

C.7 OAKLAND OPERATIONS OFFICE SUMMARY

NOTE: This site summary provides information and data for sites under the Department's Oakland Operations Office. The data for this summary were collected in 1999 and do not necessarily reflect funding or completion profiles for the site. The data do not include changes that resulted from actual FY 2000 appropriations or anticipated changes as a result of both FY 2000 supplemental and FY 2001 budget requests. The Department is in the process of updating its life-cycle information for the EM program.

The 1999 data were the basis for DOE's *Status Report on Paths to Closure* (March 2000). The costs in the "Cost and Completion Date" section of this summary are the sum of the project planning baselines prepared by the field office and generally do not include estimates of project uncertainty. On the other hand, the cost range in the national status report includes an estimate of the cost resulting from project uncertainties, and EM's overall estimate of life-cycle costs of \$151-195 billion from FY 2000 to FY 2070 (or \$168-\$215 billion if the costs incurred between FY 1997 and FY 2000 are included in the cost range estimate).

The Oakland Operations Office oversees a wide range of programs at sites throughout California and one site in New York State. Activities include contract administration, site management, overseeing operations, and providing program execution activities for Department of Energy (DOE) initiatives and programs. These initiatives include risk management at multiple research facilities, which are contaminated with various hazardous and radioactive materials. The Office of Environmental Management (EM) activities at each of these sites vary from waste management to cleanup and technology development. After the EM mission is complete, most sites have ongoing research missions.

The *Energy Technology Engineering Center (ETEC)* is located in the Simi Hills of Ventura County, approximately

30 miles northwest of downtown Los Angeles. ETEC consists of government-owned buildings that occupy 90 acres of land owned by Boeing North American, Rocketdyne Division at the Santa Susana Field Laboratory. ETEC was established in the mid-1960s as a Department of Energy (DOE) laboratory to support nuclear research and energy development projects. All nuclear-related research ended by 1989. Office of Nuclear Energy activities at ETEC were terminated at the end of 1995. At ETEC, the EM cleanup mission is focused primarily on remediating contaminated groundwater and soils in addition to the

decontamination and decommissioning (D&D) of several buildings, prior to returning the facility back to Boeing North America.

General Atomics (GA) occupies two contiguous sites that are located approximately 13 miles north of downtown San Diego. The overall mission of the EM program at GA is the decontamination and demolition of the Hot Cell Facility and the remediation of the surrounding contaminated soils. The Hot Cell Facility, which GA owns and operates, was used for numerous post-irradiation examinations of DOE fuels, structural materials, reactor dosimetry materials, and instrumentation.

The **General Electric Vallecitos Nuclear Center (GE)** is a privately owned commercial site where past DOE fuel examination activities were responsible for contaminating GE high-level Hot Cell #4 and the Emissions Spectrograph (a.k.a. Glovebox). EM activities at GE are limited to the cleanup of these two areas.

The cleanup mission at the **Geothermal Test Facility (GTF)** was completed in the first quarter of FY 1997.

The **Laboratory for Energy-Related Health Research (LEHR)** is an inactive research facility where, for a period of 30 years, DOE and its predecessors funded radiation-related studies using animals. The DOE research program, concluded in 1988, was conducted by the University of California at Davis (UCD). In 1990, DOE initiated site restoration activities with emphasis on facility decontamination and the removal of on-site radioactive, chemical, and potential mixed sources. In 1994, LEHR, along with the UCD landfills and burial trenches, were added to the U.S. Environmental Protection Agency's (EPA) National Priority List (NPL). Under the terms of an agreement between DOE and UCD, DOE is responsible for the remediation of contaminated areas including domestic and septic tanks, burial trenches, dry wells, underground waste treatment facilities, leach fields, and about four acres of outside dog pen facilities.

The **Lawrence Berkeley National Laboratory (LBNL)** occupies 134 acres adjacent to the Berkeley Campus of the University of California. In the early 1930s, the University of California leased land to DOE for the construction of LBNL where DOE conducted numerous research activities. Buildings were constructed for a wide variety of energy-related research areas, including nuclear and high-energy physics, accelerator research and development, materials research, geology, molecular biology, and biomedical research. EM activities at LBNL involve remediation of soil and groundwater contamination produced by those activities.

Lawrence Livermore National Laboratory (LLNL) is composed of two non-contiguous sites, the *Lawrence Livermore National Laboratory–Main Site* and the *Lawrence Livermore National Laboratory–Site 300*, both located approximately 50 miles east of San Francisco. DOE and the University of California jointly operate both sites. In 1942, the LLNL Main Site was converted from agricultural use by the U.S. Navy. The site was used as a flight training base and for aircraft assembly, repair, and overhaul. In 1952 the site was transferred to the Atomic Energy Commission (AEC). Under AEC, the site became a weapons design and basic physics laboratory and continues with this mission under DOE today. Initial releases of hazardous materials occurred at the Lawrence Livermore Main Site in the 1940s when the site was a Naval air station. There is also evidence that localized spills, leaking tanks, and impoundments and landfills contributed volatile organic compounds (VOCs), fuel hydrocarbons, metals, and tritium to groundwater and unsaturated sediments after the Navy era. LLNL Main Site was added to the EPA’s NPL in 1987. The purpose of the EM project at LLNL is to characterize existing contamination and to remediate soil and groundwater, as well as manage and implement ongoing and planned waste management operations conducted at LLNL. EM will ensure that hazardous, radioactive, and mixed wastes are stored, treated, certified, and disposed of in compliance with federal, state and local regulations; DOE Orders; and LLNL policies. Simultaneously, EM will ensure that these activities involve stakeholders and are implemented in an efficient and cost-effective risk management manner.

LLNL–Site 300 was placed on the NPL in 1990 principally because of high concentrations of trichloroethylene (TCE) in groundwater and two off-site TCE groundwater plumes. A Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Federal Facility Agreement was negotiated between DOE/LLNL, EPA, the State Department of Toxic Substances Control, and the California Central Valley Regional Water Quality Control Board. The LLNL–Site 300 agreement was finalized in 1992 and the LLNL–Main Site agreement was finalized in 1988.

The *Separations Process Research Unit (SPRU)*, located at Knolls Atomic Power Laboratory near Schenectady, New York, is an inactive complex requiring D&D. SPRU was a pilot plant used for developing both the Reduction and Oxidation Process and the Plutonium-Uranium Extraction Process for extracting uranium and plutonium from irradiated fuel. As a result of this work conducted by the Materials Production Division of the AEC in the early 1950s, associated buildings and the surrounding ground became contaminated. The complex, in

standby status since 1953, has been accepted into the D&D Program. Until such decommissioning activities begin, a surveillance and monitoring program is in place to ensure that the facility remains in a stable condition and that it does not present an unacceptable risk to the public, the environment, or the on-site work force.

The *Stanford Linear Accelerator Center (SLAC)* is a high-energy research facility, established in 1962, which is owned and operated by Stanford University under contract to DOE. SLAC's four major experimental facilities are the Linear Accelerator, the Positron Electron Project Storage Ring, the Stanford Positron Electron Asymmetric Ring, and the SLAC Linear Collider. The primary objective of SLAC's EM program is to clean up contaminated soils and groundwater and to return the land to the site landlord, the Office of Science.

C.7.1 End State

Exhibit C.7-1 provides a summary of the anticipated end states for the Oakland Operations Office sites.

Exhibit C.7-1
Summary of Oakland Operations Office End States

Site Name	End State Description
Energy Technology Engineering Center	The Office of Environmental Management is responsible for restoration of the site. Restoration is scheduled to be complete by FY 2007. At that time, the site will be turned over to Boeing North American, the owner of the Santa Susana Field Laboratory. All wastes are being shipped off site. The end state use will likely be industrial.
General Atomics	The site is expected to be fully cleaned up in FY 2000, excluding the shipment of irradiated fuel materials (in FY 2005) to the Idaho National Engineering and Environmental Laboratory for interim storage. Completion of cleanup will include the decontamination and demolition of the Hot Cell Facility and the remediation of the surrounding contaminated soils. The site will then be released by the Nuclear Regulatory Commission, and the State of California, for unrestricted use. Soil cleanup limits are based on an industrial land use. All wastes are being shipped off site, some to the Hanford Site, and some to a commercial facility. DOE will maintain liability at the site until all waste and irradiated fuel materials are off site.

Exhibit C.7-1
Summary of Oakland Operations Office End States

Site Name	End State Description
General Electric Vallecitos Nuclear Center	Restoration of this site is expected to be complete by FY 2008, at which time DOE will have no further obligations to GE. The Hot Cell will be turned over to GE, which plans on using it commercially, though a portion of the site will be zoned industrial.
Geothermal Test Facility	The site was completed in the first quarter of FY 1997, and was turned over to the Bureau of Land Management in 1997 for unrestricted use. The brine pond waste material was removed and disposed of offsite. No long-term monitoring, surveillance, or maintenance is required. A National Environmental Policy Act categorical exclusion was issued in accordance with 10 CFR 1021, Appendix B6.1.
Laboratory for Energy-Related Health Research	Site cleanup will be complete by 2004. Closure of the Resource Conservation & Recovery Act of 1976 (RCRA) storage facility is expected to end by FY 2001. University of California at Davis is responsible for a radioactive waste burial trench and three landfills that are on the site as well as post-closure monitoring. The four buildings that DOE is responsible for cleaning up will be released for unrestricted use. All waste will be shipped off site.
Lawrence Berkeley National Laboratories	LBNL has an ongoing mission with continued generation of hazardous, mixed, and radioactive wastes. Ongoing mission, waste, handling operations, and facilities operations will continue after site restoration and legacy waste disposition are complete. Cleanup of contamination from past releases will be completed in 2003. A groundwater treatment system is scheduled to be in place by 2003. Clean closure of the Hazardous Waste Handling Facility (HWHF) was completed in FY 1998 and construction of a new HWHF was completed in FY 1997.

Exhibit C.7-1
Summary of Oakland Operations Office End States

Site Name	End State Description
Lawrence Livermore National Laboratory (Main Site)	LLNL expects to continue to occupy and conduct research indefinitely at the LLNL–Main Site. Future land use is expected to be industrial. VOCs have contaminated groundwater sources on and off site. Remediation of the soil and groundwater is in progress. By 2007, all of the soil and groundwater treatment facilities will be operating and the landlord program (Defense Program) will only be responsible for long-term operation and maintenance. No solid waste disposal will occur on site. Waste management operations will remain active and functioning to support LLNL waste generator operations in the accomplishment of their respective mission goals as the site has an ongoing mission resulting in continued generation of hazardous, radioactive, and mixed wastes. Ongoing mission waste, handling operations, and facilities will continue after site cleanup and legacy waste disposition activities are complete. It is anticipated that waste management operations in their present configuration and scope will be transferred to the landlord/generator, thereby ensuring generator accountability for the waste management program. The intent is to provide an incentive for generators to reduce waste generation rates, resulting in lower treatment, storage, and disposal operating costs. Details of such a transfer have yet to be finalized, but it is anticipated to be accomplished before FY 2007. DOE will continue to own and manage the site.
Lawrence Livermore National Laboratory (Site 300)	LLNL expects to continue to occupy and conduct research at LLNL–Site 300 indefinitely. All cleanup will be completed by FY 2008 and groundwater treatment systems will be in place and operational by FY 2008. Access will continue to be controlled. The land will continue to be a mix of industrial and wildlife areas. No solid waste disposal will occur on site.
Separations Process Research Unit	All radiological and hazardous waste (Low-Level Waste, Mixed Low-Level Waste, Transuranic, and Mixed Transuranic) will be disposed of off site. The majority of cleanup activities will occur between 2006 and 2014. The area will be remediated, then released for unrestricted use.

Exhibit C.7-1
Summary of Oakland Operations Office End States

Site Name	End State Description
Stanford Linear Accelerator Center	By 2002, this site has an ongoing mission as an active research facility. Environmental Restoration will complete cleanup of the contaminated areas and the site will be returned to the Office of Science. A network of wells has been installed to monitor groundwater contamination. Long-term monitoring responsibilities will be transferred to the site landlord, the Office of Science. Contaminants will likely remain in the soil at depths of ten to 20 feet near the Former Solvent Underground Storage Tank Area.

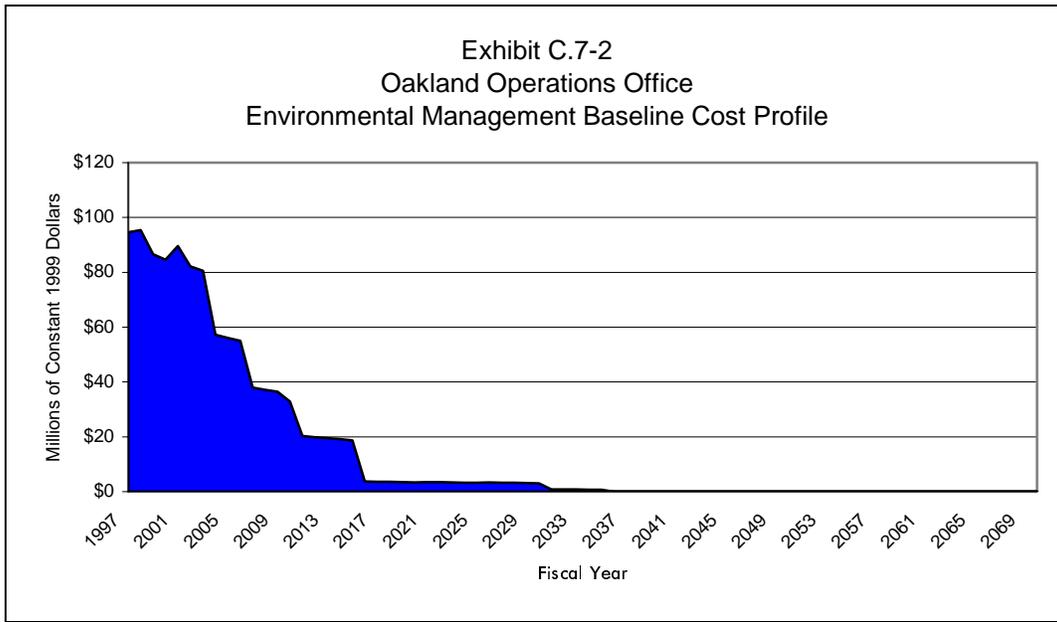
C.7.2 Cost and Completion Dates

The Oakland Operations Office has divided its EM work into 23 discrete projects. A project baseline summary (PBS) exists for each project and contains detailed programmatic information, including cost, schedule, scope, end state, and interim milestones. For additional information about these projects, refer to the individual PBSs.

The sum of the costs of the planning baselines for individual projects managed by the Oakland Operations Office's EM work scope is \$1.1 billion (constant 1999 dollars). This estimate does not include approximately \$0.7 billion (constant 1999 dollars) in costs associated with the generation of new wastes that are expected to be transferred back to the generator at two sites, nor the long-term surveillance and maintenance costs at some of the sites. The overall site completion dates of EM work scope (excluding long-term surveillance and maintenance (LTS&M)) are as follows:

Site	Date
Energy Technology Engineering Center	2007
General Atomics Site	2000
General Electric Vallecitos Nuclear Center	2008
Geothermal Test Facility	1997
Laboratory for Energy-Related Health Research	2004
Lawrence Berkeley National Laboratory	2003
Lawrence Livermore National Laboratory - Main Site	2007
Lawrence Livermore National Laboratory - Site 300.	2008
Separations Process Research Unit	2014
Stanford Linear Accelerator Center	2002

The projected cost profile for environmental management associated with the Oakland Operations Office is developed by combining the cost estimates in each of the PBSs. Exhibit C.7-2 displays the resultant baseline cost profile.



C.7.3 Accomplishments Since the 1998 *Paths to Closure* Report

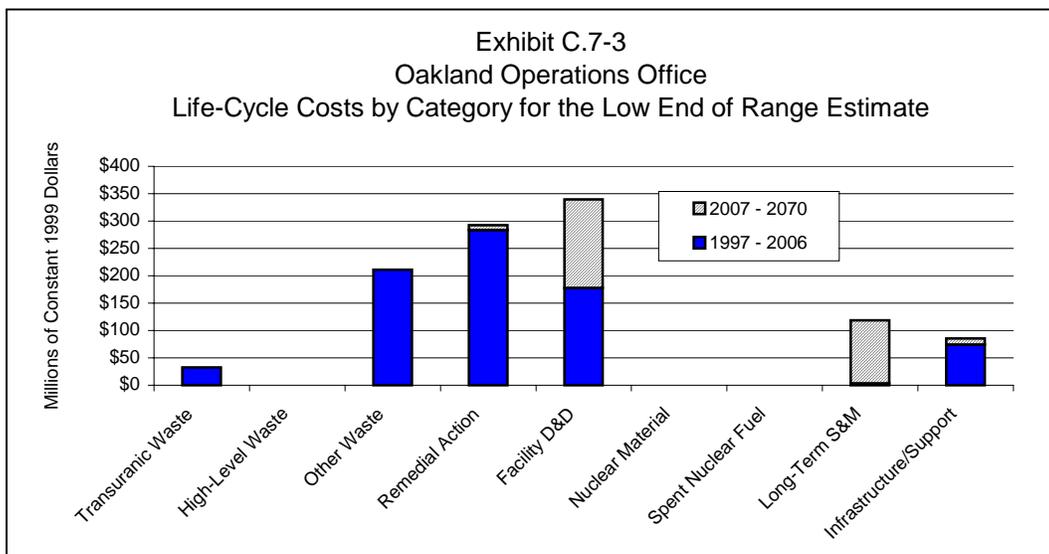
The Oakland Operations Office has made significant progress since the 1998 *Paths to Closure* report including:

- ❑ Shipped more than 690 cubic meters of low-level waste to the Nevada Test Site;
- ❑ Completed construction of the Explosive Waste Treatment Facility at LLNL–Site 300 and started treatment operations;
- ❑ Completed closure of the hazardous waste handling facility at LBNL;
- ❑ Received regulatory approval for site-wide micro-purging;
- ❑ Completed the emergency removal action of PCB contaminated capacitors without impacting the National Ignition Facility schedule at LLNL–Main Site; and
- ❑ Removed a portion of the Southwest Trenches at LEHR.

C.7.4 Work Scope Summary

The EM cleanup mission at Oakland Operations Office involves work at nine remaining sites. Cleanup activities at these sites include the management of groundwater contaminated with VOCs at LLNL and the management of TRU waste at the SPRU. In addition, EM has responsibility for the treatment, storage, and disposal of hazardous, radioactive, and mixed wastes to support site generator programmatic missions. More information about work scope can be found at the following websites, which contain links to the conceptual summary disposition maps (<http://emi-web.inel.gov/summary.html>) and the detailed disposition maps (<http://emi-web.inel.gov/dmaps.html>) in PDF format.

Exhibit C.7-3 illustrates Oakland Operations Office EM costs by major work scope category. Most costs after 2006 are associated with LTS&M and the D&D of SPRU.



C.7.5 Critical Closure Path and Programmatic Risk

The critical closure path schedule presented as Exhibit C.7-4 sets forth the estimate for completing the closure activities, some of which have high programmatic risk at the Oakland Operations Office. The bars on the critical closure path schedule represent critical activities. The Oakland Operations Office's critical closure path reflects those cleanup activities that are key to achieving completion of the sites' cleanup missions and end states.

Completion of the EM mission at the Oakland Operations Office as scheduled will depend on the timely accomplishment of critical activities. Exhibit C.7-5 presents a summary of milestones on the critical closure path that have high programmatic risk (programmatic risk scores of 4 or 5 in any category). Exhibit C.7-6 displays a summary of waste disposition data that have high programmatic risk (programmatic risk score of 4 or 5 in any category).

Exhibit C.7-4
Oakland Operations Office
Critical Closure Path

PBS	Project Description	97-98	99-00	01-02	03-04	05-06	07-08	09-10	11-12	13-14	15-16	17-18	19-20	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	
	LAWRENCE LIVERMORE NATIONAL LABORATORY																					
OAK-001	LLNL Livermore Main Site																					
OAK-002	LLNL Livermore Site 300																					
OAK-021	LLNL Base Program	Action extends to 2070																				
OAK-026	LLNL General Plant Project	Action extends to 2070																				
OAK-027	LLNL Decontamination Water Treatment Facility																					
OAK-041	LLNL Accelerated Waste Treatment																					
	LAWRENCE BERKELEY NATIONAL LABORATORY																					
OAK-003	LBNL Remediation																					
OAK-004	LBNL Hazardous Waste Handling Facility																					
OAK-015	LBNL Legacy Waste																					
OAK-016	LBNL Newly Generated Waste	Action extends to 2070																				
	STANFORD LINEAR ACCELERATOR CENTER																					
OAK-006	SLAC Remediation																					
	ENERGY TECHNOLOGY ENGINEERING CENTER																					
OAK-007	ETEC Remediation																					
OAK-009	ETEC Landlord																					
OAK-042	ETEC Waste Management																					

PBS	Project Description	97-98	99-00	01-02	03-04	05-06	07-08	09-10	11-12	13-14	15-16	17-18	19-20	21-22	23-24	25-26	27-28	29-30	31-32	33-34	35-36	
	LABORATORY for ENERGY and HEALTH-RELATED RESEARCH																					
OAK-010	LEHR Remediation																					
OAK-014	LEHR Waste Management																					
	GENERAL ATOMICS																					
OAK-012	General Atomics D&D																					
	GENERAL ELECTRIC																					
OAK-013	General Electric D&D																					
	SEPARATION PROCESS RESEARCH UNIT																					
SP-SPRU	SPRU D&D																					
	OAKLAND OPERATIONS OFFICE																					
OAK-040	Grants																					

Exhibit C.7-4
Oakland Operations Office
Critical Closure Path

Exhibit C.7-5
Oakland Operations Office
Summary of High Programmatic Risk Milestones

Site	Project, Action, Event	Dates	Programmatic Risk Categories*		
			Technological	Work Scope Definition	Intersite Dependency
Energy Technology Engineering Center	Start of TRU Waste	October 2002	4	5	5
	Corrective Measures Study	October 2002	1	4	1
	End of TRU Waste	January 2005	4	5	5
General Atomics	Package and Ship Irradiated Fuel Materials to INEEL for Interim Storage	September 2005	1	4	4
Laboratory for Energy-Related Health Research	Complete Cleanup Verification for DOE Areas	February 2003	4	3	2
	Complete Western Dog Pens Area Removal Action	February 2003	4	3	2
	Project Mission Complete	September 2004	4	3	2
	Close Out of EM-40 Project	September 2006	4	3	2
Separations Process Research Unit	Complete Release Site 5, SWMU-035, Former Slurry Drum Staging Area	September 2014	3	3	4

*For a discussion of programmatic risk categories, see Appendix D on the Internet site <http://www.em.doe/closure/>.

Exhibit C.7-6
Oakland Operations Office
Summary of High Programmatic Risk Waste Disposition Data

Site	Stream Name	Waste Stream Activity Name	Programmatic Risk Categories*		
			Technological	Work Scope Definition	Intersite Dependency
Energy Technology Engineering Center	TRU Waste (from ER)	Collect & Dispose	1	5	1
Lawrence Berkeley National Laboratory	LLW Aqueous	Treatment	4	3	1
Laboratory for Energy-Related Health Research	Control (CH) TRU Aqueous Liquids (Non-Defense)	To Be Determined	1	5	1
Laboratory for Energy-Related Health Research	Cobalt 60 Source	Other Processing	1	3	4
Lawrence Livermore National Laboratory	High Organic Sludges-DOE TBD	Treatment	1	3	5

*For a discussion of programmatic risk categories, see Appendix D on the Internet site <http://www.em.doe/closure/>.