

# COMPLIANCE SUMMARY

## Introduction

During 2002, Lawrence Livermore National Laboratory participated in numerous activities to comply with federal, state, and local environmental regulations as well as internal requirements and applicable U.S. Department of Energy (DOE) orders. This chapter, which is organized according to the various laws and regulations that drive LLNL's compliance activities, describes those activities LLNL carried out related to air, water, waste, waste reduction, community "right to know," protection of sensitive resources, and other environmental issues at the Livermore site and Site 300. A wide range of compliance activities is summarized in this chapter. Compliance activities specific to the applicable DOE orders are discussed in the chapters that follow. Applicable DOE orders are those identified in LLNL's Work Smart Standards (WSS), a set of environmental, safety, and health standards specific to operations at LLNL that are discussed in [Chapter 3](#). Other environmental program information, including the environment, safety, and health management system and pollution prevention and waste minimization activities, is also discussed in [Chapter 3](#). Many documents concerning these activities and other environmental topics are available for public viewing at the LLNL Visitors Center, the Livermore and Tracy public libraries, or on the Internet at <http://www-envirinfo.llnl.gov>.

## Comprehensive Environmental Response, Compensation and Liability Act

Ongoing groundwater investigations and remedial activities at the Livermore site and Site 300 are called the Livermore Site Ground Water Project (GWP) and the Site 300 CERCLA Project, respectively. These activities fall under the jurisdiction of the Comprehensive Environmental Response,





Compensation and Liability Act (CERCLA), Title I of the Superfund Amendments and Reauthorization Act (SARA). As part of work on these projects, DOE and LLNL also continued community relations activities. These projects and activities are described in the following sections.

### **Livermore Site Ground Water Project**

The Livermore site became a CERCLA site in 1987 when it was placed on the National Priorities List. The GWP at the Livermore site complies with provisions specified in a federal facility agreement (FFA) entered into by the U.S. Environmental Protection Agency (EPA), DOE, the California EPA's Department of Toxic Substances Control (DTSC), and the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). As required by the FFA, the project addresses compliance issues by investigating potential contamination source areas (such as suspected old release sites, solvent-handling areas, and leaking underground tank systems), through continuous monitoring and by the remediation of groundwater.

The groundwater contaminants (constituents of concern) are volatile organic compounds (VOCs), primarily trichloroethene (TCE) and tetrachloroethene (PCE). For the most part, these contaminants are present within the site boundary but are also present to some extent beyond the boundary, mainly to the west and south of the site (see **Figures 8-3 to 8-8**).

In 2002, DOE and LLNL submitted documents required by the CERCLA and the Livermore site FFA. In addition, DOE and LLNL continued environmental restoration and community activities as discussed below.

### **Documentation**

As required by the FFA, DOE and LLNL issued the *Ground Water Project 2002 Annual Report* (Dibley et al. 2003) on schedule on March 31, 2003. DOE and LLNL also issued six final Remedial Project Managers' (RPMs') meeting summaries. Quarterly self-monitoring data were reported in letter reports (Bainer and Abbott 2002; Bainer and Joma 2002a, 2002b, 2003a).

### **Milestones and Activities**

In 2002, DOE/LLNL completed all 2002 Remedial Action Implementation Plan (RAIP) milestones (Dresen et al. 1993). One milestone (Treatment Facility C-East remediation) was delayed with regulatory concurrence because new work was not authorized under the terms and provisions of a Federal Budget Continuing Resolution at the beginning of Fiscal Year 2002.

Milestones in 2002 for the GWP included constructing Treatment Facility C East (TFC-E) and Treatment Facility 406 Northwest (TF406-NW), expanding soil vapor treatment facility 5475 (VTF5475), and preparing a five-year review. Other 2002 GWP activities included operating 27 groundwater treatment facilities and 1 soil vapor treatment facility, operating 82 groundwater extraction wells, installing 10 new wells, and conducting 7 hydraulic tests. In addition to the extraction wells, the Livermore site currently has 512 monitor wells.

### **Treatment Facilities**

DOE and LLNL operated treatment facilities TFA, TFB, TFC, TFD, TFE, TFG, TF406, TF518, and TF5475 in 2002. A total of 82 groundwater extraction wells operated at an average flow rate of 2,572,000 L/day. Vapor treatment facility VTF5475 operated at an average flow of 393 m<sup>3</sup>/day from 1 soil vapor extraction well. Together, the groundwater and vapor treatment facilities removed approximately 146 kg of VOC



mass in 2002 compared to 215 kg in 2001. Since remediation began in 1989, approximately 7.4 billion L of groundwater and more than 1,076,000 m<sup>3</sup> of vapor have been treated, removing more than 1,380 kg of VOCs. See [Chapter 8](#) for further information.

### Community Relations

The Community Work Group (CWG) met once in 2002 to discuss the DOE budget, the Consensus Statement, and progress of the Livermore site cleanup. Correspondence and communication continued with CWG members throughout the year. DOE and LLNL met three times with members of Tri-Valley Communities Against a Radioactive Environment (CAREs) and their scientific advisor as part of the activities funded by an Environmental Protection Agency Technical Assistance Grant (TAG).

Other Livermore site community relations activities in 2002 included communications and meetings with neighbors, local, regional, and national interest groups, and other community organizations; making public presentations; producing and distributing the Environmental Community Letter; maintaining the Information Repositories and the Administrative Record; conducting tours of the site environmental activities; and responding to public and news media inquiries. In addition, community questions were addressed via e-mail, and project documents, letters, and public notices were posted on a public website at <http://www-envirinfo.llnl.gov>.

### Site 300 CERCLA Project

Investigations and remedial activities are ongoing at Site 300, which became a CERCLA site in 1990, when it was placed on the National Priorities List. Investigations and remedial activities are conducted under the joint oversight of the EPA, the Central Valley Regional Water Quality Control Board

(CVRWQCB), California EPA's DTSC, and the authority of an FFA for the site. (There are separate FFAs for Site 300 and the Livermore site.)

During 2002, LLNL performed all actions stipulated in the FFA and maintained liaison with community groups. Results and status for Site 300 environmental restoration operable units are discussed in [Chapter 8](#). Background information for LLNL environmental characterization and restoration activities at Site 300 can be found in the *Final Site-Wide Remedial Investigation Report, Lawrence Livermore National Laboratory Site 300* (Webster-Scholten 1994) and *Final Site-Wide Feasibility Study for Lawrence Livermore National Laboratory Site 300* (Ferry et al. 2000).

### Documentation

LLNL submitted all required documentation to oversight agencies on time in 2002. The *Final Interim Remedial Design Report for the Building 834 Operable Unit Treatment Facility at Lawrence Livermore National Laboratory Site 300* (Gregory et al. 2002), the *Final 5-Year Review Report for the Building 834 Operable Unit at Lawrence Livermore National Laboratory Site 300* (Ferry et al. 2002), the *Characterization Summary Report for the Building 854 Operable Unit at Lawrence Livermore National Laboratory Site 300* (Ferry and Kearns 2002), the *Final Interim Remedial Design Report for the High Explosives Process Area Operable Unit at Lawrence Livermore National Laboratory Site 300* (Madrid et al. 2002), the *Final Compliance Monitoring Plan/Contingency Plan for Interim Remedies at Lawrence Livermore National Laboratory Site 300* (Ferry et al. 2002), quarterly reports, and work plans were among the documents submitted.

### Milestones and Activities

LLNL completed all the 2002 FFA milestones for Site 300 on or ahead of schedule. These included construction of the Building 815-PRX



groundwater and soil vapor extraction and treatment facility and initiation of build-out and upgrade of the Building 834-SRC groundwater and soil vapor treatment facility in the Building 834 Operable Unit.

### Treatment Facilities

VOCs (primarily TCE) are the main contaminants at Site 300. High explosives, tritium, depleted uranium, organosilicate oil, nitrate, and perchlorate are also found in the groundwater. Eleven treatment facilities operated during 2002. Twenty-one wells that extract groundwater only, 7 wells that extract soil vapor only, and 24 wells that extract both groundwater and soil vapor operated during 2002, treating about 93.1 million L of groundwater. The 24 wells that extract both vapor and groundwater and the 7 wells that extract only vapor together removed 795,960 m<sup>3</sup> of vapor. In 2002, the Site 300 treatment facilities removed approximately 9.5 kg of VOCs. Since remediation efforts began in 1990, more than 895 million L of groundwater and approximately 3.93 million m<sup>3</sup> of vapor have been treated, to yield about 231 kg of removed VOCs. See [Chapter 8](#) for further information.

### Community Relations

The Site 300 CERCLA project maintains continuing communications with the surrounding communities of Tracy and Livermore. Community relations activities in 2002 included maintenance of the information repositories and administrative records; off-site, private well-sampling activities; mailings to stakeholders; and interviews with the news media.

On April 16, 2002, LLNL held a public workshop to present to the community the overall plan for implementation of, and to respond to comments on, the *Final Compliance Monitoring Plan/Contingency Plan for Interim Remedies at Lawrence Livermore National Laboratory Site 300* (Ferry et al. 2002).

LLNL hosted TAG meetings with the community and Tri-Valley CAREs on January 11, June 10, and October 29, 2002. These meetings provided a forum for focused discussions on CERCLA activities at the various operable units at Site 300. Tri-Valley CAREs receives the annual TAG grant from EPA to support an environmental consultant to review Site 300 CERCLA activities.

### Site Evaluations Prior to Construction

Before any construction begins, the CERCLA Record of Decision (ROD) for the Livermore site requires that the project site be evaluated to determine if soil or rubble (concrete and asphalt) is contaminated. Soil is sampled and analyzed for potential radioactive and/or hazardous contamination. Depending on the analytical results, soil may be reused on site or disposed of according to established procedures. Depending on the potential for radioactive contamination, rubble may be either surveyed or analyzed for radioactivity. During 2002, soil and rubble were evaluated at 67 construction sites.

### Agency for Toxic Substances and Disease Registry Assessment

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public-health agency of the U.S. Department of Health and Human Services. The ATSDR's mission is to serve the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and disease related to toxic substances.

The ATSDR is mandated by Congress to conduct public health assessments (PHAs) of communities that are adjacent to DOE sites undergoing CERCLA cleanup. A PHA is an evaluation of whether exposures to hazardous substances from a site might be harmful to site neighbors. The



ATSDR conducts PHAs of Livermore communities in response to its Congressional mandate. These assessments began almost ten years ago and are now drawing to conclusion.

One PHA addresses community concerns about the health impacts of releases of tritium from LLNL. An ATSDR report, *Health Consultation on Tritium Releases and Potential Offsite Exposures* (March 11, 2002) was based on the ATSDR's findings and those of a panel of five tritium experts. In the report, the ATSDR concluded that total tritium doses to the communities surrounding LLNL, including potential contributions from organically bound tritium, tritiated water, and tritiated hydrogen gas, are below levels of public health concern and are adequately assessed by current monitoring and modeling.

As part of an effort to address concerns about the 1965 and 1970 releases that account for about 80% of all the tritium released by LLNL, the ATSDR issued a draft report in May 2002, titled *Focused Public Health Assessment of 1965 and 1970 Accidental Tritium Releases at the Lawrence Livermore National Laboratory*. LLNL provided comments on this draft before the original public comment period ended in August 2002. The public comment period was subsequently extended until March 31, 2003. In this document, the ATSDR presented doses predicted by modeling both releases based on the best available information, including meteorological conditions. Preliminary conclusions indicate that, though some public exposure to tritium probably did occur as the result of the accidental releases, the maximum exposures predicted were below levels that might cause adverse health effects.

The ATSDR also issued a PHA in early 2003, *Plutonium 239 in Sewage Sludge Used as a Soil or Soil Amendment in the Livermore Community*. A release, well within regulatory limits, of about 32 grams of plutonium over several weeks in 1967 raised community concerns. The plutonium was found in sewage sludge that was available to the community and public organizations. Both the California Department of Health Services (DHS) and the Atomic Energy Commission found no public health concern at the time. Public sludge distribution ended in the mid-1970s.

The ATSDR PHA determined there was no apparent public health hazard from the sludge. ATSDR stated that, while exposure may have occurred or may still be occurring, the resulting doses will not cause sickness or death. The ATSDR determined that any potential radiological doses are below levels of health concern. It stated it had no recommendations concerning additional soil sampling in areas of known or unknown sludge distribution. The agency found that available data and evaluations provide an adequate basis for these public health conclusions. It added that any additional sampling data would be subject to the same types of uncertainties as existing historical data. The agency recommended public outreach on this topic, which it conducted in February 2003. It also recommended that LLNL continue required routine regulatory monitoring of released plutonium.

Both ATSDR PHAs are expected to become final in late 2003 or early 2004. Additional information concerning these ATSDR findings may be read in the environmental repositories or at LLNL's environmental information website <http://www-envirinfo.llnl.gov/>.



## Emergency Planning and Community Right-to-Know Act and Toxics Release Inventory Report

Title III of the Superfund Amendment and Reauthorization Act (SARA) is known as the Emergency Planning and Community Right-to-Know Act (EPCRA). It requires owners or operators of facilities that handle certain hazardous chemicals on site to provide information on the release, storage, and use of these chemicals to organizations responsible for emergency response planning. Executive Order 13148 directs all federal agencies to comply with the requirements of the EPCRA, including SARA Section 313, “Toxics Release Inventory (TRI) Program.”

As a result of greatly reduced TRI reporting thresholds, LLNL submitted for Site 300 the TRI Form R report for lead to the Department of Energy on June 25, 2002, for reporting year 2001. Monitoring and other pollution prevention options are being evaluated to help minimize environmental releases.

EPCRA requirements and LLNL compliance are summarized in [Table 2-1](#).

## Clean Air Act—Air Quality Management Activities

All activities at LLNL are evaluated to determine the need for air permits. Air permits are obtained from the Bay Area Air Quality Management District (BAAQMD) for the Livermore site and from the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and/or BAAQMD for Site 300.

In 2002, LLNL operated 199 air emission sources for the Livermore site. BAAQMD inspectors found no deficiencies at the Livermore site in 2002 (see

[Table 2-2](#)). However, during an inspection in April 2003, the BAAQMD issued a notice of violation (NOV) for a record keeping violation during the time period September 2002 to February 2003. LLNL was subsequently assessed a \$2650 penalty.

The BAAQMD finalized LLNL’s Synthetic Minor Operating Permit in November 2002 and forwarded the draft to EPA. The Synthetic Minor Operating Permit conditions require LLNL to ensure that the emissions of regulated air pollutants are below the permitted threshold values. These values limit emissions from combustion sources to less than 50 tons per year for oxides of nitrogen and emissions from solvent evaporating sources to less than 50 tons per year for precursor organic compounds and to less than 23 tons per year for all hazardous air pollutants. Permit conditions also require LLNL to prepare an annual emissions report for each year ending on June 30. In 2002, the SJVUAPCD issued or renewed air permits for 44 air emission sources for Site 300 (see [Table 2-3](#)).

## National Emission Standards for Hazardous Air Pollutants, Radionuclides

To demonstrate compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAPs) for radiological emissions, LLNL is required to monitor certain air release points and evaluate all potential sources of radionuclide air emissions to determine the maximum possible dose to the public. These evaluations include modeling (using EPA-sanctioned computer codes) based on radionuclide inventory data, air effluent (source emission) monitoring, and air surveillance monitoring.

The *LLNL NESHAPs 2002 Annual Report* (Harrach et al. 2003), submitted to DOE and EPA, reported that the estimated maximum radio-

**Table 2-1. Summary of LLNL compliance with EPCRA**

EPCRA requirement <sup>(a)</sup>	Brief description <sup>(a)</sup>	Compliance
302 Planning Notification	Operator must notify SERC of presence of extremely hazardous substances. In California, operator must notify CEPRC of presence of extremely hazardous substances above threshold planning quantities.	Originally submitted May 1987.
303 Planning Notification	Operator must designate a facility representative to serve as emergency response coordinator.	Update submitted April 26, 2002.
304 Release Notification	Releases of certain hazardous substances must be reported to SERC and LEPC.	No EPCRA-listed extremely hazardous substances were released above reportable quantities in 2002.
311 MSDS/Chemical Inventory	Operator must submit MSDSs or chemical list to SERC, LEPC, and Fire Department.	Update submitted April 26, 2002.
312 MSDS/Chemical Inventory	Operator must submit hazardous chemical inventory to local administering agency (county).	Business plans and chemical inventory submitted to San Joaquin County (January 11, 2002) and Alameda County (April 15, 2002).
313 Toxic Release Inventory	Operator must submit Form R to U.S. EPA and California EPA for toxic chemicals released.	Form R for lead (Site 300 only) was submitted to DOE June 25, 2002; DOE forwarded it to U.S. EPA and California EPA June 28, 2002.

<sup>a</sup> See [Acronyms and Abbreviations](#) for list of acronyms

logical doses to the public were 0.23  $\mu\text{Sv}$  (0.023 mrem) for the Livermore site and 0.21  $\mu\text{Sv}$  (0.021 mrem) for Site 300 in 2002.

The reported doses include contributions from both point and diffuse sources. The totals were well below the 100  $\mu\text{Sv}/\text{y}$  (10 mrem/y) dose limits defined by the NESHAPs regulations. The details of these data are described in [Chapter 13](#).

In 2002, LLNL continuously monitored radionuclide emissions from Building 331 (the Tritium Facility), Building 332 (the Plutonium Building), and portions of five other facilities (see [Chapter 4](#)). There were no unplanned atmospheric releases at the Livermore site or at Site 300 in 2002.

## Clean Water Act and Related State Programs

Preserving clean water is an objective of local, state, and federal regulations. The National Pollutant Discharge Elimination System (NPDES) under the federal Clean Water Act (CWA) establishes permit requirements for discharges into waters of the United States. In addition, the State of California, under the Porter Cologne Water Quality Control Act, requires permits, known as Waste Discharge Requirements (WDRs), for any waste discharges affecting the beneficial uses of waters of the state. The local regional water quality control boards (RWQCBs) are responsible for issuing and enforcing both types of permits as well as water quality certifications for discharges authorized under Section 401 of the CWA.



**Table 2-2. Inspections and tours of the Livermore site and Site 300 by external agencies in 2002**

Medium	Description	Agency <sup>(a)</sup>	Date	Finding <sup>(a)</sup>
<b>Livermore Site</b>				
Air	Emission sources	BAAQMD	2/8 3/13 6/6 9/6 10/24	No violations <sup>(b)</sup>
Sanitary sewer	Annual compliance sampling	LWRP	10/7–10/8	No violations
	Categorical sampling		10/21	No violations
Waste	Hazardous waste facilities	DTSC	5/22–5/24, 5/30, 6/4	Received an inspection report and summary of violations on 8/21/02. See <b>Table 2-8</b> for description and resolution.
	Medical waste	ACDEH	9/25	No violations
Storage tanks	Compliance with underground storage tank requirements and operating permits	ACDEH	10/15 10/16	No violations
<b>Site 300</b>				
Air	Emission sources Startup inspection of Contained Firing Facility and CGSA air stripper	SJVUAPCD	6/4	No violations
Water	Permitted operations	CVRWQCB	11/11	No violations
Waste	Permitted hazardous waste operational facilities (EWTF, EWSF, B883 CSA), hazardous waste-related documentation, and hazardous waste transporter registration inspection	DTSC	11/20–11/21	No violations
Storage tanks	Compliance with underground storage tank requirements and operating permits	SJCEHD	10/17, 11/25–11/27, 12/13	Received notification of three minor violations on 10/17. See <b>Table 2-8</b> for description and resolution.

<sup>a</sup> See [Acronyms and Abbreviations](#) for list of acronyms

<sup>b</sup> LLNL is currently working with BAAQMD on an NOV issued in April 2003 for an alleged recordkeeping violation during September 2002 through February 2003.

Several agencies issue other water-related permits. The Livermore Water Reclamation Plant (LWRP) requires permits for discharges to the city's sanitary sewer system. The Army Corps of Engineers (ACOE) issues permits for work in navigable waterways and for controlling fill operations in waters of

the United States below the ordinary high water mark. The State Water Resources Control Board (SWRCB) can issue statewide NPDES permits/WDRs. The California Department of Fish and Game (CDFG), under the Fish and Game Code, requires streambed alteration agreements (SAAs)


**Table 2-3. Summary of permits active in 2002<sup>(a,b)</sup>**

Type of permit	Livermore site	Site 300
Air	<p>BAAQMD issued 199 permits for operation of various types of equipment, including boilers, emergency generators, cold cleaners, ultrasonic cleaners, degreasers, printing press operations, manual wipe-cleaning operations, metal machining and finishing operations, silk-screening operations, silk-screen washers, paint spray booths, adhesives operations, image tube fabrication, optic coating operations, storage tanks containing VOCs in excess of 1.0%, plating tanks, drum crusher, semiconductor operations, diesel air-compressor engines, groundwater air strippers/dryers, material-handling equipment, sewer diversion system, oil and water separator, fire test cells, gasoline-dispensing operation, paper-pulverizer system, and firing tanks.</p>	<p>SJVUAPCD issued 44 permits for operation of various types of equipment, including boilers, emergency generators, paint spray booth, groundwater air strippers, soil vapor extraction units, woodworking cyclone, gasoline-dispensing operation, explosive waste treatment units, and drying ovens, and the Contained Firing Facility.</p>
Water	<p>WDR Order No. 88-075 for discharges of treated groundwater from Treatment Facility A to percolation pits and recharge basin.</p> <p>WDR Order No. 95-174, NPDES Permit No. CA0030023 for discharges of storm water associated with industrial activities and low-threat nonstorm water discharges to surface waters.</p> <p>WDR Order No. 99-08-DWQ, NPDES California General Construction Activity Permit No. CAS000002; Terascale Simulation Facility, Site ID No. 201S317827; Sensitive Compartmented Information Facility, Site ID No. 201S317621; Soil Reuse Project, Site ID No. 2015305529; and National Ignition Facility, Site ID No. 201S306762, for discharges of storm water associated with construction activities affecting two hectares or more.</p> <p>WDR Order No. 99-086 for the Arroyo Las Positas Maintenance Project.</p> <p>Nationwide Permits 18 and 33 for the Arroyo Las Positas Maintenance Project.</p> <p>One off-site project (at Arroyo Mocho) completed under a streambed alteration agreement.</p> <p>FFA for groundwater investigation/remediation.</p>	<p>WDR Order No. 93-100 for post-closure monitoring requirements for two Class I landfills.</p> <p>WDR Order No. 96-248 for operation of two Class II surface impoundments, a domestic sewage lagoon, and percolation pits.</p> <p>WDR Order No. 97-03-DWQ, NPDES California General Industrial Activity General Permit No. CAS000001 for discharge of storm water associated with industrial activities</p> <p>WDR Order No. 97-242, NPDES Permit No. CA0082651 for discharges of treated groundwater from the eastern General Services Area treatment unit.</p> <p>WDR Order No. 5-00-175, NPDES Permit No. CAG995001 for large volume discharges from the drinking water system that reach surface waters.</p> <p>FFA for groundwater investigation/remediation. 57 registered Class V injection wells.</p>


**Table 2-3. Summary of permits active in 2002<sup>(a,b)</sup> (continued)**

Type of permit	Livermore site	Site 300
Hazardous waste	<p>EPA ID No. CA2890012584.</p> <p>Authorization to mix resin in Unit CE231-1 under conditional exemption tiered permitting.</p> <p>Final Closure Plan submitted to DTSC for the Building 419 interim status unit (February 2001).</p> <p>Authorizations to construct the permitted units of Building 280, Building 695, and additions to Building 693.</p> <p>Authorization under hazardous waste permit to operate 18 waste storage units and 14 waste treatment units.</p> <p>Continued authorization to operate seven waste storage units and eight waste treatment units under interim status. Final Closure Plans submitted to DTSC for the Building 233 and Building 514 interim status units (May 2000).</p> <p>Notified DTSC on 3/31/01 that LLNL will not construct and operate Building 280 as a permitted unit as described in our Hazardous Waste Facility permit.</p>	<p>EPA ID No. CA2890090002.</p> <p>Part B Permit—Container Storage Area (Building 883) and Explosives Waste Storage Facility (issued May 23, 1996).</p> <p>Part B Permit—Explosives Waste Treatment Facility (issued October 9, 1997).</p> <p>Docket HWCA 92/93-031. Closure and Post-Closure Plans for Landfill Pit 6 and the Building 829 Open Burn Facility.</p>
Medical waste	<p>One permit for large quantity medical waste generation and treatment covering the Biology and Biotechnology Research Program, Health Services Department, Forensic Science Center, Medical Photonics Lab, Tissue Culture Lab, and Chemistry and Materials Science Department.</p>	<p>Limited Quantity Hauling Exemption for small quantity medical waste generator.</p>
Sanitary sewer	<p>Discharge Permit No. 1250 (2001/2002 and 2002/2003<sup>(c)</sup>) for discharges of wastewater to the sanitary sewer.</p> <p>Permit 1510G (2001/2002<sup>(d)</sup>) for discharges of groundwater from CERCLA restoration activities.</p>	
Storage tanks	<p>Eight operating permits covering 11 underground petroleum product and hazardous waste storage tanks: 111-D1U2 Permit No. 6480; 113-D1U2 Permit No. 6482; 152-D1U2 Permit No. 6496; 271-D2U1 Permit No. 6501; 321-D1U2 Permit No. 6491; 322-R2U2 Permit No. 6504<sup>(e)</sup>; 365-D1U2 Permit No. 6492; and 611-D1U1, 611-G1U1, 611-G2U1, and 611-O1U1 Permit No. 6505.</p>	<p>One operating permit covering five underground petroleum product tanks assigned individual permit numbers: 871-D1U2 Permit No. 008013; 875-D1U2 Permit No. 006549; 879-D1U1 Permit No. 006785; 879-G3U1 Permit No. 007967; and 882-D1U1 Permit No. 006530</p>

a Permit numbers are based on actual permitted units or activities maintained and renewed by LLNL during 2002.

b See [Acronyms and Abbreviations](#) for list of acronyms.

c The Discharge Permit No. 1250 period is from May 15 to May 14; therefore, two permits were active during the 2002 calendar year.

d Permit 1510G is a two-year (January to December) permit.

e LLNL received permit exemption in October 2002.



for any work that may disturb or impact rivers, streams, or lakes. The Safe Drinking Water Act requires registration with the EPA and management of injection wells to protect underground sources of drinking water. The CWA and California Above-ground Petroleum Storage Act also require facilities meeting specific storage requirements to have and implement Spill Prevention Control and Countermeasure (SPCC) plans for oil-containing equipment and tanks. Finally, Alameda County Department of Environmental Health (ACDEH) and San Joaquin County Environmental Health Department (SJCEHD) issue permits for operating underground storage tanks containing hazardous materials or hazardous waste as required under the California Health and Safety Code. Water-related permits are summarized in **Table 2-3** and discussed in detail in **Chapters 6, 7, and 9**.

## Groundwater and Surface Water

In 2002, LLNL discharged storm water associated with industrial activities, low-threat equipment wastewater, process wastewater, sanitary sewage, treated groundwater, and domestic drinking water to surface waters, percolation pits, surface impoundments, septic systems, and sewage ponds under five NPDES permits, four WDRs, and agreements developed under CERCLA (**Table 2-3**). Details about surface water discharges are found in **Chapter 7** of this report and in quarterly and annual compliance monitoring reports. Details about groundwater monitoring and discharges from CERCLA remediation actions are found in **Chapters 8 and 9** of this report and in quarterly and annual compliance monitoring and groundwater program reports.

In July 2000, LLNL submitted a Report of Waste Discharge to the CVRWQCB to amend WDR 96-248 to include low-threat discharges going to ground. Previously, these discharges were permitted under WDR 94-131, which was rescinded by the

CVRWQCB in August 2000. The CVRWQCB continues to work on the revision to WDR 96-248; during the revision process, they decided to split discharges in the existing permit into two separate permits. LLNL expects these two permits to be issued in 2003.

During 2002, LLNL continued construction of two projects that were covered by the California General Construction Activity permit and obtained coverage for two new projects (see **Table 2-3**). Continuing operations included construction of the Soil Reuse Project and the National Ignition Facility (NIF) at the Livermore site. Construction operations began in June 2002 at both the Tera-scale Simulation Facility and the Sensitive Compartmented Information Facility projects.

LLNL received no NOV's in 2002 from the RWQCB that issued the NPDES permits and WDRs; however, LLNL identified administrative nonconformances with one of the five NPDES permits (see **Table 2-4**). These events are documented in the annual compliance certification required by NPDES Permit No. CAS000002. In addition, LLNL was unable to comply with prohibitions in WDR 96-248 on two occasions. These discharges were reported to the applicable regional boards and are discussed further in **Chapter 7** and in quarterly and annual compliance monitoring reports under WDR 96-248.

The CVRWQCB inspected the Site 300 permitted facilities in November 2002. No violations were found during this inspection (see **Table 2-2**).

## Sewerable Water

The Livermore site's sanitary sewer discharges are sampled continuously to satisfy various permit requirements. The monitoring results for the LLNL effluent are reported monthly to the LWRP. In 2002, LLNL sanitary effluent monitoring identi-

**Table 2-4. Summary of NPDES permit nonconformance**

Permit No.	Outfall	Nonconformance	Date(s) of nonconformance <sup>(a)</sup>	Description–solution
CAS000002	Arroyo Las Positas (Livermore site)	Sensitive Compartmented Information Facility – Began construction prior to approval and certification of Storm Water Pollution Prevention Plan (SWPPP)	5/13/02–6/14/02	SWPPP was revised, approved, and certified. Incident was reported to the regional board.
CAS000002	Arroyo Las Positas (Livermore site)	National Ignition Facility— Failure to inspect one significant rain event.	12/21/01	Incident was identified to project management and noted in compliance certification.

<sup>a</sup> These dates reflect the construction reporting period of June 2001 through May 2002.

fied five events that were at or slightly above effluent limitations contained in Permit No. 1250. Two of these events resulted in a Letter of Warning from the LWRP (see [Table 2-5](#)). Daily effluent samples collected on August 3 and 6 contained lead at concentrations of 0.226 mg/L and 0.208 mg/L, respectively, exceeding the discharge limit of 0.2 mg/L. The LWRP issued a Letter of Warning dated October 10, 2002, for these discharges. The other three events were brief pH monitoring fluctuations, reported to the LWRP. Following LWRP's evaluation of each event, they decided formal enforcement action was not appropriate. Further details of these events are found in [Chapter 6](#).

LLNL also conducts self-monitoring of federally regulated processes, called categorical processes, and reports results to the LWRP semiannually. The data show compliance with all categorical pretreatment discharge standards.

On October 7 and 8, 2002, LWRP and EPD personnel collected split samples of site effluent as part of routine annual compliance sampling. Sample results confirmed compliance with effluent discharge limits. LLNL and LWRP also inspected and sampled categorical processes and their waste streams on October 21, 2002. No facility deficiencies were noted during any of the inspections ([Table 2-2](#)).

**Table 2-5. Summary of nonconformance with LWRP permit limits for discharges to the sanitary sewer**

Permit No.	Nonconformance	Date(s) of nonconformance	Description–solution
1250	Lead in the August 3 and 6 daily effluent samples exceeded the permit limit. LWRP issued a warning letter dated October 10, 2002.	8/3/02 8/6/02	Effluent samples collected August 4 and 9, 2002, confirmed LLNL's return to compliance.

LLNL monitors discharges from groundwater treatment facilities to the sanitary sewer under Permit 1510G (2002) as they occur. Data are reported annually to the LWRP. In 2002, LLNL complied with all the terms and conditions of Permit 1510G.

Chapter 6 discusses the self-monitoring programs and the analytical results for the site effluent, categorical processes, and discharges from groundwater treatment facilities.

### Streambed Alteration Agreements, Nationwide Permits, and Waste Discharge Requirements

CDFG, RWQCBs, and ACOE all issue permits for work in streams (Table 2-6). In 2001, CDFG Legal Counsel advised LLNL that, because LLNL is federal property, LLNL is exempt from SAA requirements for activities conducted in streams at the Livermore site and Site 300. To ensure ongoing protection of streams, LLNL and CDFG are developing a memorandum of understanding (MOU) regarding LLNL activities that affect streams. In the interim, LLNL provides copies of the ACOE and RWQCB permit applications for comment to CDFG and continues to follow the substantive requirements of previously issued SAAs.

During 2002, LLNL continued operations under a five-year SAA and WDR issued for the Arroyo Las Positas Maintenance Project. Although LLNL's coverage under Nationwide Permit (NWP) 18 was completed in 2000, LLNL continued to comply with reporting required by NWP 18 through 2002. In 2002, LLNL obtained coverage under NWP 33 to use cofferdams for dewatering areas to be desilted as part of the Arroyo Las Positas Maintenance Project. Operations continued maintenance activities under an SAA issued for vegetation management in Arroyo Seco. No projects at Site 300 required permits from ACOE during 2002.

LLNL operates a drinking water pump station approximately twenty miles south of LLNL where drinking water is pumped from the Hetch Hetchy underground pipeline to provide water for Sandia National Laboratories/California (Sandia/California) and LLNL. To access this facility, LLNL maintains, through an easement, an access road and low-water crossing at Arroyo Mocho. In 2002, LLNL began a project to stabilize the banks of the Arroyo Mocho pump station. The first phase of the stabilization project was conducted under an SAA from CDFG.

**Table 2-6. Summary of streambed alteration agreements, Nationwide Permits, and Waste Discharge Requirements**

Project	Location	Agency/type of permit <sup>(a)</sup>	Year submitted
Storm-generated debris removal and vegetation management (five-year project plan)	Arroyo Seco	CDFG/SAA	1999
Arroyo Las Positas Maintenance Project (five-year project plan)	Arroyo Las Positas	CDFG/SAA SFBRWQCB/WDR ACOE/NWP 18 ACOE/NWP 33	1998 1999 2000 2002
Arroyo Mocho bank stabilization	Arroyo Mocho	CDFG/SAA	2001

<sup>a</sup> See [Acronyms and Abbreviations](#) for list of acronyms.



## Tank Management

LLNL manages its underground and aboveground storage tanks through the use of underground tank permits, monitoring programs, operational plans, closure plans and reports, leak reports and follow-up activities, and inspections. At LLNL, permitted underground storage tanks contain diesel fuel, gasoline, and used oil; aboveground storage tanks contain diesel fuel, insulating oil, and process wastewater. Some nonpermitted wastewater tank systems are a combination of underground storage tanks and aboveground storage tanks. **Table 2-7** shows the status of tanks at the Livermore site and Site 300 as of December 31, 2002. All permitted underground storage tanks were inspected by the

regulating agencies in 2002. See **Table 2-2** for summary of inspections and **Table 2-8** for a description of a violation notice received as a result of a November 5 inspection.

## Resource Conservation and Recovery Act and Related State Laws

The Resource Conservation and Recovery Act (RCRA) provides the framework at the federal level for regulating the generation and management of solid wastes, including wastes designated as hazardous. Similarly, the California Hazardous Waste Control Act (HWCA) and the California Code of Regulations (CCR) Title 22, set require-

**Table 2-7. Summary of in-service tanks in 2002**

Tank type	Livermore site			Site 300		
	Permitted	Permits not required	Total	Permitted	Permits not required	Total
<b>Underground storage tanks</b>						
Diesel fuel	7	0	7	4	0	4
Gasoline	2	0	2	1	0	1
Used oil	1	0	1	0	0	0
Process wastewater	1 <sup>(a)</sup>	41	42	0	11	11
Subtotal	11	41	52	5	11	16
<b>Aboveground storage tanks</b>						
Diesel fuel	0	27	27	0	7	7
Insulating oil	0	1	1	0	4	4
Process wastewater	10 <sup>(b)</sup>	63	73	0	13	13
Miscellaneous non-waste tanks	0	17	17	0	0	0
Subtotal	10	108	118	0	24	24
<b>Total</b>	<b>21</b>	<b>149</b>	<b>170</b>	<b>5</b>	<b>35</b>	<b>40</b>

a LLNL received permit exemption in October 2002.

b These 10 tanks are located at the LLNL Treatment and Storage Facility.

**Table 2-8. Environmental occurrences reported under the Occurrence Reporting (OR) System, 2002**

Date <sup>(a)</sup>	Occurrence category	Description <sup>(b)</sup>
April 5	Off-Normal	<p>LLNL was notified by a scrap metal company on April 4 that equipment (a pulse-electron beam generator) shipped to them by LLNL that day contained a large volume of liquid. Before shipping the equipment, LLNL removed approximately 3000 gallons of Shell Diala insulating oil from the equipment.</p> <p>Upon receiving the equipment, the scrap metal company discovered that additional liquid was contained in a separate reservoir. Representatives from LLNL were sent to the scrap metal facility with a container truck to remove the remaining liquid. LLNL removed 2766 gallons of Shell Diala insulating oil from the equipment and shipped the oil to an outside company for recycling.</p> <p>Equipment containing liquid violates the definition of "scrap metal" as defined in California Code of Regulations, Title 22. Shipping scrap metal containing Shell Diala insulating oil violated the off-site facility acceptance criteria and meets the definition of an Off-Normal Occurrence. OR 2002-0008</p>
June 6	Off-Normal	<p>LLNL received an SOV from DTSC for alleged violations observed during the 2002 CEI of permitted hazardous waste handling operations.</p> <p>The alleged violations and resolutions were as follows:</p> <ul style="list-style-type: none"> <li>• Storage of one container of waste for greater than 90 days in the B612-4 90-day generator area. This waste container was moved to a permitted storage location.</li> <li>• Storage of two waste containers for greater than one year in the B693 Container Storage Unit. This waste was transferred to an off-site TSDF.</li> <li>• Inadequate aisle spacing in the Area 514-3 portable tank area. LLNL maintained that adequate aisle spacing was provided.</li> <li>• Failure of an individual to take a required refresher training course. LLNL maintained that the individual met the training requirements until he was transferred to a different position where the training was no longer required.</li> </ul> <p>Later, LLNL received notice from DTSC that the agency had rescinded the last two alleged violations. Receiving an SOV meets the requirements of an Off-Normal Occurrence. OR 2002-0012.</p>
November 5	Off-Normal	<p>LLNL received a field inspection report from the SJCEHD listing three minor violations:</p> <ul style="list-style-type: none"> <li>• Lack of documentation for tank alarms at Buildings 871, 875, and 879.</li> <li>• Line leak detector at Building 879 was not functioning at the required rate.</li> <li>• Lack of documentation of line leak test or positive turbine pump shutdown due to lack of dispenser pan sensors at Building 879.</li> </ul> <p>To address the observations, LLNL has developed logbooks at the tank system alarm panels and instituted documentation requirements for documenting alarms. In addition, the B879 line leak detector was replaced and the unleaded line system was leak tested and the results submitted to the SJCEHD as requested. Receiving a notice of violation meets the requirements of an Off-Normal Occurrence. OR 2002-0033.</p>

a The date indicated is the date when the occurrence was categorized, not the date of its discovery.

b See [Acronyms and Abbreviations](#) for list of acronyms

ments for managing hazardous wastes in California. RCRA and HWCA also regulate hazardous waste treatment, storage, and disposal facilities, including permit requirements. Because RCRA program

authorization was delegated to the State of California in 1992, LLNL works with DTSC on compliance issues and in obtaining hazardous waste permits.



## Hazardous Waste Permits

### Livermore Site

The hazardous waste management facilities at the Livermore site consist of permitted units (located in Area 612 and Buildings 693 and 695 of the Decontamination and Waste Treatment Facility [DWTF]) and units that operate under interim status (Area 514 Facility and the Building 233 Container Storage Facility). Permitted and interim status waste management units include container storage, tank storage, and various treatment processes (e.g., wastewater filtration, blending, and size reduction). A final closure plan for the Building 419 Interim Status Facility has been submitted to DTSC for approval. See **Table 2-2** for a summary of inspections and **Table 2-8** for a description of a Summary of Violations (SOV) received as a result of a May inspection.

In accordance with the document *Transition Plan: Transfer of Existing Waste Treatment Units to the Decontamination and Waste Treatment Facility* (EPD 1997), operations in the Area 514 Facility will eventually be replaced by those in the new DWTF, and Area 514 will be closed. The Building 233 Container Storage Facility also will be closed. Final closure plans for the Area 514 Facility and the Building 233 Container Storage Facility were submitted for approval to the DTSC in May 2000.

In May 1999, DTSC signed the hazardous waste permit and issued a Notice of Final Permit Decision for DWTF. In July 1999, Tri-Valley CAREs et al. filed a petition for review to appeal the permit decision. The appeal was denied by the DTSC in November 1999, and the permit immediately became effective.

Tri-Valley CAREs et al. filed a California Environmental Quality Act (CEQA) lawsuit in December 1999 that challenges many of the environmental

impact evaluations made in the DTSC initial study, which formed the basis of the CEQA Negative Declaration determination by DTSC. A Settlement Agreement was reached on June 26, 2001, between Tri-Valley CAREs et al. and the Regents of the University of California and DOE. As part of the Settlement Agreement, DTSC, the Regents, and DOE agreed to comply with all of the items listed under Section 6 (Actions by Respondents) of the Settlement Agreement. The Regents are currently in compliance with their responsibilities described in Section 6. The Regents deliver all information requested by DTSC, on an ongoing basis, to support an evaluation to determine the need for additional permit conditions or modifications. DTSC submitted status reports to Tri-Valley CAREs et al. in December 2001 and on March 25, 2002, and finalized their determination in June 2003.

### Site 300

On November 20 and 21, DTSC conducted the 2002 compliance evaluation inspection of the Building 883 Container Storage Area (B883 CSA), Explosives Waste Storage Facility (EWSF), and the Explosives Waste Treatment Facility (EWTF). In addition to physical inspections of the hazardous waste facilities, DTSC inspected facility personnel training records, facility inspection checklists, waste inventories, waste requisitions, hazardous waste manifests, hazardous waste transporter registration, and Land Disposal Restriction Notifications/Certifications. No violations were issued at the conclusion of the inspection.

## Hazardous Waste Reports

LLNL completes two annual hazardous waste reports, one for the Livermore site and the other for Site 300, that address the 2002 transportation, storage, disposal, and recycling of hazardous wastes. LLNL received an extension past the April 1, 2003, deadline for the 2002 annual



reports, required under 22 CCR 66262.41. These reports, *2002 Hazardous Waste Report-Mainsite* and *2002 Hazardous Waste Report-Site 300* were submitted to the DTSC by the extended deadline of April 15, 2003.

### **Hazardous Waste Transport Registration**

Transportation of hazardous waste over public roads (e.g., from one LLNL site to another) requires DTSC registration (22 CCR 66263.10). DTSC renewed LLNL's registration in November 2002.

### **Waste Accumulation Areas**

In January 2002, there were 22 waste accumulation areas (WAAs) at the Livermore site. One temporary WAA was put into service, and one temporary WAA was taken out of service. Program representatives conducted inspections at least weekly at all WAAs to ensure that they were operated in compliance with regulatory requirements. Approximately 1170 prescribed WAA inspections were conducted at the Livermore site.

One WAA was in operation at Site 300 during 2002. Program representatives conducted 52 prescribed inspections of the WAA at Site 300.

### **California Medical Waste Management Act**

All LLNL medical waste management operations comply with the California Medical Waste Management Act. The Medical Waste Management Act establishes a comprehensive program for regulating the management, transport, and treatment of medical wastes that contain substances that may potentially infect humans. The program is administered by DHS and is enforced by the ACDEH.

LLNL is registered with the ACDEH as a generator of medical waste and has a treatment permit. No violations were issued as a result of the September 2002 ACDEH inspection of buildings at LLNL Health Services, the Biology and Biotechnology Research Program, and the Medical Photonics Lab (see [Table 2-2](#)).

### **Federal Facility Compliance Act**

LLNL continues to work with DOE to maintain compliance with the Federal Facilities Compliance Act Site Treatment Plan (STP) for LLNL that was signed in February 1997. All milestones for 2002 were completed on time. Reports and certification letters were submitted to DOE as required. LLNL continued to pursue the use of commercial treatment and disposal facilities that are permitted to accept mixed waste. These facilities provide LLNL greater flexibility in pursuing the goals and milestones set forth in the STP.

### **Toxic Substances Control Act**

The Federal Toxic Substances Control Act (TSCA) governs the uses of newly developed chemical substances and TSCA-governed waste by establishing requirements for recordkeeping, reporting, disposal standards, employee protection, compliance and enforcement, and cleanup standards.

In 2002, LLNL generated the following PCB-containing waste: PCB oil drained from electrical equipment and vacuum pumps, electrical equipment contaminated with PCBs, liquid PCBs used to calibrate analytical equipment, and animal bedding and personnel protective equipment from lab experiments using PCBs. TSCA-regulated asbestos waste was generated from building demolition or renovation projects.



All TSCA-regulated waste was disposed of in accordance with TSCA, state, and local disposal requirements except for radioactively contaminated PCB waste. Radioactive PCB waste is currently stored at one of LLNL's hazardous waste storage facilities until the Waste Isolation Pilot Plant, or other approved facility, accepts this waste for final disposal.

## National Environmental Policy Act

The National Environmental Policy Act (NEPA) established federal policy for protecting environmental quality. The major method for achieving established NEPA goals is the requirement to prepare an environmental impact statement (EIS) for any major federal or federally funded project that may have significant impact on the quality of the human environment. If the need for an EIS is not clear, or if the project does not meet DOE's criteria for requiring an EIS, an environmental assessment (EA) is prepared. A Finding Of No Significant Impact (FONSI) is issued when an EIS is determined to be unnecessary.

Certain groups of actions that do not have a significant effect on the environment either individually or cumulatively can be categorically excluded from a more in-depth NEPA review (i.e., from the preparation of either an EA or EIS). DOE NEPA implementing procedures identify those categorical exclusions and the eligibility criteria for their application. If a proposed project does not clearly fit one of the exclusion categories, DOE determines which type of assessment document may be needed.

In 2002, two DOE EAs were prepared for LLNL projects. On September 25, 2002, DOE issued a FONSI as a result of the *Environmental Assessment for the East Avenue Security Upgrade at Lawrence Livermore National Laboratory/Sandia National Laboratories, California*. This project will provide increased security to LLNL and Sandia/California

facilities in the area of the federally owned section of East Avenue (between Vasco and Greenville Roads) shared by both laboratories.

On December 16, 2002, DOE issued a FONSI as a result of the *Environmental Assessment for the Proposed Construction and Operation of a Biosafety Level 3 Facility at Lawrence Livermore National Laboratory, Livermore, California*. This project will provide an enhanced ability for LLNL to conduct research on detection, identification, and protection measures that relate to the potential terrorist use of biological agents against U.S. personnel or facilities.

Twenty-three categorical exclusion applications were approved by DOE, and there were no proposed actions at LLNL that required separate DOE floodplain or wetlands assessments under DOE regulations in 10 Code of Federal Regulations (CFR) 1022.

In 2002, DOE began the NEPA process of preparing a new sitewide EIS by seeking public involvement and comment on the scope for the EIS document. The new EIS will replace the 1992 *Final Environmental Impact Statement and Environmental Impact Report for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore* (1992 EIS/EIR) (U.S. DOE and UC 1992a,b) and its March 1999 Supplement Analysis. The draft EIS is projected to be available for public review and comment in fall 2003; completion of a ROD is expected in late fall 2004.

## California Environmental Quality Act

In November 1992, the University of California (UC) and LLNL made a commitment to implement 67 mitigation measures identified by the 1992 *EIS/EIR* and to provide annual reports on their



implementation. An addendum to the EIR was prepared in 1997. The measures are being implemented in accordance with the approved 1992 Mitigation Monitoring and Reporting Program associated with the 1992 EIS/EIR. The 1997 and 1998 mitigation monitoring reports were published in 2001. The 1999 mitigation monitoring report was published in 2002. The 2000 and 2001 mitigation monitoring reports will be published in 2003.

## National Historic Preservation Act

The National Historic Preservation Act (NHPA) applies to historically important places and things affected by the federal government. LLNL contains resources subject to NHPA consideration. These range from prehistoric archeological sites to remnants of LLNL's own history of scientific and technological endeavor.

The responsibility to comply with the provisions of NHPA rests solely with DOE as a federal agency. LLNL, and UC as its contractor operator, supports DOE NHPA responsibilities. LLNL does so in a limited manner with direction from DOE. The two primary NHPA sections that apply to LLNL are Sections 106 and 110.

Section 106 requires federal agencies to take into account the effects their projects may have on historic properties. The agencies must allow and consider comments of the federal Advisory Council on Historic Preservation. The Section 106 rules outline a five-step review process that is conducted on a project-by-project basis.

Section 110 sets forth broad affirmative responsibilities to balance agency missions with cultural values. Its purpose is to ensure full integration of historic preservation into federal agency programs.

LLNL is working on two approaches to streamline historic preservation efforts and focus on important historic properties. One approach is to construct an agreement among DOE, the UC, and the State Historic Preservation Office (SHPO). As of July 2003, a signed Programmatic Agreement exists among DOE, the UC, and the SHPO related to Section 106 responsibilities and the operation of LLNL.

The second approach is to complete an inventory of places that meet a statutory threshold of historic importance. During 2001 and 2002, LLNL developed historic background information, a necessary precursor for the inventory, and funded an analysis to make recommendations for historic significance determinations at the Livermore site and Site 300.

To date, 50 buildings have been evaluated by DOE with SHPO concurrence that the buildings are not eligible for listing on the National Register of Historic Places.

## Endangered Species Acts and Sensitive Natural Resources

LLNL meets the requirements of the U.S. Endangered Species Act, the California Endangered Species Act, the Eagle Protection Act, the Migratory Bird Treaty Act, and the California Native Plant Protection Act as they pertain to endangered or threatened species and other special status species, their habitats, and designated critical habitats that exist at the LLNL sites. For example, LLNL consults with the USFWS when activities will result in an impact to federally endangered or threatened species, surveys for the presence of species of special concern, and follows mitigation requirements in WDRs and biological opinions.

Four species, the California red-legged frog (*Rana aurora draytonii*), Alameda whipsnake (*Masticophis lateralis euryxanthus*), valley elderberry



long-horn beetle (*Desmocerus californicus dimorphus*), and the large flowered fiddleneck (*Amsinckia grandiflora*), that are listed under the federal or California endangered species acts are known to occur at Site 300. Although there are no recorded observations of the federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*) at Site 300, this species is known to have occurred in the adjacent Carnegie and Tracy Hills areas (USFWS 1998). Because of the proximity of known observations of San Joaquin kit fox to Site 300, it is necessary to consider potential impacts to San Joaquin kit fox during activities at Site 300. State threatened Swainson's hawks (*Buteo swainsoni*) have been observed at Site 300, but Swainson's hawk breeding habitat does not occur at Site 300. The federally threatened California red-legged frog is also known to occur at the Livermore site.

Several other species that are considered rare or otherwise of special interest by the federal and state governments also occur at Site 300. These species in addition to state and federally listed species that occur at Site 300 and the Livermore site are described further in [Appendix A](#). These species include California Species of Special Concern, California Fully Protected Species, federal Species of Concern, species with respect to the federal Migratory Bird Act, and those species included in the California Native Plant Society's Inventory of Rare and Endangered Plants (CNPS 2001).

In 2001, the U.S. Fish and Wildlife Service (USFWS) designated critical habitat for the California red-legged frog (USFWS 2001). The North Buffer Zone and eastern edge of the Livermore site in addition to approximately half of Site 300 were included in this 2001 critical habitat designation. Most of this critical habitat designation, including all LLNL areas, were rescinded in 2002 due to a recent court decision. The USFWS plans to issue a new critical habitat proposal for the California red-legged frog in 2004 (USFWS 2002).

Critical habitat for the Alameda whipsnake was designated in 2000 and includes the southwest quarter of Site 300 (USFWS 2000). Similar to the California red-legged frog critical habitat designation, the Alameda whipsnake critical habitat designation was rescinded in 2003 by a court decision. A portion of Site 300 has also been designated as a critical habitat area for the large flowered fiddleneck and as the *Amsinckia grandiflora* Reserve through a declaration by Secretary of the U.S. DOE. Activities within the reserve are conducted under a memorandum of agreement between the DOE and the USFWS.

During desilting activities in 2002, Livermore site populations of the California red-legged frog (*Rana aurora draytonii*) were monitored in accordance with the 1997 and 1998 amended USFWS Biological Opinion for the Arroyo Las Positas Maintenance Project. A checkerboard pattern of Arroyo sections, ranging in length from one-hundred feet to three-hundred feet, were managed for excess in-stream vegetation and 73 California red-legged frogs were protected from harm in project locations during the maintenance process.

In implementing the mitigation monitoring requirements of the 1992 EIS/EIR, biological assessment surveys were performed in 2002 for specific special-status species at Site 300 project construction (ground-disturbing) areas. Presence data for the San Joaquin kit fox, American badger (*Taxidea taxus*), and western burrowing owl (*Speotyto cunicularia hypugaea*) were collected at each project location, and other applicable mitigation measures were implemented where appropriate. In addition, Site 300 populations of the federally threatened California red-legged frog and a federal species of concern, the California tiger salamander (*Ambystoma californiense*), were monitored at wetland locations statewide.



As part of the preparation for the new site-wide EIS, several surveys of biological resources at Site 300 were initiated in 2002. The surveys or inventories that were completed in 2002 as part of the sitewide EIS effort are described further in [Appendix A](#).

As a result of these studies, information was gained about the presence, distribution and abundance of wildlife and plant species at Site 300 and at the Livermore site. Several special status species that were not previously recognized at Site 300 were observed during these studies. This includes four plants that are in the California Native Plant Societies Inventory of Rare and Endangered plants of California (CNPS 2001) and sixteen birds that are federal or California species of concern. In addition, the first known observation of a California legless lizard (*Anniella pulchra*), a California Species of Special Concern, at Site 300 occurred during the special status reptile studies conducted in 2002, and the occurrence of the valley elderberry longhorn beetle, a federally threatened species, was also confirmed in 2002.

In all, eight species of rare plants are known to occur at Site 300. Restoration and/or monitoring activities were conducted for three of these species in 2002: the large-flowered fiddleneck (*Amsinckia grandiflora*), the big tarplant (*Blepharizonia plumosa*, also known as *Blepharizonia plumosa* ssp *plumosa*), and the diamond-petaled poppy (*Eschscholzia rhombipetala*). The results of this work are described in more detail in an annual progress report (Carlsen et al. 2003). Rare plant research and monitoring is further described in [Appendix A](#).

## Antiquities Act (of 1906): Paleontological Resources

Provisions of the Antiquities Act provide for recovery of paleontological remains. With the discovery of mammoth remains in conjunction with the National Ignition Facility construction in 1997, LLNL has remained vigilant for other fossil finds. No remains subject to the provisions of the Antiquities Act were identified in 2002.

## Environmental Occurrences

Notification of environmental occurrences is required under a number of environmental laws and regulations as well as DOE Order 232.1, *Occurrence Reporting and Processing of Operations Information*. DOE Order 232.1 provides guidelines to contractor facilities regarding categorization and reporting of environmental occurrences to DOE and divides occurrences into two categories: unusual occurrences and off-normal occurrences. Operational emergencies are also reported under DOE Order 232.1; however, DOE Order 151.1, *Categorization and Classification of Operational Emergencies*, defines the criteria for categorization and classification of operational emergency events.

LLNL's response to environmental occurrences is part of the larger on-site emergency response organization that includes representatives from Hazards Control (including the LLNL Fire Department), Health Services, Plant Engineering, Public Affairs, Safeguards and Security, and Environmental Protection. In 2002, three environmental incidents, summarized in [Table 2-8](#), were reportable under DOE Order 232.1 and were categorized as off-normal occurrences according to DOE Order 232.1. DOE was notified of these incidents. No other agencies required notification.



## **Contributing Authors Acknowledgment**

Many authors significantly contributed to this large and diverse chapter. We acknowledge here the work of Richard Blake, Richard Brown, Tina Carlsen, Stephanie Goodwin, Charlene Grandfield, Allen Grayson, Robert Harrach, Steve Harris, Bert Heffner, Rod Hollister, Sandra Mathews, Paul McGuff, Jennifer Nelson-Lee, Barbara Nisbet, Lisa Paterson, Ring Peterson, Kathy Raine, Victoria Salvo, Lily Sanchez, Bill Schwartz, Michael Taffet, Stan Terusaki, Joseph Woods, and Kenneth Zahn