

## **SANDIA REPORT**

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# **Sandia National Laboratories, California Environmental Management System Program Manual**



Prepared by  
Environmental Management Department  
Sandia National Laboratories  
Livermore, California 94550

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Environmental Management Department  
Sandia National Laboratories, California  
7011 East Avenue  
Livermore, CA 94550

## **Abstract**

The Sandia National Laboratories, California (SNL/CA) Environmental Management System (EMS) Program Manual documents the elements of the site EMS Program. The SNL/CA EMS Program conforms to the International Standard on Environmental Management Systems, ISO 14001:2004 and Department of Energy (DOE) Order 436.1.

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## Summary of Document Changes

Significant changes made to the 2012 edition of the EMS Program Manual are marked with a sidebar within the document and summarized in Table 1.

**Table 1 Summary of Changes to EMS Program Manual, 2012**

<b>Section</b>	<b>Page</b>	<b>Change</b>
1.1	11	Updated the driver for EMS requirement
3.2 / Table 2	16	Updated list of key personnel
4.1 / Table 4	21	Updated ranking scores of environmental aspects
8	32	Removed reference to Appendix A
12.2	49	Updated process for providing EMS awareness to visitors
15 / Figure 13	55	Updated audits diagram with most current
15.1.1	56	Updated with results of 2011 audit conducted by Org 857
15.1.2	56	Updated with results of 2012 gap analysis
20.2	64	Updated community outreach efforts for 2011
Appendix A		Appendix A removed

# Acronyms and Abbreviations

BAAQMD	Bay Area Air Quality Management District
CARB	California Air Resources Board
CATS	Corrective Action Tracking System
CCR	California Code of Regulations
CEDT System	Corporate Education, Development, and Training System
CFR	Code of Federal Regulations
DOE	Department of Energy
EMS	Environmental Management System
EO	Executive Order
EP Rep	Environmental Programs Representative
ES&H	environment, safety, and health
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
H&S Code	Health and Safety Code
HPSB	High Performance Sustainable Building
IDT	Interdisciplinary Team
ISMS	Integrated Safety Management System
ISO	International Organization for Standardization
JSA	Job Safety Analysis
LEED	Leadership in Energy and Environmental Design
LESA	Laboratory Enterprise Self Assessments
M&O Contract	management and operating contract
MSDS	material safety data sheet
NEPA	National Environmental Policy Act
PHS	primary hazard screening
QA	quality assurance
QAPP	Quality Assurance Program Plan
RCRA	Resource Conservation and Recovery Act
SSHEAC	Security, Safety, Health & Environment Action Committee
SME	subject matter expert
SNL	Sandia National Laboratories
SNL/CA	Sandia National Laboratories, California
SNL/NM	Sandia National Laboratories, New Mexico
SWPPP	Stormwater Pollution Prevention Plan
USC	United States Code
WPC	Work Planning and Control

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# 1 Program Introduction

Sandia National Laboratories, California (SNL/CA) has maintained functional environmental programs to assist with regulatory compliance for more than 30 years. During 2005, these existing programs were rolled into a formal environmental management system (EMS) that expands beyond the traditional compliance focus to managing and improving environmental performance and stewardship practices for all site activities. An EMS is a set of inter-related elements that represent a continuing cycle of planning, implementing, evaluating, and improving processes and actions undertaken to achieve environmental policy and goals. The SNL/CA EMS Program conforms to the International Standard for Environmental Management Systems, ISO 14001:2004 (ISO 2004). The site first received ISO 14001 certification in September 2006 and recertification in 2009.

SNL/CA's EMS Program is applicable to the Sandia, Livermore site only. Although SNL/CA operates as one organizational division of the overall Sandia National Laboratories, the EMS Program is site-specific, with site-specific objectives and targets. SNL/CA (Division 8000) benefits from the organizational structure as it provides corporate level policies, procedures, and standards, and established processes that connect to and support elements of the SNL/CA EMS Program. Additionally, SNL/CA's EMS Program benefits from two corporate functional programs (Facilities Energy and Water Resource Management and Fleet Services programs) that maintain responsibility for energy management and fleet services for all Sandia locations<sup>1</sup>. Each EMS element is further enhanced with site-specific processes and standards.

Division 8000 has several groups operating at Sandia National Laboratories, New Mexico (SNL/NM). Although these groups, from an organizational perspective, are part of Division 8000, they are managed locally and fall under the environmental requirements specific to their New Mexico location. The New Mexico groups in Division 8000 follow the corporate EMS Program for New Mexico operations.

## 1.1 Integration with Corporate EMS Standards

The requirement for an EMS at SNL/CA was initially driven by *DOE Order 450.1A, Environmental Protection Program*. Order 450.1A was cancelled in 2011 and replaced by *Order 436.1, Departmental Sustainability*. DOE Order 436.1 was established to ensure that an EMS and site sustainability are at the forefront of environmental excellence. Although this order is not within the Sandia Management and Operations Contract (M&O Contract), the intent of the Order is implemented through an M&O Contract requirement for Sandia to maintain an EMS that is certified to the International Organization for Standardization (ISO) 14001 standard.

## 1.2 SNL/CA EMS Program Mechanics

SNL/CA prepared the *Sandia National Laboratories, California Environmental Management System Program Manual* (EMS Manual) to document and provide a roadmap to its EMS

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<sup>1</sup> Water resources are managed locally by SNL/CA personnel.

Program. Annually, the SNL/CA EMS Core Team updates the EMS Manual to document the aspects/impacts of current operations, the goals and objectives that respond to these impacts and the EMS changes and improvements that occurred during the year. The EMS Manual represents a point in time. Updated information about the EMS program is added to the Environmental Management Department website. Consequently, the most up-to-date information is typically found on Sandia's website.

The SNL/CA EMS Program encompasses an annual cycle of planning, implementing, assessing, and improving operations in support of site-specific environmental goals. The EMS Program cycle is presented in Figure 1. As shown, the EMS cycle aligns with the budget cycle so that investment and resource requirements can be requested for the next budget year. To provide further detail of the timing of EMS actions throughout the year, an annual EMS calendar is maintained and included as Figure 2.

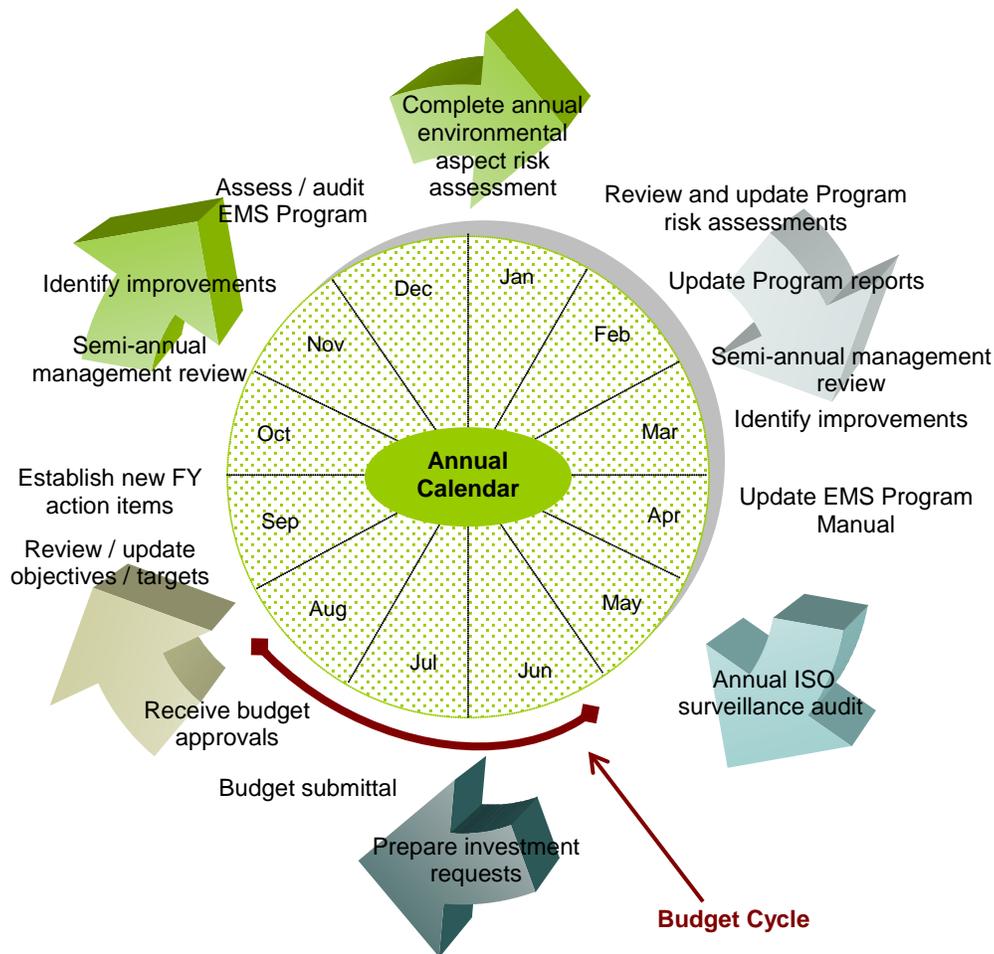


Figure 1 EMS Program Cycle

Figure 2 Annual EMS Calendar, 2012

FY 2012						Month											
EMS Calendar of Major Tasks	Assigned To	Start Date	Complete Date	% Complete	Last Update	O	N	D	J	F	M	A	M	J	J	A	S
Staff Workload																	
Red = heavy Orange = moderate Green = light																	
<b>RISK ASSESSMENT</b>																	
Annual Environmental Aspect Risk Assessment	Core Team	11/1/2011	12/1/2011	100%													
Environmental Programs PHS update	Leads	1/1/2012	2/1/2012														
Review / update program risk assessments	Leads	1/1/2012	2/1/2012														
<b>PROGRAM REPORTS</b>																	
Update annual program reports	Leads	2/1/2012	3/1/2012														
Dept. Mgr review & approval of program reports	Shamber	2/15/2012	3/15/2012														
Publish annual program reports - website	Leads	3/31/2012	3/31/2012														
<b>OBJECTIVES/TARGETS/ACTIONS PLANNING</b>																	
Establish/modify objectives and targets for FY2013	Core Team	8/1/2012	10/1/2012														
SSHEAC review/approval of objectives/targets for FY2012	SSHEAC	10/12/2011	12/2/2011	100%													
Establish actions supporting objectives/targets	Core Team	10/13/2011	1/31/2012														
Modify FY12 objectives/targets/actions based on SSHEAC feedback	Core Team	10/13/2011	12/2/2011	100%													
<b>REPORTING/MANAGEMENT REVIEW</b>																	
Top Mgmt EMS Review 1 - Audit results, external communications, corrective/preventive actions, follow-up actions, recommendations for improvement	Shamber	6/7/2012	6/7/2012														
Top Mgmt EMS Review 2 - Past FY performance, metrics, new objectives/targets review and approval (fiscal year 2011 summary)	Shamber	10/12/2011	12/2/2011	100%													
<b>EMS PROGRAM MANUAL</b>																	
Annual EMS Program Manual update	Larsen	3/1/2012	3/31/2012														
Dept. Mgr review & approval of EMS manual	Shamber	4/1/2012	4/1/2012														
Publish annual EMS Manual - website	Larsen	4/15/2012	4/15/2012														
<b>EARTH DAY</b>																	
Earth Day Planning	Dicker	2/15/2012	4/15/2012														
Earth Day / EMS awareness survey	Shamber	4/15/2012	4/22/2012														
Virtual Earth Day website	Core Team	4/1/2012	4/22/2012														
<b>ANNUAL ASSESSMENTS</b>																	
Prepare annual program self assessment plans	Leads	10/1/2011	11/1/2011	100%													
Mgr approval of self assessment plans	Shamber	11/1/2011	11/1/2011	100%													
Perform program line self assessment	Leads	11/1/2011	1/31/2012														
Perform annual EMS self assessment	Shamber	11/1/2011	1/31/2012														
<b>ISO CERTIFICATION ACTIONS</b>																	
Surveillance Audit 2012	Core Team	5/7/2012	5/9/2012														
<b>MISCELLANEOUS EMS ACTIONS</b>																	
Update Env reports/documents spreadsheet	Shamber	10/1/2011	11/1/2011														
Annual VP Delegation of Authority	Shamber	10/13/2011	10/13/2011	100%													
ASER Preparation - draft submission	Larsen	1/1/2012	3/8/2012														
ASER Submission - final (CY summary)	Larsen	6/1/2012	6/1/2012														
Publish and distribute ASER	Larsen	6/1/2012	8/1/2012														
Review web-based EMS Roadmap and correct as appropriate - Qtrly	Larsen	10/1/2011	9/30/2012														

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## 2 SNL/CA Environmental Policies

SNL/CA follows corporate and site-specific environmental policies that are combined with broader environment, safety, and health (ES&H) requirements. The Sandia corporate ES&H policy (ESH100) (SNL 2009d) states: It is the policy of Sandia Corporation to protect Members of the Workforce and the public, prevent incidents, and integrate environmental stewardship and sustainability throughout the life cycle of its activities.

Sandia's ES&H performance objectives also include creating a work environment that strives for zero environmental incidents and zero operational fines, violations, or penalties.

In addition, the SNL/CA Vice President re-issued a Division 8000 ES&H standard of performance statement in November 2009. The statement reinforces individual accountability, environmental stewardship, and regulatory compliance. It also stresses the need to move beyond compliance requirements to nurture a positive ES&H culture at all levels of the workforce.

Annually, the SNL/CA EMS Core Team reviews the ES&H standard of performance statement to ensure that it remains aligned with the site vision and the corporate ES&H policy. This review is executed as part of the internal EMS program audit. If needed, the EMS team presents recommendations for revisions to site management during the management review process described in Chapter 17.

The Standard of Performance Statement resides on the SNL/CA ES&H website at <http://info.sandia.gov/centers/8500/esh/CA-EnvMgmt/policy> and the Sandia external website at [http://public.ca.sandia.gov/casite/about/community/environmental\\_mgt.php](http://public.ca.sandia.gov/casite/about/community/environmental_mgt.php).

### SNL/CA ES&H Standard of Performance

SNL/CA is firmly committed to meeting all corporate and regulatory ES&H policies and requirements that apply to its operations. The application of compliant ES&H principles and practices is considered a fundamental element of everyone's work assignment.

In this regard, SNL/CA commits to:

- **Nurture a safety and health conscious work ethic and culture.** We will all assume responsibility for creating and maintaining a worksite, as well as performing our work, in a manner that respects and supports the safety and health of every individual. SNL/CA believes that all accidents are preventable. We will all strive to create a workplace that is free of accidents and injuries.
- **Be a responsible steward of the environmental resources in our care.** We will integrate environmental risk assessment, planning and impact mitigation into every aspect of our work. SNL/CA programs, operations, processes, and facilities will be planned and managed such that they support environmental objectives and targets to minimize the creation of waste, pollution, and adverse impact on the public and the environment. SNL/CA will remain committed to an efficient and effective Environmental Management System as part of the laboratory's Integrated Safety Management System.
- **Comply with all applicable laws, regulations and permits.** Compliance with the letter and the spirit of ES&H laws and regulations is viewed as the minimum acceptable standard. When necessary and appropriate we will go beyond legal mandates in order to implement more effective approaches and to nurture a positive and learning ES&H culture. SNL/CA is committed to continual improvement in all aspects of our environment, safety, and health performance and commits to establish performance indicators to guide these efforts and measure our progress.

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## **3 Structure, Responsibilities, and Authorities**

### **3.1 Management Structure**

The management structure for SNL/CA's EMS Program is depicted in Figure 3. As shown, the EMS Program is implemented through the Environmental Management Department under the Site Operations Center. Site Operations is one of six centers at SNL/CA reporting to the SNL/CA (Division 8000) Vice President. The site Vice President oversees the Security, Safety, Health, & Environment Action Committee (SSHEAC) comprised of the site vice president and center directors. SSHEAC provides leadership and strategic management oversight of Security and ES&H for Division 8000, and validates and approves the site EMS Program. The SNL/CA EMS Core Team manages day-to-day implementation and maintenance of the EMS Program.

### **3.2 Key Responsibilities**

SNL/CA personnel with key responsibility for the EMS Program include the site Vice President, the Director of Site Operations, the Level II Manager for ES&H, Facilities, and Security, the Manager for the Environmental Management Department, and the environmental functional program leads. The site Vice President holds overall responsibility for the success of the SNL/CA EMS Program and establishes the ES&H standard of performance for all site operations. The Director, Level II Manager, and Department Manager are responsible for providing the appropriate resources to implement and maintain the EMS, functional programs, and site infrastructure to support EMS objectives and targets. The Department Manager also serves as the designated management representative for the EMS. The functional program leads are responsible for day-to-day management of EMS elements and for assisting the site workforce in meeting established objectives and targets. The Environmental Programs Representative serves as an environmental liaison to the workforce. SNL/CA personnel assigned to each job function are listed in Table 2.

### **3.3 Authorities**

EMS authorities at SNL/CA are defined in an internal memorandum issued by the Division 8000 Vice President on August 11, 2009. Authorities are defined for all levels of the workforce from the site vice president, directors, and managers, to the basic worker. A copy of the authorities memorandum is provided in Figure 4.

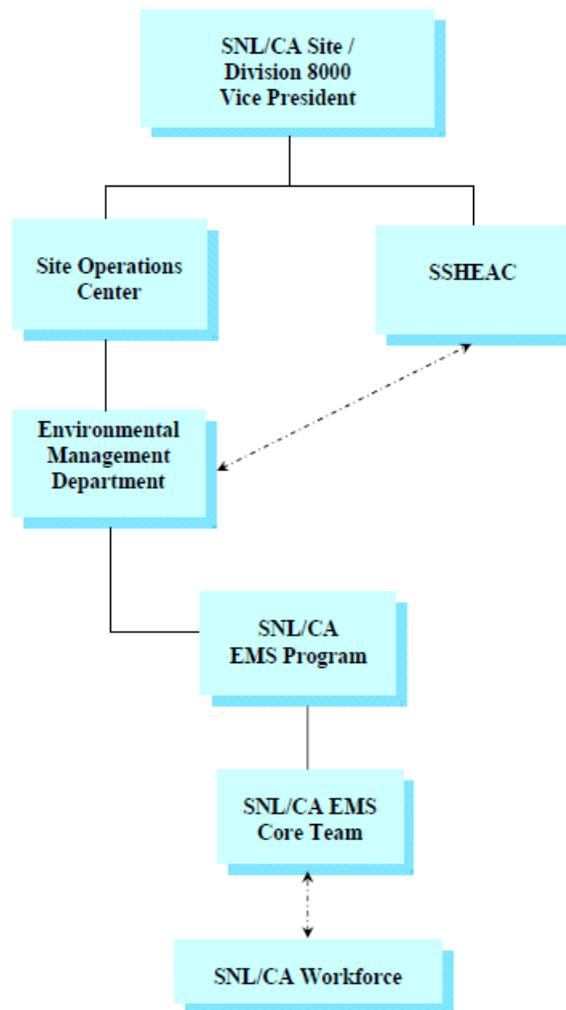


Figure 3 SNL/CA EMS Management Structure

Table 2 SNL/CA EMS Key Personnel, 2012

Job Function or Title	Name
Vice President, SNL/CA (Division 8000)	Rick Stulen
Director, Site Operations	Denise Koker
Level II Manager, ES&H, Facilities, and Security	John Garcia
Department Manager, Environmental Management	Gary Shamber
Designated Management Representative	Gary Shamber
Environmental Programs Representative	Deanna Dicker
<b>Functional Program Leads:</b>	
Air Quality	Leslee Gardizi
Environmental Monitoring	Robert Holland
Environmental Planning	Barbara Larsen
Chemical Management	Mark Brynildson
Pollution Prevention and Waste Minimization	Deanna Dicker
Waste Management	Janet Harris

Figure 4 SNL/CA EMS Authorities and Responsibilities



*date:* August 11, 2009

*to:* Division 8000 / CA Site Members of the Workforce

*from:* Rick Stulen, 8000, MS 9001

*subject:* Personal Authorities and Responsibilities regarding the SNL/CA Environmental Management System (EMS).

SNL/CA's Environmental Management System (EMS) is ISO14001:2004 certified. Certification requires that roles, responsibilities and authorities of persons working for or on behalf of the EMS be identified and approved. This memorandum constitutes this identification and approval by me. Please direct questions and concerns to the site EMS Management Representative, Gary Shamber, 4-2237.

Vice President	<ul style="list-style-type: none"> <li>○ Endorse and communicate the site environmental standards of performance,</li> <li>○ Set the tone and priority, and demonstrate full commitment and support to the EMS and the maintenance of ISO14001 certification,</li> <li>○ Communicate the site's environmental stewardship commitment to the local community as opportunities to do so are presented,</li> <li>○ Provide annual delegation of authority for the generation and submission of required environmental reports, documents and payment of fees.</li> </ul>
Director, Site Operations	<ul style="list-style-type: none"> <li>○ Ensure adequate budget and resources for EMS and the maintenance of the site ISO14001 certification.</li> </ul>
Division ES&H Committee (SHEAC) (VP and site Directors)	<ul style="list-style-type: none"> <li>○ Review and approve proposed changes to environmental policies or practices,</li> <li>○ Promote site awareness of environmental policies and issues,</li> <li>○ Champion a culture of environmental stewardship as the way of conducting business,</li> <li>○ Approve site environmental goals, objectives</li> </ul>

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	<p>and targets,</p> <ul style="list-style-type: none"> <li>○ Review environmental performance and issues as required by ISO14001.</li> </ul>
EMS Management Representative	<ul style="list-style-type: none"> <li>○ Ensure that an EMS is established, implemented and maintained in accordance with ISO14001,</li> <li>○ Annually develop goals, objectives and targets (reflecting site operations) aimed at reducing environmental risks and impacts,</li> <li>○ Annually report to site senior management (SHEAC) on the performance and status of the site EMS,</li> <li>○ Recommend improvements of the site EMS.</li> </ul>
Manager, Environmental Management	<ul style="list-style-type: none"> <li>○ Provide effective management of site environmental programs,</li> <li>○ Direct the environmental programs towards meeting approved environmental goals, objectives and targets.</li> </ul>
Procurement & Purchasing Management	<ul style="list-style-type: none"> <li>○ Develop, maintain and execute processes and procedures that support the procurement of environmentally supportive (friendly) products and services.</li> <li>○ Communicate the site's environmental policies to suppliers, vendors and contractors and include contract requirements and provisions as necessary to fully implement and support the EMS.</li> </ul>
Facilities Management	<ul style="list-style-type: none"> <li>○ Develop, maintain and execute processes and procedures that support sustainable design principles in facilities design, construction and operations,</li> <li>○ Develop, execute and maintain processes and procedures that minimize the environmental impacts of site and building construction and maintenance.</li> </ul>

All Managers	<ul style="list-style-type: none"> <li>○ Assure operations remain compliant with all applicable environmental laws and requirements,</li> <li>○ Develop, execute and maintain processes and procedures that minimize the production of waste (all types), minimize air and water pollutant emissions, promote water and energy conservation and encourage procurement of environmentally friendly products and services,</li> <li>○ Promote environmental awareness and best practices.</li> </ul>
Subject Matter Experts, ES&H Coordinators, and Environmental Programs Representative	<ul style="list-style-type: none"> <li>○ Assist members of the workforce in the environmental planning, analysis and execution of projects and activities to reduce environmental impacts and risks.</li> </ul>
Members of the Workforce	<ul style="list-style-type: none"> <li>○ Comply with all environmental laws and requirements,</li> <li>○ Perform all operations and activities such that they support site environmental goals, objectives and targets,</li> <li>○ Refrain from participating in operations or activities that are non-compliant with environmental laws and requirements,</li> <li>○ Report all environmentally non-compliant operations or activities,</li> <li>○ Suspend operations and activities they observe to be non-compliant with environmental laws and requirements.</li> </ul>

Distribution:  
 SNL/CA Members of the Workforce

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## 4 Environmental Aspects

An environmental aspect is an element of an organization's activities, products, or services that can interact with the environment. Simply put, an environmental aspect is a pathway for an environmental impact, either beneficial or adverse. For 2012, the EMS Core Team reviewed the previous environmental aspects identified for SNL/CA to reaffirm their applicability to current operations. SNL/CA's environmental aspects are presented in Table 3 along with the specific site activities that correspond to each aspect.

**Table 3 SNL/CA Environmental Aspects**

<b>Environmental Aspect</b>	<b>Site activity</b>
<b>Water discharges</b>	office operations, medical operations, laboratory and test activities, facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations, general environmental operations
<b>Air emissions</b>	laboratory and test activities, facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations, onsite receiving and transportation, offsite transportation
<b>Land use</b>	general environmental operations, facilities construction and deconstruction, exterior maintenance and operations
<b>Material procurement and use</b>	office operations, medical operations, laboratory and test activities, facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations, general environmental operations
<b>Hazardous materials</b>	medical operations, laboratory and test activities, facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations, security operations
<b>General transportation</b>	onsite receiving and transportation, offsite transportation, security operations
<b>Radioactive and mixed waste</b>	laboratory and test activities
<b>Hazardous waste</b>	medical operations, laboratory and test activities, facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations, security operations, office operations
<b>Biological agents</b>	laboratory and test activities
<b>Radiological materials</b>	laboratory and test activities
<b>Contaminated sites</b>	general environmental operations
<b>Solid waste (non-hazardous)</b>	office operations, medical operations, laboratory and test activities, facilities construction and deconstruction, building maintenance and operations, security operations, onsite receiving and transportation
<b>Legacy asbestos</b>	facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations
<b>Natural gas use</b>	office operations, medical operations, laboratory and test activities
<b>Water use</b>	office operations, medical operations, laboratory and test activities, exterior maintenance and operations, facilities construction and deconstruction, building maintenance and operations
<b>Hazardous material transportation</b>	onsite receiving and transportation, offsite transportation
<b>Electricity use</b>	office operations, medical operations, laboratory and test activities
<b>Fire</b>	emergency event
<b>Earthquake</b>	emergency event

## 4.1 Significant Environmental Aspects

Significant environmental aspects for SNL/CA were identified through the risk ranking process described in Section 5.3. The site's significant aspects are those with the highest risk score under normal operations: water discharges, air emissions, land use, general transportation, and hazardous waste. Table 4 provides the complete list of SNL/CA aspects for 2012 along with the ranking score from the risk assessment process for both normal operations and off-normal events. Significant environmental aspects are highlighted in bold. The risk ranking for off-normal events is also shown in Table 4 (highlighted in italics). There was no change in significant aspects from 2011 to 2012.

**Table 4 Ranking of SNL/CA Environmental Aspects**

Aspect	Ranking Score <sup>a</sup>		Aspect	Ranking Score <sup>a</sup>	
	Normal	Off-Normal		Normal	Off-Normal
<b>Air emissions</b>	<b>14.3</b>	8	<i>Radioactive and mixed waste</i>	5	42
<b>Water discharges</b>	<b>14</b>	20	Contaminated sites	5	0
<b>Land use</b>	<b>12.1</b>	15	Water use	4.8	18
<b>General transportation</b>	<b>11</b>	1	Natural gas use	4.5	21
<b>Hazardous waste</b>	<b>8</b>	45	<i>Hazardous material transportation</i>	4.4	44
Material procurement and use	6.3	16	<i>Legacy asbestos</i>	4	34
Hazardous materials	6.3	13	Electricity use	4	11
Solid waste (non-hazardous)	6	10	EMERGENCY ASPECTS		
Radioactive materials	6	24	Fire	0	22
<i>Biological agents</i>	<i>5.5</i>	<i>52</i>	Earthquake	0	26

<sup>a</sup> See Section 5.3 for description of methodology used to rank environmental aspects.

## 5 Quality Assurance and Risk Management

SNL/CA follows the Corporate Quality Assurance (QA) Process defined in Corporate Procedure: CG 100.5 (SNL 2009a). Site-specific procedures enhance SNL/CA'S overall approach to quality assurance. The Environmental Management Department supports corporate requirements and site quality objectives in two primary ways: 1) by implementing all required processes and procedures; and 2) by applying a vigorous risk management approach to the EMS, individual environmental programs, and worker safety. Figure 5 depicts the elements of the Environmental Management Department's risk management process.

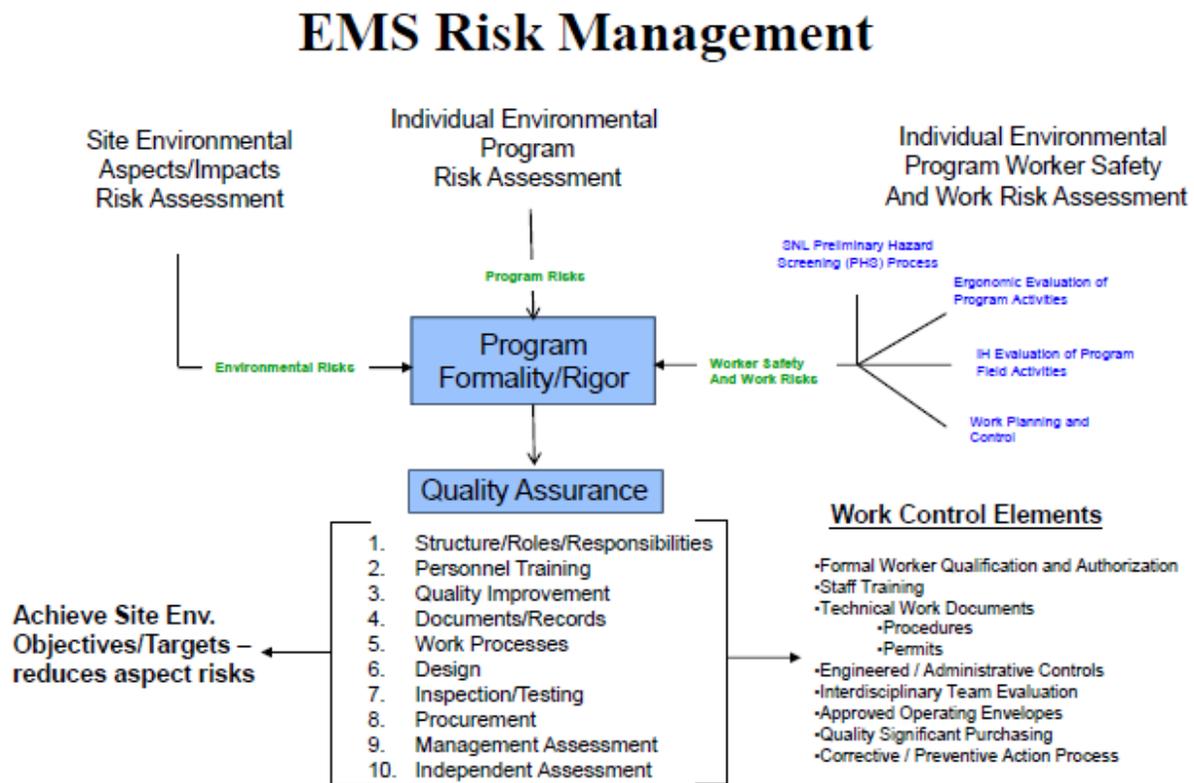


Figure 5 Environmental Management Department Risk Management

### 5.1 Identifying and Managing Risk to Environmental Management Personnel

The execution of each of the six EMS environmental programs introduces personal risks to the staff performing the various actions of these programs. Identification of risk (or hazards) to workers occurs through implementation of the Division 8000 work planning and control (WPC)

process, a graded approach for managing activity-level work. The process incorporates existing tools/systems such as the corporate primary hazard screening (PHS) software, a site Interdisciplinary Team (IDT) review, and a job safety analysis (JSA) to identify hazards. The PHS uses a detailed set of questions about all aspects of environment, safety, and health. The PHS software generates a hazard evaluation based on the answers provided, and identifies training requirements and safety controls needed to protect the workforce. The JSA focuses on individual steps in an activity and associated hazards. Results of both the PHS and the JSA support the operating envelope that is presented to the IDT. An IDT review results in a rigor level determination for a specific activity or set of activities. Each functional environmental program maintains a program-specific PHS, has established an operating envelope through the WPC process, and has identified the rigor level to manage the safety risks associated with program activities. As new activities and changes to program activities occur, the WPC process is reinitiated to ensure that the PHS, operating envelope, and rigor level remain valid for environmental programs.

## **5.2 Identifying and Managing Environmental Program Risk**

Each environmental program completes an annual program risk assessment to evaluate potential environmental program risk as it relates to a specific site activity or aspect of site operations. For risks that are categorized as medium or high, actions are identified and implemented to manage and control the risk. The Environmental Management Department uses the annual risk assessment as a best management practice to further the goals of the EMS and manage the risks associated with the site's environmental aspects.

## **5.3 Identifying and Managing Risk Associated with Environmental Aspects**

Annually, the EMS Core Team ranks the environmental aspects identified through the EMS Program to evaluate the risks of SNL/CA operations. Environmental aspects are ranked first under normal operating conditions using a modified risk assessment process that accounts for existing controls, compliance programs, and EMS improvements made during the previous year. Each aspect is evaluated against nine exposure pathways and rated on an impact scale from zero to 3 (negligible to high consequence). The resulting risk score is then adjusted (either up or down) to account for changes that occurred in the previous year in funding, resources, knowledge, or activity level gained or lost. Figure 6 shows the assessment matrix for one environmental aspect under normal operating conditions. A second assessment of each aspect is performed for a plausible off-normal event (determined by the core team and listed for each aspect) using a similar risk assessment process with the addition of a probability index of zero to 4 (zero to very high probability of an occurrence). Figure 7 shows the assessment matrix for an environmental aspect for an off-normal event. Ranking results are compiled and presented in Figure 8. Figure 9 graphically shows a summary of the ranking assessment for both normal operations and off-normal events. As shown, the highest risk aspects associated with normal operations are different from those identified for off-normal events.

The results of the aspects risk analysis are used to validate the resources applied to the environmental program that manages those risks. The results are also used to help establish the set of actions for the year that are designed to:

- Reduce the impacts of high-risk normal operations;
- Reduce the probability of high-risk off-normal events;
- Reduce the consequences of high-risk off-normal events should they occur.

## 5.4 Quality Assurance Program Plan

The Environmental Management Department QA Program Plan (QAPP), dated March 23, 2006 documents the activities that are vital to assuring the quality of work performed by the department. It applies to all environmental programs within the department. Although not required, the QAPP was selected as the quality best practice to manage medium risk category activities and to ensure consistent application of quality practices for functional environmental programs as well as for the EMS Program. The QAPP addresses the ten QA criteria of an effective quality program identified by DOE.

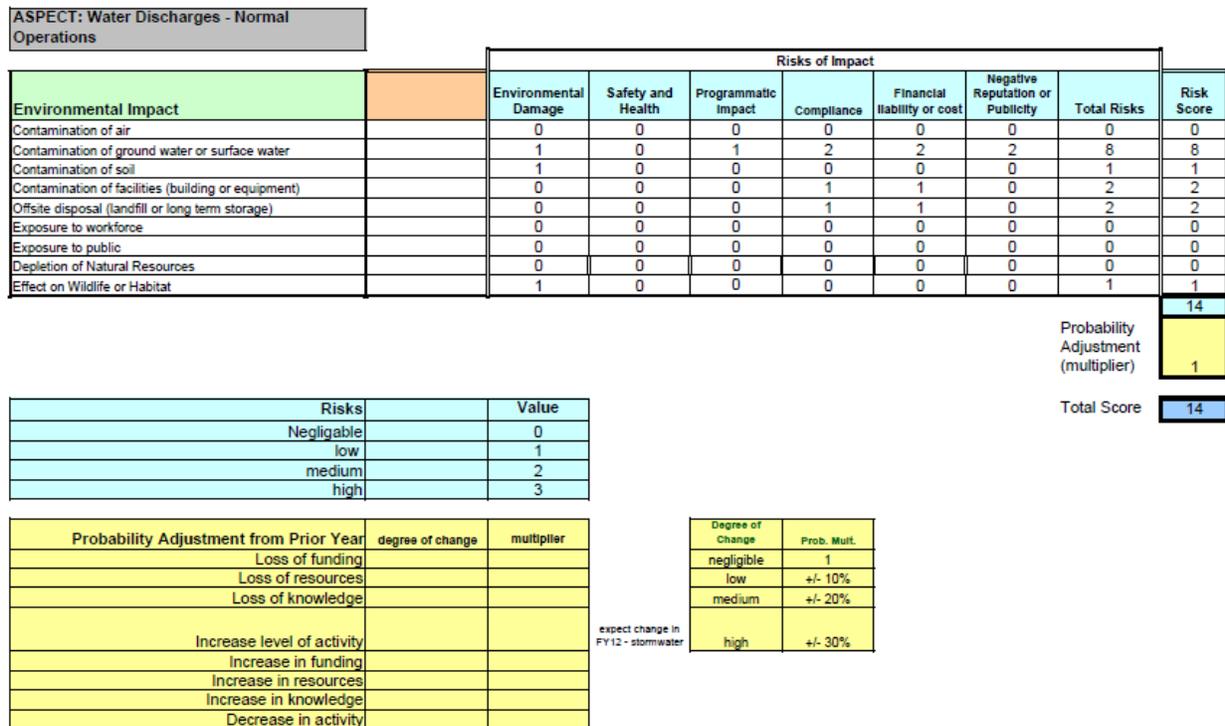


Figure 6 Aspect Ranking Example - Normal Operations

ASPECT: Water Discharges - Off Normal

Environmental Impact	Failure Probability	Risks of Impact							Risk Score
		Environmental Damage	Safety and Health	Programmatic Impact	Compliance	Financial Liability or cost	Negative Reputation or Publicity	Total Risks	
Contamination of air	1	0	0	0	0	0	0	0	0
Contamination of ground water or surface water	1	2	1	1	1	3	2	10	10
Contamination of soil	1	0	0	0	0	0	0	0	0
Contamination of facilities (building or equipment)	1	0	1	0	0	0	0	1	1
Offsite disposal (landfill or long term storage)	1	1	0	0	0	0	0	1	1
Exposure to workforce	1	0	0	0	0	0	0	0	0
Exposure to public	1	0	1	0	0	1	2	4	4
Depletion of Natural Resources	1	0	0	0	0	0	0	0	0
Effect on Wildlife or Habitat	1	1	1	0	1	0	1	4	4
									20

Probability	Value
zero or N/A	0
low	<20%
medium	20-50%
high	50-80%
very high	>80%

Risks	Value
Negligable	0
low	1
medium	2
high	3

Off Normal Scenario: An discharge from operations to the sanitary sewer that negatively affects operations at the Livermore sewer plant.

Figure 7 Aspect Ranking Example - Off-Normal Event

Aspects (Top 5 Significant in Red) Updated: 12/1/2011	Contamination of Air		Contamination of Ground Water or Surface Water		Contamination of Soil		Contamination of Facilities (bldg or equip)		Offsite Storage (landfill or long term)		Exposure to Workforce		Exposure to Public		Depletion of Natural Resources		Effect on Wildlife and Habitat		Total Impact Score - Normal Operations	Probability Multiplier due to change from prior year baseline	Adjusted Impact Score - Normal Operations	Rank - Top 5 Significant identified in Red	Total Impact Score - Off Normal Event	Rank
	N	ON	N	ON	N	ON	N	ON	N	ON	N	ON	N	ON	N	ON	N	ON						
Air Emission	6	6	0	0	0	0	2	0	0	0	3	2	0	0	0	0	0	0	11	1.3	14.3	1	9	17
Legacy Asbestos	1	4	0	0	0	0	3	8	0	4	0	9	0	9	0	0	0	0	4	1	4	16	34	10
Biological Agents	2	0	0	0	0	0	0	11	0	0	9	15	0	15	0	0	0	11	5	1.1	5.5	10	52	7
Contaminated Sites (Areas)	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	5	11	0	15
Water Discharges	0	0	8	10	1	0	2	1	2	1	0	0	0	4	0	0	1	4	14	1	14	5	20	10
Hazardous Material	0	0	0	0	0	0	1	0	0	4	12	2	1	0	0	0	0	0	7	0.9	6.3	6	13	14
Hazardous Waste	0	0	0	6	0	0	6	4	16	4	5	0	12	0	0	0	0	0	8	1	8	7	45	2
Hazardous Material Transportation	1	4	0	7	0	7	0	5	0	1	0	14	2	0	1	1	0	5	4	1.1	4.4	15	44	3
General Transportation	2	-3	2	0	0	0	1	0	1	1	5	1	-1	2	-1	1	0	0	11	1	11	2	1	18
Solid Waste (Non-Hazardous)	0	0	0	0	0	0	0	3	12	0	0	3	0	-1	-2	1	0	0	6	1	6	8	10	16
Radiological Materials	0	0	0	5	0	6	4	5	0	3	2	5	0	0	0	0	0	0	6	1	6	8	24	7
Radiological and Mixed Waste	0	6	0	0	0	6	0	7	5	12	0	0	0	9	0	0	0	2	5	1	5	11	42	4
Material Procurement and Use	1	1	1	1	1	0	0	3	7	0	0	0	1	1	4	0	1	1	7	0.9	6.3	6	16	12
Land Use	0	2	1	1	1	0	0	0	0	2	1	2	0	5	0	1	8	2	11	1.1	12.1	5	15	13
Natural Gas Use	4	3	0	1	0	0	0	0	3	0	14	0	0	1	0	0	0	0	5	0.9	4.5	14	21	9
Electricity Use	2	2	0	1	0	0	0	0	0	2	7	0	0	1	1	0	0	0	5	0.8	4	16	11	15
Water Use	0	0	2	2	0	1	0	7	0	1	0	6	0	0	2	1	2	0	6	0.8	4.8	13	18	11
Emergency Aspects																								
Site Fire	8	2	0	0	0	0	4	6	0	2	0	0	0	0	0	0	0	0	0	0	0	0	22	8
Seismic Event	2	1	1	10	6	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	6

Figure 8 Environmental Aspect Ranking Results, 2012

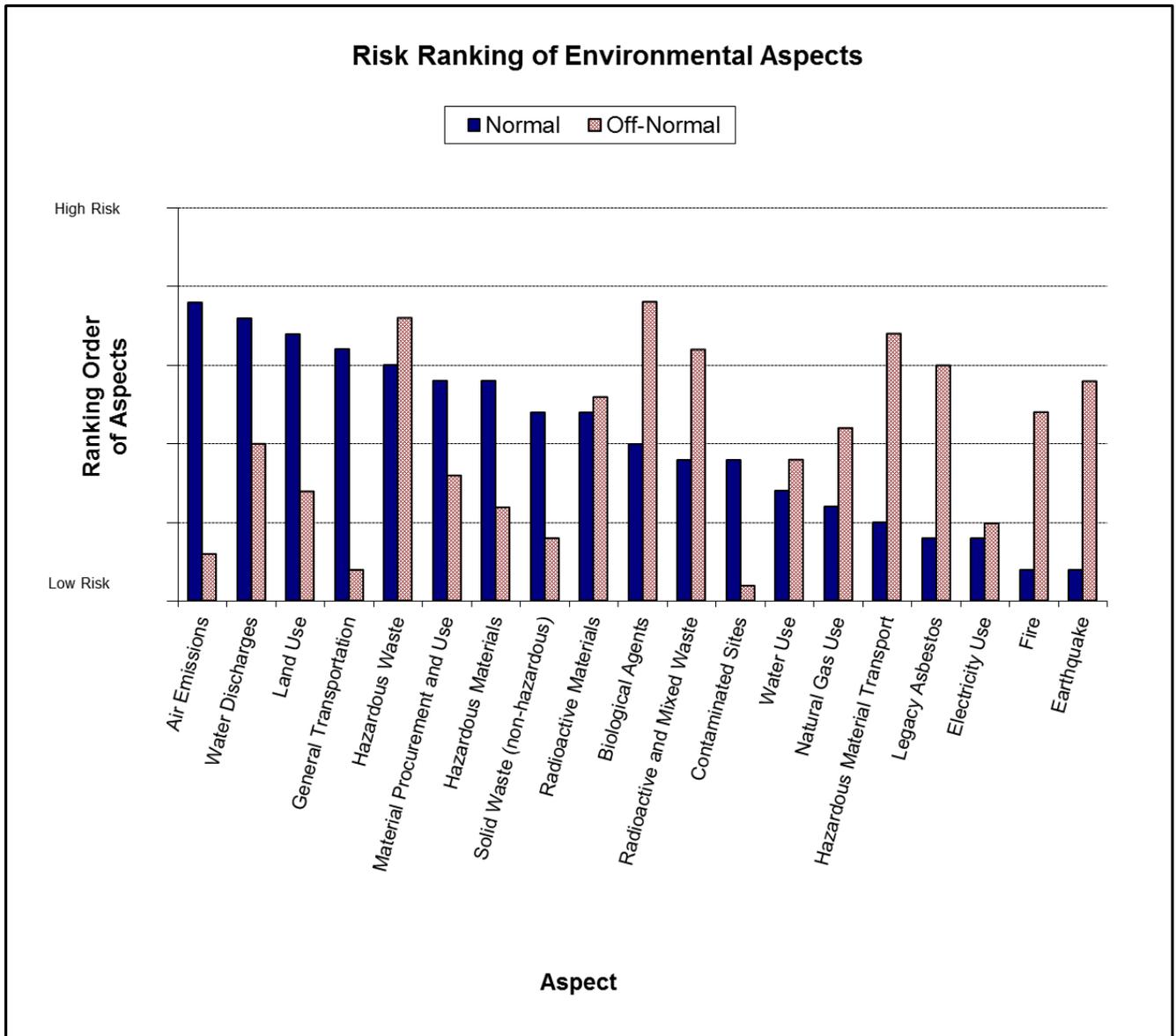


Figure 9 SNL/CA Aspect Ranking Summary

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## 6 Objectives and Targets

Setting objectives and targets, and establishing actions to help achieve these is a continuous cycle as shown in Figure 10. Objectives and targets provide a measure of environmental performance and the effectiveness of an EMS. SNL/CA's objectives support efforts to reduce potential environmental risk from site operations and enhance environmental stewardship. Our targets are detailed measurable performance requirements directly linked to site objectives. Each year, the EMS Core Team reviews EMS objectives and targets and evaluates the sites progress in meeting them. Targets are modified and new action items are established for the upcoming calendar year. As part of this review process, the Core Team identifies additional resources needed to implement current or future action items and submits an investment request through the budget cycle.

The site's senior management team (vice president and directors) are responsible for approving new EMS objectives and targets, and validating existing objectives and targets annually. The management team approved and validated the 2012 EMS objectives and targets on September 29, 2011.

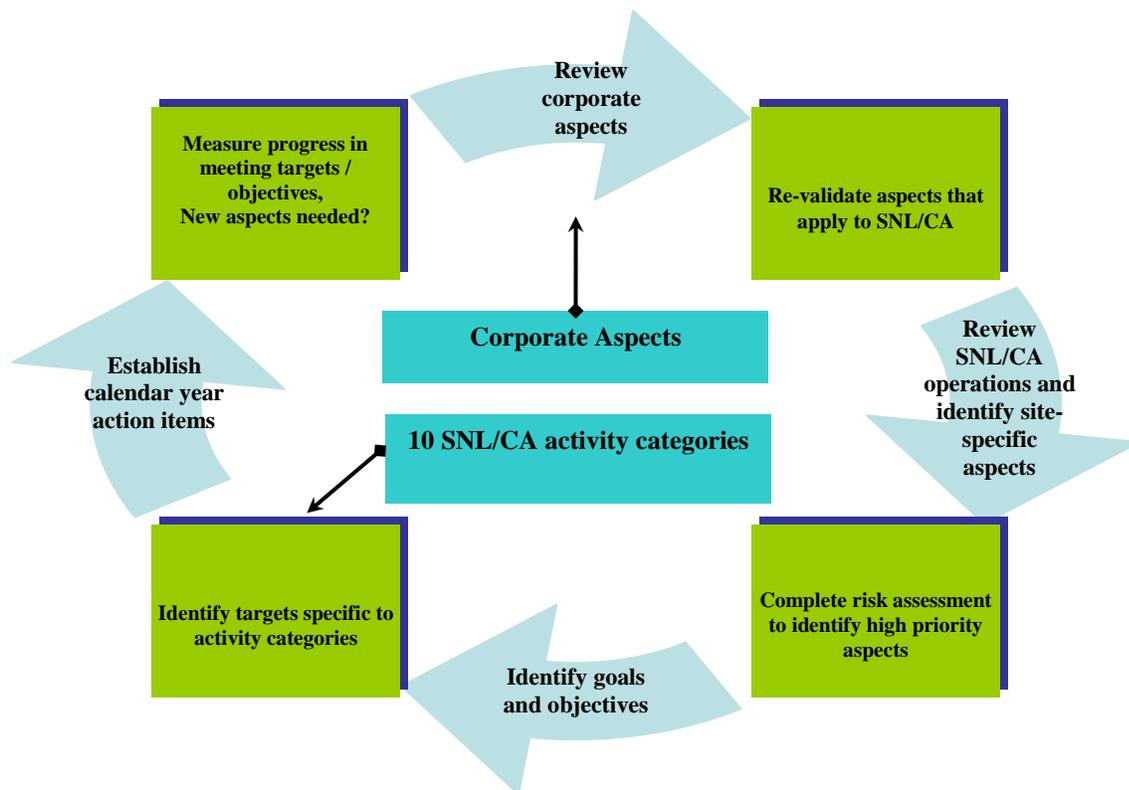


Figure 10 Cycle of Setting and Evaluating EMS Objectives and Targets

## 6.1 Defining Objectives

The ten broad objectives established in 2011 to support SNL/CA EMS activities were continued in 2012. EMS objectives are formed around the concept that the site’s negative environmental impacts cannot be eliminated, in most cases, but should be minimized to the extent practical. For example, site operations will continue to generate waste, use hazardous materials, etc, but these can be managed to reach a minimum level appropriate to the level of operations and mission of the site. SNL/CA EMS objectives are shown in Table 5.

**Table 5 SNL/CA EMS Objectives**

<b>Environmental Aspect/Area</b>	<b>Objective</b>
All	Demonstrate exceptional environmental performance and management.
General Transportation	
Electricity Use	
Natural Gas Use	
Water Use	Minimize consumption (energy, water, non-renewable resources).
Hazardous Waste	
Legacy Asbestos	
Solid Waste	
Radioactive and Mixed Waste	Minimize the production of waste (non-hazardous, hazardous, radioactive, and wastewater).
Water Discharges	
Air Emissions	
General Transportation	Minimize air pollutants and greenhouse gas emissions.
Land Use	Preserve and, when possible, enhance the site’s natural habitat.
Land Use	
Material Procurement and Use	
Electricity / Natural Gas Use	
Hazardous Materials	Design and manage all buildings and facilities using “green” principles.
Water Discharges	Maintain sewer effluent within regulatory discharge limits.
Water Discharges	Minimize the volume and pollution of storm water runoff and other water discharges.
Contaminated Sites	
Material Procurement and Use	
Hazardous Materials	Procure and use environmentally friendly products and materials.
Contaminated Sites	
Water Discharges	Minimize pollutants released to the ground or ground water (spills, landscape chemicals, metals, etc.)
Hazardous Materials	

## 6.2 Defining Targets and Assigning Actions

Annually, the EMS Core Team evaluates and identifies potential targets to support site environmental objectives. The Core Team identifies specific actions, timeframes, and personnel assignments needed to meet these targets. Completion of actions and progress towards meeting established targets is tracked on an Excel spreadsheet. A sample of the spreadsheet is presented in Figure 11.

For 2012, SNL/CA is supporting corporate targets only, with one minor modification. Each of the five significant aspects applicable to SNL/CA activities are addressed in one or more of the corporate targets. Fiscal year 2012 targets are:

- By FY15, reduce energy intensity by 30 percent from an FY03 baseline.
- By FY20, reduce Scope 1 and Scope 2 green house gas emissions by 28 percent from an FY08 baseline.
- By FY20, reduce scope 3 green house gas emissions by 13 percent from an FY08 baseline.
- By FY20, reduce water use intensity by 26 percent from an FY07 baseline.
- By FY20, reduce the use of diesel, gasoline, and E85 by 30 percent from an FY05 baseline.
- By FY15, increase fleet alternative fuel consumption by 10 percent per year from an FY05 baseline.
- By FY12, divert at least 80 percent of non-hazardous solid waste, excluding construction and demolition debris.<sup>2</sup>
- To the maximum extent practical install advanced metering for electricity (by October 2010), steam and natural gas (by October 2015), and standard meters for water.
- Achieve LEED (Leadership in Energy and Environmental Design) Gold for all new construction >\$5M and compliance with HPSB (high performance sustainable building) principles for projects <\$5M.
- By FY12, achieve a reduction in aged chemical inventory (<15% for chemicals aged between 10-15 years, <10% for chemicals aged > 15 years, 0% for manufactureres expired chemicals).

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<sup>2</sup> The corporate target for solid waste diversion is 65%, which SNL/CA has met the last two years. The target was modified for SNL/CA to support continued and expanded waste diversion.

### FY12 SNL/CA Environmental Objectives/Targets/Means and Status

CA Objective	Aspect(s) Impacted	Target	FY11 Status		Special FY12 CA-Specific Actions (Means)	Time frame	Responsible CA Org.	Supporting Org.
			Corp	CA				
1. Demonstrate exceptional environmental performance and management.	All	No Current Targets			1. Maintain ISO 14001 certification of SNL/CA's Environmental Management System.	continual	Environmental Management, 8516	
					2. Implement CA elements of SNL Site Sustainability Plan (FY2010) and other environmental plans, orders, etc. as required.	continual	several organizations	
					3. Brief CA management (Tri-Level) on sustainability and the Corporate/CA plan.	Spring 2011	Environmental Management, 8516	
2. Minimize consumption (energy, water, non-renewable resources).	General Transport (SIG ASPECT), Electricity Use, Natural Gas Use, Water Use	CORPORATE: By FY15, reduce energy intensity by 30 percent. (FY03 baseline). (2010 SSP) (Total Bldg)	-8.6%	0%	4. Re-lamping and ballast change from T12 to T5 in Bldgs 905/906.	by Oct 1, 2011	Facilities 8514, Craig Taylor	POC: Chris Evans, Dept. 4853 Strategic Corporate Partnership LT SMG
					5. Provide for modifications to Energy Mgmt software and deploy new hardware.	by Oct 1, 2011	Facilities 8512	
			-30.1%	-9.7%	6. Continued installation of "Dolphin water treatment units on all major towers to reduce blowdown.	by Oct 1, 2011	Facilities Maintenance, 8513	POC: Chris Evans, Dept. 4853 Strategic Corporate Partnership LT SMG
			-61.2%	-70.2%	No specific CA actions/means.			POC: Mark Crawford, Dept. 10265 Fleet Services
			met	Meets for elect and gas. Water needs more eval.	No specific CA actions/means.		Facilities Planning, 8512, Facilities Maintenance, 8513	POC: Chris Evans, Dept. 4853 Strategic Corporate Partnership LT SMG

Figure 11 Sample of Actions Spreadsheet Supporting FY2012 Targets

## 7 Emergency Preparedness and Response

SNL/CA has an established Emergency Plan (SNL/CA 2011a) and procedures to provide an effective and timely response to emergency conditions. The site's Emergency Management Program was established in accordance with a separate DOE order, *Order 151.1C, Comprehensive Emergency Management System* (DOE 2005). SNL/CA's Emergency Plan establishes guidelines and procedures to mitigate the potential consequences of an operational emergency. The Emergency Management Program maintains implementing procedures for all assigned roles that support emergency events on site. SNL/CA conducts annual training exercises to validate elements of the Emergency Management Program. Routine training drills and communication tests are also completed. The Emergency Plan and Emergency Plan Implementing Procedures are available to the site workforce on SNL/CA's web site at <http://info.sandia.gov/centers/8500/security/em>.

Emergency response actions support our EMS Program by managing and mitigating the potential environmental risk from site operations. During site emergencies, members of the Environmental Management Department provide support with hazardous materials spill response and clean-up. Through these efforts, potential long-term environmental effects are avoided or minimized. The Chemical Inventory System, managed by the Chemical Management Program, one of the six environmental programs, provides invaluable information in support of the Emergency Management Program.

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## 8 Environmental Programs

SNL/CA maintains an Environmental Management Department that manages six functional program areas supporting the site EMS Program. The program leads from each of these six programs are part of the EMS Core Team responsible for developing, implementing, and modifying the site EMS. SNL/CA functional program areas are:

- Air Quality
- Environmental Monitoring
- Environmental Planning
- Chemical Management
- Pollution Prevention and Waste Minimization
- Waste Management

The program lead for each functional area prepares an annual report that provides detailed information about all aspects of program operations. Program reports are provided on the SNL/CA Environmental Management Department website at <http://info.sandia.gov/centers/8500/esh/CA-EnvMgmt>.

Report contents include the following:

- A detailed summary of program activities
- Program drivers
- Operational controls
- Documents produced
- Job descriptions and current assignments
- Training and competency
- Performance measures
- Quality assurance / program risk assessment
- Program assessments
- Accomplishments in the last 12 months
- Issues
- Trends
- Goals and objectives (short-term)

The SNL/CA EMS Program also supports DOE and corporate sustainability goals for environmental, energy, and economic performance. In 2011, a team comprised of Facilities and Environmental staff from both sites updated the corporate Site Sustainability Plan to support DOE's sustainability goals. Sustainability initiatives are implemented at SNL/CA through the Project Engineering, Maintenance and Operations Organization when funding is available. The Site Sustainability Plan is available on the SNL/CA Environmental Management Department website (<http://info.sandia.gov/centers/8500/esh/CA-EnvMgmt>).

## 8.1 Air Quality

The Air Quality Program provides compliance assistance for all nonradiological air emission sources at SNL/CA. Program staff review all directives, laws, and regulations relevant to air emissions for applicability to the site. This program manages the air permit process, from the initial steps of preparing permit applications through implementation of permit conditions and annual renewals. The Air Quality Program is responsible for evaluating proposed projects, assessing chemical use, and assessing emissions of all criteria pollutants and toxic air contaminants.

The Air Quality Program assists the site in complying with the Clean Air Act, California Air Resources Board (CARB) regulations, and local Bay Area Air Quality Management District (BAAQMD) regulations.

## 8.2 Environmental Monitoring

The Environmental Monitoring Program routinely monitors wastewater, storm water, and groundwater systems at SNL/CA to assess the effect of site operations on the public and local environment. Storm water is evaluated for general water quality, and for non-radiological and radiological constituents. Wastewater effluent resulting from site operations is monitored for non-radiological constituents. Liquid effluent control systems are operated and maintained by the program to capture wastewater from laboratory activities for analysis prior to release to the sanitary sewer. Groundwater is sampled and analyzed for non-radiological and radiological constituents to assess the extent of groundwater contamination from past operations. In addition, monitoring of external radiation at the site perimeter is conducted using thermo luminescent dosimeters. Comparisons are made of site data to offsite dose rates. The program also conducts project specific soil sampling to assess potential soil contamination from past or current operations and implements restoration activities, as needed. In addition, the Environmental Monitoring Program provides oversight for ecological resource management coordinates and oversees wildlife, and vegetation surveys.

The Environmental Monitoring Program assists the site in complying with federal requirements (Clean Water Act, National Emission Standards for Hazardous Air Pollutants Rule for Radionuclides); state of California requirements (Porter-Cologne Water Quality Act); and state and local permits for storm water and wastewater discharges. Environmental Monitoring also assists in compliance with the Endangered Species Act; Migratory Bird Treaty Act; California Endangered Species Act; and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as it applies to wildlife and habitat.

## 8.3 Environmental Planning

The Environmental Planning Program oversees activities associated with site-level National Environmental Policy Act (NEPA) analyses, site-level ecological assessments, and cultural resources. Environmental Planning maintains responsibility for general environmental reporting that spans all six environmental program areas.

The Environmental Planning Program assists the site in complying with the Endangered Species Act; California Endangered Species Act; National Historic Preservation Act; NEPA; DOE NEPA Implementing Procedures; and DOE Order 231.1 Environment, Safety, and Health Reporting.

## 8.4 Chemical Management

The Chemical Management Program is responsible for tracking hazardous materials (chemical and biological), managing the Material Safety Data Sheets (MSDS) library, providing MSDS information to site personnel, and for regulatory compliance reporting required under various hazardous materials regulations. The program is also responsible for supporting hazardous material safety and information requirements site-wide.

The Chemical Management Program assists the site in complying with the Emergency Planning and Community Right-to-Know Act and California Right-to-Know regulations. The Hazard Communication/Lab Standard of the Occupational Safety and Health Administration is also key to program operations.

## 8.5 Pollution Prevention and Waste Minimization

The Pollution Prevention and Waste Minimization Program promotes the elimination or reduction of all types of wastes generated at SNL/CA. Program staff work closely with site organizations to establish routine and project specific recycling programs. The program provides guidance for resource and energy conservation and assists in identifying recycled-content products for use throughout the site. Pollution Prevention and Waste Minimization also implements the universal waste program to ensure proper handling and disposal of low-hazard waste such as consumer electronics, mercury wastes, cathode ray tubes, and fluorescent tubes.

The Pollution Prevention and Waste Minimization Program assists the site in complying with the Pollution Prevention Act; Resource Conservation and Recovery Act (RCRA); and the California Hazardous Waste Source Reduction and Management Review Act.

## 8.6 Waste Management

The Waste Management Program manages hazardous, radioactive, and mixed wastes generated by SNL/CA operations. Program personnel collect waste from the point of generation and transfer it to either the Hazardous Waste Storage Facility or the Radioactive Waste Storage Facility for storage, consolidation, and packaging. The program establishes and maintains contracts for offsite treatment and disposal of wastes, manages the RCRA permit process and

implements conditions of the permit, conducts process knowledge evaluations to characterize waste types generated from specific operations, and provides training to all SNL/CA waste generators.

The Waste Management Program assists the site in complying with Federal requirements (RCRA, Toxic Substances Control Act, Federal Facilities Compliance Act, FIFRA); State of California requirements (Hazardous Waste Control Law, Medical Waste Management Act); DOE orders for radioactive waste management and packaging and transportation of waste; and the RCRA Part B Permit for SNL/CA.

## 9 Legal and Other Requirements

SNL/CA is subject to many federal, state, and local environmental laws, regulations, and requirements. Sandia operations are also subject to DOE directives identified in Sandia Corporation’s contract with DOE for management and operation of Sandia National Laboratories and Presidential executive orders. Sandia is committed to managing all activities in accordance with these policies, directives, and processes within the boundaries of the prime contract, applicable laws, and best management practices. As part of our mission, we strive to serve our customers by anticipating their needs, meeting their requirements, and exceeding their expectations. DOE and Sandia establish an annual performance evaluation plan that outlines the expectations for performance.

### 9.1 Current Requirements

Environmental requirements applicable to SNL/CA operations are detailed in annual program reports prepared for each environmental program area. Table 6 provides a list of primary environmental requirements that are applicable to each environmental aspect. In addition to the requirements listed in Table 6, DOE and Sandia establish a set of operational expectations each year. DOE’s expectations of Sandia for 2012 can be found in the *Fiscal Year 2012 Performance Evaluation Plan for Sandia Corporation, Management and Operation of the Sandia National Laboratories*. The 2012 Performance Evaluation Plan includes a performance measure for maintaining effective and efficient ES&H programs.

**Table 6 Primary Environmental Requirements Associated with Environmental Aspects**

<b>Environmental Aspect</b>	<b>Environmental Requirement</b>
<b>Water discharges (significant aspect)</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures. Sandia Site Sustainability Plan
	33 United States Code (USC) §1251, Clean Water Act
	40 Code of Federal Regulations (CFR) 112, Oil Pollution Prevention
	40 CFR 122 - 125, National Pollutant Discharge Elimination System
	40 CFR 129 Toxic Pollutant Effluent Standards and Prohibitions
	40 CFR 403 General Pretreatment Regulations for Existing and New Sources of Pollution
	40 CFR 433 Metal Finishing Point Source Category
	Title 23 California Code of Regulations (CCR), Division 3
	Title 17 CCR Public Health
	California Health and Safety Code (H&S Code), Division 20, Chapter 6.6, California Safe Drinking Water and Toxic Enforcement Act of 1986, Proposition 65
<b>Air emissions (significant aspect)</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures Sandia Site Sustainability Plan
	Clean Air Act, 42 USC § 7401
	40 CFR 61, National Emissions Standards for Hazardous Air Pollutants, Subpart H
	California H&S Code, Division 26
	California Clean Air Act
	California Air Resources Board Regulations
	Bay Area Air Quality Management District Regulations
	Executive Order (EO) 12843, Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances
	EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance
	California H&S Code, Division 25.5 § 38500 et. seq. California Global Warming Solutions Act of 2006

Environmental Aspect	Environmental Requirement		
<b>Land use (significant aspect)</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures Sandia Site Sustainability Plan 42 USC § 4321 et. seq., National Environmental Policy Act 16 USC § 1531 et. seq., Endangered Species Act 16 USC § 703 et. seq., Migratory Bird Treaty Act 33 USC § 1251, Clean Water Act 7 USC § 136, Federal Insecticide, Fungicide, and Rodenticide Act 10 CFR 1022 Compliance with Floodplain and Wetlands Environmental Review Requirements		
	EO 11988 Floodplain Management EO 11990 Protection of Wetlands EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance California Fish and Game Code §§ 2050 – 2068, California Endangered Species Act California Fish and Game Code Biological and Conference Opinion for SNL/CA Operations DOE Order 4700.1 Project Management System DOE Order 413.3 Program and Project Management for the Acquisition of Capital Assets EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management		
	<b>General transportation (significant aspect)</b>	Sandia Site Sustainability Plan Energy Policy Act of 2005 EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance	
		ESH100 Environment, Safety & Health Policy, and related processes and procedures Sandia Site Sustainability Plan 42 USC § 6901 et. seq., RCRA 42 USC § 6961, Federal Facility Compliance Act 40 CFR 239 – 299, RCRA Implementing Regulations 29 CFR 1910.120, Hazard Communication Standard California H&S Code, Division 20, Chapter 6.5, California Hazardous Waste Control Law California H&S Code, Division 104, Part 14, §§ 117600 -118360, California Medical Waste Management Act Title 22 CCR California Implementing Regulations for RCRA 42 USC § 13101 et. seq., Pollution Prevention Act of 1990 EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management California Hazardous Waste Source Reduction and Management Review Act of 1989 California H&S Code, Division 20, Chapter 6.5, Hazardous Waste Control California H&S Code, Division 20, Chapter 6.5, Waste Minimization Certification 15 USC § 2601 et. seq., Toxic Substances Control Act SNL/CA Hazardous Waste Facility Permit SNL/CA Part B Hazardous Waste Operation Plan	
	<b>Hazardous waste (significant aspect)</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures Sandia Site Sustainability Plan 42 USC § 11001 et. seq., Emergency Planning and Community Right-to-Know Act 29 CFR 1910.1200 Hazard Communication Standard 29 CFR 1910.1450 Lab Standard 40 CFR 68 Risk Management Plan EO 12856 Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements	
		<b>Hazardous materials</b>	DOE Order 151.1C Emergency Management California H&S Code, Chapter 6.95, California Hazardous Materials Release Response Plans and Inventory Law EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management California H&S Code Division 20, Chapter 6.7, Underground Storage Tanks 42 USC § 6901 et. seq. RCRA (related to underground storage tanks) 40 CFR 280 RCRA Implementing Regulations for Underground Storage Tanks 15 USC § 2601 et. seq., Toxic Substances Control Act 7 USC § 136, Federal Insecticide, Fungicide, and Rodenticide Act

<b>Environmental Aspect</b>	<b>Environmental Requirement</b>
<b>Material procurement and use</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures DOE Sandia Site Sustainability Plan DOE Order 413.3 Program and Project Management for the Acquisition of Capital Assets EO 12843, Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance 42 USC § 6901 et. seq., Resource Conservation and Recovery Act (RCRA)
<b>Radiological materials</b>	42 USC § 2011 et. seq., Atomic Energy Act ESH100 Environment, Safety & Health Policy, and related processes and procedures MN471016 Radiological Protection Procedures Manual DOE Order 458.1, Radiation Protection of the Public and Environment DOE/EH-0173T, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance 10 CFR 835, Radiological Protection
<b>Radioactive and mixed waste</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures 42 USC § 2011 et. seq., Atomic Energy Act DOE Order 435.1 Radioactive Waste Management DOE Order 458.1 Radiation Protection of the Public and the Environment 42 USC § 6961, Federal Facility Compliance Act SNL/CA Hazardous Waste Facility Permit SNL/CA Part B Hazardous Waste Operation Plan California H&S Code, Division 20, Chapter 6.5, Hazardous Waste Control Law Nevada Test Site Waste Acceptance Criteria
<b>Biological agents</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures SNL/CA Biohazardous Waste Management Plan SNL/CA Medical Waste Management Plan
<b>Contaminated sites</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures California Regional Water Quality Control Board, San Francisco Bay Region Waste Discharge Requirements
<b>Legacy asbestos</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures 40 CFR 61, National Emissions Standards for Hazardous Air Pollutants 15 USC § 2601 et. seq., Toxic Substances Control Act
<b>Solid waste (non-hazardous)</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures Sandia Site Sustainability Plan 42 USC § 13101 et. seq., Pollution Prevention Act of 1990 EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management California Public Resources Code § 42961.5, Waste Tire Manifest Program California H&S Code Division 20, Chapter 6.5, § 25211, Appliance Recycling Title 22 CCR Division 4.5, Chapter 16, Recyclable Materials Title 22 CCR, Division 4.5, Chapter 23, Universal Waste Management Title 22 CCR, 66273, California Electronic Waste Recycling Act California Public Resources Code §§ 42490 – 42499, Cell Phone Recycling Act EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance
<b>Hazardous material transportation</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures DOE Order 460.1B, Packaging and Transportation Safety 49 CFR - Transportation SNL/CA Transportation Safety Document SNL/CA Transportation Security Plan
<b>Natural gas use</b>	Sandia Site Sustainability Plan Energy Policy Act of 2005 EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance
<b>Water use</b>	Sandia Site Sustainability Plan EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance
<b>Electricity use</b>	Sandia Site Sustainability Plan Energy Policy Act of 2005 EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance

<b>Environmental Aspect</b>	<b>Environmental Requirement</b>
<b>Fire (emergency aspect)</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures DOE Order 151.1C, Emergency Management
<b>Earthquake (emergency aspect)</b>	ESH100 Environment, Safety & Health Policy, and related processes and procedures DOE Order 151.1C, Emergency Management

## 9.2 Monitoring Requirements

The process for monitoring ES&H requirements is identified in Administrative Procedure (AOP 04-02 (SNL 2009g)). At the corporate level, Sandia monitors DOE directives, DOE Acquisition Regulation activity, Federal Register, and federal, state, and local government publications for regulatory changes and issues applicable to SNL operations. New requirements are communicated to the workforce through established internal mechanisms and incorporated into Sandia ES&H processes and procedures. New requirements are then incorporated into facility- and operation-specific work planning and control documents.

Environmental subject matter experts (SMEs) at SNL/CA monitor state and local issues to augment corporate monitoring. Subscriptions to electronic and paper publications and interactions with regulators are two primary ways that SNL/CA's SMEs stay current on environmental requirements. SNL/CA SMEs work directly with regulating agencies to obtain information on new and changing requirements well in advance of requirements becoming effective. Such advance notice allows the SNL/CA EMS Core Team to identify resources and implement effective and cost efficient processes for compliance. When budgets allow, environmental staff members attend conferences to keep abreast of regulatory changes.

SMEs at both SNL/CA and SNL/NM interact regularly with their DOE counterparts and regulators. Through these customer and stakeholder interactions, some changes (i.e., executive orders and policies, applicable litigation results, best management practices, etc.) may be identified that are not incorporated into Sandia's Management and Operating Contract (M&O Contract) as formal requirements. Although such changes are not necessarily contract requirements, where appropriate, they are incorporated into the EMS and implemented through functional environmental programs. However, because this process is informal, some changes that may be appropriate may not be captured.

## 9.3 Recent Modifications to Requirements

Table 7 summarizes information from the annual program reports pertaining to new and modified environmental requirements that were recently issued or are pending for 2012.

**Table 7 New and Modified Environmental Requirements, 2011 / 2012**

<b>Requirement Summary</b>	<b>Effective Date</b>	<b>Driver</b>	<b>Program Modification</b>	<b>Environmental Aspect</b>
Businesses (including public entities) that generate 4 cubic yards or more of trash per week must recycle solid waste	July 1, 2012	CA H&S Code, Section 38561, Title 17 CCR, Div. 3, Chapter 1	Recycling of solid waste already occurs and will continue	Solid waste (non-hazardous)
SPCC Plan requirements for a new group of Qualified Facilities	2009	40 CFR 112	Upgrade of site SPCC Plan to Tier 1 qualified facility plan in 2011	Water discharges
Hydromodification project requirements, sampling requirements, effluent triggers and / or limits, NOI/SWPPP public review, and qualifications for SWPPP developers and practitioners.	July 1, 2010	State Water Resources Control Board Construction Activities General Permit	Facility construction specification was revised to include new requirement	Water discharges

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## 10 Operational Control

Sandia maintains a Corporate Policy System that reflects the requirements of its contract with DOE and is consistent with the intent of Lockheed Martin Corporate Policy (Sandia's parent company). The Corporate Policy System governs all Sandia operations (SNL 2009c) and it is part of Sandia's Integrated Laboratory Management System. Operational controls for the site are further enhanced with division and project-specific technical work documents.

### 10.1 Corporate Controls

The Corporate Policy System contains nine policy areas and three levels within each area. The nine policy areas include corporate governance, ES&H, facilities, finance, human resources management, information management, integrated safeguards and security, mission execution, and supply chain management. The policy system levels are: Level 1 Corporate Policies; Level 2 Corporate Processes; and Level 3 Corporate Procedures. All policies, processes, and procedures require review at least every three years.

Many of the Corporate Policy System requirements support the SNL/CA EMS Program. References to specific corporate policy system requirements are made throughout this manual when appropriate.

#### 10.1.1 ES&H Policy Area (ESH100)

The ES&H Policy Area provides the processes and procedures for implementing environmental requirements throughout Sandia. It includes four broad processes focused on planning work, analyzing and controlling hazards, performing work, and providing feedback and improvement. Each process is supported by an extensive set of corporate procedures with requirements that flow down to all members of the workforce. Corporate ES&H policy, processes, and procedures are supplemented by site-specific process requirements when needed to address state and local requirements that are applicable at SNL/CA.

### 10.2 Local Work Planning and Control

SNL/CA maintains a variety of operational controls that are site specific. These include a Division 8000 work planning and control procedure, activity-specific technical work documents, an ES&H, Facilities, and Security Interdisciplinary Team, environmental permits and compliance documents, and contract specifications. The process used at SNL/CA for work planning and control is depicted in Figure 16 and documented in Administrative Procedure AP800015 (SNL/CA 2010). The process follows ES&H process steps to plan work, analyze hazards, control hazards, perform work, and improve. Relevant significant environmental aspects for specific activities are determined during analyses of hazards.

## 10.2.1 Primary Hazard Screening (PHS)

The initial step in identifying operational controls is accomplished through Sandia's PHS process. The PHS is an online tool used to identify potential hazards associated with new and continuing activities. Through execution of the PHS tool, technical work documents, training, and personal protective equipment are identified to control safety conditions and environmental releases. All active PHSs are reviewed and updated annually. At SNL/CA, the Facility Management Coordinators assist the site workforce with preparation and update of PHSs. The PHS database is available online to all Sandia workers at <http://info.sandia.gov/esh/phs/>.

## 10.2.2 Job Safety Analysis

Another tool used to identify specific and unique hazards and environmental concerns for an activity is the job safety analysis. SNL/CA uses a graded approach to determine need for more detailed analysis and to ensure that the level of analysis is commensurate with the scope of the activity. Through this process, additional training, personal protective equipment, administrative controls, or engineered controls may be identified for an activity as a whole or for a critical step. Participants in the analysis process include staff from environmental and safety organizations along with the work planner.

## 10.2.3 Interdisciplinary Team Evaluation

The Interdisciplinary Team (IDT) evaluation is an element of the work planning and control process. The focus of the evaluation is to assist work planners in planning proposed work, in identifying and evaluating associated risks and requirements, and then in identifying resources and subsequent actions necessary to mitigate associated risks and assure compliance with all applicable regulations and policies. The IDT evaluation relies on representatives from the Major Functional Areas of ES&H, Security, Quality, Emergency Management, and Facilities to verify the effectiveness and completeness of the planning, analysis and control of work activities, and to ensure SME involvement in the initial planning, design, and eventual execution of work activities. The IDT process has been used for more than ten years and is recognized by internal and DOE stakeholders as a successful best management practice and operational control mechanism. Additional information about IDT is provided in Chapter 14.

## 10.2.4 Technical Work Documents

Technical work documents are required for all operations. The procedure for preparing and maintaining technical work documents is identified in Corporate Procedure ESH100.2.GEN.3 Develop & Use Technical Work Documents (SNL 2009f). Technical work documents are used to define administrative and engineered controls required to address the hazards identified through the PHS and the job safety analysis. Technical work documents include operating procedures, standard operating procedures, safe work permits, and radiological work permits. These documents are updated every one to three years, or more frequently as needed. Technical work documents are maintained in an online database that can be found at <https://sharepoint.sandia.gov/sites/eshdoc/SitePages/Home.aspx>.

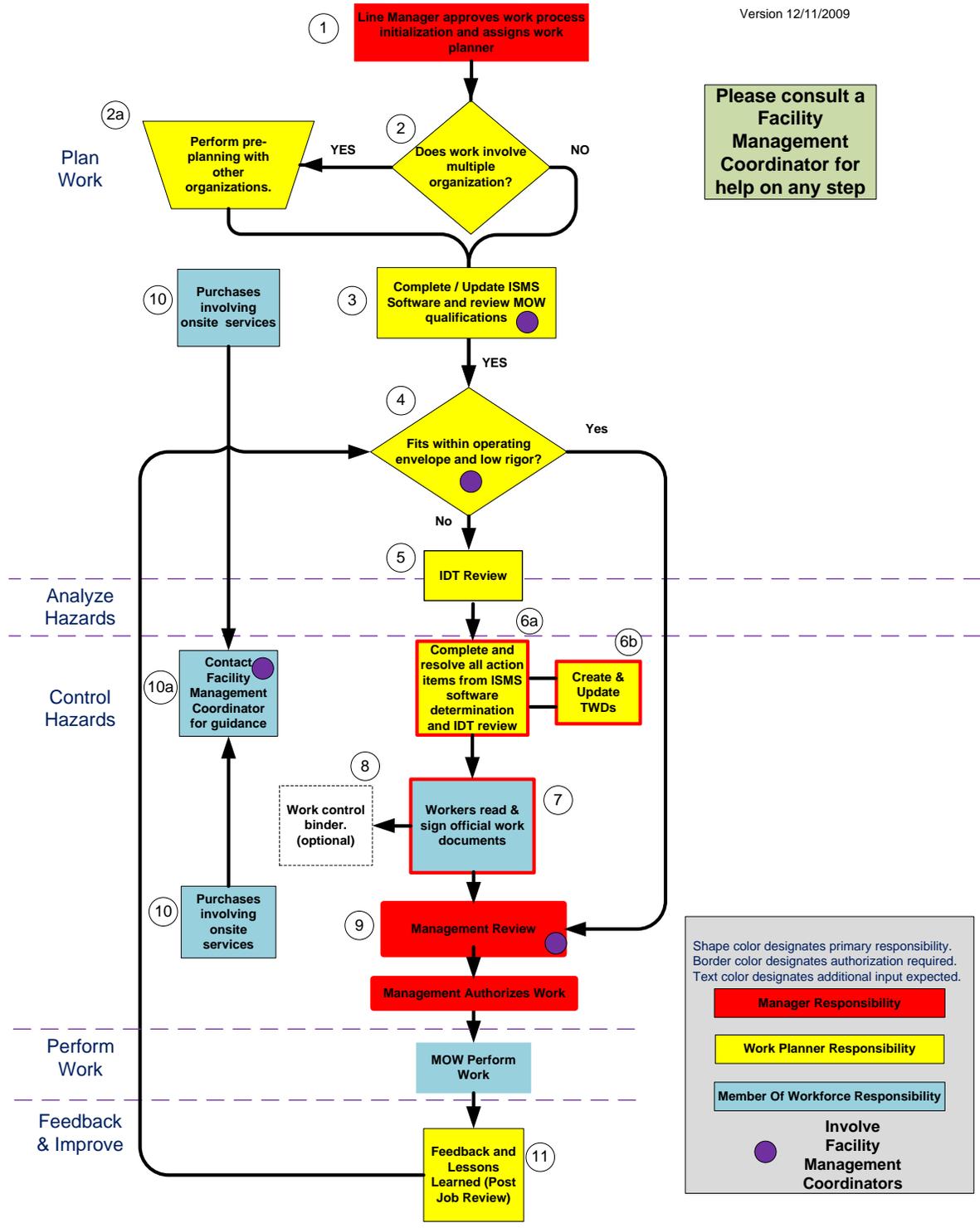


Figure 12 SNC/CA ES&H Review Process

## 10.2.5 Environmental Permits and Compliance Documents

Environmental permits and compliance documents function as activity-specific operational controls. They provide conditions under which the SNL/CA site may operate to meet federal, state, and local environmental regulatory requirements. Table 8 provides a list of the permits and documents valid in 2012. The individual environmental program annual reports provide additional information about each type of permit or compliance document.

**Table 8 Environmental Permits and Compliance Documents, 2012**

Type	Description	Statute / Regulation	Agency /Authority
Air	Permit to Operate emission sources (13 sources for 2011/2012)	Clean Air Act	BAAQMD
Environmental restoration	Site Clean-up Order No. 89-184	California Water Code	Regional Water Quality Control Board, San Francisco Bay
Hazardous materials	Business Plan Permit to Operate	California Health and Safety Code	Livermore-Pleasanton Fire Department
Hazardous waste	RCRA Hazardous Waste Facility Permit	RCRA	California Department of Toxic Substances Control
Hazardous waste	Permit by Rule (2 operations)	RCRA	Livermore-Pleasanton Fire Department
Hazardous waste	Conditionally Authorized Permit to Operate (2 operations)	California Health and Safety Code	Livermore-Pleasanton Fire Department
Medical waste	Small Quantity Generator with Onsite Treatment	California Health and Safety Code	Alameda County Environmental Health Department
Medical waste	Small Quantity Generator without Onsite Treatment	California Health and Safety Code	Alameda County Environmental Health Department
Wastewater	Wastewater Discharge Permit	Clean Water Act	City of Livermore Water Reclamation Plant
Storm water	State of California General Industrial Permit	Clean Water Act	State of California Water Resources Control Board
Jurisdictional waters of the U.S.	Channel improvements under the Arroyo Seco Improvement Program	Clean Water Act	Army Corp of Engineers
Underground storage tank	Permit to Operate	Resource Conservation and Recovery Act and California Health and Safety Code	Livermore-Pleasanton Fire Department
Aboveground storage tanks	Storage statement	Aboveground Petroleum Storage Act	Livermore-Pleasanton Fire Department
Environmental assessment	Final Site-wide Environmental Assessment of the SNL/CA	NEPA	DOE
Biological resources	Biological and Conference Opinion for SNL/CA	Endangered Species Act	U.S. Fish and Wildlife Service
Universal waste	Generator statement	California Electronic Waste Recycling Act, 22 CCR § 66273	California Department of Toxic Substances Control

## **10.2.6 Contract Specifications**

SNL/CA's contract specifications function as operational controls for contracted work activities. An SNL/CA specific environmental specification consolidates all environmental requirements applicable for construction activities into one document. An environmental permit is also included as part of the bid package to identify check points and contacts for various activities. Contractors are also required to report to SNL/CA on their efforts in waste reduction, recycling, and reuse of materials.

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# 11 Document Control

## 11.1 Corporate Documents

The Information Management Policy Area (IM 100) identifies the process and procedures for managing and protecting Sandia information (SNL 2009b). The official version of all corporate policies, processes, and procedures is the electronic version maintained on the Sandia internal website. These documents are disseminated to the workforce exclusively through the Corporate Policy System. They are reviewed and updated at least every three years. Each document is assigned an Executive Policy Sponsor. Only the sponsor or their delegate can approve changes to these documents.

## 11.2 Technical Work Documents

ES&H requirements and concerns related to activities and operations at SNL/CA are addressed through technical work documents such as operating procedures, hazard assessments, safety plans, and other similar documents. Technical work documents are marked with an issue identifier for version control, date of publication, review period, and renewal date. The most current version of technical work documents is maintained in an online database. Technical work documents contain authorized users lists. Personnel must read updated versions when issued and sign the authorized users list indicating their understanding and agreement to operate in accordance with new and modified procedures. Outdated versions are removed from the online system when new versions are issued to prevent unintended use of electronic obsolete documents.

To prevent unintended use of a printed copy of an obsolete document, a note is included on each page to indicate that any printed copy may not be the most current, even if the date on the procedure is still current. Managers are responsible for ensuring that printed documents maintained at point of use are current. Obsolete documents maintained in the ES&H Records Center are stamped as superseded when updated versions are filed in the Records Center.

## 11.3 Environmental Program Documents

EMS program and other environmental program documents are controlled by the Environmental Management Department (Organization 8516). These documents are reviewed annually as part of the EMS assessment process outlined in AP800005 (SNL/CA 2011e). Each program lead controls and approves changes to their documents. The department manager controls and approves changes to EMS-specific documents. Current versions are maintained in active records storage in the ES&H Records Center, and displayed on the SNL/CA ES&H web site. Paper copies are not distributed to the workforce.

Environmental documents of external origin (e.g. permits, regulatory authorizations, etc.) are maintained by the Environmental Management Department. Many of these documents are marked as valid for a specified period of time. Environmental program leads coordinate updates to external documents to ensure that documentation remains current. Permits and other regulatory authorizations that require posting at point of use are controlled and distributed by environmental program leads to ensure that obsolete documents are not used unintentionally.

## **12 Competence, Training, and Awareness**

### **12.1 SNL/CA Members of the Workforce**

Members of the workforce at SNL/CA include Sandia employees and onsite contractors. Onsite contractors are individuals that perform work activities under the direction of a Sandia employee pursuant to the terms of their contract.

#### **12.1.1 Members of the Workforce - Competence**

It is Sandia's policy to select the best qualified individuals for employment on the basis of demonstrated competence and to provide opportunities for, and encourage, professional development. For onsite contractors, specific competencies required for each position are identified in the scope of work and verified through the contractor selection process.

For activity level work, SNL/CA applies skill of the worker / skill of the craft to demonstrate that an individual is qualified and holds the appropriate competencies to perform assigned tasks. Skill of the worker job qualifications are documented in a Job Qualification / Worker Authorization Form in accordance with the site work planning and control process. Skill of the craft qualifications specific to the Project Engineering and Operations Department are documented in a skill standard.

Each of the six SNL/CA functional environmental program areas (Chapter 8) supporting the site's EMS Program maintain job descriptions and qualifications for each environmental program job position. Program leads review job descriptions and qualification requirements annually, update them as needed, and document the results of the review in annual program reports. The annual review and update provides an opportunity to modify and identify new competencies needed to support new or changing requirements.

#### **12.1.2 Members of the Workforce - Training**

Sandia employees are subject to all corporate policies, processes, and procedures and are expected to maintain compliance with training requirements at all times. Training requirements for onsite contractors are identified in the contract. Onsite contractors are also expected to maintain compliance with training requirements at all times. Sandia maintains a set of general corporate training courses that cover a wide range of areas such as information and physical security, business ethics and diversity, ES&H, and general business processes. Many of these are also applicable for onsite contractors. General corporate training requirements are assigned automatically at the time of hire (or placement of contract). Job, function, and organization specific training is identified by the responsible manager. Sources that are used to identify training requirements may include the PHS and job safety analysis discussed in Section 10.

Sandia maintains an online Corporate Learning Management System (known as TEDS) at <https://hrprod.sandia.gov/cfdocs/prod/hris/ctd/apps/cedtweb/cedtmain/index.cfm> to track completion status for all corporate training requirements and to provide electronic reminders to members of the workforce and their manager when a course is due. Job-specific training courses can also be added to TEDS for tracking purposes.

In addition to the training requirements discussed above, Environmental Management Department staff are often subject to regulatory training requirements for a specific job function. These requirements are listed in annual program reports. New and modified training requirements are identified during the annual review process or as part of the requirements monitoring process presented in Section 9.

### **12.1.3 Members of the Workforce – EMS Awareness**

SNL/CA provides general EMS awareness training to the site work force through the following mechanisms.

- New-hire orientation is a one-time basic orientation to ES&H for members of the workforce.
- ESH100 is an annual training requirement for the site workforce.
- ENV112CA is an annual training requirement for generators of hazardous waste at SNL/CA.
- Presentations tailored to site organizations.
- Discussions at department and functional program group meetings (Environmental staff)

## **12.2 Visitors - Training and Awareness**

The level of training required for visitors is dependent on the length of stay and activity that they will perform. ES&H training for visitors at SNL/CA is addressed in an attachment to Corporate Procedure: ESH100.2.GEN.2 Determine, Complete, and Document Required ES&H Training (SNL 2009e). Sandia hosts and their managers determine the level of training required for visitors. At a minimum, visitors performing hands-on work in SNL/CA facilities receive ES&H awareness training. Laboratory- and equipment-specific training is also provided for visiting researchers performing hands-on work at SNL/CA user facilities. For general EMS awareness, environmental information is posted and available to visitors at the Badge Office.

## **12.3 Project-Specific Construction Contractors**

Project-specific construction contractors perform work at SNL/CA under established contract specifications that include specialized training, credential, or certification requirements. Construction contractors must submit an Injury Illness Prevention Program and a Job Hazard Analysis for review by SNL/CA's Construction Safety Engineer. Work does not begin until these documents are approved by Sandia. A Preliminary Hazard Assessment prepared by Sandia is also included in contract documents. The hazard assessment identifies specific environmental issues, such as air quality, waste management, and storm water pollution prevention that are applicable to a specific project.

SNL/CA requires contractors to provide a project safety officer when conducting work at Sandia, and to provide written documentation that the safety officer meets the qualifications defined in the contract specifications. Additionally, specifications require contractors to maintain

appropriate contractor training records on site and make available to Sandia oversight personnel upon request.

Non-routine construction projects or construction-like activities at SNL/CA are presented to the ES&H IDT for review. The IDT process functions both as an awareness and compliance mechanism. SNL/CA executes the IDT process to identify ES&H requirements and to disseminate EMS information to the respective SNL Project Manager. Requirements and other applicable information identified during the IDT review are provided to contractors through contract specifications and during the safety plan review process. A pre-construction conference is held to determine if the pre-work contract requirements have been met (e.g. approved safety plan, activity hazard assessment, construction site requirements, etc.). Environmental staff routinely attend pre-construction conferences to provide awareness training on topics of concern such as storm water pollution prevention, wildlife, and recycling/reuse of materials.

Sandia provides oversight throughout the length of projects. Oversight personnel identify non-conformances through deficiency notices, non-compliance notices, and safety violation notices. All non-conformance notices are tracked by Sandia and used during evaluations for contract renewals.

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## 13 Environmental Monitoring and Measurement

Each SNL/CA functional environmental program routinely monitors and measures the key characteristics of site operations that can affect the environment. Monitoring and measurement information supports our compliance requirements as well as assessment of overall progress in meeting site environmental objectives. For instance, the Environmental Monitoring Program routinely samples and analyzes wastewater and storm water for contaminants of concern and other parameters. Data collected provide a measure of the quality of water discharges that can be used to determine if site operations meet permit conditions (compliance), or minimize pollutants in sewer water (wastewater discharge objective). Program leads report the monitoring results as site metrics and publish these on the SNL/CA ES&H webpage. Table 9 identifies the monitoring activities conducted at SNL/CA and the EMS objective that the activities support.

**Table 9 EMS Monitoring Activities**

<b>Key Characteristics of Site Operations</b>	<b>Monitoring Activity</b>	<b>Supports EMS Objective</b>
Laboratory wastewater discharges	Routine sampling/analyses of sewer water; weekly monitoring of continuous flow meter at sewer outfall	Minimize production of waste (including wastewater) Maintain sewer effluent within regulatory discharge limits. Minimize volume and pollution of storm water runoff and water discharges
Industrial and construction activities	Routine sampling/analyses of storm water (2 storm events per year)	Minimize volume and pollution of storm water runoff and water discharges Minimize pollutants released to the ground or ground water
Emissions generated from site operations	Annual reporting of greenhouse gas emissions	Minimize air pollutants and greenhouse gas emissions Minimize consumption
Material procurement and use	Monitor contracts for affirmative procurement clauses	Procure and use environmentally friendly products and materials Design and manage all buildings and facilities using “green” principles
Use of land where sensitive wildlife and habitat are present	Monitor habitat improvements from Arroyo Seco project and compare against success criteria	Preserve and, when possible, enhance the site’s natural habitat
Commuter site	Periodic survey of site population on use of commute alternatives	Minimize air pollutants and green house gas emissions Minimize consumption
Use of fuel in onsite vehicles / equipment	Annually monitor use of liquid transportation fuels	Minimize air pollutants and green house gas emissions Minimize consumption
Hazardous and biological material use	Annually conduct chemical inventory reconciliation	Procure and use environmentally friendly products and materials
Hazardous waste generation	Monitoring of quantities and types of hazardous waste generated	Minimize the production of waste
Radioactive and mixed waste generation	Monitoring of quantities and types of radioactive and mixed waste generated	Minimize the production of waste
Solid waste generation	Monitoring of quantities of solid waste generated and quantities and types of materials recycled	Minimize the production of waste

Key Characteristics of Site Operations	Monitoring Activity	Supports EMS Objective
Use of energy and water resources	Monitoring of resources used	Minimize consumption Minimize air pollutants and greenhouse gas emissions
Previously contaminated areas	Monitoring of groundwater at previously contaminated areas	Minimize pollutants released to the ground or ground water

## 13.1 EMS Metrics

SNL/CA uses various metrics to measure environmental affects or impacts from site operations. Additionally, SNL/CA established metrics to measure general environmental management and awareness. Table 10 provides a list of site EMS metrics. Graphical representation of each metric is displayed on the SNL/CA Environmental Management website at <http://info.sandia.gov/centers/8500/esh/CA-EnvMgmt/metrics>.

**Table 10 List of EMS Metrics**

Impact Metrics	EMS Management Metrics
Recycling	Environmental violations, findings, DOE occurrences
Fuel use	NEPA reviews
Energy use / cost	Site chemical inventory
Sewer flow	Chemical inventory reconciliation
Sewer water contamination	NFPA health 3 & 4 containers
Storm water system controls	
Water use	
Hazardous waste	
Hazardous waste chemical spills	
Radioactive waste	
Landfill waste	

## 14 Evaluating Compliance with Environmental Requirements

Compliance evaluations are supported by a wide variety of audits. Implementation of requirements across all SNL/CA operations, as well as management processes, are evaluated through internal and external audits. Audit results are maintained as Sandia records either in the ES&H Records Center or in an online database. Table 11 identifies the types of audits routinely conducted for SNL/CA operations, and the records that result from each.

In 2006, SNL/CA's EMS Program received registration under the international standard for environmental management systems, ISO 14001:2004. The ISO 14001:2004 standard requires routine audits by an independent registrar and re-registration every three years. In June 2009, SNL/CA received re-registration. SNL/CA underwent a successful surveillance audit in June 2011, receiving one major and two minor non-conformances.

**Table 11 SNL/CA Environmental Audits**

Type	Guidance Document / Driver	Conducted By	Schedule	Scope	Record Type	Record Maintenance
<b>Internal</b>						
Division 8000 Self Assessments	AP800033	VP, Directors, Managers	Monthly	Select ES&H areas	Laboratory Enterprise Self Assessments database	Online and SNL/CA ES&H Records Center
Environmental Program Audits	AP800005	Functional program lead	Annual	Adequacy and effectiveness of processes, adequacy of resources, communication of requirements, line ownership of requirements	Laboratory Enterprise Self Assessment database	Online and SNL/CA ES&H Records Center
EP Representative Line Audits	AP800005, AP800008	EP Representative	Routine / ongoing	Informal, focus on critical environmental requirements and trouble spots	Laboratory Enterprise Self Assessment database	Online and SNL/CA ES&H Records Center
EMS Mgmt Representative EMS Audit	AP800005	EMS Mgmt Representative	Annual	Review of all EMS elements	Laboratory Enterprise Self Assessment database	Online and SNL/CA ES&H Records Center
<b>External</b>						
External regulating agency audits and inspections	Federal, state, and local regulations and permits	Regulatory Inspectors	Annual	All aspects of facility operations, record keeping, program processes, and adherence to permit conditions / requirements, audits are generally unplanned and unannounced	Official correspondence	SNL/CA ES&H Records Center
DOE audits	M&O Contract, DOE policies and requirements	DOE auditors	Annual	Subset of ES&H programs audited each year	Audit report	SNL/CA ES&H Records Center
Corporate Audits	CG100.6	Assessment teams	Varies	Select ES&H areas or laboratory systems	Audit report	SNL/CA ES&H Records Center
Non-government audits	M&O Contract, discretionary	varies	varies	Select ES&H areas	Audit report	SNL/CA ES&H Records Center
Third party certification	ISO 14001	External third party auditor	Recertify every three years; surveillance annually	Requirements of the ISO 14001 Standard	Audit report	SNL/CA ES&H Records Center

## 15 EMS Internal Audit and Self-Assessment

Annually, Sandia staff complete an internal audit of the EMS Program to determine if it conforms to the ISO 14001 Environmental Management System standard, and to ensure that it is properly implemented and maintained. Additionally, the various audits described in Chapter 14 support management and maintenance of the EMS. SNL/CA maintains an administrative procedure for conducting audits used in support of the EMS Program (SNL/CA 2011e). Figure 13 summarizes the audits that assist in keeping SNL/CA's EMS on track.

### Environmental/EMS Audits

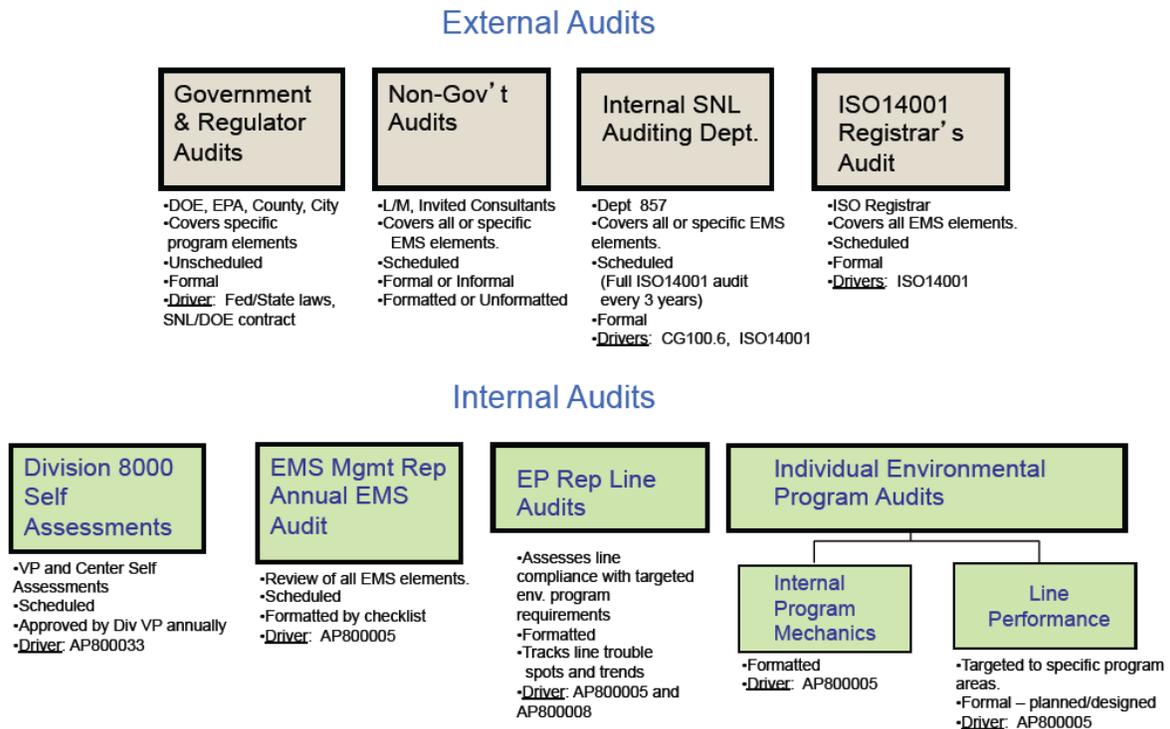


Figure 13 Audits Supporting SNL/CA's EMS Program

### 15.1 EMS Audits

Sandia's corporate audit team in the ES&H, Safeguards & Security, and IT Operations auditing organization (Organization 857) conducts periodic audits of SNL/CA's EMS Program. These audits are completed every three years to evaluate the EMS Program against the requirements of

the ISO 14001 standard. The most recent audit against ISO 14001:2004 requirements was conducted in September 2011. During interim years, the EMS Core Team completes a gap analysis of select ISO elements. The gap analysis provides a broad look at requirements rather than an in-depth comparison against the details of the ISO standard. Audit reports and gap analyses are EMS records and maintained in the ES&H Records Center.

### **15.1.1 2011 Audit**

The 2011 audit conducted by Organization 857 confirmed that overall, the SNL/CA EMS program conforms to the ISO 14001:2004 standard. The audit report notes that EMS environmental targets are effectively monitored, and EMS is integrated into planning and management decisions. The audit identified three items requiring action and several others for consideration. Four noteworthy practices were also identified. Detailed results are documented in Audit Report 2011-ES-022 issued on December 8, 2011.

### **15.1.2 2012 Audit**

The EMS Core Team completed a gap analysis in February 2012. Several continuing issues were identified. They include site awareness of EMS policy and obsolete document control.

## **15.2 EMS Management Representative Review**

The primary internal method of review used for the EMS Program is the annual EMS Management Representative review. Other audits may also be used to evaluate the EMS Program, including corporate and DOE audits. EMS Program review results are EMS records and maintained in the ES&H Records Center.

The EMS Management Representative review was completed in January 2012. The review found that the SNL/CA EMS requires a few updates and minor improvement actions. One issue related to obsolete documents, has resulted in several minor non-conformances in the annual ISO surveillance audits. This issue has been identified as a corporate level issue and cannot be entirely solved at SNL/CA. Complete EMS review results are documented in the Laboratory Enterprise Self Assessments system.

## 16 Nonconformity, Corrective, and Preventive Action

SNL/CA maintains a procedure for identifying nonconformities through a system of internal and external audits. *Administrative Procedure AP800005, Environmental Management System Audit Process* (SNL/CA 2011e) describes the various audits that are conducted to assess site compliance with environmental regulations and requirements, and continually improve the site EMS. The procedure also describes scheduling, tracking, and management of results. Audits conducted at SNL/CA are described in Chapters 14 and 15 of this manual.

### 16.1 Audit Tracking

SNL/CA environmental and EMS-related audits are tracked and documented in one of three databases: the Laboratory Enterprise Self Assessments (LESA) database, the Corrective Action Tracking System (CATS), or the EMS Audit Documentation and Tracking spreadsheet. LESA and CATS are online corporate systems. The EMS Audit Documentation and Tracking spreadsheet is an Environmental Management Department tool used to track all audit actions in one central location.

### 16.2 Corrective and Preventive Action

The EMS Core Team evaluates the results of environmental and EMS-related audits to identify corrections and corrective or preventive actions. Whereas corrections are those actions to correct the immediate actual or potential nonconformity, corrective or preventive actions are the actions taken to eliminate the cause of the actual or potential nonconformance and prevent it from occurring in the future. Audit results are also forwarded to the Division Assurance organization for determination on appropriate entries into corporate database systems (specifically CATS and LESA). Verification of corrective actions entered into CATS is conducted by an independent verifier, generally a member of the Division Assurance organization. Verification of corrective actions entered into LESA and the EMS Audit Documentation and Tracking spreadsheet are verified by the EMS Core Team. A root cause determination is required for all findings entered into CATS.

### 16.3 Validating Effectiveness of Actions

SNL/CA's process for validating the effectiveness of corrective and preventive actions for environmental and EMS-related issues is documented in *Administrative Procedure AP800010, Validation of Environmental or EMS-Related Corrective / Preventive Actions* (SNL/CA 2011c). The manager of the Environmental Management Organization and Environmental Program Leads determine which actions require validation. Actions are selected for validation based on the significance or risk of nonconformity. For example, actions that address serious

nonconformities with potential for a fine, significant negative environmental impact, or actions attempting to correct recurring issues, may be selected for effectiveness validation. The validation of an action is documented on an SNL/CA EMS Corrective / Preventive Action Validation Form. Completed forms serve as the ES&H record of validation.

## 17 Management Review

Annually, the EMS Management Representative reviews SNL/CA's EMS Program with SSHEAC (Section 3.1). Management reviews are intended to ensure continued suitability, adequacy, and effectiveness of the EMS Program. Reviews include the following topics.

- Results of internal audits and evaluations of compliance with legal and other requirements
- Communications from external parties
- Site environmental performance
- Progress in meeting EMS objectives and targets
- Status of corrective and preventive actions
- Follow-up actions from previous management reviews
- Changing circumstances including developments in legal and other requirements related to environmental aspects
- Recommendations for improvements
- Modifications and additions to environmental objectives and targets

In the past year, management reviews were completed in June and September 2011.

The June management review (conducted June 7, 2011), was accomplished via electronic communication and included follow-up on issues from the previous review, results of audits and assessments, compliance and changes to requirements, communications with external parties, the status of corrective and preventive actions, and recommendations for improvements. There were no actions identified from the June review.

During the September management review (conducted September 29, 2011) the EMS presentation included a follow-up from the prior review, recent major events, environmental performance for past year, extent to which objectives and targets were met, new and modified objectives and targets, recent audit results, and recommendations for improvement. The 2012 objectives were approved by SSHEAC during this review. Two actions were identified:

- Place new EMS poster in the lobby of the Combustion Research Facility.
- Engage with the City of Livermore to foster a relationship to further the principles of environmental management and sustainability in the community and on site.

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## 18 EMS Documentation

Documentation to support SNL/CA'S EMS Program is comprised of both EMS-specific and general corporate and site documents and information sources. The SNL/CA EMS Program Manual is the primary EMS document for the site. It describes all elements of the EMS Program, how these elements connect, and it provides reference to other general documents that support the program. The EMS Program Manual documents the process used to identify significant environmental aspects applicable to site operations, and to establish objectives and targets that are measurable and relevant. It serves as a roadmap for continual EMS implementation, assessment, and improvement. The SNL/CA EMS Program Manual is reviewed and updated annually. Other documentation established for the SNL/CA EMS Program includes an ES&H policy/standard of performance (Chapter 2) and annual environmental program reports (maintained on the SNL/CA Environmental Management website). EMS documents also include procedures developed specifically for the EMS Program, EMS decision documents, EMS audit results, communications with external parties, and results of management reviews. All documents created under the EMS Program are records in accordance with the definition of a record used at Sandia.

Other SNL/CA site-specific and corporate policies, document systems, and databases also support the EMS Program. Figure 14 identifies the documents and document systems that support the SNL/CA EMS Program.

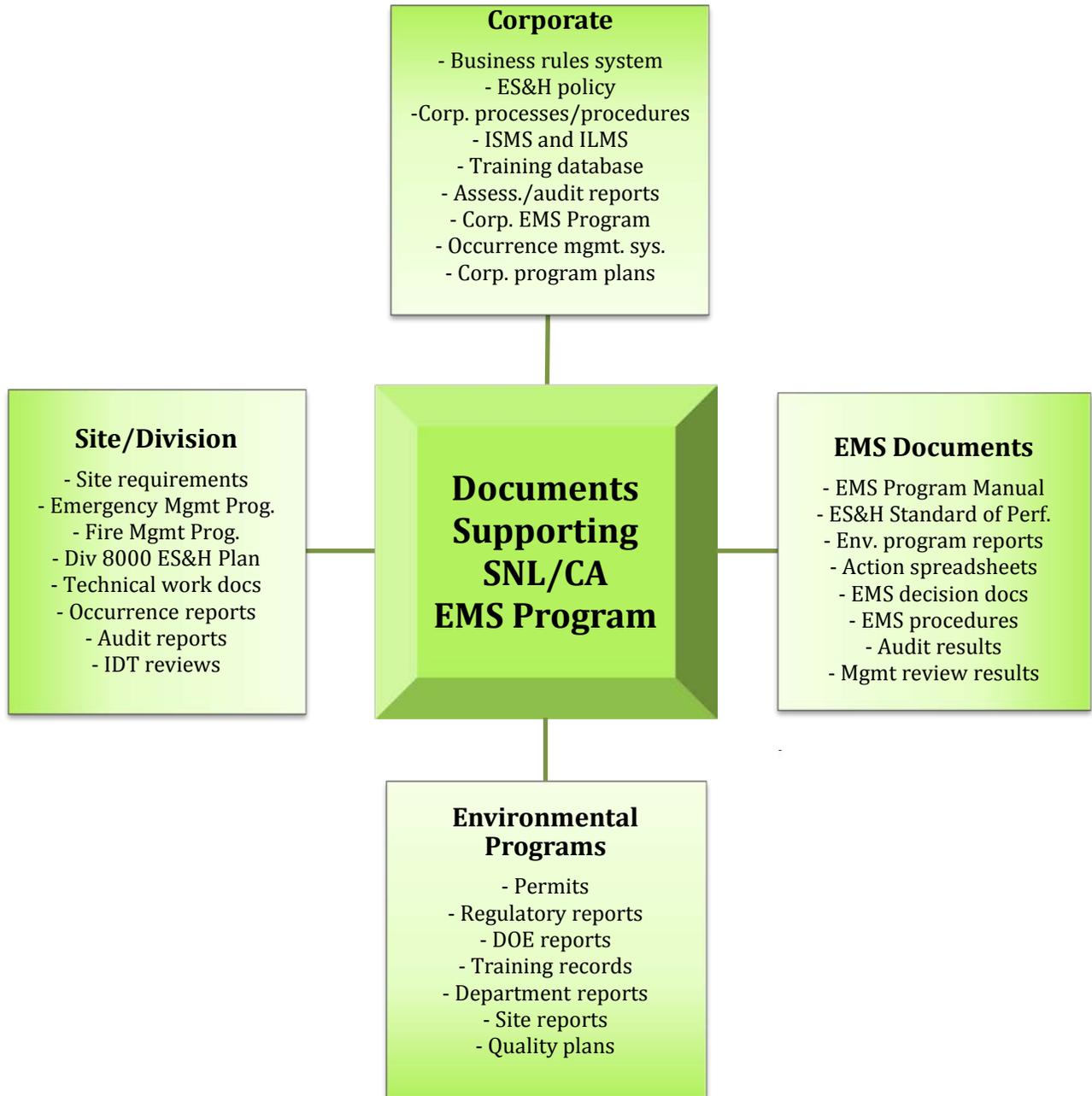


Figure 14 EMS Documentation

## 19 Records

Sandia manages all information created by Sandia work in accordance with the Corporate Policy System requirements identified in *IM 100, Information Management* (SNL 2009b). As defined in the information management procedures, information encompasses data, records, published material, and knowledge in written, pictorial, electronic, audio, oral, or other form. To assist the workforce with the requirements for managing information, Sandia developed a Records Management Manual. The Records Management Manual provides guidance on identifying records and non-records, provides a list of federal and DOE requirements governing records management, and summarizes the records retention and disposition schedule. The complete manual is available on the Sandia intranet at <http://info.sandia.gov/recordsmgmt/rmm/rmmframe.html>.

SNL/CA maintains an additional procedure for managing ES&H records, *OP471347 Administrative Procedures for Managing Sandia/CA ES&H Recorded Information* (SNL/CA 2011b). This procedure incorporates corporate policies, requirements of the Records Management Manual, best business practices, program-specific regulatory requirements, and the requirements of the ISO 14001 standard. Under this procedure, ES&H programs are responsible for transmitting recorded information to the SNL/CA ES&H Record Center for storage and protection. The Record Center establishes file guides for categories of records and assigns a file code number. The file guide describes the record, identifies the retention period, describes the disposition instructions (where applicable), and provides filing instructions. Record Center personnel log all transmitted records into an electronic database. Document titles, dates, authors, and key words are included in the database to assist with tracking and retrieval of records.

SNL/CA established a file guide and code for EMS records in March 2005. The file code is AD-MAN-07.05. EMS program documents and supporting information are filed under this code with a permanent retention. SNL/CA maintains separate file guides and codes for other functional environmental program records that also support the EMS Program.

SNL/CA also uses a corporate database, EiMS / FileNet Workplace, to maintain electronic environmental program records. Environmental Program Leads have the option of submitting records to the electronic system instead of creating paper copies. Electronic records support reductions in paper use and resources needed to manage and maintain paper records. The electronic system has been established and is managed as a permanent record.

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## 20 Communications

SNL maintains an active communication system with established tools and processes to share information both internally and externally. As a result, SNL/CA has many options available to communicate EMS information to the site workforce and to external stakeholders. Table 12 provides a list of communication methods used for the site's EMS.

**Table 12 SNL/CA EMS Communication Methods**

<b>Action</b>	<b>Communicator</b>	<b>Audience</b>	<b>Method</b>	<b>Schedule</b>
Interdisciplinary Team (IDT) Project Reviews	Subject Matter Experts/Members of IDT	Presenters of Proposed Projects	Meeting, Minutes, SME written responses	Weekly
Annual Site Environmental Report	EMS Core Team	External Community Members of Workforce	Publication	July
Earth Day Activities Target	EMS Core Team	Select Line Organizations	Various	April
Organizational Presentations	EMS Core Team	Senior Site Management	Presentation	Various
Senior Management Annual Presentation	EMS Management Representative	External Community and Potential Hires	Presentation	April / October
External 8000 Web Page	EMS Core Team	Members of Workforce	Web	Continuous
SNL/CA ES&H Web Site	EMS Core Team	New Members of Workforce	Web	Continuous
New Hire Orientation Briefings	EMS Core Team	Site Contractors	Presentation	Routine
Contractor ES&H Briefing	various	Line Organizations	Video	Routine
EP Rep Line Visits and Audits	EP Rep	Members of Workforce	One-on-one	Routine
TNT	EMS Core Team	Waste Generators	Publication	Varies
ENV 233	EMS Core Team	Members of Workforce	Classroom Training	Annual
Banners / Posters / Handouts	EMS Core Team	Potential New Hires	Misc. Distribution	Routine
Recruiting	Recruiters		Brochures	Varies

### 20.1 Internal Communications

The SNL/CA EMS Core Team communicates EMS information to the site workforce through the IDT process, publications, internal web sites, briefings, assessments, and promotional materials. The EMS Core Team receives input on environmental issues, including aspects and

impacts, through the IDT process, the NEPA process, an ES&H telephone hotline, the self-assessment process, and the ES&H internal web site contacts list.

## 20.2 External Communications

SNL/CA's decision to communicate externally about the EMS program, including significant environmental aspects, is documented in a Memo-To-File (Figure 19). SNL/CA accomplishes external EMS communications through the annual site environmental report and Sandia's external web site at [http://public.ca.sandia.gov/about/community/environmental\\_mgt.php](http://public.ca.sandia.gov/about/community/environmental_mgt.php). Figure 19 provides a list of EMS topics included in the annual report. A comment response card is distributed with the annual report and a link is provided on the web site to gather input from external stakeholders. All published information distributed externally must be reviewed and approved for public release in accordance with Sandia requirements.

The EMS Core Team routinely communicates with external parties about elements of the SNL/CA EMS. External communications follow the *Administrative Procedure (AP800007), Receiving, Documenting, and Responding to EMS Communications from External Parties* (SNL/CA 2011d). Environmental staff members also conduct community outreach efforts by participating in site events, such as family days and site celebrations, and through presentations at conferences. In March 2011, Environmental Management staff presented at the annual Energy Facility Contractors Group meeting about hazardous materials transportation and security. In December 2011, Environmental Management staff initiated routine awareness meetings with the City of Livermore, Planning Department.

Regulating authorities also conduct scheduled and unannounced site audits. These audits provide an additional avenue for communicating with our stakeholders and keeping them abreast of our EMS Program.



**Sandia National Laboratories**

Operated for the U.S. Department of Energy by  
**Sandia Corporation**  
Livermore, California 94551-0969

date: July 18, 2006

to: Memo-to-File

from: Gary Shamber  
SNL/CA EMS Management Representative

A handwritten signature in blue ink, appearing to read 'G. Shamber', written over the printed name.

subject: External Communications of the SNL/CA EMS

This Memo-to-File documents SNL/CA's decision to communicate externally on the various elements of its EMS Program. External communications shall be accomplished through an annual environmental report as required by *DOE Order 231.1A, Environment, Safety, and Health Reporting*. The annual report shall provide information of significant site EMS elements including:

- The site's environmental policy
- Significant environmental aspects and impacts
- Legal and other requirements
- Environmental objectives, targets and programs
- Pollution Prevention and waste minimization
- Resources, roles, responsibilities and authorities
- EMS competence, training and awareness
- Communication and community involvement
- Environmental documentation
- Control of documents
- Operational control
- Emergency preparedness and response
- Monitoring and measurement
- Evaluation of compliance
- Nonconformity and corrective and preventive actions
- Control of records
- Internal audits
- Management Review

SNL/CA's annual report shall include other content items as required by the annual content guidance issued annually by DOE.

The report shall be made available to the external community on Sandia's external website and by direct distribution to interested parties upon request.

*Exceptional Service in the National Interest*

**Figure 15 External Communication Decision Memo**

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