

Technical Assessment

This section evaluates the functioning of the remedy as intended, the current status of assumptions, and new information affecting the remedy.

6.1 Functioning of the Remedy as Intended by Decision Documents

Is the remedy functioning as intended by the decision documents?

6.1.1 OU-1

This section discusses how OU-1 is operating and functioning in relationship to its intended objectives, O&M implementation, optimization opportunities, any early indicators of potential issues, and access controls and institutional control implementation.

6.1.1.1 Obtaining Objectives

The objective of OU-1 is to address onsite control of constituents by confinement of the trash prism and extraction and treatment of LFG, LFG condensate, and leachate. Currently, the integrity of the landfill is intact. From the site tour, there did not appear to be any settling of the landfill, exposed membranes, or other disrepair. The vegetation was thick and healthy. The monitoring wells are in good condition.

Evaluation of plume containment was not possible at the time of this Five-Year Review. The Phase I evaluation report scheduled for completion in early 2006 will evaluate plume containment. The concentrations of VOCs are low in the sampled stormwater. While OU-1 is successful in transporting the LFG from the landfill to the flare, the operation of the flare is not currently meeting the performance requirement of a destruction efficiency of 98 percent for any reactive organic other than methane. The second round of testing was performed in April 2005. At the time of this Five-Year Review, the second compliance testing report was still in preparation by Kleinfelder and therefore results were not available for review.

6.1.1.2 System Operation

The onsite City of Fresno operator conducts preventative maintenance on the flare and gas monitoring wells.

The O&M costs for OU-1 for 2003 and 2004 (available data) are lower than estimated. The ROD-estimated costs were \$432,700; actual costs were \$212,600. The lower actual costs are due, in part, to the fact that the contingency leachate collection system was never installed because very little leachate is generated.

The City is proactively in looking for optimization opportunities. Currently, the percent oxygen, methane, and carbon dioxide is adjusted at the LFG monitoring wells manually. This optimizes the performance of the flare.

6.1.1.3 Potential Issues

Issues include the flare's performance, dioxin testing of the flare, lack of an ecological risk assessment, and maintenance of the gas monitoring wells.

A secure fence around the entire complex is well-maintained. The public does have access to the landfill during the day, however. People could hurt themselves or vandalize the LFG collection system.

The park is located adjacent to the landfill. EPA evaluated health risks using a worker scenario. This method is conservative and therefore the remedy is also protective for recreational users. The treated groundwater is used for irrigation for the park. This is not a health risk because the effluent is tested and has consistently met the requirements for non-detect for the COCs. The soil is not considered contaminated and, therefore, is not an exposure route.

6.1.2 OU-2

This section discusses how OU-2 is operating and functioning in relationship to its intended objectives, O&M implementation, optimization opportunities, any early indicators of potential issues, and access controls and institutional control implementation.

6.1.2.1 Obtaining Objectives

The objective of OU-2 is to restore the aquifer to beneficial use in a timely and cost-effective manner. Beneficial use is defined here as when levels are at or below MCLs. The ROD listed 16 COCs.

OU-2 is currently in Phase 1 operations. The Phase 1 objective is plume containment around the landfill. The plume size has decreased in the years that the treatment system has been operating, but the low extraction rates have inhibited complete containment. A second assessment of Phase 1 will be reported later this year. It will include a capture-zone analysis and a newly-calibrated version of the groundwater model (Phillips 2005). The first assessment was not able to completely evaluate the effectiveness because the agricultural wells were still in operation and creating drawdown.

The effluent standards are defined in the Clean Water Act, Title 33, Code of Federal Regulations, Parts 301 and 302. The PTA is treating the influent to those standards – non-detect for COCs.

6.1.2.2 System Operation

An employee for the City of Fresno is onsite during workday hours maintaining the system. The Project Manager/Coordinator for the City is also frequently onsite. Preventative maintenance is performed daily to ensure a properly-functioning system. Daily printouts provide information about maintenance to be performed for the day. The maintenance is logged and kept electronically in an Excel spreadsheet, which includes the scheduled start date, completion date, equipment description, task number, and other relevant information.

The extraction wells have not been pumping at the rate for which they were designed. A known cause for the low flow is the decrease in groundwater levels. The City cleaned extraction wells PW-2A and PW-3A to see if biofouling was also part of the cause of the low

flow. In 2004, all of the extraction wells were operating between 81 and 99 percent of the time. Reasons for extraction well downtime include well rehabilitation activities and adjustment of flow rates to compensate for the low water levels.

The treatment plant, including the flare, was down for routine maintenance because of local power failures and upgrades and repair of the SCADA system. According to the *Fall 2004 Semi-Annual Monitoring Report* (CDM 2005a), there were numerous weekend shutdowns while staff were not present. The system was not started up again until Monday when staff returned. The O&M plan states that the plant will remain offline until a manual shutdown RESET is invoked in the main plant central computer monitor. This does not appear to be a large problem because operation of the extraction wells has been consistently over 80 percent in recent years (CDM 2003d).

Actual O&M costs for 2003 and 2004 were approximately \$100,000 less than the anticipated O&M costs. Potential optimization in the process could be responsible for the reduced costs. Detailed information about the costs was not reviewed and therefore specific reasons for the lower costs are not described here.

The City is currently in the process of requesting a decrease in sampling for inorganics. Possible opportunities exist to use the LFG for the treatment plant's electricity needs. This was examined in the past and was, for the time, deemed impractical. Documentation regarding potential LFG usage was not available.

6.1.2.3 Potential Issues

The flow meters are to be replaced within the next 6 months. Low flows could indicate a potential problem as far as the ability to contain the contamination. Also, vertical migration of constituents appears to be increasing the concentration of PCE in the C-Aquifer.

The implementation of institutional controls as required by the ROD is still being discussed between the City and Fresno County. Fresno County would be responsible for enforcing the proposed controls, which include denying permit approval for installation of wells into the Well Prohibition Zone, as defined in the 2003 technical memorandum. According to current limited information, two wells were installed within the well assessment zone. The City is trying to obtain the well installation data in order to determine if these wells might have an adverse effect on the groundwater plume and remediation system. In addition, the City will continue their discussions with the County to work out an agreement as it relates to these institutional controls.

6.2 Current Validity of Assumptions Used During Remedy Selection

Are the exposure assumptions, toxicity data, cleanup levels, and remediation objectives used at the time the remedy selection still valid?

The exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of remedy selection are generally unchanged. The following section describes any changes that have been made.

The post-closure groundwater monitoring indicates the presence of constituents at concentrations exceeding the respective MCLs and confirms the need to continue monitoring the extent of contamination. Thus, the Title 22 Groundwater Protection requirements are relevant and appropriate (CCR, Div 4.5, Chap 14, Art 6). In 1993, the primary state statutory provisions governing solid waste management under California Integrated Waste Management Board (CIWMB) and the State Water Resources Control Board were combined under Title 27, Division 2, Subdivision 1 entitled "Consolidated Regulations for Treatment, Storage, Processing or Disposal of Solid Waste" (27 CCR §20164). Title 14 provisions identified in the 1993 FSL OU-1 ROD can now be found under Title 27, Division 2. There were no known significant changes noted in these regulations that would affect the FSL site current remedy.

The groundwater cleanup goals were based on MCLs promulgated under the Safe Drinking Water Act, which is an ARAR. The cleanup goals for the COCs in the aquifer were listed in the ROD. Whenever the state MCL was more stringent than the federal MCL, the state MCL was used, with the exception of trans-1,2-DCE. The state MCL for trans-1,2-DCE has been 10 µg/L since September 1994, prior to the ROD; yet, the higher federal MCL of 100 µg/L was used. The more stringent of the two standards for the trans-1,2-DCE should be considered for remediation cleanup goal for complete aquifer restoration. Based on review of recent groundwater monitoring reports prepared under Phase 1, it appears that the MCL of 10 µg/L for trans-1,2-DCE is being used. The actual trans-1,2-DCE concentration levels were slightly above the MCL in one well in the A-Aquifer in 2004. That well, CDM-12A had a maximum concentration of 1,2-DCE of 13 µg/L. The concentrations of trans-1,2-DCE are below the MCL in the B- and C-Aquifers. The correct MCL of 10 µg/L for trans-1,2-DCE will be cited in the ESD that the USEPA has recommended be prepared for the Site.

It was noted, while conducting the ARARs review, that there were two incorrect citations made in the 1996 OU-2 ROD. These related to the Clean Water Act, Title 33. The citations made in the ROD indicated that the regulations for these would be found in 33 CFR, Parts 301, 302 and 307. The actual citations should have been 33 USC [§1311](#), 1312, and 1317, which were derived from the Clean Water Act Sections 301, 302, and 307. The performance of the remedy has not been compromised based on this finding, since the general intent has been complied with. These incorrect citations will be corrected in the ESD that the USEPA has recommended be prepared for the site.

During this Five-Year Review, the assumptions concerning COC exposure and toxicity data and changes in remedial action objectives were evaluated. No current or potential changes have been identified during this Five-Year Review process.

The land use of the site changed with the development of the regional park/sports complex on the western portion of the site in 2002. No documentation on the health risk exposure pathways to citizens using the park was available for review, but it is assumed that the exposure pathways are similar to those used in the risk assessment conducted in 1994. The risk assessment was conducted with the analysis that a worker would be spending 8 hours per day working at the site.

6.3 Recent Information Affecting the Remedy

Has any other information surfaced that could call into question the protectiveness of the remedy?

No other information has surfaced that could call into question the protectiveness of the remedy. An ecological risk assessment has not been conducted at the Site. USEPA has asked the City to conduct a screening-level ecological risk assessment. There have not been any natural disasters, such as weather-related or seismic incidents in recent years that would affect or compromise the protectiveness of the remedy.

Issues and Recommendations

This section describes the issues and recommendations for the site as a whole, OU-1, and OU-2. Table 7-1 summarizes the issues and recommendations as well as presents the party responsible, oversight agency, and the effect that it has on the protectiveness of the environment and human health currently and in the future.

7.1 Issues Related to OU-1 and OU-2

Issue

An institutional control needs to be in place to prohibit well installation and construction in the area around the FSL that could cause contamination of that well or adversely affect the containment of the plume by the extraction wells. An institutional control also needs to be put in place to restrict certain uses of the site itself and protect the landfill cap.

Recommendation

USEPA recommends that an ESD be prepared for the site. The ESD will include the following recommendations with regard to institutional controls for the site. The OU-1 ROD relied on the State Water Resources Control Board and Integrated Waste Management Board regulations for closure and post-closure maintenance requirements to ensure integrity of the landfill cap and protect public health and safety by preventing public contact with the waste. However, the State Water Resources Control Board and the Integrated Waste Management Board regulations cited in the Landfill ROD (Title 22, Chapter 15 and Title 14, Division 7, respectively) have been superseded and replaced by Title 27. Thus, the ESD will cite to the Title 27 regulations that pertain to closure and post-closure maintenance requirements. The ESD will also recommend that the City execute and record a restrictive covenant for the property that would bind current and future owners and restrict certain uses of the site itself, including residential use, and prohibit use of the groundwater underneath the site.

7.2 Issues Related to the Landfill (OU-1)

Issues related to the landfill include the flare's compliance with the SJVAPCD requirements, the dioxin testing of the flare, lack of an ecological risk assessment, and maintenance on the gas monitoring wells.

Issue

During the first compliance testing, the flare did not achieve 98 percent destruction efficiency. The second compliance testing occurred in April 2005, but the report will not be available for this Five-Year Review.

Recommendation

The second compliance testing report will not be available for this Five-Year Review. Therefore, the second compliance testing report will include how to address any problems identified with the performance of the flare. Additionally, resolutions will be identified for all outstanding recommendations included in the First Compliance Testing Report Fresno Sanitary Landfill Jensen Avenue Fresno California (July 2004).

This includes evaluating data collected as part of the second compliance testing to determine the mass of VOCs in the exhaust air from the groundwater treatment packed tower aerator (PTA) to account for all VOC sources. Because of the correlation between the VOC concentrations in groundwater and the potential VOC emissions in the exhaust air from the PTA, future scheduled compliance tests should include review and discussion of the total VOC influent groundwater concentrations. This review should include verification that no significant increases in total VOCs have occurred over time. Only if significant changes are found, would retesting the PTA exhaust air emissions be necessary.

Issue

The absence of dioxin testing of the flare has been an issue raised in the past.

Recommendation

1. Perform modeling to evaluate what dioxin emissions level from the flare stack would result in a 10^{-6} excess cancer risk to the maximally-exposed individual (probably a worker at the adjacent sports complex or a neighbor). If the level of emissions necessary for a 10^{-6} increase in cancer risk is much higher than we would expect from the landfill flare, then dioxin testing may not be called for at this time.
2. Consider reviewing data (when they are available) from a similar landfill site where dioxin testing has been performed recently. These data may assist in drawing further conclusions about the potential need for testing at FSL.
3. Perform sampling if analysis above indicates flare stack emissions level may exceed health protective standards (10^{-6} excess cancer risk or 200 pg/m^3).

Additional recommendation: In evaluating the performance of the flare, consideration should be given to modifying the stack so that dioxin testing could be easily accomplished in the future, particularly if system reengineering already will be necessary to bring the flare into compliance.

Issue

There has not been an ecological risk assessment conducted at the site. A review of ecological reports for the site found that a screening-level ecological risk assessment should have been conducted (USEPA 2003). The squirrel bait that is currently dispensed around the

landfill and the heat of the flare that kills birds and bees could both be a threat to endangered species in the area.

Recommendation

Conduct a screening-level ecological risk assessment or an acceptable alternative assessment that evaluates the protectiveness of the remedy (i.e., ensure there are no exposure pathways connecting landfill constituents and ecological receptors) and identifies any current adverse impacts of the remedy on the environment.

Issue

Debris and water were found in some of the gas monitoring wells (MMW4 at depths of 5 feet, 25 feet, and 45 feet and MMW3 at 5 feet). Also, one of the wells, MMW5 at 25 feet deep, detected methane at 13.4 percent by volume.

Recommendation

Maintenance should be conducted on the gas monitoring wells. MMW5 is located close to the waste and not near the property line. If the methane levels do not decrease, the City may need to install an additional well between MMW5 and the property line along Jensen Avenue.

7.3 Issues Related to the Groundwater (OU-2)

Issues identified during the Five-Year Review process relate to groundwater movement concerns and flow meter issues.

Issue

The vertical migration of constituents appears to be increasing the concentration of PCE in the C-Aquifer.

Recommendation

- Continue to monitor the concentration changes in well clusters.
- Use the groundwater model to predict how vertical migration of constituents of concern can be reduced, and consider the results of this analysis in evaluating the effectiveness of the Phase 1 remedial action for groundwater cleanup as appropriate.

Issue

The extraction wells have been operating at lower flow rates than designed. This leads to issues such as incomplete containment of the plume and non-functioning flow meters.

Recommendation

- Replace flow meters.
- Review flow rate data after the extraction well rehabilitation activities. Semi-annual or annual well rehabilitation activities may be necessary if these activities are found to result in improved flow rates.

- Review groundwater elevation data since the decommissioning of the agricultural wells.
- The Phase 1 evaluation should assess the implications of the low extraction rates.

TABLE 7-1

Summary Table- Issues, Recommendations, and Follow-up Actions

First Five-Year Review Report for Fresno Municipal Sanitary Landfill Superfund Site, Fresno County, California

Issue	Recommendations and Follow-up Actions	Party Responsible	Over-sight Agency	Milestone Date*	Affects Protectiveness (Y/N)	
					Current	Future
Sitewide Institutional controls need to be in place.	a) An ESD will be produced for the site including comprehensive institutional controls including a restrictive covenant.	USEPA	—	2007	N	Y
The flare did not achieve 98% destruction efficiency.	<p>a) The second compliance testing report will include how to address any problems identified with the performance of the flare. Additionally, resolutions will be identified for all outstanding recommendations included in the First Compliance Testing Report Fresno Sanitary Landfill Jensen Avenue Fresno California (July 2004).</p> <p>This includes evaluating data collected as part of the second compliance testing to determine the mass of VOCs in the exhaust air from the groundwater treatment packed tower aerator (PTA) to account for all VOC sources. Because of the correlation between the VOC concentrations in groundwater and the potential VOC emissions in the exhaust air from the PTA, future scheduled compliance tests should include review and discussion of the total VOC influent groundwater concentrations. This review should include verification that no significant increases in total VOCs have occurred over time. Only if significant changes are found, would retesting the PTA exhaust air emissions be necessary.</p>	City of Fresno	USEPA	2005	Y	Y

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Issue	Recommendations and Follow-up Actions	Party Responsible	Over-sight Agency	Milestone Date*	Affects Protectiveness (Y/N)	
					Current	Future
Absence of dioxin testing of the flare has been an issue raised in the past.	<p>a) Perform modeling to evaluate what dioxin emissions level from the flare stack would result in a 10^{-6} excess cancer risk to the maximally-exposed individual (probably a worker at the adjacent sports complex or a neighbor). If the level of emissions necessary for a 10^{-6} increase in cancer risk is much higher than we would expect from the landfill flare, then dioxin testing may not be called for at this time.</p> <p>b) Consider reviewing data (when available) from a similar landfill site where dioxin testing has been performed recently. These data may assist in drawing further conclusions about the potential need for testing at FSL.</p> <p>c) Perform sampling if analysis above indicates flare stack emissions level may exceed health protective standards (10^{-6} excess cancer risk or 200 pg/m^3)</p> <p>Additional recommendation: In evaluating the performance of the flare, consideration should be given to modifying the stack so that dioxin testing could be easily accomplished in the future, particularly if system reengineering already will be necessary to bring the flare into compliance.</p>	City of Fresno	USEPA	April 2006	N	Y
<p>There has not been an ecological risk assessment conducted at the site.</p> <p>The squirrel bait and heat of the flare are potential threats to endangered species in the area.</p>	<p>a) Conduct a screening-level ecological risk assessment or an acceptable alternative assessment that evaluates the protectiveness of the remedy (i.e., ensure there are no exposure pathways connecting landfill constituents and ecological receptors) and identifies any current adverse impacts of the remedy on the environment.</p>	City of Fresno	USEPA	April 2006	N	N

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Issue	Recommendations and Follow-up Actions	Party Responsible	Over-sight Agency	Milestone Date*	Affects Protectiveness (Y/N)	
					Current	Future
Debris and water were found in some of the gas monitoring wells. Also, one of the wells, MMW5 at 25 ft. deep, detected methane at 13.4% by volume.	<ul style="list-style-type: none"> a) Conduct maintenance on the gas monitoring wells. b) Continue to monitor methane levels. c) If the methane levels do not decrease, the City may need to install an additional well between MMW5 and the property line along Jensen Avenue. 	City of Fresno	USEPA	April 2006	N	Y
The vertical migration of constituents appears to be increasing the concentration of PCE in the C-Aquifer.	<ul style="list-style-type: none"> a) Continue to monitor the concentration changes in well clusters. b) Use the groundwater model to predict how vertical migration of constituents of concern can be reduced, and consider the results of this analysis in evaluating the effectiveness of the Phase 1 remedial action for groundwater cleanup as appropriate. 	City of Fresno	USEPA	Early 2006	Y	Y
The extraction wells have been operating at lower flow rates than designed. This leads to issues such as incomplete containment of the plume and non-functioning flow meters.	<ul style="list-style-type: none"> a) Replace flow meters. b) Review flow rate data after extraction well rehabilitation activities. Semi-annual or annual well rehabilitation activities may be necessary if these activities are found to result in improved flow rates. c) Review groundwater elevation data since the decommissioning of the agricultural wells. d) The Phase 1 evaluation should assess the implications of the low extraction rates. 	City of Fresno	USEPA	Early 2006	Y	Y

* Per the protectiveness statement.

SECTION 8.0

Protectiveness Statement

A protectiveness determination of the remedies for both OU-1 and OU-2 cannot be made at this time until further information is obtained and actions are completed. The information and actions required for OU-1 includes demonstration that the flare performs adequately to prevent/eliminate emission levels that are unsafe, resolution of the potential dioxin emissions issue (i.e., perform modeling or sampling, and/or review data from similar landfill site), and completion of a screening-level ecological risk assessment. It is expected that these actions will take no more than 6 months to complete.

The information and actions required for OU-2 includes demonstration of adequate capture and migration control of the contamination plume through capture-zone analysis. The Phase I evaluation will assess the overall efficacy and protectiveness of the remedy. This evaluation will provide recommendations for any further modifications and is anticipated to be completed in early 2006.

The action required for both operable units relates to institutional controls. For the remedy to be protective in the long-term, institutional controls such as execution and recordation of a restrictive covenant for the property that would bind current and future owners and restrict certain uses of the site itself, including residential use, and prohibit use of the groundwater underneath the site, need to be implemented. It is anticipated that this action would be completed by 2007.

As the required information is obtained and actions are completed at each of the operable units, the protectiveness determination will be made at that time.

SECTION 9.0

Next Five-Year Review

The next Five-Year Review for the Fresno Sanitary Landfill will be performed in 2010.

SECTION 10.0

References

- Camp Dresser & McKee (CDM). 1994. *Fresno Sanitary Landfill: Remedial Investigation Report; Final*. May.
- _____. 1999. *Fresno Sanitary Landfill: Early Groundwater Remedial Action Construction Completion Report*. November.
- _____. 2000. *Fresno Sanitary Landfill: Performance Monitoring Program Plan Operable Unit 2*. November.
- _____. 2001a. *Fresno Sanitary Landfill: Operable Unit No. 2 Construction Completion Report*. September.
- _____. 2001b. *City of Fresno: Revised Plume Boundary Monitoring Well Siting*. January.
- _____. 2002. *Fresno Sanitary Landfill: Fall 2001 Semi-Annual Performance Monitoring Program Report*. January.
- _____. 2003a. *Fresno Sanitary Landfill: Fall 2003 Semi-Annual Performance Monitoring and Phase 1 Groundwater Remedial Action Evaluation Report*. December.
- _____. 2003b. *Fresno Sanitary Landfill: Spring 2003 Semi-Annual Performance Monitoring Program Report*. July.
- _____. 2003c. *Final Fresno Sanitary Landfill Technical Memorandum – Institutional Controls*. January.
- _____. 2003d. *Fresno Sanitary Landfill Operations and Maintenance Plan OU-2 Groundwater Remediation System*. May.
- _____. 2003e. *Interim Remedial Action Report*. May.
- _____. 2004. *Fresno Sanitary Landfill: Spring 2004 Semi-Annual Performance Monitoring Program Report*. July
- _____. 2005a. *Sanitary Landfill: Fall 2004 Semi-Annual Performance Monitoring Program Report (Compact Disc)*. January.
- _____. 2005b. *Raw Data in Excel Sheet: TREND PLOTS and waterlevel2.xls* May.
- _____. 2005c. *Raw Data in Excel Sheet: July 2003 voc trends v02.xls* May.
- _____. 2005d. *Fresno Sanitary Landfill: Emerging Compounds Analytical Results*. August 1.
- City of Fresno. 1992. *Letter from Jay Adams, Management Analyst Solid Waste Division, to George Slater, Project Coordinator for the City of Fresno. Status: Residents in Proximity to City Landfill Receiving Bottled/Filtered Water*. January.

- City of Fresno. 2000. *1999-2000 Annual Report for Storm Water Discharges Associated with Industrial Activities*. Submitted to: State of California – State Water Resources Control Board. July.
- _____. 2001. *2000-2001 Annual Report for Storm Water Discharges Associated with Industrial Activities*. Submitted to: State of California – State Water Resources Control Board. July.
- _____. 2002. *2001-2002 Annual Report for Storm Water Discharges Associated with Industrial Activities*. Submitted to: State of California – State Water Resources Control Board. July.
- _____. 2003. *2002-2003 Annual Report for Storm Water Discharges Associated with Industrial Activities*. Submitted to: State of California – State Water Resources Control Board. July.
- _____. 2004. *2003-2004 Annual Report for Storm Water Discharges Associated with Industrial Activities*. Submitted to: State of California – State Water Resources Control Board. July.
- _____. 2005. *Fresno Sanitary Landfill: Progress Report – 1st Quarter 2005*. April.
- GeoSyntec Consultants, Inc. 2001. *Draft Construction Completion Report Closure Construction Activities for Operable Unit 1; Fresno Sanitary Landfill; Volume 1 of 3*. September.
- _____. 2002. *Prefinal Compliance Testing Plan; Fresno Sanitary Landfill*. September.
- _____. 2003. *Final Compliance Testing Plan; Fresno Sanitary Landfill*. February.
- ICF Technology, Inc. 1994. *Final Human Health Risk Assessment for the Fresno Sanitary Landfill Superfund Site Fresno, California*. September.
- Kleinfelder. 20B04. *First Compliance Testing Report Fresno Sanitary Landfill Jensen Avenue Fresno, California*. July.
- Kleinfelder and GeoSyntec Consultants. 2003a. *Final Remedial Action Report for Operable Unit 1; Fresno Sanitary Landfill*. June.
- _____. 2003b. *Final Post-Closure Operations and Maintenance Plan for the Source Control Operable Unit (SCOU); Fresno Sanitary Landfill*. June. (Appendix E of Final Remediation Action Report for OU1)
- Nyznyk, Yash, Project Manager for CDM. 2005. *Email correspondence to Debbie Seibold, CH2M HILL: May 17th. C-Aquifer April 2000 Water Quality Results*. May.
- Phillips, Pete, URS Technical Oversight for USEPA. 2005. *Email correspondence to Debbie Seibold, CH2M HILL: April 11, 2005 Tech Mtg. for FSL*. May.
- Slater, George. 2005. *Conversation during Site Inspection*. March.
- United States Department of the Interior (USDOI) 1991. *Fish and Wildlife Enhancement; Species List for the Proposed Fresno Sanitary Landfill Site, Southwest of Fresno, Fresno County, California*. December.

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- United States Environmental Protection Agency (USEPA). 1993a. *Record of Decision – Fresno Sanitary Landfill*. September.
- _____. 1993b. *Amendment to Administrative Consent Order U.S. Docket No. 90-22*. December.
- _____. 1996. *Record of Decision – Fresno Sanitary Landfill*. September.
- _____. 2001. *Comprehensive Five-Year Review Guidance, EPA 540-R-01-007*. June.
- _____. 2003. *Letter to George Slater, Project Coordinator for the City of Fresno. Comments for the Operable Unit No. 2 Construction Completion Report and Operations and Maintenance Plan OU-2 Groundwater Remediation System; Fresno Sanitary Landfill November 2002*. January.
- _____. 2003. *Summary of Ecological Information on Fresno Sanitary Landfill Site*.
- _____. 2004. *Letter to George Slater, Project Coordinator for the City of Fresno. New Remedial Project Manager (RPM), Five-Year Review, Dioxin/Furan Sampling*. August.
- _____. 2005. E-mail from Dan Stralka/USEPA to Lisa Hanusiak/USEPA. August 17.

APPENDIX A

Documents Reviewed

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Documents Reviewed

- Camp Dresser & McKee. 1992. *Technical Memorandum; Fresno Sanitary Landfill Leachate Investigation*. May.
- _____. 1994. *Fresno Sanitary Landfill: Remedial Investigation Report. Final*. May 20.
- _____. 1996. *Fresno Sanitary Landfill: Revised Final Feasibility Study Report*. July.
- _____. 1997. *Fresno Sanitary Landfill: September 1997 Semiannual Groundwater Monitoring Report*. November.
- _____. 1998. *Fresno Sanitary Landfill: April 1998 Semiannual Groundwater Monitoring Report*. June.
- _____. 1999. *Fresno Sanitary Landfill: Technical Memorandum; Early Groundwater Remedial Action*. January.
- _____. *Final (100 percent) Groundwater Remedial Design Submittal. Volume 1: Design Report*. July.
- _____. 1999. *Fresno Sanitary Landfill: Early Groundwater Remedial Action Construction Completion Report*. November.
- _____. 2000. *Fresno Sanitary Landfill: Performance Monitoring Program Plan Operable Unit 2*. November.
- _____. 2001. *Fresno Sanitary Landfill: Fall 2000 Semi-Annual Performance Monitoring Program Report*. January.
- _____. 2001. *Fresno Sanitary Landfill: Revised Plume Boundary Monitoring Well Siting*. January.
- _____. 2001. *Fresno Sanitary Landfill: Operable Unit No. 2 Construction Completion Report*. September.
- _____. 2001. *Fresno Sanitary Landfill: Operable Unit No. 1 Construction Completion Report*. September.
- _____. 2002. *Fresno Sanitary Landfill: Fall 2001 Semi-Annual Performance Monitoring Program Report*. January.
- _____. 2002. *Fresno Sanitary Landfill: Spring 2002 Semi-Annual Performance Monitoring Program Report*. July.
- _____. 2003. *Final Fresno Sanitary Landfill Technical Memorandum – Institutional Controls*. January.

- _____. 2003. *Fresno Sanitary Landfill: Fall 2002 Semi-Annual Performance Monitoring Program Report*. January.
- _____. 2003. *Fresno Sanitary Landfill: Operations and Maintenance Plan OU-2 Groundwater Remediation System*. May.
- _____. 2003. *Interim Remedial Action Report*. May.
- _____. 2003. *Fresno Sanitary Landfill: Spring 2003 Semi-Annual Performance Monitoring Program Report*. July.
- _____. 2003. *Fresno Sanitary Landfill: Fall 2003 Semi-Annual Performance Monitoring and Phase 1 Groundwater Remedial Action Evaluation Report*. December.
- _____. 2004. *Fresno Sanitary Landfill: Spring 2004 Semi-Annual Performance Monitoring Program Report*. July.
- _____. 2005. *Letter to Ms. Lisa Hanusiak U.S. Environmental Protection Agency; Fresno Sanitary Landfill- Operable Unit 2 Proposed Modification of the Phase 1 Performance Monitoring Program*. January.
- _____. 2005. *Fresno Sanitary Landfill: Fall 2004 Semi-Annual Performance Monitoring Program Report*. January. (Compact Disc)
- _____. 2005. *Fresno Sanitary Landfill: Emerging Compounds Analytical Results*. August 1.
- City of Fresno. 1992. *Letter from Jay Adams, Management Analyst Solid Waste Division, to George Slater, Project Coordinator for the City of Fresno. Status: Residents in Proximity to City Landfill Receiving Bottled/Filtered Water*. January.
- _____. 2000. *1999-2000 Annual Report for Storm Water Discharges Associated with Industrial Activities. Submitted to: State of California – State Water Resources Control Board*. July.
- _____. 2001. *2000-2001 Annual Report for Storm Water Discharges Associated with Industrial Activities. Submitted to: State of California – State Water Resources Control Board*. July.
- _____. 2002. *2001-2002 Annual Report for Storm Water Discharges Associated with Industrial Activities. Submitted to: State of California – State Water Resources Control Board*. July.
- _____. 2003. *2002-2003 Annual Report for Storm Water Discharges Associated with Industrial Activities. Submitted to: State of California – State Water Resources Control Board*. July.
- _____. 2004. *2003-2004 Annual Report for Storm Water Discharges Associated with Industrial Activities. Submitted to: State of California – State Water Resources Control Board*. July.
- _____. 2005. *Fresno Sanitary Landfill: Progress Report – 1st Quarter 2005*. April.
- _____. 2005. *Fresno Sanitary Landfill: Progress Report – 4th Quarter 2004*. January.

- Department of the Interior (United States) 1991. *Fish and Wildlife Enhancement; Species List for the Proposed Fresno Sanitary Landfill Site, Southwest of Fresno, Fresno County, California*. December.
- Eastern District Court. 1998. *Consent Decree*. CIV FR -98-5195 REC SMS. February.
- GeoSyntec Consultants 2001. *Draft Construction Completion Report Closure Construction Activities for Operable Unit 1; Fresno Sanitary; Volume 1 of 3*. September.
- _____. 2002. *Prefinal Compliance Testing Plan; Fresno Sanitary Landfill*. September.
- _____. 2003. *Final Compliance Testing Plan; Fresno Sanitary Landfill*. February.
- ICF Technology, Inc. 1994. *Final Human Health Risk Assessment for the Fresno Sanitary Landfill Superfund Site Fresno, California*. September.
- Kleinfelder. 2004. *First Compliance Testing Report; Fresno Sanitary Landfill*. July.
- Kleinfelder and GeoSyntec Consultants. 2003. *Final Remedial Action Report for Operable Unit 1 Fresno Sanitary Landfill Fresno, California*. June.
- Kleinfelder and GeoSyntec Consultants. 2003. *Final Post-Closure Operations and Maintenance Plan for the Source Control Operable Unit (SCOU); Fresno Sanitary Landfill*. June. (Appendix E of Final Remediation Action Report for OU1).
- San Joaquin Valley Unified Air Pollution Control District. 1998. *Re: Air Pollution Control Requirements for Fresno Landfill Remediation Project*. September.
- State Water Resources Control Board. 1996. *Letter to Ms. Thelma Estrada Office of Regional Counsel United States Environmental Protection Agency, Region 9 City of Fresno Sanitary Landfill ARARS*. January.
- USEPA. 1993. *Record of Decision – Fresno Sanitary Landfill*. September.
- _____. 1993. *Amendment to Administrative Consent Order U.S. Docket No. 90-22*. December.
- _____. 1996. *Letter for the public: USEPA Issues Proposed Plan to Clean Up Groundwater*. July.
- _____. 1996. *Record of Decision – Fresno Sanitary Landfill*. September.
- _____. 2001. *Comprehensive Five-Year Review Guidance, EPA 540-R-01-007*. June.
- _____. 2003. *Letter to George Slater, Project Coordinator for the City of Fresno. Comments for the Operable Unit No. 2 Construction Completion Report and Operations and Maintenance Plan OU-2 Groundwater Remediation System; Fresno Sanitary Landfill November 2002*. January.
- _____. 2003. *Summary of Ecological Information on Fresno Sanitary Landfill Site*.
- _____. 2004. *Letter to George Slater, , Project Coordinator for the City of Fresno. New Remedial Project Manager (RPM), Five-Year Review, Dioxin/Furan Sampling*. August.
- _____. 2005. *Letter to George Slater, Project Coordinator for the City of Fresno. RE: Request for Operational Modification for Phase 1 Groundwater Remedial Action, Fresno Sanitary Landfill*. April.

_____. 2005. *Fact Sheet: USEPA begins Five-Year Review of Cleanup at Site: Fresno Sanitary Landfill Superfund Site*. March.

_____. 2005. *Newspaper Ad: USEPA begins Five-Year Review of Cleanup at Fresno Sanitary Landfill Superfund Site*.

APPENDIX B

Community Notification



Fresno Sanitary Landfill Superfund Site



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY • REGION IX • SAN FRANCISCO, CALIFORNIA

FRESNO, CALIFORNIA

MARCH 2005

U.S. EPA BEGINS FIVE-YEAR REVIEW OF CLEANUP AT SITE

The United States Environmental Protection Agency (U.S. EPA) has begun the process of reviewing the cleanup remedies at the Fresno Municipal Sanitary Landfill Superfund site (Site) in Fresno, CA. The review process will evaluate the effectiveness of the landfill cover and groundwater remediation (cleanup) systems installed by the City of Fresno (City). This fact sheet explains the review process.

THE ISSUE AND THE SOLUTION IMPLEMENTED

The primary objective of the review is to assure that the cleanup activities undertaken by the City are protective of both human health and the environment. Cleanup goals established for the Site include stopping the migration of contaminated groundwater from leaving the Site, and cleaning up contaminated groundwater that has already moved off the Site to drinking water standards established by the federal government and the State of California. Contaminants that are currently being cleaned up at the Site include chemicals contained in the gas that is emitted to the atmosphere from the landfill and volatile organic chemical compounds in groundwater. To better manage the cleanup activities, the Site was divided into two components called Operable Units (OUs). Operable Unit 1 included the installation of a landfill cover, a landfill gas collection system and a surface water management system. All these components of OU 1 help collect gas and leachate currently released by the landfill. Operable Unit 2 included the installation of a groundwater extraction and treatment system to cleanup chemical contaminants and a groundwater monitoring well network to measure the effectiveness of the groundwater treatment system.

regarding operation, maintenance, and effectiveness of the cleanup systems. The methods, findings, and conclusions of the review will be documented in a five-year review report. The report will also include a "Statement of Protectiveness" declaring if the Site is effectively remediating contaminants and recommending improvements if necessary. The report is scheduled to be completed by the end of the year. Upon completion, a copy of the final report will be placed in each of the local information repositories listed on back page. Additionally, a notice, announcing the completion of the Five-Year Review Report will be placed in the local paper.

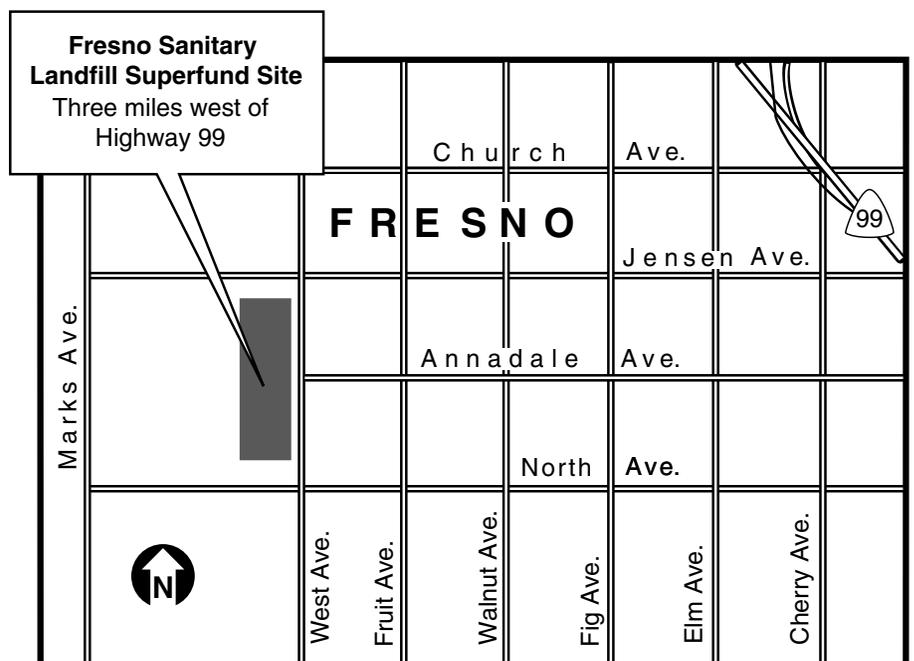


Figure 1: Area map

THE REVIEW PROCESS

As part of the Superfund law, the U.S. EPA is required to evaluate the effectiveness and protectiveness of remedial (cleanup) systems every five years until the cleanup is complete. This first, five-year review of the Site will address the operation of the OUs and the Site's institutional controls. Institutional controls are measures or actions taken to enhance or assure that the remedies (i.e., cleanup systems) are and continue to be effective. As part of this review, the U.S. EPA will conduct a site inspection of the cleanup systems and review required information produced by the City

COMMUNITY INVOLVEMENT

The U.S. EPA invites the community to learn more about this review process and get involved. One way to get involved is to call Jackie Lane, Community Involvement Coordinator or Lisa Hanusiak, Remedial Project Manager at toll-free (800) 231-3075 to let us know how you feel about the cleanup conducted so far. You can obtain further site information from the U.S. EPA's web site at <http://yosemite.epa.gov/r9/sfund/overview.nsf> and click on the link for the Fresno Municipal Sanitary Landfill site.

SITE BACKGROUND

The Fresno Sanitary Landfill is located four miles southwest of the City of Fresno in Fresno County. The landfill is approximately 145 acres in size and rises approximately 60 feet above the surrounding land. It is located along West Avenue between North Avenue and Jensen Avenue. The area surrounding the landfill is primarily agricultural. The Fresno Sanitary Landfill is owned and was operated by the City of Fresno. The landfill began operations in 1937 and stopped accepting trash in 1989. A protective liner was never installed beneath the landfill. Groundwater, soils and air are all impacted by the releases of contaminants from the landfill. In 1993, a Record of Decision was signed to control the source of methane gas in soil and the waste that was moving underground and away from the landfill and is referred to as OU1. It consists of the building of a landfill cover system, landfill gas control system and treatment system and surface water management system. The systems were built in 2001 along with the construction of a new regional sport park on the landfill property. In 1996, a Record of Decision was signed that called for a three-phased approach to clean up the groundwater and is referred to as OU2. Phase I, which is a two-year project to construct, will contain the contaminated groundwater underneath the landfill by installation of extraction wells along the perimeter, Phase II will prevent the spread of the plume into clean portions of the aquifer by installing extraction wells at the outside edge of the plume to pump and treat the contaminated water and Phase III will reduce contaminant levels at the contained groundwater plume by pumping and treating the contaminated water to drinking water standards. Prior to the construction of Phase I, the City of Fresno initiated an Early Groundwater Cleanup Action in January 1999 to begin pumping and treating the contaminated water plume to keep it from moving farther away from the property. Phase I of the groundwater system was completed and operational in 2001. Upon the U.S. EPA approval, each additional phase will be installed.

U.S. EPA BEGINS FIVE-YEAR REVIEW OF CLEANUP AT SITE

INFORMATION REPOSITORIES

The U.S. EPA maintains an information repositories that contain the site Administrative Record, project reports and documents, fact sheets and other reference materials at the following addresses.

Fresno County Central Library

2420 Mariposa Street
Fresno, CA
(209) 488-3155



Superfund Records Center

95 Hawthorne Street
San Francisco, CA 94105
(415) 536-2000

CONTACT INFORMATION

Lisa Hanusiak

Remedial Project Manager, SFD-7-3
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3152

Jackie Lane

Community Involvement Specialist (SFD-3)
75 Hawthorne Street
San Francisco, CA 94105
(415) 972-3236

Printed on 30% Postconsumer  Recycled / Recyclable Paper

 U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street (SFD-3)
San Francisco, CA 94105
Attn: Jacqueline Lane (Fresno SL 3/05)

Official Business

Penalty for Private Use, \$300

Address Service Requested

FIRST CLASS MAIL
POSTAGE & FEES PAID
U.S. EPA
Permit No. G-35



U.S. EPA BEGINS FIVE YEAR REVIEW OF CLEANUP AT THE FRESNO MUNICIPAL SANITARY LANDFILL SUPERFUND SITE

The United States Environmental Protection Agency (U.S. EPA) has begun the process of reviewing the cleanup remedies at the Fresno Municipal Sanitary Landfill Superfund site (Site) in Fresno, CA. The review process will evaluate the effectiveness of the landfill cover and groundwater remediation systems installed by the City of Fresno (City).

THE ISSUE AND THE SOLUTION IMPLEMENTED

The primary objective of the review is to assure that the cleanup activities undertaken by the City are protective of both human health and the environment. Cleanup goals established for the Site include stopping the migration of contaminated groundwater from leaving the Site and cleaning up contaminated groundwater that has already moved off the Site to drinking water standards established by the federal government and the State of California. Contaminants that are currently being cleaned up at the Site include chemicals contained in the gas that is emitted to the atmosphere from the landfill and volatile organic chemical compounds in groundwater. To better manage the cleanup activities, the Site was divided into two components called operable units (OUs). Operable Unit 1 included the installation of a landfill cover, a landfill gas collection system and a surface water management system. All the components of OU 1 help collect gas and leachate currently released by the landfill. Operable Unit 2 included the installation of a groundwater extraction and treatment system to cleanup chemical contaminants and a groundwater monitoring well network to measure the effectiveness of the groundwater treatment system.

THE REVIEW PROCESS

The Superfund law requires the U.S. EPA to evaluate the effectiveness and protectiveness of remedial systems every five years until the cleanup is complete. This first, Five-Year review of the Site will address the operation of the OUs and the Site's institutional controls. Upon completion, a copy of the final report will be placed in the local information repository listed below. Additionally, a notice, announcing the completion of the Five-Year Review Report will be placed in the local paper.

INFORMATION REPOSITORIES: Fresno County Central Library, 2420 Mariposa Street, Fresno, CA. (209) 488-3155.

CONTACT INFORMATION: Jackie Lane, Community Involvement Specialist (SFD-3)(415) 972-3236 or toll-free 800 231-3075. You can obtain further site information from the U.S. EPA's web site at <http://yosemite.epa.gov/r9/sfund/overview.nsf>

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APPENDIX C

Five-Year Review Site Inspection Checklist and Interview Summary Forms

APPENDIX C

Five-Year Review Site Inspection Checklist and Interview Summary Forms

TABLE C-1

Site Inspection Team Roster

Site Inspection- March 9-10, 2005

First Five-Year Review Report for Fresno Municipal Sanitary Landfill Superfund Site, Fresno County, California

Name	Title	Affiliation
Lisa Hanusiak	Remedial Project Manager	United States Environmental Protection Agency Region 9
George Slater	Project Manager/Coordinator for the City	City of Fresno
Jeff Garner	Groundwater Treatment Plant Operator	City of Fresno
Debbie Seibold	Task Manager	CH2M HILL Oakland Office
Tina Girard	Task Manager	CH2M HILL Oakland Office

3. **Local regulatory authorities and responsible 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	California RWQCB Central Valley Region			
Contact:	Bruce Myers	Associate Engineering Geologist	3/10/05	(559) 488-4397
	Name	Title	Date	Phone No.

Problems; suggestions: See attached interview summary form

Agency				
Contact	Name	Title	Date	Phone No.

Problems; suggestions:

4. **Other interviews** (optional)

III. ONSITE DOCUMENTS AND RECORDS VERIFIED (Check all that apply) ✓ *Applicable*

1. **O&M Documents**

O&M manual	✓ Readily available	✓ Up to date
As-built drawings	✓ Readily available	✓ Up to date
Maintenance logs	✓ Readily available	✓ Up to date

Remarks _____

2. **Site-Specific Health and Safety Plan** ✓ Readily available ✓ Up to date

Contingency plan/emergency response plan	✓ Readily available	✓ Up to date
--	---------------------	--------------

Remarks _____

3. **O&M and OSHA Training Records**

✓ Readily available	~Up to date	N/A
---------------------	-------------	-----

Remarks Jeff will be trained next month – or at the first available in-town class.

4. **Permits and Service Agreements**

Air discharge permit	Readily available	Up to date	✓ N/A
Effluent discharge	Readily available	Up to date	✓ N/A
Waste disposal, POTW	Readily available	Up to date	✓ N/A
Other permits <u>Storm Water Permit</u>	✓ Readily available	✓ Up to date	N/A

Remarks _____

5.	Gas Generation Records	✓ Readily available	✓ Up to date	N/A
Remarks _____				
6.	Settlement Monument Records	Readily available	Up to date	✓ N/A
Remarks <u>There are no settlement monuments at the landfill.</u>				
7.	Groundwater Monitoring Records	✓ Readily available	✓ Up to date	N/A
Remarks _____				
8.	Leachate Extraction Records	Readily available	Up to date	✓ N/A
Remarks <u>Leachate collection not performed.</u>				
9.	Discharge Compliance Records			
	Air – <i>See below</i>	Readily available	Up to date	N/A
	Water (effluent)	✓ Readily available	✓ Up to date	N/A
Remarks <u>Air – 2 rounds of start up performance monitoring; next round scheduled May.</u>				
10.	Daily Access/Security Logs	Readily available	Up to date	
Remarks <u>None</u>				
IV. O&M COSTS ✓ Applicable				
1.	O&M Organization			
	State in-house	Contractor for State		
	PRP in-house	Contractor for PRP		
	✓ Other <u>City in-house</u>			
2.	O&M Cost Records			
	Readily available	✓ Up to date		
	Funding mechanism/agreement in place	✓ NA		
	Original O&M cost estimate _____		Breakdown attached	
Total annual cost by year for review period if available				
	Date	Date	Total cost	
From	<u>2004</u>	To <u>2005</u>	<u>\$787,100 (estimate)</u>	Breakdown attached
	Date	Date	Total cost	
From	<u>2003</u>	To <u>2004</u>	<u>\$551,308</u>	Breakdown attached
	Date	Date	Total cost	
See Section 4.2.3 in the Five-Year Review for more information.				

2.	Adequacy	ICs are adequate	✓ICs are inadequate	N/A
Remarks <u>See the Five-Year Review for a more complete discussion of additional ICs necessary for the Site.</u>				
D. General				
1.	Vandalism/trespassing	Location shown on site map	✓No vandalism evident	
Remarks _____				
2.	Land use changes onsite			
Remarks <u>Redeveloped to regional park/sports complex</u>				
3.	Land use changes offsite			
Remarks <u>Purchased land to the east and constructed pond. Purchased land to west for sports complex.</u> <u>Purchased home and land to north now not occupied. Purchased land to south for pond.</u>				
VI. GENERAL SITE CONDITIONS ✓ Applicable				
A. Roads		Applicable		
1.	Roads	✓Location shown on site map	✓Roads adequate	N/A
Remarks <u>Good condition</u>				
B. Other Site Conditions				
Remarks <u>Very good vegetation coverage; no erosion present; Stormwater collection system in good condition. General housekeeping needed around treatment compound; specifically the removal of former temporary groundwater treatment unit antiscalent containers.</u>				
VII. LANDFILL COVERS ✓ Applicable				
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 _____	Depth _____	
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 <u>Squirrel holes only</u>		

5.	Vegetative Cover	✓Grass ✓Cover properly established	✓No signs of stress
	Trees/Shrubs (indicate size and locations on a diagram)		
	Remarks <u>Grass and wild flowers in abundance ~80% coverage</u>		

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 Area/Water Damage	✓Wet areas/water damage not evident	
	Wet areas	Location shown on site map	Areal extent _____
	Ponding	Location shown on site map	Areal extent _____
	Seeps	Location shown on site map	Areal extent _____
	Soft subgrade	Location shown on site map	Areal extent _____
	Remarks _____		

9.	Slope Instability	Slides Location shown on site map	✓No evidence of slope instability
	Areal extent _____		
	Remarks _____		

B. Benches			
	Applicable	✓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	Location shown on site map	N/A or okay
	Remarks _____		

2.	Bench Breached	Location shown on site map	N/A or okay
	Remarks _____		

3.	Bench Overtopped Remarks _____ _____	Location shown on site map	N/A or okay
C. Letdown Channels ✓Applicable 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 Areal extent _____ Depth _____ Remarks _____ _____	Location shown on site map	✓No evidence of settlement
2.	Material Degradation Material type _____ Areal extent _____ Remarks _____ _____	Location shown on site map	✓No evidence of degradation
3.	Erosion Areal extent _____ Depth _____ Remarks _____ _____	Location shown on site map	✓No evidence of erosion
4.	Undercutting Areal extent _____ Depth _____ Remarks _____ _____	Location shown on site map	✓No evidence of undercutting
5.	Obstruction Location shown on site map Type _____ Areal extent _____ Size _____ Remarks _____ _____		✓No obstruction
6.	Excessive Vegetative Growth Type _____ No evidence of excessive growth ✓Vegetation in channels does not obstruct flow Location shown on site map Areal extent _____ Remarks _____ _____		
D. Cover Penetrations ✓Applicable N/A			
1.	Gas Vents ✓NA Remarks _____ _____		

2.	Gas Monitoring Probes Properly secured/located ✓Functioning ✓Routinely sampled ✓Good condition Evidence of leakage at penetration Remarks <u>Vault box lids should be replaced or repaired as needed.</u>		
3.	Monitoring Wells (within surface area of landfill) ✓ Properly secured/located ✓Functioning ✓Routinely sampled ✓Good condition Evidence of leakage at penetration Remarks <u>All fitted with dedicated QED low flow sampling equipment.</u>		
4.	Leachate Extraction Wells Properly secured/located Functioning Routinely sampled Good condition Evidence of leakage at penetration Needs O&M ✓N/A Remarks _____		
5.	Settlement Monuments Located Routinely surveyed ✓N/A Remarks _____		
E. Gas Collection and Treatment		Applicable	N/A
1.	Gas Treatment Facilities ✓ Flaring Thermal destruction Collection for reuse ✓ Good condition Needs O&M Remarks <u>Operating at the time of inspection.</u>		
2.	Gas Collection Wells, Manifolds and Piping ✓ Good condition Needs O&M Remarks <u>Majority of the structures are underground. All above ground structures appear in good condition.</u>		
3.	Gas Treatment Facilities (e.g., gas monitoring of adjacent homes or buildings) Good condition Needs O&M ✓N/A Remarks _____		
F. Cover Drainage Layer		✓ Applicable	N/A
1.	Outlet Pipes Inspected ✓ Functioning N/A Remarks _____		
2.	Outlet Rock Inspected ✓ Functioning N/A Remarks _____		
G. Detention/Sedimentation Ponds		✓ Applicable	N/A

1.	Siltation	Areal extent _____	Depth _____	N/A
	Siltation not evident			
	Remarks <u>3 ponds: Georges, South, East used for collection of treated groundwater and Stormwater runoff. Discharge is at the base of the pond at Georges, South lake – discharge pipe with rocks. Park irrigation system from Georges: South and East – high infiltration.</u>			
2.	Erosion	Areal extent _____	Depth _____	
	Remarks <u>Erosion not evident.</u>			
3.	Outlet Works			✓ N/A
	Remarks _____			
4.	Dam			✓ N/A
	Remarks _____			
H. Retaining Walls		Applicable		✓ N/A
1.	Deformations	Location shown on site map		Deformation not evident
	Horizontal displacement _____			Vertical displacement _____
	Rotational displacement _____			
	Remarks _____			
2.	Degradation	Location shown on site map		Degradation not evident
	Remarks _____			
I. Perimeter Ditches/Off-Site Discharge		Applicable		✓ N/A
1.	Siltation	Location shown on site map		Siltation not evident
	Areal extent _____	Depth _____		
	Remarks _____			
2.	Vegetative Growth	Location shown on site map		N/A
		Vegetation does not impede flow		
	Areal extent _____	Type _____		
	Remarks _____			
3.	Erosion	Location shown on site map		Erosion not evident
	Areal extent _____	Depth _____		
	Remarks _____			
4.	Discharge Structure	Functioning		N/A
	Remarks _____			

VIII. VERTICAL BARRIER WALLS		<input checked="" type="checkbox"/> Not Applicable
1.	Settlement Location shown on site map Settlement not evident Areal extent _____ Depth _____ Remarks _____ _____	
2.	Performance Monitoring Type of monitoring Performance not monitored Frequency _____ Evidence of breaching Head differential _____ Remarks _____ _____	
IX. GROUNDWATER/SURFACE WATER REMEDIES		<input checked="" type="checkbox"/> Applicable
A. Groundwater Extraction Wells, Pumps, and Pipelines		<input checked="" type="checkbox"/> Applicable
1.	Pumps, Wellhead Plumbing, and Electrical <input checked="" type="checkbox"/> Good condition All required wells located Needs O&M N/A Remarks <u>2 extraction wells inspected. Flow meters will be replaced next week.</u> _____	
2.	Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input checked="" type="checkbox"/> Good condition Needs O&M Remarks <u>Most underground; above ground appeared in good condition.</u> _____	
3.	Spare Parts and Equipment <input checked="" type="checkbox"/> Readily available <input checked="" type="checkbox"/> Good condition Requires upgrade Needs to be provided Remarks _____ _____	
B. Surface Water Collection Structures, Pumps, and Pipelines		<input checked="" type="checkbox"/> NA
1.	Collection Structures, Pumps, and Electrical Remarks _____ _____	
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances Good condition Needs O&M NA Remarks _____ _____	
3.	Spare Parts and Equipment Remarks _____ _____	

C. Treatment System ✓ Applicable			
1.	Treatment Train (Check components that apply)		
	Metals removal	Oil/water separation	Bioremediation
	✓ Air stripping	Carbon adsorbers	
	Filters		
	✓ Additive (e.g., chelation agent, flocculent) - Chlorine (bleach), antiscalant		
	✓ Good condition	Needs O&M	
	✓ Sampling ports properly marked and functional		
	✓ Sampling/maintenance log displayed and up to date - on computer		
	✓ Equipment properly identified		
	Quantity of groundwater treated annually _____		
	Quantity of surface water treated annually <u>0</u>		
	Remarks _____		
2.	Electrical Enclosures and Panels (properly rated and functional)		
	N/A	✓ Good condition	Needs O&M
	Remarks _____		
3.	Tanks, Vaults, Storage Vessels		
	N/A		
	Remarks <u>Good Condition</u>		
4.	Discharge Structure and Appurtenances		
	✓ Good condition		Needs O&M
	Remarks _____		
5.	Treatment Building(s) – support building		
	N/A	✓ Good condition (especially roof and doorways)	Needs repair
	✓ Chemicals and equipment properly stored		
	Remarks <u>Very well organized and maintained.</u>		
6.	Monitoring Wells (pump and treatment remedy)		
	✓ Properly secured/locked	✓ Functioning	✓ Routinely sampled
	✓ All required wells located	Needs O&M	✓ Good condition
			N/A
	Remarks <u>50% wells located.</u>		
D. Monitored Natural Attenuation ✓ Not Applicable			
1.	Monitoring Wells (natural attenuation remedy)		
	Remarks _____		
X. OTHER REMEDIES ✓ Not Applicable			
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 ✓ Applicable

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 objective of OU-1 is to address onsite control of constituents by confinement of the trash prism and extraction and treatment of LFG, LFG condensate, and leachate. Currently, the integrity of the landfill is intact. From the site tour, there did not appear to be any settling of the landfill, exposed membranes, or other disrepair. The vegetation was thick and healthy. The monitoring wells are in good condition.

The objective of OU-2 is to restore the aquifer to beneficial use in a timely and cost-effective manner. OU-2 is currently in Phase I operations. The Phase I objective is plume containment around the landfill. The plume size has decreased in the years that the treatment system has been operating, but the low extraction rates have inhibited complete containment. A second assessment of Phase I will be reported later this year. It will include a capture zone analysis and a newly calibrated version of the groundwater model. (Phillips 2005) The first assessment was not able to completely evaluate the effectiveness because the agricultural wells were still in operation and creating drawdown. From the site tour, OU-2 appeared to be operating smoothly.

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.

An employee for the City of Fresno is onsite during work-day hours maintaining the system. The Project Manager/Coordinator for the City is also frequently onsite. Preventative maintenance is performed daily to ensure a properly-functioning system. Daily print-outs provide information about maintenance to be performed for the day. The maintenance is logged and kept electronically in an Excel spreadsheet, which includes the scheduled start date, completion date, equipment description, task number, and other relevant information.

The onsite City of Fresno operator conducts preventative maintenance on the flare and gas monitoring wells. The extraction wells have not been pumping at the rate for which they were designed. A known cause for the low flow is the decrease in groundwater levels. The City cleaned extraction wells PW-2A and PW-3A to see if biofouling was also part of the cause of the low flow. In 2004, all of the extraction wells were operating between 81 and 99 percent of the time. Reasons for extraction well downtime include cleaning and adjustment of flow rates to compensate for the low water levels.

The treatment plant, including the flare, was down for routine maintenance because of local power failures and upgrades and repair of the SCADA system. According to the Fall 2004 Semi-Annual Monitoring Report (CDM 2005a), there were numerous weekend shutdowns while staff were not present. The system was not started up again until Monday when staff returned. The Operations and Maintenance Plan states that the plant will remain off-line until a manual shutdown RESET is invoked in the main plant central computer monitor. This does not appear to be a large problem because operation of the extraction wells has been consistently over 80% in recent years. (CDM 2003d)

The flow meters are to be replaced in early 2005. Low flows could indicate a potential problem as far as the ability to contain the contamination.

The early action groundwater treatment equipment is still kept onsite in the treatment area. This is unnecessary and should be removed.

<p>C. Early Indicators of Potential Remedy Failure</p>
<p>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.</p> <p>From the site inspection, no major issues exist that could affect the protectiveness of the remedy.</p>
<p>D. Opportunities for Optimization</p>
<p>Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.</p> <p>The City is proactive in looking for optimization opportunities. Currently, the percent oxygen, methane, and carbon dioxide is adjusted at the methane gas monitoring wells manually. This optimizes the performance of the flare.</p> <p>The City is currently in the process of requesting a decrease in sampling for inorganics. The City is proactive in looking for opportunities to reduce costs via sampling. Possible opportunities exist to use the methane gas for the treatment plant's electricity needs. This was examined in the past and was, for the time, deemed impractical. Documentation regarding potential methane gas usage was not available.</p>

Five-Year Review Interview Record		Interviewee: George Slater City of Fresno			
Site Name		EPA ID No.		Date of Interview	Interview Method via
Fresno Municipal Sanitary Landfill		CAD 98036914		3/10/05	Phone <input type="checkbox"/> Fax/email <input type="checkbox"/> In person <input checked="" type="checkbox"/>
Interview Contacts	Organization	Phone	Email	Address	
Lisa Hanusiak	US EPA Region 9	(415)972-3152	Hanusiak.lisa@epa.gov	75 Hawthorne Street San Francisco, CA 94105	
Tina Girard	CH2M HILL / SFO, as rep of EPA	(510) 587-7586	Tgirard@ch2m.com	155 Grand Ave, Suite 1000 Oakland, CA 94612	
Interview Questions					
<p>1. What is your current role as it relates to the site? What is your overall impression of the work conducted at the site to date? (general sentiment) Response: Project Manager/Coordinator for the City of Fresno Overall impression is that there is very good work conducted at the site.</p>					
<p>2. What is the current status of construction? Have any problems or difficulties been encountered that have impacted construction progress or implementability? Response: OU1: Complete. IT Corporation (contractor) declared bankruptcy during construction causing some delays. OU2: Phase I Complete. Evaluating the need for Phase II. Ability to acquire offsite irrigation wells was a long process (approximately 2 years). Wanted to obtain these wells because of the pumping affects and the potential for cross contamination (screened across multiple zones). Resident was operating irrigation well throughout negotiations.</p>					
<p>3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc) conducted by your office regarding the site? If so please give purpose and results. Response: The City of Fresno Manages the site. George is onsite regularly.</p>					

4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Have any new or emerging COCs been identified? If so, have they impacted the effectiveness of the remedy?

Response: I have limited knowledge of data trends; overall there are sporadic changes in wells: some decreasing, others fluctuate.

In terms of new COCs: there was discussion of dioxin from the flare; however this was never sampled for. Dioxin is developed in the flare it is a by-product of combustion. Never sampled for emergent chemicals such as NDMA, perchlorate, chromium, etc...

5. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

Response:

Continuous on-site presence weekdays from 7 am to 3:30 pm and there is an auto dialer connected to the treatment compound should any alarms sound.

CDM (City's consultant) is onsite monthly and perform regular site audits.

Rosemary (City of Fresno employee) assists Jeff Garner (City of Fresno employee) with groundwater sampling events.

6. Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details.

Response:

OU1: Currently there are plans to paint the flare. The heat from the flare has created a need to repaint sooner than expected.

OU2: Chemical injection system was not planned for in the original design. The design was updated to incorporate because the temporary groundwater treatment facility was used prior to construction of the current OU2 treatment facility.

Higher frequency of well cleaning necessary than anticipated (i.e. algae).

The flow meters and totalizer were designed for higher flow. The water levels have decreased across the site resulting in lower flow and therefore the flow meters are ineffective for the lower range. Currently investigating and replacing as needed.

7. Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.

Response: Improved efficiency has occurred through the following:

City of Fresno took over groundwater sampling one year ago to decrease costs, however maintained CDM for quality assurance oversight.

Recently, proposed using the City's waste water treatment lab for analyses of certain compounds to reduce long term costs.

Computerized the operations and maintenance schedule using the waste water treatment plant system to produce daily work orders.

Currently, there is a trailer under construction for groundwater sampling to improve efficiency.

The City recently requested reduced sampling frequency for organics. EPA is reviewing the request.

8. Are you aware of any institutional controls, site access controls, new ordinances in place, changes in actual or projected land use, complaints being filed or unusual activities at the site? If so, please describe in detail.

Response:

The land (Fresno Landfill) will remain a park for the foreseeable future.

There have been no complaints or unusual activities, nor known changes in land use or ordinances.

The status of other project related institutional controls is unknown.

9. Have any problems been encountered which required, or will require changes to this remedial design or ROD?

Response:

Not thus far, currently the following activities are in progress:

OU2: Contingent upon Phase I evaluation report.

OU1: Round 1 evaluation of flare did not pass the performance criteria. The temperature of the flare was increased after sampling by altering the louver controls in hopes that Round 2 of sampling will pass the performance criteria.

10. Do you have any comments, suggestions, or recommendations regarding the site?

Response:

I would like to see Site delisted from NPL. From community stand point, there is negative connotation associated with a Superfund Site.

Five-Year Review Interview Record		Interviewee: Jeff Garner City of Fresno			
Site Name		EPA ID No.		Date of Interview	Interview Method via
Fresno Municipal Sanitary Landfill		CAD 98036914		3/10/05	Phone <input type="checkbox"/> Fax/email <input type="checkbox"/> In person <input checked="" type="checkbox"/>
Interview Contacts	Organization	Phone	Email	Address	
Lisa Hanusiak	US EPA Region 9	(415)972-3152	Hanusiak.lisa@epa.gov	75 Hawthorne Street San Francisco, CA 94105	
Tina Girard	CH2M HILL / SFO, as rep of EPA	(510) 587-7586	Tgirard@ch2m.com	155 Grand Ave, Suite 1000 Oakland, CA 94612	
Interview Questions					
<p>1. What is your current role as it relates to the site? What is your overall impression of the work conducted at the site to date? (general sentiment) Response: Groundwater Treatment Plant Operator, primary on-site staff person for the past 2 years. Work conducted at the site is the best job; a very “tight ship”; enjoys the work.</p>					
<p>2. What is the current status of construction? Have any problems or difficulties been encountered that have impacted construction progress or implementability? Response: OU1: Completed. Maintenance (mowing) will transfer to Parks Dept. this year. OU2: Phase I completed. Currently constructing new irrigation wells for neighboring properties.</p>					
<p>3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc) conducted by your office regarding the site? If so please give purpose and results. Response: George Slater visits the site every day Supervisor – Waste Management – once a month CDM – once a month</p>					

4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Have any new or emerging COCs been identified? If so, have they impacted the effectiveness of the remedy?

Response:

Data fluctuates. Overall the groundwater data is decreasing.
The soil gas data is predictable, there is nothing consistently unusual.

5. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

Response: Yes – Jeff performs all O&M operations per O&M manuals and MP2 Program.

6. Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details.

Response:

The flow meters were designed for higher flow. There has been a decrease in water level elevation at the site and therefore lower pumping rates. The flow meters are not able to accurately record the lower flow rates.

Throttle valves on extraction wells – bad design, plan to replace during plant shutdown with a better design.

7. Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.

Response:

Jeff mapped the sampling order (route) more efficiently for periodic groundwater sampling events. Currently a sampling trailer is being fabricated to increase efficiency. Proposed performing inorganic analyses by the City's waste water management lab to save money. Also MP2 software is used to plan, track & document a preventive maintenance schedule.

8. Are you aware of any institutional controls, site access controls, new ordinances in place, changes in actual or projected land use, complaints being filed or unusual activities at the site? If so, please describe in detail.

Response:

May restrict access to landfill in the future – concerned over open vaults. PVC bait dispensers for squirrels are not an issue for coyotes or the public. Vandalism was a concern but has not occurred at the site.

9. Have any problems been encountered which required, or will require changes to this remedial design or ROD?

Response:

Flow Meter , Landfill Gas Vault lids & Throttle Valves will be changed.

10. Do you have any comments, suggestions, or recommendations regarding the site?

Response:

The concrete vault lids on the soil gas monitoring locations are too heavy (approximately 200 pounds) for one person to lift. Currently looking into new vault lids for soil gas monitoring locations – durable (sun damage) and lighter weight. \$15,000 budgeted for lids.

Suggest using extracted gas for power generation or compressor station and send to wastewater treatment plant. Additionally, place gravel or pavement on the perimeter road (currently muddy). Lastly, dispose of the old air strippers no longer needed for use at the site.

Five-Year Review Interview Record		Interviewee: John (Yash) Nyznyk CDM (925) 296-8065			
Site Name		EPA ID No.		Date of Interview	Interview Method via
Fresno Municipal Sanitary Landfill		CAD 98036914		3/28/05	Phone <input checked="" type="checkbox"/> Fax/email <input type="checkbox"/> In person <input type="checkbox"/>
Interview Contacts	Organization	Phone	Email	Address	
Lisa Hanusiak	US EPA Region 9	(415)972-3152	Hanusiak.lisa@epa.gov	75 Hawthorne Street San Francisco, CA 94105	
Tina Girard	CH2M HILL / SFO, as rep of EPA	(510) 587-7586	Tgirard@ch2m.com	155 Grand Ave, Suite 1000 Oakland, CA 94612	
Interview Questions					
<p>1. What is your current role as it relates to the site? What is your overall impression of the work conducted at the site to date? (general sentiment)</p> <p>Response: Currently the Project Manager for CDM (contractor for the City) working primarily on OU-2 (groundwater). CDM has been involved since the beginning of the project. CDM performed the RI/FS for both OU-1 and OU-2 and the remedial design for OU-2; Geosyntec was the design engineer for OU-1. Currently serves as the primary contact with EPA on OU-2 issues, preparation of FSL site monthly reports, and management of operation of the groundwater remediation program, including monitoring and reporting. Overall impression is that the project has consisted of addressing a range of issues, resulting in a comprehensive evaluation of conditions and implementation of effective remediation. The OU-2 remedial action was developed in a very collaborative way. This project represents the first time EPA incorporated phased-implementation of remedial action into a ROD.</p>					
<p>2. What is the current status of construction? Have any problems or difficulties been encountered that have impacted construction progress or implementability?</p> <p>Response: OU-1 is complete, currently carrying out performance testing. OU-2 is near completion, the remaining Phase 1 element is well decommissioning (3 agricultural supply wells in the plume downgradient of landfill). Delays due to acquiring wells on private property, negotiations lasted for approximately 1 year. Acquired wells in October 2004.</p>					

Operation of the agricultural wells is believed to have caused the vertical migration of contamination. Initially, contamination was confined to the A-aquifer (depth to water approximately 60 feet below ground surface). The A-zone and B-zone aquifers are separated by an A/B aquitard. There appears to be degree of communication between the A- and B-zone aquifers. Attribute the vertical migration to the agricultural wells completed in the B-zone aquifer without conductor casing. These wells were periodically operated at approximately 1,500 gallons per minute when the irrigation canal water was not available. The irrigation canal runs parallel to the eastern perimeter of the FSL, and is conveyed in an underground pipeline on the southern and western perimeters of the landfill. This pipeline is used to transport treated groundwater to the south detention basin.

The Phase 1 Evaluation Report will be completed in January 2006, after one full year of Phase 1 operations without the agricultural wells operating. The report will evaluate the effectiveness of the Phase 1 Remedial Action and determine whether to proceed to Phases 2 and 3 are or if modifications to Phase 1 will be sufficient for achieving the overall objectives of the groundwater remedial action.

3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc) conducted by your office regarding the site? If so please give purpose and results.

Response:

Reports include: Site-wide monthly project reports - now prepared quarterly; Starting in March 2005, project schedule updates are submitted monthly to EPA electronically; Semi-Annual Performance Monitoring Reports (groundwater and groundwater treatment system monitoring) are submitted.

Periodic project meetings with all interested parties.

CDM performs periodic inspections of the O&M of treatment facility and SCADA system (O&M system for the groundwater treatment compound, data summarized in reports).

4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Have any new or emerging COCs been identified? If so, have they impacted the effectiveness of the remedy?

Response:

Monitoring Data:

The Fall 2002-3 Groundwater Monitoring Reports show generally decreasing or stable trends, increasing in certain wells; depends upon location.

For example, an A-zone extraction well may show decreasing or stable concentration and the B-zone wells are stable with some slightly increasing near agricultural wells and decreasing when proximity is farther from agricultural wells. Within the plume concentrations are variable near some agricultural supply wells. Down-gradient of the site, near the edge of the plume concentrations are generally less than the detection limit for all VOCs except PCE (some wells low concentration but increasing).

COCs: An extensive list of metals was analyzed for during the RI/FS. DTSC has mentioned other COCs; City recently collected treatment plant influent and effluent samples for analysis for perchlorate, 1,4-dioxane, cyanide, and 1,2,3-trichloropropane.

5. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

Response:

There is a continuous on-site presence by a City staff member for OU-1 and OU-2 O&M. George Slater makes periodic visits to the site. CDM visits the site periodically to troubleshoot O&M issues. CDM transitioned away from groundwater sampling but continues to provide assistance/QC once a year during the annual sampling event.

6. Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details.

Response:

There have been some issues with the SCADA system (instrumentation and controls for the groundwater treatment system) -- reports are automatically generated, improved the computer system, and added a protective box for the hard drive to address dust problems. Flow meters: system was designed for much higher flows; actual flow is at low end of optimum range for current flow meters. The same issue exists for the treatment plant flow totalizer. For reporting, CDM has had to estimate flow 1 well. Currently evaluating the need for rehabilitation (annual or semiannual cleaning) of extraction wells as the well yield has decreased.

7. Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.

Response:

Optimization has occurred. Over time, modifications to the program have been proposed. During January 2005, a request was made to reduce the sampling frequency for inorganics at some monitoring wells at the site as there are a lot of historic data.

8. Are you aware of any institutional controls, site access controls, new ordinances in place, changes in actual or projected land use, complaints being filed or unusual activities at the site? If so, please describe in detail.

Response:

CDM prepared Institutional Controls technical memo (Jan 21, 2003). This memo addressed offsite pumping and identified well prohibition and assessment zones through groundwater modeling. Phase 1 Remedial Action included decommissioning of the agricultural wells within the well prohibition zone. Additional wells can be installed but a detailed evaluation (i.e., depth, pumping rates) is required prior to approval. The City has met with Fresno County and they are working to incorporate this into the County's well permitting process.

9. Have any problems been encountered which required, or will require changes to this remedial design or ROD?

Response:

There have been no significant changes at the site. Closure under OU-1 is a presumptive remedy. The groundwater treatment system is operating as intended, modifications may be necessary based on the Phase 1 evaluation to address capture and the lowered water table to achieve the goal of hydraulic control.

10. Do you have any comments, suggestions, or recommendations regarding the site?

Response:

This parties involved in the project have a very good working relationship; issues are identified and collaboratively dealt with. The City proactively implemented the Early Groundwater Remedial Action, which included several of the Phase 1 extraction wells and wellhead treatment systems.

Additional Comments

-There are a number of residences north and south of landfill purchased by City and the City provides bottled water and/or well head treatment to additional residences.

-Vapor intrusion is probably not an issue any more given that the gas collection system is operating, there is perimeter monitoring, and the depth to water (60 ft). In-home gas testing to address vapor intrusion had been performed in homes adjacent to the landfill in the early 1990's.

Five-Year Review Interview Record		Interviewee: Wayne Pickus CDM (925) 296-8070			
Site Name		EPA ID No.		Date of Interview	Interview Method via
Fresno Municipal Sanitary Landfill		CAD 98036914		3/22/05	Phone <input checked="" type="checkbox"/> Fax/email <input type="checkbox"/> In person <input type="checkbox"/>
Interview Contacts	Organization	Phone	Email	Address	
Lisa Hanusiak	US EPA Region 9	(415)972-3152	Hanusiak.lisa@epa.gov	75 Hawthorne Street San Francisco, CA 94105	
Tina Girard	CH2M HILL / SFO, as rep of EPA	(510) 587-7586	Tgirard@ch2m.com	155 Grand Ave, Suite 1000 Oakland, CA 94612	
Interview Questions					
<p>1. What is your current role as it relates to the site? What is your overall impression of the work conducted at the site to date? (general sentiment)</p> <p>Response: Current role is Project Director. I first started on the project in 1990. My overall impression is high caliber work conducted at site. The City has performed comprehensive work at the site in accordance with CERCLA.</p>					
<p>2. What is the current status of construction? Have any problems or difficulties been encountered that have impacted construction progress or implementability?</p> <p>Response: OU2: CDM Phase I construction is almost complete (currently decommissioning agricultural wells). There were no delays in construction of the treatment facility. The decreased regional groundwater elevation (15 to 20 feet) has affected the remedy in that the treatment system is not operating at full capacity. Therefore, some pumps, flow meters, and totalizers are not functioning as intended and must be replaced.</p>					
<p>3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc) conducted by your office regarding the site? If so please give purpose and results.</p> <p>Response: I regularly attend team meetings. CDM is assisting with O&M oversight for the onsite City Operator (Jeff Garner).</p>					

4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Have any new or emerging COCs been identified? If so, have they impacted the effectiveness of the remedy?

Response:

Monitoring data shows generally decreasing or stable concentrations. There are no new COCs identified.

5. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

Response:

Initially the design contractor was responsible for startup. There is currently a continuous (business hours) O&M presence onsite.

6. Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details.

Response:

The decreased regional water table has decreased the flow rate and created the need for new pumps and flow meters.

7. Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.

Response:

In terms of monitoring, the City proposed decreased monitoring in January 2005 in an effort to optimize. Currently awaiting EPA response.

8. Are you aware of any institutional controls, site access controls, new ordinances in place, and changes in actual or projected land use, complaints being filed or unusual activities at the site? If so, please describe in detail.

Response:

CDM developed an Institutional Control (IC) Plan to regulate the installation of new wells.

9. Have any problems been encountered which required, or will require changes to this remedial design or ROD?

Response:

No problems have been encountered which would require changes to the ROD.

In terms of remedial design, the Phase I evaluation may indicate need for changes/improvements for OU2.

10. Do you have any comments, suggestions, or recommendations regarding the site?

Response:

Continue with the Phase I evaluation to determine if the remedial action is meeting the objectives.

Additional Notes/Comments:

-The model developed during the RI was used at different phases of project i.e. to determine extraction well location, effectiveness, and the Phase I evaluation. The model indicates there is a local influence of retention ponds and agricultural wells in the area of the Site.

-CDM identified the main production wells and abandoned accordingly. There may be other that exists farther away, beyond the plume, but there may be no need to abandon.

-The early groundwater action system started early cleanup of the plume and provided data to design the Phase I remedial action more effectively.

Five-Year Review Interview Record		Interviewee: Jeff Dunn Kleinfelder (925) 484-1700			
Site Name		EPA ID No.		Date of Interview	Interview Method via
Fresno Municipal Sanitary Landfill		CAD 98036914		3/28/05	Phone <input checked="" type="checkbox"/> Fax/email <input type="checkbox"/> In person <input type="checkbox"/>
Interview Contacts	Organization	Phone	Email	Address	
Lisa Hanusiak	US EPA Region 9	(415)972-3152	Hanusiak.lisa@epa.gov	75 Hawthorne Street San Francisco, CA 94105	
Tina Girard	CH2M HILL / SFO, as rep of EPA	(510) 587-7586	Tgirard@ch2m.com	155 Grand Ave, Suite 1000 Oakland, CA 94612	
Interview Questions					
<p>1. What is your current role as it relates to the site? What is your overall impression of the work conducted at the site to date? (general sentiment)</p> <p>Response: Contractor for the City, Project Manager for OU1 design. Continue to be in direct contact with the City regarding OU1, scope is limited to Compliance Testing. OU1 design was completed in December 1993 and approved in 1997 (when Jeff worked for Geosyntec – contracted by the City). Overall impression is that the remedial construction is good and in compliance with plans.</p>					
<p>2. What is the current status of construction? Have any problems or difficulties been encountered that have impacted construction progress or implementability?</p> <p>Response: OU1: Construction complete. The biggest issue during construction was contractor-IT Corporation filled for bankruptcy during construction which caused delays.</p>					
<p>3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc) conducted by your office regarding the site? If so please give purpose and results.</p> <p>Response: Regularly attend team meetings. The CD for OU1 requires 2 rounds of compliance testing, Kleinfelder is completing the second round of testing in April 2005.</p>					

4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Have any new or emerging COCs been identified? If so, have they impacted the effectiveness of the remedy?

Response:

The Remedy for OU1 seems to be working for the most part.

-During performance testing round 1 the flare was not meeting 98% destruction efficiency because when sampled it was not operating at a high enough temperature.

-Performed a surface sweep, there was no evidence of leakage (gas).

-Evaluated monitoring data from soil gas wells: for the perimeter monitoring points only 1 location showed methane.

-Landfill gas condensate is pumped to the sanitary sewer line. There is no specific requirement for sampling. Sampled and did not meet the City's discharge requirements. The City agency is ok with it because such low volume (few hundred gallons/day) and it is treated by the POTW.

-The City monitors landfill gas regularly and adjusts as needed. I do not know if there is a set schedule and reporting timeline.

-Unsure of landfill gas data trend, there was a decrease in concentrations after startup.

5. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

Response:

The City has a continuous O&M presence (during business hours).

6. Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details.

Response:

None

7. Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.

Response:

O&M efforts have been optimized by the City.

8. Are you aware of any institutional controls, site access controls, new ordinances in place, changes in actual or projected land use, complaints being filed or unusual activities at the site? If so, please describe in detail.

Response:

There are no ICs associated with OU1. In terms of OU2 there are ICs for groundwater uses (well installation) in the area.

9. Have any problems been encountered which required, or will require changes to this remedial design or ROD?

Response:

In relation to OU1 there have not been any problems encountered which will require changes, the design is working as intended.

10. Do you have any comments, suggestions, or recommendations regarding the site?

Response:

Overall remedy was implemented successfully despite the construction delayed due to bankruptcy. The remedy is functioning well and consistent with land use.

Other Comments/Notes:

There are no permits associated with OU1.

Five-Year Review Interview Record		Interviewee: Lynn Suer suer.lynn@epa.gov 415-972-3148 EPA: Former Remedial Project Manager			
Site Name		EPA ID No.		Date of Interview	Interview Method via
Fresno Municipal Sanitary Landfill		CAD 98036914		4/12/05	Phone <input type="checkbox"/> Fax/email <input type="checkbox"/> In person <input type="checkbox"/>
Interview Contacts	Organization	Phone	Email	Address	
Lisa Hanusiak	US EPA Region 9	(415)972-3152	Hanusiak.lisa@epa.gov	75 Hawthorne Street San Francisco, CA 94105	
Tina Girard	CH2M HILL / SFO, as rep of EPA	(510) 587-7586	Tgirard@ch2m.com	155 Grand Ave, Suite 1000 Oakland, CA 94612	
Interview Questions					
<p>1. What was your relationship to the site? What was your overall impression of the work conducted at the site to date? (general sentiment) Response: Remedial Project Manager from July 27, 2003 to approximately September 2004</p>					
<p>2. Did you feel well informed about the site's activities and progress? Response: Yes. The team was very open and responsive.</p>					
<p>3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc) conducted by your office regarding the site? If so please give purpose and results. Response: Routine communications. Regular meetings, approximately every 3 months depending on deliverables and issues.</p>					

4. Is the remedy functioning as expected? How well is the remedy performing?

Response:

The remedy is not complete. Phase I of OU2 remedy is in progress; there were delays due to gaining access to neighboring properties to abandon irrigation wells, difficult property owner. There was an influence of pumping agricultural wells on the hydraulics of the system and therefore could not interpret success of the groundwater extraction system.

Flare was operating during my time as RPM.

5. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Have any new or emerging COCs been identified? If so, have they impacted the effectiveness of the remedy?

Response:

Although landfill gas data was not routinely reported to EPA, landfill gas was monitored and records probably kept by the landfill operator.

Groundwater data: reported semi-annually. The Phase I report will evaluate data trends, this is currently in progress. There was a preliminary Phase I report released but this is not a good tool to evaluate conditions given that agricultural wells are still operating. The goal of Phase I is plume containment.

Effluent data: not reported.

New or emerging COCs: not aware of any sampling performed.

6. Are you aware of any institutional controls, site access controls, new ordinances in place, changes in actual or projected land use, complaints being filed or unusual activities at the site? If so, please describe in detail.

Response:

There are access and use restrictions at the site. For example, it is fenced. However, I don't know whether access or use restrictions are formalized in a legally binding document.

7. Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.

Response: When compliance testing was performed, it was realized that the destruction efficiency was not met; the City contracted someone to alter the gas extracted from the wells. Unsure if there was a process in place to ensure O&M was optimized, this maybe a weakness at the Site.

8. Are you aware of any ongoing community concerns regarding the site or its administration?

Response:

I am not aware of any concerns from the community. Pete Phillips (URS) raised concern that the electrical panel was placed in a hazardous place on the soccer field.

9. Do you have any comments, suggestions, or recommendations regarding the site?

Response:

The Air Board and Water board should be involved and ensuring compliance. The requirements of Air Board are not detailed in compliance testing plan, CD, nor ROD. Groundwater treatment system effluent was cleaned up to MCLs as opposed to water board cleanup standards. Concerned that the treatment system was not able to meet discharge standards.

During my time as RPM, an issue was whether or not to sample for dioxins from the landfill gas flare. Dioxane emissions from the type of flare operating are not well documented; however similar flares show no problem. This is a complex issue in terms of how to sample (i.e. sample outside of the stack within emissions air – where/when? sample air or organisms?, etc...). EPA currently does not have enough research to tell the City where/how to sample. The cost would have been approximately \$150,000 per sampling event. There is a great possibility of false negative results if sampled in the wrong place.

Five-Year Review Interview Record		Interviewee: Cynthia Wetmore US EPA Region 9 415-972-3059			
Site Name		EPA ID No.		Date of Interview	Interview Method via
Fresno Municipal Sanitary Landfill		CAD 98036914		4/8/2005	Phone <input checked="" type="checkbox"/> Fax/email <input type="checkbox"/> In person <input type="checkbox"/>
Interview Contacts	Organization	Phone	Email	Address	
Lisa Hanusiak	US EPA Region 9	(415)972-3152	Hanusiak.lisa@epa.gov	75 Hawthorne Street San Francisco, CA 94105	
Tina Girard	CH2M HILL / SFO, as rep of EPA	(510) 587-7586	Tgirard@ch2m.com	155 Grand Ave, Suite 1000 Oakland, CA 94612	
Interview Questions					
<p>1. What was your relationship to the site? Response: Remedial Project Manager for EPA in the mid 1990's.</p>					
<p>2. What were the major concerns when you were Remedial Project Manager for the site? Response: -The cap was not yet constructed. -The focus during this time was OU2 (groundwater). There was a public meeting that focused on groundwater during which there was not a lot of public participation. The City provided well head filters to affected residences. -The City wanted to plan to reuse the site (land); -Leachate investigation/recovery was not technically/economically feasible. The landfill was not lined and there were no records of disposal. Interception of groundwater was the primary solution.</p>					

Five-Year Review Interview Record		Interviewee: Bret Moxley Moxley.Bret@epamail.epa.gov 415-972-3114 Former Remedial Project Manager			
Site Name		EPA ID No.		Date of Interview	Interview Method via
Fresno Municipal Sanitary Landfill		CAD 98036914		5/4/05	Phone <input checked="" type="checkbox"/> Fax/email <input type="checkbox"/> In person <input type="checkbox"/>
Interview Contacts	Organization	Phone	Email	Address	
Lisa Hanusiak	US EPA Region 9	(415)972-3152	Hanusiak.lisa@epa.gov	75 Hawthorne Street San Francisco, CA 94105	
Debbie Seibold	CH2M HILL / SFO, as rep of EPA	(510) 587-7700	dseibold@ch2m.com	155 Grand Ave, Suite 1000 Oakland, CA 94612	
Interview Questions					
1. What was your relationship to the site?					
Response: Remedial Project Manager about 12 years ago – left just after the 1993 ROD.					
2. What was the status of the site when you were Remedial Project Manager for the site? What were the major concerns for the site?					
Response:					
- There were only a few monitoring wells and the landfill barrier at the time. The landfill barrier was not properly installed - the impermeable membrane was not placed in correctly.					
- Around six houses were sampled for vinyl chloride. There was little public concern – one resident was concerned about any stress this could cause on his strawberry vegetation. Another resident wanted to sell and was interested in the effect on their property value. Another resident had two small children and therefore was concerned.					
- A public meeting was held to discuss an aspect of the site – it was either about the indoor air sampling or in advance to the ROD.					
- There was a fence around the landfill to keep the public off of it. There wasn't any vandalism or trespassing.					

Five-Year Review Interview Record		Interviewee: Pete Phillips URS Corporation 916-679-2259			
Site Name		EPA ID No.		Date of Interview	Interview Method via
Fresno Municipal Sanitary Landfill		CAD 98036914		4/06/2005	Phone <input type="checkbox"/> Fax/email <input type="checkbox"/> In person <input checked="" type="checkbox"/>
Interview Contacts	Organization	Phone	Email	Address	
Lisa Hanusiak	US EPA Region 9	(415)972-3152	Hanusiak.lisa@epa.gov	75 Hawthorne Street San Francisco, CA 94105	
Tina Girard	CH2M HILL / SFO, as rep of EPA	(510) 587-7586	Tgirard@ch2m.com	155 Grand Ave, Suite 1000 Oakland, CA 94612	
Interview Questions					
<p>1. What is your current role as it relates to the site? What is your overall impression of the work conducted at the site to date? (general sentiment)</p> <p>Response: Technical oversight contractor to U.S. EPA. Good to excellent PRP has managed to complete the primary elements of implementing the remedial design under difficult conditions. PRP continues to support the RD/RA activities in a responsible manner.</p>					
<p>2. What is the current status of construction? Have any problems or difficulties been encountered that have impacted construction progress or implementability?</p> <p>Response: Construction complete, shake-down complete. Some operational difficulties associated with groundwater chemistry have been solved and long term evaluation of the current groundwater extraction strategy is currently being conducted.</p>					
<p>3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc) conducted by your office regarding the site? If so please give purpose and results.</p> <p>Response: URS continually evaluates operational reports submitted by the PRP. The regulatory remedial project managers meetings are held at the site on a routine basis. Construction complete. Final inspections have all occurred.</p>					

4. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Have any new or emerging COCs been identified? If so, have they impacted the effectiveness of the remedy?

Response:

Monitoring data are continually evaluated. Migration of contaminant plume past the toe of the landfill has ceased. Capture zone analysis is currently underway.

No new emerging COC's have been identified.

5. Is there a continuous on-site O&M presence? If so, please describe staff and activities. If there is not a continuous on-site presence, describe staff and frequency of site inspections and activities.

Response:

Yes, City of Fresno staff operate the groundwater treatment and landfill gas plume components of the treatment facility.

The site operates in automatic mode overnight and on weekends.

6. Have there been unexpected O&M difficulties or costs at the site in the last five years? If so, please give details.

Response:

No difficulties outside of the typical "start-up" type of shake down adjustments and modifications.

7. Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.

Response:

Too early for optimization evaluation of O&M.

8. Are you aware of any institutional controls, site access controls, new ordinances in place, changes in actual or projected land use, complaints being filed or unusual activities at the site? If so, please describe in detail.

Response:

Institutional controls regarding construction of new domestic supply and industrial supply wells are currently under review by the PRP legal staff.

9. Have any problems been encountered which required, or will require changes to this remedial design or ROD?

Response:

No, however, evaluation of the Phase I remedial strategy is currently under way with possible implementation of the Phase II strategy.

10. Do you have any comments, suggestions, or recommendations regarding the site?

Response:

Site team including the PRP staff, their consultants and regulatory members work in an excellent cooperative environment.

Five-Year Review Interview Record		Interviewee: Bruce Myers Regional Water Quality Control Board			
Site Name		EPA ID No.		Date of Interview	Interview Method via
Fresno Municipal Sanitary Landfill		CAD 98036914		3/10/2005	Phone <input type="checkbox"/> Fax/email <input type="checkbox"/> In person <input checked="" type="checkbox"/>
Interview Contacts	Organization	Phone	Email	Address	
Lisa Hanusiak	US EPA Region 9	(415)972-3152	Hanusiak.lisa@epa.gov	75 Hawthorne Street San Francisco, CA 94105	
Tina Girard	CH2M HILL / SFO, as rep of EPA	(510) 587-7586	Tgirard@ch2m.com	155 Grand Ave, Suite 1000 Oakland, CA 94612	
Interview Questions					
<p>1. What is your relationship to the site? What is your overall impression of the work conducted at the site to date? (general sentiment)</p> <p>Response: Relationship to the site is Project Manager for the Regional Water Quality Control Board (RWQCB) since late 2003. DTSC encouraged RWQCB's involvement when OU2 remedial action started. Overall, the work conducted at the site has been good. There is a need to continue to evaluate the site based on new data collected.</p>					
<p>2. Do you feel well informed about the site's activities and progress?</p> <p>Response: Yes, well informed. There is always open communication. CDM keeps RWQCB informed of field activities and other site progress.</p>					
<p>3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc) conducted by your office regarding the site? If so please give purpose and results.</p> <p>Response: For the RWQCB there is no specific inspection schedule. Once waste discharge requirements are adopted, then there will be regular site inspections, etc. The groundwater treatment system discharges treated water to onsite ponds, therefore NPDES does not apply, but waste discharge requirements (WDRs) will apply. Once WDRs are in place, monthly reporting will be required. The first round of WDR baseline sampling was performed and reported in the fourth quarter 2004 monitoring report.</p>					

4. Is the remedy functioning as expected? How well is the remedy performing?

Response:

There has been a large decrease in the water table since system design; therefore full capture of the plume at the edge of the landfill is not occurring. The initial plan was for full capture at the edge of the landfill. Phase I, II, and III implementation of remedial actions was accounted for in the ROD. If Phase I is successful this could negate the need for Phase II and Phase III. Because of the decreased water table the Phase I system cannot capture the entire plume; therefore there has been plume movement. Currently, we may not completely understand the hydrogeology of the site. A-zone extraction wells are pulling a lot of water from the B-zone. The groundwater model was not corrected based on initial real world data. The Phase I evaluation will be completed once four quarters of sampling data have been collected following the destruction of the agricultural wells (January 2005?) at which time the model will be corrected.

5. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Have any new or emerging COCs been identified? If so, have they impacted the effectiveness of the remedy?

Response:

There is vertical plume movement between the A and B-zones. Preliminary Phase I assessment concentration plots show: 25% of wells are increasing, 40% steady state, and 35% of wells are decreasing. Looking at paired wells, there is vertical movement in the aquifer. When the pumping at A-zone wells is increased there is a large decrease in concentration in A-zone wells; however the concentration in B-zone wells increased. The agricultural wells influenced plume movement. The general groundwater flow direction is to the south and west.

When evaluating the dissolved oxygen data from the field data sheets, the concentration mimics the vinyl chloride data. There is vinyl chloride at the site due to reducing conditions at the landfill. Dissolved oxygen ranged from 0.1 to 6 or 7 mg/L (background concentrations). The model needs to be calibrated to incorporate the affects of agricultural well pumping. Data is not available for the historic pumping rates of the agricultural wells; therefore general assumptions of the agricultural wells pumping rates should be added to the model. Uncertain if emerging COCs have ever been sampled for at the site. There could be perchlorate present from the Chilean nitrate fertilizer.

6. Are you aware of any institutional controls, site access controls, new ordinances in place, changes in actual or projected land use, complaints being filed or unusual activities at the site? If so, please describe in detail.

Response:

There is a well prohibition institutional control (IC) program in progress. Within the City of Fresno, an application for a well permit is required prior to installation. The City will implement an IC program to restrict well installation in the site area.

7. Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.

Response:

May be able to decrease monitoring frequency given the large history of data but conditions may change now that the agricultural wells have been destroyed. We may need to sample monitoring wells near recently destroyed agricultural wells more frequently until a baseline can be established.

8. Are you aware of any ongoing community concerns regarding the site or its administration?

Response:

No

9. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or emergency response from local authorities?

Response:

None

10. Do you have any comments, suggestions, or recommendations regarding the site?

Response:

Evaluate the groundwater plume and take action as necessary.

Additional comments/information:

-There are no site monitoring wells as deep as the new agricultural replacement wells.

-A-zone depth to water is approximately 80 feet below ground surface.

-Currently, the groundwater extraction system is drawing a substantial amount of water from the B-zone. The aquitard between the A and B-zones is not competent. Even if an extraction well is screened in the A zone it is extracting water from the B-zone. The pumping rate, K, and heads between zones indicate water from other zones is being extracted.

-There is a lot of dissolved organic matter coming from the southern portion of the landfill; high concentration and high mass flux. It is imposing locally reducing conditions and forming vinyl chloride from PCE and TCE in groundwater.

Five-Year Review Interview Record		Interviewee: Emanuel Mensah Department of Toxic Substance (DTSCs) Phone: 916-255-3704			
Site Name		EPA ID No.		Date of Interview	Interview Method via
Fresno Municipal Sanitary Landfill		CAD 98036914		3/22/05	Phone <input checked="" type="checkbox"/> Fax/email <input type="checkbox"/> In person <input type="checkbox"/>
Interview Contacts	Organization	Phone	Email	Address	
Lisa Hanusiak	US EPA Region 9	(415)972-3152	Hanusiak.lisa@epa.gov	75 Hawthorne Street San Francisco, CA 94105	
Tina Girard	CH2M HILL / SFO, as rep of EPA	(510) 587-7586	Tgirard@ch2m.com	155 Grand Ave, Suite 1000 Oakland, CA 94612	
Interview Questions					
<p>1. What is your relationship to the site? What is your overall impression of the work conducted at the site to date? (general sentiment)</p> <p>Response: Relationship is the Project Manager at DTSC for the past 4 years. Overall good work has been conducted at the site.</p>					
<p>2. Do you feel well informed about the site's activities and progress?</p> <p>Response: Yes</p>					
<p>3. Have there been routine communications or activities (site visits, inspections, reporting activities, etc) conducted by your office regarding the site? If so please give purpose and results.</p> <p>Response: Attend team meetings regularly in person or by conference call.</p>					

4. Is the remedy functioning as expected? How well is the remedy performing?

Response:

The groundwater treatment system is functioning as expected.
The flare system is functioning properly after increasing temperature following the first performance test.

5. What does the monitoring data show? Are there any trends that show contaminant levels are decreasing? Have any new or emerging COCs been identified? If so, have they impacted the effectiveness of the remedy?

Response:

Overall the concentrations in soil gas and groundwater are decreasing.
A comprehensive evaluation of COCs has been performed.

6. Are you aware of any institutional controls, site access controls, new ordinances in place, changes in actual or projected land use, complaints being filed or unusual activities at the site? If so, please describe in detail.

Response:

Not aware of any institutional controls; there are site access control in place.

7. Would you say that O&M and/or sampling efforts have been optimized? Please describe how improved efficiency has or has not occurred.

Response:

Uncertain

8. Are you aware of any ongoing community concerns regarding the site or its administration?

Response:

Minor concerns from neighbors regarding their wells and site contaminants.

9. Are you aware of any events, incidents, or activities that have occurred at the site, such as dumping, vandalism, trespassing, or emergency response from local authorities?

Response:

No emergency responses, etc....

10. Do you have any comments, suggestions, or recommendations regarding the site?

Response:

None.