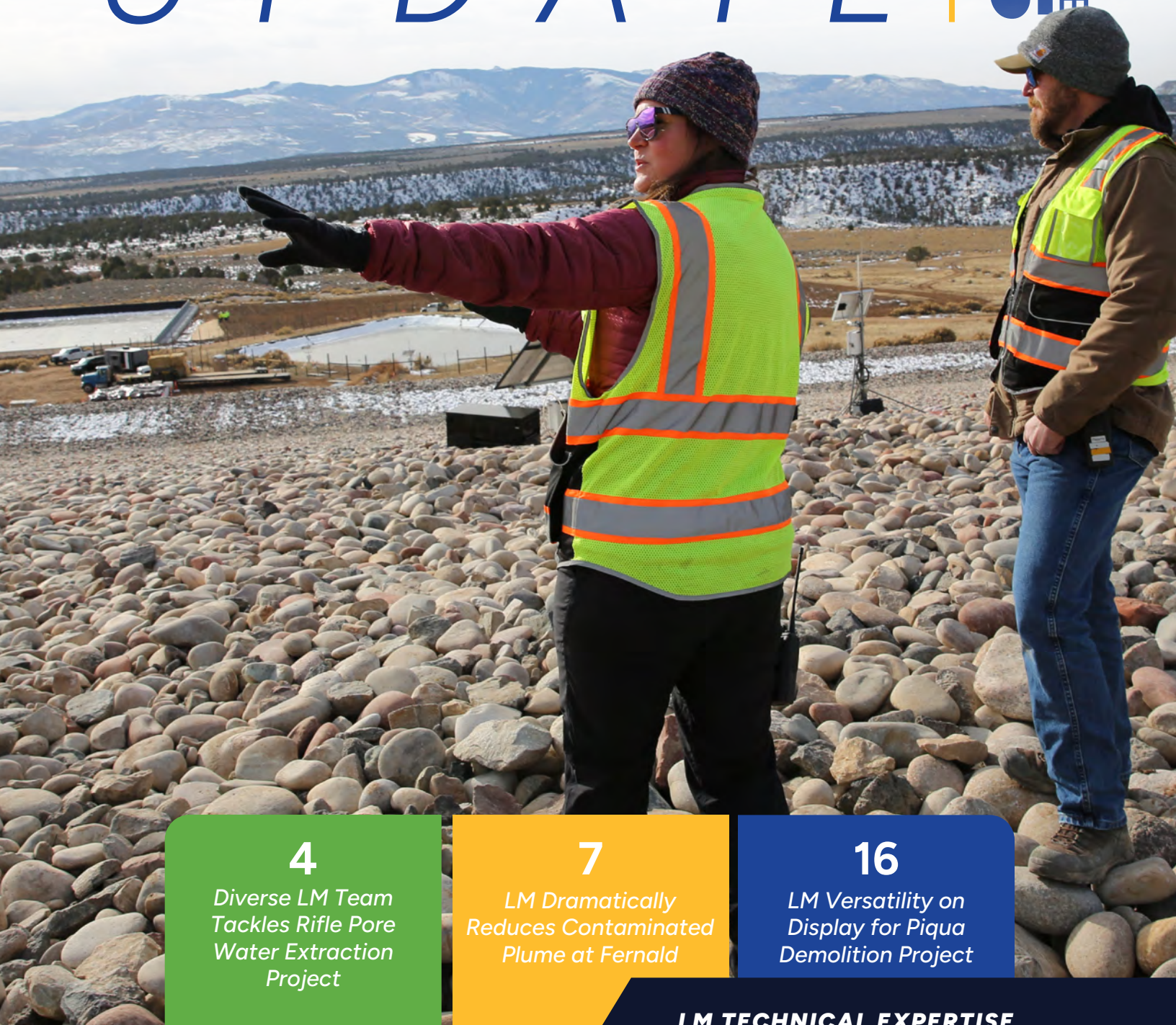
U.S. DEPARTMENT of ENERGY | Office of Legacy Management

PROGRAM UPDATE

APRIL–JUNE 2025



LM TECHNICAL EXPERTISE

Director's Corner

LM Team's Versatility Fosters Protection, Service to Public in Many Ways

When it comes to successful organizations, there are a few common threads that exist, whether in government, business, nonprofits, or other entities.

Successful organizations all conduct work with safety in mind. They all have personnel with a variety of skills. They all recognize how to maximize resources and work efficiently. They all have a clear mission and work as a team to achieve a common goal.

For instance, consider a football team. A team might have 11 extraordinary quarterbacks, but it takes a lot more than players with quarterback skills to make a great offense. There must be people skilled at blocking, running the ball, and catching the ball. Similarly, on defense, a great pass rusher might not have the skills to be a cornerback.

Great teams must have personnel who are great at different aspects of a mission. At the U.S. Department of Energy Office of Legacy Management (LM), we have such a team. LM has a diverse set of responsibilities, and therefore has a diverse set of LM and support partner professionals who expertly carry out our Office's six goals.

We protect human health and the environment; preserve, protect, and share records; safeguard former contractor workers' retirement benefits; manage and optimize land and assets; sustain management excellence; and engage the public and interested parties.

The personnel across our team are skilled in administrative services, aviation, biology, chemistry, communications, data management, ecology, education, engineering, finance, geology, history, human resources, information technology, journalism, law, management, marketing, mine safety, natural resources, property management, public health, regulatory affairs, science, security, technology, waste management, and many other areas.

Additionally, the LM team has professionals certified in a multitude of disciplines that are applicable to our work. You put all these hard-working and capable professionals together, with an understanding of complex federal and state regulatory environments, and what you have is a diverse team … a great team.

In this edition of *Program Update*, you'll read about some of that technical expertise, ranging from decontamination and decommissioning to complex groundwater remediation to mining safeguards to smart energy solutions and more.

We could fill volumes of *Program Updates* if we were to detail the totality of the work performed by LM and its support partners. And all that work is in service to the American public. It is difficult and challenging, and it is work we are proud of because we know the impact it has on our fellow citizens.

Our work is not as noticeable as the teams that play football on television. But for the communities that gave so much to our nation, our diverse team comprises our own set of stars who quietly do the work we revere because it is our contribution to the final chapters of World War II and the Cold War.

Warm regards,

Carmelo

Carmelo Melendez

U.S. DEPARTMENT of ENERGY | Office of Legacy Management

Welcome to the April-June 2025 issue of the U.S. Department of Energy Office of Legacy Management ***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.

GOAL **ONE**
Protect human health and the environment.

GOAL **TWO**
Preserve, protect, and share records and information.

GOAL **THREE**
Safeguard former contractor workers' retirement benefits.

GOAL **FOUR**
Sustainably manage and optimize the use of land and assets.

GOAL **FIVE**
Sustain management excellence.

GOAL **SIX**
Engage the public, governments, and interested parties.

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Wide Range of LM Expertise Tapped for Rifle Disposal Cell Pore Water Extraction Project

Multi-disciplinary approach ensured success of evaporative pond installation

When the U.S. Department of Energy Office of Legacy Management (LM) recently faced an operational challenge at the Rifle Disposal Site in Colorado, it took subject matter experts across a wide array of disciplines to tackle it.

The 71-acre disposal cell was constructed in 1996 to contain uranium mill components and mill tailings from two former uranium and vanadium processing sites, known as Old Rifle and New Rifle, located near the city of Rifle, Colorado. The disposal cell is a Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I disposal cell, and is located 6 miles north of the City of Rifle in Estes Gulch.

Beginning in 2001, water began accumulating inside the disposal cell and had to be pumped into a nearby lined evaporation pond. As the system aged, the environmental remedy was unable to keep up with the rapidly rising water levels, threatening the system's structural stability. As a result, in 2024, LM prioritized developing and executing a new network of strategically placed solar-powered extraction wells and evaporation ponds to address the issue.

"Once we realized that our existing infrastructure was not keeping up with the rising water levels, the first approach was to look at modifying operational parameters to maximize pumping rate," said UMTRCA Team Lead Paul Kerl. "We redeveloped existing wells and we freeze-proofed existing infrastructure to maximize run time and pump year-round, but unfortunately that still wasn't enough. Seeing the water levels rising further, we assessed the risks associated with saturating the side slope of the disposal cell and realized a full court press was needed to implement a priority project to mitigate the risks in very short order. Only a multi-disciplinary, rapid-response, cross-functional team could develop and implement a project to quickly address these risks. Fortunately, the Office of Legacy Management has such a team," said Kerl.

After briefing the situation, the site team rapidly gathered all the support needed to prepare for successful project execution and risk mitigation. The team coordinated communication and support across the organization, including from leadership, finance, regulatory, planning, design, and construction teams, information technology, communications, asset management, environmental compliance, project management, radiation safety, surveying, contracting and subcontracts, safety, and data management. All stakeholders treated this project with high priority, acknowledging the risks and executing the project as the organization's top priority.

"This was an all-in effort," Kerl said, "and the dedication and professionalism of the joint LM-LMSP team paid dividends and drove success."

A variety of challenges had to be addressed before work on the site began, such as environmental compliance issues related to radiological waste removal, water rights, and required project permitting. The environmental compliance team assessed the potential effects of the project on the land, air, wildlife, water, and plants.

LM completed an extensive review of the disposal cell construction and water accumulation to determine how many new extraction wells were needed and the best placement of the wells for maximum efficiency. To avoid hitting buried mill materials during drilling, hydrogeologists depended on a geophysical survey to find the best location to place the new wells.

"To simulate how the water levels within the cell would change because of pumping, we developed a numerical groundwater flow model. Historically, what we knew about the cell came from three locations: the two standpipes with 30 years of water level records, plus one that's dry. That didn't give us a lot of information to calibrate a single groundwater flow model," said LM Support Partner (LMSP) Senior Hydrogeologist Pete Schillig.

"To account for the uncertainty, we developed an ensemble approach and calibrated 223 numerical groundwater flow models. With that ensemble, we selected a design strategy that worked for all the models in the ensemble," Schillig said.

After LM completed the planning phase, work began at the site in June 2024. Despite a compressed schedule, the team managed parallel tasks and subcontractors seamlessly.

The project team set up drilling on top of the disposal cell. To avoid disturbing the existing riprap cover layer, workers made a temporary road surface using interlocking heavy-duty construction mats. After building a path, LM brought in a drill rig and on-site equipment. LM used "super sacks" to store drill cuttings, including tailings material, away from the construction area. Once filled, each sack was brought to a radiation control area and cordoned off with

Project contractors and LMSP staff install a well based on a design strategy developed by LMSP Senior Hydrogeologist Pete Schillig.

radiological hazard signs. During drilling, the makeshift paths were moved and repositioned to accommodate each drilling area. These mats provided safe, stable surfaces for the workers.

Throughout drilling operations, LMSP used a lidar, or light detection and ranging, system to scan the disposal cell and address the concern of maintaining disposal cell integrity during drilling.

"Lidar sends a single beam of light to a point or points on the ground to the front slope of the cell. When it does that, the light bounces back to the instrument and the instrument knows its location and orientation," said LMSP Surveyor Services Lead Jeff Schaaf.

Using the lidar system, LM confirmed that no movement of the cell occurred while equipment and staff performed work.

Once all preparations were complete, drilling began. The goal was to drill 10 additional extraction wells, totaling 12 wells actively drawing water from the cell. An additional four monitoring wells were drilled to measure water levels in the cell. While the main drilling work progressed, other workers constructed the modular evaporative ponds.

The introduction of new wells and more infrastructure meant that additional power was needed to operate the system. Once drilling was completed on the disposal cell, the new solar power systems and System Operation and Analysis at Remote Sites (SOARS) were put in place to provide the power. The SOARS system allows LM to operate and monitor the new water extraction system remotely.

After the components for the SOARS systems were complete and the pipeline from the wells was attached to the modular evaporative ponds, extraction rates of pore water — the water that infiltrates the small spaces between grains of soil and sand — were tested. The first test demonstrated a steady 2.5 gallons per minute. Once the first well began producing water from the cell, the remaining wells were brought online.

The additional water removal meant more evaporative capacity was needed, too.

"The site was originally built with one small evaporative pond, but we needed to install two additional 1-acre modular evaporation ponds to support the volume of pore water to be extracted from the cell," said LM Site Manager Mary Young.

Construction and engineering teams worked together to secure a plan for the two modular evaporative ponds. Procurement streamlined acquiring the equipment and continued to play a key role in resolving supply issues as they arose.

With the maintenance efforts for the disposal cell complete, it was time to restore the surrounding land to its condition before work began. Workers first scored the soil to help native plants take root. After that, native plant seeds were planted to revegetate the area and stabilize the disturbed soil.

Work on the site is now complete and the wells are working as expected, extracting pore water as necessary to maintain cell integrity. Site monitoring using data collected and transmitted by the SOARS stations and adherence to the Long-Term Surveillance Plan will continue to protect human health and the environment.

"This project required personnel with expertise in many areas," Young said. "We completed this complex project with a comprehensive approach that has allowed us to maintain the integrity of the disposal cell."

Kerl agreed, saying the joint effort and the outcome of the project was a success by all measures.

"I am extremely proud of the team's dedication, professionalism, long hours, and esprit de corps exemplified during the execution of this important priority project," Kerl said. "I congratulate you all on a job well done."

LMSP Survey Technician Josh Helmick demonstrates how to set up the lidar scan while LM Site Manager Sara Woods listens.

Two-Thirds Reduction in Fernald Groundwater Contamination Plume Highlights Success

Removing more than 16,000 pounds of uranium from the Great Miami Aquifer required planning and technology

Fernald's extraction wells draw contaminated groundwater at a rate of roughly 4,200 gallons per minute — about nine Olympic-sized swimming pools per day.

More than 30 years of treatment at the Fernald Preserve near Hamilton, Ohio, have shrunk a uranium-contaminated groundwater plume from 200 acres to under 70 acres — and it keeps getting smaller. The plume is anticipated to be fully remediated by the mid-2040s.

The Feed Material Production Center in Fernald was the tip of the spear for Cold War efforts to produce high-purity uranium metal products for the nation's defense from 1951 to 1989. After nearly four decades of production, the Fernald site was left with soil and groundwater contamination, becoming one of the largest Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) remediation efforts in U.S. history.

Beginning in 1991, investigation and planning led the U.S. Department of Energy (DOE) to conduct extensive remediation, demolish buildings and equipment, and remove contaminated waste material, soil, and debris. High-level radioactive materials were transported off-site to controlled waste storage and disposal facilities. Low-level materials were placed into an engineered on-site disposal facility, following strict waste acceptance criteria protocols.

DOE and its contractors cleaned the site to a set of standards determined collaboratively by the U.S. Environmental Protection Agency (EPA), Ohio EPA, and DOE with community input. Many invested stakeholders, including former workers, regulators, and neighbors, remain engaged with the site today.

> *The Fernald Preserve is an outstanding story of beneficial reuse.*
>
> –Brian Zimmerman

With the exception of groundwater, comprehensive environmental remediation and ecological restoration of the site was completed in 2006 at a cost of $4.4 billion. Water sampling and extensive analysis during remediation identified the presence of a large plume of uranium contamination nearly 200 acres in size.

Dowex-1 is made up of small beads that attract and hold uranium, removing it from the contaminated groundwater.

"The plume covers three distinct areas at the site," notes Brian Zimmerman, DOE Office of Legacy Management (LM) site manager for the Fernald Preserve. "The Waste Storage Area, the site where the original waste was stored for disposal; the South Field area of the plume, which covers the largest area on-site; and the South Plume, which includes off-site contamination." DOE has connected all impacted residential areas to the local public water supply and has institutional controls in place to mitigate public contact with the groundwater.

Male Northern Harrier Hawk, also known as Gray Ghost.

Recovery wells installed at the edges of the plume control the further spread of contamination. Meanwhile, extraction wells drilled into the "body" of the plume draw out contaminated groundwater at a rate of roughly 4,200 gallons per minute, or about nine Olympic-sized swimming pools per day. The groundwater is then treated at an on-site Converted Advanced Wastewater Treatment (CAWWT) facility to meet regulatory discharge standards. The treatment system uses an ion-exchange system comprising a resin of small beads that attracts and holds uranium, removing it from the water. The treated water leaves the site below EPA's drinking water standard.

"Our success in reducing the contamination plume from over 200 acres down to under 70 acres is truly remarkable. In addition, the site has undergone extensive ecological restoration, which has helped transform the Fernald Preserve from a once-barren landscape at the end of remediation into a healthy and thriving habitat for birds and wildlife and a great asset to the surrounding communities," said Zimmerman.

The Fernald Preserve has become a destination for birds and birders. The recent Bird Fest in February brought in 1,400 visitors who spotted over 80 species, including short-horned owls, harriers, and other birds of prey. To the delight of visitors, a local family of beavers also made an appearance.

"The Fernald Preserve is an outstanding story of beneficial reuse," Zimmerman said.

Birdwatchers and bird lovers look for birds during the 2025 Fernald Bird Fest.

From Maps to Mines: Inside DRUM's Verification and Validation Process

Specialized teams work together to assess risks mines might pose

The U.S. Department of Energy Office of Legacy Management's (LM) Defense-Related Uranium Mines (DRUM) program has a distinct task — to verify and validate the condition of abandoned uranium mines across the country that sold uranium ore to the Atomic Energy Commission for defense-related activities between 1947 and 1970.

The 2014 report to Congress identified 4,225 mines across 19 states needing verification and validation (V&V). Part of V&V activities is an initial screening to determine if a mine poses risks to human health and the environment. These mines fall into three campaigns based on land ownership:

- ***Campaign 1:*** **Public lands.**
- ***Campaign 2:*** **Tribal lands.**
- ***Campaign 3:*** **Private lands.**

Five Legacy Management Support Partner (LMSP) DRUM field teams handle this huge task. Each team includes an ecologist, a geologist, a radiological control technician — who also serves as a safety and health specialist — and a field team lead. Each member has their own area of expertise, but they work together to accurately inventory and sample mine sites.

A Day in the Field: V&V in Action

Before a team begins work, they start with a pre-job safety briefing. Since there's no set office, briefing information varies depending on location. The team reviews expected weather conditions, road safety, site access, and emergency contacts.

Once on-site, they have another safety briefing, calling out alternate exit routes and discussing the DRUM Job Safety Analysis (JSA) and other safety-related topics. During a recent V&V in western Colorado, Team 4 had to wait out some typical spring weather — snow flurries, gusty winds, and bouts of sunshine. While they waited, the team's safety and health specialist presented the JSA, covering issues such as cold stress, slips, trips, fall hazards, local snakes and insects, lightning, first-aid kits, evacuation routes, and local emergency services.

LMSP Geologist Kyle Karren taking a soil sample during V&V activities, March 18, 2025.

Mine rock pile, Mill 2 mine, near Uravan.
(Note the bright greenish-yellow mineral in one of the rocks — that's carnotite, an important source of uranium.)

The DRUM team's focus on safety isn't just part of a checklist; they are committed to making sure everyone returns home the same, if not better, when they finish each day.

"I've always been impressed how the DRUM teams come together as almost a family unit," said Wil Burns, supervisory physical scientist for LM Environmental Team 3. "They really take care of each other out there."

Mapping the Total Disturbed Area

Once the sun prevailed, Team Lead John Stanfield and the rest of the team surveyed the area to determine the mine's total disturbed area (TDA). They looked for signs of mechanical disturbance such as mine entries, pits, trenches, or mine rock piles that indicate mining-related activity. Using GPS devices and data collection software, Stanfield mapped the TDA while the team's geologist, Kyle Karren, mapped mine rock — any material not economically worth mining that's disposed of on-site.

While mapping, they worked closely with the team's Safety and Health Specialist, Cody Kem, who walked the perimeter of the TDA during the early stage of the gamma walkover survey.

Once the TDA was mapped, the team circled up to review the collected data and discuss observations and limiting factors, such as areas of inaccessibility.

Gamma Walkover Survey and Soil Sampling

Next, Kem completed a gamma walkover survey of the mine's accessible areas based on the established TDA. He used a scintillator detector to measure gamma radiation, a digital radiation survey meter, and RadScout software, which records a gamma dose rate every second. Kem walked transects spaced 20 to 50 feet apart to accurately capture the gamma dose rate at the mine.

After completing the walkover survey, the team uploaded the data into Stanfield's computer for quality assurance and for analysis, checking for areas of possible sediment movement, gaps in the transects, and areas of opportunity for additional sampling if the radiation dose rate was more than 256 µR/hr. The walkover survey is color-coded depending on radiation levels identified in the DRUM work plan.

At the same time, Karren calculated the mine rock pile's square footage to determine the number of nodes required to collect a composite soil sample. He also looked for any evident sediment shed areas (visible off-site migration of waste material).

Soil sampling is a key part of the process. Each sample is labeled with the date, time, location, and type of material. Geologists make sure they have the correct information documented in their field notebooks. Soil samples are analyzed at an accredited laboratory for constituents of interest.

The Ecologist's Eye

The team's ecologist, Josey King, looked at the site through a different lens — one that's focused on plants and animals. Before they go on-site, ecologists check for special status species that might be in the area. At the site, King kept an eye out for wildlife, assessed and observed instances of wildlife use, and looked for potential wildlife hazards such as mining debris.

King performed an ecological survey on the mine rock piles, documenting observed plant species, the percent of foliage cover, plant succession, and what's been reseeded by saltbush and rabbitbrush — two common indicators of reseeding efforts in western Colorado.

She then performed an inventory of mine features such as mine openings, shafts, vents, structures, and drill holes. The teams don't go into any openings, so they estimate the dimensions. They take a photo of each feature, which

is logged in their field notebook. Range poles are used for scale comparisons of features in the photos. Photos are later used in the mine reports.

The team also notes any signs of modern site use such as tire tracks, campfires, or trash in the TDA. All these impact the site's risk scoring assessment (RSA). The RSA clearly explains any potential physical safety hazards and risks to human health and the environment.

Wrapping Up

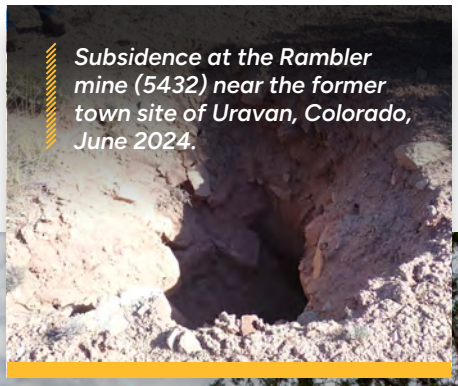
Once the data is collected — GPS data, feature information, gamma readings, photos, ecological data, sample logs — the team heads back to the office and uploads all their collected information. A report writer assigned to the DRUM team compiles their information and writes a report documenting everything captured during the field V&V. Once it's finished, the field team reviews the report and notes any edits. These reports are used by LM, stakeholders, and other government agencies to make informed decisions about the next steps regarding safeguarding hazardous features.

Fieldwork for the DRUM program is scheduled to end on Sept. 30, 2026. Over the past several years, field teams have worked concurrently on Campaign 1 and 2 mines. As of early 2025, 99.8% of Campaign 1 mines have been completed. While significant progress continues on Campaign 3 mines, some private landowners have declined access to their property. From the beginning, it has been understood that land access constraints could limit the ability to V&V every Campaign 3 mine, regardless of the program's timeline.

The fieldwork DRUM teams do cascades throughout LM. As Burns said, "DRUM team members are high-performing professionals. Their accomplishments are noticed throughout the different facets of LM. They easily move into different roles and continue to operate at a high level."

If you'd like to learn more about the DRUM program, visit energy.gov/lm/defense-related-uranium-mines-program.

An open shaft at the San Rafael mine, Buckmaster Draw, Utah, October 2018.



Subsidence at the Rambler mine (5432) near the former town site of Uravan, Colorado, June 2024.

Adit at the Thunderbird mine, near the San Rafael Swell, Utah, June 2018.

LMSP DRUM Field Team 4 near the former town site of Uravan, Colorado, March 18, 2025. Pictured from left to right, Senior DRUM Safety and Health Advisor Kyle Bishop, DRUM Field Team 4 Lead John Stanfield, Geologist Kyle Karren, Ecologist Josey King, and DRUM Safety and Health Specialist Cody Kem.

Technical Experts Tackle Contaminants at the Rocky Flats Site in Colorado

On the path toward more efficient uranium treatment

The Solar Ponds Plume Treatment System at the Rocky Flats Site, Colorado. The new uranium treatment component will be housed at this location.

Water leaving the Rocky Flats Site northwest of Denver, Colorado, must meet strict standards. In an environment rich in natural uranium, this is no small task. Fortunately, the U.S. Department of Energy Office of Legacy Management's (LM) technical experts are more than up to the challenge, and they are committed to continuous improvement. Currently, they are in the midst of implementing a more efficient and effective way to remove uranium from groundwater.

After cleanup and closure, LM assumed responsibility for the approximately 1,300-acre Rocky Flats Site. Monitoring groundwater and surface water has been a standard practice for LM at the site. Technical experts have used the collected data to develop the monitoring network and treatment systems that support long-term surveillance and maintenance. The remedy at the Rocky Flats Site has continued to protect human health and the environment for 19 years since cleanup was completed.

One of LM's regulatory requirements is to treat nitrate and uranium at the Solar Ponds Plume Treatment System (SPPTS). Treated water leaving the SPPTS must meet the corresponding standards established at the site.

To meet these requirements, LM has effectively reconfigured the SPPTS over the years to both collect and treat additional nitrate- and uranium-contaminated groundwater. Nitrate is the primary contaminant at SPPTS. The challenge of improving nitrate treatment was investigated starting the year after closure and was resolved in 2016.

The goal of the current project at the site is to improve the effectiveness of treating uranium, the secondary contaminant, while not negatively influencing the current nitrate treatment component.

In order to create an effective uranium treatment component (UTC), LM had to work with some challenging site conditions and constraints. The Rocky Flats Site is off-grid, remote, and subject to weather extremes; the new system would need to rely on solar or battery power and operate autonomously and reliably. In addition, the quantity of water that must be treated is very low compared to typical water treatment plants, making the selection of effective treatment options more difficult.

The technical team started with small-scale uranium treatment field testing a few years after closure. The many small-scale tests led to bench testing four different uranium treatment options: co-precipitation, ion-exchange resins, bone char, and electrocoagulation. With the exception of electrocoagulation, which was tested in a laboratory, these options were field tested in a conex housed at the SPPTS.

Based on a comparison of how each option performed, LM selected co-precipitation for pilot testing, as it was able to effectively remove uranium to below the site-specific uranium standard and did not affect nitrate treatment. A solar and battery power facility that was installed in 2022 powered the pilot tests. Additional solar power will be added for the full-scale UTC system.

Rocky Flats Site senior hydrogeologist with the Legacy Management Strategic Partner John Boylan noted that co-precipitation is a common industry technology, and the equipment and application requirements are well understood. In this case, a chemical added at SPPTS bonds with uranium, creating small particles that settle out and can be removed from the water. During the six-month pilot testing phase, the technical team performed stress tests under various conditions and collected data to inform the design of a full-scale UTC.

The last phase of the project is to build and install the full-scale UTC, which is scheduled to be operating by summer of 2025.

"Our historical and technical knowledge of the site helped develop this important piece of technology," said LM Site Manager Michelle Franke. "Our rigorous research and testing give us confidence that it will effectively and efficiently remove uranium from the groundwater plume."

The Rocky Flats Site is regulated under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. The Corrective Action Decision/Record of Decision guides the corrective and remedial actions at the site. The treatment of nitrate and uranium at the SPPTS is one of its requirements and is reiterated in the post-closure Rocky Flats Legacy Management Agreement.

The solar and battery power facility at the Solar Ponds Plume Treatment System.

LM, LMSP Professionals Provide Expertise at

Waste Management Symposia

Phoenix conference attracts waste management experts from around the globe

LM's Padraic Benson, second from left, presents during a panel session on the Manhattan Project National Historical Park at the 2025 Waste Management Symposia in Phoenix.

The annual Waste Management Symposia in Phoenix provides waste management professionals from around the world a platform to illustrate technological and environmental achievements and fosters a spirit of cooperation.

The Office of Legacy Management (LM) played a role in that effort with several LM and LM Support Partner (LMSP) subject matter experts providing their insights on a range of technical issues.

"From permitting on the Navajo Nation to federal real property transfer to addressing disposal cell challenges and more, LM and LM Support Partner staff exhibited expertise across a range of disciplines," LM Site Manager Sara Woods said. "LM's presenters and panelists illustrated the dynamic nature of LM's mission and the different aspects of how we protect human health and the environment."

The Waste Management Symposia is a leading international conference for addressing safe, environmentally responsible, technically sound, and cost-effective solutions to the management and disposition of radioactive wastes and the decommissioning of nuclear facilities to enhance the transparency and credibility of the global radioactive waste industry.

LM had a booth where conference attendees could learn about LM's mission to fulfill the U.S. Department of Energy's post-closure responsibilities and ensure the future protection of human health and the environment. LM also participated in the conference's STEM Zone, where organizations illustrated how science, technology, engineering, and mathematics (STEM) fields apply to their missions.

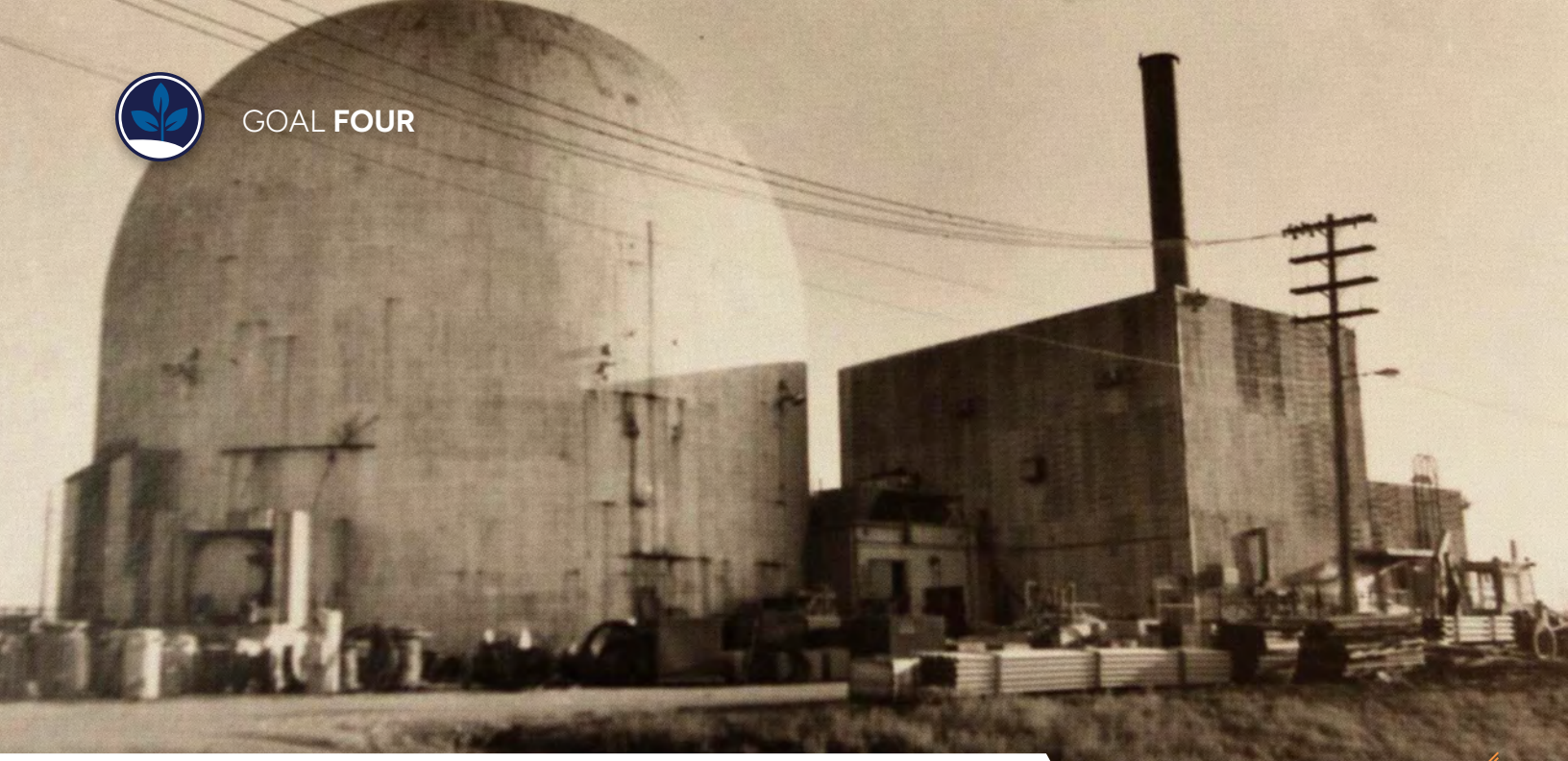
LM's David Von Behren, the supervisor of the Education, Communication, History, and Education team, said LM and LMSP personnel engaged with a wide range of professionals and communicated information alongside other industry leaders in a technically competent and sophisticated manner.

"The Waste Management Symposia brings the very best in our field together, and our team did an excellent job of representing the difficult work we perform and the important partnerships we have with other agencies, Tribal partners, and stakeholders," Von Behren said. "We find what we learn to be valuable, and we hope others find value in learning from us."

Several LM and LM staff participated at the conference, including:

- LM's Padraic Benson, who presented a historical summary on the Manhattan Project National Historical Project on a panel dedicated to the program.
- LM's Jay Glascock, who presented on a panel related to operational excellence and creating and maintaining a psychologically safe work environment.
- LM's Stephen Pitton, who participated on a panel session on Arctic monitoring and assessment of radioactivity in the Arctic environment.
- LM's Ken Kreie and Melissa Lutz, who presented on collaborative efforts between LM and the U.S. Army Corps of Engineers that have resulted in more efficiency in the Formerly Utilized Sites Remedial Action Program.
- LM's Michelle Franke, who presented on uranium treatment at the Rocky Flats Site in Colorado.
- LM's Bud Sokolovich and LM Support Partner Ann Wei, who presented on federal real property transfer and the Comprehensive Environmental Response, Compensation, and Liability Act 120(h) law.
- LM's Kate Whysner and Annette Moore and LM Support Partner Tony Pace, who presented on stakeholder collaboration on data management and long-term stewardship at the Tonawanda Landfill Site in New York.
- LM's Tiffany Drake and LM Support Partner Greg Lupton, who presented on the Mound Site in Ohio, including the 811-call notification system.
- LM's Mary Young, who presented on pore water accumulation and extraction enhancements at the Rifle Disposal Site in Colorado.
- LM's Brian Zimmerman and LM Support Partner Dave Parker, who presented on the demolition of the Piqua Decommissioned Reactor Site in Ohio.
- LM's Whysner and LM Support Partner Miquette Gerber, who presented on the diversity of LM sites.
- LM's Sokolovich also presented on condition assessments across LM's portfolio of sites.
- LM Support Partner John Boylan, who presented on careful design of site closures to avoid post-closure surprises.
- LM Support Partner Ray Johnson, who presented during a paper session on environmental remediation of uranium mines and mills.
- LM Support Partner Stuart Bartlett, who presented on permitting on the Navajo Nation.
- LM Support Partner Richie Ashcraft, who co-chaired a session on workforce development and community engagement.

The 2025 Waste Management Symposia attracted about 3,000 attendees and nearly 200 exhibitors from 30 countries.



Piqua reactor circa 1961.

LM Know-How and Knowledge Key in Safe, Successful Demolition of Piqua Decommissioned Reactor Building

Two-year project required 49,000 safe work hours

A successful demolition of a former decommissioned nuclear reactor facility without adversely impacting the low-level radiological waste entombment that remains in place isn't a typical project for LM to undertake.

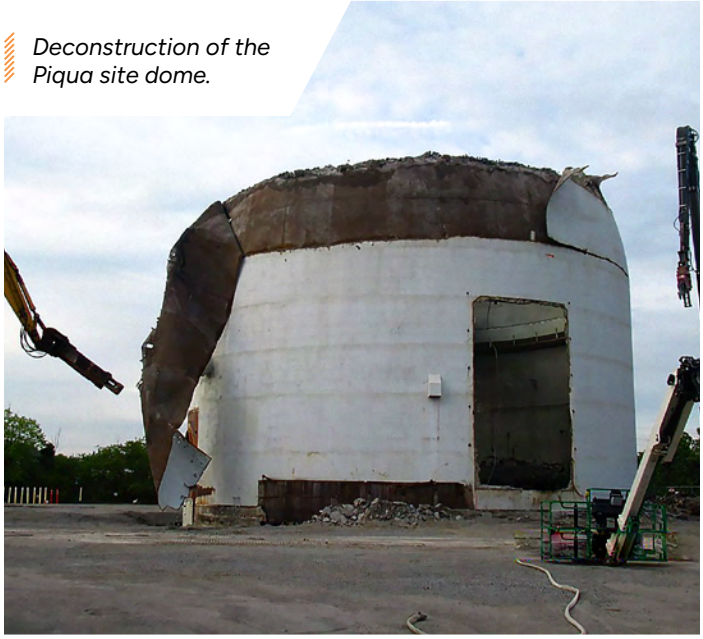
It takes years of design development, integrated planning among the support partners, and focused leadership. In the case of the demolition of the Piqua Decommissioned Reactor Site in Ohio, challenges arose real-time in the field. Subject matter experts from the U.S. Department of Energy Office of Legacy Management (LM) and its support partner, RSI, led the project to a safe and still-protective end state.

The Piqua Nuclear Power Facility was part of the U.S. Atomic Energy Commission's (AEC) Power Demonstration Reactor Program to explore peaceful applications of nuclear technology. Built in 1963, the reactor was one of the earliest municipal nuclear power-generating reactors. It operated for about two years before it was shut down and decommissioned due to technical issues. During the decommissioning process, AEC removed the reactor fuel and coolant that contained higher radioactivity and transported it to DOE's Oak Ridge Site in Tennessee for disposal. AEC sealed the remaining reactor vessel at Piqua and nonremovable parts in place with concrete.

The city of Piqua maintained the site and used the adjoining buildings for administrative offices and storage until 2018, when the city notified LM that near- and long-term maintenance costs at the site were much greater than anticipated, and they were no longer interested in using the facility. LM worked with the city to find a solution.

"Once the decision was made to move forward with demolition, the planning started. We had to come up with an approach that would be effective while mitigating risks. That's where we rely on our subject matter experts across the Office of Legacy Management," said LM Piqua Site Manager Brian Zimmerman. "Coordination across the organization was essential in getting the proper plans in place, then executed."

Piqua, Ohio, Decommissioned Reactor Site prior to demolition.



Deconstruction of the Piqua site dome.

In this case, the best way to do that was to demolish the site. This task was assigned to LM Support Partners Demolition Project Manager David Parker and Deputy Project Manager Amy Jones, who would see the project through from concept to completion.

"We had to write the demolition plan in chapters," said Parker. "It happens when dealing with the complexities of a project like this. The situation was ever evolving. It was daunting at times, but taking a step-by-step approach helped us stay focused, remain fluid, consult with experts, make appropriate adjustments, and keep moving."

The demolition project presented several challenges. The portion of the reactor facility above ground consisted of a 58-foot-tall concrete dome encased in a steel shell. The entombment structure containing the decommissioned reactor core could not be damaged during demolition.

LM encased the entombment structure with additional waterproof concrete to increase the longevity and protectiveness of the entombment while the radioactive elements naturally decay. This required the dome to be demolished from the top down in a highly controlled manner to ensure the dome debris fell in pieces that could be managed.

Workers used a lift to access the top of the dome and used a cutting torch to cut sections of the steel shell. Then they used a hydraulic claw to peel back the steel and broke the underlying concrete dome into manageable bits — piece by piece.

Once the dome structure was safely removed from the vertical walls of the containment shell, workers removed a steel gantry crane that was originally used to lower fuel material into the reactor. The gantry crane structure weighed more than 40,000 pounds. Removing this safely and without damaging the encased reactor required careful calculation, rigging, and a massive hydraulic crane.

"In projects like this, your situation may change, and you depend on the experience and precision techniques of LM and our contractors," Zimmerman said. "The safe demolition of the Piqua facility required expertise across a variety of areas, and it's that know-how that ensured a safe and successful demolition."

The project was officially declared complete in November 2023, after workers successfully removed and disposed of industrial and hazardous waste, demolished the dome and auxiliary building, encased the entombed core in two feet of self-healing waterproof concrete, and paved a parking lot for a protective cover that could also be beneficially used by the city. The two-year project required 49,000 work hours and was completed with no safety issues.

"This is a really good example of why LM exists as an organization," said Zimmerman. "Long-term stewardship is not passive; it's active. Sites, stakeholders, societies, and values evolve over time. We're here to oversee the remedy and protect human health and the environment over time."

Jay Glascock, LM's director for site operations, said, "The entire team did a great job. This was not an easy project, and this type of work is not something we do every day. The team should be commended for successfully and safely completing this major project. Their ability to work together, overcome challenges, and keep everyone safe while informing the local community along the way was tremendous."

Final end state of the Piqua site.

LM Site Manager Stephen Pitton shares a presentation about the LM Site in Amchitka, Alaska, at the Alaska Forum on the Environment in Anchorage in February 2025.

LM Partners with Office of Environmental Management to Present at Alaska Forum on the Environment

LM connects with stakeholders in Anchorage, Alaska, to share site information

The Alaska Forum on the Environment took place Feb. 3-7, 2025, in Anchorage, drawing attendees and exhibitors with an interest in the environment in Alaska. During the forum, the Department of Energy's (DOE) Office of Legacy Management (LM) engaged with participants at their booth and delivered a presentation. LM Site Manager Stephen Pitton and Office of Environmental Management General Engineer Amanda Anderson co-presented on "Monitoring Radioactivity in the Arctic."

Anderson, who is also the co-chair of the Arctic Monitoring and Assessment Programme Radioactivity Expert Group, began the presentation by highlighting the Radioactivity Assessment report, which is scheduled to be released this year. The publication will have five chapters, including a chapter on anthropogenic radioactivity, which mentions LM's site in Amchitka, Alaska.

Pitton highlighted LM's work in the second half of the presentation, noting that the agency is responsible for the long-term surveillance and maintenance of 103 sites. Two of those sites are in Alaska — Amchitka and Chariot.

The Chariot, Alaska, Site is in northwest Alaska. Project Chariot was part of the Plowshare Program, which was created in 1957 by the U.S. Atomic Energy Commission (a predecessor agency to DOE) and utilized atomic energy for peaceful purposes. The work at the site was canceled due to strong public opposition, and no nuclear tests were conducted nor any nuclear devices brought to the site.

The U.S. government conducted three underground nuclear tests at the Amchitka, Alaska, Site between 1965 and 1971. These locations are classified as a Weapons Related and Vela Uniform Site. Amchitka is located on the western end of the Aleutian Islands chain. LM monitors the radioactive and hazardous materials from those test sites and ensures the site continues to protect human health and the environment. The Amchitka site is typically inspected every five years.

Pitton said Amchitka's environmental sampling plan guides the labs and field teams for each inspection effort. Stakeholder input is important to LM, and the Amchitka Working Group helps to provide insight when developing the sampling plans. Members of the group include LM and LM Support Partners, the Alaska Department of Environmental Conservation, a consultant from the University of Alaska Fairbanks, the U.S. Fish and Wildlife Service, Lawerence Livermore National Laboratory, and Argonne National Laboratory. Alaska Native stakeholders also provide input to the group. The Amchitka Working Group analyzes the environmental sampling plan and refines the plan as needed.

During the last 25 years, over 1,000 biological samples representing 30 different species were collected at LM's Amchitka site. The samples represent resident species and subsistence- and commercial-catch seafood.

While the full data set from the 2023 sampling effort is still being processed, Pitton shared that tritium data was analyzed and concentrations are below the regulatory limits.

Overall, Pitton mentioned that the monitoring results from the last 25 years indicate that terrestrial and marine food resources are not being impacted by the historical underground testing and radiation concentrations in samples at Amchitka are similar to background levels.

DOE staff gathered at LM's booth at the Alaska Forum on the Environment in Anchorage in February 2025. Left to right: LM Public Participation Specialist Christine Jost, LM Director Carmelo Melendez, LM Site Manager Stephen Pitton, and Office of Environmental Management General Engineer Amanda Anderson.

LM Offers Specialized Trainings to Tribal Partners at Triannual Meeting

Courses include safe operation of UTVs, instruction on protection from radiation

At the request of Navajo and Hopi Tribes, the U.S. Department of Energy (DOE) Office of Legacy Management (LM) offered two specialized training courses to Tribal partners during a recent visit to Grand Junction, Colorado.

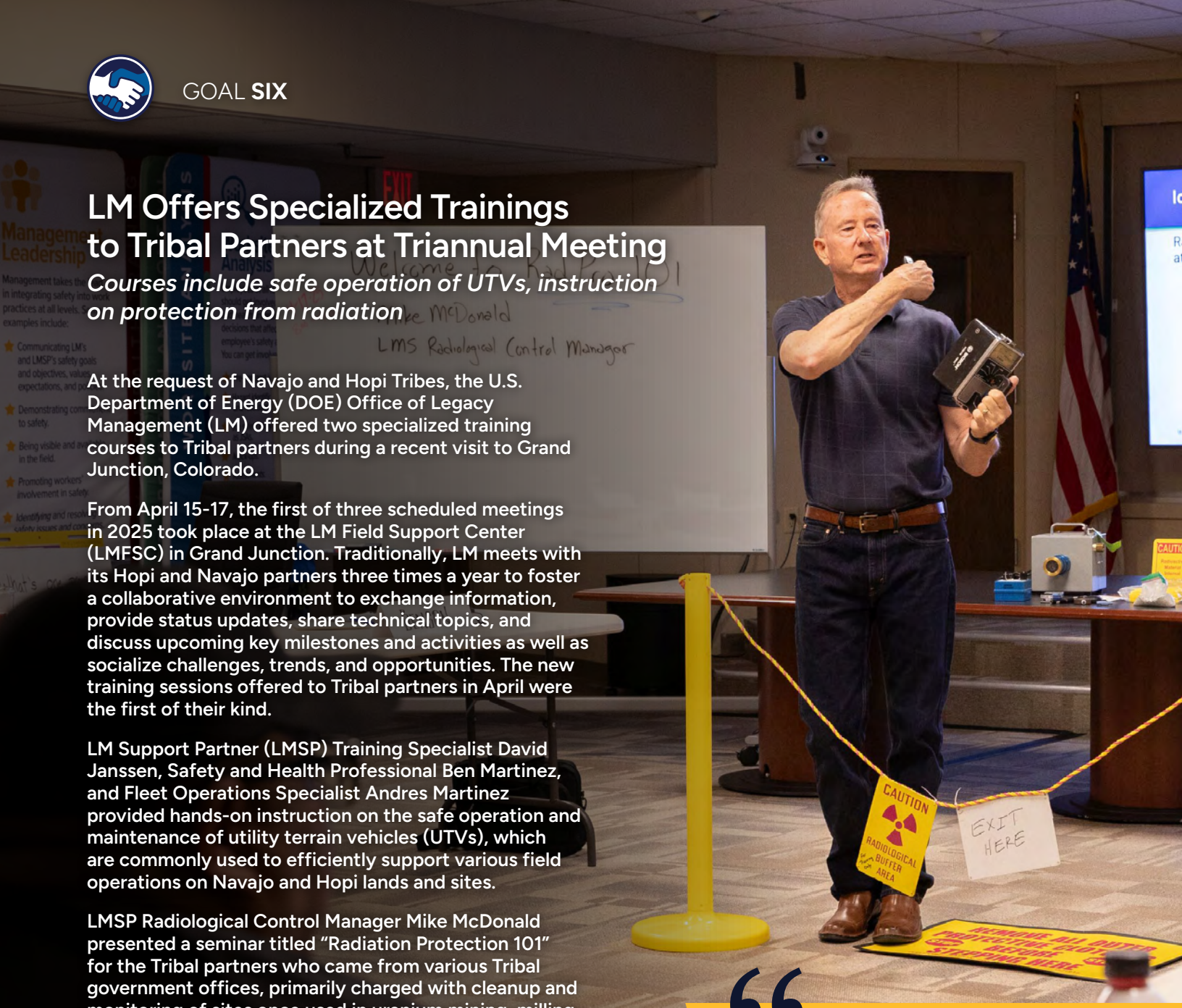
From April 15-17, the first of three scheduled meetings in 2025 took place at the LM Field Support Center (LMFSC) in Grand Junction. Traditionally, LM meets with its Hopi and Navajo partners three times a year to foster a collaborative environment to exchange information, provide status updates, share technical topics, and discuss upcoming key milestones and activities as well as socialize challenges, trends, and opportunities. The new training sessions offered to Tribal partners in April were the first of their kind.

LM Support Partner (LMSP) Training Specialist David Janssen, Safety and Health Professional Ben Martinez, and Fleet Operations Specialist Andres Martinez provided hands-on instruction on the safe operation and maintenance of utility terrain vehicles (UTVs), which are commonly used to efficiently support various field operations on Navajo and Hopi lands and sites.

LMSP Radiological Control Manager Mike McDonald presented a seminar titled "Radiation Protection 101" for the Tribal partners who came from various Tribal government offices, primarily charged with cleanup and monitoring of sites once used in uranium mining, milling, and production on Tribal lands.

Janssen said the goal of the presentation was to provide participants with information on what ionizing radiation is, where it comes from, how it damages living tissue, and how much it takes to cause harm to humans. McDonald discussed the risk associated with occupational radiation exposure compared to other industries and everyday activities and how people can protect themselves in an occupational setting.

With this information, attendees were provided the foundational basis on which they can evaluate the risk associated with exposure to low levels of ionizing radiation, both from background and occupational sources, Janssen said.



> *The trainings fulfilled a vision we collectively established over a year ago between LM and our Tribal partners.*
>
> —Paul Kerl

LMSP Radiological Control Manager Mike McDonald presents a seminar titled "Radiation Protection 101" to attendees at the Navajo-Hopi-DOE Triannual Meeting in Grand Junction, Colorado.

"Along with this knowledge is an explanation of the LM mission as it pertains to the protection of human health and the environment," he said. "Part of this discussion is the history of where we came from and where we are at now."

Representatives of the Hopi and Navajo Tribes requested the trainings, and LM was excited to afford "an enriching opportunity to provide them," said LMFSC Office Manager Paul Kerl.

"The trainings fulfilled a vision we collectively established over a year ago between LM and our Tribal partners," Kerl said.

During a previous triannual session, Karen Bedonie of the Navajo Abandoned Mine Lands Department (NAML) asked what training tracks LM used to train personnel who work at sites under the authority of the Uranium Mill Tailings Radiation Control Act (UMTRCA).

"The UMTRCA community of practice is truly a niche field, and most training takes place on the job," Kerl said. "We realized that our existing in-house training would be valuable to our partners, so we identified the training that best aligned with our mutual interest and needs."

LM then systematically reviewed the content to convert the training curriculums from inward facing to be more presentable to external audiences.

LMSP Safety and Health Professional Ben Martinez provides instruction on the safe operation and maintenance of utility terrain vehicles.

At the meeting in Grand Junction, participants exchange information on work taking place at four former uranium-processing sites on the Navajo Nation.

"With that process complete, we finally were able to deliver on the promise to help afford training opportunities to those we work so closely with in the Tribal communities," Kerl said.

"The training is also a good refresher for those who have been working in this field for some time," he said. "It's important to continue to fold in lessons learned into the training to keep it relevant and state of the art."

LM staff meets regularly with its Tribal partners, who are included in outreach activities, document review and participation in annual site inspections, and site security visits at four former uranium-processing sites on the Navajo Nation.

LM relies on its partnerships with the Navajo and Hopi governments, such as the NAML program. This Tribal department works closely with LM and its partners to monitor daily activities occurring at the four sites.

Cory Dayish, an environmental specialist with NAML in Shiprock, New Mexico, said he was happy to take part in the trainings in Grand Junction.

"I'm getting a lot of information about the different radiation monitoring and how to interpret that for community outreach and transmit that to the Navajo Nation," he said. "I'm still learning and looking for the information that's most helpful."

LM Deputy Director Retires

Whiteford ends federal career after 37 years

LM Deputy Director Scott Whiteford was awarded a Distinguished Career Service Award April 24 for his contributions to the U.S. Department of Energy (DOE) within the Office of Legacy Management (LM) and previously as director of the Office of Asset Management.

Whiteford was recognized by LM Director Carmelo Melendez at an LM managers meeting at DOE Headquarters in Washington, D.C. Melendez said Whiteford's contributions were substantive and that his achievements were across many areas.

"You were instrumental in affecting change by improving long-term sustainability of environmental remedies with your expert knowledge, willingness to address complex and often controversial issues, and ability to put forth amiable collaborative innovative solutions," Melendez said. "You have been an accomplished leader, colleague, and manager in bringing LM to where it is today, a recognized organization in long-term stewardship of former atomic sites."

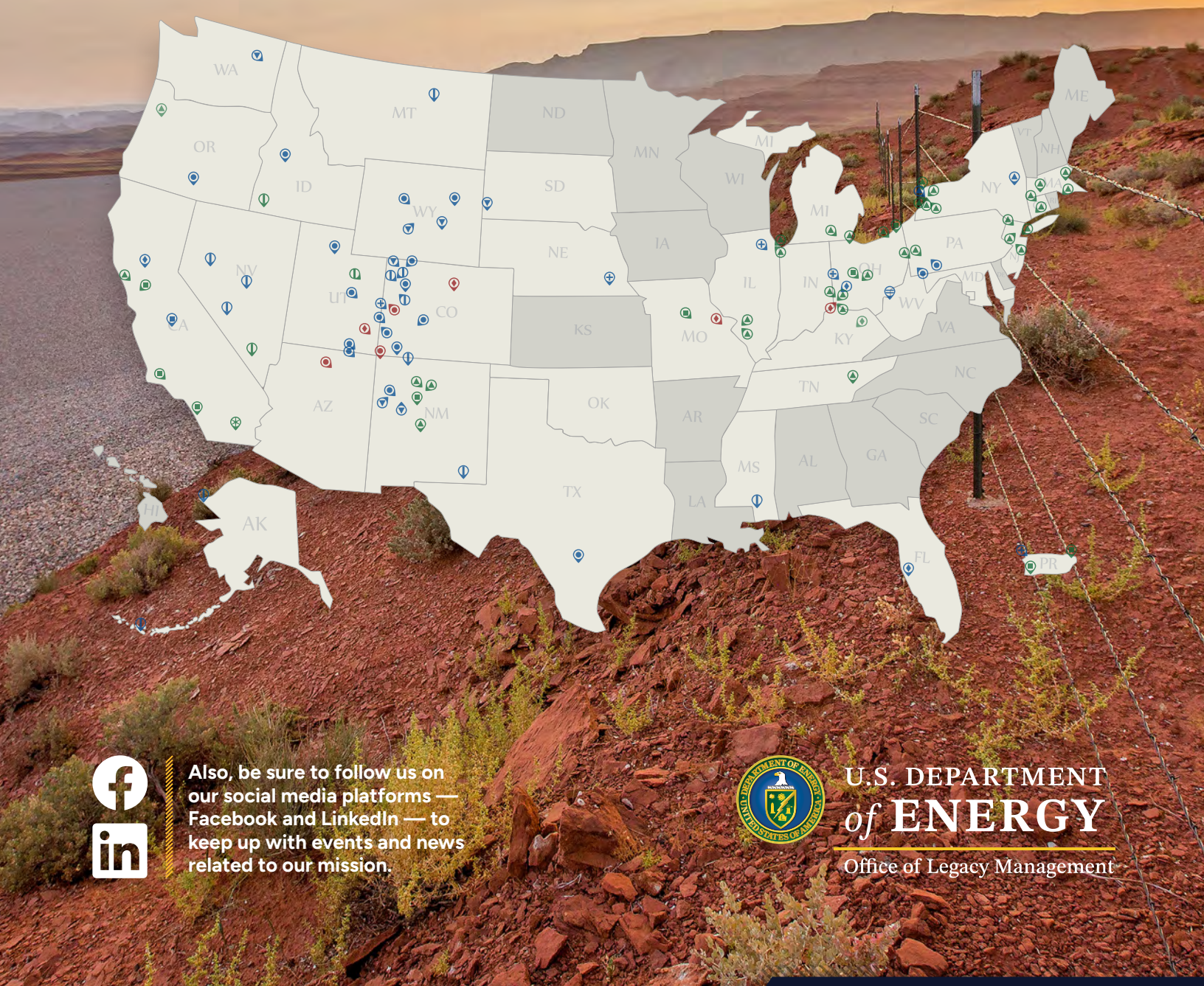
Whiteford is a member of the Senior Executive Service, and his retirement follows 37 years of federal service.

LM Deputy Director Scott Whiteford, right, is awarded a Distinguished Career Service Award April 24 by LM Director Carmelo Melendez, left.

WOULD YOU LIKE TO Learn More?

You can get valuable information about the U.S. Department of Energy Office of Legacy Management on our website.

www.energy.gov/lm/office-legacy-management



Also, be sure to follow us on our social media platforms — Facebook and LinkedIn — to keep up with events and news related to our mission.

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