7.0. TECHNICAL ASSESSMENT

The technical evaluations in this section of the review are addressed by OU. The 1988 OU-2 ROD was issued before completion of the baseline risk assessment in the 1990 RI/FS and the 1992 RI Addendum 3 which addressed vapor intrusion. The 1992 OU-1 ROD contained provisions to address those groundwater issues (vapor intrusion and deeper groundwater Zones C and D monitoring) that were not addressed in the OU-2 ROD for a shallow groundwater extraction and treatment system and is considered the "final remedy" for the LB&D site. Although vapor intrusion and the associated risks are of interest in both OUs, issues related to risk evaluation, recommended sampling activities, actions to assess the presence or absence of potential risks, and possible application of institutional controls were addressed in discussions pertaining to OU-1. Future work in this area will be dependent on screening level evaluations.

7.1. Operable Unit 1

7.1.1. Question A:

Is the remedy functioning as intended by the decision documents?

7.1.1.1. Remedial Action Performance and Operations

The existing cap system is functioning as expected. The cap was designed to seal the surface and have adequate strength to function as a parking facility. The LB&D property was sold to 10th Street in 2002 which leases the space to auto dealerships to stage cars in transit to the sales lot.

The soil vapor extraction system installed at the LB&D property was intended to reduce total VOC concentrations in soil to below 1 ppm. Since the startup of the system in 1999, approximately 330 pounds of VOCs and TPH have been removed by the system. Though the system has removed some mass from the subsurface, the extracted VOC concentrations from the seven SVE wells had declined to minimal levels and the system was shut down in June 2004. The system has remained shut down except for one sampling round in January 2005 to assess the rebound in site soils. An assessment of the SVE system is included in the following paragraph 7.1.1.2. below.

The deep aquifer (Zones C) monitoring has verified that efforts implemented during the OU-1 and OU-2 remedial actions have been successful in preventing contamination from reaching the deeper aquifer. The deep aquifer quarterly monitoring from the time period between the OU-1 RA completion in 1998 and April 2005 has not detected contamination in the aquifer. The EPA has recently approved revising the deep aquifer sampling frequency to semi-annually in accordance with the original OU-1 ROD requirement.

7.1.1.2. Opportunities for Optimization

The SVE system installed at the LB&D property was intended to reduce total VOC concentrations in soil to below 1 ppm (presumably 1 mg/kg). There have been concerns about the performance of the system given the relatively low VOC mass removal rates. Limited rebound of VOC concentrations has been observed in the extraction wells following the system shut down in 2004. The design of the extraction system was assessed relative to the past documentation of the distribution of contamination, past removal actions, and past groundwater conditions to determine if the system should be dismantled, restarted as it currently exists, or modified to improve performance. The analysis assumes the cleanup goals identified in the ROD to reduce concentrations to less than 1 ppm is still relevant.

Past characterization efforts have suggested that the predominant mass remaining following various soil excavations existed at depths below 10 feet in the central and northeastern portion of the LB&D property. Groundwater was expected at depths between 15 and 20 feet below current grade. The SVE wells were screened from 6 to 21 feet below current grade (including cap).

The flow rates achieved from each extraction well are higher than expected and suggest there is some degree of short-circuiting. These short circuits likely exist at shallow depths where excavation and backfilling has occurred. If a substantial amount of relatively clean air is getting into the system, the contaminant mass removed from the deeper native soils will be minimal and the extracted concentrations will be significantly diluted. There are no soil-vapor monitoring points installed at the site to measure operational vacuums or soil gas concentrations. This limits the analysis of the performance of the system and the assessment of air-flow paths.

Excavations have occurred at the LB&D property during multiple cleanup activities. Some have occurred in the vicinity of the SVE system. These excavations have extended from 4 to 12 feet below grade and either removed contaminated soils associated with the various sumps and drain lines or, in the case of the construction of the existing cap, attempted to improve structural characteristics of the soil. The placement of materials with higher air-permeability than native soils is likely to have occurred. For example, the excavation and replacement of soft soils during the construction of the cap included placing extensive layers of coarse bedding materials.

Investigations supporting the RI indicated VOC concentrations above the remediation level of 1 ppm in the northeastern corner of the LB&D property. The nearest SVE well is EW-7, located over 100 feet to the south of the area. This SVE well had elevated VOC concentrations in sampling conducted in January 2005.

Based on these observations, the EPA may consider evaluating operation of the SVE system and optimizing it as appropriate. Optimization may include such items as equipment adjustments, evaluating rebound and extraction well radius of influence, potential installation of new SVE wells, and doing incremental VOC soil sampling between the asphalt cap and the groundwater surface to determine if soil clean up criteria have been met.

7.1.1.3. Implementation of Institutional Controls

The OU-1 ROD identified the need for institutional controls that would 1) limit exposure pathways to contaminated soil and groundwater, and 2) restrict changes in water well installation and use that might interfere with the groundwater remedy.

In order to ensure the integrity of the cap and limit exposure pathways, the OU-1 ROD specified land use restrictions to prevent well construction for water supply purposes in the source areas that remain contaminated and deed restrictions for the 10th Street property (identified in the OU-1 ROD as the LB&D property), the Newark property (identified in the OU-1 ROD as the RFI property) and the adjacent city sidewalk area that contain contaminated soil exceeding cap action levels. The contemplated deed restrictions were expected to prohibit residential development and to limit industrial development to activities that do not breach the integrity of the cap or do not mobilize the soil contaminants. Restrictions would also prevent activities that could disturb the cap and underlying contaminated soils from occurring without prior review and approval by the CERCLA lead agency.

In 2002, DTSC took a restrictive covenant on the 10th Street property (parcel no. 477-09-037). In 2005, DTSC took a restrictive covenant on the Newark property (parcel nos. 477-09-034 and 477-09-036). These covenants were recorded in the Santa Clara County Assessor, Recorder's Office (tel. 408-299-7677). The DTSC website identifies hazardous waste sites with restrictive covenants. The URL for deed restricted properties is: http://www.dtsc.ca.gov/HazardousWaste/index.html#Deed. Copies of the restrictive covenants are included herein as Attachment G.

In addition to executing restrictive covenants, 10th Street and Newark also executed documents with EPA that provide for inspection, maintenance and reporting with respect to the caps on their respective properties. In 2002, 10th Street signed a Prospective Purchaser Agreement and in 2005, Newark signed a Consent Decree.

At the time of this FYR, there is no covenant in place on the adjacent city sidewalk area. Discussions to date between the EPA, State and the City of San Jose have not produced a recorded covenant with respect to the sidewalk. Existing governmental controls, as discussed below, may be functioning as institutional controls on the adjacent city sidewalk area. The layering of informational controls, such as warning signs on the site property fencing near the relevant sidewalk areas, may enhance institutional controls with respect to the sidewalk.

The San Jose City Department of Transportation has permitting responsibilities for sidewalk maintenance activities and for utility work beneath the sidewalk. In order for this or any other relevant permitting processes to function as an institutional control for the site, the LB&D site would have to be identified to the permitting authorities as a hazardous waste site with contamination left in place. In addition, San Jose Municipal Code Sections 14.16.2200 and 14.16.227 may help restrict exposure pathways at the site by requiring property owners to maintain adjacent sidewalks. Additional coordination with the San Jose City Department of

Transportation with respect to the sidewalk areas of the site should be included in the development of an institutional controls monitoring plan as discussed below.

Institutional controls for groundwater exist in the form of SCVWD well permitting requirements. SCVWD requires a permit for any water well (monitoring or water supply) installed or removed within the district boundaries. Permitting criteria are summarized on the SCVWD Permits web link. As noted above, in order for a permitting process to function as an institutional control, the LB&D site should be identified to the permitting authorities as a hazardous waste site with contamination left in place. In connection with this FYR, Bill Cameron of the SCVWD was contacted at 408-265-2654 (ext. 2654). Mr. Cameron is responsible for reviewing all water well permits and each monitoring well permit is reviewed either by Mr. Cameron or by his supervisor. Any questions concerning potential contaminated areas are referred to George Cook, the State/Federal liaison at 408-265-2607.

The effectiveness of the SCVWD permitting process as an institutional control at the site was verified during the abandonment and relocation of MW-39 in connection with development activities. The relevant property owner funded the MW-39 relocation effort while concurrently coordinating with the EPA Remedial Project Manager (RPM) and SCVWD.

The OU-1 remedy addresses monitoring vadose zone soil gas near residences located above the shallow groundwater contaminant plume. However, the vapor intrusion pathway for receptors in potential future building development above the shallow groundwater contaminant plume may not have been addressed. No institutional controls were selected to prevent the future construction of commercial or industrial building development on the SJSU sports field overlying the most-contaminated area of the groundwater plume (between Spartan Stadium and the track). As the vapor intrusion pathway is more fully evaluated, additional institutional controls may be suggested to address vapor intrusion pathway risks.

7.1.1.4. Early Indicators of Potential Issues

The OU-1 remedial action is functioning as proposed. There are some issues that require clarification to expedite site close out, or enhance the perceived protectiveness of the remedy. These items include:

- Definition of the soils cleanup criteria beneath the cap. The ROD identifies the criteria as 1 ppm total VOCs in soil. It is believed the 1 ppm value was selected to be protective of leaching to groundwater. The following language was recommended for inclusion in the ROD but was not included: "The VOC standard is 1 ppm, unless it can be shown that an alternate clean up standard is appropriate and that there is no present or future impact to the groundwater."

- Optimization of the SVE system should be initiated as soon as possible. Annual weather cycles (i.e., rainy season, etc.) that contribute to potential system inefficiencies should be included in the optimization study. The VOC concentrations in the extracted gas are below levels which necessitate off-gas treatment. Following

system revisions, the need for off-gas treatment should be reevaluated and a recommendation made to the EPA and Bay Area Air Quality Management District (BAAQMD) concerning its continued use.

- Damage to curbs surrounding the SVE vaults is evident. Curbing around vaults that has been damaged should be repaired, and/or pipe bollards placed around the vaults to limit future damage to the curbing once it is repaired.

- Current groundwater concentrations of trichloroethylene and vinyl chloride from available monitoring points on some portions of the SJSU sports fields (between Spartan Stadium and the track) are above EPA residential, but not above RWQCB industrial groundwater screening levels for evaluation of potential vapor intrusion. Further evaluation of the vapor intrusion pathway and institutional controls may be needed to prevent construction and occupation of occupied structures in this area.

- The 1996 Remedial Design Report No. 5 Soil Gas Survey determined that vapor intrusion was not of concern for current residences. Results from the latest shallow groundwater sampling round conducted by the LSGTF in late 2004 in the vicinity of the SJSU student housing area revealed the TCE and VC exposure point concentrations in the vicinity of the student housing were below EPA and RWQCB screening levels for the vapor intrusion pathway.

- The OU-1 ROD included an RAO to "Provide advance warning to drinking water suppliers and residents in the event that shallow groundwater contaminants begin significant migration to deeper aquifers..." The OU-1 ROD also states "Both the intermediate and deep aquifers will be monitored for VOCs on a semi-annual basis to alert the community if VOCs are ever detected." Monitoring well MW-44 fulfilled this purpose but was destroyed in 1998. It was the only well screened in the deeper (Zone D) aquifer. Information obtained from the SCVWD indicates the reason for destruction was that the well was no longer needed and the well was screened in multiple aquifers, which could provide a conduit for cross-contamination. In order to meet the RAOs described in the OU1 ROD and the requirement for monitoring the deep aquifer, EPA needs to assess whether a replacement well is necessary. If EPA determines that a replacement well is no longer needed, an OU-1 ROD amendment or ESD may be required.

- Steps to complete implementation of ICs should be taken. Specifically, institutional controls for the adjacent city sidewalk area should be finalized and a site-wide ICs monitoring plan should be developed.

7.1.2. Question B:

Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

7.1.2.1. Changes in standards, newly promulgated standards, and TBCs

As stated in section 7.2 of the OU-1 ROD, only *action specific* ARARs were identified for the soils operable unit remedy. It is assumed that all action-specific ARARs listed in the ROD were complied with during the construction phase associated with soil remediation activities. Currently, only the BAAQMD Regulation 8 – Rule 47 (soil vapor extraction emissions) requires evaluation, as the other listed ARARs do not carry over to current operations.

BAAQMD Regulation 8 – Rule 47 was adopted on 12/20/89 with a most recent version of 6/15/1994. Since the OU-1 SVE system historically emitted more than one VOC listed in 8-47-109.1, the site did not meet the exemption criteria of 8-47-109. However, 8-47-113 allows a provision to petition for a "less than 1 pound per day" exemption. Total emissions of benzene, vinyl chloride, perchloroethylene, methylene chloride and/or trichloroethylene must be less than 1 lb/day and total organic compound emissions must be less than 15 lbs/day. Historically, emission control features of the SVE system have performed as required. The following is a trend analysis of SVE data abstracted from the summary section of the Seventh Quarterly Soil Vapor Extraction System Monitoring Reports. Data from the startup (12/7/98 – 2/3/99) timeframe are not included (i.e., period 1).

Table 4: OU-1 SVE System Summary (VOCs & TPH-G)

Time frame	Run Time (hrs)	VOCs Removed, Total (lbs)	TPH-G Removed, Total (lbs)	Lbs/day Removed Rate (avg.)
4/14 – 5/27 1999 (2nd)	669 – ~1,500	89.4 "contaminants"	N/A	2.29
10/1 – 12/31 2001 (3rd)	2,000	61.8	23.9	1.1
2/1 – 10/31 2002 (4th)	2,581	44.42	32.29	0.7
11/1 – 7/31 2003 (5th)	3,167	21.3	16.2	0.3
8/1 – 12/31 2003 (6th)	3,714	13.5	12.00	0.2
1/1 –6/5/2004 (7th)	3,730	6.5	5.3	0.1

The SVE system is currently shut down; however, given the above mass recoveries, the substantive requirements of BAAQMD for an exemption under BAAQMD 8-47-113 (< 1 lb/day)

could likely be met after a short duration of data collection upon system restart. The standards under BAAQMD 8-47 remain unchanged.

7.1.2.2. Changes in Risk Assessment Methods

Numerous changes in toxicity and other contaminant characteristics have occurred as evidenced in Attachment C, Table C2. Significant changes in toxicity factors, exposure parameters and methodology (e.g., vapor intrusion) have evolved since the OU-1 and OU-2 risk assessments were developed. The short term protectiveness of both OU-1 and OU-2 remedies is based on meeting ARARS and effectiveness of institutional controls to prevent complete exposure pathways to contaminated soils and Zone B (shallow) groundwater. With the exception of the potential vapor intrusion pathway, changes in toxicity do not affect protectiveness of the remedy.

The OU-1 ROD provided for evaluation of the vapor intrusion pathway in residences located above the shallow groundwater plume down gradient of the LB&D property, but this pathway was not addressed for current or potential future indoor industrial/commercial workers in structures overlying the shallow groundwater plume on or down gradient of the LB&D property.

- Other non-residential properties overlying the shallow groundwater plume. In a phone conversation with SJSU South Campus Building personnel on 24 June 2005, USACE confirmed that a structure on the corner of East Humboldt and 10th Street is currently used as offices by SJSU coaching staff. A metal structure used for recycling on the Newark property is not enclosed. The OU-1 ROD and first five-year review did not address the vapor intrusion pathway for indoor commercial/industrial workers. Current groundwater data and data in the 1996 Remedial Design Report No. 5 Soil Gas Survey indicate that vapor intrusion would not be of concern for receptors on the SJSU campus. However, this pathway should be evaluated prior to any construction on the SJSU sports field overlying the most-contaminated area of the groundwater plume (between Spartan Stadium and the track) because VOC concentrations in the groundwater may be higher than groundwater screening levels for evaluation of potential vapor intrusion as cited in Federal and State agencies' guidance (EPA, 2002 and RWQCB, February 2005).

- The 1996 Remedial Design Report No. 5 Soil Gas Survey determined that vapor intrusion would not be of concern for current residences. In residential areas overlying the plume, evaluation of potential vapor intrusion using EPA *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils* (EPA, 2002) and *Screening for Environmental Concerns at Site with Contaminated Soil and Groundwater, Interim Final* (RWQCB, February 2005) indicated most recent groundwater concentrations (October 2004) of trichloroethylene and vinyl chloride were not of concern for the vapor intrusion pathway.

Remaining exposure pathways have not changed, and the existing remedy for OU-1 remains protective for those pathways. Surrounding land use has not changed, and the limitations placed on the LB&D property as designated in the ROD have remained unchanged.

7.1.2.3. Expected Progress Towards Meeting Remedial Action Objectives (RAOs)

Since the waste above the ROD excavation action levels has been removed and the remaining waste will remain in place under the cap, the RAOs for that portion of the remedy have been met. Concentrations of VOCs below the cap previously subjected to SVE have not been measured to determine if concentrations are present above the stated RAO of 1 ppm. Sampling of VOC concentrations in soils should be conducted to verify the extent (if any) of the contamination above clean up goals. Only then will it be possible to ascertain if the SVE portion of the remedy is progressing as expected. Expected operation was to be 3 years.

7.1.3. Question C

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

There have been no newly identified ecological risks identified at the site. There is no evidence of any site impact due to natural disasters. There is no new information that might affect the protectiveness of the remedy with the exception of evaluation of potential vapor intrusion impacts prior to construction and occupation of future structures overlying the most contaminated areas of the shallow groundwater plume as addressed above.

7.2. Operable Unit 2

7.2.1. Question A

Is the remedy functioning as intended by the decision documents?

7.2.1.1. Remedial Action Performance and Operations

The primary focus of this OU as indicated in the ROD is "to prevent existing contamination in the shallow aquifers from migrating deeper and farther from the site." This includes preventing discharge of VOC-contaminated water to Coyote Creek, and contamination of the deeper aquifers known as Zones C and D. A pump and treat system installed to contain the plume consists of a series of 18 wells constructed in two areas (see Figure 4). The first group of wells is located adjacent to the LB&D property along East Alma Avenue, and a second group of wells is installed in a line perpendicular to the flow axis of the plume beginning parallel to Humboldt Avenue and veering to the southeast between the SJSU running track and baseball diamond. During initial operations all 18 wells operated and discharged to the groundwater treatment plant. Shortly after startup, the group of wells near East Alma Avenue was shut down. As time went on, several of the extraction wells in the north line of wells were taken out of service. Currently there are only three (3) extraction wells operating. Based on a data trend analysis of the shallow

groundwater monitoring network over the extraction system's period of operation, some contamination exceeding MCLs (e.g., 1,1-DCE) continues to be detected downgradient of the extraction well system. However, no contamination has been detected in well MW-24 (the furthest downgradient well), indicating contaminant movement towards Coyote Creek has not progressed. As discussed in the earlier OU-1 discussion, contaminant migration to the lower aquifers has not occurred.

Treatment facility operations have not changed since the last FYR. The GAC-based treatment system continues to provide effluent quality which meets the NPDES permit requirements.

7.2.1.2. Opportunities for Optimization

Given the stability of the plume over a long period of time, the PRPs may consider doing a monitored natural attenuation (MNA) assessment to ascertain if subsurface conditions are suitable for MNA application. Additional data needs should be evaluated to determine the viability of this option.

The regulatory agencies should revisit current language addressing clean up goals and clarify, as appropriate, remediation endpoints for PRP implementation.

If groundwater extraction will continue until site-related contaminants reach remediation goals, it may be beneficial to operate the existing extraction wells nearest the 10th Street property. This will provide greater mass removal and ultimately should decrease the operating time of the extraction system.

7.2.1.3. Implementation of Institutional Controls

Institutional controls for this OU are limited to restrictions on well drilling as already described for OU-1 (see paragraph 7.1.1.3 regarding well drilling permits required by the SCVWD).

7.2.1.4. Early Indicators of Potential Issues

The OU-2 remedial action is functioning as required. There are some issues that require clarification to expedite site close out, or enhance the perceived protectiveness of the remedy. These items include:

- Remediation Goals - All stakeholders would benefit from a regulatory review and clarification of groundwater remediation goals in support of obtainable and reasonable beneficial uses.

- Capture Zone - A qualitative capture zone analysis indicates the extraction system may not obtain complete containment between extraction wells EX-13 and EX-19. Based on concentrations of 1,1-DCE in monitoring points P-12, P-26, and MW-38 (which all exceed the MCL), there may be insufficient contaminant containment which could result in the plume eventually migrating to Coyote Creek.

- Vapor Intrusion - Although current institutional controls prevent residential development, there should also be restrictions *which prevent construction of occupied industrial/commercial structures* at the 10th Street SJSU sports field (between Spartan Stadium and the track) overlying the plume unless it is demonstrated that groundwater concentrations pose no unacceptable risk by vapor intrusion pathway. Current groundwater concentrations of trichloroethylene and vinyl chloride from available monitoring points on this portion of the SJSU property are above MCLs, but not above the RWQCB industrial groundwater screening levels for evaluation of potential vapor intrusion. However, this pathway should be evaluated further using the 1996 Soil Gas Survey and current USEPA or RWQCB vapor intrusion guidance prior to construction and occupation of new structures. The result of that review, including consideration of the detection limits achieved and proposed changes in toxicity factors for TCE, will determine whether a repeat of the 1996 survey is merited.

7.2.2. Question B

Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

7.2.2.1. Changes in Standards and TBCs

In the OU-2 ROD, Table 8.1 provides a summary of ARARs entitled "Federal and State of California Regulatory, Advisory, and Action Levels for Analytes in Groundwater." The OU-2 ROD also compiled a list of COC's in Table 6.1. Shallow groundwater cleanup objectives for OU-2 were identified in Table 8-2 of the 1988 ROD but the title of the table appears to be somewhat misleading, as the listed values appear to represent action specific treatment levels. While the relationship between Federal and State MCL values listed in Table 8-1 (ARARs) and the Federal MCLs listed in 8-2 ("cleanup objectives") is not entirely clear, a summary comparing the 1988 MCL values to current MCL values is provided in Attachment C, Table C6. Current NPDES permit effluent limits and those originally presented in the OU-2 ROD are also listed and compared in Attachment C, Table C6.

The Lorentz Shallow Groundwater Task Force is complying with both the substantive and administrative requirements of the RWQCB, San Francisco Bay Region Order NO. R2-2004-0055, NPDES No. CAG912003 for discharge of treated water. Attachment C, Table C6 has been compiled to compare original COCs and ARAR values to existing (i.e., currently issued) General NPDES Permit effluent limitations and originally listed maximum contaminant levels (MCLs).

The first column has both numbered and un-numbered compounds. Compounds 1 - 21 are existing effluent limitations established under permit CAG912003. Compounds listed in column 2 in bold face were constituents originally identified in the ROD. Column 2 and column 7 must be evaluated together in order to see the scope of the parameters list covered by CAG912003. Compounds 1 – 21 are required to be actively monitored and reported under provisions of the

permit. The column 7 entries are trigger threshold values, *not* effluent limits, and if exceeded require further evaluation on the part of the permitee to determine if additional numerical limits are necessary. While antimony was not indicated as a COC in the 1988 OU-2 ROD nor identified in the ARARs table, antimony was discussed as a non-carcinogenic groundwater pathway constituent in section 6.4.2 of the OU-1 ROD. Antimony was not an original constituent of the self-monitoring program addressed by CAG912003, however it is now included as a trigger parameter requiring evaluation on a three (3) year cycle. Antimony is included in the summary table to further clarify this for later FYRs.

Shaded areas in column 6 and 7 indicate there are seven (7) compounds originally identified as a COC or ARAR constituent that are not specifically covered by the NPDES permit provisions. However a review of analytical reports indicates that EPA 5030/8260B addresses chloroethane, 1,2-dichloropropane and Freon 113 (i.e. CFC 113) and these parameters are being analyzed for and reported. That leaves the four metals: barium, cobalt, molybdenum, and vanadium that may not be monitored.

As a matter of policy, ARARs are typically frozen at the ROD; however, from a protectiveness perspective it is useful to evaluate changes in standards or the emergence of new standards to ensure the remedy remains protective. All items highlighted in column 3 are new standards, except chloroform and arsenic. Those two compounds now have more stringent pending MCLs. There have been nine (9) new or more stringent MCLs promulgated since the original ROD for OU-2. However, all those additions are included in the effluent limitation parameter analysis suite or they are on the trigger list of the NPDES permit. A comparison of Federal vs. State MCL values outlined in column 3 indicates there are currently twelve parameters for which California DHS has a more stringent value than promulgated at the Federal level.

Since the receiving water, Coyote Creek, has multiple designated uses (see San Francisco Bay Basin Plan, Santa Clara Basin), it is no surprise the effluent limitation values authorized by CAG912003 are equal to or more stringent than federal MCLs. Based on Attachment C, Table C6 comparisons and the fact that the LSGTF is generally in substantive and administrative compliance with the California General NPDES permit CAG912003, existing regulatory compliance goes beyond CERCLA compliance with ARARs requirement. An authorization to discharge to Coyote Creek under permit provisions should be considered protective of all designated uses assigned to the receiving surface water body. This protectiveness statement further applies to surface water discharges conducted in association with the OU-1 SVE system provided the substantive requirements of CAG912003 are met.

7.2.2.2. Changes in Exposure Pathways, Toxicity, Other Contaminant Characteristics

The 1988 OU-2 ROD screening level assessment looked at only carcinogens in Zone B groundwater, and was focused on treatment of volatiles. The 1990 RI and 1993 OU-1 ROD documented that risk/hazard of some non-volatiles (i.e., antimony) was also unacceptable, and remedial activities have not addressed these compounds. Although groundwater COCs (VOCs only) concentrations downgradient of the extraction wells are for the most part acceptable, concentrations on and immediately downgradient of the 10th Street property still present

unacceptable risk. Unless groundwater is treated in this area, institutional controls to prevent use of groundwater will be needed indefinitely.

7.2.2.3. Changes in Risk Assessment Methods

Numerous changes in toxicity and other contaminant characteristics have occurred as evidenced in Attachment C, Table C2-C6. Significant changes in toxicity factors, exposure parameters and methodology have evolved since the OU-1 and OU-2 risk assessments were developed. The short term protectiveness of both OU-1 and OU-2 RODs is based on meeting ARARs and the implementation of effective institutional controls to prevent complete exposure pathways to contaminated soils and Zone B (shallow) groundwater. With the exception of the vapor intrusion pathway, changes in toxicity do not affect protectiveness of the remedy. Table 8-2 in the 1988 OU-2 ROD does identify some shallow water cleanup objectives (see section 7.2.2.1), but risk-based cleanup goals based on current risk assessment methodology, toxicity and exposure factors may be needed for chemicals not identified as contaminants of potential concern (COPCs) or not having MCLs to achieve site closeout.

7.2.2.4. Expected Process Towards Meeting RAOs

Since the RAOs have not been clearly defined, status towards closure for the shallow groundwater operable unit cannot be measured. Elevated concentrations of COCs remain near the LB&D property boundary along East Alma Avenue. Under the current operation scenario where only a few extraction wells located near the downgradient end of the plume are operational, the travel time needed for the plume to reach the extraction wells will extend the time considerably until the plume contaminants meet MCLs, assuming MCLs are the cleanup standards.

7.2.3. Question C

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

There have been no newly identified ecological risks identified at the site. There is no evidence of any site impact due to natural disasters. There is no new information that might affect the protectiveness of the remedy with the exception of potential vapor intrusion impacts to residential and industrial/commercial workers, and the presence of some VOCs downgradient of the extraction system (as discussed elsewhere). There are no other concerns.

8.0. ISSUES, RECOMMENDATIONS, AND FOLLOW-UP ACTIONS

Issues for the LB&D Site are presented in Table 5. This table summarizes some of the concerns raised in the previous sections. Corresponding recommendations and follow-up actions are discussed below. Recommendations are provided to increase system effectiveness and protectiveness, reduce costs, promote technical improvement, and to achieve site closeout.

Table 5 Issues

	Issue[1]	Affects Current Protectiveness (Y/N)?	Affects Future Protectiveness (Y/N)?	Responsible Entity[2] and Milestone[3]
Protectiveness Issues				
1.	Potential exposure of construction/utility workers during intrusive activities in soils overlying the shallow groundwater plume may not be adequately addressed in areas of the SJSU property or sidewalk adjacent to the 10th Street and Newark properties (Sec. 8.1.1)	N	Y	EPA/DTSC/ PRP (12/31/2006)
2.	Vapor intrusion pathway for receptors in potential future building development may not be adequately evaluated and addressed (Sec. 8.1.2)	N	Y	EPA (12/31, 2006)
3.	Institutional controls need to be fully implemented (8.1.3).	N	Y	EPA/DTSC/ PRP (12/31/2006)
Technical Improvement				
4.	Optimize soil vapor extraction system operations (Sec. 8.2.1).	N	N	EPA (3/31/2006)
5.	Optimize groundwater extraction system (Sec. 8.2 .2).	N	N	PRP (9/30/2006)
6.	Groundwater Natural Attenuation Study (Sec. 8.2.3)	N	N	PRP (12/31/2007)
7.	Groundwater sampling technique to improve VOCs measurement (Sec. 8.2.4).	N	N	PRP (12/31/2005)
Future Site Closeout				
8.	An evaluation to determine if SVE has met soils cleanup criteria is needed (Sec. 8.3.1).	N	N	EPA (12/31/2007)
9.	Remediation goal for OU 2 shallow groundwater needs clarification (Sec. 8.3.2).	N	N	EPA (12/31/2007)
10.	MW-44, the only monitoring well in the Zone D aquifer, was removed. The OU-1 ROD requires the Zone D aquifer be monitored semi-annually (Sec. 8.3.3).	N	Y	EPA/DTSC (12/31/2005)

[1]Reference to section where issue and recommendations are discussed.
[2]PRP = Potentially Responsible Party, EPA = US Environmental Protection Agency, DTSC = Department of Toxic Substances Control
[3]Milestones for implementing recommendations as determined by EPA Region 9

8.1. Recommendations to Improve Protectiveness

8.1.1. Potential Exposure of Construction/Utility Workers

There are ICs addressing worker health and safety for intrusive activities on the 10th Street and Newark properties. However, ICs have not been fully implemented on the adjacent city sidewalks and SJSU sports fields. Since shallow Zone A aquifer is 20 ft bgs, it is unlikely that construction or utility workers would contact contaminated groundwater during intrusive activities in soils overlying the plume. However, VOC concentrations in these soils may be problematic for construction or utility workers during such intrusive activities as trenching, and additional protections for these construction or utility workers may be needed. Current owners of land overlying the plume and/or potentially contaminated subsurface soils may need to ensure that construction activities include appropriate measures to ensure worker safety.

8.1.2. Evaluation of Vapor Intrusion Pathway

Current groundwater data and data in the 1996 Remedial Design Report No. 5 Soil Gas Survey indicate that vapor intrusion would not be of concern for current residential and commercial/industrial receptors in occupied structures overlying the shallow groundwater plume. Consideration of the potential for vapor intrusion in future occupied buildings overlying the shallow groundwater plume may not be adequately addressed. No institutional controls have been selected to prevent construction of occupied structures on the SJSU sports fields between Spartan Stadium and the track. The vapor intrusion pathway should be more fully evaluated for new construction. If the pathway presents a risk, an additional remedy may need to be designed. Such a remedy may include the selection of new institutional controls.

8.1.3. Implement Institutional Controls

Institutional controls for the adjacent city sidewalk area need to be fully implemented. In addition to the recording of a restrictive covenant, layering of alternate institutional controls for the sidewalk areas may be desired and would enhance protectiveness. Further coordination with the San Jose City Department of Transportation, as described in 7.1.1.3, would allow existing governmental controls on sidewalk maintenance and utility work to be used as institutional controls. Signage should also be placed on 10th Street property fences to indicate that contaminated soils may be present under the adjacent city sidewalk.

As the vapor intrusion pathway is more fully evaluated, ICs related to vapor intrusion issues may be suggested.

An IC monitoring plan should be developed. This monitoring plan should identify the type and frequency of monitoring necessary to ensure the continued effectiveness of the implemented institutional controls. In connection with this FYR, a title search was completed for both the restrictive covenant on the 10th Street property and the restrictive covenant on the Newark property. These title searches verified that the covenants appear in their relevant chain of title

and are not negatively impacted by any prior-in-time encumbrances. Copies of the title searches are included herein as Attachment G.

8.2. Recommendations for Technical Improvement

8.2.1. Soils (OU-1)

The extent of VOC contamination in soil is not well-defined. The SVE system was shut down in December 2004 due to significant downward trends in the recovery rates and is not currently operating. Due to limited analytical data, it is uncertain if clean up criteria have been met. A systems operations optimization should be conducted. Based on findings of the optimization study, soil sampling may be needed to determine if cleanup goals have been reached.

8.2.2. Groundwater Extraction System Optimization (OU-2)

A qualitative capture zone analysis identified a potentially incomplete capture area between extraction wells EX –13 and EX-19. To ensure there is complete capture between extraction wells EX-13 and EX-19, the groundwater extraction system should be evaluated. It may be necessary to bring additional extraction well(s) on line to improve the extraction efficiency.

8.2.3. Groundwater Natural Attenuation Study (OU-2)

The current groundwater remediation may not be as efficient and cost effective as possible. The LSGTF may be able to accelerate source removal and/or possibly reduce cleanup time by initiating pumping from wells located adjacent to the LB&D property along Alma Avenue. The LSGTF also needs to conduct a MNA study to determine if down gradient low concentration plume is attenuating and therefore unlikely to impact Coyote Creek..

8.2.4 Sampling Technique

The monitoring program offers some potential for cost reduction and improvement in data quality. The current practice of using the purge and bail approach for sampling groundwater should be replaced with low-flow sampling. This would potentially reduce the field time needed for sampling, reduce turbidity (and the resulting interference with metals analysis), and would reduce the potential for loss of volatile organics. Low flow sampling should be applied to OU-2 groundwater sampling to ensure sample quality is consistent with the current state of the science.

8.3. Recommendations to Achieve Site Closeout

8.3.1. Soils (OU-1)

The remediation goal specified in the OU-1 ROD needs to be clarified. The goal is given as 1 ppm total VOCs in soil. Regulatory agencies should review existing decision documents and determine how to implement the remediation goals. Procedures to measure progress toward the goal also need to be identified and instituted. The SVE system is not currently operating, and due to limited analytical data, it is uncertain if clean up criteria have been met. Methodology to determine if SVE has met soils cleanup criteria needs to be developed and appropriate samples to verify the achievement of clean up goal should be collected.

8.3.2. Groundwater (OU-2)

Cleanup goals for OU-2 shallow groundwater have not been clearly defined for the LSGTF to accelerate cleanup. Regulatory agencies should review existing decision documents and clarify quantitative remediation goals as appropriate.

8.3.3. Assessment of the necessity of MW-44 Replacement

In order to fulfill the OU-1 ROD requirement, an assessment of the necessity of MW-44 replacement is required. If EPA determines that a replacement well of MW-44 is no longer necessary, an OU-1 ROD amendment or ESD may be necessary.

8.4. Follow-Up Actions

The responsibility for follow-up actions is summarized in Table 5. Milestone dates are best estimates and will be further evaluated by EPA in consultation with the PRPs.

9.0. PROTECTIVENESS STATEMENT

The remedy is considered protective in the short-term since there is no evidence of currently complete exposure pathways to contaminated soils and groundwater. However, in order for the remedy to remain protective in the long-term until performance standards specified in the ROD are met, institutional controls for the site must be fully implemented.

10.0. NEXT REVIEW

The next review will be performed in 2010, and will address both OU-1 and OU-2. The next Five Year Review will be due in September, 2010.