



Office of Legacy Management  
U.S. Department of Energy



# Program Update

July – September 2006

Welcome to the July – September 2006 issue of the U.S. Department of Energy (DOE) Office of Legacy Management (LM) Program Update. This publication is designed to provide a status of activities within LM. Please direct all comments and inquiries to [LM@hq.doe.gov](mailto:LM@hq.doe.gov).

## Goal 2

### LM Strategic Plan

The Office of Legacy Management (LM) is pleased to announce the availability of the *Draft LM Strategic Plan* for public comment. This document will be available on the LM website at <http://www.LM.doe.gov>, through January 2, 2007.

We are using a web-based approach to reduce cost and minimize the environmental impacts of preparing this plan. However, hard copies can be requested by either completing a document request form at <http://its1.gjo.doe.gov/forms/documentrequestplan.cfm> or by sending an email to [LM@hq.doe.gov](mailto:LM@hq.doe.gov).



Wayne, New Jersey, Site

## Goal 4

### Wayne Interim Storage Site, New Jersey

W.R. Grace and Co., Inc., originally used the 6.5-acre Wayne Interim Storage Site as a rare earth and thorium processing operation facility. This site is located in a mixed industrial and residential area of Wayne Township, New Jersey. In 1984, the U.S. Environmental Protection Agency (EPA) listed the site on the National Priorities List. The U.S. Department of Energy (DOE) acquired the property in 1984 and used it for interim storage of contaminated material from vicinity properties because a disposal option did not exist at that time.

In 1997, Congress assigned responsibility for remedial action to the U.S. Army Corps of Engineers (USACE). EPA concurred in the May 2000 Record of Decision, which selected excavation and off-site disposal of contaminated materials as the remedy. USACE remediated the site to conditions that allow unrestricted use. Regulator concurrence and deletion from the National Priorities List is pending.

## Goal 2

### Freedom of Information Act

Effective October 1, 2006, Freedom of Information Act (FOIA) and Privacy Act (PA) requests for Rocky Flats, Colorado; Nevada Offsites Sites (Amchitka and Chariot, Alaska; Central Nevada Test Area and Shoal, Nevada; Gas Buggy and Gnome, New Mexico; Rio Blanco and Rulison, Colorado; and Salmon, Mississippi); and Columbus, Fernald, and Mound, Ohio, Sites must be submitted to

Chief Freedom of Information Act Officer  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, DC 20585

Requests can also be submitted electronically at <http://www.mbe.doe.gov/execsec/foia.htm>.

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A request by the General Services Administration to transfer the property to Wayne Township under the Federal Lands to Parks Program was accepted by the National Park Service on June 12, 2006. The township will transform the site into a community recreation site with ball fields for soccer, lacrosse, soft ball, and baseball.

The DOE Office of Legacy Management (LM) coordinated outreach activities with the Township of Wayne, New Jersey, and prepared the required disposition forms required under the 1949 Property Disposal Act and the McKinney Act, such as the Report of Excess, the Excess Real Property Check List, and the Title V excess property survey report. LM resolved legal description problems and land survey issues for the site with USACE information and prepared an environmental checklist for compliance with the National Environmental Policy Act. LM also prepared responses to congressional inquiries and represented DOE at meetings with the Mayor of Wayne, city staff members, EPA, and the New Jersey Department of Environmental Protection.

Since the acceptance of the property by the National Park Service, LM has worked with the General Services Administration and the National Park Service to resolve a trespass by an adjoining landowner and legal description issues that delayed the transfer. These issues were all resolved, and the National Park Service transferred the site to the City of Wayne the week of September 25, 2006.

### Contractor Work Force Restructuring Annual Report

The *Annual Report on Contractor Work Force Restructuring*, covering fiscal year 2005, is available on the LM website at [www.LM.doe.gov](http://www.LM.doe.gov). This is a congressionally mandated report that provides an update to Congress and the public on the results of contractor work force restructuring.



*The Fernald Site, part of the former weapons complex, is being transformed to an undeveloped park that includes a wide variety of wildlife habitat.*

### Goal 1

#### The End Is Just the Beginning at Fernald

As soon as Declaration of Physical Completion for the Fernald Project is achieved, targeted for October 2006, the Office of legacy Management (LM) is ready to begin operations. The LM/S.M. Stoller Corporation (LM contractor) team is excited about taking on the task of managing the former nuclear weapons site as a nature preserve and a center for historical information on the Fernald site near Cincinnati, Ohio.

The transition process has been a 2-year effort to effectively and seamlessly transition the site and involves collaboration between the DOE Office of Environmental Management, LM, and the prime contractors. All aspects of post-closure activities, including active groundwater remediation and long-term surveillance and maintenance, are the key aspects of operational transfer.

At the start of fiscal year 2007 (October 1, 2006), LM assumed Budget Authority for Fernald and custodianship of all Fernald records. LM was responsible for



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processing Energy Employees Occupational Illness Compensation Program Act (EEOICPA) claims on September 12, 2006, and will be responsible for Freedom of Information Act and Privacy Act requests on the date that the EM contractor declares Physical Completion.

### Goal 1

### Applied Science for Legacy Management

The Office of Legacy Management (LM) supports an Applied Science and Technology (AS&T) program to more effectively manage LM sites, ensure protection of human health and the environment, and reduce long-term costs.

Facilities used for AS&T efforts are maintained at the Grand Junction, Colorado, office and include a 4,500-square-foot geochemistry/ecology laboratory and a mobile laboratory. The on-site laboratory is equipped with a broad array of instrumentation to conduct analyses, including kinetic phosphorescence (uranium), atomic absorption (calcium, magnesium, potassium, and sodium), ion chromatography (bromide, chloride, nitrate, nitrite, and sulfate), liquid scintillation (radon), and spectrophotometry (ammonium and molybdenum). Field and laboratory instrumentation for ecophysiology, soil hydrology, and soil fertility investigations is also maintained for use in AS&T projects.



*Monticello, Utah, Treatment System Construction*

The AS&T program evaluates the progress of site remediation using data transmitted to Grand Junction via an extensive telemetry system. Dataloggers collect data at remote sites from flow meters, water-level meters, pressure sensors, unsaturated-zone water-flux meters, moisture sensors, and other instruments. These data are currently being transmitted from 32 dataloggers at 7 project sites that are located in 5 states. In addition, meteorological data (wind speed, wind direction, rainfall, and relative humidity) are being collected from 5 stations in 4 states. Data are automatically processed to produce real-time graphs that are made available to all project scientists across LM.

Significant AS&T projects conducted during fiscal year (FY) 2006 include evaluation of (1) an innovative treatment system that supplements a subsurface permeable reactive barrier (PRB) to treat contaminated ground water, (2) the hydraulic and chemical effects on an aquifer of installing groundwater collection drains, (3) an innovative method for measuring water flux in unsaturated media, and (4) enhanced sustainability of disposal cell covers. Results of these AS&T investigations are often presented at technical meetings and published in scientific journals.

### FY 2006 AS&T Project Summaries

**Treatment System**—A PRB was constructed at LM's Monticello, Utah, Site in 1999 as part of a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Interim Action. Because of decreasing effectiveness of the PRB, the AS&T program built a supplemental ex situ treatment system in June 2005. This system contains a mixture of gravel and granular cast iron and has treated more than 2 million gallons of ground water at a rate of about 5 gallons per minute. The hydraulics of the treatment system have been continuously monitored by the telemetry system. Influent and effluent samples are collected monthly. Measured uranium concentrations of these samples indicate that the system continues to meet project treatment goals. The cost to construct, operate, and monitor the treatment system is significantly less than for the PRB, while providing a comparable rate of groundwater treatment.

**Groundwater Collection Drain**—At LM's Shiprock, New Mexico, Disposal Site, two groundwater collection drains were installed in February 2005. Each





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drain is 200 feet long and is intended to help protect the environment by intercepting contaminated groundwater flowing toward the San Juan River adjacent to the site. Standard construction methods of digging and shoring were impractical because of the shallow groundwater table. The AS&T program provided technical support to the construction effort by investigating alternative means of drain installation. The result was successful implementation of the drains using vegetable-based guar gum to hold the trenches open during excavation. The AS&T program is now evaluating the effects of the drains on the aquifer by monitoring the hydraulics with the telemetry system and regular collection of samples. The drains are capturing a large volume of the contaminated groundwater that is subsequently pumped to an evaporation pond.

**Water Flux Instrumentation**—Water flux through unsaturated soil was previously calculated by relating measurements of physical soil properties to hydraulic properties, such as hydraulic conductivity. Water-flux meters, developed at DOE's Pacific Northwest National Laboratory in Richland, Washington, are a great improvement because they measure flux directly, thus avoiding the errors inherent in modeling flux from soil parameters. To test the new instrumentation, the AS&T program is measuring percolation flux through the disposal cell cover at LM's Lakeview, Oregon, Site using water-flux meters installed in November 2005. Data retrieved from the water-flux meters via a telemetry system indicate that the meters are a viable tool for investigating water flux through unsaturated media. The results show that percolation flux through the Lakeview cover was higher than anticipated.

**Sustainable Covers**—Monitoring data indicate that the permeability of disposal cell covers can increase during aging because of root intrusion from establishment of plants. The increased permeability results in increased flux of contamination to the groundwater. Thus, covers that maintain their functionality for long time periods could reduce long-term costs and provide better protection of human health and the environment by minimizing contaminated water flux. AS&T program efforts to develop these sustainable covers include designing vegetative covers that use plant transpiration to limit water flux through the covers; construction of a large (7.5-acre) lysimeter at the Monticello, Utah, Disposal Site to evaluate



*Lakeview, Oregon, Site Flux Meter Installation*

sustainable covers at field scale; and investigation of low-cost means of renovating existing covers to minimize contaminated water flux.

### **Goal 1**

## **Enhancing Sustainability of Disposal Cell Covers**

Office of Legacy Management (LM) scientists, funded under the Applied Science and Technology (AS&T) program, are evaluating the performance of disposal cell covers at LM sites and exploring ways to enhance their sustainability. The goals of these activities are to reduce long-term surveillance and maintenance (LTS&M) costs and to prevent long-term increases in risks to human health and the environment.

### **Performance of Older Covers**

Many of the oldest covers at LM sites rely on the low permeability of a compacted soil layer to limit water percolation and radon escape and on an overlying



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*Inspection of Rock Cover at Falls City, Texas, Site*

rock layer to prevent erosion. During the past decade, AS&T and predecessor programs conducted LTS&M follow-up investigations of plant-root intrusion in covers and measured the permeabilities of compacted soil layers that were often higher than expected. In 2005, AS&T initiated field tests of a new water-monitoring device, called a water flux meter, and measured percolation rates in 2006 that were higher than expected. AS&T is planning follow-up evaluations of the potential impacts from higher percolation rates to make sure that disposal cells remain protective.

LM scientists identified the causes for high soil permeabilities and percolation rates in these older covers. The surface layer of rock acts as mulch by limiting evaporation, thus increasing water storage and creating habitat favorable for growth of deep-rooted woody plants. Root intrusion and natural soil formation processes, which occur both in engineered soil layers and in the borrow soils excavated to build them, create channels and planes of weakness in the soil structure that cause preferential flow of water.

### ***Evapotranspiration Cover at Monticello, Utah***

During the mid-1990s, DOE and the U.S. Environmental Protection Agency (EPA) partnered to develop an alternative cover for the Monticello, Utah, disposal cell, a Superfund site. The goal was to accommodate long-term ecological processes, thereby sustaining performance with as little maintenance as possible. In a semiarid climate like Monticello, relatively low precipitation, high soil evaporation, and plant transpiration—together called evapotranspiration (ET)—and thick unsaturated soils favor long-term hydrologic isolation of buried waste. The alternative ET cover constructed at Monticello was designed to mimic the natural soil-water balance of the area.

The Monticello cover relies on two processes.:

- A thick soil “sponge” layer, which overlays a sand-and-gravel “capillary barrier” layer, that stores precipitation while plants are dormant.
- A diverse stand of native vegetation that is used to dry the sponge layer during the growing season to prevent percolation.

These two layers work together because the capillary barrier enhances water storage in the overlying soil sponge layer.

The Monticello cover was the first ET cover design constructed at a Superfund site. Hoping to learn from this experience, AS&T's predecessors teamed with EPA-funded scientists and installed instrumentation, called a lysimeter, during construction of the cover in 1999 to monitor soil-water storage and percolation on a very large scale. The monitoring area of the lysimeter encompasses more than 7.5 acres of the cover! LM scientists continue to monitor the performance of the Monticello ET cover. As of September 2006, only a thin film of water, an average of 0.02 inch per year, has percolated from the ET cover. Most of this percolation occurred following the winter of 2004 – 2005, one of the wettest seasons on record at Monticello. EPA has used these results, along with results of smaller scale ET cover tests around the country, to revise its design guidance for solid and hazardous waste disposal cells.

### ***Cover Renovation Initiative***

We are currently applying lessons learned from older covers and experience gained with ET covers to explore ways to reduce LTS&M costs and to enhance sustainability of the older covers. In an effort to prevent increases in permeability, the cost of spraying herbicides on older covers to control vegetation has been on the rise for several years. This cost is expected to continue to increase as ecological conditions become more favorable for plant growth.

Without human intervention, ecological succession and soil formation processes will effectively transform older, compacted-soil covers into ET-type covers. AS&T is acquiring data to help LM decide whether to continue spraying, discontinue spraying and allow Mother Nature to take her course, or facilitate a more favorable transformation into ET-type covers—called cover renovation. As part of this initiative, LM scientists and collaborators will select an LM site in





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FY 2007 that has an older cover and will install a test facility adjacent to the disposal cell to compare the hydrological performance of the existing cover design with a renovation design. The goal of cover renovation is to accommodate inevitable ecological processes, sustain a high level of performance, reduce long-term maintenance costs, and avoid possible long-term increases in risk associated with deep percolation. Results of the test will help determine if cover renovation will ultimately reduce long-term surveillance and maintenance costs as well as prevent long-term increases in risks to human health and the environment.

### Weldon Spring Site Award Recipient

Matt Blunt, Governor of the State of Missouri, presented the 2006 Governor's Award for Quality and Productivity in the category of innovation to the U.S. Department of Energy Weldon Spring Site in St. Charles County, Missouri. A team of collaborators was recognized for their efforts to not only clean up the contaminated site, but also to provide for community reuse through the Interpretive Center, the native prairie, the hike-and-bike trail, and the viewing platform on top of the disposal cell. The team consists of the Missouri Department of Natural Resources, the Missouri Department of Conservation, the Missouri Department of Health and Senior Services, the St. Charles County Government, the Weldon Spring Citizens Commission, the U.S. Environmental Protection Agency, and the U.S. Department of Energy.



**Matt Blunt** (front row center), Governor of the State of Missouri, presented the 2006 Governor's Award for Quality and Productivity in the category of innovation to the Weldon Spring Site. Award recipients included (front row, left to right) **John Smith**, Assistant Director, Missouri Department of Conservation; **Julia Eckstein**, Missouri Department of Health and Senior Services; **Governor Blunt**; **Yvonne Deyo**, S.M. Stoller Corporation, Weldon Spring Site Manager, accepting on behalf of DOE; and **Myrna Rueff**, Missouri Department of Natural Resources.

Second row (left to right) **Mimi Garstang**, State Geologist and Division of Geology and Land Survey Director, Missouri Department of Natural Resources; **Paul Mydler**, Chair of the Weldon Spring Citizens Commission; **Branden Doster**, Missouri Department of Natural Resources; and **Peter Price**, Environmental Geology Section Chief, Missouri Department of Natural Resources.

Third row (left to right) **Gale Carlson**, Bureau of Environmental Epidemiology Chief, Missouri Department of Health and Senior Services; **Doyle Childers**, Director, Missouri Department of Natural Resources; **Gene Gunn**, Branch Chief, Superfund Division, U.S. Environmental Protection Agency; **Dan Wall**, Remedial Project Manager, U.S. Environmental Protection Agency; and **John Vogel**, Missouri Department of Conservation.

Fourth row (left to right) **Larry Erickson**, Section Chief, Federal Facilities, Missouri Department of Natural Resources, and **Joe Ortwerth**, County Executive, St. Charles County.

Recipients who were unable to attend the award ceremony but have been involved in the cleanup of the site for community reuse include **Ben Moore**, Environmental Engineer, Missouri Department of Natural Resources; **Steve Lang**, Environmental Engineer, Missouri Department of Natural Resources; **Dave Geiser**, Deputy Director, U.S. Department of Energy Office of Legacy Management; and **Tom Pauling**, Project Manager, U.S. Department of Energy Office of Legacy Management.



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#### Fax or Mail to:

Ms. Sheila G. Dillard  
U.S. Department of Energy  
Office of Legacy Management  
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