

2. Compliance Summary

LLNL activities comply with federal, state, and local environmental regulations, internal requirements, Executive Orders, and DOE orders as specified in Contract DE-AC52-07NA27344. This chapter provides an overview of LLNL's compliance programs and activities during 2010. **Table 2-1** is a summary of active permits in 2010 at the Livermore site and Site 300. **Table 2-2** lists environmental inspections and findings from them at both LLNL sites in 2010.

2.1 Environmental Restoration and Waste Management

2.1.1 Comprehensive Environmental Response, Compensation and Liability Act

Ongoing remedial investigations and cleanup activities for legacy contamination of environmental media at LLNL fall under the jurisdiction of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Title I of the Superfund Amendments and Reauthorization Act (SARA). CERCLA is commonly referred to as the Superfund law.

CERCLA compliance activities for the Livermore site and Site 300 are summarized in **Sections 2.1.1.1** and **2.1.1.2**. Community relations activities conducted by DOE/LLNL are also part of these projects. See **Chapter 8** for more information on the activities and findings of the investigations.

2.1.1.1 Livermore Site Ground Water Project

The Livermore site came under CERCLA in 1987 when it was placed on the National Priorities List. The Livermore site Ground Water Project (GWP) 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 GWP addresses compliance issues by investigating potential contamination source areas (e.g., suspected old release sites, solvent-handling areas, leaking underground tank systems), monitoring water quality through an extensive network of wells, and remediating contaminated soil and groundwater. The primary soil and groundwater contaminants (constituents of concern) are common volatile organic compounds (VOCs), primarily trichloroethene (TCE) and perchloroethylene (PCE).

During 2010, the Remedial Project Managers signed a Consensus Statement for Environmental Restoration of the Livermore site that included 19 Federal Facility Agreement milestones. The Livermore site environmental restoration project had 13 milestones scheduled for completion in 2010. The following deliverables were submitted to the regulatory agencies:

- Draft, Draft Final, and Final Work Plan for the Delineation of Mercury in Soil at the Building 212 Facility
- Fourth Quarter 2009 Self Monitoring Report

2. Compliance

- 2009 Annual Report
- Plan for TFD Helipad *in situ* Bioremediation Treatability Test
- First, Second, and Third Quarter 2010 Self Monitoring Report
- Draft Focused Feasibility Study (FFS) for TF5475-1, TF5475-3, VTF5475 and TF518 North

The other regulatory milestones included:

- Receive regulatory comments on Draft Work Plan for the Delineation of Mercury in Soil at the Building 212 Facility
- Restart VTF518-PZ in current configuration (pre-upgrades)
- Neighborhood Meeting on the Treatment Facility A West Construction
- Receive regulatory comments on Draft FFS

All calendar year 2010 milestones were met.

During 2010, the Livermore site initiated three enhanced source area remediation (ESAR) treatability tests: (1) pneumatic fracturing at the Treatment Facility E Hotspot; (2) bioremediation at the Treatment Facility D Helipad; and (3) enhanced thermal remediation at the Treatment Facility E Eastern Landing Mat. The results of these treatability tests could potentially accelerate cleanup at the Livermore site. The pneumatic fracturing treatability test is scheduled for completion in 2011 while the bioremediation and thermal heating treatability tests are scheduled for completion in 2012.

In addition to these treatability studies, the Livermore site conducted extensive direct-push cone penetration testing (CPT) surveys to better delineate the Building 518 Perched Zone and Building 511/Building 419 source areas.

During 2010, six dual extraction wells, two ground water extraction wells, three soil-vapor extraction wells, and nine monitor wells were installed at the Livermore site. In addition, 90 obsolete wells in the Treatment Facility A Vadose Zone Observatory and Treatment Facility 406 Gas Pad areas were properly sealed. See [Buscheck et al. \(2011\)](#) for additional information on the current status of cleanup at the Livermore site.

Treatment Facilities. During 2010, the Livermore GWP maintained 29 groundwater and 9 soil vapor treatment facilities. The groundwater extraction wells and dual phase extraction wells extracted about 1,052 million L of groundwater during 2010. The dual-phase extraction wells and soil-vapor extraction wells together removed 1.7 million m³ of soil vapor.

In 2010, the Livermore GWP treatment facilities removed about 98.9 kg of VOCs. Since remediation efforts began in 1989, more than 15.5 billion L of groundwater and approximately 12 million m³ of soil vapor have been treated, removing about 2,876 kg of VOCs.

Community Relations. Livermore site community relations activities in 2010 included communication and meetings with neighbors (for example, the Neighborhood Meeting on the Treatment Facility A West Construction held in October 2010) and local, regional, and national interest groups and other community organizations; public presentations; maintenance of information repositories and an administrative record; tours of site environmental activities; and responses to public and news media inquiries. In addition, DOE/LLNL met with members of Tri-Valley Communities Against a Radioactive Environment (Tri-Valley CAREs) and the organization's scientific advisor as part of the activities funded by an EPA Technical Assistance Grant (TAG). Community questions were also addressed via electronic mail, and project documents, letters, and public notices were posted on a public website: <http://www-envirinfo.llnl.gov>.

2. Compliance

Table 2-1. Active permits in 2010 at the Livermore site and Site 300.

Type of permit	Livermore site ^(a)	Site 300 ^(a)
Hazardous waste	<p>EPA ID No. CA2890012584. Hazardous Waste Facility Permit Number 99-NC-006 (RCRA Part B permit)—to operate hazardous waste management facilities.</p> <p>Registered Hazardous Waste Hauler authorized to transport wastes from Site 300 to the Livermore site. Permit number 1351.</p> <p>Conditionally Exempt Specified Wastestream Permit to mix resin in Unit CE231-1.</p> <p>Conditional Authorization Permit to operate sludge dewatering unit in Building 322A.</p> <p>PT0305819. RCRA large-quantity hazardous waste generation facility—ACDEH.</p>	<p>EPA ID No. CA2890090002. Hazardous Waste Facility Permit—CSA (Building 883) and EWSF.</p> <p>Hazardous Waste Facility Permit —EWTF.</p> <p>Hazardous Waste Facility Post-Closure Permit—Building 829 High Explosives Open Burn Treatment Facility.</p> <p>PT0010318. Hazardous waste generation facility—SJCEHD.</p>
Medical waste	<p>ACDEH issued a permit that covers medical waste generation and treatment activities for the six BSL 2 facilities, and the BSL 3 facility at Building 368.</p>	<p>NA</p>
Air	<p>BAAQMD issued 165 permits for operation of various types of equipment.</p> <p>BAAQMD issued a revision to the SMOP in 2009, which was initially issued in 2002 to ensure the NOx and HAPs emissions from the site do not exceed federal Clean Air Act Title V emission limits.</p> <p>BAAQMD issued 13 Asbestos Removal and Demolition Permits.</p> <p>CARB issued 5 permits for the operation of portable diesel air compressors and generators.</p>	<p>SJVAPCD issued 34 permits for operation of various types of equipment.</p> <p>SJVAPCD approved a Prescribed Burn Plan for the burning of 2176.5 acres of grassland.</p> <p>BAAQMD issued 1 permit for the operation of an emergency diesel generator.</p> <p>CARB issued 1 permit for the operation of portable diesel air compressor</p> <p>BAAQMD approved a Prescribed Burn Plan for the burning of 139.1 acres of grassland.</p>
Storage tanks	<p>Seven operating permits covering 10 underground petroleum product storage tanks.</p>	<p>One operating permit covering three underground petroleum product tanks assigned individual permit numbers.</p>
Sanitary sewer	<p>Discharge Permit 1250^(b) for discharges of wastewater to the sanitary sewer.</p> <p>Permit 1510G for discharges of groundwater from CERCLA restoration activities.</p>	<p>WDR R5-2008-0148 for operation of sewage evaporation pond.</p>

Table 2-1 (cont.). Active permits in 2010 at the Livermore site and Site 300.

Type of permit	Livermore site ^(a)	Site 300 ^(a)
Water	<p>WDR No. 88-075 for discharges of treated groundwater from Treatment Facility A to recharge basin.^(c)</p> <p>NPDES Permit No. CA0030023 for discharges of storm water associated with industrial activities and low-threat nonstorm water discharges to surface waters.</p> <p>NPDES General Permit No. CAS000002,) for discharges of storm water associated with construction activities affecting 0.4 hectares (1 acre) or more.</p> <p>FFA for groundwater investigation/remediation.</p>	<p>WDR No. 93-100 for post-closure monitoring requirements for two Class I landfills.</p> <p>WDR R5-2008-0148 for discharges to percolation pits and septic systems.</p> <p>NPDES General Permit No. CAS000001 for discharge of storm water associated with industrial activities.</p> <p>NPDES Regional General Permit No. CAG995001 for large volume discharges from the drinking water system.</p> <p>FFA for groundwater investigation/remediation.</p> <p>32 registered Class V injection wells.</p>

Note: See the **Acronyms and Glossary** section for acronym definitions.

- a) Numbers of permits are based on actual permitted units or activities maintained and/or renewed by LLNL during 2010.
- b) Permit 1250 includes some wastewater generated at Site 300 and discharged at the Livermore site.
- c) Recharge basin referenced in WDR Order No. 88-075 is located south of East Avenue within Sandia National Laboratories/California boundaries. The discharge no longer occurs; however, the agency has not rescinded the permit.

Table 2-2. Inspections of Livermore site and Site 300 by external agencies in 2010

Site	Medium	Description	Agency	Date	Finding
Livermore site	Waste	Hazardous waste facilities Compliance Evaluation Inspection (CEI)	DTSC	6/21/10–6/23/10, and 6/29/10	Two minor violations and one Class I violation were issued. The first minor violation was issued for failure to include Hazardous Waste Report Management Method Codes on three manifests observed during the inspection, and the second minor violation was issued for failure to note a discrepancy when LLNL received hazardous waste accompanied by a manifest. The Class I violation was issued for LLNL's failure to inspect for and remedy the presence of beryllium contamination in the ductwork at Building 695, Room 1025. (Note: DTSC rescinded violations 1 & 3 per DTSC letter dated March 9, 2011.)
		Medical Waste Inspection	ACDEH	3/17/10	No violations
		Waste Tire Inspection	ACDEH	4/28/10	No violations

2. Compliance

Table 2-2. (cont) Inspections of Livermore site and Site 300 by external agencies in 2010

Air	Air pollutant emission sources	BAAQMD	1/21/10 2/24/10 3/25/10 4/29/10** 6/24/10 7/21/10 8/26/10* 9/30/10 11/17/10	No violations *A "Notice To Comply" was issued 8/30/10; one boiler was missing the required "Tune-up" record for CY2009. The boiler was in compliance as of CY2010 and at the time of inspection on 8/26/10. No further action was required. ** Two inspections occurred on April 29, 2010, one for the two permitted fuel dispensing facilities, and one for 14 other permitted and permit-exempt stationary sources.
	Asbestos	BAAQMD	4/20/10 5/20/10	No violations
	Synthetic Minor Operating Permit (SMOP)	BAAQMD	1/21/10 2/24/10 3/25/10 4/29/10 6/24/10 7/21/10 8/26/10 9/30/10 11/17/10	No violations
Sanitary sewer	Categorical sampling/inspection Building 153 and Building 321C.	WRD	10/20/2010	No violations
	Annual compliance sampling at the Sewer Monitoring Complex	WRD	10/21/2010	No violations
	Building 432–Optic and Target Fabrication Shop Review	WRD	11/8/2010	No violations
	Building 581–Operational Support (OSB) of National Ignition Facility (NIF)	WRD	11/16/2010	No violations
	Café grease interceptor inspections, Buildings 123 and 471	WRD	11/10/2010	No violations

Table 2-2. (cont)

	Storage tanks	Compliance with underground storage tank requirements and operating permits	ACDEH	9/7/2010 9/14/2010	Three violations. 1) Designated Operator who performed monthly inspections did not possess the correct certification. LLNL hired a contractor who possessed the correct certification to perform the monthly inspections until LLNL staff were trained and certified and could resume this inspection function. 2) The company that services the cathodic protection system was not notified per the operating procedure when the system current went out of range. LLNL developed a Cathodic Protection Inspection Procedure that included a Compliance Criteria that defines the requirements for notification. The Compliance Criteria was posted on the cathodic protection panel. 3) Facility Employees for USTs were not trained by a certified Designated Operator. LLNL hired a contractor who possessed the correct certification to perform the training of the Facility Employees until LLNL staff were trained and certified and could resume this training function.
	Pesticides	Pest control records inspections	ACCDA	(a)	No violations.
Site 300	Waste	Permitted hazardous waste operational facilities: EWTF, EWSF (Building 816 and Magazine 2), Building 883 CSA and WAA. Hazardous waste generator areas: Buildings 801, 805, and 875. Review of hazardous waste-related documentation.	US EPA Region IX	6/24/2010	No violations were issued as a result of the 6/24/2010 inspections in the 8/27/2010 EPA Warning Letter and Return to Compliance. However, three potential violations were identified. 1) At Building 875, an empty aerosol can of brake parts cleaner was observed in a garbage can. The liquid product formerly in the empty container meets the RCRA hazardous waste characteristic of ignitability when declared a waste. However, the remaining propellant was carbon dioxide (CO ₂) which is not a hazardous waste. This information was not clearly documented at the time of the inspection so the can was removed from the garbage can. The potential violation was identified as "storage of hazardous waste without a permit" pursuant to 22 CCR 66262.34. The waste containers were removed from the metal cabinet and transferred to a waste storage area in compliance with 22 CCR 66262.34. No further follow up action was required. 2) Outside Building 875, two open containers which were labeled only as "compressor condensate" with small amounts of liquid inside were observed in a metal cabinet. The containers were not clearly identified as non-hazardous wastewater, although the compressor condensate is not a regulated hazardous waste. The potential violation was identified as "storage of hazardous waste without a permit" pursuant to 22 CCR 66262.34(c). The waste containers were removed from the metal cabinet and transferred to a waste storage area in compliance with 22 CCR 66262.34. No further follow up action was required. 3) Outside Building 875, one spent lead-acid vehicle battery was observed in a battery recycling storage container without the receipt date written on the battery. The potential violation was identified as "failure to properly manage lead-acid batteries" pursuant to 22 CCR 66266.81. The date the battery was received into the storage container was immediately written on the battery. Additionally, the battery terminals were taped with electrical tape. No further follow up action was required.

2. Compliance

Table 2.2 (cont)

<p>Permitted hazardous waste operational facilities EWSF (Magazines 816, 2, 3, 4, and 5), Building 829 post-closure facility, EWTF (Control Room, Detonation Pad, Burn Pan, Burn Cage, one-year storage units by the Detonation Pad and Burn Units, Building 883 CSA, Building 883 WAA, Building 875 outside areas [former waste storage cabinet and current lead acid vehicle battery recycling storage container]) and a review of hazardous waste-related documentation.</p>	<p>DTSC</p>	<p>11/30/2010 12/1/2010</p>	<p>One minor violation was issued for failing to include the "Hazardous Waste Report Method Codes" [Handling Codes(s)] in field #19 on manifest # 00016789, which is required under 22 CCR 66564.71(a)(2)(b). The manifest was corrected on the same day that the "Summary of Violations" notice was issued. The final inspection report, dated 2/3/11, acknowledges the corrective action. No further follow up action was required.</p>
<p>Hazardous waste generator areas: Building 899 Armory, Building 801 Contained Firing Facility, Building 875 Heavy Equipment, Building 883 WAA, Building 805 Process Area, Building 879 Fleet Management, and Building 874 Machine Shop.</p>	<p>San Joaquin County, Environmental Health Department, Certified, Unified Program Agency (CUPA).</p>	<p>3/31/2010</p>	<p>Two violations were issued: 1. Building 875 Heavy Equipment. Anti-freeze that was declared as hazardous waste was observed in a secondary containment pallet. The violation was identified as a failure to maintain spill control equipment pursuant to 22 CCR 66265.33. The violation was corrected by removing the liquid, managing the liquid and paper wipes as hazardous waste and removing all liquid from the pallet prior to returning to service. The corrective actions and "Return to Compliance" Certification was submitted to San Joaquin CUPA on 4/26/2010. No further follow up action was required. 2. Universal Waste battery shipments from LLNL Site 300 to LLNL Livermore Site occurred without maintaining a record of each shipment at LLNL Site 300. The regulation cited was 22 CCR 66373.39. The violation was corrected by implementing a Universal Waste Battery Shipment Log for all Universal Waste battery shipments from LLNL Site 300 to LLNL Site 200 (Livermore site). The corrective action was described in the same "Return to Compliance" Certification submittal to San Joaquin CUPA on 4/26/2010. No further follow up action was required.</p> <p>Two non-compliance issues were described on the CUPA Inspection Report as "Notes:"</p> <ol style="list-style-type: none"> 1. Outside Building 801 Container Firing Facility, four empty 55-gallon drums did not have the "emptied date" written on each drum. The issue was corrected during the inspection by writing the date the drums were emptied on each drum. The applicable regulation would be 22 CCR 66261.7(f). No further follow up action was required. 2. The Building 883 WAA Contingency Plan did not include the current phone number for the San Joaquin County Office of

Table 2.2 (cont)

Emergency Services. The issue was corrected by writing the current phone number in the contingency plan. The applicable regulation would be 22 CCR 66265.52. No further follow up action was required.

Air	Air pollutant emission sources	SJVAPCD BAAQMD	5/04/10 6/15/10 6/21/10	No violations
Water	Permitted operations	CVRWQCB	4/29/2010	No violations
Storage tanks	Compliance with underground storage tank requirements and operating permits	SJCEHD	8/30/2010	Two violations. 1) UST leak detector was not installed all the way to the bottom, so it would not detect a leak at the earliest opportunity. During the inspection the licensed contractor lowered the leak-detector probe to the bottom of the interstitial space so that it could detect a leak at the earliest opportunity. 2) Line leak detector did not pass the annual test until it was adjusted during the inspection and then passed.

Note: See the **Acronyms and Glossary** section for acronym definitions.

(a) Inspection for 2010 records occurred 1/25/2010

2. Compliance

2.1.1.2 Site 300 Environmental Restoration Project

Remedial activities are ongoing at Site 300, which became a CERCLA site in 1990 when it was placed on the National Priorities List. Remedial activities are overseen by the EPA, the Central Valley Regional Water Quality Control Board (CVRWQCB), and DTSC, under the authority of an FFA for the site. Contaminants of concern at Site 300 include VOCs (primarily TCE), high-explosive compounds, tritium, depleted uranium, silicone-based oils, nitrate, perchlorate, polychlorinated biphenyls, dioxins, furans, and metals. The contaminants present in environmental media vary within the different environmental restoration operable units (OUs) at the site. See Webster-Scholten (1994), and Ferry et al. (1999) for background information on LLNL environmental characterization and restoration activities at Site 300. See Dibley et al. (2011) for the current status of cleanup progress.

The Site 300 ERP milestones scheduled for 2010 were the submittal of the Draft, Draft Final, and Final Building 812 Proposed Plan and Draft Amendment to the Site-Wide Record of Decision for the Building 812 OU. The Building 812 milestones scheduled for completion in 2010 were put on hold while the CERCLA path forward for the Building 812 OU was renegotiated with the regulatory agencies. The regulatory agencies have agreed that additional characterization of the environmental contamination in the Building 812 OU is necessary before selecting a remedy. The characterization is scheduled for 2011 and 2012. The regulatory agencies also agreed to postpone the Proposed Plan and Draft Amendment to the Site-Wide Record of Decision for the Building 812 OU. A new schedule for these deliverables is being developed in concert with the regulators.

Treatment Facilities. During 2010, the Site 300 ERP operated 15 groundwater and 5 soil vapor treatment facilities at Site 300. The groundwater extraction wells and dual-phase extraction wells extracted about 36.7 million L of groundwater during 2010. The dual-phase extraction wells and soil-vapor extraction wells together removed 2.3 million m³ of soil vapor.

In 2010, the Site 300 treatment facilities removed nearly 13 kg of VOCs, 0.12 kg of perchlorate, 1,400 kg of nitrate, 0.15 kg of the high explosive compound RDX, 0.0061 kg of silicone oils (TBOS/TKEBS), and 0.0078 kg of uranium in 2010. Since ground water remediation began in 1990, approximately 1,461 million L of ground water and over 16 million m³ soil vapor has been treated, resulting in removal of more than 550 kg of VOCs, 1.0 kg of perchlorate, 9,400 kg of nitrate, 1.5 kg of RDX, 9.5 kg of silicone oils, and 0.0078 kg of uranium.

Remediation efforts in the Eastern GSA have successfully reduced concentrations of trichloroethylene (TCE) and other VOCs in ground water to below their respective cleanup standards set in the GSA Record of Decision (ROD) (United States [U.S.] Department of Energy [DOE], 1997). The Eastern GSA ground water extraction and treatment system was shut off on February 15, 2007 with the U.S. Environmental Protection Agency (EPA), Regional Water Quality Control Board (RWQCB), and California Department of Toxic Substances Control (DTSC) approval. As required by the GSA ROD, ground water monitoring will be conducted for five years after shutdown to determine if VOC concentrations rise or “rebound” above cleanup standards. TCE concentrations were below the 5 µg/L cleanup standard for all Eastern GSA

ground water samples collected during 2010. The Eastern GSA will begin the fifth year of post-shut monitoring in February 2011.

Community Relations. The Site 300 CERCLA Project maintains continuing communications with the community of Tracy and nearby neighbors. Community relations activities in 2010 included maintenance of information repositories and an administrative record; tours of site environmental activities; offsite, private, well-sampling activities; mailings to stakeholders; and providing responses to public and news media inquiries. LLNL hosted TAG meetings with Tri-Valley CAREs to provide a forum for focused discussions on CERCLA activities at Site 300.

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

Title III of SARA, known as the Emergency Planning and Community Right-to-Know Act (EPCRA), requires owners and operators of facilities who 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 13423, Strengthening Federal Environmental, Energy, and Transportation Management, directs all federal agencies to comply with the requirements of the EPCRA, including SARA, Section 313, the Toxic Release Inventory (TRI) Program. EPCRA requirements and LLNL compliance are summarized in **Table 2-3**.

Table 2-3. Compliance with EPCRA.

EPCRA section	Brief description of requirement	LLNL action
302	Notify SERC of presence of extremely hazardous substances.	Originally submitted 5/87.
303	Designate a facility representative to serve as emergency response coordinator.	Update submitted 1/28/09 to San Joaquin County for Site 300 and 2/27/09 to Alameda County for Livermore site. No changes for 2010.
304	Report releases of certain hazardous substances to SERC and LEPC.	No EPCRA-listed extremely hazardous substances were released above reportable quantities in 2010.
311	Submit MSDSs or chemical list to SERC, LEPC, and Fire Department.	As per the California Emergency Management Agency, the EPCRA Section 311 requirement is satisfied by the EPCRA Section 312 submittal and the filing of necessary amendments within 30 days of handling a previously undisclosed hazardous material subject to Section 312 inventory requirements.
312	Submit hazardous chemical inventory to local administering agency (county).	Submitted to San Joaquin and Alameda counties on 1/29/10 and 3/1/10, respectively
313	Submit Form R to U.S. EPA and California EPA for toxic chemicals released above threshold levels.	Form R for lead for Site 300 and mercury for Livermore site submitted to DOE on 6/22/10; DOE forwarded it to U.S. EPA and California EPA 7/1/10.

2. Compliance

On June 22, 2010, LLNL submitted to DOE/NNSA the TRI Form R for mercury for the Livermore site detailing environmental release estimates for calendar year (TRI reporting year) 2009. Form R is used for reporting TRI chemical releases and includes information about waste management and waste minimization activities.

LLNL has reported lead release data for Site 300 since 2002. Over 99 percent of lead releases are associated with activities at the Site 300 Small Firearms Training Facility (SFTF). Data for the 2009 TRI Form R for lead at Site 300 was submitted to DOE/NNSA on June 22, 2010. Over the past few years, the lead releases have decreased due to increased use of frangible bullets.

2.1.3 California Accidental Release Prevention (CalARP) Program

The California Accidental Release Prevention (CalARP) Program is the combined federal and state program for the prevention of accidental release of regulated toxic and flammable substances. The goal of the combined program is to eliminate the need for two separate and distinct chemical risk management programs.

In June 2000, LLNL Site 300 submitted a risk-management plan (RMP) to the San Joaquin County, Office of Emergency Services (SJCOES). The RMP described the systems in place to prevent or mitigate the hazards associated with chlorine used in the LLNL Site 300 water treatment system. In accordance with the Final CalARP Program Regulations in the California Code of Regulations (Title 19, Division 2, Chapter 4.5), the LLNL Site 300 RMP was last updated in September 2010. It has been determined that the Site 300 water treatment system falls under CalARP Program Level 2. This plan is updated at least every five years.

LLNL submitted a revised Livermore site CalARP Level 1 RMP in September 2009 to cover new processes that would be handling hydrofluoric acid above state threshold quantities. The Livermore site RMP now includes lithium hydride, nitric acid and hydrofluoric acid.

2.1.4 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 solid wastes, including wastes designated as hazardous. The California Hazardous Waste Control Law (HWCL) and California Code of Regulations (CCR) Title 22 set requirements for managing hazardous wastes and implementing RCRA in California. LLNL works with DTSC to comply with these regulations and obtain hazardous waste permits.

The hazardous waste management facilities at the Livermore site consist of permitted units in Area 612 and Buildings 625, 693, 695, and 696 of the Decontamination and Waste Treatment Facility (DWTF). Permitted waste-management units include container storage, tank storage, and various treatment processes (e.g., wastewater filtration, blending, and size reduction). LLNL submitted the permit renewal application to DTSC in April 2009, followed by submittal of the human health risk assessment (HHRA) in December 2010 as part of the permit renewal process. DTSC approved the Building 419 Closure Plan in October 2009. Closure activities that were completed include sampling of the facility structure, abatement and demolition of the facility, and partial concrete, asphalt, and soil sampling around the facility's footprint. During

2009/2010, LLNL submitted several permit modification requests to DTSC, all of which have been approved and implemented.

The hazardous waste management facilities at Site 300 consist of three operational RCRA-permitted facilities. The Explosives Waste Storage Facility (EWSF) and the Explosives Waste Treatment Facility (EWTF) are permitted to store and treat explosives waste, respectively. The Building 883 container storage area (CSA) is permitted to store routine facility-generated waste such as spent acids, bases, contaminated oil, and spent solvents. Site 300 has one post-closure permit for the RCRA-closed Building 829 High Explosives Burn Pits. LLNL is currently in the process of renewing the hazardous waste facility permit for EWSF, EWTF, and Building 883 CSA. The Building 829 permit will not expire until April 2, 2013. Transportation of hazardous or mixed waste over public roads occurs by DTSC-registered transporters, including LLNL.

2.1.5 California Medical Waste Management Act

All LLNL medical waste management operations are conducted in accordance with the California Medical Waste Management Act (CMWMA). The program is administered by the California Department of Health Services (DHS) and is enforced by the Alameda County Department of Environmental Health (ACDEH). LLNL's medical waste permit is renewed on an annual basis and covers medical waste generation and treatment activities for the six Biosafety Level (BSL) 2 facilities, and the BSL 3 facility at Building 368.

2.1.6 Radioactive Waste and Mixed Waste Management

LLNL manages radioactive waste and mixed waste in compliance with applicable sections of DOE Order 435.1, and the LLNL-developed *Radioactive Waste Management Basis for the Lawrence Livermore National Laboratory* (LLNL 2009), which summarizes radioactive waste management controls relating to waste generators and treatment and storage facilities.

Additional information on the management of radioactive and mixed wastes, prepared by EPD, is available to LLNL employees in the *Environment, Safety and Health (ES&H) Manual*. LLNL does not release to the public any property with residual radioactivity above the limits specified in DOE Order 5400.5. Excess property of this type is either transferred to other DOE facilities for reuse or transferred to LLNL's Radioactive and Hazardous Waste Management Division for disposal.

2.1.7 Federal Facility Compliance Act

LLNL continues to work with DOE to maintain compliance with the Federal Facilities Compliance Act (FFCA) Site Treatment Plan (STP) for LLNL, which was signed in February 1997. LLNL completed 17 milestones during 2010, and of those, 4 had due dates in 2011.

LLNL requested and was granted an extension for one additional milestone to allow LLNL time to develop new procedures and work control documents for 0.0189 m³ of waste.

LLNL removed approximately 53 m³ of mixed waste from LLNL in 2010. An additional 51 m³ of newly generated mixed waste was accepted into the approved storage facilities and added to the STP, reflecting an overall reduction of 2 m³ of mixed waste being stored by LLNL.

2. Compliance

Reports and certification letters were submitted to DOE as required. LLNL continued the use of available commercial treatment and disposal facilities that are permitted to accept LLNL mixed waste. These facilities provide LLNL greater flexibility in pursuing the goals and milestones set forth in the STP.

2.1.8 Toxic Substances Control Act

The Federal Toxic Substances Control Act (TSCA) and implementing regulations found in Title 40 of the Code of Federal Regulation, Parts 700–789 (40 CFR 700-789) govern the uses of newly developed chemical substances and TSCA-governed waste. All TSCA-regulated waste was disposed of in accordance with TSCA, state, and local disposal requirements with one exception. Radioactive polychlorinated biphenyl (PCB) waste is currently stored at one of LLNL's hazardous waste storage facilities until an approved facility accepts this waste for final disposal.

2.2 Air Quality and Protection

2.2.1 Clean Air Act

All activities at LLNL are evaluated to determine the need for air permits or equipment registrations. Air permits are obtained from the Bay Area Air Quality Management District (BAAQMD) for the Livermore site and from the San Joaquin Valley Air Pollution Control District (SJVAPCD) and/or BAAQMD for Site 300. The BAAQMD also administers a boiler registration program for natural gas fueled boilers with rated heat input capacities greater than 2 million British Thermal Units per hour (Btu/hr) and less than 10 million Btu/hr.

Both the BAAQMD and the SJVAPCD are overseen by the California Air Resources Board (CARB). CARB also oversees the statewide permitting for portable diesel fuel-driven equipment such as portable generators and portable air compressors. In addition, CARB presides over the state-wide registration of In-use off-road diesel vehicles, such as diesel powered forklifts, loaders, backhoes, graders, and cranes.

In 2010, LLNL operated 183 permitted air-pollutant emission sources at the Livermore site and 36 permitted air-pollutant emission sources at Site 300. In addition, the Livermore site continues to maintain a Synthetic Minor Operating Permit (SMOP), which was initially issued by the BAAQMD in 2002 and revised in 2009, to ensure the Livermore site does not emit regulated air pollutants in excess of federal Clean Air Act (CAA) Title V limits. As such, LLNL is able to demonstrate that it does not have any major sources of air pollutant emissions per 40 CFR 70.2. In 2010, LLNL also registered 38 natural gas boilers with the BAAQMD and maintained registrations for 83 In-use off-road diesel vehicles with CARB.

Under the authority of California Assembly Bill 32 (AB32), the State of California has adopted several new regulations regarding emissions of greenhouse gases (GHG). California requires mandatory reporting of stationary-source air emissions from combustion of natural gas that exceed 25,000 metric tons per year of CO₂ equivalent emissions. For the previous three

mandatory reporting years (CY2008, CY2009, and CY2010), the Livermore site has been slightly below the reporting threshold. LLNL continues to implement reductions and controls that should reduce CO₂ emissions in future years. LLNL Site 300 emissions of CO₂ are much lower than Livermore site emissions, and there is no natural gas service at Site 300 that would generate CO₂ emissions.

Also under the authority of AB32, California has adopted special regulations pertaining to sulfur hexafluoride (SF₆), because of its high GHG potential. Beginning in CY2011, research facilities, such as LLNL, must submit an annual report describing the research uses of SF₆ and the measures taken to control the SF₆ emissions. LLNL must also report the amount of SF₆ contained in electrical switchgear and the amount of SF₆ that leaks from that switchgear.

In addition, the federal EPA has a mandatory reporting regulation for stationary-emission sources, similar to California's regulation. LLNL is currently below the reporting threshold for EPA mandatory reporting at both the Livermore site and Site 300.

2.2.2 National Emission Standards for Hazardous Air Pollutants, Radionuclides

To demonstrate compliance with 40 CFR Part 61, Subpart H (National Emission Standards for Hazardous Air Pollutants [NESHAPs] for radiological emissions from DOE facilities), LLNL monitors certain air-release points and evaluates the maximum possible dose to the public. The *LLNL NESHAPs 2010 Annual Report* (Wilson et al. 2011), submitted to EPA, reported that the estimated maximum radiological doses that could have been received by a member of the public in 2010 were 0.11 μSv (0.011 mrem) for the Livermore site and 0.0000057 μSv (0.0000057 mrem) for Site 300. The totals are well below the 100 μSv/y (10 mrem/y) dose limits defined by the NESHAPs regulations.

2.3 Water Quality and Protection

LLNL complies with requirements of the federal Clean Water Act (CWA), Porter-Cologne Water Quality Control Act, and Safe Drinking Water Act (SDWA); the California Aboveground Petroleum Storage Act, Water Code, and Health and Safety Code; and City of Livermore ordinances, by complying with regulations and obtaining permits issued by several agencies whose mission is to protect water quality.

LLNL complies with the requirements of National Pollutant Discharge Elimination System (NPDES) and Waste Discharge Requirement (WDR) permits, and Water Quality Certifications issued by Regional Water Quality Control Boards (RWQCBs) and the State Water Resources Control Board (SWRCB) for discharges to waters of the U.S. and waters of the State. Discharges to the City of Livermore's sanitary sewer system are governed by permits issued by the Water Resources Division (WRD). The SDWA requires that LLNL register Class V injection wells with EPA, and LLNL obtains permits from the Army Corps of Engineers (ACOE) for work in wetlands and waters of the U.S.

2. Compliance

The CWA and California Aboveground Petroleum Storage Act require LLNL to have and implement Spill Prevention Control and Countermeasure (SPCC) plans for aboveground, oil-containing containers. The ACDEH and the San Joaquin County Environmental Health Department (SJCEHD) also issue permits for operating underground storage tanks containing hazardous materials or hazardous waste (see **Table 2-1**). LLNL's permitted underground storage tanks, for which permits are required, contain diesel fuel, gasoline, and used oil; aboveground storage tanks, for which permits are not required, contain fuel, insulating oil, and process wastewater.

2.4 Other Environmental Statutes

2.4.1 National Environmental Policy Act and Floodplains and Wetland Assessments

The National Environmental Policy Act (NEPA) of 1969 is the U.S. government's basic environmental charter. When considering a proposed project or action at LLNL, DOE/NNSA must (1) consider how the action would affect the environment and (2) make certain that environmental information is available to public officials and citizens before decisions are made and actions are taken. The results of the evaluations and notice requirements are met through publication of "NEPA documents," such as environmental impact statements (EISs) and environmental assessments (EAs) under DOE NEPA Implementing Procedures in 10 CFR 1021.

In 2005 DOE/NNSA completed the *Final Site-Wide Environmental Impact Statement for Continued Operation of Lawrence Livermore National Laboratory and Supplemental Stockpile Stewardship and Management Programmatic Environmental Impact Statement* (2005 SWEIS) (U.S. DOE/NNSA 2005). In 2010, no EISs or EAs were completed for LLNL. One categorical exclusion was completed: Mobile Hydrogen-Fueling Station and Use of Hydrogen Buses at LLNL. In 2010, DOE/NNSA also started preparation of a Supplement Analysis (SA) of the 2005 SWEIS, which will consider if the SWEIS should be supplemented, a new SWEIS should be prepared, or no further NEPA documentation is required. The SA will examine changes in programs, projects, or operations since the 2005 SWEIS; new and modified plans, projects, and operations for the period from 2010 to 2015; as well as new information that was not available for consideration when the 2005 SWEIS was prepared. The SA process will include two public informational meetings scheduled for April 2011.

There were no proposed actions at LLNL that required separate DOE floodplain or wetlands assessments under DOE regulations in 10 CFR Part 1022.

2.4.2 National Historic Preservation Act

The National Historic Preservation Act (NHPA) provides for the protection and preservation of historic properties that are significant in the nation's history. LLNL resources subject to NHPA consideration range from prehistoric archeological sites to remnants of LLNL's own history of scientific and technological endeavors. The responsibility to comply with the provisions of

NHPA rests with DOE/NNSA as the lead federal agency in this undertaking. LLNL supports the agency's NHPA responsibilities with direction from DOE/NNSA.

In consultation with the State Historic Preservation Officer (SHPO), DOE/NNSA formally determined that five archaeological resources, five individual buildings, two historic districts (encompassing 13 historic buildings), and selected objects in one building at LLNL are eligible for listing in the National Register of Historic Places (NRHP). To assist DOE and SHPO in developing an agreement as to how to manage the NRHP-eligible properties, LLNL prepared a draft Programmatic Agreement (PA), which includes a draft archaeological resources treatment plan and a draft historic buildings treatment plan as appendices. These plans describe specific resource management and treatment strategies that DOE/NNSA, in cooperation with LLNL, could implement to ensure that significant historic properties are managed in a manner that considers their historic value. As of the end of 2010, SHPO was still reviewing the draft PA and treatment plans.

2.4.3 Antiquities Act of 1906

Provisions of the Antiquities Act provide for protection of items of antiquities (i.e., archaeological sites and paleontological remains). The five NRHP-eligible archaeological sites noted in Section 2.4.2 are protected under the Antiquities Act. No paleontological remains subject to the provisions of the Antiquities Act were identified in 2010.

2.4.4 Endangered Species Act and Sensitive Natural Resources

LLNL meets the requirements of the federal and state Endangered Species Act (ESA), the Eagle Protection Act, the Migratory Bird Treaty Act, and other applicable regulations as they pertain to endangered species, threatened species, and other special-status species (including their habitats) and designated critical habitats that exist at the LLNL sites. LLNL works with regulators to protect special-status species. For example, on February 10, 2010, LLNL received an amendment to *The Arroyo Maintenance Project on Arroyo Las Positas at Lawrence Livermore National Laboratory Biological Opinion* from the U.S. Fish and Wildlife Service. This amendment describes potential impacts to California red-legged frogs that may occur during maintenance activities throughout the Livermore site. Additional conservation measures for the protection of California red-legged frogs during maintenance activities are also included.

2.4.5 Federal Insecticide, Fungicide, and Rodenticide Act

LLNL complies with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), which provides federal control of the distribution, sale, and use of pesticides and requires that commercial users of pesticides are certified pesticide applicators. The California Department of Pesticide Regulation (DPR) has enforcement responsibility for FIFRA in California; DPR has in turn given enforcement responsibility to county departments of agriculture. All pesticides at LLNL are applied, stored, and used in compliance with FIFRA and other California, Alameda County, and San Joaquin County regulations governing the use of pesticides. The staff of the Landscape and Pest Management Shop at the Livermore site and the Laborer/Gardener Shop at Site 300 includes certified pesticide applicators. These shops ensure that all storage and use of

2. Compliance

pesticides at LLNL is in accordance with applicable regulations. LLNL also reviews pesticide applications to ensure they do not result in impacts to water quality or special status species.

2.5 Environmental Occurrences

Notification of environmental occurrences is required under a number of environmental laws and regulations as well as DOE Order 231.1A and DOE Manual 231.1-2. Table 2-4 provides a list of environmental incidents reportable under DOE Order 231.1A and DOE Manual 231.1-2 reporting requirements.

Table 2-4. Environmental Occurrences reported under the Occurrence Reporting System in 2010.

Date(a)	Occurrence category/ group	Description
3/31/10	Significance Category SC4 Occurrence under Group 9(2) OR 2010-0017	<p>LLNL received a Notice of Violation (NOV) from the SJCEHD during the CUPA inspection of Site 300. The NOV identified two violations: 1) a small amount of antifreeze was observed in the secondary containment for product storage in B-875. 2) failure to keep records for the shipment of universal waste (used batteries). On March 31, 2010, antifreeze in the secondary containment pallet was removed immediately following the agency inspection.</p> <p>On April 1, 2010, the Site 300 Manager made announcements at the Site 300 Plan-of-the-Day and Plan-of-the-Week meetings that the current procedure (which uses LLNL in-house mail services) to mail universal waste batteries to the Livermore Site Battery Shop should be immediately discontinued. (Note: Since the Occurrence, LLNL has implemented a "Universal Waste Battery Shipment Log" that complies with the universal waste recordkeeping requirements in 22 CCR 66273.39.)</p>
6/29/10	Significance Category SC4 Occurrence under Group 9(2) OR 2010-0026	<p>LLNL initially received three violations from DTSC during the 2010 CEI: 1) one Class I violation for LLNL's alleged failure to inspect and remedy for the presence of Beryllium contamination in ductwork at its hazardous waste facility, 2) one minor violation for missing waste handling codes on three manifests, and 3) one minor violation for LLNL's alleged failure to record information on one manifest about a partially rejected shipment. DTSC rescinded violations 1 and 3, per DTSC's letter dated March 9, 2011.</p>
8/26/10	Significance Category SC4 Occurrence under Group 9(2) OR 2010-0040	<p>LLNL received a Notice to Comply from the BAAQMD during a routine inspection for failure to complete an annual inspection and tune up for one boiler that had been tagged "out of service." The next time the boiler is fired up, a "tune up" is necessary to comply with the BAAQMD Regulation 9, Rule 7.</p>
8/30/10	Significance Category SC4 Occurrence under Group 9(2) OR 2010-0041	<p>LLNL received a Notice of Violation (NOV) from the SJCEHD during the underground storage tank inspection of Site 300. The NOV identified two violations: 1) the secondary containment leak detection equipment on one tank was not properly adjusted to detect a leak at the earliest possible opportunity, 2) a mechanical line leak detector failed to detect a leak when tested. Both violations were corrected at the time of the inspection, and no response actions were required by the SJCEHD.</p>
8/31/10	Significance Category SC4 Occurrence under Group 9(2)	<p>LLNL received a NOV from the EPA for findings discovered during a hazardous waste compliance inspection of Site 300 conducted on</p>

Date(a)	Occurrence category/ group	Description
OR 2010-0042		6/24/10. The NOV identified three "potential" violations: 1. A mostly empty aerosol can of brake cleaner in a garbage can was found inside the heavy equipment area of B-875. 2. Two open, undated containers in/around B-875, which contained only small amounts of liquid waste, were labeled only as "compressor condensate" 3. A used lead-acid battery located in a storage container in the heavy equipment maintenance area in/around B-875 was not dated. (Note: Two of the potential violations were corrected at the time of the inspection. With regards to violation 1, the facility representative removed the aerosol can of brake cleaner from the garbage and placed the container in a nearby flammable storage locker. With regards to violation 3, the facility representative marked the date on the battery, covered the terminals with electrical tape, and relocated the battery to the appropriate storage container. Finally, documented proof including pictures was subsequently provided to EPA to show that the containers were emptied, dated, and properly disposed of.)
9/14/10	Significance Category SC4 Occurrence under Group 9(2) OR 2008-0048	LLNL received a NOV from the ACDEH for the underground storage tank inspection conducted on 9/7/10 and 9/14/10. Three violations were identified: 1) the individual performing monthly tank inspections did not have the correct certification. 2) Facility employees for USTs were not trained by a certified Designated Operator. 3) The tank cathodic corrosion protection equipment was below the minimum compliance range for four tanks, and the service company was not notified. Resolution is pending.
12/7/10	Significance Category SC4 Occurrence under Group 9(2) OR 2010-0060	LLNL received a minor violation from the DTSC during the CEI inspection at Site 300 conducted 11/30/10 through 12/1/10. One minor violation was identified: a hazardous waste manifest was missing the appropriate waste handling code. The hazardous waste manifest was corrected on the same day the "Summary of Violations" notice was issued.

(a) Date the occurrence was categorized, not discovered.

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