telephone No: **Fax No:** **E-Mail Address: steven.herrera@hdrinc.com**	**Street Address:** **City, State, Zip:**	

Interview Questions

1. **What is your overall impression of the remedies selected for DDJC-Sharpe's Installation Restoration Program (IRP) (e.g. Excavation, SVE, Groundwater Extraction and Treatment)?**

The selected remedies have been beneficial in protecting human health and the environment.

2. **Is the groundwater remedy functioning as expected? Do you have any concerns regarding the function of the remedies?**

The GWTP is performing as expected and continues prevent further migration of VOC impacted groundwater beyond Depot boundaries. As plume VOC concentrations get closer to ACLs, further analysis may be warranted to determine if passive or in-situ technologies would be better suited to meet program objectives.

3. **Have there been unexpected Operations and Maintenance (O&M) difficulties or costs at the site since startup or in the last five years?**

No. Maintenance items performed are considered normal for the age and type of system at the Tracy facility.

.

4. **Has the site been in compliance with permitting and reporting requirements?**

Yes.

5. **Do you have any comments, suggestions, or recommendations regarding the implementation of the IRP remedies or how the program has been conducted, in general?**

In general, the implementations process is long and drawn out. This can be attributed to both the CERCLA process and extended agency review times (i.e., missed deadlines) on several documents.

.

6. **Do you have any comments on the operation of the IRP remedies related to future effectiveness or optimization of operations?**

The effectiveness of the pump and treat system will continue to diminish as VOC plumes continue to decline closer to ALCs. As a result, other alternatives should be evaluated to determine if remedial objectives can be met in a more efficient matter.

7. **What is your single greatest concern regarding the ongoing performance of the IRP remedies?**

The Northwest Corner dispute process between DLA (and DLA contractors) and the regulatory agencies took too long to resolve. Considering the many pending changes/alternations to selected remedies at several Depot sites (via new ROD, ESDs, etc.) and that the pump and treat system's efficiency may be near an end, my biggest concern is that additional differences may impede remediation progress at the site.

8. **Does the monitoring data show any trends that contaminant levels are increasing or decreasing? Have any new or emerging Contaminants of Concern (COCs) been identified? If so, have they impacted the effectiveness of the remedies?**

Generally, contaminant levels have are decreasing or remaining steady and no emerging COCs have been identified.

.

9. **Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.**

Recent optimization efforts/evaluation have resulted in a reduction of groundwater sampling at the site. However, the current sampling matrix should be evaluated to determine if additional optimization activities may further reduce sampling efforts at the site.

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy Site (DDJC-Tracy)	**EPA ID No.: CA4971520834**	
Subject: 2010 Five-Year Review Interview	**Time: N/A**	**Date: 9/15/2010**
Type: Telephone Visit **X** Other **Location of Visit:** N/A	**X** Incoming Outgoing	

Contact Made By:

Name: Kevin Spesert	**Title: Government Affairs Manager**	**Organization: URS Corporation**

Individual Contacted:

Name: Paul Marsden	**Title: Lead Operator**	**Organization: HDR/e2M**

Telephone No: **Fax No:** **E-Mail Address: paul.marsden@hdrinc.com**	**Street Address:** **City, State, Zip:**

Interview Questions

1. **What is your overall impression of the remedies selected for DDJC-Sharpe's Installation Restoration Program (IRP) (e.g. Excavation, SVE, Groundwater Extraction and Treatment)?**
I do think that they are a good application for the problems at hand.

2. **Is the groundwater remedy functioning as expected? Do you have any concerns regarding the function of the remedies?**
Yes, the ground water remedy is performing as I have expected, I do not have any concerns regarding the function of the remedy.

3. **Have there been unexpected Operations and Maintenance (O&M) difficulties or costs at the site since startup or in the last five years?**
There have been no, out of the normal problems with the plant. The plant is beginning to experience higher volume of problems due to the age and use of programs/equipment, but this is expected. For example, a recent PLC failure does have me concerned on the age of the process controls.

4. **Has the site been in compliance with permitting and reporting requirements?**
Yes, as far as I know there have been no violations since the plant was brought on line.

5. **Do you have any comments, suggestions, or recommendations regarding the implementation of the IRP remedies or how the program has been conducted, in general?**
I would recommend looking into the upgrade of the computer, operating system (Wonder ware) and PLC. At least replacement parts for the PLC if they can be found.

6. **Do you have any comments on the operation of the IRP remedies related to future effectiveness or optimization of operations?**

None at this time.

7. **What is your single greatest concern regarding the ongoing performance of the IRP remedies?**

Acquiring the out dated PLC components that may be needed in the future.

8. **Does the monitoring data show any trends that contaminant levels are increasing or decreasing? Have any new or emerging Contaminants of Concern (COCs) been identified? If so, have they impacted the effectiveness of the remedies?**

We have decreased the number of operating wells and the monitoring program which indicates we are decreasing the plume. I am not aware of any new contaminants in the last 5 years.

9. **Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.**

The sampling effort is optimized annually, and sampling has been reduced and finished quicker than in the past several years. The O&M has been optimized and that is something that is always being optimized. For example in 2005, operations data was manually logged and faxed and/or e-mailed to the PM (Project Manager). In the next few weeks, operations data will be directly logged into a computer by the operator and immediately available to the engineers for report purposes.

Having the O&M and Well Monitoring programs under a single contract facilitates internal communications and operations. In the past, there were separate contracts; one for the GWTP reporting and O&M and another for the well sampling and reporting. Now the GWTP and Well Monitoring are under one contract and the communications between the operations and engineering are quicker and better coordinated. Results of Well Monitoring are communicated faster and operational changes from the GWTP are communicated faster.

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy)	**EPA ID No.: CA4971520834**	
Subject: DDJC-Tracy 2010 Five-Year Review Survey	**Time: n/a**	**Date:8/18/10**
Type: email	Incoming	

Contact Made By:

Name: Annette Silva	**Title: Public Affairs Officer**	**Organization: DLA**

Individual Contacted:

Name: James Brownell	**Title: Remedial Project Manager**	**Organization: Central Valley RWQCB**

Telephone No: (916) 464-4675 **Fax No:** **E-Mail Address:jbrownell@waterboards.ca.gov**	**Street Address:11020 Sun Center Drive, #200** **Rancho Cordova, CA 95670**

Summary Of Conversation

Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy) 2010 Five-Year Review Survey

1) What is your overall impression of the remedies selected for DDJC-Tracy's Installation Restoration Program (IRP) (eg., excavation, SVE, groundwater extraction and treatment)?

For the most part, they have been successful at reducing mass and concentrations of contaminants.

2) Is the ground water remedy functioning as expected? Do you have any concerns regarding the function of the remedies?

Yes; for example, TCE concentration in groundwater seems to have decreased by an order of magnitude since pump and treat was implemented. I have no concerns at this time.

3) Have there been unexpected operation and maintenance (O&M) difficulties or costs at the site over the last five years?

Not that I am currently aware of.

4) Has the site been in compliance with permitting and reporting requirements?

I believe so.

5) Do you have any comments, suggestions, or recommendations regarding the implementation of the IRP remedies or how the program has been conducted in general?

No.

6) Do you have any comments on the operation of the IRP remedies related to future effectiveness or optimization of operations?

No.

7) What is your single greatest concern regarding the ongoing performance of the IRP remedies?

The TCE plume in groundwater that has migrated northeast of the Depot Annex and is outside of pump and treat system control does not appear to be attenuating.

8) Does the monitoring data show any trends that contaminant levels are increasing or decreasing? Have any new or emerging contaminants of concern (COCs) been identifies? Is so, have they impacted the effectiveness of the remedies?

Decreasing contaminant concentrations seem apparent, with the exception of the northeast TCE plume in groundwater. No new COCs.

9) Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency had or has not occurred.

Yes, the volume of groundwater that is being extracted has been reduced without loosing gradient control of COCs. Frequency of groundwater monitoring has been reduced without increasing threat to receptors.

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy Site (DDJC-Tracy)	**EPA ID No.: CA4971520834**	
Subject: 2010 Five-Year Review Interview	**Time: N/A**	**Date: 8/23/2010**
Type: Telephone Visit **X** Other **Location of Visit:** N/A	**X** Incoming Outgoing	

Contact Made By:

Name: Kevin Spesert	**Title: Government Affairs Manager**	**Organization: URS Corporation**

Individual Contacted:

Name: Pete MacNicholl	**Title: Program Manager**	**Organization: California Department of Toxic Substance Control (DTSC)**

Telephone No: **Fax No:** **E-Mail Address: pmacnich@dtsc.ca.gov**	**Street Address:** **City, State, Zip:**

Interview Questions

1. **What is your overall impression of the remedies selected for DDJC-Sharpe's Installation Restoration Program (IRP) (e.g. Excavation, SVE, Groundwater Extraction and Treatment)?**

I believe DDJC Tracy has successfully implemented and operated its SVE systems, GW pump and treat systems, including the ongoing elimination of persistent sources of GW contamination

2. **Is the groundwater remedy functioning as expected? Do you have any concerns regarding the function of the remedies?**

Yes, overall the GW system is functioning as expected. Yes, the ongoing remediation of the SWMU 20 persistent source of groundwater contamination and the Building 237/Area 1 pesticide source area

3. **Have there been unexpected Operations and Maintenance (O&M) difficulties or costs at the site since startup or in the last five years?**

Nothing comes to mind.

4. **Has the site been in compliance with permitting and reporting requirements?**

To my knowledge DDJC has complied with permitting and reporting requirements, including Water Board permits.

5. **Do you have any comments, suggestions, or recommendations regarding the implementation of the IRP remedies or how the program has been conducted, in general?**

Remedies should be constantly evaluated for potential optimization efforts to maximize the return on the investment for remedy long-term effectiveness, efficiency, and permanence

6. **Do you have any comments on the operation of the IRP remedies related to future effectiveness or optimization of operations?**

Wherever and whenever possible, eliminate persistent sources of groundwater contamination with aggressive approaches. These techniques will hopefully minimize long-term operation and monitoring for the remedies and aid their overall effectiveness

7. **What is your single greatest concern regarding the ongoing performance of the IRP remedies?**

Hydraulic capture and remediation of the NWC Dieldrin plume to reduce contaminant mass remaining in saturated soil and aquifer horizon(s).

8. **Does the monitoring data show any trends that contaminant levels are increasing or decreasing? Have any new or emerging Contaminants of Concern (COCs) been identified? If so, have they impacted the effectiveness of the remedies?**

SWMU 20 source area showed increasing groundwater contaminant concentrations (TCE) in former building footprint and its potential migration away from current extraction wells. Future efforts by DDJC should account for the TCE plume and its remediation through SVE and pump and treat system.

9. **Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.**

Through the annual review and optimization efforts related to the Annual GW Monitoring Report, DDJC, the contractor, and regulatory agencies have continuously optimized the O&M program including well sampling

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy)	**EPA ID No.: CA4971520834**	
Subject: DDJC-Tracy 2010 Five-Year Review Survey	**Time: n/a**	**Date:8/4/2010**
Type: Telephone	Incoming	

Contact Made By:

Name: Tiffany Mendoza	**Title: Public Affairs Specialist**	**Organization: URS**

Individual Contacted:

Name: Leon Churchill	**Title: City Manager**	**Organization: City of Tracy**

Telephone No: (209) 831.6000 **Fax No:** **E-Mail Address:**	**Street Address:**

Summary Of Conversation

Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy) 2010 Five-Year Review Survey

1. How long have you lived, worked, or been associated with the community adjacent to DDJC-Sharpe? What is your current role as it relates to the site (e.g., local resident, local business representative, city council member, etc.)?

Two years and three months. I am the local government administrator and resident

2. What is your overall impression of the environmental work conducted at the site to date?

That steady progress is being made

3. What effects have site environmental operations had on the surrounding community?

Little

4. Are you aware of any community concerns regarding the site or its environmental operation and administration? If so, please give details.

No, not at this time

5. Do you feel well informed about the site's environmental cleanup activities and progress?

No. When I've worked with other Federal agencies they've come and given a presentation. Other groups, such as a local landfill, will come and give updates, etc.

6. Do you have any comments, suggestions, or recommendations regarding the site's environmental management or operation?

Do some things proactive. Do a newsletter. If there is one add me to the list. Or send a rep to talk to me and staff. Also, would like to know what the facility is doing such as employment – the facility is of huge economic value. Would like to see more interaction with the city.

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy)	**EPA ID No.: CA4971520834**	
Subject: DDJC-Tracy 2010 Five-Year Review Survey	**Time: n/a**	**Date:8/4/2010**
Type: Telephone	Incoming	

Contact Made By:

Name: Tiffany Mendoza	**Title: Public Affairs Specialist**	**Organization: URS**

Individual Contacted:

Name: Jessica Cordozo	**Title: Communications Director**	**Organization: Tracy Unified School District**

Telephone No: (209) 830.3201 **Fax No:** **E-Mail Address:**	**Street Address:**

Summary Of Conversation

Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy) 2010 Five-Year Review Survey

1. How long have you lived, worked, or been associated with the community adjacent to DDJC-Sharpe? What is your current role as it relates to the site (e.g., local resident, local business representative, city council member, etc.)?

Five and a half years, as the Business Representative for the Tracy Unified School District

2. What is your overall impression of the environmental work conducted at the site to date?

Not at all familiar with the environmental work being conducted at the site.

3. What effects have site environmental operations had on the surrounding community?

Not that I know of.

4. Are you aware of any community concerns regarding the site or its environmental operation and administration? If so, please give details.

Not that I am aware of.

5. Do you feel well informed about the site's environmental cleanup activities and progress?

I am not well aware of the clean-up activities, however I would be interested in leaning more about the clean-up efforts and participating in any forums or public meetings.

6. Do you have any comments, suggestions, or recommendations regarding the site's environmental management or operation?

No additional suggestions.

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy)	**EPA ID No.: CA4971520834**	
Subject: DDJC-Tracy 2010 Five-Year Review Survey	**Time: n/a**	**Date:8/4/2010**
Type: Telephone	Incoming	

Contact Made By:

Name: Tiffany Mendoza	**Title: Public Affairs Specialist**	**Organization: URS**

Individual Contacted:

Name: Andrew Mali	**Title: Director**	**Organization: City of Tracy Planning Department**

Telephone No: (209) 831.6400 **Fax No:** **E-Mail Address:**	**Street Address:**

Summary Of Conversation

Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy) 2010 Five-Year Review Survey

1. How long have you lived, worked, or been associated with the community adjacent to DDJC-Sharpe? What is your current role as it relates to the site (e.g., local resident, local business representative, city council member, etc.)?

Thirteen and a half years working for the city and I live in the community. I work in the Engineering and Planning Dept. The site is in the County so it doesn't impact my position too much.

2. What is your overall impression of the environmental work conducted at the site to date?

I am aware of the Plume on north side of facility – and I understand that effort is still ongoing.

3. What effects have site environmental operations had on the surrounding community?

This is a more difficult question. The city owns property at Chrisman Rd. and 11th Street. We are putting college and educational uses there. The city considered buying properties on south side of street for student housing and other educational purposes – and this is how I became aware of the environmental work. The city decided not moving forward with the land purchase. The city is continuing with development of the current site.

4. Are you aware of any community concerns regarding the site or its environmental operation and administration? If so, please give details.

I'm not sure how many people really know about it. From the city's perspective, we are on municipal sources, not wells.

5. Do you feel well informed about the site's environmental cleanup activities and progress?

Because I have done more research on it, yes.

6. Do you have any comments, suggestions, or recommendations regarding the site's environmental management or operation?

No additional suggestions.

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy)	**EPA ID No.: CA4971520834**	
Subject: DDJC-Tracy 2010 Five-Year Review Survey	**Time: n/a**	**Date:8/4/2010**
Type: Telephone	Incoming	

Contact Made By:

Name: Tiffany Mendoza	**Title: Public Affairs Specialist**	**Organization: URS**

Individual Contacted:

Name: Kevin Tobeck	**Title: Director**	**Organization: City of Tracy Public Works Department**

Telephone No: (209) 831.4420 **Fax No:** **E-Mail Address:**	**Street Address:**

Summary Of Conversation

Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy) 2010 Five-Year Review Survey

1. How long have you lived, worked, or been associated with the community adjacent to DDJC-Sharpe? What is your current role as it relates to the site (e.g., local resident, local business representative, city council member, etc.)?

I've lived in the city for 26 years and have worked for the city for 21 years. Position is Public Works director for City and neighbor.

2. What is your overall impression of the environmental work conducted at the site to date?

I have not been intimately involved. I know they have had some issues trying to clean-up the water. But I have heard positive things. The city owns some property fairly close which is why the city is involved.

3. What effects have site environmental operations had on the surrounding community?

I don't know. It has not really impacted us.

4. Are you aware of any community concerns regarding the site or its environmental operation and administration? If so, please give details.

The depot is not within city limits so I don't think the community has been overly concerned

5. Do you feel well informed about the site's environmental cleanup activities and progress?

I think so, and I think if it was something that was needed, more information would be readily available

6. Do you have any comments, suggestions, or recommendations regarding the site's environmental management or operation?

No additional suggestions.

INTERVIEW RECORD

Site Name: Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy)	**EPA ID No.: CA4971520834**	
Subject: DDJC-Tracy 2010 Five-Year Review Survey	**Time: n/a**	**Date:8/4/2010**
Type: Telephone	Incoming	

Contact Made By:

Name: Tiffany Mendoza	**Title: Public Affairs Specialist**	**Organization: URS**

Individual Contacted:

Name: Sofia Valenzuela	**Title: Manager**	**Organization: Tracy Chamber of Commerce**

Telephone No: (209) 835-2131 **Fax No:** **E-Mail Address:**	**Street Address:**

Summary Of Conversation

Defense Distribution Depot San Joaquin California, Tracy (DDJC-Tracy) 2010 Five-Year Review Survey

1. How long have you lived, worked, or been associated with the community adjacent to DDJC-Sharpe? What is your current role as it relates to the site (e.g., local resident, local business representative, city council member, etc.)?

Over 20 years. Serve as a leader of the leading business organization in the region, the Tracy Chamber of Commerce.

2. What is your overall impression of the environmental work conducted at the site to date?

Not too familiar with the environmental work being conducted at the site.

3. What effects have site environmental operations had on the surrounding community?

I don't think it's had a negative effect. I have not heard anything negative coming from members of the community which I would say means that the clean-up activities have been good.

4. Are you aware of any community concerns regarding the site or its environmental operation and administration? If so, please give details.

I am not aware of any problems regarding the ongoing restoration activities.

5. Do you feel well informed about the site's environmental cleanup activities and progress?

I feel that I am well informed about the progress of the clean-up activities. However, due to my position in the community I may following the issue more closely than other member of the community.

6. Do you have any comments, suggestions, or recommendations regarding the site's environmental management or operation?

No additional suggestions.

APPENDIX C

Site Inspection Forms

Site Inspection Checklist

I. SITE INFORMATION	
Site name: OU 1 Groundwater	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny / 93°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- ✓ Groundwater pump and treatment
- o Surface water collection and treatment
- o Other _____
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Paul Marsden (Name) O&M Operator (Title) 7/16/10 (Date)
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; ø Report attached See appendix for Interviews

2. **O&M staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents** 2/06
   - ✓ O&M manual — ✓ Readily available — o Up to date — o N/A
   - ✓ As-built drawings — ✓ Readily available — o Up to date — o N/A
   - ✓ Maintenance logs — ✓ Readily available — o Up to date — o N/A

   Remarks

2. **Site-Specific Health and Safety Plan** — ✓ Readily available — ✓ Up to date — o N/A 2/10
   - ✓ Contingency plan/emergency response plan — ✓ Readily available — ✓ Up to date — o N/A

   Remarks

3. **O&M and OSHA Training Records** — ✓ Readily available — ✓ Up to date — o N/A

   Remarks Paul's onsite

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available — o Up to date — ✓ N/A
   - ✓ Effluent discharge — o Readily available — o Up to date — o N/A
   - o Waste disposal, POTW — o Readily available — o Up to date — ✓ N/A
   - o Other permits ____ — o Readily available — o Up to date — ✓ N/A

   Remarks

5. **Gas Generation Records** — o Readily available — o Up to date — ✓ N/A

   Remarks

6. **Settlement Monument Records** — o Readily available — o Up to date — ✓ N/A

   Remarks

7. **Groundwater Monitoring Records** — ✓ Readily available — ✓ Up to date — o N/A

   Remarks ~~Monthly~~ Monthly, reports and quarterly

8. **Leachate Extraction Records** — o Readily available — o Up to date — ✓ N/A

   Remarks

9. **Discharge Compliance Records**
   - o Air — o Readily available — o Up to date — ✓ N/A
   - ✓ Water (effluent) — ✓ Readily available — ✓ Up to date — o N/A

   Remarks

10. **Daily Access/Security Logs** — o Readily available — o Up to date — ✓ N/A

    Remarks GWTP2 is off the secured depot, but is patroled by security police. It is inside a locked gate.

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
o Federal Facility in-house
o Contractor for State
o Contractor for PRP
✓ Contractor for Federal Facility
o Other _____

2. **O&M Cost Records**

o Readily available o Up to date
✓ Funding mechanism/agreement in place
Original O&M cost estimate — o Breakdown attached

Total annual cost by year for review period if available

Date	Date	Total cost	
From 2005	To	1,231,725	o Breakdown attached
From 2006	To	490,910	o Breakdown attached
From 2007	To	786,735	o Breakdown attached
From 2008	To	796,850	o Breakdown attached
From 2009	To	989,498	o Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map ✓ Gates secured o N/A

Remarks _____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map ✓ N/A

Remarks _____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ✓ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ✓ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) - Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact - Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date ✓ Yes ○ No ○ N/A

Reports are verified by the lead agency ✓ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ✓ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ✓ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ✓ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ✓ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks None on site

3. **Land use changes off site** ○ N/A

Remarks None

VI. GENERAL SITE CONDITIONS

A. Roads ○ Applicable ✓ N/A

1. **Roads damaged** ○ Location shown on site map ○ Roads adequate ○ N/A

Remarks

B. Other Site Conditions

Remarks During the site inspection burrowing owls were observed on the annex east of GWTP 2 in the ag field.

VII. LANDFILL COVERS ○ Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ○ Location shown on site map ○ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** ○ Location shown on site map ○ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** ○ Location shown on site map ○ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** ○ Location shown on site map ○ Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** ○ Grass ○ Cover properly established ○ No signs of stress
   ○ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** ○ N/A
   Remarks_____

7. **Bulges** ○ Location shown on site map ○ Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** O Location shown on site map O No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
o Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Discharge Structure** o Functioning o N/A
Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. **Performance Monitoring** Type of monitoring_____
o Performance not monitored
Frequency_____ o Evidence of breaching
Head differential_____
Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☑ Applicable ○ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☑ Applicable ○ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ☑ Good condition ☑ All required wells properly operating ○ Needs Maintenance ○ N/A
   Remarks Plant has high uptime, minor maintenance.

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ☑ Good condition ○ Needs Maintenance
   Remarks

3. **Spare Parts and Equipment**
   ☑ Readily available ☑ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks Kept in Bldg. 205 / connex

B. Surface Water Collection Structures, Pumps, and Pipelines ○ Applicable ☑ N/A

1. **Collection Structures, Pumps, and Electrical**
   ○ Good condition ○ Needs Maintenance
   Remarks

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks

C. Treatment System ✓ Applicable ○ N/A

1. **Treatment Train** (Check components that apply)
   ○ Metals removal ○ Oil/water separation ○ Bioremediation
   ✓ Air stripping ✓ Carbon adsorbers @ at wells
   ○ Filters
   ✓ Additive (*e.g.*, chelation agent, flocculent) NALCO 7399 (sequestrant)
   ○ Others
   ✓ Good condition ○ Needs Maintenance
   ✓ Sampling ports properly marked and functional — Em
   ✓ Sampling/maintenance log displayed and up to date
   ✓ Equipment properly identified
   ✓ Quantity of groundwater treated annually ~170,000,000 gallons
   ○ Quantity of surface water treated annually
   Remarks Effluent could use new tag

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ○ N/A ✓ Good condition ○ Needs Maintenance
   Remarks

3. **Tanks, Vaults, Storage Vessels**
   ○ N/A ✓ Good condition ✓ Proper secondary containment ○ Needs Maintenance
   Remarks

4. **Discharge Structure and Appurtenances**
   ○ N/A ✓ Good condition ○ Needs Maintenance
   Remarks

5. **Treatment Building(s)**
   ○ N/A ✓ Good condition (esp. roof and doorways) ○ Needs repair
   ✓ Chemicals and equipment properly stored
   Remarks

6. **Monitoring Wells** (pump and treatment remedy)
   ✓ Properly secured/locked ✓ Functioning ✓ Routinely sampled ✓ Good condition
   ✓ All required wells located ○ Needs Maintenance ○ N/A
   Remarks

D. Monitoring Data

1. Monitoring Data
   ✓ Is routinely submitted on time ✓ Is of acceptable quality

2. Monitoring data suggests:
   ✓ Groundwater plume is effectively contained ✓ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

✓ Properly secured/locked ✓ Functioning ✓ Routinely sampled ✓ Good condition

o All required wells located o Needs Maintenance o N/A

Remarks - Remedy for east of Banta Rd is dispersion
- 2 new wells are ~~recommended~~ planned east of Banta Rd.

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The pump & treat remedy is to remediate the COC plumes originating from DDJC-Tracy. The remedy is effective. System is pumping a lot of clean water (low COC concentrations in influent).

LUCs in place to prevent domestic use of contaminated water. San Joaquin County implements >200' requirement for all wells in area. DDJC recommends deeper.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

The treatment plant and GAC units are functioning as intended. O&M activities are providing current and long term protectiveness.

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None.

D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Recommend moving toward passive remedy.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: SWMU 1/Area 2	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny, 90°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o oroundwater pump and treatment
- o Surface water collection and treatment
- ✓ Other SVE
- o Monitored natural attenuation
- o oroundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual o Readily available o Up to date o N/A
   - o As-built drawings o Readily available o Up to date o N/A
   - o Maintenance logs o Readily available o Up to date o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** o Readily available o Up to date o N/A
   - o Contingency plan/emergency response plan o Readily available o Up to date o N/A

   Remarks_____

3. **O&M and OSHA Training Records** o Readily available o Up to date o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit o Readily available o Up to date o N/A
   - o Effluent discharge o Readily available o Up to date o N/A
   - o Waste disposal, POTW o Readily available o Up to date o N/A
   - o Other permits_____ o Readily available o Up to date o N/A

   Remarks_____

5. **Gas Generation Records** o Readily available o Up to date o N/A

   Remarks_____

6. **Settlement Monument Records** o Readily available o Up to date o N/A

   Remarks_____

7. **Groundwater Monitoring Records** o Readily available o Up to date o N/A

   Remarks_____

8. **Leachate Extraction Records** o Readily available o Up to date o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air o Readily available o Up to date o N/A
   - o Water (effluent) o Readily available o Up to date o N/A

   Remarks_____

10. **Daily Access/Security Logs** o Readily available o Up to date o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other _____

o Contractor for State
o Contractor for PRP
✓ Contractor for Federal Facility

2. **O&M Cost Records**

✓ Readily available ✓ Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate _____ o Breakdown attached

Total annual cost by year for review period if available

From _____ Date	To _____ Date	_____ Total cost	o Breakdown attached
From _____ Date	To _____ Date	_____ Total cost	o Breakdown attached
From _____ Date	To _____ Date	_____ Total cost	o Breakdown attached
From _____ Date	To _____ Date	_____ Total cost	o Breakdown attached
From _____ Date	To _____ Date	_____ Total cost	o Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: None

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map ✓ Gates secured o N/A

Remarks ~~Depot gate open~~ 7/16/10

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map ✓ N/A

Remarks No signs at site - Agencies requested signs during inspection.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ✓ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ✓ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) - Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact - Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date ✓ Yes ○ No ○ N/A

Reports are verified by the lead agency ✓ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ✓ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ✓ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ✓ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks Agencies requested warning signs

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ✓ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks None

3. **Land use changes off site** ✓ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ✓ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ✓ Roads adequate ○ N/A

Remarks

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS o Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks_____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** O Location shown on site map O No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** O Location shown on site map O No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ O No obstructions
O Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
O No evidence of excessive growth
O Vegetation in channels does not obstruct flow
O Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations O Applicable ✓ N/A

1. **Gas Vents** O Active O Passive
O Properly secured/locked O Functioning O Routinely sampled O Good condition
O Evidence of leakage at penetration O Needs Maintenance
O N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
   o Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** o Functioning o N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   o Performance not monitored
   Frequency_____ o Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ○ Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ○ Good condition ○ All required wells properly operating ○ Needs Maintenance ○ N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Collection Structures, Pumps, and Electrical**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. SVE implemented. NDSC has recommended it is complete (STOP)

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs in place to prohibit residential Land use (beryllium / PAH's)
SVE implemented to remediate VOCs in vadose zone.

LUCs are still protective and effective.
SVE has remediated vadose ~~zone~~ zone base on STOP (modeling)
so that ~~it does not~~ VOCs do not impact groundwater

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Installation of warning signs for site.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: SWMU 2/SWMU 3	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny / 89°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- ✓ Other Excavation Completed
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual — o Readily available — o Up to date — o N/A
   - o As-built drawings — o Readily available — o Up to date — o N/A
   - o Maintenance logs — o Readily available — o Up to date — o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — o Readily available — o Up to date — o N/A
   - o Contingency plan/emergency response plan — o Readily available — o Up to date — o N/A

   Remarks_____

3. **O&M and OSHA Training Records** — o Readily available — o Up to date — o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available — o Up to date — o N/A
   - o Effluent discharge — o Readily available — o Up to date — o N/A
   - o Waste disposal, POTW — o Readily available — o Up to date — o N/A
   - o Other permits_____ — o Readily available — o Up to date — o N/A

   Remarks_____

5. **Gas Generation Records** — o Readily available — o Up to date — o N/A

   Remarks_____

6. **Settlement Monument Records** — o Readily available — o Up to date — o N/A

   Remarks_____

7. **Groundwater Monitoring Records** — o Readily available — o Up to date — o N/A

   Remarks_____

8. **Leachate Extraction Records** — o Readily available — o Up to date — o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air — o Readily available — o Up to date — o N/A
   - o Water (effluent) — o Readily available — o Up to date — o N/A

   Remarks_____

10. **Daily Access/Security Logs** — o Readily available — o Up to date — o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other_____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate_____ o Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured o N/A

Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map ✓N/A

Remarks Agencies request warning signs be installed.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ✓ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ✓ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) - Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact - Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date ✓ Yes ○ No ○ N/A

Reports are verified by the lead agency ✓ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ○ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ○ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ✓ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks Agencies request warning signs

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ✓ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks None

3. **Land use changes off site** ✓ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ○ Applicable ✓ N/A

1. **Roads damaged** ○ Location shown on site map ○ Roads adequate ○ N/A

Remarks

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS o Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent _____ Depth _____
   Remarks _____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths _____ Widths _____ Depths _____
   Remarks _____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent _____ Depth _____
   Remarks _____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent _____ Depth _____
   Remarks _____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks _____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks _____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent _____ Height _____
   Remarks _____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
   o Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** o Functioning o N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   o Performance not monitored
   Frequency_____ o Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES o Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines o Applicable o N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   o Good condition o All required wells properly operating o Needs Maintenance o N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines o Applicable o N/A

1. **Collection Structures, Pumps, and Electrical**
   o Good condition o Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   ☑ Is routinely submitted on time ☑ Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. - Excavation completed in 1997.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs in place to prohibit residential land use and to prevent exposure to construction worker.

LUCs are effective and protective.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Installation of warning signs.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: SWMU 4	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny / 90°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- o Other _____
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual o Readily available o Up to date o N/A
   - o As-built drawings o Readily available o Up to date o N/A
   - o Maintenance logs o Readily available o Up to date o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** o Readily available o Up to date o N/A
   - o Contingency plan/emergency response plan o Readily available o Up to date o N/A

   Remarks_____

3. **O&M and OSHA Training Records** o Readily available o Up to date o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit o Readily available o Up to date o N/A
   - o Effluent discharge o Readily available o Up to date o N/A
   - o Waste disposal, POTW o Readily available o Up to date o N/A
   - o Other permits_____ o Readily available o Up to date o N/A

   Remarks_____

5. **Gas Generation Records** o Readily available o Up to date o N/A

   Remarks_____

6. **Settlement Monument Records** o Readily available o Up to date o N/A

   Remarks_____

7. **Groundwater Monitoring Records** o Readily available o Up to date o N/A

   Remarks_____

8. **Leachate Extraction Records** o Readily available o Up to date o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air o Readily available o Up to date o N/A
   - o Water (effluent) o Readily available o Up to date o N/A

   Remarks_____

10. **Daily Access/Security Logs** o Readily available o Up to date o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other _____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate _____ o Breakdown attached

Total annual cost by year for review period if available

From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured ✓ N/A

Remarks _____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map ✓ N/A

Remarks Agencies requested warning signs to be installed at site

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ✓ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ✓ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) - Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact - Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date ✓ Yes ○ No ○ N/A

Reports are verified by the lead agency ✓ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ✓ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ✓ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ✓ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks Agencies are requesting warning signs

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ✓ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks None

3. **Land use changes off site** ✓ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ○ Applicable ✓ N/A

1. **Roads damaged** ○ Location shown on site map ○ Roads adequate ○ N/A

Remarks

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS o Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks_____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** O Location shown on site map O No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ O No obstructions
O Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
O No evidence of excessive growth
O Vegetation in channels does not obstruct flow
O Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations O Applicable O N/A

1. **Gas Vents** O Active O Passive
O Properly secured/locked O Functioning O Routinely sampled O Good condition
O Evidence of leakage at penetration O Needs Maintenance
O N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
o Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Discharge Structure** o Functioning o N/A
Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. **Performance Monitoring** Type of monitoring_____
o Performance not monitored
Frequency_____ o Evidence of breaching
Head differential_____
Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES o Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipeliues o Applicable o N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   o Good condition o All required wells properly operating o Needs Maintenance o N/A
   Remarks _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks _____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks _____

B. Surface Water Collection Structures, Pumps, and Pipelines o Applicable o N/A

1. **Collection Structures, Pumps, and Electrical**
   o Good condition o Needs Maintenance
   Remarks _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks _____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks _____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. Installed a wier for out flow.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

Remedy includes an elevated wier for outflow that reduces the chance sediment from the pond can be transported out of the pond. ~~Still e~~ gan LUCs to prevent residential land use in place. Storm water discharge sampling performed. No

All remedies are effective and adequate.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Installation of warning signs.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: SWMU 6	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny, 88°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- o Other _____
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual — o Readily available — o Up to date — o N/A
   - o As-built drawings — o Readily available — o Up to date — o N/A
   - o Maintenance logs — o Readily available — o Up to date — o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — o Readily available — o Up to date — o N/A
   - o Contingency plan/emergency response plan — o Readily available — o Up to date — o N/A

   Remarks_____

3. **O&M and OSHA Training Records** — o Readily available — o Up to date — o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available — o Up to date — o N/A
   - o Effluent discharge — o Readily available — o Up to date — o N/A
   - o Waste disposal, POTW — o Readily available — o Up to date — o N/A
   - o Other permits_____ — o Readily available — o Up to date — o N/A

   Remarks_____

5. **Gas Generation Records** — o Readily available — o Up to date — o N/A

   Remarks_____

6. **Settlement Monument Records** — o Readily available — o Up to date — o N/A

   Remarks_____

7. **Groundwater Monitoring Records** — o Readily available — o Up to date — o N/A

   Remarks_____

8. **Leachate Extraction Records** — o Readily available — o Up to date — o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air — o Readily available — o Up to date — o N/A
   - o Water (effluent) — o Readily available — o Up to date — o N/A

   Remarks_____

10. **Daily Access/Security Logs** — o Readily available — o Up to date — o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other _____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate _____ o Breakdown attached

Total annual cost by year for review period if available

From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured ✓ N/A

Remarks _____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map ✓ N/A

Remarks Agencies request warning signs.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ☑ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ☑ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) - Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact - Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date ☑ Yes ○ No ○ N/A

Reports are verified by the lead agency ☑ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ☑ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ☑ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks Agencies request warning signs

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ☑ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks None

3. **Land use changes off site** ☑ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☑ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ☑ Roads adequate ○ N/A

Remarks Asphalt Intact

B. Other Site Conditions

Remarks

Request new signs.

VII. LANDFILL COVERS ○ Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ○ Location shown on site map ○ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** ○ Location shown on site map ○ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** ○ Location shown on site map ○ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** ○ Location shown on site map ○ Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** ○ Grass ○ Cover properly established ○ No signs of stress
   ○ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** ○ N/A
   Remarks_____

7. **Bulges** ○ Location shown on site map ○ Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** O Location shown on site map O No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
   o Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** o Functioning o N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   o Performance not monitored
   Frequency_____ o Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ○ Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ○ Good condition ○ All required wells properly operating ○ Needs Maintenance ○ N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Collection Structures, Pumps, and Electrical**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. Excavation performed in 1999.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs implemented to prevent residential use and prevent exposure by construction workers.
The remedy is effective and adequate.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Install warning sign at site.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: SWMU 7	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny / 86°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- o Other _____
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual — o Readily available — o Up to date — o N/A
   - o As-built drawings — o Readily available — o Up to date — o N/A
   - o Maintenance logs — o Readily available — o Up to date — o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — o Readily available — o Up to date — o N/A
   - o Contingency plan/emergency response plan — o Readily available — o Up to date — o N/A

   Remarks_____

3. **O&M and OSHA Training Records** — o Readily available — o Up to date — o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available — o Up to date — o N/A
   - o Effluent discharge — o Readily available — o Up to date — o N/A
   - o Waste disposal, POTW — o Readily available — o Up to date — o N/A
   - o Other permits_____ — o Readily available — o Up to date — o N/A

   Remarks_____

5. **Gas Generation Records** — o Readily available — o Up to date — o N/A

   Remarks_____

6. **Settlement Monument Records** — o Readily available — o Up to date — o N/A

   Remarks_____

7. **Groundwater Monitoring Records** — o Readily available — o Up to date — o N/A

   Remarks_____

8. **Leachate Extraction Records** — o Readily available — o Up to date — o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air — o Readily available — o Up to date — o N/A
   - o Water (effluent) — o Readily available — o Up to date — o N/A

   Remarks_____

10. **Daily Access/Security Logs** — o Readily available — o Up to date — o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other_____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate_____ o Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured ✓ N/A

Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map o N/A

Remarks All warning signs in good condition

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ☑ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ☑ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) – Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact

Maurice Benson	DDJC RPM	16 July 2010	209.839.4065
Name	Title	Date	Phone no.

Reporting is up-to-date ☑ Yes ○ No ○ N/A

Reports are verified by the lead agency ☑ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ☑ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ☑ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ☑ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks None

3. **Land use changes off site** ☑ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☑ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ☑ Roads adequate ○ N/A

Remarks Asphalt intact

B. Other Site Conditions

Remarks Warehouses are still standing; no plan to demolish.

VII. LANDFILL COVERS o Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks_____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
o Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Discharge Structure** o Functioning o N/A
Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. **Performance Monitoring** Type of monitoring_____
o Performance not monitored
Frequency_____ o Evidence of breaching
Head differential_____
Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ○ Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ○ Good condition ○ All required wells properly operating ○ Needs Maintenance ○ N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Collection Structures, Pumps, and Electrical**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs in place to prohibit residential land use prevent exposure to construction workers, and minimize infiltration of runoff that could encourage COCs to migrate from vadose zone.

LUCs are effective and protective.
All signs visible and in good condition - no plans for warehouses to be demolished

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: SWMU 8	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny / 90°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- o Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls
- ✓ Other Excavation Completed

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual o Readily available o Up to date o N/A
   - o As-built drawings o Readily available o Up to date o N/A
   - o Maintenance logs o Readily available o Up to date o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** o Readily available o Up to date o N/A
   - o Contingency plan/emergency response plan o Readily available o Up to date o N/A

   Remarks_____

3. **O&M and OSHA Training Records** o Readily available o Up to date o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit o Readily available o Up to date o N/A
   - o Effluent discharge o Readily available o Up to date o N/A
   - o Waste disposal, POTW o Readily available o Up to date o N/A
   - o Other permits_____ o Readily available o Up to date o N/A

   Remarks_____

5. **Gas Generation Records** o Readily available o Up to date o N/A

   Remarks_____

6. **Settlement Monument Records** o Readily available o Up to date o N/A

   Remarks_____

7. **Groundwater Monitoring Records** o Readily available o Up to date o N/A

   Remarks_____

8. **Leachate Extraction Records** o Readily available o Up to date o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air o Readily available o Up to date o N/A
   - o Water (effluent) o Readily available o Up to date o N/A

   Remarks_____

10. **Daily Access/Security Logs** o Readily available o Up to date o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house o Contractor for State
o PRP in-house o Contractor for PRP
o Federal Facility in-house o Contractor for Federal Facility
o Other_____

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate_____ o Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS o Applicable ✓ N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured o N/A

Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map o N/A

Remarks_____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented o Yes o No o N/A

Site conditions imply ICs not being fully enforced o Yes o No o N/A

Type of monitoring (*e.g.*, self-reporting, drive by) – Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date o Yes o No o N/A

Reports are verified by the lead agency o Yes o No o N/A

Specific requirements in deed or decision documents have been met o Yes o No o N/A

Violations have been reported o Yes o No o N/A

Other problems or suggestions: o Report attached

2. **Adequacy** o ICs are adequate o ICs are inadequate o N/A

Remarks

D. General

1. **Vandalism/trespassing** o Location shown on site map o No vandalism evident

Remarks

2. **Land use changes on site** o N/A

Remarks

3. **Land use changes off site** o N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads o Applicable ✓ N/A

1. **Roads damaged** o Location shown on site map o Roads adequate o N/A

Remarks

B. Other Site Conditions

Remarks Open field. Site located within the Eastern Depot Soils Area which has land use controls.

VII. LANDFILL COVERS o Applicable ✓N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks_____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
o Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Discharge Structure** o Functioning o N/A
Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. **Performance Monitoring** Type of monitoring_____
o Performance not monitored
Frequency_____ o Evidence of breaching
Head differential_____
Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES o Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines o Applicable o N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   o Good condition o All required wells properly operating o Needs Maintenance o N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines o Applicable o N/A

1. **Collection Structures, Pumps, and Electrical**
   o Good condition o Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

Remedy for the Site was excavation. Excavation was completed prior this 5-Year Review. Residual contamination cleaned up to residential levels.

Remedy was effective.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: SWMU 20	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny / 90°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o oroundwater pump and treatment
- o Surface water collection and treatment
- o Other _____
- o Monitored natural attenuation
- o oroundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual — o Readily available — o Up to date — o N/A
   - o As-built drawings — o Readily available — o Up to date — o N/A
   - o Maintenance logs — o Readily available — o Up to date — o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — o Readily available — o Up to date — o N/A
   - o Contingency plan/emergency response plan — o Readily available — o Up to date — o N/A

   Remarks_____

3. **O&M and OSHA Training Records** — o Readily available — o Up to date — o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available — o Up to date — o N/A
   - o Effluent discharge — o Readily available — o Up to date — o N/A
   - o Waste disposal, POTW — o Readily available — o Up to date — o N/A
   - o Other permits_____ — o Readily available — o Up to date — o N/A

   Remarks_____

5. **Gas Generation Records** — o Readily available — o Up to date — o N/A

   Remarks_____

6. **Settlement Monument Records** — o Readily available — o Up to date — o N/A

   Remarks_____

7. **Groundwater Monitoring Records** — o Readily available — o Up to date — o N/A

   Remarks_____

8. **Leachate Extraction Records** — o Readily available — o Up to date — o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air — o Readily available — o Up to date — o N/A
   - o Water (effluent) — o Readily available — o Up to date — o N/A

   Remarks_____

10. **Daily Access/Security Logs** — o Readily available — o Up to date — o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other_____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate_____ o Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured ✓ N/A

Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map ✓ N/A

Remarks Agencies requested warning sign be installed.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ✓ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ✓ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) – Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date ✓ Yes ○ No ○ N/A

Reports are verified by the lead agency ✓ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ✓ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ✓ N/A

Other problems or suggestions: ○ Report attached

WH 10 demolished. Site is currently fenced in. There is approx. ~3-4 feet of soil over site that will be removed for disposal in 2010.

2. **Adequacy** ○ ICs are adequate ✓ ICs are inadequate ○ N/A

Remarks Agencies requested warning signs

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ✓ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks Warehouse 10 has been demolished. Parking lot to be built over site.

3. **Land use changes off site** ✓ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ✓ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ✓ Roads adequate ○ N/A

Remarks Asphalt intact - DDJC plans to repave in 2010.

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS o Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks_____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
o Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Discharge Structure** o Functioning o N/A
Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. **Performance Monitoring** Type of monitoring_____
o Performance not monitored
Frequency_____ o Evidence of breaching
Head differential_____
Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES o Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines o Applicable o N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   o Good condition o All required wells properly operating o Needs Maintenance o N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines o Applicable o N/A

1. **Collection Structures, Pumps, and Electrical**
   o Good condition o Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. Excavation performed in 1999.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs in place to prohibit residential use and to ~~minimize~~ minimize infiltration of runoff that could promote migration of VOCs to groundwater.

WA 10 demolished and soil is not covered. Agency notified of construction prior to start. Parking lot will be installed. Also SVE system is planned to remediate soil.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. WHIO was demolished (planned). Parking lot will be installed and SVE implemented.

D.	Opportunities for Optimization
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Install warning sign, install and operate SVE system, and install parking lot.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: SWMU 24	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny, 90°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- ✓ Other Bioventt Completed
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual o Readily available o Up to date o N/A
   - o As-built drawings o Readily available o Up to date o N/A
   - o Maintenance logs o Readily available o Up to date o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** o Readily available o Up to date o N/A
   - o Contingency plan/emergency response plan o Readily available o Up to date o N/A

   Remarks_____

3. **O&M and OSHA Training Records** o Readily available o Up to date o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit o Readily available o Up to date o N/A
   - o Effluent discharge o Readily available o Up to date o N/A
   - o Waste disposal, POTW o Readily available o Up to date o N/A
   - o Other permits_____ o Readily available o Up to date o N/A

   Remarks_____

5. **Gas Generation Records** o Readily available o Up to date o N/A

   Remarks_____

6. **Settlement Monument Records** o Readily available o Up to date o N/A

   Remarks_____

7. **Groundwater Monitoring Records** o Readily available o Up to date o N/A

   Remarks_____

8. **Leachate Extraction Records** o Readily available o Up to date o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air o Readily available o Up to date o N/A
   - o Water (effluent) o Readily available o Up to date o N/A

   Remarks_____

10. **Daily Access/Security Logs** o Readily available o Up to date o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**
   - o State in-house
   - o PRP in-house
   - ✓ Federal Facility in-house
   - o Other_____
   - o Contractor for State
   - o Contractor for PRP
   - o Contractor for Federal Facility

2. **O&M Cost Records**
   - o Readily available
   - o Up to date
   - o Funding mechanism/agreement in place

   Original O&M cost estimate_____ o Breakdown attached

   Total annual cost by year for review period if available

   From_____ To_____ _____ o Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ o Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ o Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ o Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ o Breakdown attached
   Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured o N/A
   Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map ✓ N/A
   Remarks Agencies request warning signs be installed

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ☑ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ☑ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) - Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact - Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date ☑ Yes ○ No ○ N/A

Reports are verified by the lead agency ☑ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ○ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ○ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ☑ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks Agencies request warning signs.

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ☑ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks None

3. **Land use changes off site** ☑ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☑ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ☑ Roads adequate ○ N/A

Remarks Asphalt intact

B. Other Site Conditions

Remarks Building 247 in place - no plans to demolish

VII. LANDFILL COVERS o Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks_____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
o Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Discharge Structure** o Functioning o N/A
Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. **Performance Monitoring** Type of monitoring_____
o Performance not monitored
Frequency_____ o Evidence of breaching
Head differential_____
Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ○ Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ○ Good condition ○ All required wells properly operating ○ Needs Maintenance ○ N/A
   Remarks _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks _____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks _____

B. Surface Water Collection Structures, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Collection Structures, Pumps, and Electrical**
   ○ Good condition ○ Needs Maintenance
   Remarks _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks _____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks _____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. Biovent/SVE implemented at site in past.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs in place to prohibit residential land use.

Remedy is effective and protective

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Install warning signs.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: SWMU 27	Date of inspection: 16 July 2010
Location and Region: DDJC-Tracy, California	EPA ID: CA4971520834
Agency, office, or company leading the five-year review: DESJC/URS	Weather/temperature: Sunny / 90°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- o Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- ✓ Other Excavation completed
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual — o Readily available — o Up to date — o N/A
   - o As-built drawings — o Readily available — o Up to date — o N/A
   - o Maintenance logs — o Readily available — o Up to date — o N/A

   Remarks _____

2. **Site-Specific Health and Safety Plan** — o Readily available — o Up to date — o N/A
   - o Contingency plan/emergency response plan — o Readily available — o Up to date — o N/A

   Remarks _____

3. **O&M and OSHA Training Records** — o Readily available — o Up to date — o N/A

   Remarks _____

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available — o Up to date — o N/A
   - o Effluent discharge — o Readily available — o Up to date — o N/A
   - o Waste disposal, POTW — o Readily available — o Up to date — o N/A
   - o Other permits _____ — o Readily available — o Up to date — o N/A

   Remarks _____

5. **Gas Generation Records** — o Readily available — o Up to date — o N/A

   Remarks _____

6. **Settlement Monument Records** — o Readily available — o Up to date — o N/A

   Remarks _____

7. **Groundwater Monitoring Records** — o Readily available — o Up to date — o N/A

   Remarks _____

8. **Leachate Extraction Records** — o Readily available — o Up to date — o N/A

   Remarks _____

9. **Discharge Compliance Records**
   - o Air — o Readily available — o Up to date — o N/A
   - o Water (effluent) — o Readily available — o Up to date — o N/A

   Remarks _____

10. **Daily Access/Security Logs** — o Readily available — o Up to date — o N/A

    Remarks _____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other _____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate _____ o Breakdown attached

Total annual cost by year for review period if available

From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS o Applicable ✓ N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured o N/A
Remarks _____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map o N/A
Remarks _____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ○ No ✓ N/A

Site conditions imply ICs not being fully enforced ○ Yes ○ No ✓ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) – Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact

Maurice Benson	DDJC RPM	16 July 2010	209.839.4065
Name	Title	Date	Phone no.

Reporting is up-to-date ✓ Yes ○ No ○ N/A

Reports are verified by the lead agency ✓ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ○ Yes ○ No ✓ N/A

Violations have been reported ○ Yes ○ No ✓ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ○ ICs are adequate ○ ICs are inadequate ✓ N/A

Remarks

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ○ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks

3. **Land use changes off site** ○ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ○ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ○ Roads adequate ○ N/A

Remarks

B. Other Site Conditions

Remarks Site covered by asphalt lot used for storing equipment used at depot.

VII. LANDFILL COVERS o Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks_____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8.	**Wet Areas/Water Damage**	o Wet areas/water damage not evident	
	o Wet areas	o Location shown on site map	Areal extent_____
	o Ponding	o Location shown on site map	Areal extent_____
	o Seeps	o Location shown on site map	Areal extent_____
	o Soft subgrade	o Location shown on site map	Areal extent_____
	Remarks_____		
9.	**Slope Instability** o Slides	o Location shown on site map	o No evidence of slope instability
	Areal extent_____		
	Remarks_____		
B. Benches	o Applicable	o N/A	
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	o Location shown on site map	o N/A or okay
	Remarks_____		
2.	**Bench Breached**	o Location shown on site map	o N/A or okay
	Remarks_____		
3.	**Bench Overtopped**	o Location shown on site map	o N/A or okay
	Remarks_____		
C. Letdown Channels	o Applicable	o N/A	
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement**	o Location shown on site map	o No evidence of settlement
	Areal extent_____	Depth_____	
	Remarks_____		
2.	**Material Degradation**	o Location shown on site map	o No evidence of degradation
	Material type_____	Areal extent_____	
	Remarks_____		
3.	**Erosion**	o Location shown on site map	o No evidence of erosion
	Areal extent_____	Depth_____	
	Remarks_____		

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
   o Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** o Functioning o N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓N/A

1. **Settlement** o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   o Performance not monitored
   Frequency_____ o Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES o Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines o Applicable o N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   o Good condition o All required wells properly operating o Needs Maintenance o N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines o Applicable o N/A

1. **Collection Structures, Pumps, and Electrical**
   o Good condition o Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

Excavation completed and area paved over w/ asphalt. Cleaned up to industrial land use.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Excavation adequate for short term and maybe for long term protectiveness, LUCs may be necessary.

C.	Early Indicators of Potential Remedy Problems
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. If neccessary, implement LUCs and install warning signs.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: SWMU 33	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny / 88°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- o Other _____
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual — o Readily available — o Up to date — o N/A
   - o As-built drawings — o Readily available — o Up to date — o N/A
   - o Maintenance logs — o Readily available — o Up to date — o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — o Readily available — o Up to date — o N/A
   - o Contingency plan/emergency response plan — o Readily available — o Up to date — o N/A

   Remarks_____

3. **O&M and OSHA Training Records** — o Readily available — o Up to date — o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available — o Up to date — o N/A
   - o Effluent discharge — o Readily available — o Up to date — o N/A
   - o Waste disposal, POTW — o Readily available — o Up to date — o N/A
   - o Other permits_____ — o Readily available — o Up to date — o N/A

   Remarks_____

5. **Gas Generation Records** — o Readily available — o Up to date — o N/A

   Remarks_____

6. **Settlement Monument Records** — o Readily available — o Up to date — o N/A

   Remarks_____

7. **Groundwater Monitoring Records** — o Readily available — o Up to date — o N/A

   Remarks_____

8. **Leachate Extraction Records** — o Readily available — o Up to date — o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air — o Readily available — o Up to date — o N/A
   - o Water (effluent) — o Readily available — o Up to date — o N/A

   Remarks_____

10. **Daily Access/Security Logs** — o Readily available — o Up to date — o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other _____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate _____ o Breakdown attached

Total annual cost by year for review period if available

From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS o Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured o N/A

Remarks _____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map o N/A

Remarks Warning signs in good condition except at WH 10. Removed because ~~of~~ the WH was demolished.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ☑ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ☑ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) – Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date ☑ Yes ○ No ○ N/A

Reports are verified by the lead agency ☑ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ☑ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ☑ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ☑ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks Still industrial, construction operations occurring out north of former WH 10.

3. **Land use changes off site** ☑ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☑ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ○ Roads adequate ○ N/A

Remarks Asphalt intact at locations or gravel road intact.

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS ○ Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ○ Location shown on site map ○ Settlement not evident
   Areal extent _____ Depth _____
   Remarks _____

2. **Cracks** ○ Location shown on site map ○ Cracking not evident
   Lengths _____ Widths _____ Depths _____
   Remarks _____

3. **Erosion** ○ Location shown on site map ○ Erosion not evident
   Areal extent _____ Depth _____
   Remarks _____

4. **Holes** ○ Location shown on site map ○ Holes not evident
   Areal extent _____ Depth _____
   Remarks _____

5. **Vegetative Cover** ○ Grass ○ Cover properly established ○ No signs of stress
   ○ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks _____

6. **Alternative Cover (armored rock, concrete, etc.)** ○ N/A
   Remarks _____

7. **Bulges** ○ Location shown on site map ○ Bulges not evident
   Areal extent _____ Height _____
   Remarks _____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
   o Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** o Functioning o N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   o Performance not monitored
   Frequency_____ o Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES o Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines o Applicable o N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   o Good condition o All required wells properly operating o Needs Maintenance o N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines o Applicable o N/A

1. **Collection Structures, Pumps, and Electrical**
   o Good condition o Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction. Excation and grouting of IWPL completed in 1997.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs in place to minimize infiltration of runoff that could encourage COCs migrate from vadose zone.

Ground cover intact. Remedy effective and protective.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Need to replace sign that was on WH/O.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Northern Depot Soils Area	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny / 88

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- o Other _____
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual — o Readily available o Up to date o N/A
   - o As-built drawings — o Readily available o Up to date o N/A
   - o Maintenance logs — o Readily available o Up to date o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — o Readily available o Up to date o N/A
   - o Contingency plan/emergency response plan — o Readily available o Up to date o N/A

   Remarks_____

3. **O&M and OSHA Training Records** — o Readily available o Up to date o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available o Up to date o N/A
   - o Effluent discharge — o Readily available o Up to date o N/A
   - o Waste disposal, POTW — o Readily available o Up to date o N/A
   - o Other permits_____ — o Readily available o Up to date o N/A

   Remarks_____

5. **Gas Generation Records** — o Readily available o Up to date o N/A

   Remarks_____

6. **Settlement Monument Records** — o Readily available o Up to date o N/A

   Remarks_____

7. **Groundwater Monitoring Records** — o Readily available o Up to date o N/A

   Remarks_____

8. **Leachate Extraction Records** — o Readily available o Up to date o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air — o Readily available o Up to date o N/A
   - o Water (effluent) — o Readily available o Up to date o N/A

   Remarks_____

10. **Daily Access/Security Logs** — o Readily available o Up to date o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other_____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate_____ o Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured ✓ N/A
Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map o N/A
Remarks Signs in good condition

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ● No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ● No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) – Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact	Maurice Benson	DDJC RPM	16 July 2010	209.839.4065
	Name	Title	Date	Phone no.

Reporting is up-to-date ● Yes ○ No ○ N/A

Reports are verified by the lead agency ● Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ● Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ● N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ● ICs are adequate ○ ICs are inadequate ○ N/A

Remarks

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ● No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks None

3. **Land use changes off site** ● N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ● Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ● Roads adequate ○ N/A

Remarks asphalt redone – intact ; swale ~~in~~ repaired

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS o Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent _____ Depth _____
   Remarks _____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths _____ Widths _____ Depths _____
   Remarks _____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent _____ Depth _____
   Remarks _____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent _____ Depth _____
   Remarks _____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks _____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks _____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent _____ Height _____
   Remarks _____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
   o Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** o Functioning o N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   o Performance not monitored
   Frequency_____ o Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES o Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines o Applicable o N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   o Good condition o All required wells properly operating o Needs Maintenance o N/A
   Remarks _____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks _____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks _____

B. Surface Water Collection Structures, Pumps, and Pipelines o Applicable o N/A

1. **Collection Structures, Pumps, and Electrical**
   o Good condition o Needs Maintenance
   Remarks _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks _____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks _____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs in place to prohibit residential land use, and prevent exposure of construction workers.

Land use unchanged. Cover intact. Signs in good condition.

Remedy effective and protective.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Building 30, Drum Storage Area	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny / 82°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- o Other _____
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual — o Readily available — o Up to date — o N/A
   - o As-built drawings — o Readily available — o Up to date — o N/A
   - o Maintenance logs — o Readily available — o Up to date — o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — o Readily available — o Up to date — o N/A
   - o Contingency plan/emergency response plan — o Readily available — o Up to date — o N/A

   Remarks_____

3. **O&M and OSHA Training Records** — o Readily available — o Up to date — o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available — o Up to date — o N/A
   - o Effluent discharge — o Readily available — o Up to date — o N/A
   - o Waste disposal, POTW — o Readily available — o Up to date — o N/A
   - o Other permits_____ — o Readily available — o Up to date — o N/A

   Remarks_____

5. **Gas Generation Records** — o Readily available — o Up to date — o N/A

   Remarks_____

6. **Settlement Monument Records** — o Readily available — o Up to date — o N/A

   Remarks_____

7. **Groundwater Monitoring Records** — ✓ Readily available — o Up to date — o N/A

   Remarks_____

8. **Leachate Extraction Records** — o Readily available — o Up to date — o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air — o Readily available — o Up to date — o N/A
   - o Water (effluent) — o Readily available — o Up to date — o N/A

   Remarks_____

10. **Daily Access/Security Logs** — o Readily available — o Up to date — o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other_____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate_____ o Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured ✓ N/A

Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map o N/A

Remarks Warning signs in good condition.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ✓ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ✓ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) – Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact

Name	Title	Date	Phone no.
Maurice Benson	DDJC RPM	16 July 2010	209.839.4065

Reporting is up-to-date ✓ Yes ○ No ○ N/A

Reports are verified by the lead agency ✓ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ✓ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ✓ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ✓ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ✓ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks No changes

3. **Land use changes off site** ✓ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ✓ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ✓ Roads adequate ○ N/A

Remarks asphalt ~~intact~~ intact
7/16/10

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS o Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks_____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
   o Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** o Functioning o N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   o Performance not monitored
   Frequency_____ o Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ○ Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ○ Good condition ○ All required wells properly operating ○ Needs Maintenance ○ N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Collection Structures, Pumps, and Electrical**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs in place to prohibit residential landuse and to minimize infiltration of runoff that could encourage cce migration from vadose zone.

Remedy is effective and protective. Asphalt/building intact. No land use changes planned.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None.

D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: DSERTS 72	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny/ 86°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- o Other _____
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual — o Readily available — o Up to date — o N/A
   - o As-built drawings — o Readily available — o Up to date — o N/A
   - o Maintenance logs — o Readily available — o Up to date — o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — o Readily available — o Up to date — o N/A
   - o Contingency plan/emergency response plan — o Readily available — o Up to date — o N/A

   Remarks_____

3. **O&M and OSHA Training Records** — o Readily available — o Up to date — o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available — o Up to date — o N/A
   - o Effluent discharge — o Readily available — o Up to date — o N/A
   - o Waste disposal, POTW — o Readily available — o Up to date — o N/A
   - o Other permits_____ — o Readily available — o Up to date — o N/A

   Remarks_____

5. **Gas Generation Records** — o Readily available — o Up to date — o N/A

   Remarks_____

6. **Settlement Monument Records** — o Readily available — o Up to date — o N/A

   Remarks_____

7. **Groundwater Monitoring Records** — o Readily available — o Up to date — o N/A

   Remarks_____

8. **Leachate Extraction Records** — o Readily available — o Up to date — o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air — o Readily available — o Up to date — o N/A
   - o Water (effluent) — o Readily available — o Up to date — o N/A

   Remarks_____

10. **Daily Access/Security Logs** — o Readily available — o Up to date — o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other_____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate_____ o Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured o N/A

Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map ✓ N/A

Remarks Agencies requested warning signs be installed

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ✓ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ✓ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) - Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact - Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date ✓ Yes ○ No ○ N/A

Reports are verified by the lead agency ✓ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ○ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ○ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ✓ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks Agencies requested warning signs

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ✓ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks None

3. **Land use changes off site** ✓ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ✓ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ✓ Roads adequate ○ N/A

Remarks Asphalt intact

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS o Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks_____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
   o Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** o Functioning o N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   o Performance not monitored
   Frequency_____ o Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES o Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines o Applicable o N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   o Good condition o All required wells properly operating o Needs Maintenance o N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines o Applicable o N/A

1. **Collection Structures, Pumps, and Electrical**
   o Good condition o Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs in place in prohibit residential land use.

No land use change

Remedy is effective and protective

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Install warning signs

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Eastern Depot Soils Area	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny / 88°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o oroundwater pump and treatment
- o Surface water collection and treatment
- o Other _____
- o Monitored natural attenuation
- o oroundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual o Readily available o Up to date o N/A
   - o As-built drawings o Readily available o Up to date o N/A
   - o Maintenance logs o Readily available o Up to date o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** o Readily available o Up to date o N/A
   - o Contingency plan/emergency response plan o Readily available o Up to date o N/A

   Remarks_____

3. **O&M and OSHA Training Records** o Readily available o Up to date o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit o Readily available o Up to date o N/A
   - o Effluent discharge o Readily available o Up to date o N/A
   - o Waste disposal, POTW o Readily available o Up to date o N/A
   - o Other permits_____ o Readily available o Up to date o N/A

   Remarks_____

5. **Gas Generation Records** o Readily available o Up to date o N/A

   Remarks_____

6. **Settlement Monument Records** o Readily available o Up to date o N/A

   Remarks_____

7. **Groundwater Monitoring Records** o Readily available o Up to date o N/A

   Remarks_____

8. **Leachate Extraction Records** o Readily available o Up to date o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air o Readily available o Up to date o N/A
   - o Water (effluent) o Readily available o Up to date o N/A

   Remarks_____

10. **Daily Access/Security Logs** o Readily available o Up to date o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**
   - o State in-house
   - o PRP in-house
   - o Federal Facility in-house
   - o Contractor for State
   - o Contractor for PRP
   - o Contractor for Federal Facility
   - o Other _____

2. **O&M Cost Records**
   - o Readily available
   - o Up to date
   - o Funding mechanism/agreement in place

   Original O&M cost estimate _____ o Breakdown attached

   Total annual cost by year for review period if available

   From _____ To _____ _____ o Breakdown attached
   Date Date Total cost

   From _____ To _____ _____ o Breakdown attached
   Date Date Total cost

   From _____ To _____ _____ o Breakdown attached
   Date Date Total cost

   From _____ To _____ _____ o Breakdown attached
   Date Date Total cost

   From _____ To _____ _____ o Breakdown attached
   Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured ✓ N/A
   Remarks _____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map ✓ N/A
   Remarks Agencies requested warning sign at site

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ✓ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ✓ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) - Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact - Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date ✓ Yes ○ No ○ N/A

Reports are verified by the lead agency ✓ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ✓ Yes ○ No ○ N/A

Violations have been reported ○ Yes ○ No ✓ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ✓ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks Agencies requested warning sigs

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ✓ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks No change

3. **Land use changes off site** ✓ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ✓ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ✓ Roads adequate ○ N/A

Remarks Asphalt

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS ○ Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ○ Location shown on site map ○ Settlement not evident
   Areal extent _____ Depth _____
   Remarks _____

2. **Cracks** ○ Location shown on site map ○ Cracking not evident
   Lengths _____ Widths _____ Depths _____
   Remarks _____

3. **Erosion** ○ Location shown on site map ○ Erosion not evident
   Areal extent _____ Depth _____
   Remarks _____

4. **Holes** ○ Location shown on site map ○ Holes not evident
   Areal extent _____ Depth _____
   Remarks _____

5. **Vegetative Cover** ○ Grass ○ Cover properly established ○ No signs of stress
   ○ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks _____

6. **Alternative Cover (armored rock, concrete, etc.)** ○ N/A
   Remarks _____

7. **Bulges** ○ Location shown on site map ○ Bulges not evident
   Areal extent _____ Height _____
   Remarks _____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
Horizontal displacement_____ Vertical displacement_____
Rotational displacement_____
Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
Areal extent_____ Depth_____
Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
o Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
Areal extent_____ Depth_____
Remarks_____

4. **Discharge Structure** o Functioning o N/A
Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
Areal extent_____ Depth_____
Remarks_____

2. **Performance Monitoring** Type of monitoring_____
o Performance not monitored
Frequency_____ o Evidence of breaching
Head differential_____
Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES ○ Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   ○ Good condition ○ All required wells properly operating ○ Needs Maintenance ○ N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines ○ Applicable ○ N/A

1. **Collection Structures, Pumps, and Electrical**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   ○ Good condition ○ Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   ○ Readily available ○ Good condition ○ Requires upgrade ○ Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs in place to prohibit residential landuse. Arsenic, aluminum, chlordane
No land use change DDX, dieldrin, PCBs
LUCs are protective and effective

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Install warning signs.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Southern Depot Soils Area	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny, 85°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- ✓ Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- o Other _____
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual — o Readily available o Up to date o N/A
   - o As-built drawings — o Readily available o Up to date o N/A
   - o Maintenance logs — o Readily available o Up to date o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — o Readily available o Up to date o N/A
   - o Contingency plan/emergency response plan — o Readily available o Up to date o N/A

   Remarks_____

3. **O&M and OSHA Training Records** — o Readily available o Up to date o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available o Up to date o N/A
   - o Effluent discharge — o Readily available o Up to date o N/A
   - o Waste disposal, POTW — o Readily available o Up to date o N/A
   - o Other permits_____ — o Readily available o Up to date o N/A

   Remarks_____

5. **Gas Generation Records** — o Readily available o Up to date o N/A

   Remarks_____

6. **Settlement Monument Records** — o Readily available o Up to date o N/A

   Remarks_____

7. **Groundwater Monitoring Records** — o Readily available o Up to date o N/A

   Remarks_____

8. **Leachate Extraction Records** — o Readily available o Up to date o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air — o Readily available o Up to date o N/A
   - o Water (effluent) — o Readily available o Up to date o N/A

   Remarks_____

10. **Daily Access/Security Logs** — o Readily available o Up to date o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other _____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate _____ o Breakdown attached

Total annual cost by year for review period if available

From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost
From _____ To _____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ✓ Applicable o N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured ✓ N/A

Remarks _____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map o N/A

Remarks Agencies requesting signs

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ✓ No ○ N/A

Site conditions imply ICs not being fully enforced ○ Yes ✓ No ○ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) - Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact - Maurice Benson (Name) DDJC RPM (Title) 16 July 2010 (Date) 209.839.4065 (Phone no.)

Reporting is up-to-date ✓ Yes ○ No ○ N/A

Reports are verified by the lead agency ✓ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ○ Yes ○ No ✓ N/A

Violations have been reported ○ Yes ○ No ✓ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ✓ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks Agencies requesting warning signs

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ✓ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks None. Still Industrial. Portion of site being developed as the depot's security track entrance.

3. **Land use changes off site** ✓ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ✓ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ✓ Roads adequate ○ N/A

Remarks

B. Other Site Conditions

Remarks _____

VII. LANDFILL COVERS o Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** o Location shown on site map o Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** o Location shown on site map o Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** o Grass o Cover properly established o No signs of stress
   o Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** o N/A
   Remarks_____

7. **Bulges** o Location shown on site map o Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
   o Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** o Functioning o N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   o Performance not monitored
   Frequency_____ o Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES o Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines o Applicable o N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   o Good condition o All required wells properly operating o Needs Maintenance o N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines o Applicable o N/A

1. **Collection Structures, Pumps, and Electrical**
   o Good condition o Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

LUCs are to prohibit residential use.
The site LUCs are still protective. Land use will remain industrial.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. None
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Install warning signs at the site.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

Site Inspection Checklist

I. SITE INFORMATION	
Site name: Day Care Center	**Date of inspection: 16 July 2010**
Location and Region: DDJC-Tracy, California	**EPA ID: CA4971520834**
Agency, office, or company leading the five-year review: DESJC/URS	**Weather/temperature:** Sunny / 95°

Remedy Includes: (Check all that apply)

- o Landfill cover/containment
- o Access controls
- o Institutional controls
- o Groundwater pump and treatment
- o Surface water collection and treatment
- o Monitored natural attenuation
- o Groundwater containment
- o Vertical barrier walls
- ✓ Other Excavation completed w/ clean soil cap

Attachments: ✓ Inspection team roster attached o Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

2. **O&M staff** _____ _____ _____
   Name Title Date
   Interviewed o at site o at office o by phone Phone no. _____
   Problems, suggestions; o Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; o Report attached _____
_____

4. **Other interviews** (optional) o Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - o O&M manual — o Readily available — o Up to date — o N/A
   - o As-built drawings — o Readily available — o Up to date — o N/A
   - o Maintenance logs — o Readily available — o Up to date — o N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** — o Readily available — o Up to date — o N/A
   - o Contingency plan/emergency response plan — o Readily available — o Up to date — o N/A

   Remarks_____

3. **O&M and OSHA Training Records** — o Readily available — o Up to date — o N/A

   Remarks_____

4. **Permits and Service Agreements**
   - o Air discharge permit — o Readily available — o Up to date — o N/A
   - o Effluent discharge — o Readily available — o Up to date — o N/A
   - o Waste disposal, POTW — o Readily available — o Up to date — o N/A
   - o Other permits_____ — o Readily available — o Up to date — o N/A

   Remarks_____

5. **Gas Generation Records** — o Readily available — o Up to date — o N/A

   Remarks_____

6. **Settlement Monument Records** — o Readily available — o Up to date — o N/A

   Remarks_____

7. **Groundwater Monitoring Records** — o Readily available — o Up to date — o N/A

   Remarks_____

8. **Leachate Extraction Records** — o Readily available — o Up to date — o N/A

   Remarks_____

9. **Discharge Compliance Records**
   - o Air — o Readily available — o Up to date — o N/A
   - o Water (effluent) — o Readily available — o Up to date — o N/A

   Remarks_____

10. **Daily Access/Security Logs** — o Readily available — o Up to date — o N/A

    Remarks_____

IV. O&M COSTS

1. **O&M Organization**

o State in-house
o PRP in-house
✓ Federal Facility in-house
o Other_____

o Contractor for State
o Contractor for PRP
o Contractor for Federal Facility

2. **O&M Cost Records**

o Readily available o Up to date
o Funding mechanism/agreement in place
Original O&M cost estimate_____ o Breakdown attached

Total annual cost by year for review period if available

From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost
From_____ To_____ _____ o Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS o Applicable ✓ N/A

A. Fencing

1. **Fencing damaged** o Location shown on site map o Gates secured o N/A

Remarks_____

B. Other Access Restrictions

1. **Signs and other security measures** o Location shown on site map o N/A

Remarks_____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ○ Yes ○ No ✓ N/A

Site conditions imply ICs not being fully enforced ○ Yes ○ No ✓ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) – Self-Reporting in Annual Well Monitoring Report

Frequency - Yearly

Responsible party/agency - DDJC

Contact	Maurice Benson	DDJC RPM	16 July 2010	209.839.4065
	Name	Title	Date	Phone no.

Reporting is up-to-date ✓ Yes ○ No ○ N/A

Reports are verified by the lead agency ○ Yes ○ No ○ N/A

Specific requirements in deed or decision documents have been met ○ Yes ○ No ✓ N/A

Violations have been reported ○ Yes ○ No ✓ N/A

Other problems or suggestions: ○ Report attached

2. **Adequacy** ○ ICs are adequate ○ ICs are inadequate ○ N/A

Remarks

D. General

1. **Vandalism/trespassing** ○ Location shown on site map ○ No vandalism evident

Remarks

2. **Land use changes on site** ○ N/A

Remarks

3. **Laud use changes off site** ○ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ○ Applicable ○ N/A

1. **Roads damaged** ○ Location shown on site map ○ Roads adequate ○ N/A

Remarks

B. Other Site Conditions

Remarks Playground area intact, no signs of digging or disruption of clean soil cap

VII. LANDFILL COVERS ○ Applicable ✓ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ○ Location shown on site map ○ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** ○ Location shown on site map ○ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** ○ Location shown on site map ○ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** ○ Location shown on site map ○ Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** ○ Grass ○ Cover properly established ○ No signs of stress
   ○ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks_____

6. **Alternative Cover (armored rock, concrete, etc.)** ○ N/A
   Remarks_____

7. **Bulges** ○ Location shown on site map ○ Bulges not evident
   Areal extent_____ Height_____
   Remarks_____

8. **Wet Areas/Water Damage** o Wet areas/water damage not evident

o Wet areas o Location shown on site map Areal extent_____

o Ponding o Location shown on site map Areal extent_____

o Seeps o Location shown on site map Areal extent_____

o Soft subgrade o Location shown on site map Areal extent_____

Remarks_____

9. **Slope Instability** o Slides o Location shown on site map o No evidence of slope instability

Areal extent_____

Remarks_____

B. Benches o Applicable o N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** o Location shown on site map o N/A or okay

Remarks_____

2. **Bench Breached** o Location shown on site map o N/A or okay

Remarks_____

3. **Bench Overtopped** o Location shown on site map o N/A or okay

Remarks_____

C. Letdown Channels o Applicable o N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** o Location shown on site map o No evidence of settlement

Areal extent_____ Depth_____

Remarks_____

2. **Material Degradation** o Location shown on site map o No evidence of degradation

Material type_____ Areal extent_____

Remarks_____

3. **Erosion** o Location shown on site map o No evidence of erosion

Areal extent_____ Depth_____

Remarks_____

4. **Undercutting** o Location shown on site map o No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ o No obstructions
o Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
o No evidence of excessive growth
o Vegetation in channels does not obstruct flow
o Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations o Applicable o N/A

1. **Gas Vents** o Active o Passive
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance
o N/A
Remarks_____

2. **Gas Monitoring Probes**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

3. **Monitoring Wells** (within surface area of landfill)
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

4. **Leachate Extraction Wells**
o Properly secured/locked o Functioning o Routinely sampled o Good condition
o Evidence of leakage at penetration o Needs Maintenance o N/A
Remarks_____

5. **Settlement Monuments** o Located o Routinely surveyed o N/A
Remarks_____

E. Gas Collection and Treatment o Applicable o N/A

1. **Gas Treatment Facilities**
   o Flaring o Thermal destruction o Collection for reuse
   o Good condition o Needs Maintenance
   Remarks_____

2. **Gas Collection Wells, Manifolds and Piping**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   o Good condition o Needs Maintenance o N/A
   Remarks_____

F. Cover Drainage Layer o Applicable o N/A

1. **Outlet Pipes Inspected** o Functioning o N/A
   Remarks_____

2. **Outlet Rock Inspected** o Functioning o N/A
   Remarks_____

G. Detention/Sedimentation Ponds o Applicable o N/A

1. **Siltation** Areal extent_____ Depth_____ o N/A
   o Siltation not evident
   Remarks_____

2. **Erosion** Areal extent_____ Depth_____
   o Erosion not evident
   Remarks_____

3. **Outlet Works** o Functioning o N/A
   Remarks_____

4. **Dam** o Functioning o N/A
   Remarks_____

H. Retaining Walls o Applicable o N/A

1. **Deformations** o Location shown on site map o Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** o Location shown on site map o Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge o Applicable o N/A

1. **Siltation** o Location shown on site map o Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Vegetative Growth** o Location shown on site map o N/A
   o Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____

3. **Erosion** o Location shown on site map o Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Discharge Structure** o Functioning o N/A
   Remarks_____

VIII. VERTICAL BARRIER WALLS o Applicable ✓ N/A

1. **Settlement** o Location shown on site map o Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Performance Monitoring** Type of monitoring_____
   o Performance not monitored
   Frequency_____ o Evidence of breaching
   Head differential_____
   Remarks_____

IX. GROUNDWATER/SURFACE WATER REMEDIES o Applicable ✓ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines o Applicable o N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
   o Good condition o All required wells properly operating o Needs Maintenance o N/A
   Remarks_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

B. Surface Water Collection Structures, Pumps, and Pipelines o Applicable o N/A

1. **Collection Structures, Pumps, and Electrical**
   o Good condition o Needs Maintenance
   Remarks_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
   o Good condition o Needs Maintenance
   Remarks_____

3. **Spare Parts and Equipment**
   o Readily available o Good condition o Requires upgrade o Needs to be provided
   Remarks_____

C. Treatment System o Applicable o N/A

1. **Treatment Train** (Check components that apply)
   o Metals removal o Oil/water separation o Bioremediation
   o Air stripping o Carbon adsorbers
   o Filters_____
   o Additive (*e.g.*, chelation agent, flocculent)_____
   o Others_____
   o Good condition o Needs Maintenance
   o Sampling ports properly marked and functional
   o Sampling/maintenance log displayed and up to date
   o Equipment properly identified
   o Quantity of groundwater treated annually_____
   o Quantity of surface water treated annually_____
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   o N/A o Good condition o Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   o N/A o Good condition o Proper secondary containment o Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   o N/A o Good condition o Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   o N/A o Good condition (esp. roof and doorways) o Needs repair
   o Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   o Properly secured/locked o Functioning o Routinely sampled o Good condition
   o All required wells located o Needs Maintenance o N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   o Is routinely submitted on time o Is of acceptable quality

2. Monitoring data suggests:
   o Groundwater plume is effectively contained o Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

o Properly secured/locked o Functioning o Routinely sampled o Good condition

o All required wells located o Needs Maintenance o N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

Excavation performed in 1995 to remove exposure to PPA and dioxin to children.
Install 1 feet of clean soil and collected confirmation samples from 1' of cover and play ground equipment. Results were ~~non-da~~ clean of contaminants.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

N/A

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.
	Implement LUCs to ~~prot~~ prevent disruption of cap.

DDJC-TRACY 2010 FIVE-YEAR REVIEW SITE INSPECTIONS

Inspection Team Roster

Name	**Agency/Company**
Maurice Benson	Defense Logistics Agency, Enterprise Support, San Joaquin California
Phillip Ramsey	U.S. Environmental Protection Agency, Region 9
Christopher Sherman	California Department of Toxic Substances Control
Marcus Pierce	California Regional Water Quality Control Board−Central Valley Region
Gregory Korose	URS Group, Inc
Michael Thomas	URS Group, Inc
Andrew Archuleta	URS Group, Inc
Steven Herrera	e2M|HDR

APPENDIX D

Risk and Hazard Estimates for the Vapor Intrusion Pathway

Location CP0914

Detected Concentrations, January 2009

Sampling Depth: 7 to 8 feet below ground surface

SG-SCREEN
PA Version 2.0; 04/

DTSC
Vapor Intrusion Guidance
Interim Final 12/04
(last modified 2/04/09)

Sample #CP0914SG001NS, Boring Location CP0914
collected 1/29/2009

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical	
100414			1.20E-01	Ethylbenzene	
1330207			3.20E-01	Xylenes	m- & p-xylenes
95476			8.90E-02	o-Xylene	
108883			2.40E-02	Toluene	
			Maximum detected concentration		

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	215	24			1.00E-08
	7 ft bgs actual sampling depths: 7-8 ft bgs				

MORE ↓

ENTER Vandose zone SCS soil type	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
	1.5	0.43	0.15	5

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	30	30	350

END

RESULTS SHEET

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)	
3.4E-07	3.2E-04	Ethylbenzene
not a carcinogen	8.1E-03	Xylenes
not a carcinogen	2.6E-03	o-Xylene
not a carcinogen	2.1E-04	Toluene
3.4E-07	1.1E-02	**(Screening-Level) Cumulative**

MESSAGE SUMMARY BELOW:

END

Location CP0914

Detected Concentrations, January 2009

Sampling Depth: 15 to 16 feet below ground surface

SG-SCREEN
PA Version 2.0; 04/

DTSC
Vapor Intrusion Guidance
Interim Final 12/04
(last modified 2/04/09)

Samples #CP0914SG002NS and DS, Boring Location CP0914 collected 1/29/2009

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical	
100414			3.10E-02	Ethylbenzene	
1330207			8.40E-02	Xylenes	m- & p-xylenes
95476			2.60E-02	o-Xylene	
108883			2.10E-01	Toluene	

Maximum detected concentration from Standarad & Field Duplicate pair results

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	460	24			1.00E-08

15 ft bgs
actual sampling depths: 15-16 ft bgs

MORE ↓

ENTER Vandose zone SCS soil type	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
	1.5	0.43	0.15	5

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	30	30	350

END

RESULTS SHEET

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)	
4.6E-08	4.3E-05	Ethylbenzene
not a carcinogen	1.1E-03	Xylenes
not a carcinogen	4.1E-04	o-Xylene
not a carcinogen	9.6E-04	Toluene
4.6E-08	2.5E-03	**(Screening-Level) Cumulative**

MESSAGE SUMMARY BELOW:

END

Location CP0915

Detected Concentrations, January 2009

Sampling Depth: 15 to 16 feet below ground surface)

SG-SCREEN
PA Version 2.0; 04/

DTSC
Vapor Intrusion Guidance
Interim Final 12/04
(last modified 2/04/09)

Samples #CP0915SG002NS, Boring Location CP0915
collected 1/21/2009

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
108883			3.80E+00	Toluene
			Maximum detected concentration	

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	460	24			1.00E-08
	15 ft bgs actual sampling depths: 15-16 ft bgs				

MORE ↓

ENTER Vandose zone SCS soil type	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
	1.5	0.43	0.15	5

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	30	30	350

END

RESULTS SHEET

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)	
not a carcinogen	1.7E-02	Toluene
0.0E+00	1.7E-02	**(Screening-Level) Cumulative**

MESSAGE SUMMARY BELOW:

END

Locations CP0914 and CP0915

Chemical-specific Detection Limits, January 2009

Sampling Depths: 7 to 8 feet and 15 to 16 feet below ground surface

SG-SCREEN
PA Version 2.0; 04/

DTSC
Vapor Intrusion Guidance
Interim Final 12/04
(last modified 2/04/09)

Samples #CP0914SG001NS, and #CP0914SG002NS and DS; Boring Location CP0914, collected 1/29/2009
Sample #CP0915SG001NS, and #CP0914SG002NS and DS; Boring Location CP0914, collected 1/29/2009
Chemical-specific Maximum Detection Limits:

Soil Gas Concentration Data

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Soil gas conc., C_g ($\mu g/m^3$)	OR	ENTER Soil gas conc., C_g (ppmv)	Chemical
71556			3.20E-03	1,1,1-Trichloroethane
79345			3.00E-03	1,1,2,2-Tetrachloroethane
76131			1.50E-03	1,1,2-Trichloro-1,2,2-trifluoroethane
79005			2.40E-03	1,1,2-Trichloroethane
75343			2.20E-03	1,1-Dichloroethane
75354			3.40E-03	1,1-Dichloroethylene
120821			1.60E-03	1,2,4-Trichlorobenzene
95636			2.80E-03	1,2,4-Trimethylbenzene
106934			2.40E-03	1,2-Dibromoethane (ethylene dibromide)
95501			2.90E-03	1,2-Dichlorobenzene
107062			2.70E-03	1,2-Dichloroethane
78875			2.90E-03	1,2-Dichloropropane
108678			7.80E-03	1,3,5-Trimethylbenzene
106990			1.50E-03	1,3-Butadiene
541731			3.10E-03	1,3-Dichlorobenzene
106467			3.00E-03	1,4-Dichlorobenzene
123911			7.50E-03	1,4-Dioxane
622968			3.80E-03	1-Ethyl-4-methylbenzene / 4-Ethyltoluene is not modeled in this version of SG-SCREEN
540841			2.90E-03	2,2,4-Trimethylpentane is not modeled in this version of SG-SCREEN
78933			3.10E-03	Methylethylketone (2-butanone)
591786			4.60E-03	2-Hexanone is not modeled in this version of SG-SCREEN
67630			4.00E-03	2-Propanol is not modeled in this version of SG-SCREEN
108101			7.40E-03	Methylisobutylketone (4-methyl-2-pentanone)
67641			7.80E-03	Acetone
107051			5.20E-03	Allyl chloride is not modeled in this version of SG-SCREEN
71432			3.30E-03	Benzene
100447			3.20E-03	Benzylchloride
75274			3.40E-03	Bromodichloromethane
75252			3.10E-03	Bromoform
74839			6.10E-03	Methyl bromide
75150			2.60E-03	Carbon disulfide
56235			2.40E-03	Carbon tetrachloride
108907			2.30E-03	Chlorobenzene
75003			4.60E-03	Chloroethane (ethyl chloride)
67663			3.30E-03	Chloroform
74873			3.40E-03	Methyl chloride (chloromethane)

156592			2.50E-03	cis-1,2-Dichloroethylene
10061015			2.60E-03	cis-1,3-Dichloropropene is not modeled in this version of SG-SCREEN
110827			2.60E-03	Cyclohexane is not modeled in this version of SG-SCREEN
124481			2.40E-03	Chlorodibromomethane
75718			1.60E-03	Dichlorodifluoromethane
64175			1.10E-02	Ethanol is not modeled in this version of SG-SCREEN
100414			3.40E-03	Ethylbenzene
76142			4.90E-03	Freon 114 is not modeled in this version of SG-SCREEN
142825			3.50E-03	Heptane is not modeled in this version of SG-SCREEN
87683			3.60E-03	Hexachloro-1,3-butadiene
110543			2.40E-03	Hexane
98828			2.50E-03	Cumene
1330207			1.90E-03	Xylenes
75092			3.60E-03	Methylene chloride
103651			2.80E-03	n-Propylbenzene
95476			2.60E-03	o-Xylene
100425			3.40E-03	Styrene
1634044			5.20E-03	MTBE
127184			3.00E-03	Tetrachloroethylene
109999			4.20E-03	Tetrahydrofuran
108883			2.60E-03	Toluene
156605			4.90E-03	trans-1,2-Dichloroethylene
10061026			4.00E-03	trans 1,3-Dichloropropene is not modeled in this version of SG-SCREEN
79016			2.30E-03	Trichloroethylene
75694			2.00E-03	Trichlorofluoromethane
75014			3.60E-03	Vinyl chloride (chloroethene)

DATA ENTRY SHEET

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Soil gas sampling depth below grade, L_s (cm)	ENTER Average soil temperature, T_S (^oC)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	215	24			1.00E-08
	7 ft bgs actual sampling depths: 7-8 ft bgs, 15-16 ft bgs				

MORE ↓

ENTER Vandose zone SCS soil type	ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
	1.5	0.43	0.15	5

MORE ↓

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
70	30	30	350

END

INCREMENTAL RISK CALCULATIONS:

row	Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)	
13	NA	2.2E-06	1,1,1-Trichloroethane
14	3.0E-07	8.7E-04	1,1,2,2-Tetrachloroethane
15	not a carcinogen	2.4E-07	1,1,2-Trichloro-1,2,2-trifluoroethane
16	5.7E-08	5.9E-04	1,1,2-Trichloroethane
17	3.7E-09	7.8E-06	1,1-Dichloroethane
18	not a carcinogen	1.3E-04	1,1-Dichloroethylene
19	not a carcinogen	8.6E-04	1,2,4-Trichlorobenzene
20	not a carcinogen	1.0E-03	1,2,4-Trimethylbenzene
21	1.2E-07	5.0E-03	1,2-Dibromoethane (ethylene dibromide)
22	not a carcinogen	5.0E-05	1,2-Dichlorobenzene
23	7.6E-08	2.1E-05	1,2-Dichloroethane
24	3.6E-08	2.1E-03	1,2-Dichloropropane
25	not a carcinogen	3.4E-03	1,3,5-Trimethylbenzene
26	3.1E-07	2.1E-03	1,3-Butadiene
27	not a carcinogen	1.0E-04	1,3-Dichlorobenzene
28	4.9E-08	1.3E-05	1,4-Dichlorobenzene
29	1.1E-07	1.1E-08	1,4-Dioxane
30	not modeled		1-Ethyl-4-methylbenzene / 4-Ethyltoluene is not modeled in this version of SG-SCREEN
31	not modeled		2,2,4-Trimethylpentane is not modeled in this version of SG-SCREEN
32	not a carcinogen	1.2E-06	Methylethylketone (2-butanone)
33	not modeled		2-Hexanone is not modeled in this version of SG-SCREEN
34	not modeled		2-Propanol is not modeled in this version of SG-SCREEN
35	not a carcinogen	6.2E-06	Methylisobutylketone (4-methyl-2-pentanone)
36	not a carcinogen	5.2E-07	Acetone
37	not modeled		Allyl chloride is not modeled in this version of SG-SCREEN
38	9.0E-08	2.4E-04	Benzene
39	2.1E-07	1.0E-02	Benzylchloride
40	1.0E-07	9.4E-05	Bromodichloromethane

41	2.3E-09	7.1E-05	Bromoform
42	not a carcinogen	2.8E-03	Methyl bromide
43	not a carcinogen	9.0E-06	Carbon disulfide
44	1.7E-07	2.4E-04	Carbon tetrachloride
45	not a carcinogen	6.4E-06	Chlorobenzene
46	5.7E-09	1.6E-06	Chloroethane (ethyl chloride)
47	2.8E-08	4.2E-05	Chloroform
48	4.8E-09	6.8E-05	Methyl chloride (chloromethane)
49	not a carcinogen	1.7E-04	cis-1,2-Dichloroethylene
50	not modeled		cis-1,3-Dichloropropene is not modeled in this version of SG-SCREEN
51	not modeled		Cyclohexane is not modeled in this version of SG-SCREEN
52	4.7E-08	5.8E-05	Chlorodibromomethane
53	not a carcinogen	2.2E-05	Dichlorodifluoromethane
54	not modeled		Ethanol is not modeled in this version of SG-SCREEN
55	9.7E-09	9.1E-06	Ethylbenzene
56	not modeled		Freon 114 is not modeled in this version of SG-SCREEN
57	not modeled		Heptane is not modeled in this version of SG-SCREEN
58	1.8E-07	5.4E-03	Hexachloro-1,3-butadiene
59	not a carcinogen	1.4E-05	Hexane
60	not a carcinogen	1.7E-05	Cumene
61	not a carcinogen	4.8E-05	Xylenes
62	4.1E-09	2.4E-05	Methylene chloride
63	not a carcinogen	5.1E-05	n-Propylbenzene
64	not a carcinogen	7.7E-05	o-Xylene
65	not a carcinogen	9.5E-06	Styrene
66	1.6E-09	4.8E-06	MTBE
67	3.1E-08	3.5E-04	Tetrachloroethylene
68	not a carcinogen	2.6E-04	Tetrahydrofuran
69	not a carcinogen	2.2E-05	Toluene
70	not a carcinogen	1.9E-04	trans-1,2-Dichloroethylene
71	not modeled		trans 1,3-Dichloropropene is not modeled in this version of SG-SCREEN
72	6.8E-09	1.3E-05	Trichloroethylene
73	NA	1.1E-05	Trichlorofluoromethane
74	2.4E-07	7.2E-05	Vinyl chloride (chloroethene)
	2E-06	4E-02	**(Screening-Level) Cumulative**

	MESSAGE SUMMARY BELOW:
X	MESSAGE (1,1,2,2-Tetrachloroethane): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.
X	MESSAGE (1,1,2-Trichloroethane): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.
X	MESSAGE (1,1-Dichloroethane): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.
X	MESSAGE (1,3-Dichlorobenzene): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.
X	MESSAGE (Acetone): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.
X	MESSAGE (Bromodichloromethane): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.
X	MESSAGE (Bromoform): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.
X	MESSAGE (cis-1,2-Dichloroethylene): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.
X	MESSAGE (Chlorodibromomethane): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.
X	MESSAGE (Hexachloro-1,3-butadiene): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.
X	MESSAGE (n-Propylbenzene): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.
X	MESSAGE (trans-1,2-Dichloroethylene): Risk/HQ or risk-based soil concentration is based on a route-to-route extrapolation.

END

APPENDIX E

Regulatory Agency Comments and Responses to Comments

Regulatory Agency Comments
and Responses to Comments
on Draft Second Five-Year Review

AIR FORCE CENTER FOR ENGINEERING AND THE ENVIRONMENT (AFCEE)

DESIGN REVIEW COMMENTS Project: Defense Distribution Depot San Joaquin – Tracy Site Second Five-Year Review Report

☒ SITE DEV & GEO	☐ MECHANICAL	☐ SAFETY	☐ SYSTEMS ENG	REVIEW	Draft
☐ ENVIR PROT & UTIL	☐ MFG TECHNOLOGY	☐ ADV TECH	☐ VALUE ENG	DATE	29 October 2010
☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME	James Brownell, CVWB
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS			

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
		Of particular interest to the Central Valley Water Board is the volatile organic compound (VOC) groundwater plume east of Banta Road and northeast of the depot. The remedy for this plume was changed to monitored natural attenuation (MNA) in an Explanation of Significant Difference document completed in 1995. However, after 15 years of monitoring, it appears that the concentrations of VOCs in the plume have not decreased and have remained constant. Furthermore, it remains unknown whether or not the plume is migrating because the down-gradient extent of VOCs has not been determined. DLA has proposed additional characterization to determine the extent if the plume. DLA must also present an analysis to establish the effectiveness of the MNA remedy. The analysis results must show whether or not DLA will need to augment or replace MNA in order to establish long-term protectiveness.	The DLA currently evaluates remedy performance and presents results in the *Well Monitoring Program, Annual Monitoring Report*. Several of the tools currently used can be further developed to assess the effectiveness of the dispersion remedy at the Banta Road Plume. Thus, the DLA will formally document a multi-tiered program to assess the effectiveness of the dispersion remedy for the Banta Road Plume. The evaluation will be conducted annually and consist of: 1. A Mann-Kendall test will be performed for TCE concentrations from each well associated with the plume. This statistical analysis will allow for a mathematical evaluation of contaminant trends. 2. A contaminant time–concentration plot will be prepared for TCE from each well associated with the plume. These time-series plots will allow for a graphical evaluation of concentrations across time for each well in the plume. 3. The groundwater contamination will be modeled using historical concentrations and aquifer characteristics to project the extent of contamination without the reductive effects of attenuation. The shape of the modeled plume will be compared to the actual configuration. The depiction of plume configurations will allow for a graphical comparison to assess the effects of attenuation on plume configuration. (continued)

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☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME	James Brownell, CVWB
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS			

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
			(continued) 4. Assess the need to conduct additional characterization or install additional monitoring wells to determine the full extent of the plume. New wells will allow for an empirical assessment of plume migration. (The two downgradient groundwater monitoring wells to be installed downgradient of the toe of the Banta Road plume in 2011 is an example of a recommendation from this type of evaluation. These new wells will be co-located and installed in the Upper and Middle Hydrologic Horizons to better assess the downgradient extent of the plume.) Using the methods described above, an assessment of the effectiveness of the dispersion remedy will be included in each Well Monitoring Program, Annual Monitoring Report. The initial evaluation will occur in 2011.

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DESIGN REVIEW COMMENTS Project: Defense Distribution Depot San Joaquin – Tracy Site Second Five-Year Review Report

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☐ ENVIR PROT & UTIL	☐ MFG TECHNOLOGY	☐ ADV TECH	☐ VALUE ENG	DATE	29 September 2010
☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME	Michael Montgomery, EPA
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS			

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
1.		The U.S. Environmental Protection Agency (EPA) has reviewed the "Draft Defense Distribution Depot San Joaquin –Tracy Site Second Five-Year Review Report", dated August 27, 2010 (Tracy Five-Year Review or 5YR). While EPA concurs with DLA on many of the Protectiveness determinations as they apply to individual sites at the Tracy Site, there are several sites where we do not concur at this time. As explained below, EPA will defer our protectiveness determination for the Basewide Soils remedy until additional information has been submitted by DLA and reviewed by EPA, and EPA will document that the Groundwater remedy is "Protective in the Short-Term" only. **Basewide Soils** **Protectiveness Statement:** EPA cannot make a protectiveness determination of the remedy for the Basewide Soils OU until further information is made available, as described below. It is EPA's expectation that the actions necessary to obtain the additional information should take place within a year from now. Upon review of the information, EPA will make a final protectiveness determination. **Day Care Center:** EPA defers our protectiveness determination for the Day Care Center until DLA can demonstrate through a compilation of site information, including possibly new sampling data, that there are no unacceptable risks present. Executive Summary, Section ES.4.3, page ES-7 indicates, "[t]he remedy at the Day Care Center is protective of human health and the environment in the short term; however, annual inspections of the <u>clean soil barrier</u> need to be continued to assure exposure pathways that could result in unacceptable risk are being controlled"(emphasis added). Additional descriptions of the site are provided in Section 21.0, indicating that the, "[t]he upper 12 inches of soil were excavated and replaced with clean soil to provide a barrier of contaminated free soil in the play area...[c]onfirmation wipe samples were collected from the playground (continued)	Comment noted. Comment noted. The 1996 *Child Care Facility Closure Report* provides the soil sample results from the clean soil barrier and wipe sample results from the playground equipment. This clean soil barrier eliminates the exposure pathway from the pesticide contamination. The Day Care Center site was observed during the July 2010 5YR site inspection and there were no signs of disturbance of the clean soil barrier; therefore, there is no evidence that the one foot thick clean soil barrier at the Day Care Center is not protecting children and workers from exposure. The risk was re-evaluated during the preparation of the (continued)

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☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME	Michael Montgomery, EPA
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS			

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
1. (cont'd)		(continued) equipment; all results were below method detection limits….[a]fter the time-critical removal action was completed, the Site-Wide Comprehensive ROD identified the Day Care Center as a no further action site." Section 21.2.1, 2005 FYR Protectiveness Statement, and Section 21.2.2, Status Recommendation from the First FYR, provide inconsistencies that need to be resolved. The 2005 Protectiveness Statement for this site as provided in Section 21.2.1 indicates, "[t]he remedy is considered protective of human health and the environment because the exposure pathway has been eliminated." Recommendations provided in Section 21.2.2 indicate that, "[r]emedial action has been completed at the Day Care Center. As part of the five-year review, the historical soil data were reviewed. Based on the data, land use controls are recommended. Land use control requirements will be documented in future revisions of the Installation Master Plan (IMP) in early 2006" (emphasis added). Based on the recommendations of the 2005 FYR, it appears DLA was to have established LUCs for the site; however, the LUCs were not subsequently documented in an appropriate remedy decision document or in the IMP.	(continued) 2nd 5YR and there is still no risk because the pathway is incomplete as long as the clean soil barrier is not disturbed. It is not necessary to collect new samples. The LUCs recommended in the 2005 FYR were not established or documented for the Day Care Center. LUCs are not typically implemented on sites that have an active day care facility; this was confirmed by the EPA representative during the July 2010 5YR site inspection. DLA is currently constructing a new day care facility at a location on the depot that does not have a history of contamination. The day care facility is scheduled to move to the new location by 2011. After the day care operations are moved to another area of the depot, formal LUCs will be implemented at the current location by documenting them in the appropriate decision document (to be determined by DLA and EPA) and incorporating them into the Real Property Master Plan Digest (RPMPD) (formerly the Installation Master Plan) to prevent disturbance of the clean soil layer in 2012.This information will be added to the Summary Form, Executive Summary, and Section 21.0.
2.		**Area 1/Building 237 – Vapor Intrusion:** EPA defers our protectiveness determination for Soil Vapor Extraction (SVE) site – Area 1/Building 237, since there is the possibility of exposure to building occupants from the vapor intrusion pathway. DLA should evaluate the vapor intrusion pathway as soon as possible and take precautionary actions to prevent possible exposure to installation employees until the risk evaluation is complete, and thereafter take action as required based on the risk evaluation.	By CY 1Q2011, DLA will notify the Building 237 workers of the potential for exposure to vapors originating from the subsurface. In 2011, DLA will initiate a vapor intrusion assessment at Building 237. The assessment may consist of soil vapor modeling and/or soil gas sampling.

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☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME	Michael Montgomery, EPA
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS			

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
3.		**Land Use Control Sites:** There is insufficient information in the 5YR to confirm that the current land use LUCs are in place and enforceable. Consequently, EPA cannot concur on the long term protectiveness at these sites.	Land use controls are in place, enforceable, and monitored annually at the Tracy Site. The land use controls and procedures to enforce them are provided in the 2004 Explanation of Significant Differences. The land use controls and procedures were developed to be consistent with the 2003 DoD/EPA Guidance "*Principles and Procedures for Specifying, Monitoring, and Enforcement of Land Use Controls and Other Post-Rod Actions*". The following text will be added to Section 4.5 Site Inspection and Land Use Control Management to document that the 2003 guidance was followed in the development of the land use controls: "The land use control procedures for the Tracy Site were developed to be consistent with the 2003 Department of Defense – EPA guidance *Principles and Procedures for Specifying, Monitoring and Enforcement of Land Use Controls and Other Post-ROD Actions.* The Federal Facilities Land Use Control ROD Checklist (EPA, 2006) was used during this five-year review to confirm the land use control procedures are consistent with the referenced 2003 guidance."
4.		**SWMU 24 – Petroleum Waste Oil Tank:** The remedy for SWMU 24 is protective in the short term. The goals of the remedy for SWMU 24 were to address contamination that could pose a vapor intrusion risk and to prevent migration of contamination to groundwater. The 5YR documents that there is no evidence of a complete pathway for contamination to reach groundwater and was not found to be a risk in indoor air samples. Therefore, the current remedy is protective in the short term. However, as indicated in the document, the current remedy was not successful at achieving cleanup goals. Consequently, the remedy is not protective in the long term.	The COCs at SWMU 24 with concentrations greater than ROD cleanup goals are beneath Building 247. There are no plans to demolish Building 247.The recommendation in the Five-year Review Report is remediation by SVE, bioventing, or excavation when the building is demolished. After the building is demolished, implementation of a soil remedy will achieve long-term protectiveness. No text revisions are necessary.

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☐ ENVIR PROT & UTIL	☐ MFG TECHNOLOGY	☐ ADV TECH	☐ VALUE ENG	DATE	29 September 2010
☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME	Michael Montgomery, EPA
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS			

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
1.		**Groundwater Remedy (OU1)** **Protectiveness Statement:** The Groundwater OU remedy currently protects human health and the environment in the short term because exposure pathways that could result in unacceptable risks are being controlled. However, several actions as described below must be taken to ensure long-term protectiveness. **Banta Road Plume:** The remedy for the Banta Road groundwater (GW) plume was changed to monitored natural attenuation (MNA) in the 1995 Explanation of Significant Difference (ESD) (p. 5-1). The remedy is protective in the short term because the plume appears stable. However, the 5YR does not present evidence that this mechanism is successful and making progress towards remedial goals. DLA must implement a program to document the progress of MNA or other response actions may be necessary in order to ensure long term protectiveness.	Comment noted. The DLA currently evaluates remedy performance and presents results in the *Well Monitoring Program, Annual Monitoring Report*. Several of the tools currently used can be further developed to assess the effectiveness of the dispersion remedy at the Banta Road Plume. Thus, the DLA will formally document a multi-tiered program to assess the effectiveness of the dispersion remedy for the Banta Road Plume. The evaluation will be conducted annually and consist of: 1. A Mann-Kendall test will be performed for TCE concentrations from each well associated with the plume. This statistical analysis will allow for a mathematical evaluation of contaminant trends. 2. A contaminant time–concentration plot will be prepared for TCE from each well associated with the plume. These time-series plots will allow for a graphical evaluation of concentrations across time for each well in the plume. (continued)

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☐ ENVIR PROT & UTIL	☐ MFG TECHNOLOGY	☐ ADV TECH	☐ VALUE ENG	DATE	29 September 2010
☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME	Michael Montgomery, EPA
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS			

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
1. (cont'd)			(continued) 3. The groundwater contamination will be modeled using historical concentrations and aquifer characteristics to project the extent of contamination without the reductive effects of attenuation. The shape of the modeled plume will be compared to the actual configuration. The depiction of plume configurations will allow for a graphical comparison to assess the effects of attenuation on plume configuration. 4. Assess the need to conduct additional characterization or install additional monitoring wells to determine the full extent of the plume. New wells will allow for an empirical assessment of plume migration. (The two downgradient groundwater monitoring wells to be installed downgradient of the toe of the Banta Road plume in 2011 is an example of a recommendation from this type of evaluation. These new wells will be co-located and installed in the Upper and Middle Hydrologic Horizons to better assess the downgradient extent of the plume.) Using the methods described above, an assessment of the effectiveness of the dispersion remedy will be included in each Well Monitoring Program, Annual Monitoring Report. The initial evaluation will occur in 2011.

AIR FORCE CENTER FOR ENGINEERING AND THE ENVIRONMENT (AFCEE)

DESIGN REVIEW COMMENTS Project: Defense Distribution Depot San Joaquin – Tracy Site Second Five-Year Review Report

☒ SITE DEV & GEO	☐ MECHANICAL	☐ SAFETY	☐ SYSTEMS ENG	REVIEW	Draft
☐ ENVIR PROT & UTIL	☐ MFG TECHNOLOGY	☐ ADV TECH	☐ VALUE ENG	DATE	29 September 2010
☐ ARCHITECTURAL	☐ ELECTRICAL	☐ ESTIMATING	☐ OTHER	NAME	Michael Montgomery, EPA
☐ STRUCTURAL	☐ INST & CONTROLS	☐ SPECIFICATIONS			

ITEM	DRAWING NO. OR REFERENCE	COMMENT	ACTION
2.		**Banta Road Plume -Impacts to Private Well:** The current remedy is protective in the short term only. The remedy needs to be revised to include operation and maintenance (O&M) of the well-head treatment system, including sampling and maintenance of the residential liquid-phase granular activated carbon. In addition, a screening risk assessment must be completed and documented to assess the potential of vapor intrusion risk to the occupants of this residential site.	The groundwater treatment system installed on the groundwater supply well at the Rose residence (PW001) is for protective purposes only and not considered part of the OU 1 groundwater remedy for the Tracy Site. Concentrations of TCE and PCE at the well are less than maximum contaminant levels and aquifer cleanup levels. PW001 does not extract sufficient volumes of water to influence the plume and residential treatment systems are not specified as an approved remedy in the ROD. Furthermore, data from the well is not used to monitor the OU 1 groundwater treatment performance nor is it used to model plume migration. Therefore, inclusion of the wellhead treatment system in the OU 1 Groundwater ROD is not warranted. Operations, maintenance and, sampling activities for the treatment system at PW001 are presented each year in the Well Monitoring Program Annual Monitoring Report. In addition, samples are collected and reviewed on a quarterly basis for protectiveness. Shallow soil vapor samples were collected from two locations (CP0904 and CP0905) near PW001 in January 2009 as reported in the *Groundwater Remedy Enhancement Summary* (URS, 2009). A screening level vapor intrusion assessment was completed as part of the 5YR Report (Section 5.4.3, pages 5-33 – 5-35). Soil gas samples were compared to EPA target concentrations. All but one detected VOC concentration (ethylbenzene at CP0914) were less than the corresponding generic target concentrations. Ethylbenzene concentrations (continued)

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2. (cont'd)			(continued) at CP0914 are only slightly above target concentrations and are considered inconsequential due to conservative assumptions used to derive target concentrations. Therefore, soil vapor is an inconsequential exposure pathway. An additional assessment of soil vapor data collected near the Rose residence was completed using the Johnson & Ettinger model. Model results estimate cancer risks and cumulative hazard indices for all samples at less than $1x10^{-6}$ and 1.0, respectively.
3.		**Vapor Intrusion - On Depot:** There are plumes of TCE and PCE in the shallowest groundwater in the Upper Hydrologic Zone with concentrations of 5 to 104 ug/L under storage areas (Area 3), parking lots (formerly northern portion of Building 10), and agricultural fields but not occupied depot buildings. The potential rise of VOC vapors into open spaces is unlikely to pose health risks because the VOC vapors rise into the air and are diluted quickly. DLA may have no current plans to build work spaces or residences over these groundwater plumes but does not have restrictions in place to prevent such construction. In the absence of LUCs for areas above the existing GW plumes, vapor intrusion is considered a threat to long-term protectiveness until the plumes are cleaned up or the risk evaluated.	In 2012, DLA will prepare an appropriate decision document (to be determined by DLA and EPA) to modify the existing OU 1 groundwater LUCs. Wherever shallow (Upper Hydrologic Zone) VOC plumes are present on the Depot or on the annex with concentrations greater than ACLs, an LUC will be implemented to ensure long-term protectiveness from the vapor intrusion pathway. The LUC will require an assessment of potential vapor intrusion risk if work spaces or residences are to be constructed over shallow VOC plumes. In 2012, the LUC will be documented in the RPMPD (formerly the Installation Master Plan) for areas potentially subject to vapor intrusion restrictions. Through the RPMPD, DLA planners will be advised of the restrictions and the necessity to investigate and/or mitigate potential health risks from the vapor intrusion pathway at any planned (new) structures. (continued)

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3. (cont'd)			(continued) In the event an unacceptable health risk from vapor intrusion is estimated, the planned location of the new structure will either be moved or engineering controls, such as vapor barriers, will be included in the building design. In 2011, vapor intrusion pathway assessments will be initiated at Areas 1, 2 and 3. The assessments may consist of soil vapor modeling and/or soil gas sampling. In 2012, DLA intends to modify the LUCs at SWMU 20 in the appropriate decsion document (to be determined by DLA and EPA) to address the potential for vapor intrusion from the soil and groundwater contamination at this location.
		I. EPA GENERAL COMMENTS ON THE 5YR	
1.		**Soil Vapor Extraction (SVE) Sites (Areas 1-3) - Protectiveness Statement:** EPA agrees with DLA that two of the three SVE sites (i.e., Areas 2 and 3) are currently protective in the short-term. However, for the third SVE site (Area 1/Building 237), EPA will defer our Protectiveness determination until DLA conducts an evaluation of vapor intrusion. As indicated in the 5YR, "*Vapor Intrusion Pathway. Inhalation of VOCs in indoor air was not evaluated at Area 1/Building 237 in the baseline risk assessment. PCE contamination in soil may extend under the northern side of Building 237. The potential exists for PCE vapors in the soil to migrate vertically into Building 237, which is occupied by employees every work day.*" Recommendations: "*Because PCE contamination in soil may extend under Building 237, evaluate the vapor intrusion pathway.*"	By CY 1Q2011 DLA will notify the building workers of the potential for exposure to vapors originating from the subsurface. In 2012, DLA will initiate a vapor intrusion assessment at Building 237. The assessment may consist of soil vapor modeling and/or soil gas sampling.
2.		**SVE Site (Area 2):** EPA requests that DLA ensure that the existing LUCs for Area 2, as selected in a 2001 Record of Decision (ROD) and modified in a 2004 Explanation of Significant Differences (ESD), are consistent with (continued)	Comment acknowledged. The LUC procedures, described in Section 2 of the 2004 ESD, for SWMU 1/Area 2 (and all other Tracy sites with LUCs) are (continued)

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2. (cont'd)		(continued) indicated by the EPA representative during the July 16, 2010 Site Inspection, DLA should assess its current LUC procedures and 2003 DoD-EPA Guidance, "Principles and Procedures for Specifying, Monitoring, and Enforcing Land Use Control…" (DoD-EPA Principles). As requirements against the 2003 DoD-EPA Principles. If there are deficiencies in DLA's procedures for implementing, monitoring, maintaining, reporting and notifying regulators regarding any LUC changes, site use changes, property transfer, and/or breaches, these should be detailed in the Five Year Review and documented for subsequent planned correction to improve long-term protectiveness. Based upon EPA's review of the 5YR, it does not appear DLA conducted this analysis. LUC requirements that need updating shall be detailed, along with a plan for correcting the deficiency, an identification of the appropriate document (via ROD, ESD, or RD/RA Work Plan) and the schedule for document development and establishment of long-term protectiveness.	(continued) consistent with the referenced 2003 DoD-EPA guidance and the 2006 LUC checklist. DLA performed the appropriate procedures and followed the LUC requirements during the 5YR. No deficiencies in LUC procedures were noted; therefore, recommendations were not necessary. In Section 4.5 Site Inspection and Land Use Control Management, the following text will be added: "The land use control procedures for the Tracy Site were developed to be consistent with the 2003 Department of Defense – EPA guidance *Principles and Procedures for Specifying, Monitoring and Enforcement of Land Use Controls and Other Post-ROD Actions.* The *Federal Facilities Land Use Control ROD Checklist* was used during this five-year review to confirm land use control procedures are consistent with the referenced 2003 guidance."
3.		**Soil Sites Protectiveness**: With the exception of the Day Care Center, EPA agrees with DLA that the fifteen soil sites are protective in the short-term. EPA does have some long-term protectiveness concerns with the 11 soil sites with existing LUCs, and consistent with EPA's General Comment number 2 above for the Area 2 SVE Site with LUCs, requests that DLA assess the LUCs at the respective Soil Sites for compliance with the 2003 DoD-EPA Principles and make appropriate recommendations where deficiencies are determined to exist.	See previous comment response.

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4.		**Recommendations/Follow-Up Actions:** The Follow-Up Actions delineated in the 5YR Summary Form and in the report must include dates for completion. This is important to ensure proper tracking of compliance with the statutory requirement to perform five-year reviews, and is therefore required by EPA's 5YR Guidance. This issue received specific focus by the EPA Inspector General during their recent review of the EPA 5YR Program. In EPA's CERCLIS database, the 5YR module tracks progress and completion of recommendations and/or follow-up actions by actual date. EPA provided this same comment to DLA last year in our review of the draft Five Year Review for the DDJC-Sharpe Site (Tracy's sister site).	DLA concurs. A table (ES-2) providing the proposed dates for the completion of the follow-up actions that will ensure long-term protectiveness identified in the Five-Year Review and expected dates of completion will be included in the Executive Summary as shown in Attachment 1.
5.		**Recommendations/Follow-up Actions:** DLA provided an extensive list of follow-up actions that are recommended by DLA for completion in order to ensure the long-term protectiveness of the site; however, many of the recommended tasks are not directly related to any long-term protectiveness issues and therefore appear unnecessary for purposes of tracking 5YR Follow-up Actions. DLA should re-evaluate its recommendations and develop a more focused list of priority activities that are necessary to ensure the long-term protectiveness.	DLA disagrees. For our own tracking purposes, DLA has included recommendations that resolve issues that were noted during the five-year review process. A "focused" list of recommendations that resolve issues that ensure the long term protectiveness will be provided in Table ES-2 (Attachment 1) for agency tracking purposes.
		II. EPA SPECIFIC COMMENTS ON THE 5YR	
1.		**Five-Year Review Summary Form (5YRSF):** Under the heading "Remediation Status", DLA has selected "Operating" and "Complete", but not "Under Construction". Given that DLA must complete additional remedial actions at the Northwest Corner, Warehouse 10/SWMU 20, and Area 1 Pesticide sites, EPA believes that "Under Construction" should be selected over "Complete".	DLA concurs and will revise the remediation status as "Operating" and "Under Construction," not "Complete.'

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2.		**5YRSF:** The 5YR should not state that the preferred alternative for the Northwest Corner dieldrin groundwater remedy was "negotiated", but rather indicate that the Feasibility Study (FS) is complete and a Proposed Plan has been prepared and is being reviewed by EPA and State regulatory agencies. DLA need not discuss the dispute at all. This appears in the Summary Form narrative (p. 5 of 5), the Executive Summary (E.S.1.1, E.S. 2.1), and Section 5.5 (Issues). Table 5-6 indicates that a remedy has been selected for the NWC dieldrin -- this should be changed to say that a Proposed Plan recommending a remedy will be issued shortly.	DLA disagrees. The preferred remedy was developed during the dispute resolution process. However the text in the Summary Form, Executive Summary, and Section 5 will be revised as follows: "No remedy is currently in place for the NWC dieldrin plume; however, a preferred remedy, developed during the dispute resolution process, was agreed upon by DLA, EPA, and the State of California." In addition, Table 5-6 has been revised as suggested.
3.	**Executive Summary (ES), Section 0**	The ES list of RODs/Amendments/ESDs would be more useful if it included a description of the remedy decision documented in each.	DLA concurs. A brief description of the remedy decision for each document in the list will be added. The revised text is Attachment 2 to this response-to-comments table.
4.		The 5YR should state that it complies with CERCLA, the NCP and EPA guidance (see *Comprehensive Five-Year Review Guidance*, OSWER No. 9355.7-03B-P June 2001).	DLA concurs and will add the text as requested.
5.	**ES Section 1.2**	**SVE Sites:** The final sentence in this section states that "[t]he SVE sites are currently recommended for no further action by [DLA], pending modification in a decision document of the Site-Wide Comprehensive ROD language related to determining vadose zone cleanup." It is not clear what this means – please clarify how DLA is planning to document this.	On 22 November 2010, DLA submitted the draft *2010 Explanation of Significant Differences to the Site-Wide Comprehensive Record of Decision, Defense Distribution Depot San Joaquin-Tracy Site* (HDR, 2010) to modify vadose zone cleanup criteria. The ESD will modify the ROD language and clarify cleanup criteria for the Tracy SVE sites. In addition, the ESD introduces the SVE Termination or Optimization Process (STOP) as a basis for closing SVE sites. The text in the 5YR Report will be revised as follows: "The SVE sites are currently recommended for no further action by DLA Installation Support at San Joaquin, pending an ESD of the Site-Wide Comprehensive ROD that will (continued)

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5. (cont'd)			(continued) (1) revise the terminology in Sections 9.6.5 and 9.7.5.10 of the ROD by deleting the "and" at the end of the second vadose zone cleanup achievement item and adding an "or" after the first and second vadose zone cleanup achievement items and (2) incorporate the SVE Termination or Optimization Process (STOP) protocol as a basis for closing SVE sites at the Tracy Site."
6.	**ES Section 1.3**	**Soil Sites:** The text indicates there was an FS, and then says "a remedial design/remedial action work plan is being developed to implement the remedy" to address the TCE under Bldg. 10, but says nothing about a remedy being selected. Please modify this discussion to detail the planning and scheduling of an ESD to document the remedy modification.	The *Solid Waste Management Unit 20 Feasibility Study* (URS, 2009) recommended soil vapor extraction enhanced with pneumatic fracturing as the remedy for SWMU 20. On 22 November 2010, DLA submitted the draft *2010 Explanation of Significant Differences to the Site-Wide Comprehensive Record of Decision, Defense Distribution Depot San Joaquin-Tracy Site* (HDR, 2010) to incorporate the remedy at the SWMU 20 site. Construction of the system is scheduled to begin in spring 2011. The following text will replace the existing text in Sections ES.1.3 and 12.1.2 to clarify this: "DLA is preparing for November 2010 submittal, a draft *ESD to the Site-Wide Comprehensive Record of Decision* to document that soil vapor extraction enhanced with pneumatic fracturing will be the selected remedy for SWMU 20."

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7.	**Section ES.2**	**Issues of Second Five-Year Review:** Each groundwater plume should be defined (e.g., TCE exceeding XXppb). The statement of the issues regarding the SWMU 20 plume and the Area 3 TCE Plume is not clear -- what are the issues? In the discussion of the DDT issue, the 5YR leaves out the word "Protection" in Environmental Protection Agency. In the discussions of ROD monitoring requirements not being met for both groundwater and soils, the 5YR should explain what requirements are not being met – monitoring requirements (e.g., performing the monitoring as required in the ROD) or performance standards (e.g., the cleanup concentration levels for VOCs in the groundwater). If the latter, the 5YR should say that, and state that the remedial action will continue, in addition to the monitoring, until the standards are met; this is also true for several of the soil sites.	DLA concurs and the text of Section ES.2 will be revised as follows: 1) Contaminant concentrations were added to the text regarding plumes to better define them. 2) The issue for the SWMU 20 plume is that there are no monitoring wells in or downgradient from the plume to monitor its migration. The issue for the Area 3 plume is that the downgradient extraction well could be shut down because concentrations at the well are less than ACLs, even though the Area 3 plume (concentrations 5 to 25 μg/L) is upgradient and in its capture zone. 3) The word “protection” has been inserted into the EPA’s full title. 4) Text has been added to ES.2.1, ES.2.2, and ES.2.3 to clarify that the performance of groundwater monitoring as required in the ROD that has not been met at groundwater, SVE, or soil sites has not been attained because either groundwater concentrations that require evaluation have been exceeded or because the number of analyses required in the ROD for some contaminants has not been attained. The complete revised Section ES.2 text is provided in Attachment 3 of this response to comments.

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8.	**ES. 3**	**Recommendations and Follow-Up Actions:** The explanation of the monitoring of the Banta Road plume should state that the monitoring data will help determine whether the plume is attenuating or migrating, not that it will increase confidence. The explanation of how DLA will address the lack of clear data that natural attenuation of VOCs in groundwater is occurring should state that groundwater extraction & treatment will continue. For the Area 3 TCE Plume, the recommendation should be to evaluate whether natural attenuation is occurring and whether monitoring well EW046AU could be shut down without increasing the potential for downgradient migration of contamination. DLA should identify what type of documentation is necessary where the remedy is apparently complete.	The DLA currently evaluates remedy performance and presents results in the *Well Monitoring Program, Annual Monitoring Report*. Several of the tools currently used can be further developed to assess the effectiveness of the dispersion remedy at the Banta Road Plume. Thus, the DLA will formally document a multi-tiered program to assess the effectiveness of the dispersion remedy for the Banta Road Plume. The evaluation will be conducted annually and consist of: 1. A Mann-Kendall test will be performed for TCE concentrations from each well associated with the plume. This statistical analysis will allow for a mathematical evaluation of contaminant trends. 2. A contaminant time–concentration plot will be prepared for TCE from each well associated with the plume. These time-series plots will allow for a graphical evaluation of concentrations across time for each well in the plume. 3. The groundwater contamination will be modeled using historical concentrations and aquifer characteristics to project the extent of contamination without the reductive effects of attenuation. The shape of the modeled plume will be compared to the actual configuration. The depiction of plume configurations will allow for a graphical comparison to assess the effects of attenuation on plume configuration. (continued)

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8. (cont'd)			(continued) 4. Assess the need to conduct additional characterization or install additional monitoring wells to determine the full extent of the plume. New wells will allow for an empirical assessment of plume migration. (The two downgradient groundwater monitoring wells to be installed downgradient of the toe of the Banta Road plume in 2011 is an example of a recommendation from this type of evaluation. These new wells will be co-located and installed in the Upper and Middle Hydrologic Horizons to better assess the downgradient extent of the plume.) Using the methods described above, an assessment of the effectiveness of the dispersion remedy will be included in each Well Monitoring Program, Annual Monitoring Report. The initial evaluation will occur in 2011. For the Area 3 plume, EW046AU serves as the remedial extraction well for TCE contamination defined by a single HydroPunch sample collected in 2008. Because natural attenuation is not a ROD-specified remedy for on the depot contamination, EW046AU will continue to operate until the magnitude of the groundwater contamination at this location can be further assessed via samples from additional HydroPunch sampling or new monitoring well(s).

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9.	**ES. 4-1**	**Protectiveness Statement – Groundwater Sites:** This section only says that the groundwater remedies are protective of human health and the environment in the short term. According to the Guidance, Protectiveness Statements should be in terms of protection of human health and the environment, using risk range or hazard index, and describe efforts to be protective where there is remaining contamination.	DLA disagrees that a risk range or hazard index must be included in the protectiveness statement. In the Five-Year Review Guidance, none of the examples of protectiveness statements included a risk range or hazard index value. However, DLA has revised the protectiveness statement for groundwater. Text has been changed to the following: "The remedy for OU 1 is protective of human health and the environment in the short term. Contaminant plumes are present in groundwater. However, exposure pathways that could result in unacceptable risks are being controlled by institutional controls on groundwater beneath federal government property. Groundwater containing TCE has reached a drinking water well that is treated with LGAC and monitored quarterly. To assure long-term protectiveness, monitoring wells that can demonstrate containment by natural attenuation will be installed and included in the groundwater monitoring program. The remedy for the NWC Groundwater Operable Unit will address dieldrin–contaminated groundwater that would pose health risks if it were being used."

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10.	**Table ES-1,**	**Issues and Recommendations and Follow-up Actions for Soil Sites:** See recommendation above regarding meeting ROD monitoring requirements. For SWMU 27 and the Day Care Center, DLA should identify the specific land use controls and how they will be implemented.	See response to comment 7 on pages 12 and 13 regarding recommendations on meeting ROD monitoring requirements. Recommended LUCs for SWMU 27 and the Day Care Center are stated in Sections 14.6 and 21.6 of the document, respectively. For the two sites, LUCs will prohibit use of the site for residence, day care facility, play area or school. The LUCs and procedures to enforce them will be documented in the appropriate decision document (to be determined by DLA and EPA) in 2012. The LUCs for SWMU 27 and the Day Care Center site will also be incorporated into the Tracy Site RPMPD. The text will be revised in the Summary Form, Table ES-1 (Attachment 3), and Sections 14.6 and 21.6 to clarify that the LUCs will be implemented through an appropriate decision document. The procedures to enforce the LUCs will be consistent with the 2003 DoD/EPA Guidance *Principles and Procedures for Specifying, Monitoring, and Enforcement of Land Use Controls and Other Post-Rod Actions.* The Federal Facilities Land Use Control ROD Checklist (EPA, 2006) will be used to confirm the land use control procedures are consistent with the referenced 2003 guidance.
11.		Under the discussion of ecological issues and the SVE remedies, and for the particular site where the burrowing owl has been found, the 5YR should explain that DLA will perform further investigation into the distribution of burrowing owls at Tracy and the potential risks to burrowing owls from contaminants at the Site.	In 2011, DLA will perform a survey to determine the population and location of burrowing owls at the Tracy Site. Burrowing owls were observed for the first time on the Tracy Site during the July 2010 5YR site inspection. The burrowing owls were on the annex property. There is no history of source areas at the annex, and VOC concentrations in the Upper Hydrologic Zone are less than 5 μg/L with the exception of one small area near Banta Road.

(continued)

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11. (cont'd)			(continued) Therefore, there is minimal potential for exposure to VOC contamination in soil vapor. The following text will be added to the Groundwater: OU 1 Section 5.4.3: "A burrowing owl survey will be performed in 2011 to determine the size of the population and location at the Tracy Site." No text concerning burrowing owls will be added for the SVE sites, because all of the sites that have SVE remedies are paved (Area 1/Building 237, SWMU 1/Area 2, Area 3, and SWMU 20). Because these sites are paved, they are not suitable burrowing owl habitat.

Attachment 1

Table ES-2. Focused Follow-Up Action Schedule of Completion, Tracy Site

Action	Reporting Document	Completion Date (Calendar Year)
Groundwater Sites		
Operable Unit 1 – Install and sample monitoring wells in and downgradient from the SWMU 20 plume.	Annual Monitoring Report	2010
Operable Unit 1 – Install and sample monitoring wells downgradient from the Banta Road plume.	Annual Monitoring Report	2011
Operable Unit 1 – Sample groundwater for pesticides near Building 237.	Technical Memorandum	2011
Operable Unit 1 – Modify LUCs for government property to address potential vapor intrusion from volatilization of VOC plumes in the Upper Hydrologic Zone.	Appropriate Decision Document[a]	2012
Northwestern Corner Groundwater Operable Unit – Establish the NWC Groundwater Operable Unit.	Record of Decision	2011
Northwestern Corner Groundwater Operable Unit – Implement the dieldrin remedy in the NWC Groundwater Operable Unit.	Interim Remedial Action Report	2011
SVE Sites		
SVE Sites – Notify workers in Building 237 of the potential vapor intrusion pathway.	Technical Memorandum	2011
SVE Sites – Evaluate potential vapor intrusion pathway at Building 237.	Technical Memorandum	2011
SVE Sites – Delineate the pesticide contamination in soil beneath Area 1/ Building 237.	Technical Memorandum	2012
SVE Sites – Install LUC warning signs at SWMU 1/Area 2**.**	Annual Monitoring Report	2012
Soil Sites		
SWMU 2/SWMU 3 – Install LUC warning signs.	Annual Monitoring Report	2012
SWMU 4 – Install LUC warning signs.	Annual Monitoring Report	2012
SWMU 4 – Change the analytical method to SW8081A to analyze stormwater samples.	Annual Monitoring Report	2011
SWMU 6 – Install LUC warning signs.	Annual Monitoring Report	2012

Table ES-2. (Continued)

Action	Reporting Document	Completion Date (Calendar Year)
Soil Sites (cont'd)		
SWMU 20 – Establish SVE as the remedy for SWMU 20.	Explanation of Significant Differences	2011
SWMU 20 – Implement SVE at SWMU 20.	Annual Monitoring Report	2012
SWMU 20 – Install LUC warning signs.	Annual Monitoring Report	2012
SMWU 24 – Install LUC warning signs.	Annual Monitoring Report	2012
SMWU 24 – Remediate soil contamination beneath Building 247 after it is demolished (no current plans for demolition).	Remedial Action Report	Unknown
SWMU 27 – Implement LUCs at the site and install LUC warning signs.	Appropriate Decision Document[a]	2012
SWMU 33 – Replace LUC warning sign.	Annual Monitoring Report	2012
DSERTS 67 – Per the LUCs, re-cover (with grass, gravel, asphalt, etc.) the western portion of the site.	Annual Monitoring Report	2012
DSERTS 72 – Install LUC warning signs.	Annual Monitoring Report	2012
Eastern Depot Soil Area – Install LUC warning signs.	Annual Monitoring Report	2012
Southern Depot Soil Area – Install LUC warning signs.	Annual Monitoring Report	2012
Day Care Center – Implement LUCs at the Day Care Center site once the day care facility is moved and install LUC warning sign.	Appropriate Decision Document[a]	2012

[a] DLA and EPA will decide whether the decision document will be a memo to the file or an explanation of significant differences.

DLA = Defense Logistics Agency
EPA = United States Environmental Protection Agency
LUCs = land use controls
NWC = northwestern corner
OU = operable unit
ROD = record of decision
SVE = soil vapor extraction
SWMU = solid waste management unit
VOC = volatile organic compound

Attachment 2

Operable Unit 1

- *Operable Unit No. 1, Record of Decision, DDRW-Tracy, California* (Woodward-Clyde Consultants, 1993), herein referred to as the OU 1 ROD. This ROD documented the groundwater extraction, air stripping, and on-site discharge remedy for trichloroethene (TCE), tetrachloroethene (PCE), and 1,1-dichloroethene (DCE) in groundwater.

- *DDRW-Tracy, Operable Unit 1 Explanation of Significant Difference* (Montgomery Watson, 1996a), herein referred to as the 1996 ESD. The remedy for OU 1 was modified adding dispersion as a remedy for removing volatile organic compounds (VOCs) from groundwater in the portion of the contaminant of concern (COC) plumes east of Banta Road.

Site-Wide

- *DDJC-Tracy Site-Wide Comprehensive Record of Decision* (Radian International, 1998a), herein referred to as the Site-Wide Comprehensive ROD. This ROD selected soil vapor extraction, bioventing, excavation, and land use control remedies for sites at which soil was contaminated with VOCs, semivolatile organic compounds (SVOCs), pesticides, and metals. It also confirmed the remedy for VOCs in groundwater, established a cleanup level for dieldrin in groundwater, and included wellhead carbon treatment to remove dieldrin from groundwater.

- *DDJC-Tracy 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* (URS Group, Inc. [URS], 2001a), herein referred to as the 2001 ESD. Land use controls were added in the 2001 ESD because the Site-Wide Comprehensive ROD does not address future land use for eight sites. Changes or clarifications to the remedies at solid waste management units (SWMUs) 2 and 3, 7, 33, and Defense Site Environmental Reporting and Tracking System (DSERTS) 67 were also documented in the 2001 ESD.

- *DDJC-Tracy Amendment to the Site-Wide Comprehensive Record of Decision* (URS, 2003), herein referred to as the Site-Wide Comprehensive ROD Amendment. This amendment modified the remedy for pesticides, lead, and selenium in soil at SWMU 4 after a site-specific evaluation of ecological risk was performed. The amendment modified the discharge option for treated groundwater to include overland flow, and it added a new site, DSERTS 72, that was identified after the Site-Wide Comprehensive ROD was signed.

- *DDJC-Tracy 2004 Explanation of Significant Differences to the Site-Wide Comprehensive Record of Decision* (URS, 2004a), herein referred to as the 2004 ESD. This ESD amended requirements for pre-existing land use controls and added land use controls for OU 1, SWMU 6, and SWMU 20. Changes to the remedies at SWMUs 6, 8, and 20 and DSERTS 67 were also documented in the 2004 ESD.

Attachment 3

ES.2.1 Groundwater Sites

Banta Road Plume. In 2010, TCE concentrations in the plume ranged from 5 to 14 μg/L. Most of the Banta Road plume is now east of Banta Road. The remedy for that portion of the plume is dispersion with metabolism and volatilization processes in accordance with the 1996 ESD. Recent cone penetrometer test investigation results indicate the plume extends more than 1,500 feet east of Banta Road. There are no monitoring wells to provide data to determine whether the plume is attenuating or migrating toward residential supply wells; therefore, long-term protectiveness of the remedy for the plume east of Banta Road is uncertain.

SWMU 20 Plume. In 2009, the SWMU 20 plume had the highest TCE concentrations (104 μg/L) in groundwater beneath the Tracy Site. Prior to 2009, there was little evidence that TCE concentrations exceeding 100 μg/L were present in groundwater beneath the area. TCE concentrations at two monitoring wells downgradient of SWMU 20 have been less than the aquifer cleanup level (ACL) since they were installed in 1993 and 2002, respectively. Furthermore, TCE concentrations at EW011AU, an extraction well only 120 feet north of the SWMU 20 plume, have been less than the ACL since 2001. The plume appears to be stable or migrating at a very slow rate, even under the influence of an extraction well. The potential for this plume to migrate cannot be determined with the existing monitoring wells.

DDT Detection. During SVE remedy enhancement activities at the Area 1/Building 237 site in 2009, DDT, DDE, and lindane were detected in investigation-derived waste at concentrations exceeding levels protective of human health and the environment. Subsequently, groundwater samples were collected at the site (LM192AU), and the highest concentrations were DDT at 0.234 μg/L, DDE at 0.0681 μg/L, and DDD at 0.0711 μg/L. The DDT concentration equals the United States Environmental Protection Agency regional screening level for tap water. The extent of these pesticide concentrations in groundwater is not known.

Natural Attenuation. The declining volatile organic compound (VOC) concentrations in several portions of the OU 1 plume may be due not only to extraction of VOCs by the pump-and-treat remedy but also to natural attenuation processes, including adsorption, dispersion, and volatilization. The potential exists that the TCE and PCE plumes will continue to be reduced in size without extraction. Groundwater modeling results indicate that groundwater concentrations in most plumes (excluding the SWMU 20 plume) would decrease to less than ACLs within 12 years with no extraction. Evidence for natural attenuation through biodegradation or reductive dechlorination processes was evaluated; geochemical data supporting those processes was not found.

Area 3 TCE Plume. Although the plume is within the capture zone of EW046AU, concentrations of TCE and PCE in groundwater at the extraction well are less than ACLs, which could make it a candidate for shut down. However, the plume (concentrations: 5 to 25 μg/L TCE and 5 to 5.7 μg/L PCE) would not be in a capture zone if EW046AU were shut down in a rebound evaluation. If EW046AU is considered for shut down, monitoring of the Area 3 TCE plume must continue to assure it does not migrate downgradient.

Groundwater Treatment Plant 2 (GWTP2) Operation and Maintenance (O&M) Manual. Three inline liquid-phase granular activated carbon (LGAC) units were installed at dieldrin extraction wells because GWTP1, where dieldrin-contaminated groundwater had been treated, was taken out of service. After groundwater passes through the LGAC units, it is conveyed to and treated at GWTP2 and then discharged. The O&M manual for GWTP2 does not include information on the O&M of the inline LGAC units or the conveyance lines to GWTP2.

SWMU 8. The Site-Wide Comprehensive ROD requires installation of two pesticide extraction wells at SWMU 8 because dieldrin, chlordane, DDD, DDE, and DDT had been detected in groundwater downgradient from the site during the remedial investigation. However, after the Site-Wide Comprehensive ROD was signed, chlordane, DDE, and DDT were detected only once at concentrations exceeding the site-specific concentrations requiring evaluation, and dieldrin never exceeded the site-specific concentration requiring evaluation. Therefore, a consensus decision among remedial project managers was reached that the two extraction wells were no longer necessary. This decision has not been fully documented.

Vapor Intrusion Pathway. Although there are no work spaces or residences over the groundwater plumes in the shallowest groundwater in the Upper Hydrologic Zone and none are currently planned, the potential exists for VOC vapors from the volatilization of shallow groundwater plumes to migrate vertically into buildings constructed over the plumes.

1,1-Dichloroethene (DCE). An ACL of 6.0 μg/L was established for 1,1-DCE in the OU 1 ROD and that ACL was maintained in the Site-Wide Comprehensive ROD. Concentrations of 1,1-DCE have not exceeded the ACL in any sample collected at the Tracy Site since 1997, and 1,1-DCE has not been detected in any groundwater sample from the site since the third quarter of 2004. These results indicate that 1,1-DCE is no longer be a contaminant of concern (COC) for groundwater at the Tracy Site.

ROD Monitoring Requirements. The monitoring required is incomplete for TCE at LM056C, LM067B, LM151B, LM156A, and LM157A and for dieldrin at LM028A and LM094AU because detections of those contaminants exceeded the groundwater concentrations requiring evaluation specified in the Site-Wide Comprehensive ROD. Monitoring of these wells will continue until requirements are met.

NWC Dieldrin Plume. No remedy is currently in place for the NWC dieldrin plume (highest concentration 0.25 μg/L); however, a preferred remedy developed during the dispute resolution process was agreed upon by DLA, EPA, and the State of California. The NWC Groundwater OU should be established in a ROD to address the NWC dieldrin plume. The remedy consisting of extraction, treatment for dieldrin, and percolation of the treated effluent for three years is expected to be implemented within the next year.

ES.2.2 SVE Sites

The following issues for the SVE sites have been identified since the first five-year review.

STOP Evaluation. No further action has been recommended at all three SVE sites. The STOP evaluations completed for Area 1/Building 237, SWMU 1/Area 2, and Area 3 and VLEACH modeling results indicate that the functional components of requirements for vadose zone cleanup cited in Section 9.6.5 of the Site-Wide Comprehensive ROD have been met. Regulatory acceptance of the STOP evaluation through a decision document is necessary to permanently terminate SVE at these sites.

Vapor Intrusion Pathway. Inhalation of VOCs in indoor air was not evaluated at Area 1/Building 237 in the baseline risk assessment. The PCE contamination in soil may extend under the northern side of Building 237. The potential exists for PCE vapors in the soil to migrate vertically into Building 237, which is occupied by employees every work day.

ROD Monitoring Requirements. The required monitoring is incomplete for PCE at LM030AUA and LM137A; TCE at LM041B; and PCE and TCE at LM032AU LM094AU because detections of those contaminants exceeded the groundwater concentrations requiring evaluation specified in the Site-Wide Comprehensive ROD. Monitoring of these wells will continue until requirements are met.

Pesticides. Concentrations of pesticides in excess of the hazardous criteria for disposal were detected in IDW generated from the installation of an SVE well (VEW0051) during the remedy enhancement activities completed in June 2009 at Area 1/Building 237. DDT was detected at a concentration of 21,000 µg/kg; DDE was detected at a concentration of 5,700 µg/kg; and gamma-BHC at a concentration of 4,700 µg/kg. Pesticide contamination was confirmed during an October 2009 limited hand auger effort. The current remedy for Area 1/Building 237 is not appropriate for the treatment of pesticides detected in soils.

Land Use Controls. During the second five-year review site inspection, it was determined that land use control warning signs were not present at SWMU 1/Area 2.

ES.2.3 Soil Sites

Issues identified since the first five-year review for non-SVE soil sites are presented in Table ES-1.

Table ES-1. Issues and Recommendations and Follow-Up Actions for Soil Sites, Tracy Site		
Site Name	**Issues**	**Recommendations and Follow-Up Actions**
SWMUs 2 and 3	• No land use control warning signs are installed at the site. • Performing the monitoring required in the Site-Wide Comprehensive ROD for dieldrin at LM003AA.	• Install land use control warning signs. • Continue sampling groundwater at LM003AA for dieldrin because dieldrin was detected at concentrations exceeding its ROD-specified concentration requiring evaluation.
SWMU 4	• No land use control warning signs are installed at the site. • The detection limits for the method used by the laboratory to analyze stormwater samples for DDT and dieldrin are greater than the stormwater discharge standards required by the Site-Wide Comprehensive ROD. • Performing the monitoring required in the Site-Wide Comprehensive ROD for 2,4-D at LM027AUA.	• Install land use control warning signs. • Use EPA Method 8081A to achieve lower detection limits for discharge samples. • Continue sampling groundwater at LM027AUA for 2,4-D until the ROD monitoring requirement of sufficient analyses is met.
SWMU 6	• No land use control warning signs are installed at the site. • Performing the monitoring required in the Site-Wide Comprehensive ROD for PCE at LM017AA.	• Install land use control warning signs. • Continue sampling groundwater at LM017AA for PCE until the ROD monitoring requirement of sufficient analyses is met.
SWMU 7	• No issues are identified for SWMU 7.	• No recommendations are identified for SWMU 7.
SWMU 8	• Performing the monitoring required in the Site-Wide Comprehensive ROD for TPHD at LM119A or chlordane, 2,4-D, and MCPA at LM168AU.	• Continue sampling groundwater at LM119A for TPHD and LM168AU for chlordane, 2,4-D, and MCPA until the ROD monitoring requirement of sufficient analyses is met.
SWMU 20	• No land use control warning signs are installed at the site. • Soil at SWMU 20 was not covered at the time of the site inspection. Temporary fencing has been erected around the site, preventing unauthorized access to the exposed soil. • TCE was detected at concentrations above cleanup standards in the vadose zone beneath the former location of Building 10. SVE was deleted from the SWMU 20 remedy in the 2004 ESD. • Performing the monitoring required in the Site-Wide Comprehensive ROD for TCE, PCE, diethylphthalate, 2,4-dinitrophenol, pentachlorophenol, 2,4,6-trichlorophenol, methiocarb, and linuron at LM175AU or for PCE at LM115AU.	• Install land use control warning signs. • An asphalt parking lot that will cover SWMU 20 is planned for construction in 2010. • Add SVE as the remedy for SMWU 20 in an ESD, and implement SVE at SWMU 20. At the completion of the SVE remedial action, evaluate whether land use controls are needed. • Continue sampling groundwater at LM175AU for TCE, PCE, diethylphthalate, 2,4-dinitrophenol, pentachlorophenol, 2,4,6-trichlorophenol, methiocarb, and linuron and at LM115AU for PCE until the ROD monitoring requirement of sufficient analyses is met.

Table ES-1. (Continued)		
Site Name	**Issues**	**Recommendations and Follow-Up Actions**
SWMU 24	• No land use control warning signs are installed at the site.	• Install land use control warning signs.
	• Residual contaminant concentrations nearby and below Building 247 have not been reduced to the ROD cleanup standards.	• Consider remediation with SVE, bioventing, or soil excavation and removal if Building 247 is demolished, though there are no plans for the demolition of the building at this time.
	• Performing the monitoring required in the Site-Wide Comprehensive ROD for 2-butanone, 2-hexanone, 4-methyl-2-pentanone, 2, 4-dimethylphenol, fluoranthene, 2-methylnaphthalene, 4-methylphenol, naphthalene, phenol, pyrene, TPHG, and TPHD at LM116A or 2-butanone, 2-hexanone, 4-methyl-2-pentanone, TPHG, and TPHD at LM118AU.	• Continue sampling groundwater at LM116A for 2-butanone, 2-hexanone, 4-methyl-2-pentanone, 2, 4-dimethylphenol, fluoranthene, 2-methylnaphthalene, 4-methylphenol, naphthalene, phenol, pyrene, TPHG, and TPHD and at LM118AU for 2-butanone, 2-hexanone, 4-methyl-2-pentanone, TPHG, and TPHD until ROD monitoring requirement of sufficient analyses is met.
SWMU 27	• Residual concentrations of benzo[a]pyrene remain in soil at SWMU 27 at concentrations that preclude unlimited use and unrestricted exposure (e.g., residential use).	• Prepare a memo to the file and modify the RPMPD to add land use controls (including appropriate signage) to the remedy for SWMU 27. The land use controls will prohibit use of the site for a residence, day care facility, play area, or school.
	• Performing the monitoring required in the Site-Wide Comprehensive ROD for TPHMO at LM117A.	• Sample groundwater at LM117A for TPHMO until ROD monitoring requirement of sufficient analyses is met.
SWMU 33	• The land use control warning sign that was on Building 10 was removed when the building was demolished.	• Replace the land use control warning sign that was on Building 10.
DSERTS 67	• The western portion of the site is no longer covered with grass to prevent erosion and dust generation, as required by the 2004 ESD.	• Re-cover this portion of the site (with grass, gravel, asphalt, etc.) to minimize dust generation and potential exposure to airborne dust.
Building 30 Drum Storage Area	• No issues are identified for Building 30 Drum Storage Area.	• No recommendations are identified for Building 30 Drum Storage Area.
DSERTS 72	• No land use control warning signs are installed at the site.	• Install land use control warning signs.
Eastern Depot Soils Area	• No land use control warning signs are installed at the site.	• Install land use control warning signs.
Southern Depot Soils Area	• No land use control warning signs are installed at the site.	• Install land use control warning signs.

Table ES-1. (Continued)

Site Name	Issues	Recommendations and Follow-Up Actions
Day Care Center	• Soil samples collected from the subsurface (greater than 1 foot bgs) have pesticide concentrations that do not allow for unlimited use and unrestricted exposure. • With no land use controls in place, demolition/construction activities could disturb the soil barrier after the day care facility has been moved to a new location. The concentrations in soil may pose a risk to construction workers at the site.	• Relocate the day care facility to another portion of the depot that allows unlimited use and unrestricted exposure. • Once the day care facility has been relocated from its current location, prepare a memo to the file and modify the RPMPD to include land use controls at the former Day Care Center location. Install land use control warning signs. • In the interim, perform annual inspections of the clean soil barrier at the Day Care Center and report on the status in Well Monitoring Program Annual Reports.

bgs = below ground surface
DDT = dichlorodiphenyltrichloroethane
DSERTS = Defense Site Environmental Reporting and Tracking System
EPA = United States Environmental Protection Agency
ESD = explanation of significant differences
MCPA = 4-chloro-o-tolyoxyacetic acid
PCE = tetrachloroethene
ROD = record of decision
RPMPD = real property master plan digest
SVE = soil vapor extraction
SWMU = solid waste management unit
TCE = trichloroethene
TPHD = total petroleum hydrocarbons as diesel
TPHG = total petroleum hydrocarbons as gasoline
TPHMO = total petroleum hydrocarbons as motor oil
2,4-D = dichlorophenoxy acetic acid

USEPA Comments
on Draft Final Second Five-Year Review
and
Draft Final Second Five-Year Review Teleconference
(February 2012) Meeting Minutes

From: Phillip Ramsey [mailto:Ramsey.Phillip@epamail.epa.gov]
Sent: Monday, February 06, 2012 11:38 AM
To: Benson, Maurice L (DESJC); O'Neill, Charles; Korose, Gregory
Cc: Christopher Sherman; James Brownell
Subject: Tracy Five-Year Review - Updated EPA Response - 4 issues

Hello Maurice,

Per our January 25, 2012, Tracy Quarterly RPM meeting, EPA agreed to provide DLA with its major issues with the Tracy December 27, 2010 Draft Final Five-Year Review (5YR) by February 7, in preparation for a tentatively planned February 14, 5YR meeting. Included below are EPA 's limited issues with the 5YR:

1. Banta Road Plume: Need for installation of 2 shallow wells at down-gradient end of Banta Road Plume. Work Plan approved in 2010 - delays due to weather and site access. The issue/recommendation has not been addressed. This outstanding action effects long-term protectiveness issue for Groundwater and will need to be tracked for completion.

2. Vapor Intrusion Pathway: Draft Final 5YR says "...the potential exists for VOC vapors from the volatilization of shallow groundwater plumes to migrate vertically into buildings constructed over the plumes. Recommendations/Follow-up Action: Prepare an appropriate decision document (to be determined by DLA and EPA) and update the Real Property Master Plan to modify the existing land use controls for OU1 to require an assessment of potential vapor intrusion risk if work space or residences are to be contracted over shallow OVC plumes". No OU1 decision document has been developed to include vapor intrusion risks.

3. Day Care Center: Recommendation/Follow-up Action: "The relocation of the day care facility to a place on the depot that allows unlimited use and unrestricted exposure is planned for 2011. Once the day care facility is relocated, land use controls (including appropriate signage) should be implemented at the former Day Car Center site through an appropriate decision document (to be determined by DLA and EPA) and modification to the RPMPD." As informally discussed, EPA has determined that no significant residual contamination exists at the DCC and therefore the site is suitable for unrestricted use and no LUCs are needed. DLA should also change the description of the removal action to replace reference to installation of a "cap" with installation of clean "Backfill".

4. Operation and Maintenance Manual Update: The Draft Final 5YR indicates that the O&M Manual did not include O&M information of the inline liquid-phase granular activated carbon (LGAC) units or the conveyance lines to the Groundwater Treatment Plant.

If you have any questions concerning this matter, please do not hesitate to contact me.

Phillip Ramsey
U.S. Environmental Protection Agency
75 Hawthorne Street, SFD-8-3
San Francisco, CA 94105
ramsey.phillip@epa.gov
(415) 972-3006

DRAFT FINAL SECOND FIVE-YEAR REVIEW TELECONERENCE – FEBRUARY 2012
DEFENSE DISTRIBUTION DEPOT SAN JOAQUIN – TRACY SITE
MEETING MINUTES

DATE: 14 February 2012

LOCATION: URS Office, 2870 Gateway Oaks Drive, Sacramento, CA

ATTENDEES: Maurice Benson, DLA
Nanette Werner, DLA
Susan Trussell, U.S. Army Corps of Engineers
Chris Sherman, DTSC
Phillip Ramsey, EPA
Mike Thomas, URS
Greg Korose, URS
Charlie O'Neill, HDR

The following acronyms and abbreviations are used in these minutes:

DLA	Defense Logistics Agency
EPA	U.S. Environmental Protection Agency, Region 9
LGAC	liquid-phase granular activated carbon
O&M	operations and maintenance
URS	URS Group, Inc.

SUMMARY OF DISCUSSION:

Maurice Benson (DLA) began the teleconference with introductions and stated that the purpose of the teleconference was to discuss U. S. Environmental Protection Agency's (EPA's) issues on the draft final *Second Five-Year Review Report, Tracy Site* provided in an email dated 6 February 2012 (attached).

Phillip Ramsey (EPA) stated that EPA does not agree that all of the recommendations in the Five-Year Review Summary Form are major recommendations that need to be tracked in the Five-Year process and that only a couple of the recommendations currently in the document would be considered major. Mr. Ramsey then discussed the four issues he discussed in his email dated 6 February 2012: 1) Banta Road Plume, 2) Vapor Intrusion Pathway, 3) Day Care Center, and 4) Operation and Maintenance Manual Update.

<u>Banta Road Plume:</u> Mr. Ramsey confirmed that the recommendation for the installation of groundwater monitoring wells at the downgradient end of the Banta Road plume is a major issue and needs to be included on the summary form. He stated that the text in the report needs to be updated since DLA is now installing two Upper Zone wells instead of one Upper Zone and one Middle Zone well. In addition, the text will need to include a date when the installation of those wells will be completed and documented. Charlie O'Neill (HDR) stated that those wells are planned for installation in 2012 and will be documented in the Tracy Annual Monitoring Report. Mr. Ramsey agreed with this approach. Mr. Benson agreed to revise the text as discussed.

Vapor Intrusion Pathway: Mr. Ramsey stated that vapor intrusion from contaminated groundwater should not be a recommendation in the Five-Year Review. He explained that the size and contaminant concentrations for the plumes at the Tracy Site are not a concern for EPA with regards to vapor intrusion. Mr. Benson agreed to remove the recommendation from the report.

Day Care Center: Mr. Ramsey stated that the Day Care Center is no longer an issue for EPA and the section discussing Day Care Center should be revised. He requested that the text should clarify that the 1996 excavation was backfilled with clean soil. The text should not state that a cap was installed. He also reiterated from his 6 February 2012 email that EPA has determined that no significant residual contamination exists at the Day Care Center and therefore the site is suitable for unrestricted use and no land use controls are needed. He requested the text be revised to reflect this determination. Mr. Benson agreed to revise the text as requested. Gregory Korose (URS) suggested that the revised text for the Day Care Center (Section 21.0) be submitted to the agencies for review prior to submitting the final. All parties agreed to this approach.

Operation and Maintenance Manual Update: Mr. Ramsey confirmed that the update to the Operation and Maintenance (O&M) Manual is a major recommendation that needs to be included on the Five-Year Review Summary Form. Mr. Ramsey explained that the update needs to include the in-line liquid-phase granular activated carbon (LGAC) unit located at the private residence on Banta Road (PW001). Mr. Korose stated that the O&M Manual update would also include the LGAC system treating the sanitary sewer lagoon plume. Mr. O'Neill stated that they are funded for updating the O&M Manual and the completion date for the manual will be included in the report. Mr. Ramsey agreed with the approach.

Nanette Werner (DLA) asked if EPA was going to provide formal comments. Mr. Ramsey stated formal comments will not be provided, but the 6 February 2012 email and meeting minutes from this teleconference would be the documentation for resolution of EPA's issues with the draft final report. Mr. Ramsey stated that DLA could revise the draft final document or prepare an addendum that documents the changes discussed during this meeting. Mr. Benson told the agencies that DLA will discuss this internally on how they will finalize the report and will notify the agencies of their decision.

At the conclusion of the meeting, Mr. Korose asked Mr. Ramsey to confirm that the only major recommendations to include on the Five-Year Review Summary form are the Banta Road well installations and the O&M Manual update. Mr. Ramsey confirmed this. Mr. Korose stated that he would prepare meeting minutes from this teleconference and would submit them to the agencies for review.

ACTION ITEMS:

1. DLA to notify the agencies with how the report will be finalized; and
2. DLA to prepare and submit meeting minutes for this teleconference.