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Annual Site Environmental Report Summary Pamphlet

Sandia National Laboratories, New Mexico

Sandia National Laboratories
U.S. DEPARTMENT OF ENERGY
NNSA National Nuclear Security Administration

The U.S. Department of Energy (DOE) National Nuclear Security Administration (NNSA) Sandia Field Office (SFO) and Sandia Corporation (Sandia) are committed to protecting the environment and preserving the health and safety of our employees and the public. This Annual Site Environmental Report (ASER) Summary Pamphlet was published in response to the community's desire for a document that summarizes annual environmental activities at Sandia National Laboratories, New Mexico (SNL/NM). For additional technical information and monitoring results at SNL/NM, we encourage you to view an online copy of the Calendar Year (CY) 2013 ASER at:

http://www.sandia.gov/news/publications/environmental_reports/

Sandia collects environmental data to determine and report the impact of existing SNL/NM operations on the environment. The environmental programs and focus areas are discussed in the phamplet (see table of contents).

Sandia's objective is to maintain compliance with federal, state, and local requirements, and to affect the corporate culture so that environmental compliance practices continue to be an integral part of operations.

This ASER Summary pamphlet was prepared in accordance with and as required by DOE Order 231.1B, Environmental, Safety, and Health Reporting. The order addresses the timely and accurate reporting of information about events that have affected or could adversely affect the health, safety, and security of the public or worker, the environment, the operations of DOE facilities, or the credibility of the DOE.

We hope that you will find the following pages informative and interesting. We appreciate feedback from the community and invite you to ask questions or offer suggestions about what you would like to see in next year's Summary Pamphlet by contacting:

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Monarch butterfly

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The Environment At Sandia National Laboratories, New Mexico

Sandia National Laboratories/New Mexico (SNL/NM) is located on Kirtland Air Force Base (KAFB) in Albuquerque, New Mexico (NM) (Figure 1). NM is the fifth largest state in the U.S. comprising approximately 121,000 square miles. Based on recent U. S. Census Bureau projections, the estimated 2013 population of NM was approximately 2,085,287. The largest city in NM is Albuquerque with approximately 555,400 metro-area residents. The estimated population within a 50-mile radius of the zip code for KAFB is approximately 962,000 residents. Nine counties are contained or partially included in that radius (Figure 2). In 2013, the total workforce at SNL/NM was approximately 10,610 and the NM location has approximately 6.17 million gross square feet (sq ft) of existing facilities.

KAFB is a military installation that is 51,559 acres, which includes 20,486 acres withdrawn from the Cibola National Forest through an agreement with the U.S. Forest Service (USFS). Located at the foot of the Manzanita Mountains, it has a mean elevation of 5,384 feet (ft) and a maximum elevation of 7,986 ft. KAFB is host to more than 450 federal government and private sector tenants and associate units. KAFB and SNL/NM are adjacent to the Albuquerque, which borders KAFB on its north, northeast, west, and southwest boundaries. The Albuquerque International Sunport (airport) and Mesa del Sol, a 12,800-acre mixed-use urban area under development, are west of KAFB. The Isleta Pueblo is located south of KAFB boundary. SNL/NM consists of five DOE fee-owned secured Technical Areas (TAs), buildings, and structures in non-secured leased areas, and several remote testing areas, also on leased land. These remote test areas are collectively known as the Coyote Test Field and are located in the canyons on the west side of the Manzano Mountains.

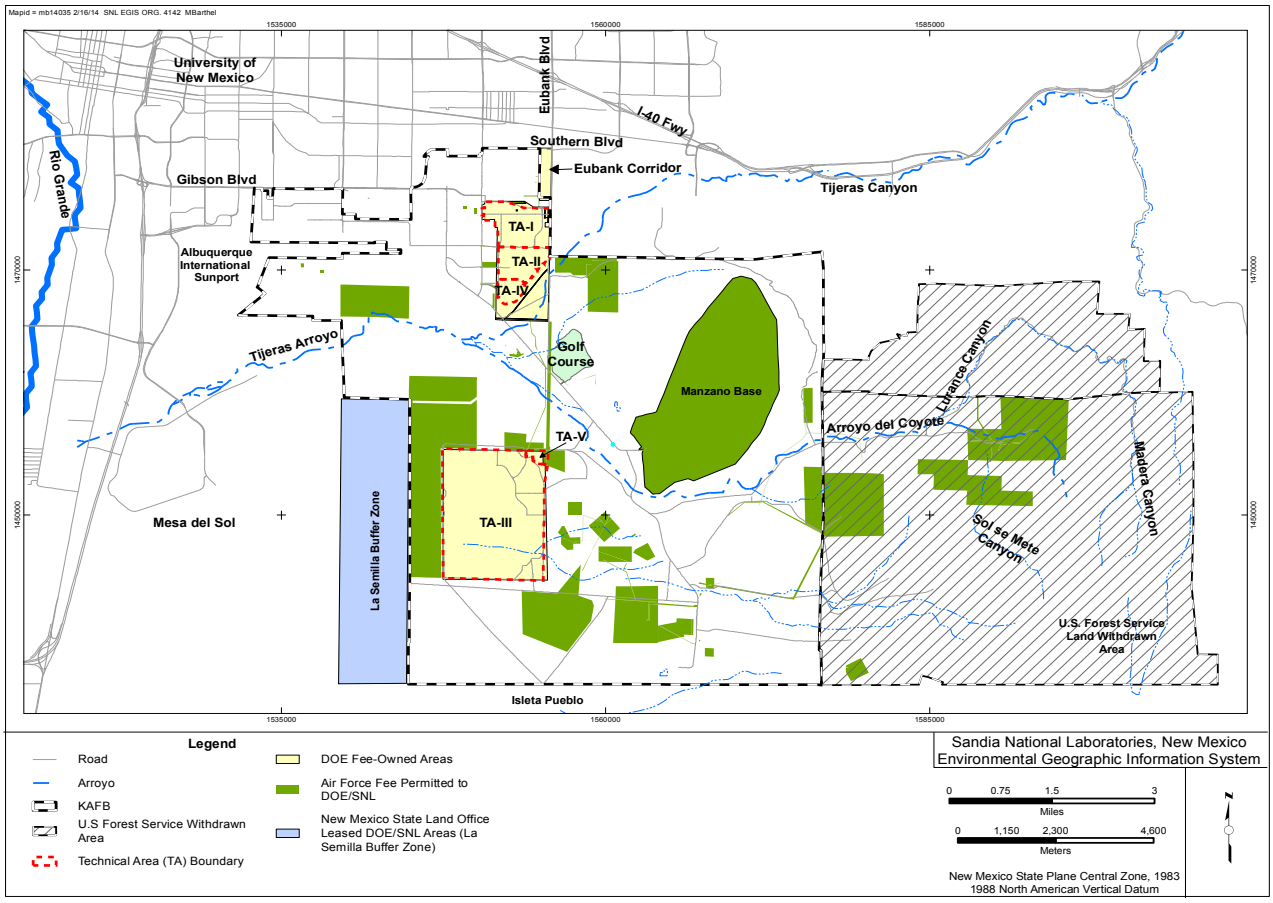


Figure 1. SNL/NM Technical Areas and the U.S. Forest Service Land Withdrawn Area

SNL operations are conducted on DOE-owned property assigned for operational use, non-DOE-owned property contracted from other Federal agencies, and privately-owned leased property. SNL sites located on DOE-owned property comprise 2,938 acres and include the five TAs (Figure 1). For non-DOE-owned property, Sandia conducted operations on 5,637 acres of land permitted from the U.S. Air Force, a portion of which are on land withdrawn from the USFS. DOE leases approximately 2,750 acres from the New Mexico State Land Office (La Semilla Buffer Zone) west of the KAFB boundary. This area serves as a margin of safety and a sound buffer for testing operations. In addition, Sandia conducts operations at off-site leased facilities.

SNL/NM is set in the high desert region in central NM. The mountains on the east and plains on the west create a diverse range of geological, hydrological, ecological, and climatic settings. The most prominent topographic feature in the Albuquerque region is the Sandia Mountains, which form an impressive backdrop to the east of the COA and KAFB. The Sandia Mountains form a 13-mile long escarpment distinguished by steep cliffs, pinnacles, and narrow canyons; the tallest point is Sandia Crest at 10,678 ft. At sunset, the Sandia Mountains are often bathed briefly in a pinkish glow, which is how they got their name. Sandia is Spanish for "watermelon".

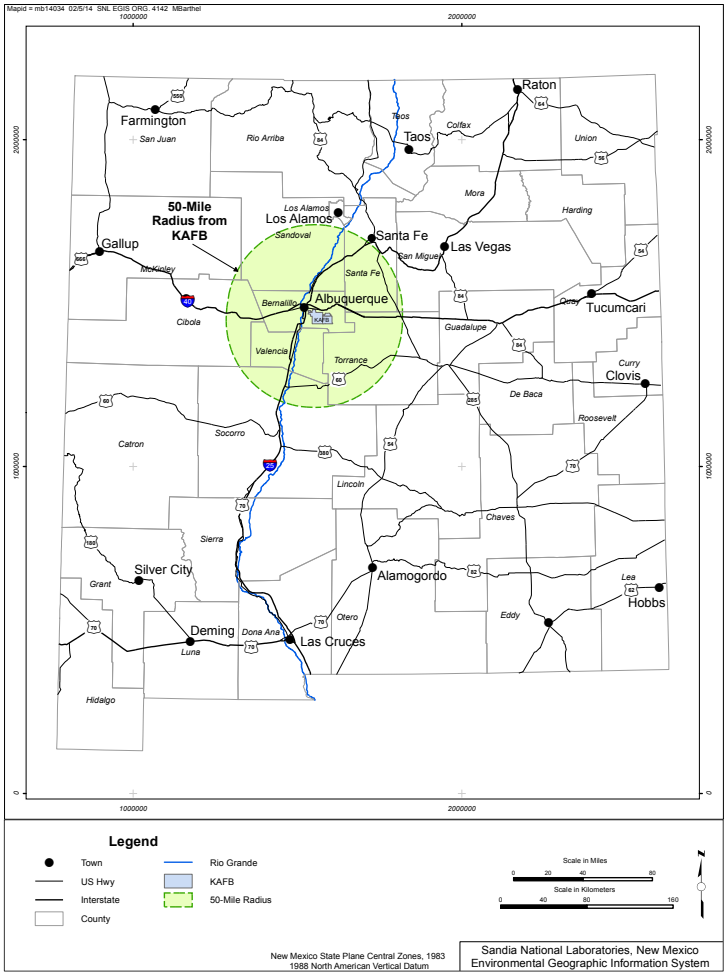


Figure 2. State of New Mexico Map


The Sandia Mountains at Sunset

Environmental Programs & Environmental Management System


Desert cottontail

Environmental Programs

The environmental programs and waste management activities at Sandia meet or exceed the requirements of federal, state, and local environmental regulations, as well as DOE directives in the Prime Contract between Sandia and DOE. While all 2013 program activities are performed continuously, they are reported in this ASER on a calendar year (CY) basis, unless otherwise noted (programs based on the fiscal year operate from October 1st through September 30th, annually). A description of the environmental programs and 2013 activities at SNL/NM are summarized below.

Environmental Management System (EMS) Program

EMS is the primary management approach for addressing environmental aspects of operations and activities, including environmental programs, energy, and transportation functions. Sandia continues to improve environmental management and work processes and has received International Organization for Standardization (ISO) 14001 Certification.

DOE Order 436.1, Departmental Sustainability, ensures the EMS and site sustainability are at the forefront of environmental excellence. Although this order is not within Sandia's Prime Contract, the intent of DOE Order 436.1 is implemented through the Prime Contract requirement for an ISO 14001 certified EMS. Sandia has implemented an EMS as part of the Integrated Safety Management System (ISMS). The Integrated Laboratory Management System (ILMS) is how Sandia conducts its operations and manages the laboratories. ISMS is one of Sandia's constituent elements of ILMS and provides the context for implementing the Sandia EMS. The EMS is the framework to manage and improve its environmental compliance and sustainability practices. Through the EMS, Sandia identifies the environmental consequences of activities, products, and services at SNL/NM, and develops objectives and measurable targets to mitigate potential impacts to the environment. Sandia implemented its EMS in December 2005, received third-party ISO 14001 Certification in 2009, and certification in 2012. An ISO Surveillance Audit was completed in 2013 and the ISO 14001 Certification was retained. Sandia has worked to fully implement and establish the EMS in conjunction with ISMS in all site operations. The EMS identifies the environmental consequences of Sandia's activities, products, and services and develops objectives and measurable targets to mitigate potential impacts to the environment.

DOE defines its key clean energy and sustainability strategies and goals in its Site Sustainability Plan (SSP). Each DOE site is required to prepare an annual SSP that articulates the site's performance status and planned actions for meeting DOE's SSP goals and broader sustainability program. Sandia uses its EMS as a platform for SSP implementation, as well as for other programs with objectives and measurable targets that contribute to meeting sustainability goals.

Some major accomplishments of the EMS in 2013 include the following:

Sandia won a DOE/NNSA Sustainability Best in Class Award for Greenhouse Gas Management. The award was for reducing the use of sulfur hexafluoride (SF6), which is identified by the U.S. Environmental Protection Agency (EPA) as having the highest global warming potential of any gas. Sandia's Saturn-Hermes III pulsed-power facilities use SF6 as an electrical insulator for high-voltage switching devices, such as spark gaps and cascade switches. The Saturn-HERMES III team has reduced Sandia's SF6 emissions by upgrading the gas handling systems, and identifying and replacing probable leaks and failure modes in the systems.

Sandia has and continues to encourage members of its workforce to use alternatives to single-passenger commuting through incentive and assistance programs, including preferred parking to incentivize carpooling/vanpooling and bus-pass discounts. Commuting alternatives reduce traffic on Albuquerque streets, save money on fuel costs, help the environment, ease the parking situation at SNL/NM, and can even provide exercise. Approximately ten percent of Sandia's workforce participates in alternative commuting opportunities.

Sandia strives to implement sustainability in the construction of new buildings and operation and maintenance of existing buildings on the SNL/NM campus. As such, Sandia implements the Federal High Performance Sustainable Building Guiding Principles (GPs). As part of the GPs, all new-building construction projects over 5,000 sq ft are required to be certified under the U.S. Green Building Councils Leadership in Energy and Environmental Design (LEED) Green Building Rating System. Sandia currently has seven LEED-certified buildings and another under construction in 2013. Sandia is also implementing the GPs on all its existing buildings greater than 5,000 sq ft, through measures that improve energy performance, conserve water, enhance indoor environmental quality, and reduce environmental impacts of materials.

Beyond the GP, Sandia emphasizes energy use reduction in building operations and computing equipment. Energy conservation at Sandia is an ongoing process involving numerous projects and operational strategies. Energy reduction measures and projects implemented in 2013 include:

- Conversion of building controls from pneumatic to direct digital controls zone control, enabling more efficient operation of building heating, ventilation, and air conditioning (HVAC) systems.

- Installation of occupancy sensors in buildings that allows both lighting and HVAC to be turned off when spaces are unoccupied.

- Replacement of aging chillers with new energy efficient chiller systems.

- Operation of most buildings within a strict temperature band of 70 to 76 degrees Fahrenheit.

- Implementation of computer power management programing on many non-mission critical desktop computers.

- Installation of plate-and-frame heat exchangers in several buildings that utilize large scale evaporative cooling using outside air (referred to as free cooling systems). These systems use outside air as the source of cooling when conditions permit.

- Utilization of the Building Automation System to shut off or set back systems during nonstandard working hours in buildings that do not require 24/7 operation.

Similar to energy use reduction, Sandia recognizes the importance of water resources and implements measures to minimize water use. Sandia uses a Central Irrigation Control System that applies the correct amount of water to landscaping based on the time of year, historic evapotranspiration rates, and irrigation system audit calculations. A High-Efficiency Reverse Osmosis system is operated at the highest deionized water use facility that maximizes water recovery and minimizes waste water. A spent rinse water recycling process is also operated that enables the reuse of process water at this facility. Sandia is also installing and retro-fitting high-efficiency restroom fixtures in new buildings and renovation projects.

Sandia's Fleet Services provides vehicles for Sandia business use and was recognized within the top 100 Best Fleets in North America in 2013 for the second straight year. Fleet Services implements a number of environmental practices, including replacement of retired light-duty vehicles with alternative fuel vehicles. This not only reduces the consumption of petroleum fuel, it increases use of alternative fuels (including compressed natural gas, biodiesel, and E-85 gasoline). Other efficiency measures employed by Sandia's Fleet Services include "right-size" vehicle use to maximize fuel-use efficiency, use of low-rolling resistant tires, and synthetic oil use.

Environmental Programs & Environmental Management System

Sandia continues installation of "Cool Roofs" at buildings requiring roof replacements. Sandia has approximately 3,338,971 gross sq ft total roof area and 128 roofs, or approximately 75 percent (2,490,548 gross sq ft) that comply with the "cool roof" definition. The roofs have either bright white installed membranes or existing membranes that have been coated with a bright white roof coating.

Sandia continually strives to reduce the generation and landfill disposal of nonhazardous solid waste. excluding construction and demolition (C&D) debris, The SSP goal for nonhazardous solid waste, excluding construction and demolition (C&D) debris, is to divert 50 percent from landfill disposal by 2015. Sandia achieved an approximate 64 percent diversion rate for the nonhazardous solid waste, excluding the C&D debris category of solid waste in 2013. Similarly, the SSP goal for C&D debris is to divert 50 percent from landfill disposal by 2015. C&D debris differs significantly from the typical office-generated solid waste stream. Concrete, asphalt, wood, metal, insulation, and other C&D debris are required to be managed and disposed separately from the typical office solid waste stream. Sandia achieved an approximate 94 percent diversion rate for C&D solid waste in 2013. This high diversion rate is primarily due to concrete recycling, which is typically conducted on a 2- to 3-year interval. Sandia routinely diverts scrap metal, wood, ceiling tiles, carpet, concrete and asphalt from the C&D debris stream for recycling.

Sandia is committed to reducing its greenhouse gas emissions and the two major sources associated with Sandia operations are fugitive emissions associated with SF6 and grid-based electricity use. Energy reduction efforts at Sandia, including electricity use, were described above. SF6 used in pulsed power and high-voltage research and development applications account for the majority of use at Sandia. In 2013, Sandia made several improvements to minimize SF6 emissions, including:

- Upgrading SF6 gas supply and return manifolds with new fittings and piping to eliminate leaks at one of the pulsed power facilities.

- Upgraded SF6 gas supply and return tubing at one of the pulsed power facilities that is more durable and has less permeability than the tubing previously used.

- Procured three new high efficiency SF6 gas reclaimer units for use at several of the pulsed power facilities. This includes installation of the infrastructure for use of the reclaimer units, as well as training of the personnel in operation of the reclaimer units.

- Continued to improve tracking SF6 gas cylinder use during maintenance and operation modes.

Additional information can be found on the EMS website:

www.sandia.gov/about/environment/index.html

Collared lizard

Environmental Life-Cycle Management (ELM) Program & National Environmental Policy Act (NEPA) Program

Environmental Life-Cycle Management (ELM) Program

The ELM Program provides environmental stewardship for past, present, and future activities. The purpose of the ELM Program is to promote the long-term stewardship of a site's natural and cultural resources throughout its operational, closure, and post-closure life cycle.

The ELM Program ensures proactive management toward sustainable use and protection of natural and cultural resources affected by SNL's operations and operational legacies. This mission will be accomplished by identifying potential environmental impacts and applying environmental processes and guidance.

The objectives of the ELM Program are to:

- Protect human health and the environment from past, present, and future operations,
- Preserve and protect natural and cultural resources, and
- Apply life-cycle cost principles to environmental impacts of SNL operations.

The ELM Program reviews all proposed projects and activities that have the potential to impact the environment through the National Environmental Policy Act (NEPA) process.

National Environmental Policy Act (NEPA) Program

The NEPA Program provides the DOE/NNSA/SFO with technical assistance in support of compliance with NEPA and the National Historic Preservation Act at all of Sandia's locations: NEPA Program personnel reviewed a total of 980 proposed projects in various corporate systems. To support mission activities at SNL/NM, 81 DOE NEPA checklists were transmitted to the DOE/NNSA/SFO for review and determination in 2013.

Also in 2013, Sandia personnel assisted the DOE in the continued development of a new Site-Wide Environmental Impact Statement (SWEIS). Environmental Programs personnel reviewed the Preliminary Draft SWEIS completed by the DOE contractor. During the review cycle, Environmental Programs personnel conferred with experts from various SNL/NM programmatic missions to review and clarify data on their current and anticipated future operations.

View of SNL/NM

Environmental Restoration (ER) Operations

Sandia's ER Operations was created under the DOE Office of Environmental Management to identify, assess, and remediate sites potentially contaminated by past spills, releases, or disposal activities. These sites were investigated in accordance with corrective action requirements of the Resource Conservation and Recovery Act (RCRA), applicable implementing regulations, and Hazardous Waste Operating Permit NM5890110518-1 (the Permit) issued in 1992 to DOE and Sandia by the EPA and the New Mexico Environment Department (NMED). In 1993, EPA issued Module IV of the issued Permit. ER sites addressed included solid waste management units (SWMU) and areas of concern (AOC).

Sandia, DOE, and NMED signed a Compliance Order on Consent (the Order) in April 2004. The Order specifies the current requirements for corrective action for releases of hazardous waste or hazardous constituents. The Order will terminate upon completion of its requirements, with the exception of record preservation, and the Permit will remain as the enforceable document.

ER Operations History, Waste Cleanup, and Closures

The initial identification of ER sites at SNL/NM was completed in 1987. At that time, there were 117 identified sites under Sandia's jurisdiction in the initial Comprehensive Environmental Assessment and Response Program (CEARP); those at SNL/NM were also identified as potential SWMUs in a RCRA Facility Assessment in 1987. Additional sites were identified in subsequent years and were incorporated into the list of sites subject to the RCRA corrective action requirements in Module IV of the RCRA Part B Operating Permit.

Since then, approximately 500 individual sites, potential sites, or individual historical activities have been identified for investigation. Many of these sites were confirmed to contain little or no contaminants of concern (COCs). In 1992, ER Project (now Operations) at SNL/NM was officially initiated to implement assessment and remediation activities for sites that had been contaminated or potentially contaminated because of past SNL operations. Waste generated from corrective action at SNL/NM ER sites includes hazardous waste, radioactive low-level waste, mixed hazardous/radioactive waste, waste subject to the Toxic Substances Control Act (primarily polychlorinated biphenyls), and industrial solid waste.

Corrective Action Complete Status

DOE and Sandia propose ER sites to NMED for Corrective Action Complete (CAC) status when they meet NMED criteria, either before or after remediation; the criteria includes acceptable levels of risk to human health and the environment presented by the contaminants at the site.

After NMED grants CAC status, DOE and Sandia submit a request for a Class III modification to the Hazardous and Solid Waste Amendments (HSWA) Module of the Permit. The majority of ER sites are granted CAC status under a risk-based scenario. Risks to human health and the environment are calculated for sites with residual contamination according to EPA and NMED guidelines. The level of contamination remaining and the appropriate land-use category (i.e., industrial, residential, or recreational use) are used together with the available information and conceptual model for each site to determine the risk to human health and the environment.

The 2013 status of the ER Operations site closure is as follows:

- There are 278 SNL/NM SWMUs/AOCs not currently requiring corrective action.
- There are 36 SWMUs/AOCs requiring corrective action.

• As stated in letters from the NMED in 2010 and 2012, 6 of the 36 SWMUs/AOCs require additional investigation or groundwater monitoring as part of the corrective action. SWMUs 8, 58, 68, 149, and 154 require groundwater monitoring. SWMU 52 requires backfilling of the tanks and associated piping.

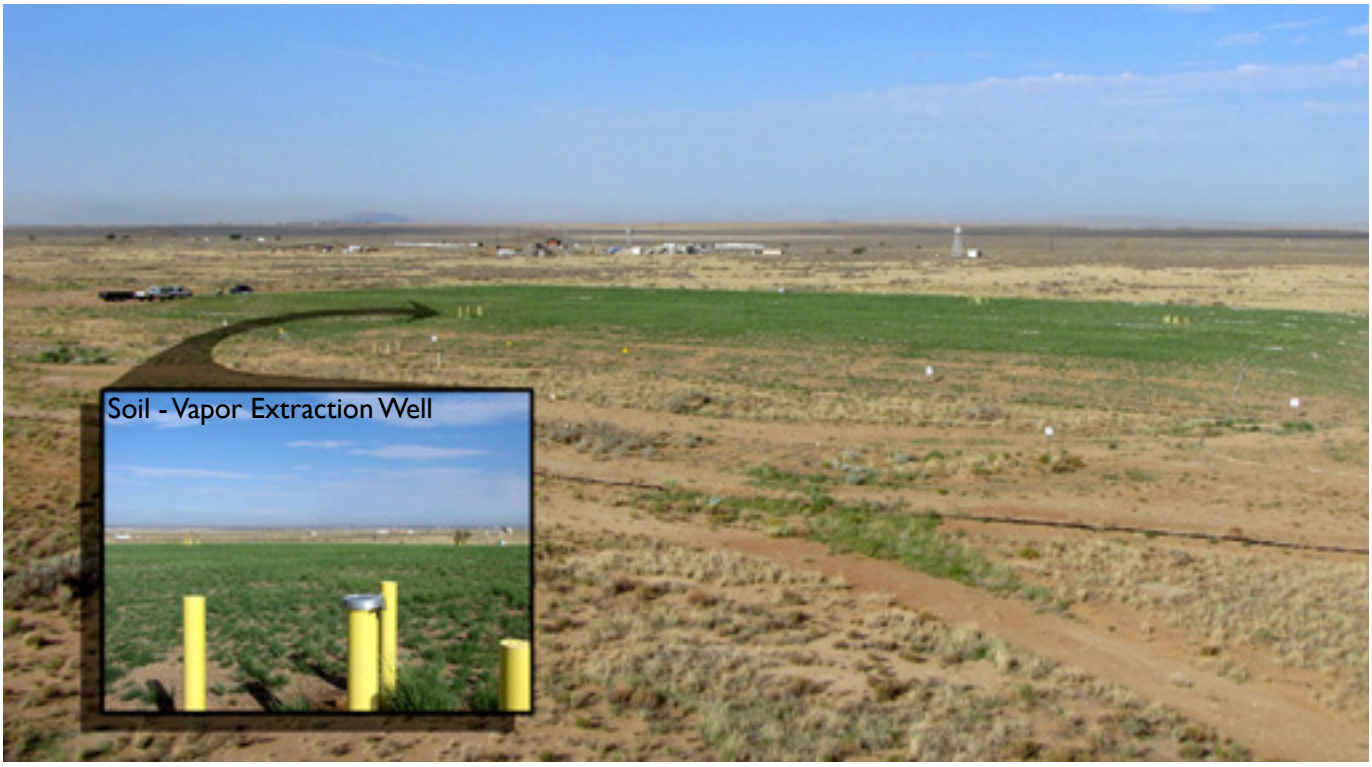
• In 2013, SWMU 52 activities were completed, reported, and approved by the NMED.

Included in the 36 SWMUs/AOCs requiring corrective action are three groundwater AOCs (Technical Area V [TA-V], Tijeras Arroyo Groundwater [TAG], and Burn Site Groundwater [BSG]) that have final remedies pending. Also included in the 36 SWMUs/AOCs requiring corrective action are three sites at active test facilities (SWMUs 83, 84, and 240) with potential soil contamination that will be evaluated at the end of their test operations.

Mixed Waste Landfill (MWL)

The MWL is a 2.6 acre SWMU located in the north-central part of TA-III undergoing corrective action in accordance with the HSWA module of the SNL/NM RCRA Permit and the Order. From March 1959 through December 1988 the MWL received approximately 100,000 cubic ft of low-level radioactive waste and minor amounts of mixed waste generated at SNL/NM research facilities. Groundwater, which is approximately 500 ft below ground surface at the MWL, has been monitored since 1990. More than twenty years of data indicate that groundwater has not been contaminated by the MWL.

The Evapotranspirative (ET) Cover was completed during FY 2009 as the final remedy. The MWL Long-Term Monitoring and Maintenance Plan (LTMMP) was submitted to the NMED in March 2012. In 2013, the MWL LTMMP was pending NMED approval; a 150-day public comment period was completed that included a public meeting. Upon NMED approval, implementation of the monitoring, inspection, maintenance/repair, and annual reporting requirements of the LTMMP will begin immediately, including the process to install three multiport soil-vapor monitoring wells proposed in the LTMMP.



MWL Evapotranspirative Cover

The mission of the LTS Program is the long-term protection of human health and the environment from hazards associated with residual contamination at legacy sites, and minimization of Sandia's environmental liability by ensuring compliance with the environmental requirements provided in multiple NMED permits. Stewardship of legacy sites (former ER Sites) is necessary to maintain long-term protection of human health, the environment, and natural and cultural resources from hazards associated with residual radioactive and hazardous contamination at legacy sites. Sandia's LTS activities are increasing as remedial activities at ER sites are completed. The LTS Program conducts Compliance Oversight, Institutional Control, and Community Liaison and Stakeholder Involvement activities. LTS Compliance Oversight activities include groundwater monitoring, various types of monitoring at the Corrective Action Management Unit (CAMU), and Chemical Waste Landfill (CWL) to meet NMED regulatory requirements, and investigation of any new releases.

Groundwater Monitoring

Groundwater monitoring at SNL/NM consists of monitoring a network of approximately 79 wells for presence of COCs at various intervals during the year. Sixty seven groundwater monitoring wells associated with legacy sites (former ER sites) are monitored to meet NMED requirements. An additional 12 wells and a spring are sampled to assess SNL/NM operations impacts on groundwater. Water level measurements are obtained from 96 SNL/NM wells and 29 wells owned by other agencies. Monitoring wells are maintained or replaced as necessary.

Under LTS, 67 groundwater monitoring wells associated with former ER sites are monitored to meet NMED requirements. Sandia personnel collect groundwater samples at six project areas: CWL, Mixed Waste Landfill, TA-V, TAG, BSG, and miscellaneous SWMUs. The 2013 water quality results for these six areas were consistent with results from past years.

All 2013 groundwater monitoring activities, analytical results, hydrographs, and contour maps are provided in 2013 Annual Groundwater Monitoring Report, available as an attachment in the CY 2013 ASER.

CAMU

The CAMU is a containment cell located in TA-III and is permitted under the RCRA. It was engineered to hold treated soil wastes generated from the excavation of the CWL. The CAMU containment cell consists of engineered barriers and a final cover system, and incorporates a bottom liner system with a leachate collection system and a vadose zone monitoring system (VZMS). Leachate is pumped from the containment cell leachate collection system on a weekly basis and the VZMS is monitored on a quarterly basis.

In 2013, 398 gallons (gal) of leachate (a listed hazardous waste) were removed from the collection system. The waste is containerized, characterized and transported to the HWHF and subsequently shipped to an off-site hazardous waste facility for treatment. The 2013 VZMS monitoring results indicate an influence from the residual soil vapor plume emanating from the location of the former CWL. This is consistent with the conceptual model of the CWL residual soil vapor plume. Volatile organic compounds (VOC) concentrations continue to correlate with soil temperature variations, increasing when the soil temperature is warmer and decreasing when soil temperature is cooler. The VOC concentrations are not attributed to the material in the CAMU containment cell.

CWL

The CWL is a remediated, closed, interim status landfill undergoing post-closure care in accordance with the CWL Post-Closure Care Permit (PCCP). The site is approximately 2 acres and is located in the southeast corner of TA-III. From 1962 through 1985, the CWL was used for disposal of hazardous wastes, chemicals, solid wastes, and minor amounts of radioactive wastes generated by SNL/NM research activities. Liquid waste disposal ended in 1982.

The groundwater monitoring network at the CWL consists of four wells. In 2013, CWL groundwater monitoring was performed in January and July (two semi-annual sampling events) in accordance with CWL PCCP requirements. No analytes were detected at concentrations exceeding the EPA maximum contaminant levels.

The 2013 soil-gas monitoring results continue to indicate the residual VOC soil-gas plume beneath the CWL is slowly dissipating in the vadose zone. The Evapotranspirative (ET) Cover maintenance activities (i.e., weed removal, seeding, discrete application of herbicides, and supplemental watering) were performed from February through October 2013. The CWL ET Cover continues to meet PCCP-defined criteria for successful revegetation. No repairs were required based upon inspections of the ET Cover, stormwater diversion structures, compliance monitoring system (groundwater and soil-gas monitoring wells and sampling equipment), and security fence. All PCCP-required monitoring, inspection, and maintenance/repair requirements were met for 2013.

Institutional Controls

Administrative and physical institutional controls (ICs) are in place at SNL/NM to appropriately limit access to and use of legacy sites. Legacy sites are periodically inspected and maintained when necessary. A total of 27 IC site inspections were completed in 2013. No large scale maintenance requirements or other concerns with physical ICs were identified on legacy sites during the 2013 annual inspections.

Community Liaison and Planning, and Stakeholder Involvement

It is important that the public be made aware of the work being conducted at SNL/NM to maintain long-term protection of human health, the environment, and natural and cultural resources from hazards associated with residual radioactive and hazardous contamination at legacy sites. In addition to making technical documents available to the public, stakeholders participated in semi-annual DOE, U.S. Department of Defense meetings on environmental activities.

Additional 2013 LTS Activities

A Voluntary Corrective Action (VCA) was conducted at SWMU 502/Building 9938 Surface Discharge Site. As reported in the CY 2012 ASER, a surface discharge of wastewater occurred in December 2012 at Coyote Test Field Building 9938 (also referred to as LTS SWMU 502). SNL personnel periodically conducted research and development activities involving the production, isolation, and purification of materials used in the synthesis of explosives at Buildings 9938 and 9939. The wastewater generated from each synthesis activity was containerized in polyethylene plastic containers and discharged to the ground surface in an area south of Building 9938. The volume of wastewater discharged from each synthesis activity was conservatively estimated at ten gal. A total of 25 synthesis activities were held from July 2010 through September 2012, thus a total of approximately 250 gal of wastewater was discharged to the ground surface.

The 2013 VCA at SWMU 502 included completion of a site assessment and surface and subsurface soil sampling. Based upon field investigation results, a determination of CAC without controls is recommended for SWMU 502 for the following explanations:

- No COCs are present in the soil at levels considered hazardous to human health for either an industrial or residential land-use scenario.

- No COCs warrant ecological concern because ecological risks were acceptable per NMED guidance. Details can be found in the Investigation Report for Voluntary Corrective Action at Solid Waste Management Unit 502 Building 9938 Surface Discharge Site, submitted to the NMED in October 2013. Final determination by the NMED is pending.


Horned Lark

Environmental Outreach Program & Chemical Information System (CIS) and Chemical Exchange Program (CEP)

Gunnison's prairie dogs

Environmental Outreach Program

The Environmental Outreach Program reaches out to the community through various events and provides environmental information. Sandia recognizes that in addition to complying with requirements, it is important to communicate with Sandia's workforce and the local community to help reduce environmental impacts at work and at home. Using an integrated approach, Sandia communicates environmental awareness to its workforce via various newsletters, awareness campaigns, and outreach events.

In 2013, Outreach Program personnel coordinated the semi-annual DOE Public Meetings, hosted the Annual Youth Conference on the Environment, and participated in several outreach and awareness events. At these events, the outreach team distributed fact sheets and newsletters.

Outreach and Awareness Events

The Annual Youth Conference on the Environment is a free, one-day conference offered to high school students as a means to educate them on various environmental issues. In 2013, approximately 100 students attended and learned about urban farming. The event was co-sponsored by Sandia, the City of Albuquerque (COA), and the Environmental Education Association of New Mexico (EEANM).

The annual EMS Excellence Awards Program recognizes members of the workforce who demonstrate environmental excellence in areas such as energy and water conservation, environmental protection, waste minimization, and recycling. Since its inception in 2006, the EMS Team has received over 190 nominations from individuals and teams who are contributing to Sandia's vision of EMS.

For years, SNL/NM has received over 800 Yellow Page phone books that were distributed to employees across the laboratory. This process occupied time and resources for very little gain, as most people use internet search tools to find phone numbers for local businesses. Additionally, each year, hundreds of phone books were disposed of as new phone books were received. In 2013, SNL/NM committed to eliminating the receipt and delivery of paper phone books for the laboratory. With an estimated weight of 4 pounds (lbs) each, elimination of phone book delivery will remove 3,200 lbs of mixed paper from our waste stream, and save the labor cost of unpackaging, sorting, loading and delivering phone books to 800 mail stops, as well as the use of fuel and vehicle emissions that accompany those deliveries. By reducing consumption and eliminating the laboratory's annual order of 800 phone books, thousands of pounds of paper will be saved and will remain in the supply chain for other printing opportunities; therefore, decreasing Sandia's environmental footprint.

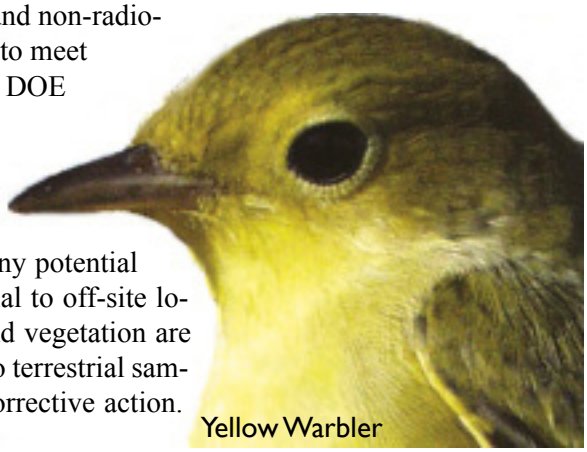
Chemical Information System (CIS) and Chemical Exchange Program (CEP)

The CIS Program maintains a comprehensive chemical information management system that provides work place chemical container tracking as well as information about the chemical hazards found in the associated Safety Data Sheets (SDS) (previously known as Material Safety Data Sheets [MSDS]). The SDS library in CIS currently contains over 80,000 SDSs. The CEP was developed to reduce the amount of usable chemicals disposed as waste, resulting in cost avoidance for both new acquisitions and disposal. In 2013, CEP delivered 163 lbs of excess chemical to new users.

Quality Assurance, Terrestrial Surveillance Program & Ecology Program

Quality Assurance

All environmental monitoring (includes sampling) is conducted in accordance with program-specific sampling and analysis plans or work plans, which contain applicable quality assurance elements. These documents meet appropriate federal, state, and local regulatory guidelines for conducting sampling and analysis activities. Environmental samples are collected by personnel in various programs and analyzed for radiological and non-radiological contaminants. Some sampling is specifically mandated by regulations to meet compliance, while other sampling activities are carried out in accordance with DOE Directives.


Yellow Warbler

Terrestrial Surveillance Program

The Terrestrial Surveillance Program conducts sampling activities to detect any potential releases or migration of radiological or non-radiological contaminated material to off-site locations (community locations outside KAFB boundaries). Soil, sediment, and vegetation are collected from on-site, perimeter, and off-site locations. In 2013, there were no terrestrial sample results that indicated concerns, or that required further investigation or corrective action.

Ecology Program

The Ecology Program provides for biota monitoring as an additional element of environmental monitoring. Ecology Program personnel collect ecological resource data, plant and animal data, biota contaminant data (as needed), assist in complying with regulations and laws, and provide biological surveys in support of site activities. Table 1 provides a list of common bird, mammal, and reptile species found on KAFB. Ecological data are used to support documentation, land use decisions, and wildlife communication campaigns to ensure safe work environments and sustainable decision making strategies. Since no significantly elevated levels of radionuclides or metals were observed in soil or vegetation samples during sampling under the Terrestrial Surveillance Program no contaminant analysis of radionuclides and metals on wildlife were performed in 2013.

Table 1. Common Bird, Mammal, and Reptile Species Found on KAFB

Birds	American Kestrel	Black-headed Grosbeak	Dark-eyed Junco	Killdeer	Mountain Bluebird	Spotted Towhee
	Black-chinned Hummingbird	Broad-tailed Hummingbird	Horned Lark	Loggerhead Shrike	Red-tailed Hawk	Yellow Warbler
Mammals	Black bear	Banner-tailed kangaroo rat	Desert cottontail	Gunnison's prairie dog	Mule deer	
	Bobcat	Black-tailed jackrabbit	Deer mouse	Gray fox		
Reptiles	Collared lizard	Round-tailed horned lizard	Gopher snake	New Mexico spadefoot toad	Side-blotched lizard	
	Chihuahuan spotted whiptail	Prairie lizard	Great Plains skink	Western diamondback rattlesnake	Short-horned lizard	

Air Quality Compliance (AQC) Program

The AQC Program ensures compliance with regulations, monitor ambient air quality and radionuclide air emissions.

Meteorological Monitoring Program and the Clean Air Network (CAN)

In 2013, data were collected from eight CAN meteorological towers located throughout SNL/NM and KAFB. The data provided air dispersion and transport modeling information. Table 2 shows some of the variations and extremes found in meteorological measurements.

AQC

Air quality standards are implemented by regulations promulgated by local and federal governments in accordance with the Clean Air Act (CAA) and the CAA Amendments of 1990. The Albuquerque Bernalillo County/Air Quality Control Board, the State of New Mexico, and the EPA determine applicable air quality standards for non-radiological pollutants. The AQC Program personnel currently maintains 13 issued authority-to-construct New Source Review (NSR) permits; and 28 issued NSR registrations from the COA. Currently, there are no new NSR applications pending issuance with the COA.

Ambient Air Monitoring

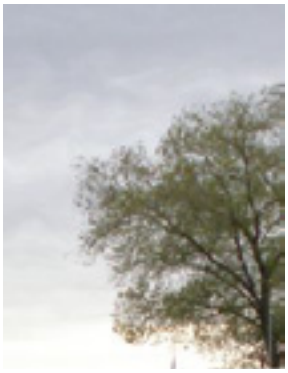
Sandia measures ambient air quality (a non-compliance activity) at 6 locations throughout SNL/NM, and compares results with National Ambient Air Quality Standards and local ambient air regulations. The network monitors particulate matter (PM10 and PM2.5) and volatile organic compounds (VOCs). Results of monitoring in 2013 indicate the following: PM10 concentrations are comparable to results from previous years, the high PM2.5 concentration measured in June was likely the result of wildland fire and smoke, and a statistical analysis of VOC concentration at one station indicated a slightly higher value than other stations and may be due to a high traffic pattern in the vicinity.


Coyote Springs

Radiological National Emission Standards for Hazardous Air Pollutants (NESHAP) Compliance

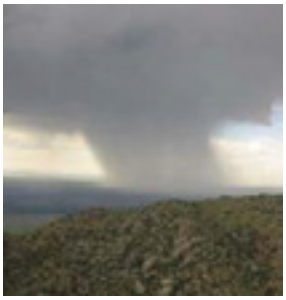
Subpart H of NESHAP regulates radionuclide air emissions from DOE/NNSA facilities, with the exception of naturally occurring radon. Facilities that have the potential to release emissions to the environment are evaluated annually. In 2013, the primary radionuclides released from SNL/NM facilities were tritium and argon-41. The on-site maximally exposed individual (MEI) was located on KAFB. The on site MEI dose of 1.11E-03 millirems per year (mrem/yr) at the Chestnut Site resulted primarily from tritium releases at the Neutron Generator Facility (NGF). The off-site MEI was located at the Eubank Gate Area. The off-site MEI dose of 1.42E 03 mrem/yr at the Eubank Gate Area resulted also primarily from tritium releases at the NGF. Both doses are well below the 10 mrem/yr EPA standard.

TABLE 2. Variations and Extremes in Meteorological Measurements across the Meteorological Tower Network During Calendar Year 2013



Wind Speed	Minimum (m/sec)	Maximum (m/sec)	Spread (m/sec)
Average Annual Wind Speed	3.63 Tower KU1	3.88 Tower CW1	0.25
Greatest Difference in Average Wind Speed over 24 hours	9.71 Tower SC1	15.07 Tower A13	5.36
Greatest Difference in Daily Maximum Wind Speed	19.91 Tower CW1	43.23* Tower CL1 *record	23.32 Summer Microburst
Average Difference in Daily Wind Speed Variations	0.97 All towers		

Temperature	Minimum (ºC)	Maximum (ºC)	Spread (ºC)
Average Annual Temperature	13.22 Tower SC1	13.86 Tower A13	0.64
Network Annual Extremes	-19.91 Tower CW1	40.35 Tower MW1	60.26
Greatest Difference in Daily Minimum Temperature	-5.43 Tower CW1	2.07 Tower SC1	7.50
Greatest Difference in Average Daily Temperature	2.55 Tower KU1	5.10 Tower SC1	2.55
Greatest Difference in Daily Maximum Temperature	17.14 Tower SC1	20.64 Tower CL1	3.50



Precipitation	Minimum (cm)	Maximum (cm)	Spread (cm)
Annual Precipitation (Extremes)	27.94 Tower SC1	30.76 Tower A36	2.82
24 hour Rainfall Variation	0.22 Tower SC1	4.90 Tower A36	4.68
Greatest Monthly Precipitation Difference	7.98 Tower SC1	12.06 Tower A36	4.08
Greatest in Monthly Rainfall		12.06 Tower A36	

NOTES: Winter precipitation that falls as snow is underestimated (mostly at the SC1 tower)
ºC = degrees Celsius
cm = centimeter
m/sec = meters per second

Water Quality Program

The Water Quality Program conducts effluent monitoring through wastewater, surface discharge, and stormwater monitoring and surveillance activities.

Wastewater

Wastewater from SNL/NM is discharged from 6 on-site outfalls permitted by the Albuquerque Bernalillo County Water Utility Authority (ABCWUA). Wastewater monitoring is conducted to ensure that all discharges meet the standards set by the ABCWUA's Publicly-Owned Treatment Works. In 2013, there was one reportable event resulting in a Notice of Violation (NOV) issued by ABCWUA. The event was discovered when a one-gallon glass bottle containing a mixture of waste solvents fractured and spilt on a table and some of the liquid released into the laboratory sink, which went into the sanitary sewer (approximately 3/4 gal) in Permitted Flow Basin 2069A. All discharge parameters at the other permitted locations were met resulting in DOE/NNSA and Sandia receiving five "Gold Pre-Treatment Awards" and one "Silver Pre-Treatment Award" from the ABCWUA for the 2012-2013 treatment year.

Surface Discharge

All water that will be released to the ground surface, either directly or to lined containments is defined as a surface discharge. These discharges must meet State of New Mexico surface discharge standards. All internal discharges approved by Sandia in 2013 met NMED New Mexico Water Quality Control Commission standards. Routine surface discharges are made to two evaporation lagoons that service the pulsed power facilities under an existing discharge permit. During 2013, all permit requirements were met for both NMED-permitted lagoons. There were four surface releases reported to NMED.

Stormwater Runoff

Stormwater Program personnel perform quarterly observations and analytical sampling at the SNL/NM stormwater monitoring points, in addition to maintaining permits and ensuring compliance with applicable regulations. In 2013, all monitoring data collected was submitted to EPA. Observations of stormwater and sampling were performed when there was adequate runoff to collect a sample. The observations and sampling of the stormwater were performed from July through October. There were exceedances of benchmark levels at six monitoring points in July and at three monitoring points in September. The exceedences included chemical oxygen demand, lead, silver, cadmium, cyanide, magnesium, and zinc. Soil concentrations for certain constituents indicated exceedences due to natural background at SNL/NM, other exceedences are being reviewed as part of the selection, design, installation, and implementation of stormwater control measures and improvements.

Oil Storage and Spill Control

The Spill Prevention Control and Countermeasures Plan (required under the Clean Water Act) describes the oil storage facilities at SNL/NM and the mitigation controls in place to prevent inadvertent discharges of oil. Oil storage facilities subject to regulations include the following types of soil-containing equipment:

- Aboveground storage tanks (ASTs) (e.g. tanks, transformers),
- Underground storage tanks (USTs),
- Transfer facilities,
- Container storage areas,
- Portable equipment.

Sandia currently operates 47 ASTs and three USTs at SNL/NM.

"Dragon's Teeth" – Stormwater Energy Dissipaters

Materials Sustainability and Pollution Prevention (MSP2) Program

The MSP2 Program provides guidance and technical support to reduce waste generation and increase green purchasing by organizations within SNL/NM. The program strives for continuous improvement by setting targets and associated activities for reuse and recycling, waste reduction, sustainable acquisition (SA), and electronics stewardship. The MSP2 Program is directed and guided by multiple federal requirements, and in particular, the DOE Strategic Sustainability Performance Plan.

The MSP2 Program partners with numerous organizations at SNL/NM, including research departments, Facilities Maintenance and Operations, Procurement and other environmental programs. Activities include researching waste reduction technologies and strategies applicable to Sandia work processes, seeking avenues to reuse and recycle waste streams currently landfilled or incinerated, and leading or assisting with cost-effective implementation of new waste reduction or recycling initiatives.

MSP2 Awareness and Outreach

The MSP2 staff conducts awareness programs and outreach activities that promote and teach MSP2 strategies and technologies to waste generators. MSP2 staff submits nominations for Federal recognition (i.e., DOE and EPA) and other award programs. Internal articles and notices are regularly created that showcase MSP2 activities and awards to Sandia for MSP2 accomplishments. MSP2 information and successes can be found at the following website:

http://p2.sandia.gov

The MSP2 Program supports awareness events each year. Sandia's Earth Day event was held in April 2013 and combined with the Take Our Sons and Daughters to Work Event. A booth was hosted to promote composting and recycling opportunities at work and at home and was well received by the youth and their parents. Seven "Zero Waste Events" were hosted by MSP2 with cooperation and support from catering contractors, to teach participants that it is possible to eliminate waste. These Zero Waste Events were in conjunction with other non-environmentally oriented activities such as Health Fitness Day, the Hispanic Heritage and Diversity Awareness Event, and department potlucks. MSP2 also hosts an annual booth at the main cafeteria for November's America Recycle Day and New Mexico's Recycling Awareness Month. MSP2 staff give presentations at conferences, professional society meetings, and other organized events to disseminate and share Sandia-specific MSP2 knowledge and experience.

In CY 2013, MSP2 staff presentations included:

- Internal customized training presentations to specific departments such as Fleet Services, Information Technology teams, Procurement, and new hire classes.

- "Reduce, Reuse, Recycle, Reinvest, Compost, & Buy Green - SNL/NM on the Path to Zero Waste to Landfill." to:

  - the New Mexico chapter of the Air and Waste Management Association (May), and

  - the Albuquerque and Rio Rancho Green Chamber of Commerce.

- Solid Waste Diversion Processes as they relate to the OS1 Custodial Service Program - Audit (May), and

- Pollution Prevention and Waste Minimization to the New Mexico Society of Hazardous Materials Managers continuing education seminar (October).

Through the SA Program, MSP2 works to integrate products with reduced environmental impact into purchase agreements and ongoing operations and maintenance across SNL/NM. Products with high recycled content percentages, renewable biobased source materials, and those that have been labeled by widely recognized environmental certification systems are all part of the Sandia approach to sustainable acquisition. These products reduce demand for virgin materials, while increasing demand on recycled markets; reduce material sent to landfills; use less energy for harvesting, transport, and conversion of raw materials; rely less on petroleum ingredients; and require less energy and water resource use in manufacturing. By seeking out suppliers who share these goals and communicating with Sandia procurement, purchasers, and end users, Sandia is helping to pull many markets toward products that are better for human health and the environment.

MSP2 works with procurement staff to write green purchasing requirements into all applicable contracts with Sandia. Construction specifications are another means of calling out green products and MSP2 works with Facilities groups to put in item specific language. The ultimate goal is to provide products with sustainable alternatives as a first choice to Sandia by contractual obligation. Increasingly, sustainable acquisition is being addressed as early as the Request for Quotation so that a company's environmental stance becomes a component in the contract award process.

Waste at SNL/NM is managed at several facilities: the Hazardous Waste Handling Facility (HWHF), the Radioactive and Mixed Waste Management Facility (RMWMF), the Auxiliary Hot Cell Facility (AHCF), the Thermal Treatment Facility (TTF), the five Manzano Storage Bunkers (MSG), and the Solid Waste Collection and Recycling Center (SWCRC). In addition, the Reapplication Yard recycles surplus material and equipment that cannot be reapplied, sent for auction, or donated to K-12 schools. Table 3 provides a list of waste shipped or treated by SNL/NM waste management facilities during 2013.

HWHF

The HWHF handles hazardous wastes and chemical wastes. The waste processing functions include reviewing waste characterization, as well as waste collection, segregation, packaging, storage, and shipment to permitted off-site facilities for recycling, treatment, and/or disposal. In order to track waste through each waste-handling step, each waste item received at the HWMF is labeled with a unique bar code and the information is maintained in a database. Waste is usually processed and shipped off-site within 90 days of receipt.

RMWMF

The RMWMF manages SNL/NM's radioactive and mixed waste. The waste-processing functions at the RMWMF include waste characterization, collection, segregation, treatment, packaging, storage, and shipment to permitted off-site facilities. The treated wastes were stored at the RMWMF or MSBs, or they were shipped to permitted off-site facilities. Transuranic (radioactive) waste (TRU) and mixed TRU wastes (MTRU) were stored at SNL/NM; these wastes will be sent to the Advanced Mixed Waste Treatment Project in Idaho for certification before being sent to the Waste Isolation Pilot Plant (WIPP) for final disposal.

AHCF, TTF, and MSBs

The AHCF is used for materials management activities. The TTF is operated by SNL/NM as a treatment facility for certain explosive waste streams. The MSBs are used for storage of LLW, MW, TRU, and MTRU wastes.

SWCRC

The SWCRC manages solid waste from SNL/NM operations in compliance with all applicable regulations with an emphasis on waste reduction and diversion. This has resulted in the facility being below the NM threshold of commercial solid waste picked up on an average daily basis. The function of the SWCRC is shared equally between collection and processing of recyclable and non-recyclable solid waste generated by SNL/NM operations, in compliance with all applicable regulations. It does not accept hazardous, radioactive, residential, or food service wastes. Solid waste is disposed of locally at the COA Cerro Colorado landfill, and recyclables are either picked up by or delivered to local vendors. SWCRC also processes and ships (but does not collect) solid waste from KAFB and DOE/NNSA/SFO.

Recyclables

Another important function of the SWCRC is to collect, process (screen, bale, and track), market, and ship the following recyclable materials from SNL/NM: cardboard, white paper, mixed paper, aluminum cans, and numerous categories of plastics. Recyclables constitute over 50 percent of SNL/NM commercial solid waste and diverting the recyclables significantly reduces the number of trips to the landfill. Proceeds from the sale of recyclable materials are reinvested in the recycling program. The SWCRC also provides some recycling support for KAFB on a cost-reimbursable basis, and for the DOE/NNSA Albuquerque Complex and the DOE/NNSA/SFO. Table 4 provides a list of materials recycled in 2013.

Recycling

TABLE 3. Waste Shipped by SNL/NM Waste Management Facilities During Calendar Year 2013

Waste Categories	2013 Waste Shipped	
	(kg)	(lb)
Radioactive Waste		
Low-Level Waste	25,507	56,233
Transuranic Waste	0	0
Subtotal Shipped	**25,507**	**56,233**
Mixed Radioactive/Hazardous Waste		
Mixed Low-Level Waste	22,561	49,738
Mixed Transuranic Waste	0	0
Subtotal Shipped	**22,561**	**49,738**
Resource Conservation and Recovery Act (RCRA)		
Hazardous Waste	53,435	117,803
Subtotal Shipped	**53,435**	**117,803**
Toxic Substances Control Act (TSCA)		
Polychlorinated Biphenyls (PCBs)	8,237[a]	18,159
PCBs and hazardous waste mixture	0	0
Subtotal Shipped	**8,237**	**18,159**
Other Regulated Wastes		
Infectious Waste	731	1,612
Asbestos	54,447	120,034
Chemical Waste (includes Special Waste and Industrial Solid Waste)	299,962	661,296
Used Oil (not recycled)	0	0
Subtotal Shipped	**355,140**	**782,942**
Commercial Solid Waste		
Solid Waste Collection and Recycling Center Dry Waste	732,920	1,615,795
Offsite Office Waste (Sandia Science and Technology Park)	51,880	114,375
Cafeteria Wet Waste	21,920	48,325
Construction and Demolition Waste	1,158,980	2,555,087
Subtotal Shipped	**1,965,700**	**4,333,582**
2013 Total Waste Shipped	**2,430,580**	**5,358,457**

NOTES: All wastes shipped off-site for treatment and/or disposal unless noted otherwise. Wastes that are treated on-site and shipped off-site are included in the quantities of wastes shipped off-site. Waste treatment may increase waste quantity (e.g., adding inert material to treat the waste through macroencapsulation within an outer container).
Construction and demolition waste is now included in this table.
[a] = The weight shown includes the weight of the PCB-containing equipment: two transformers and a regulator.
kg = kilogram
lb = pound
SNL/NM = Sandia National Laboratories, New Mexico

TABLE 4. Waste Recycled by SNL/NM During Calendar Year 2013

Recycle Categories	Waste Recycled	
	(kg)	(lb)
Regulated or Chemical Waste Recycled		
Batteries	32,553	71,767
Capacitors	750	1,655
Chemical Exchange Program (CEP)	73	163
Computer Electronics	292,781	645,467
Coolant	753	1,661
Lead	42,765	94,280
Light Ballasts (non-PCB)	3,925	8,655
Light Bulbs	10,851	23,924
Mercury containing items	160	354
Oil / Grease / Fuel	108,606	239,434
Soil	1,148	2,532
Toner / Ink Cartridges	14,694	32,396
Transformers	8,749	19,290
Subtotal	**517,808**	**1,141,578**
Commercial, Construction, and Demolition Solid Waste Recycled		
Asphalt	773,262	1,704,734
Batteries	1,351	2,979
Binder Exchange Program	371	819
Brake Chambers	181	400
Cardboard	167,338	368,915
Carpet Tiles	*None Shipped*	
Ceiling Tiles	*None Shipped*	
Chairs	30,472	67,180
Compost (Food, Green, Paper, Plywood and Gypsum)	163,265	359,934
Concrete	10,838,103	23,893,681
Fencing	90	200
Food Grease	9,044	19,940
Glass	743	1,640
Metals	980,709	2,162,073
Paper (Mixed and White)	112,025	246,971
Plastics	20,344	44,852
Shock Absorbers	136	300
Tires	6,599	14,550
Wood	53,291	117,486
Subtotal	**13,157,324**	**29,006,654**
Total Waste Recycled	**13,675,132**	**30,148,232**

NOTES: kg = kilogram
lb = pound
PCB = polychlorinated biphenyl
SNL/NM = Sandia National Laboratories, New Mexico

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