

# FOCUS ON ENVIRONMENT

2008

## ENVIRONMENTAL STEWARDSHIP

Long-term management aimed at preserving and enhancing the quality of the environment has evolved at Sandia National Laboratories over more than 50 years. The Laboratories strives to integrate environmental protection in all activities. This is accomplished by recycling, establishing community environmental partnerships, incorporating sustainable design in new and renovated facilities, and environmental restoration. The Laboratories' Environmental Management System (EMS) evaluates environmental aspects and impacts and mitigates those impacts consistent with the standards of the International Organization for Standardization. EMS functions within the Integrated Safety Management System (ISMS), a system that integrates safety into management and work practices at all levels so that missions are accomplished while protecting the worker, the public, and the environment.

EMS' responsibilities include identifying, and mitigating potential risks to the environment, and incorporating environmental management into daily work activities. EMS and ISMS are integrated into Sandia's Integrated Laboratory Management System (ILMS) an overarching framework based on ISO-9001, for managing the Laboratories.

## LONG TERM ENVIRONMENTAL STEWARDSHIP PROGRAM (LTES)

The LTES Program, one of the 17 programs within the EMS, is responsible for providing a corporate-wide process for minimizing adverse environmental impacts from the Laboratories' operations, including new, active, and legacy sites. The LTES mission promotes the long-term protection of human health, the environment, and management toward sustainable use and protection of natural and cultural resources.

Activities at the legacy sites, former hazardous waste sites cleaned up to risk-based levels, are conducted under the LTES program. This includes long-term monitoring activities, such as the periodic sampling and analysis of groundwater and other media to ensure that levels remain safe for human health and the environment. Institutional control activities are also conducted by the LTES program. These activities consist of periodic inspections, maintenance, and erosion control. Administrative procedures are being created and enforced that restrict access and activities at certain sites.



Enterprise Model



# FOCUS ON ENVIRONMENT

A key component of LTES is inclusion of life-cycle management in projects. Life-cycle management addresses environmental impacts early in the planning process to allow for mitigation and development of approaches that consider the entire life-cycle of a project including planning, prevention, monitoring, sampling, and clean -up.



Field technician takes a soil sample at legacy site. Field crew installs monitoring well near legacy site.

## GREEN BUILDINGS AT SANDIA

Implementation of sustainable design principles for the design, construction, and operations of new and existing buildings is a way to lessen the effects of land development and reduce the use of resources.

Sustainable design prevents environmental damage caused by buildings and facilities throughout their life; avoids resource depletion including energy, water, and raw materials; and creates building environments that are livable, healthy, and productive. Sustainable design principles include optimizing site potential, optimizing operational and maintenance practices, minimizing non-renewable energy consumptions, and using environmentally preferable products.

The Laboratories Sustainable Design Project implements sustainable design requirements for Sandia consistent with the standards of the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) certification. Sandia leads New Mexico in having more LEED -certified buildings than any other organization in the state

for new construction (LEED NC).

The LEED-certified new construction buildings at Sandia include the Center for Integrated Nanotechnologies (CINT) core facility, the Microsystems Fabrication facility, the Weapons Integrated Facility (WIF) and the Weapons Evaluation Test Laboratory (WETL) at the Pantex plant in Amarillo. Sandia also has two LEED-Silver buildings: the Joint Computational Engineering Laboratory (JCEL) and the Microsystems Laboratory. The LEED Green highlights of these buildings include:

- Development on a previously contaminated site;
- Up to 30 percent reduction in energy by including features such as an under-floor air distribution system with individual control and daylighting;
- Up to 34 percent reduction in water use
- Use of xeriscape and indigenous landscape design;
- More than 80 percent diversion of construction waste from landfill disposal; and
- Use of environmentally preferable materials that have recycled content, are non-toxic (paints, adhesives, pressed wood), and are locally manufactured and harvested.

The Experimental Sciences Complex and the Ion Beam Laboratory are currently in the initial design phase and are committed to pursue lead certification. When construction is complete on these buildings, nearly 10% of Sandia's buildings (by square footage) will be LEED certified.

The next horizon in green buildings at Sandia is to certify many of the existing buildings under the LEED for Existing Buildings (LEED EB) rating system. The combined square footage of LEED NC and LEED EB certified buildings will allow Sandia to meet (and hopefully exceed) DOE's requirements that 15 percent of the buildings stock must meet its High Performance Sustainable Building Guiding Principles by 2015.

For more information about green buildings at Sandia, contact Jack Mizner (505)845-3576 or Katrina Wagner (505)844-1810.

## PHOTOVOLTAIC APPLICATIONS

Facilities Energy Management and other sustainable groups at Sandia/New Mexico are beginning to

# COMMUNITY INVOLVEMENT

take full advantage of Albuquerque's geographic location and plentiful sun. Increasing energy costs and the competitive Photovoltaics (PV) market help this effort. The Facilities Energy Management Team hopes that Sandia will one day "power itself entirely through renewable sources."

A few years ago, it took an observant eye to notice a photovoltaic (PV) application at Sandia/New Mexico aside from the National Solar Thermal Test Facility. Now, PV powered lights are used in several parking lots across the site and are used along some walkways, corridors, and on rooftops. In many cases, PV at Sandia/New Mexico remains hidden or disguised.

The Facilities Energy Management Program, one of Sandia/New Mexico's 17 environmental programs under the Environmental Management System (EMS), identifies and implements new PV projects and installations annually. PV powered lights are used at parking lots, the credit union, and on F Avenue. PV now powers walkway lights and in the shade structure at the Innovation Corridor near buildings 898 and 897.

Building 833 incorporates PV into the membrane of the roof and also used PV for parking lot illumination. This is not a rigid PV panel but a cutting edge, flexible type that can be integrated into the roof. This new flexible PV system is called Building Integrated PV or BIPV. Surrounding Building 833 is a small PV farm used for research by the Distributed Energy Test Laboratory (DETL). The DETL team recently won an EMS Excellence Award for connecting both the Building 833 BIPV and its PV farm into the Sandia grid. The energy generated by these sources could power between 20 and 30 average homes in Albuquerque for a year.

The Facilities Energy Management Program funds a unique project called hybrid lighting. In Building 887, natural light will reach areas normally with little or no daylight. A solar collector on the roof will direct light through fiber optics to reach areas that require lighting. This new technology can reduce the need for electric lights by 80 percent. PV growth at Sandia/New Mexico may be substantial. Much bigger PV projects are on the horizon:

- A shade structure in the parking lot north of 887, 1 megawatt, enough to power over 300 average homes in Albuquerque.
- A BIPV for Building 956 roof generating 50 kilowatts, enough to power over 15 average homes in Albuquerque,

- Stations for electric carts,
- More external lights in areas such as parking lots, and
- A farm to generate energy to power Sandia/New Mexico.



Building 956



Photovoltaic roof on Building 833

## ENVIRONMENTAL EDUCATION

The Annual Youth Conference on the Environment, a Sandia/New Mexico event, will be held in April of 2009. Discussion and interactive sessions are planned.

Sandia helps plan promote, sponsor, and provide presenters for the annual New Mexico Environmental Health Conference. The conference, a major regional event and one of the largest environmental health conferences in the country, attracts 400-600 participants. The conference, an EMS outreach event for several years, will be held October 18-22, 2008.

## DOCUMENTS AND LINKS

- Sandia Site Environmental Reports:  
[www.sandia.gov/news/publications/environmental/index.html](http://www.sandia.gov/news/publications/environmental/index.html)
- Pollution Prevention Program  
[www.p2.sandia.gov](http://www.p2.sandia.gov)
- New Mexico Environmental Health Conference:  
[www.nmehc.net](http://www.nmehc.net)
- Long-Term Environmental Stewardship:  
[ltes.sandia.gov](http://ltes.sandia.gov)

# FOCUS ON ENVIRONMENT

## PREVENTATIVE MAINTENANCE AND GOOD DESIGN HELP PREVENT FLOODING AT SANDIA NEW MEXICO SITE

The summer rains of 2006, dropping more than 14 inches from the end of June through the beginning of September, reminded many of the volatility and power of the New Mexico monsoon season. However, a preventative maintenance program, and good system design helped



The energy dissipater at the end of the 9th Street channel during a 5-year frequency storm event on July 30, 2006. Photo courtesy of Darell Rogers.

keep the Sandia New Mexico site safe from major flooding damage.

Facilities maintenance crews and engineers prepare for rains by inspecting more than 400 drainage structures and cleaning problem spots prior to the summer rains. Each year it is difficult to predict the exact power of the monsoon season, but Facilities engineering and maintenance will continue working to help ensure the storm drain system functions properly and site missions are not interrupted.

Visit us at [www.sandia.gov/about/community.html](http://www.sandia.gov/about/community.html) or call (505) 284-5200 for more information.

Editor: Tally Lobato, Community Involvement

Author: Ted Wolff, Community Involvement

**Contributors:** Carolyn Byrd, Matthew Brito, Morgan Gerard, Jack Mizner, Freeman Leaming, Israel Martinez, and Katrina Wagner

Designer: Michael Vittitow, Creative Arts

Community Involvement  
Sandia National Laboratories  
Organization 03652

