U.S. DEPARTMENT OF ENERGY | Legacy Management

January–March 2018

PROGRAM UPDATE

LM Director Visits South Texas Sites

Got it Covered? Are Natural Processes Changing Engineered Disposal Cells?

LM Participates in STEM-sation Day

Director's Corner

Dear *Program Update* Readers,

As steward of more than 90 defense-related legacy sites across the country, the U.S. Department of Energy Office of Legacy Management's mission is to ensure that humans and the environment are protected following site remediation. Our long-term stewardship (LTS) responsibilities include monitoring and maintaining our sites; physical and institutional controls designed to contain, or prevent exposures to, residual contamination and waste; managing records; managing and reusing land assets; and engaging stakeholders.

These responsibilities present unique challenges, such as evolving technologies, groundwater contamination issues, and growing communities that affect stakeholder interaction.

Later this summer, we will have the chance to address many LTS challenges and opportunities with other professionals during our 2018 Long-Term Stewardship Conference in Grand Junction, Colorado. The conference will give U.S. and international experts an opportunity to exchange knowledge and ideas, as well as network with professional colleagues.

Conference sessions are designed to support effective and timely communication of decisions related to LTS, and the factors influencing LTS efforts. Topics will include:

- Planning for long-term stewardship during remediation
- Garnering international perspectives on current practices
- Maintaining continuity of stewardship while transitioning from cleanup to stewardship
- Advancing science and technology to reduce costs while maintaining or improving protection of human health and the environment
- Preserving critical information and making it accessible to future generations
- Maintaining strong partnerships with stakeholder, regulatory, and tribal communities
- Optimizing federal land and properties for beneficial reuse
- Addressing legacy uranium production sites
- Managing mine reclamation, remediation, and closure

It is our hope that conference attendees will gain a better understanding of the many aspects involved in LTS and learn strategies for effectively communicating LTS issues to stakeholders. The conference will also serve as a forum for leaders in higher education to discuss how to attract future scientists and engineers to LTS careers.

Grand Junction is a great place to visit in August. The region is known for its award-winning peaches and wineries, breathtaking scenery, abundant outdoor activities, and vibrant downtown—all of which can keep you busy during your free time.

Please visit our conference website at https://www.lm.doe.gov/2018LTS-Conference/index.html for more information.

I'm looking forward to seeing many of you in August.

Respectfully,

Carmelo

Carmelo

Welcome to the January–March 2018 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.

Cover Photo: Director Melendez confers with LM's Tashina Jasso during a visit to the Falls City, Texas, Disposal Site.

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1 Protect Human Health and the Environment

2 Preserve, Protect, and Share Records and Information

3 Safeguard Former Contractor Workers Retirement Benefits

4 Sustainably Manage and Optimize the Use of Land and Assets

5 Sustain Management Excellence

6 Engage the Public, Governments, and Interested Parties

GOALS 4 & 6

LM Director Visits South Texas Sites

The Panna Maria, Texas, Disposal Site. Approximately 6.8 million tons of uranium ore were processed at the former mill, which shut down in 1992. Site reclamation was completed in 2015. The site is expected to transfer to LM for long-term surveillance and maintenance in 2020.

LM director tours the Conquista, Texas, Site with other LM representatives.

In March 2018, U.S. Department of Energy (DOE) Office of Legacy Management (LM) Director Carmelo Melendez joined other DOE staff on a tour of four former uranium mill sites in south Texas.

Accompanied by Tashina Jasso, LM Texas sites manager, and David Shafer, LM site operations director, Melendez visited Falls City, an LM site remediated under the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978 Title I program. The group also visited the Conquista, Ray Point, and Panna Maria sites, which are currently undergoing cleanup and regulatory closure. When remedial action is complete, these latter sites will transition from private ownership to LM under Title II of UMTRCA.

Each of these sites contains a disposal cell that encapsulates low-level radioactive material and debris from uranium milling operations.

At the Falls City site, which DOE remediated between 1992 and 1994, the site manager gave Melendez and the team an overview of LM's long-term surveillance and maintenance efforts. The group also took a close look at local land management practices such as haying, a historic land use in south Texas that is currently implemented at the site.

"At Falls City, haying provides the best reuse option for DOE," Jasso said. "In exchange for the hay, the vegetation is maintained and we have a local point of contact who maintains our fences and signs and lets us know if there is a problem at the site."

At the Conquista, Ray Point, and Panna Maria sites, Melendez and the team met with site licensees and their representatives to discuss operations, land-use issues, and health and safety protections.

In 2016, LM initiated a process to prepare for assuming perpetual responsibility for Title II reclaimed sites. As part of the process, LM conducts thorough evaluations of site conditions, which includes coordinating with regulators and licensees to ensure that site documentation is complete and remedies are protective and stable. The office collaborates closely with State of Texas regulators, the U.S. Nuclear Regulatory Commission, and the site licensees to reach solutions that are protective of public health and the environment.

At Panna Maria and Ray Point, Melendez and Shafer were briefed on the pre-transition work that LM has undertaken for these sites. The office began meeting regularly with the licensees and Texas Commission on Environmental Quality early in the regulatory closure process, allowing staff to identify potential challenges from the outset and collaborate on solutions.

The trip to Texas was part of a larger initiative by Melendez, who was appointed LM Director in December 2016, to familiarize himself with LM sites around the nation. In April, he visited Defense-Related Uranium Mine sites in Colorado and Formerly Utilized Sites Remedial Action Program sites on the east coast. In June, he will tour UMTRCA sites in Wyoming. ❖

GOAL 6

Grand Junction Office History a Hot Topic at Colorado Conference

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) presented at Colorado Preservation, Inc.'s Saving Places Conference held January 31 through February 3, 2018, at the Colorado Convention Center in Denver. LM historian Padraic Benson and LM Support contractor, Navarro Research and Engineering Inc. historian Laurena Davis, presented to roughly 45 people in a "Hot Topic" session titled "Grand Junction Atomic Legacy Learning Center." The session covered the story of a historic log cabin at the Grand Junction office site that is expected to open to the public as an interpretive center.

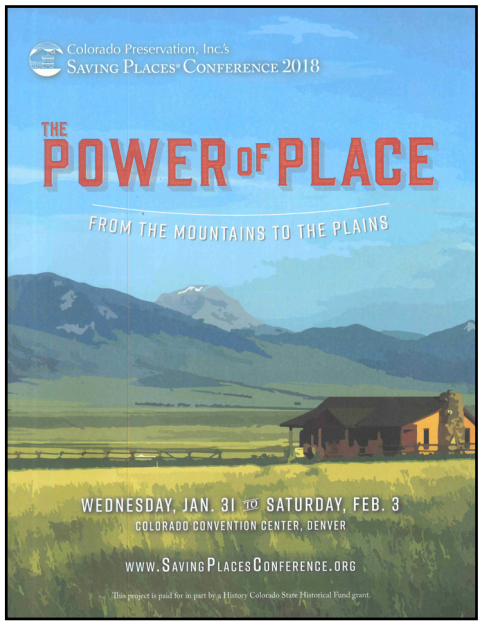
The conference theme was "The Power of Place: From the Mountains to the Plains." Colorado Preservation, Inc. promotes historic preservation through advocacy, education, and outreach. Since 1984, the Saving Places Conference has provided training and networking opportunities to those working to protect Colorado's heritage. Colorado Governor John Hickenlooper delivered opening remarks at the event and Kevin Jennings, president of the Tenement Museum in New York City, gave the keynote presentation.

In 2016, the Grand Junction office was listed on the National Register of Historic Places in recognition of its important, historical roles in the Manhattan Project and the Cold War. During World War II, Grand Junction was the center for procurement and refining of domestic uranium for the Manhattan Project—a secret research and development undertaking that produced the first nuclear weapons. During the Cold War, Grand Junction was the center of a government-sponsored uranium boom that rivaled the gold rush of California.

The work of DOE and its predecessor agencies in Grand Junction has been continuous for 75 years, even as its mission changed. Forty-six acres of the site were transferred to the nonprofit Riverview Technology Corporation for economic development in 2001. Today, LM works from leased offices on the site.

Audience members at the half-hour session had many questions. Some asked about the current work being done by LM in Grand Junction. Others wanted to know if the log cabin interpretive center displays would represent Manhattan Project contributions of other Western Colorado communities, such as Uravan and Durango. ❖

Laurena Davis, Navarro historian, presents about the Atomic Legacy Cabin at Colorado Preservation, Inc.'s Saving Places Conference in Denver.



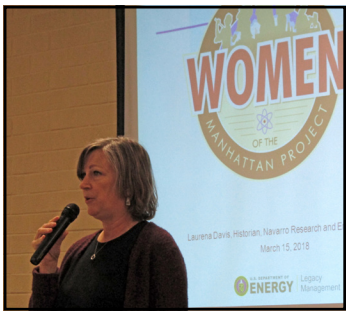
Saving Places Conference 2018 poster.

Padraic Benson, LM historian, presents about the Atomic Legacy Cabin.

GOAL 6

Women of the Manhattan Project Honored in March



Left to right: (1) J.P. Moore and Muriel Evans Moore on their wedding day, May 31, 1942. (Photo courtesy of the J.P. and Muriel Moore family.) (2) The Children's Museum of Oak Ridge celebrated 75 years of Girl Scouts in the community. (3) Staff of the Colorado Area Engineer's office pose in front of the Gamble's building at Third and Main Streets in Grand Junction, Colorado, circa 1944. (4) Navarro Historian Laurena Davis presents to the Mesa County Historical Society in Grand Junction.

During the month of March, the U.S. Department of Energy (DOE) and the Manhattan Project National Historical Park (MAPR) partnered to showcase the contributions women made to the top-secret mission to develop the world's first nuclear weapons during World War II.

DOE celebrated Women of the Manhattan Project throughout Women's History Month by posting digital resources to its website that included a timeline, photo album, coloring book, and biographies highlighting the accomplishments of five women who worked for the Manhattan Project in the fields of science, technology, engineering, and mathematics (STEM).

In addition to working in STEM fields, multitudes of women worked for the Manhattan Project behind the scenes in various other capacities. They worked as welders, nurses, bankers, and administrative assistants. Other women supported their spouses' Manhattan Project work by uprooting their families and moving to live in makeshift, isolated towns.

That gamut of paid and unpaid work was featured at Women of the Manhattan Project events at MAPR sites and in Grand Junction, Colorado, the headquarters for domestic uranium procurement for the Manhattan Project.

MAPR preserves and interprets the three largest Manhattan Project sites: Los Alamos, New Mexico; Oak Ridge, Tennessee; and Hanford, Washington. The park is managed jointly by the U.S. National Park Service and DOE Office of Legacy Management (LM).

"As I learn more about the women who contributed to the Manhattan Project, I am appreciative of the resilience, creativity, and perseverance demonstrated in their stories," said Tracy Atkins, LM Program Manager for MAPR. "Many women made major contributions, broke new ground, and/or moved away from family and what they knew to contribute to the war effort."

Events for Women of the Manhattan Project included:

- The Los Alamos Historical Society exhibition (through June), "Women, Science, and Project Y" at the Los Alamos County Municipal building. The exhibit is free and open to the public.
- Her Story: A Special Women's History Reception and Celebration hosted at the New Hope Visitor Center in Oak Ridge on March 22. The celebration included the opening of a photography exhibition of Women in the Secret City and the presentation to the park of a scrap-metal biscuit pan owned by Kattie Strickland, an African-American from Alabama who moved to Oak Ridge with her husband to work for the Manhattan Project. African-American spouses were not allowed to live together in segregated Oak Ridge. Strickland bribed guards with her homemade biscuits in order to spend more time with her husband.
- The Children's Museum of Oak Ridge celebrated 75 years of Girl Scouts in the community, with free admission to any Girl Scout in uniform and their immediate family. Scouts had opportunities to earn multiple patches.
- The Hanford site and Leona Libby Middle School hosted an event featuring women in science from the Manhattan Project era forward, with booths and student demonstrations.
- Navarro Research and Engineering Inc. Historian Laurena Davis presented to the Mesa County Historical Society in Grand Junction on March 15, and was recorded for their oral history program. Featured in the program was Muriel Evans Moore, who worked as secretary to the purchasing agent at Uravan, Colorado, where uranium was refined for the Manhattan Project.

For more on Women of the Manhattan Project, go to https://www.energy.gov/lm/programs-and-services/manhattan-project-national-historical-park. ❖

GOAL 1

New Agreement Expands Support for DOE Long-Term Stewardship

Officials from the U.S. Department of Energy (DOE) signed a Memorandum of Understanding (MOU) formally establishing Savannah River National Laboratory (SRNL) as the lead national laboratory providing technical support to DOE's management of remediated cleanup sites around the United States.

According to the agreement, the DOE Office of Legacy Management (LM) will gain formal access to SRNL technical expertise and assistance. Since the mid-1990s, the lab has lent targeted assistance to address critical technical issues for LM, which provides management and surveillance of more than 90 sites in the former nuclear weapons complex where environmental cleanup has been completed.

SRNL is the lead national laboratory supporting ongoing cleanup by the DOE Office of Environmental Management (EM) at former weapons sites and government-sponsored nuclear research facilities. The MOU designates the laboratory as lead for LM as well.

(L-R) Dr. Terry A. Michalske, director of SRNL, DOE Under Secretary Paul Dabbar, and Michael Budney, manager of the Savannah River Operations Office signed a Memorandum of Understanding establishing SRNL as the lead national laboratory providing technical support to remediated cleanup sites around the United States.

"Expanded access to DOE national laboratory expertise will accelerate LM's ability to assess and deploy technology and expertise to sustainably manage the use of legacy land and assets," said LM Director Carmelo Melendez. "We believe this collaboration will help LM reduce budget expenditures and improve our stakeholder confidence."

Melendez signed the agreement along with DOE Under Secretary Paul Dabbar, EM Principal Deputy Assistant Secretary James Owendoff, Savannah River Operations Office Manager Michael Budney, and SRNL Director Dr. Terry A. Michalske.

"Given the Savannah River National Laboratory's role and experience in supporting the EM clean-up mission, it is a natural fit to be the lead national lab and entry point to help LM assess science, technology, and its strategic needs," Owendoff said.

LM's mission is sustainable, post-closure management of legacy sites where active remediation is complete, but where there is a need to ensure that sites remain protective, sometimes for thousands of years. Responsibilities include effective and efficient long-term surveillance and maintenance, operation of cleanup systems for surface and groundwater, and the management of land and assets by emphasizing safety, reuse, and disposition.

EM's mission is the safe cleanup and closure of 107 contaminated nuclear weapons manufacturing and testing sites across the United States, making it the largest environmental cleanup program in the world. To date, cleanup has been completed at 91 sites.

"The experience SRNL gains in supporting LM can also be applied to future EM efforts making this relationship beneficial to all," Budney said.

SRNL is a multi-program national laboratory that puts science to work providing practical, cost-effective solutions for the nation's environmental, nuclear security, energy, and manufacturing challenges. For more information about the lab, visit https://srnl.doe.gov.

"SRNL developed many of the environmental remediation technologies implemented at cleanup sites across the DOE complex," Michalske said. "This deep understanding makes SRNL well suited to monitor legacy sites to ensure long-term success."

GOAL 1

Got it Covered? Are Natural Processes Changing Engineered Disposal Cells?

In the 1980s, the U.S. Department of Energy (DOE) began remediating abandoned uranium mill tailings piles to protect local communities and ecosystems, as required under the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978. UMTRCA remedies included constructing disposal cells with layered, earthen covers to contain tailings and other contaminated materials. The engineered covers feature a highly compacted layer of clayey soil designed to limit the release of radon gas to the atmosphere and protect groundwater by limiting percolation of rainwater into tailings. These low-permeability radon barriers were armored to control erosion, either with durable rock or with topsoil and sustainable vegetation. To meet the standards of the U.S. Nuclear Regulatory Commission (NRC), UMTRCA disposal cells were designed to be effective "for a period of 1,000 years, to the extent reasonably achievable, and, in any case, for at least 200 years."

Natural ecological and soil-forming processes are changing disposal cell covers. The DOE Office of Legacy Management (LM) is studying these natural processes and their effects on the performance of engineered covers to answer important long-term stewardship questions: Will existing covers continue to be protective of human health and the environment? Can we better understand and then manage favorable natural processes in ways that will enhance cover sustainability? If so, can we then reduce costs by discontinuing unnecessary maintenance activities? Can we use our understanding of natural processes to design more sustainable covers? In other words, can we do a better job of working with, rather than against, Mother Nature?

Scientists from LM's Applied Studies and Technology (AS&T) program are conducting a suite of interrelated studies to answer these questions. In 2016, LM and the NRC began a joint study designed to measure and model the effects of ecological and soil-forming processes on radon diffusion and flux, and on soil hydraulic properties and rainwater percolation in existing engineered covers. AS&T and NRC scientists are collaborating on the study with researchers from the University of Virginia, University of Wisconsin-Madison, University of California-Berkeley, and Desert Research Institute in Nevada.

The research team selected four of LM's 27 UMTRCA disposal sites for this study: Falls City, Texas; Bluewater, New Mexico; Shirley Basin South, Wyoming; and Lakeview, Oregon (Figure 1). Selection of these sites was intentionally biased. The researchers chose these four sites because they encompass the range of cover designs, climates, and ecological conditions found at LM's UMTRCA disposal cells (Figure 2).

Figure 1: Four uranium mill tailings disposal sites selected for the AS&T disposal cell cover performance study.

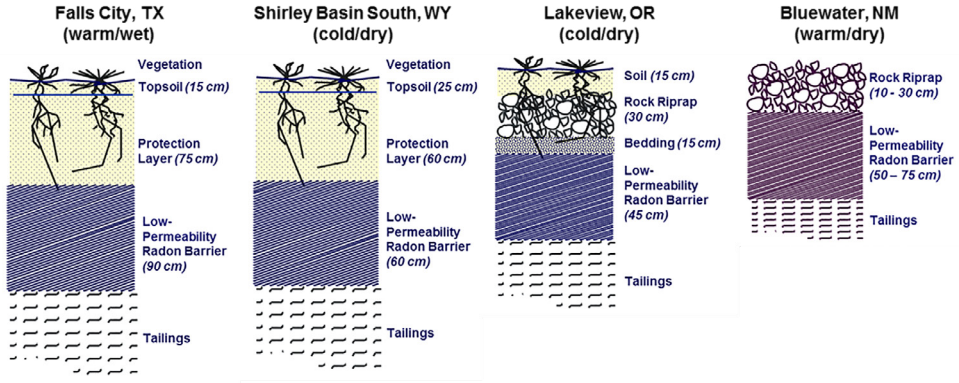


Figure 2: Cross sections of engineered top slope covers and climate types at four sites selected for the AS&T disposal cell cover performance study.

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Got it Covered? Are Natural Processes Changing Engineered Disposal Cells?

The researchers also chose to study the worst case conditions at each site—not the average condition. They selected test locations on disposal cell covers where ecological succession was well underway, and where the greatest change in soil engineering properties was expected. The team completed fieldwork at Falls City and Bluewater during the summer of 2016, and at Shirley Basin South and Lakeview during the fall of 2017.

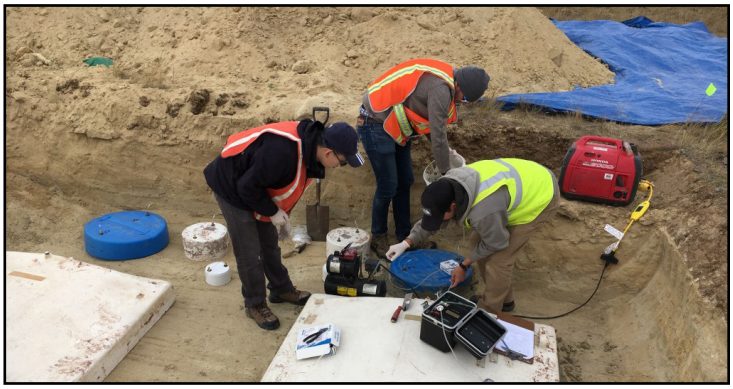
Fieldwork at these sites included characterization of ecology and soil profile morphology, measurements of radon flux (the amount of radon gas released from soil to the atmosphere per unit time), and sampling to characterize soil engineering and hydraulic properties, all within test pits excavated on the tops and side slopes of the disposal cell covers. The researchers recorded ecological parameters and acquired samples to evaluate soil morphology. Laboratory analyses are currently underway at the University of California, Berkeley. The team also characterized the ecology and soil morphology of analog sites—nearby natural areas that can provide clues about potential paths of change in engineered covers over hundreds and thousands of years.

Radon flux measurements were collected at both the upper and lower surfaces of the radon barriers in each test pit. The researchers compared radon fluxes in areas with deep-rooted plants to adjacent areas without deep-rooted plants. They also compared (1) results from different sizes of flux chambers to test the scaling effects associated with soil structure, (2) conventional activated charcoal methods with new electronic monitoring devices for measuring radon flux, and (3) replicate measurements to evaluate repeatability. The researchers then removed large-diameter "block" samples and extracted smaller core samples of radon barrier material.

After they finished sampling, the team restored all test pits to their as-built condition. Analysis of these samples includes testing the water-retention properties of radon barrier samples at the University of Wisconsin's Geotechnical Engineering Laboratory. The researchers are currently evaluating the hydraulic conductivity, radon diffusion coefficients, grain size, plasticity, in situ water content profiles, and lead-210 profiles that might be used as a tracer for radon-222 diffusion (radon-222 decays to lead-210).

What's next? The research team will first complete laboratory work on soil morphology and engineering properties of radon barriers. They then plan to convene a working group meeting in the spring of 2018 to review key research findings and to outline final reports and publications. LM will then use the results of this and associated studies to develop changes to long-term stewardship plans that maintain protectiveness and reduce costs. ❖

A University of California, Berkeley soil scientist characterizes a cover analog soil profile near the Falls City, Texas, disposal cell.



University of Virginia and University of Wisconsin-Madison researchers install radon flux chambers on the radon barrier surface at the Shirley Basin, Wyoming, Disposal Site.

A Desert Research Institute scientist and a University of Wisconsin-Madison student excavate a radon barrier block sample on the Lakeview, Oregon, disposal cell cover.

GOAL 4

Prescribed Burning at the Weldon Spring Site

A specialty subcontractor was hired to safely perform the December 2017 prescribed burn.

Prairies can't exist without periodic fires. Routine prescribed burns are essential to the preservation of prairies and the wildlife supported by them. Howell Prairie at the Weldon Spring, Missouri, Site is an excellent example of how a comprehensive vegetation management program enhances long-term surveillance and maintenance at the site, in addition to increasing habitat associated with a rare ecosystem. To prevent ecological succession and preserve prairies year after year, a special set of conditions are required for ecosystems. Historically, prairie fires would advance across the Midwest landscape for miles, but today these types of natural fires are typically suppressed through various forms of human intervention. Prescribed burning replicates these natural processes, and reduces undesirable species, returns nutrients back into the soil, increases density and diversity during regrowth, and reduces fuel loads that could potentially lead to major wildfires.

A prescribed burn was conducted at the Weldon Spring Site December 18 and 19, 2017, on approximately 65 acres of the 150-acre Howell Prairie. Named after one of the area's first settlers, the Howell Prairie was established in 2002 at the end of site remedial actions. Subsequent seeding events took place in 2003 and 2004. More than 80 native species of grasses and wildflowers were planted in the prairie to recreate a pre-settlement ecology. In Missouri, less than 1 percent of historic prairie acreage currently exists, so Howell Prairie represents a unique habitat that is no longer common to the region. This diverse ecosystem not only supports many pollinator species and birds, but also provides a highly effective buffer around the site's 41-acre disposal cell that stabilizes soils and protects against erosion while complementing the surrounding 15,000 acres of state-owned conservation lands.

Prescribed burns have taken place at the Weldon Spring Site in 2006, 2009, 2010, and 2017. The time gaps between burns have occurred for a number of reasons, including the need for specific weather conditions to safely perform a controlled burn, the need for adequate fuel load within the fire management units to sustain the burn, and other project-related issues taking place during the burn season.

Planning for prescribed burns at the Weldon Spring Site is a thorough process that accounts for worker safety, as well as the safety of the environment and the general public. For the December 2017 prescribed burn, a specialty subcontractor, highly trained and experienced in the methods of prescribed fire management, was hired to perform the work. Project planning documents, including a detailed burn plan, were prepared and reviewed with the subcontractor in order to address all aspects of the work and manage and/or mitigate hazards with the appropriate safety measures.

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Join us in Grand Junction!

https://www.lm.doe.gov/2018lts-conference

GOAL 6

Environmental Justice Activities

Community Leaders Institute Technical Assistance Workshop

The U.S. Department of Energy and the Medical University of South Carolina (MUSC) sponsored a one-day collaborative Technical Assistance Workshop (TAW) in Farmington, New Mexico. The workshop featured several dynamic speakers, including Dr. David E. Rivers, MUSC; Terry Dayish, Four Corners Power Plant; Deborah N. Blacknall, South Carolina State University (SCSU); and Gwendolyn F. Mitchell Ulmer, SCSU.

Gwendolyn Ulmer and Deborah Blacknall, grant administrators, and workshop participants.

The workshop was organized as a result of the Four Corners Future Forum held late last year in Farmington. During this workshop participants were able to gain the skills needed to prepare and manage successful grant applications.

The workshop included three working sessions:

- Session 1 – *Ready, Set: Give Me Your Money, What's In A Name? And Do We Really Want To Do This? Terms And Techniques Of Grant Writing*
- Session 2 – *Go: How Do We Do It? And How Much Do We Need? Developing A Proposal And Budget*
- Session 3 – *Where Is The Money? Finding Available Grant Funding Agencies*

The Community Leaders Institute TAWs bring to the forefront the unique relationship between environmental protection, human health, environmental justice, and economic development as essential components of community development. ❖

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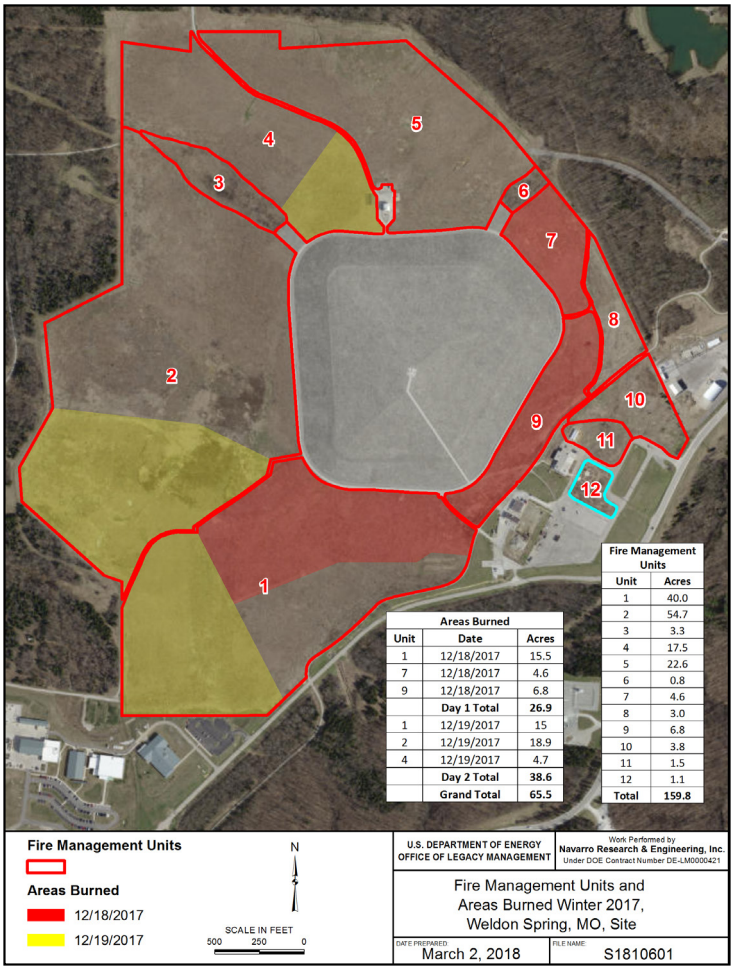
Prescribed Burning at the Weldon Spring Site

The prescribed burn was particularly effective due to an adequate amount of dry fuel, ideal wind velocity and direction, desired relative humidity, and expected smoke dispersal conditions. The 65.5 acres that were burned over two days included an area that had not been previously burned. At the end of each day, a fire watch was performed for two hours to ensure all fire was completely extinguished. All work was performed safely and without incident.

LM is planning to potentially perform additional prescribed burns in the spring of 2018, targeting fire management units that weren't addressed in the December 2017 burn. Improved plant growth, increased density, and greater diversity of desirable plant species are just some of the benefits expected at Howell Prairie as a result of the recent burn. ❖

Burning fire management unit no. 9 at the Weldon Spring Site.



Fire management units burned December 18 and 19, 2017, at the Weldon Spring Site.

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Environmental Justice Activities

Department of Energy Tribal and Environmental Justice Policies Training

Milton Bluehouse Jr., an expert trainer, facilitator, mediator, and advisor, delivered a dynamic half-day training session to the U.S. Department of Energy's (DOE) National Nuclear Security Administration Nevada Field Office on March 29. The training, *Working Effectively with Tribal Governments and Communities*, covered American Indian Tribal Government Interactions; DOE Policy Order 144.1; and Environmental Justice Executive Order 12898. Training participants indicated that they gained a good working knowledge of DOE tribal and environmental justice policies. ❖

Above: San Juan College sign.

Left: Participants attending the grant writing workshop at San Juan College in Farmington, New Mexico.

GOAL 6

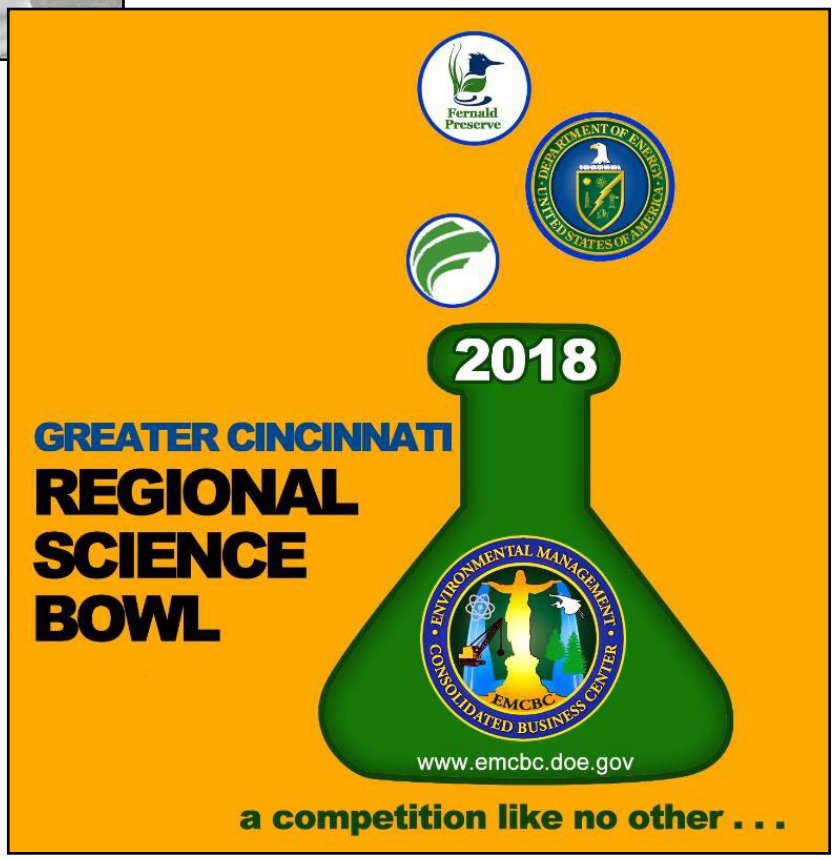
Fernald Employees Support National Science Bowl

Students watch their classmates compete in the final round to determine the 2018 Greater Cincinnati Regional Science Bowl champion.

The U.S. Department of Energy (DOE) National Science Bowl is a nationwide academic competition that tests students' knowledge in all areas of science and mathematics. Middle and high school student teams from diverse backgrounds are composed of four students, one alternate, and a teacher who serves as advisor and coach. These teams face off in a fast-paced question-and-answer format in which they are tested on a range of science disciplines including biology, chemistry, Earth sciences, physics, energy, and math.

As of January 2018, more than 9,000 high school students and 4,500 middle school students have competed in 65 high school and 50 middle school regional science bowl tournaments. Twenty-two teams of students from Ohio and Kentucky competed in the 2018 Greater Cincinnati Regional Science Bowl held February 17. The event was sponsored by DOE's Environmental Management Consolidated Business Center and hosted by Cincinnati State Technical and Community College. Ten employees and family members from LM's Fernald Preserve in Ohio enjoyed supporting the event this year in the roles of moderator, co-moderator, scorekeeper, timekeeper, and grand central station support. One Fernald employee's high school son participated as a timekeeper and observed that the event "was well organized and the students really seemed to have a great time."

DOE's Office of Science is the single largest supporter of basic research in the physical sciences in the United States, and is working to address some of the most pressing challenges of our time. ❖



The new logo for the 2018 Greater Cincinnati Regional Science Bowl.

LM is continually seeking opportunities to protect the environment and conserve natural resources. One simple step we can take toward improving environmental consciousness is to distribute the *Program Update* newsletter by email instead of sending a printed copy.

Please send your email address and your first and last names to lm@hq.doe.gov so that we can update our database.

Thank you for your assistance.

GOAL 6

LM Staff Attend Public Viewing of Coors Movie

On March 2, 2018, representatives of the U.S. Department of Energy Office of Legacy Management (LM) attended the first public screening of *Bill Coors: The Will to Live*. The documentary follows Coors' life over the past 101 years, providing inspiration to people of all ages who are struggling with stress and depression.

The film covers many fascinating aspects of Mr. Coors' life, including his historic role in providing critical insulators to the U.S. Army Corps of Engineers Manhattan Engineer District (also known as the Manhattan Project) during World War II. The film also includes footage of Mr. Coors receiving the Energy Secretary's Appreciation Award in 2016 in recognition of his work for the Manhattan Project.

While Mr. Coors may be best known for the beer brewed by his family in the Rocky Mountains, few know about his contribution to World War II and the Cold War. In January 1943, General Leslie Groves, head of the Manhattan Project, met with Y-12 Plant operators in Oak Ridge, Tennessee, and insisted that the first calutrons, or mass spectrometers, needed to be built and operational within seven months. The enormous calutrons were needed for electromagnetically separating fissionable isotopes of uranium-235 from naturally occurring uranium, for use in atomic weapons. With such a tight schedule to build an untested technology, the Y-12 project experienced setbacks with insulators constantly breaking down due to the extremely high-voltage used by the calutrons.

Searching for a solution, Richard Condit from the Berkeley Lawrence Radiation Laboratory telephoned Mr. Coors of the Coors Porcelain Company in Golden, Colorado. The company had the experience, expertise, and capacity to make the desperately needed, large quantities of high-quality ceramic insulators capable of handling the tremendous electrical loads produced by the calutrons. Mr. Coors accepted the request and immediately got to work.

Although Mr. Coors was not aware of the purpose of his insulators, they arguably saved the Y-12 project from failure. By February 1944, Y-12 began sending uranium-235 to Los Alamos, New Mexico, to create the nation's first atomic weapons. ❖

Tracy Atkins, DOE Principal Representative for the Manhattan Project National Historical Park, and LM Historian Padraic Benson joined Bill Coors for a viewing of the documentary Bill Coors: The Will to Live.

GOAL 2

LM Conducts Records Emergency Tabletop Exercise in Grand Junction

LMS Records Management Specialist Shawn Hawkins stands along the banks of the Gunnison River that borders the LM office in Grand Junction, Colorado.

The U.S. Department of Energy Office of Legacy Management (LM) federal records staff and the LM Support (LMS) contractor conducted an annual emergency preparedness exercise to build a collective understanding of how to respond in the event of a disaster that would affect LM records in storage facilities or records stored locally in offices. Historically, the exercise has been held at the LM Business Center (LMBC) in Morgantown, West Virginia. This year's exercise, held at the LM office in Grand Junction, Colorado, centered on protecting records in the event of localized flooding based on a real-life event—a flood that occurred at the LM Grand Junction office in the 1990s.

The Gunnison River, which borders the Grand Junction site on the west and north, rises in the spring when warm temperatures melt snow that has accumulated in the surrounding mountains. Conditions in the region normally allow for weeks of notice for potential flooding, giving records personnel ample opportunity to either relocate records or mitigate potential damage to the records storage area.

When the Gunnison River rose to a high level in 2011, Grand Junction records personnel created a statement of work to address proper precautions in the event of a flood. That statement of work served as a starting point for how records personnel would handle potential flood situations during the exercise.

In the event of flooding, under the plan, records would be evacuated from building 12 and, depending on the expected flood severity, elsewhere throughout the site. Evacuating records involves palletizing and wrapping records boxes and file cabinets and relocating them on trucks to a safe area.

A follow-on task from the exercise focused on identifying security measures that would need to be taken for any relocated records in order to ensure protection of personally identifiable information or other sensitive information. Staff also identified the need to ensure that the Emergency Management Team is apprised of records locations and any requirements for handling them in the event of an emergency. Additional follow-on tasks involved prioritizing records so site personnel could easily and readily identify essential records that should be relocated first, updating appropriate LM procedures and forms, and addressing other lessons learned from the discussions. ❖

GOAL 6

LM Staff Conducts Briefings on L-Bar Disposal Site

LM's Bill Frazier visits with community members about the L-Bar site.

During the week of February 26, 2018, staff from the U.S. Department of Energy Office of Legacy Management (LM) Grand Junction, Colorado, office provided brief presentations to neighboring communities of the L-Bar, New Mexico, Disposal Site, a Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978 Title II uranium ore processing site in Cibola County.

LM staff presented information on L-Bar to the Pueblo of Laguna community, a local Native American tribe, and to the Cebolleta Land Grant Board of Trustees, the current owners of the land surrounding the L-Bar disposal site. A brief tour of

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GOAL 6

LM Participates in STEM-sation Day

An important part of the U.S. Department of Energy (DOE) Office of Legacy Management's (LM) mission is to partner with tribal communities within the Navajo Nation. LM participated in "STEM-sation Day" at Shiprock High School in New Mexico on March 14, 2018, to promote science, technology, engineering, and mathematics (STEM) studies and careers.

More than 580 9th through 12th grade science students participated in the event, along with 15 different tribal and federal agencies who engaged them using hands-on activities that promote STEM learning. The event was organized by the Navajo Abandoned Mine Lands Reclamation/Uranium Mill Tailings Remedial Action (AML/UMTRA) Program and the Navajo Transitional Energy Company.

"This was a great opportunity for our students and organizations to meet some young people and get them interested in STEM careers, majors, and STEM projects. It was a win-win for everybody," stated John Tohtsoni, Jr., Shiprock High School principal. He added that this is the first partnership the high school has had with Navajo AML/UMTRA, and the event location was selected because of the nearby former uranium mill tailings sites.

LM Support staff engages STEM students by discussing the office's area activities.

As part of the event, students learned about the nearby Shiprock disposal site. They were given an overview of the site's disposal cell, which encapsulates low-level radioactive material generated from uranium milling operations between 1954 and 1968. When operating, the mill used leaching processes to separate uranium from crushed ore. The radioactive "tailings" left behind were placed in the disposal cell. Students also learned about an evaporation pond and LM activities to clean contaminated groundwater using extraction wells.

The site was remediated under the Uranium Mill Tailings Radiation Control Act of 1978 Title I program. LM performs long-term surveillance and maintenance at the site, working closely with the Navajo AML/UMTRA Department under a cooperative agreement. LM's mission is to fulfill DOE's post-closure responsibilities and ensure the future protection of human health and the environment. For more information about LM, visit https://www.energy.gov/lm/office-legacy-management. ❖

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LM Staff Conducts Briefings on L-Bar Disposal Site

the site was also conducted. LM also met the new Cebolleta Land Grant Board of Trustees newly elected officials. In addition to introductions and the briefing, LM was successful in strengthening relationships and reinforcing communication with the local community. ❖

The L-Bar, New Mexico, Disposal Site.

GOAL 6

LM Representatives Join Hopi and Navajo Nation Officials at Quarterly Meeting

Representatives from the U.S. Department of Energy Office of Legacy Management (LM) joined officials from the Navajo Nation Abandoned Mine Lands Reclamation/Uranium Mill Tailings Remedial Action (AML/UMTRA) Department and the Hopi Office of Mining and Mineral Resources UMTRA Program for a quarterly meeting on March 7, 2018, in Kykotsmovi, Arizona. The meeting focused on the four LM sites on the Navajo Nation and offered opportunities for coordination and collaboration.

Quarterly meetings provide platforms for information sharing and updates between LM, Navajo, and Hopi counterparts. Some of this quarter's presenters gave general overviews about each of the four LM sites on the Navajo Nation, as well as the Five-Year Plan. Other presentations, from the Navajo and Hopi tribes, addressed the importance of cultural awareness and relations between federal agencies and tribes.

Navajo Nation AML/UMTRA Department Director Madeline Roanhorse updated the group about the recent Diné Uranium Remediation Advisory Commission (DURAC) meetings held at various locations within the Navajo Nation. Roanhorse, a member of DURAC, noted that the focus of quarterly meetings has largely been on abandoned uranium mines and related potential groundwater contamination. However, a discussion was also held about the Tuba City, Arizona, Disposal Site.

The group was greeted by Hopi Vice Chairman, Clark W. Tenakhongva, who offered the opening prayer and welcomed the group to Hopi tribal lands. He expressed the local concern within the Moenkopi Village regarding the Tuba City disposal site and groundwater contamination, and asked that LM maintain monitoring and surveillance at the Tuba City site.

Norman Honie, director of the Office of Mining and Mineral Resources and Hopi UMTRA Project Manager, stated, "It was a privilege to have LM representatives visit Hopi lands, experience Hopi hospitality, and meet Vice Chairman Tenakhongva." He expressed that he was glad that LM was able to "hear firsthand the Hopi Tribe's concerns and appreciation for the remedial efforts at the Tuba City site."

LM continues to work effectively with Navajo AML/UMTRA and the Hopi Tribe as part of its commitment to tribal stakeholder communications and outreach. ❖

LM representatives tour the Mexican Hat, Utah, Disposal Site.

LM representatives tour the Tuba City, Arizona, Disposal Site.

Quarterly meeting attendees.

GOAL 6

LM NEWS Feed

Visit https://energy.gov/lm/listings/lm-news to access these articles in the LM NEWS Feed.

MARCH 28, 2018

Manhattan Project Park Established Through Hard Work

Women work together to see establishment of the Manhattan Project National Historical Park.

MARCH 9, 2018

LM Director Plans Visits to Former Uranium Mill Sites in Texas

LM Director will travel to south Texas during the week of March 13, 2018, to visit four former uranium mill sites.

MARCH 1, 2018

New Agreement Expands Support for DOE Long-Term Stewardship

Memorandum of Understanding formalizes relationship between DOE long-term stewardship organization and Savannah River National Laboratory

FEBRUARY 14, 2018

LM Releases 2019 Budget Request

The U.S. Department of Energy Office of Legacy Management (LM) released its 2019 budget request of $159 million—a $4.5 million increase from FY 2017.

JANUARY 25, 2018

NSSAB Members Receive Briefing on Area Sites

LM briefs Nevada Site Specific Advisory Board (NSSAB) members on agency history and former nuclear testing sites.

JANUARY 25, 2018

Repairs Improve Calibration Facilities

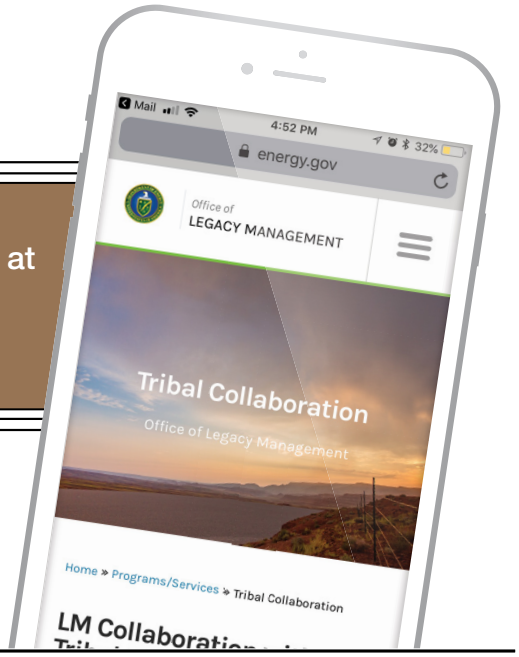
Work to repair instrument calibration facilities in Grand Junction, Colorado, is completed.

JANUARY 10, 2018

Fernald Preserve Upgrades Waste Water Treatment System

Work continues toward improving the Converted Advanced Waste Water Treatment Facility at the Fernald Preserve, Ohio, Site.

Check out our new tribal collaboration webpage at https://www.energy.gov/lm/programs-and-services/tribal-collaboration



Anticipated LM Sites Through Fiscal Year (FY) 2025

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