

January-March 2019

PROGRAM UPDATE

Safe Passage: Wildlife-Friendly Fencing Gains Momentum at LM Sites

Women of LM Celebrated During Women's History Month

Colorado STEM Events Feature Plants, Soil, and Yo-Yos





While considering ideas about what I wanted this section's *Program Update* message to be, I realized that a keystone of the U.S. Department of Energy Office of Legacy Management (LM) mission is **trust**. It's said that trust is easy to lose and difficult to gain back. LM has a large number of public and intergovernmental stakeholders who rely on us to be trustworthy, long-term stewards of 94 legacy sites (with four more sites transitioning later this year) across the nation. As the number of legacy sites grows, so will our number of beneficiaries. With this in mind, it is important that LM be vigilant in earning and maintaining our public's trust. It is our duty to execute our long-term stewardship mission along the lines of Scott Weiss' often-repeated thought on trust: "Trust leads to approachability and open communications."

Part of our service to the public is ensuring we fulfill our mission to protect people and the environment by honoring our promise to monitor and maintain LM sites, manage historical records and make them accessible, reuse land assets, engage our stakeholders, and address issues involving defense-related mine sites. An essential part of fulfilling our public role and upholding our promise is to carry out our stewardship activities while being approachable and communicating our accomplishments and challenges in a clear and concise manner.

We currently have two previously established interpretive centers that relay LM information to the public, one at the Fernald Preserve in Ohio, and another in Weldon Spring, Missouri. A third center opened last year in Mound, Ohio, as the Mound Cold War Discovery Center. A fourth center will be opening at the Grand Junction, Colorado, office site this summer. All four sites have exhibits that interpret the story of our country's role in supplying fuel and parts for the creation of nuclear weapons during World War II and the Cold War. The Fernald and Weldon Spring interpretive centers also regularly host meetings and activities to keep the public engaged and informed about LM activities at those sites.

Toward the mission of being open with the public, each year we release several documents — such as data validation reports, quarterly newsletters, and community involvement plans — that relate current LM activities. In February, we released our *2018 Annual Historical Summary*. This public document records significant accomplishments achieved by LM during calendar year 2018. The summary highlights a selection of the many

activities performed during the calendar year and offers stakeholders information about recent work conducted by LM. It also provides budget information reflecting fiscal year 2018.

We are in the process of completing our second *Defense-Related Uranium Mines Report*, which shares information gathered from verification and validation activities on abandoned uranium mines across the nation that provided ore for U.S. defenserelated activities, as well as costs associated with the program. The report also updates readers on the latest public outreach activities designed to inform involved federal and state agencies and stakeholders about the latest program activities. During the first quarter of 2019, a number of outreach events were held at educational facilities and community centers. A large focus was on sites near tribal lands where LM stewardship activities are more prominent.

LM will continue to keep our commitment to maintain our public's trust through open and transparent communication. We will remain consistent in our actions to fulfill our goal of protecting human health and the environment through long-term stewardship of legacy sites, while treating all people fairly and in a respectful manner. Trust takes years to build, seconds to break, and a lifetime to repair. As public servants, we should never take the public trust for granted and should work even harder to earn the respect and trust of those who may doubt or misunderstand our actions, motives, or how we honor our promise.



Welcome to the January-March 2019 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-ProgramUpdate@lm.doe.gov.

LM Goals



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Cover: Pronghorn antelope at the Riverton, Wyoming, Processing Site.



Safe Passage: Wildlife-Friendly Fencing Gains Momentum at LM Sites

At the Gunnison, Colorado, Disposal Site, a set of pronghorn tracks leads beneath a fence surrounding the site and continues on the other side.

The tracks are a testament to early efforts by the U.S. Department of Energy (DOE) Office of Legacy Management (LM) to implement wildlife-friendly fencing at its far-flung sites. In 1999, LM removed the bottom strand of wire from the Gunnison fence, converting a four-strand fence into a three-strand fence that allows easier passage for wildlife without compromising the fence's function of delineating the site boundary.

The result has been no new reports of dead or tangled pronghorn at the site.

Furthermore, wildlife-friendly fencing also saves LM money, as fewer wildlife encounters means less fence repair.

"Wildlife-friendly fencing is a demonstration of LM's commitment to protectiveness of human health and the environment by reducing adverse impacts to the environment while also lessening site maintenance costs," said Jalena Dayvault, LM site manager for the Gunnison site.

Efforts, such as those at the Gunnison site, have steadily gained momentum in LM over the years. The Slick Rock, Colorado, Disposal Site features





Above: Wildlife path at the Gunnison site. Left: Cows graze at the Slickrock site.

a smooth bottom wire on its four-strand barbed fence. The office erected a similar fence at the Maybell West, Colorado, Disposal Site several years ago, and has since noted a dramatic reduction in animal fatalities. And in 2014, when LM installed a fence between DOE property and a private land owner at the Monticello, Utah, Site, the entire fence was designed to be friendly to wildlife.



STEM Careers Encouraged by the DOE-Sponsored National Science Bowl

The U.S. Department of Energy (DOE) National Science Bowl[®] is a nationwide academic competition created in 1991 to encourage student interest in science, technology, engineering, and mathematics (STEM) topics and careers. Middle and high school student teams are composed of four students, one alternate, and a teacher who serves as an advisor and coach. These teams from diverse backgrounds face off in a fast-paced, question-and-answer format, with questions on a range of science disciplines, including biology, chemistry, earth science, physics, energy, and math. To date, over 275,000 students have participated in National Science Bowl[®] competitions. Each year a new theme is featured — for 2019 the theme is "Women in Science."

The 2019 Greater Cincinnati Regional Science Bowl competition was held March 2, and was sponsored by DOE's Environmental Management Consolidated Business Center and the Cincinnati State Technical and Community College. Employees from the Fernald Preserve, Ohio, Site were among many community members who supported the event, serving in several roles. This year the regional science bowl included space for exhibitors, including DOE, local universities with environmental curricula, and local organizations that perform environmental work and education. The Fernald Preserve provided an exhibit where staff members engaged with students about STEM careers available in DOE's Office of Legacy Management and described the public amenities and educational programs at the Fernald Preserve. \diamondsuit



Fernald Preserve exhibit at the National Science Bowl®.

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Safe Passage: Wildlife-Friendly Fencing Gains Momentum at LM Sites

"I think fence design is an important topic, not just for LM but for everyone who cares about wildlife," said Marilyn Kastens, ecologist for the LM Support contractor. "Wildlife-unfriendly fencing is one of the primary causes of early death in pronghorn, mule deer, and elk, particularly for fawns and calves. It's one of the easiest things that can be changed to positively affect the death rate."

Colorado Parks and Wildlife (CPW), along with other western game departments, recommends that bottom wires on livestock fences be barbless and at least 16-18 inches off the ground, specifically to allow pronghorn and young game animals safe passage beneath fences.

According to CPW, deer, elk, and pronghorn are all capable of jumping fences (although pronghorn typically scoot underneath on their bellies). Barbed wire can snag the animals and tangle legs, especially if the wires are loose or spaced too closely together. If animals can't pull free, they usually perish. Even when animals do clear fences or crawl under the strands, they often bear scars from barbed wire.

Researchers at Utah State University recently completed a study of wildlife mortality along more than 600 miles of fences in the rangelands of northeastern Utah and northwestern Colorado. On average, one ungulate (hoofed mammals, including deer, elk, and pronghorn) per year was found tangled for every 2.5 miles of fence, and juveniles were eight times more likely to die in fences than adults. Fences that adults can jump over can be a complete barrier to fawns and calves, who become separated from their mothers and die of starvation.

"Incorporating thoughtful practices such as wildlife-friendly fencing helps LM contribute to regional conservations efforts as well as manage resources wisely," said Joyce Chavez, LM reuse asset manager. \diamondsuit



LM Shares Ideas and Lessons Learned at the 45th Annual Waste Management Conference



LM personnel at the 45th Annual Waste Management Conference in Phoenix, Arizona.

During the week of March 3-7, staff from the U.S. Department of Energy (DOE) Office of Legacy Management (LM) gathered in Phoenix, Arizona, to participate in the 45th Annual Waste Management Conference, the premier international conference for providing education and information exchange on global radioactive waste management. This year's conference theme was "Encouraging Young Men and Women to Achieve Their Goals in Radwaste Management."

LM staff was well represented in breakout and poster sessions, with 13 LM employees giving presentations or displaying posters. LM staff gave presentations on a range of topics, including: long-term stewardship at former uranium mill tailing sites, best practices in project communications, site closure strategies, pathways to beneficial reuse, natural resource restoration planning, stakeholder relationships, and groundwater compliance strategies.

LM Program Analyst Tony Carter stated, "It's been great to meet with the visitors to the LM booth. Everyone has been very interested in learning about our long-term stewardship activities at our nearly 100 sites across the nation."

The Waste Management conference promotes global innovation and collaboration, which was reflected by the attendance of more than 2,000 engineers, scientists, managers, and students from over 35 countries. A comprehensive and technical program delivered over 130 sessions and panels, 450 papers, poster sessions, networking events, and an extensive exhibition. This year's featured DOE site—the Idaho National Laboratory was developed in 1949 as the National Reactor Testing Station and is the site of the Idaho Cleanup Project, which employs state-of-the-art waste characterization, treatment, repackaging, and shipping methods, many of which are unique in the world. There were also reserved sessions on research, development, and operational experience over the complete spectrum of nuclear waste activities, as well as special reserved sessions on the used fuel, decontamination and decommissioning, procurement and contracting, safety, and clean-up of legacy sites worldwide.

The conference showcased Canada as their featured country and included exhibits on how Canadian waste management is being planned and carried out in consultation with the public, with respect for the needs and interests of Canada's indigenous peoples, and with an eye on the changing federal process for environmental assessment.

For those in attendance unfamiliar with LM, it was a chance to provide education on the Department's responsibility for long-term historical documentation, stewardship of legacy sites, and protection of human health and the environment.

Overall, the conference provided LM attendees a great opportunity to share and exchange ideas, technical information, and solutions with the world's leading experts in the nuclear waste industry. "This week has been a great opportunity for us to engage with folks from around the world who share our commitment to protecting human health and the environment," said LM Director Carmelo Melendez. \Leftrightarrow



Tuba City Site Hosts Tour for University of Arizona Graduate Students

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) hosted five graduate students from the Indigenous Food, Energy, and Water Security and Sovereignty (Indige-FEWSS) program at the University of Arizona, as well as two journalism students and a university employee on a tour of the Tuba City, Arizona, Disposal Site on March 8. Chris Yazzie, a University of Arizona environmental engineering Ph.D. student from Tuba City, requested the tour. Yazzie's family still lives in the area.

Peter Lemke, the LM Support site lead for Tuba City, led the tour along with Jeff Towers, the Tuba City facility lead. Lemke said the students were particularly interested in the extent of contamination at the site and the groundwater treatment system. Lemke said the site hosts a large number of middle school tours, but as far as he can remember, this was the first tour by a group of university students.

"The University of Arizona students' visit to the Tuba City site allowed us to reach a new audience in academia," said Lemke. "It's a connection that we will nurture, and could lead to future collaboration in environmental studies, which will be beneficial to the LM site for groundwater remediation and monitoring and to the students in their academic and professional careers. The visit also provided the students with information about the site that they can further share within their community."

Yazzie said he hopes the tour may spark a collaborative relationship between Indige-FEWSS and the Tuba City site.



"The work going on at the DOE site in Tuba City fits perfectly with the goals and mission of Indige-FEWSS, as well as the interests of the students in engineering processes and resource management on Navajo land," Yazzie said. "Hopefully, we can do a tour with another group of students in the future and explore more opportunities for partnership." *



Top Row Above: Peter Lemke, right, the LM Support site lead, and Jeff Towers, the facility lead, give a presentation to University of Arizona graduate students during a tour of the Tuba City site. Bottom Row Above: Students from the multi-disciplinary Indige-FEWSS program learn about groundwater contamination and treatment at the Tuba City site.

LM Takes on Stewardship at Two New FUSRAP Sites

On January 25, the U.S. Department of Energy (DOE) Office of Legacy Management (LM) added two more former nuclear weapons complex sites to its inventory for long-term stewardship. LM is now responsible for meeting DOE's post-closure responsibilities and ensuring the protection of human health and the environment at nearly 100 sites across the nation.

The Attleboro, Massachusetts, and Windsor, Connecticut, sites were cleaned up by the U.S. Army Corps of Engineers (USACE) and transitioned to LM for long-term stewardship under the Formerly Utilized Sites Remedial Action Program (FUSRAP). LM's stewardship responsibilities at these new sites are limited to managing site records and responding to stakeholder inquiries.

FUSRAP addresses radiological contamination primarily at privately owned sites that were contracted by the Manhattan Project and the U.S. Atomic Energy Commission (AEC). The sites were cleaned up to contemporary environmental standards when they were no longer needed for government radiological work. However, increasingly stringent environmental regulations enacted over time required additional remediation at some sites to ensure protectiveness. The successful completion of these cleanup projects transforms potential community hazards into safe and beneficial community assets. LM takes over long-term stewardship of FUSRAP sites after USACE completes site cleanup.

FUSRAP sites account for 33 of LM's sites. Within the next 10 years LM expects to take over responsibility for the long-term stewardship of an additional eight FUSRAP sites as USACE completes its cleanup efforts.

The 9.4-acre Attleboro, Massachusetts, Site, located about 40 miles southwest of Boston, was known as the Shpack Landfill. Approximately 6 acres of the site is in the town of Norton, while the remaining 3.4 acres are in Attleboro.

The landfill was operated from 1946 until the 1970s. From 1957 to 1965, Metals and Controls Incorporated disposed of trash and other materials in the landfill.



Windsor, Connecticut, Site in 2012.

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LM Takes on Stewardship at Two New FUSRAP Sites



Powerlines where inaccessible soil remains at the Attleboro, Massachusetts, Site.

Metals and Controls Incorporated fabricated enriched uranium foils at its Attleboro plant in 1952 and, after merging with Texas Instruments, used enriched and natural uranium to fabricate nuclear fuel for the U.S. Navy and commercial customers. The site was listed on the National Priorities List (NPL) in 1986, primarily to address non-FUSRAP contaminants. The Shpack Landfill site was congressionally added to FUSRAP in 1980. FUSRAP remedial action started in 2005, and cleanup was completed in 2011. The cleanup included restoring wetlands and emplacing wildlife enhancement features. The site was removed from the NPL in September 2017. The city of Attleboro manages the site and the city provides a continuing presence for long-term monitoring and maintaining institutional controls.

The Windsor, Connecticut, Site, formerly the Combustion Engineering (CE) Site, was designated for remediation under FUSRAP in June 1994. The site is located about 10 miles north of Hartford and covers approximately 612 acres. In the 1940s and 1950s, the CE facility supplied non-nuclear components for reactor projects that were managed by the AEC. While under contract with the AEC from 1955 to 1962, the site was used to research, develop, and manufacture nuclear fuel; to develop, design, and fabricate fuel-element subassemblies for submarines; and to construct and operate the S1C test reactor facility for the U.S. Navy. FUSRAP cleanup was completed between 2007 and 2011 by the property owner, ABB, Inc., under USACE, U.S. Nuclear Regulatory Commission (NRC), and state oversight. The NRC license was terminated in September 2013. The cleanup of the Windsor site allows for unlimited use, making it a potential site for future development.

LM cannot succeed in its mission to protect human health and the environment without coordination and collaboration with USACE. Understanding the activities performed by USACE during remediation enables us to perform our stewardship duties more effectively and efficiently. The partnership between LM and USACE has made the transfer of these sites a success. \Leftrightarrow

GOALS 2 & 6

LM Shares Lessons Learned in Environmental Data Management

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) is sharing lessons learned with the Hanford Mission Support Alliance and the DOE Office of Environmental Management (EM) Nevada Program Office regarding implementation of a new environmental data management system.

Environmental data management systems are complex collections of tools that govern environmental data from the time it's requested to the time it becomes available to stakeholders. The effectiveness of these systems often decreases over time as more data is managed and technology advances. LM recently migrated from an older system to EarthSoft's EQuIS environmental data management system.

EQuIS comprises a suite of software applications that support the complete environmental data workflow. Specifically, these tools support task management, field data collection, analytical data checking, data verification and validation, reporting, graphics, and visualization. This functionality is consistently needed by those managing environmental data and is a reason EQuIS is used so prevalently. While the uses of the application suite are similar from site to site and project to project, there are nuances that can confound data managers as they migrate from one environmental data management system to another.

LM's experience with addressing these nuances is valuable to other DOE offices and programs going through similar system migrations. The Hanford, Washington, Site is migrating data from two aging homegrown databases currently used for Hanford's Environmental Surveillance program. These two databases will be retired once they have migrated to EQuIS. To facilitate the Hanford migration, LM has provided computer code, data-table templates, and associated process documentation. These tools and information should help expedite system migration, assist in avoiding pitfalls, and mitigate risks to data integrity and quality. Similar collaboration has recently occurred with EM's Nevada Program Office.

Other DOE sites are experiencing similar issues with aging environmental data management systems and are working to identify solutions. In discussions at the DOE Annual Site Environmental Report workshop in October 2018, some attendees expressed difficulties with their current systems and a desire to transition to newer systems with upgraded features. LM will continue to collaborate and share lessons learned with the wider DOE environmental data community related to environmental data management. \Leftrightarrow



Above: EQuIS EDGE field data entry application on laptop capturing real-time field chemistry from a well. Left: EQUIS Dashboards reporting analytical data over time for several locations within an area.





LM Makes STEM Concepts Fun for Elementary Students

Fifth-grade students from Dos Rios Elementary School in Grand Junction, Colorado, recently learned important energy concepts that scientists use in the U.S. Department of Energy Office of Legacy Management (LM).

Two LM Support (LMS) contractors, Richie Ann Ashcraft and Cecylia Wentz, challenged some 20 students to a hands-on activity to measure and compare the power that small solar panels, wind turbines, and batteries produce. Students measured the output using a multimeter, recorded the power voltage readings on a data sheet, and analyzed the data to determine which energy source provided the most power.

The students then discussed the advantages and disadvantages of different renewable energy sources. They determined that solar would be the preferred alternative energy source for Grand Junction's high desert environment. "The outdoor hands-on activity was excellent," said Kathy Applebee-Page, a Dos Rios Elementary School teacher. "The small groups allowed everyone to actively participate, and the instructors did an excellent job presenting the information in language the children could understand."

She said she will encourage other teachers to explore the science, technology, engineering, and mathematics (STEM) education resources available through the LM office in Grand Junction.

"Sharing energy information concepts related to LM's work is one of the major areas we can help promote STEM concepts to the next generation of leaders in the energy industry," said Padraic Benson, a program analyst for LM.

LM Support contractor Cecylia Wentz explains different types of energy sources with a class at Dos Rio Elementary School in Grand Junction, Colorado.



GOALS 2 & 6



GEMS Mapping Data Integrated into EPA Cleanups in My Community Website



CIMC page view showing the Green River, Utah, Disposal Site point and boundary, and the pop-up with links back to the DOE webpage and fact sheet.

The U.S. Department of Energy (DOE) Office of Legacy Management is collaborating with the U.S. Environmental Protection Agency (EPA) to integrate LM's Geospatial Environmental Mapping System (GEMS) mapping data with EPA's Cleanups in My Community (CIMC) application and website (https://www.epa.gov/cimc).

CIMC provides a way for the public to find out about hazardous waste cleanup sites in their community or any area across the United States. These hazardous waste sites include Superfund National Priority List (NPL) sites, Resource Conservation and Recovery Act (RCRA) facilities, brownfield properties, emergency response sites, and federal facilities. On the website, "community" can be defined in any number of ways:

- Point and radius around an address or latitude/longitude coordinate.
- City, state or territory, county, or ZIP Code area.
- Cleanup (defined by name or number) and vicinity.
- Tribal area.

- Congressional district.
- Watershed hydrological unit code, catalog unit name, or sub-region name.
- The entire United States, or just the contiguous 48 states.

CIMC provides both a mapping and a listing interface. The former is similar to a large "mash-up" that provides additional layers of mapping data to put the sites in perspective. For instance, you could show flood zones or sea level rise to get a sense of which sites might need additional protection against high waters. The listing interface helps ensure CIMC is compliant with section 508 of the Rehabilitation Act and provides a convenient way to download the data. CIMC also provides the data in a web service that can be accessed for interactive web maps, as well as three versions of a geodatabase (one for Superfund NPL sites, one for brownfields, and one with all the CIMC hazardous waste sites) that can be downloaded for use locally. The idea is to provide open access to these government data.

GEMS Mapping Data Integrated into EPA Cleanups in My Community Website

CIMC was developed by the EPA Office of Land and Emergency Management in 2007 and the agency has gradually been adding data and functionality to the mapping interface to help put hazardous waste sites in perspective with other relevant data. This contextual data includes:

- Impaired waters.
- Sea level rise scenarios.
- Flood zones.
- Water monitoring stations.
- Wastewater permitted facilities.
- Air pollution areas.
- Toxic Release Inventory locations.
- Congressional districts.
- Tribal areas and federal lands.
- Alternative energy (wind, solar, geothermal, and biomass) potential at cleanup sites.
- Various base maps.

Many of these layers also enable the user to drill down to additional information about each feature, using links in the map pop-ups.

More recently the CIMC team has been focused on adding boundary information to the mapping interface. Some Superfund and RCRA Corrective Action boundaries have been added on the East coast, and EPA is continuing to try to collect, capture, and share additional boundaries.

The latest addition to boundaries in CIMC is the collection of GEMS boundaries provided to the CIMC team by LM. As a result, users will be able to add the DOE GEMS layer to the CIMC mapping interface and click on site points and boundaries to get additional information on DOE sites. The points link back to DOE's web pages and fact sheets about each LM site.

Combining the DOE locations and boundaries with the contextual data and EPA's own site data in CIMC, enables the general public to access more information, all in one online location.



CIMC view showing a site with no boundary data on an aerial photo background, one of several base maps available in the application.



Tracy Atkins

Tracy accepted a position with the U.S. Department of Energy (DOE) Office of Legacy Management (LM) in November 2016 as program manager for the Manhattan Project National Historical Park. She is also the acting team lead for the Defense-Related Uranium Mines Program team. Tracy spent 20 years in both the private and public sectors, including energy and technology development. In addition to her robust professional résumé, she also holds a master's degree in planning. After completing a fellowship with the National Park Service in Washington, DC, Tracy was recruited by LM to coordinate the Department's park efforts.



What advice would you share with women wanting to enter your field?

Don't sell yourself short and be willing to go for stretch goals.

What is the best advice anyone ever gave you about work?

Integrity is by far the most important attribute of a leader.

Describe a great experience you've had at work.

I have had the opportunity to be part of some great teams as part of my career. The joint National Park Service and DOE team that worked to develop the agreement on how the Manhattan Project National Historical Park would be jointly managed was a high-performing team where everyone brought their expertise and passion to the table. We had a very aggressive schedule of addressing 20-plus sites to consider including in the park. We worked hard, traveled for weeks, engaged the public, and had some fun along the way.

What attracted you to working for LM?

The mission and the people.

What personal values do you hold that help you further LM's mission?

I personally value protecting human health and the environment. This is part of why I joined the federal service — both National Park Service and LM.

What do you hope to see LM do in the future?

I hope to see LM continue our mission with a high degree of success. I think we have opportunities to expand our mission, especially around public outreach and taking a larger role with telling the story of DOE and its history.

LM Women Celebrated During Women's History Month

Joyce Chavez

Joyce accepted a position with LM in September 2016 as a reuse asset manager. She is one of two National Environmental Policy Act (NEPA) compliance officers who ensures the accuracy and adequacy of NEPA documentation for LM. Joyce's active professional career involves research and development for remediation technology, managing numerous environmental programs and projects on military installations and ranges in the United States and across western Europe. Her work includes:

- Environmental planning.
- Encroachment analysis.
- Range sustainment for public works projects and weapon systems.
- Implementation of environmental policy and guidance for 10 environmental programs.
- Ensuring compliance for four water systems and two treatment plants.
- Executing strategic planning for nine cross-functional regional groups.

What advice would you share with women wanting to enter your field?

Find a good mentor and try to learn as many topic areas as possible, while always tying your work tasks back to your employer's overall mission and goals.

What is the best advice anyone ever gave you about work?

Those who set goals get there faster than those who don't. This has helped me to always keep the big picture in mind and not get buried in the details when planning events to reach goals.

Describe a great experience you've had at work.

Germans love their dogs and dogs have more privileges in Europe than in the U.S. When I worked in Germany, I was able to bring my lab mix with me on work trips to many military installations. I used to joke that my dog had been in more countries than some of my family members!



What attracted you to working for LM?

I was closely involved in sustainability and reuse in my past position. I was excited about the idea of expanding the beneficial reuse program and promoting conservation efforts.

What personal values do you hold that help you further LM's mission?

I was not in military service, but I was associated with the military lifestyle for many years. The U.S. Army values of loyalty, duty, respect, selfless service, honor, integrity, and personal courage resonate with me on many levels. One needs to ensure they are upholding the overall mission, yet be accountable and have the courage to speak up and do what's right if a problem arises.

What do you hope to see LM do in the future?

Due to the nature of LM sites and long-term care, I'd love to see multiple reuses at more sites to the extent practical and to expand conservation regional efforts.

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LM Women Celebrated During Women's History Month

Karen Edson



Karen accepted a position with LM in June 2016 as a public participation specialist. Before joining LM, Karen led community engagement for the U.S. Environmental Protection Agency at high-profile Superfund sites in Montana and Wyoming. She also completed a two-year volunteer service for the Peace Corps as an environmental educator in Nicaragua.

What advice would you share with women wanting to enter your field?

Rather than spending time doubting yourself and underestimating what you can do, seek opportunities that may at first appear challenging and learn new skills as you go.

Don't be afraid to ask questions. Asking questions does not make you appear incompetent or uneducated, rather it gives you clarification to better problem-solve and gain deeper insights.

Pay attention to your inner voice. If you are constantly telling yourself, "I'm bad at math," then guess what? You will be bad at math. That's not to say that merely thinking positively

will make you an expert — that can only be achieved through a lot of hard work — but having a positive mindset will give you the boost to put your best self forward.

Trust your gut; listening to your intuition can serve as a good GPS to guide you throughout your career and life. One decision or project can change your whole life. Enjoy the ride. Yes, work hard, but don't forget to have fun!

Last, don't look at obstacles as roadblocks; look at them as challenges to conquer and opportunities to think outside of the box, engage creatively, and be resourceful.

What is the best advice anyone ever gave you about work?

Take ownership for your career — meaning you are in the driver's seat. It's up to you to decide which way to go, what hill to climb, and how to handle the bumps in the road.

Describe a great experience you've had at work.

Working with my Navajo and Hopi colleagues on the long-term stewardship and stakeholder engagement of the four LM sites on the Navajo Nation. Through our collaborative work, I really enjoy the chances for storytelling and learning more about the Navajo and Hopi cultures.

What attracted you to working for LM?

I'm not someone who can sit still or do one assignment for long periods of time. The diversity of the LM portfolio is exciting, and each site presents its own complexities and challenges. That means my day-to-day work requires constant multi-tasking and is anything but boring.

What personal values do you hold that help you further LM's mission?

I believe in the mission of protecting human health and the environment. It is a core value of mine. I gain fulfillment serving others and doing my part to ensure a healthy planet for future generations.

What do you hope to see LM do in the future?

I look forward to helping develop STEM outreach programs for LM and inspiring our young women (and men!) to pursue STEM-related careers. \diamond



Colorado STEM Events Feature Plants, Soil, and Yo-Yos

A Math and Science Night for students and their families at Thunder Mountain Elementary School in Grand Junction, Colorado, drew more than 250 people and included some 15 interactive booths.

U.S. Department of Energy Office of Legacy Management (LM) Support (LMS) contractors presented three booths at the March event with hands-on activities, interaction between students and scientists, plus stickers and yo-yos.

"This was a wonderful opportunity for LM's local ecologists to participate in science, technology, engineering, and mathematics (STEM) activities and introduce students to real-life applications of physical sciences" said Joyce Chavez, LM Reuse Asset Manager and Sustainability Advocate for the Ecosystem Management Team.

Marilyn Kastens, the LMS Environmental Sciences lead and member of the Ecosystem Management Team, told students about "The Dirt on Dirt!" at her booth, which was filled with soil samples, rocks, and tools of the environmental scientist's trade. Kids were encouraged to touch everything and really get their hands dirty. She helped students test rock and soil samples and answered a vast array of questions from students and their parents.

At an adjacent booth overflowing with plant specimens and vegetation samples, David Holbrook, an LMS botanist and rangeland ecologist, let students hold and read a hand scale while explaining the methods used to measure the amount of vegetation in a large area of land, such as a pasture. Students learned that measuring annual production of plants is an important part of determining the amount of livestock that can sustainably graze in a given area.

Richie Ann Ashcraft and intern Ashton Peterhans, members of the LMS Public Affairs team, beta tested a new STEM presentation at the event. "Energize the Yo-Yo, Yo!" explained the different types of energy used to make a yo-yo go. A tri-fold poster showed advanced math that converted yo-yo energy from joules to watts, and explained how many hours it would take for that energy to power common modern devices (example: It would take 25 hours of yo-yoing to power an LED light bulb for one hour).

More than 200 yo-yos were given to the children at the event, many of whom said they had never played with a yo-yo before.

"I'm sure that getting a yo-yo was a big part of what brought people to this event," Principal Diane Carver. "We want to thank your organization for coming and sharing this kind of STEM information in really fun ways." \Leftrightarrow

Top Photo: LMS contractor Marilyn Kastens discusses her job as an environmental scientist with a Thunder Mountain Elementary student. Bottom Photo: David Holbrook, an LMS botanist and rangeland ecologist, talks about seeding rangeland with a student. Background: More than 200 yo-yos were given to students at the Math and Science Night at Thunder Mountain Elementary School in Grand Junction, Colorado.







Grand Junction Office Displays Historical Photo Exhibit at Colorado Mesa University



Prior to the mid-1960s, mill tailings were used as fill material and concrete and mortar by area residents and builders. As part of the vicinity property cleanup, DOE remediated more than 4,000 area properties. Photo courtesy of Museums of Western Colorado Daily Sentinel Collection.

In January, the U.S. Department of Energy (DOE) Office of Legacy Management (LM) installed a temporary photography exhibit at the Colorado Mesa University (CMU) Tomlinson Library in Grand Junction, Colorado. The exhibit recognized the area's role in the Manhattan Project.

The exhibit, "DOE Grand Junction Office Marks 75 Years of Contribution to the Nation's Defense Program," displayed photos of western Colorado and its residents during World War II through the Cold War uranium boom. It also documented the ongoing efforts to cleanup and addressed the legacy of uranium environmental issues in the area, including the recent reuse project that transformed the site of a former uranium processing mill into a public park and amphitheater.

The exhibit was previously on display at the Grand Junction City Hall in August.

"We had a great opportunity to share our story with folks through this exhibit last year at City Hall, and we truly appreciate CMU giving us the opportunity to reach new audiences at the Tomlinson Library," said LM Program Analyst Padraic Benson. "Given that DOE's roots in Grand Junction stretch back three quarters of a century to the Manhattan Project, our story really belongs to this community."

In addition to displaying photographs, Tomlinson Library reached out to professors and former DOE employees, many of whom are also associated with the Grand Junction Geological Society, to donate artifacts that were also displayed.

"The library is pleased to host the photo exhibit of the history of DOE in Grand Junction," said Tomlinson Library Director Sylvia Rael. "The university has a special connection to this history through both its geological faculty and materials in Tomlinson Library's Special Collections and Archives."

The Grand Junction office site was listed on the National Register of Historic Places in recognition of its important, historic roles in the Manhattan Project and the Cold War. The complex along the Gunnison River south of Grand Junction was purchased by the U.S. government in 1943 to be used as a uranium processing site for the Manhattan Project.

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Grand Junction Office Displays Historical Photo Exhibit at Colorado Mesa University

The office site was later the location of the U.S. Atomic Energy Commission Colorado Raw Materials Office, the center of an unprecedented uranium boom fueled by the government's need to secure domestic uranium for nuclear weapons during the Cold War. The photo exhibit portrays the contributions of the office and the town through the decades.

A reception for the display took place on February 20, with attendance from members of the Grand Junction Geological Society, Tomlinson Library, CMU History Department, and other local organizations. LM Site Manager Jalena Dayvault presented an overview of DOE's history in Grand Junction and the city's contributions to the nation's defense program. She also discussed LM's current mission of protecting human health and the environment.

"Events like this are key to making connections and communicating our current mission to the local community," Dayvault said.

The exhibit was available for viewing through February 28.

Top Right Photo: Jalena Dayvault, LM, presents at the exhibit's reception in CMU's Tomlinson Library.

Bottom Left Photo: Exhibit photos depict events occurring in the Grand Junction area during the Manhattan Project and Cold War.



LM Evaluates Use of Unmanned Aerial Systems for LTS&M

The U.S. Department of Energy Office of Legacy Management (LM) is evaluating whether Unmanned Aerial System (UAS) technology can cost-effectively support the technical needs of long-term surveillance and maintenance (LTS&M) activities, specifically in terms of improving the quality of data collected at the sites.

LM is in the process of documenting findings from the Evaluation of UAS Technology study. Data collection was conducted through an Interagency Agreement with the U.S. Geological Survey National UAS Project Office in the Denver Federal Center in Lakewood, Colorado.

USGS performed UAS surveys at the Rocky Flats, Colorado, Site and the Grand Junction, Colorado, Disposal Site. LM is also using UAS data acquired at the Tuba City, Arizona, Disposal Site as part of the study. Remote sensing data collected as part of the study included light detection and ranging (LiDAR), Structure from Motion (SfM), thermal, and multi-spectral. Preliminary findings and lessons learned were incorporated into the Baseline Aerial Surveys of Uranium Mill Tailings Radiation Control Act of 1978 Title I and II disposal sites project and indicate UAS data provide significant benefits over traditional land-based surveys for documenting site conditions and detecting topographic changes over time.

An advantage of LiDAR or SfM-derived elevation data is a high level of precision coupled with the ability to cover a large area. These types of data will enable LM to rapidly visualize conditions at the site level, and provide the ability to combine high-resolution multispectral (aerial) imagery (Figure 1a) with high-resolution surface models (Figure 1b) to analyze vegetation at the site or calculate volumes of stockpile material (Figure 2).



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LM Evaluates Use of Unmanned Aerial Systems for LTS&M

One concern of deriving ground-surface models from UAS platforms is that UAS and associated sensor technology is rapidly changing and will continue to do so. This means the equipment used to collect LiDAR or SfM data will likely differ between acquisition periods, potentially affecting the reliability of data used for change detection (e.g., topographic change). However, using LiDAR data collected from two independent flights with different sensors, elevations on the cap of the disposal cell in Tuba City differed on average by only 0.05 (about two credit cards) and 0.48 inches on the sloped sides. This suggests changes in technology over time may not be a significant problem.



Figure 1b. Bare-earth surface model combined with high resolution aerial imagery of the Tuba City disposal cell. At this resolution, even fine-scale erosion is visible.

The Federal Aviation Administration predicts that sales of UAS for commercial purposes will grow from 600,000 in 2016 to 2.7 million by 2020. As a result, scientific applications of UAS are becoming commonplace because of rapid technology developments technology and decreased costs. For example, advancements in LiDAR technology in the past few years have resulted in smaller units that can now be carried by midsized UAS. Previously, manned aircraft were required for aerial LiDAR surveys.



Figure 2. SfM-derived surface model combined with high resolution aerial (multispectral) imagery of the Grand Junction disposal site. Note the precise 3D modeling of vegetation and stockpile material.



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-ProgramUpdate@Im.doe.gov so that we can update our database.

Thank you for your assistance.



Kyle Brown

Kyle has nearly nine years of IT experience and is currently working as an IT specialist for the U.S. Department of Energy (DOE) in Grand Junction, Colorado.

He was raised in Tacoma, Washington. A few years after high school he joined the U.S. Army as an active duty information technology (IT) specialist. During his time in service he also worked as an intern for the Drug Enforcement Administration in Seattle, Washington, where he gained experience as a telecommunication specialist, helped maintain the evidence room, and worked closely with federal agents.

After leaving active duty service, Kyle worked in civilian IT for the U.S. Air Force on Joint Base Lewis-McCord and later worked in IT for the U.S. Department of the Interior (DOI). During his time at DOI he obtained his bachelor's degree in cybersecurity at Champlain College.

Jay D. Glascock

Jay serves as field manager for the DOE Office of Legacy Management (LM) in Westminster, Colorado. He also leads the Defense-Related Uranium Mines team and the Special Projects office.

Jay has nearly 30 years of experience in leadership, management, and supervision in the field of engineering management with the U.S. Department of Defense (DOD) and DOE. He has worked with DOE since July 2009 in various leadership and management capacities in the Office of Project Management, Office of Engineering and Construction Management, and the Office of Acquisition and Project Management, as well as serving as senior advisor to the Associate Deputy Secretary of Energy.

Prior to that, he served in the U.S. Air Force more than 20 years, as a member of the Civil Engineer and RED HORSE Community. In that capacity, he held various assignments in a dozen different locations, predominantly involved in real property, operations management, and project management, executing construction programs and projects worldwide. His last assignment was as a

joint staff engineer at the Pentagon in Washington, DC, advising the Chairman of the Joint Chiefs of Staff.

Jay graduated from the U.S. Air Force Academy in May 1990 with his Bachelor of Science in general engineering. He also obtained a Bachelor and Master of Science in civil engineering with emphasis in construction management from the University of New Mexico. He is also a certified project management professional and a certified cost professional.

Paul Kerl

Paul is the new LM-21 supervisor and field manager for the LM Grand Junction office. Hailing originally from western New York, Paul Kerl attended the State University of New York at Buffalo, receiving a bachelor's degree in civil and environmental engineering. He holds an MBA from the University of Phoenix and is a 2010 Fellow of the DOD Executive Leadership Development Program. Paul is also a registered professional environmental engineer.

Paul attributes his interest in environmental topics to growing up close to Love Canal, the site of one of the worst environmental catastrophes in American history. This highly charged event shaped national environmental policy and also inspired Paul to commit to making a difference by working to prevent future events and protect human health and the environment for future generations.

Paul joined DOE in January 2017 as an environmental engineer for the Fossil Energy: Office of Petroleum Reserves and was charged with legacy remediation of the former Naval Petroleum Reserve in Southern California.

Prior to working for DOE, Paul worked for DOD for 23 years, primarily spearheading multi-disciplinary, full life cycle, public works requirements at duty stations including New York, Colorado, Hawaii, Louisiana, Georgia, Arizona, Iraq, Virginia, and Korea.

In his spare time, Paul enjoys spending time with his family, and attending his son's sporting events. He also enjoys the great outdoors, fitness, shooting, and restoring and maintain classic cars for display in car shows.

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New Employee Bios

Richard Rogers

Richard Rogers has joined LM's Financial, Audit, and Contracts Services Team. Originally from Detroit, Michigan, Richard is a graduate of South Carolina State University (SCSU) with a Bachelor of Science degree in accounting. After undergrad, Richard returned to Detroit before eventually working as a revenue agent for the Internal Revenue Service, leading him to relocate to Washington, DC, to more aggressively advance his career while completing his Masters of Public Administration at the University of Baltimore. Richard joined DOE as a U.S. Presidential Management Fellow within the DOE Loan Programs Office (LPO), where he successfully managed and supported all budgetary functions for LPO. Richard joins us from the Office of the Chief Financial Officer (CFO Office). During his time in the CFO Office, he was a valuable member of the Budget Analysis Division charged with managing the budget formulation for his assigned programs, which included LM and the National Nuclear Security Administration.

Richard is happily married to his high school sweetheart and they are excitedly expecting their first child this spring. *

GOAL 6



Environmental Justice Activities

LM Leads the DOE 2018 Combined Federal Campaign

In October, the U.S. Department of Energy (DOE) Combined Federal Campaign (CFC) chairperson, Secretary Rick Perry, and the CFC vice chairperson, LM Director Carmelo Melendez, kicked off the 2018 DOE CFC.

CFC is the world's largest and most successful annual workplace charity campaign. The 2018 CFC continued the theme of "Show Some Love." DOE set an ambitious goal for the entire DOE enterprise to raise \$600,000, and thanks to the generosity of employees across the country, DOE nearly tripled that goal by raising more than \$1,787,000. All of DOE's CFC team, and in particular all the CFC keyworkers and volunteers, who coordinated this year's efforts were the key to the Department's success. The National Nuclear Security Administration (NNSA),the Bonneville Power Marketing Authority, and the Office of Efficiency and Renewable Energy also deserve recognition for their leadership and generosity in this year's campaign.

Further, DOE was the winner of two 2018 CFC National Capital Area (NCA) contests: the NNSA received an award for "Executive Involvement" for a small federal agency, while DOE received an award for the "Best Poster/Display" for a medium federal agency. The CFCNCA raised a total of \$34M, including \$56,500 in volunteer hours. The 2018 CFCNCA was a grand success. ❖

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DOE 2018 CFC chairperson, DOE Secretary Perry, and DOE 2018 CFC Manager Denise Freeman (LM detail staff).

Environmental Justice Activities

2019 National Environmental Justice Conference and Training Program

March 13-15, the 13th National Environmental Justice Conference and Training Program was held in Washington, DC, with over 400 participants. This year's conference theme, "Education, Learning, and Cooperation in a Diverse World," was built on the messages of past conferences. Leaders from various sectors engaged in three days of free exchange of ideas and experience, research, discussion, and thought-provoking dialogue on the needs and challenges of communities, governments, municipalities, tribes, faith-based organizations, and others with an interest in environmental justice (EJ). The agenda highlighted programs and collaborations that work as well as lessons learned from initiatives that have not been successful.

Program speakers featured representatives from federal and state agencies, local governments, tribes, community groups, business and industry, public interest groups, academia, and other entities. The interactive forum format gave conference participants the opportunity to network with a variety of interests from diverse quarters, and conference participants were exposed to informative and productive resources that could potentially support their individual program goals and objectives. Conference participants also saw examples of innovative and collaborative approaches that produced positive results.

Day one of the conference was dedicated to young future EJ leaders, including high school and college students from around the country. The Honorable James E. Clyburn, majority whip and U.S. representative for South Carolina, gave the Keynote Address. Peter O'Konski, deputy director for the U.S. Department of Energy Office of Legacy Management (LM) represented the Department as the luncheon speaker.

The conference included over 40 technical assistance workshops and training sessions, including: *An Environmental Justice Outreach Program Created by Students; Common Goal of Justice for the Environment, Environmental Justice from a Civil Rights Perspective; Environmental Justice and the National Environmental Policy Act Methodologies;* a screening of the 2018 Bronze Telly Award-winning documentary film *Sea Impact of Climate Change on Human Health and the Environment; Building Capacity with Native*

Americans and Alaska Natives to Handle Hazardous Materials and Respond to Emergencies; Grant Writing and Technical Assistance; and student poster sessions.

This year the National Environmental Justice Conference Board of Directors honored two awardees: Reverend Charles Utley of the Blue Ridge Environmental Defense League for his successful relocation of the residents of Hyde Park in Augusta, Georgia. Hyde Park residents were exposed to decades of contamination from surrounding industries.

The plaque awarded to Reverend Utley stated, "We commend you for continuing to be the voice for the rights of all citizens to live in a healthy environment. Congratulations for the successful relocation of the residents from Hyde Park Community, Augusta, Georgia."

The board of directors also honored Marsha Minter, the associate director of the U.S. Environmental Protection Agency Office of Environmental Justice. Marsha Minter received the award for her outstanding leadership and commitment to furthering the mission of environmental justice, public participation, and community engagement.

The plaque awarded to Marsha Minter stated, "We express our sincere appreciation for her dedication as a public servant who for decades has been instrumental in bringing together diverse groups to forge stronger relationships with various government agencies in the best interests of the community. As the Board of Directors of the National Environmental Justice Conference, Inc., we express our sincere appreciation for your commitment and tireless efforts to protect human health, safety and environmental health." �

Environmental Justice and the Hyde Park Community in Augusta, Georgia

The following article was written by Reverend Charles Utley, a long-time Hyde Park resident and community activist. Reverend Utley is the associate director and environmental justice campaign director at the Blue Ridge Environmental Defense League. He spent all of his childhood and young adult life in the Hyde Park Community, which is located next to a toxic waste site in an industrial area of Augusta, Georgia. While he was serving in Vietnam in 1966, his parents began organizing their community to improve their neighborhood

Environmental Justice Activities

with The Hyde and Aragon Park Improvement Committee. Mary L. Utley, Charles Utley's mother spearheaded a fight for public water and sewer systems, paved streets, and streetlights.



Reverend Charles Utley, Hyde Park resident, community activist, and Grassroots Green Hero Awardee.

In the mid-1970s, the residents of Hyde Park found out there was contamination in the community from a nearby wood treatment plant (Southern Wood Piedmont Company). Despite confirmation of the contamination by the Brownfield Project of the U.S. Environmental Protection Agency, city officials refused to take action for more than 30 years.

Reverend Utley said that the vision that his parents had for the Hyde Park Community was what formed his organizing ground. Community organizing has taught him that success may not come immediately but that being persistent in your work will pay off eventually.

Reverend Utley received the Grassroots Green Hero Award at the 2019 National Environmental Justice Conference and Training Program for his work in helping to secure the relocation of the residents of Hyde Park after decades of exposure to contamination and environmental injustice.

The Hyde Park community was established in the early 1940s in Augusta, Georgia, and was primarily made up of African American residents. The community is wedged between two railroad systems and surrounded by a cesspool of contamination from several industrial facilities: the Goldberg Brothers Junk Yard, Babcock and Wilcox, Merry Brothers Brick and Tile Company, and the Southern Wood Treatment Plant. The community of approximately 150 residents was exposed to numerous carcinogens, contamination, and environmental injustices for decades. In 2007, Corey Johnson, a Hyde Park community leader, was elected to the Richmond County Board of Commissioners to represent the Hyde Park community.

He immediately began to coordinate efforts to stop the environmental injustice that haunted this community. He began by working closely with the city of Augusta engineering department to help the residents of Hyde Park relocate. Working collaboratively, they were able to develop a relocation plan. The plan included using the Housing and Urban Development (HUD) *Residential Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* as a guideline to move the residents.

The community also received assistance from the U.S. Environmental Protection Agency Brownfields Interagency Partnership, the U.S. Department of Energy Environmental Justice Program, and the Blue Ridge Environmental Defense League Environmental Justice Program.

Although there were many obstacles and hurdles to be overcome, the community continued to move forward through constant perseverance, as well as prayer and faith. Eventually, a majority of the county Board of Commissioners supported relocation. Early on, the community also received support from former Mayor Larry Sconyers, who initially approved the Brownfields Program, and has served as a committed advocate for the community.

The plan was approved in 2014 and the last resident moved out in 2018. Rather than use the HUD Uniform Relocation Act, the city decided on condonation. Due to this change, some homeowners did not receive equal compensation. This led to an appeal by the homeowners through the court system, which caused continued hardships. Some of these cases are still pending.

Although it has been a long struggle, the community never gave up its quest for relocation and environmental justice, and it has been well worth the fight.

I hold to the premise that 'it's not the size of the dog in the fight but it's the size of the fight that is in the dog,' and that we will always persevere.

— Reverend Charles Utley. 💠



LM NEWS Feed

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

MARCH 19, 2019

LM Rolls Out FY 2020 Budget Request

DOE's fiscal year 2020 budget request includes approximately \$303 million for the Office of Legacy Management.

FEBRUARY 13, 2019

LM's 2018 Annual Historical Summary Released

New document records significant accomplishments by the DOE Office of Legacy Management during 2018.

FEBRUARY 13. 2019

Navajo and Hopi Students Learn About Uranium Legacy Sites

DOE Office of Legacy Management staff share STEM concepts.

JANUARY 29, 2019

STEM Outreach Makes Energy Concepts Easy for Students

DOE Office of Legacy Management representatives teach students about alternative energy sources.

JANUARY 28, 2019

Uranium Mill Tailings Radiation Control Act (UMTRCA) Meetings Held in Wyoming

DOE Legacy Management staff met with state and federal agencies to discuss UMTRCA Title II site transitions.

JANUARY 9, 2019

The First Fifteen Years of LM Publication Released

New DOE Office of Legacy Management publication documents the Office's first 15 years in operation.

Anticipated LM Sites Through Fiscal Year 2030





Check out our beneficial reuse webpage at https://www.energy.gov/lm/services/ property-management/beneficial-reuse

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