



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

Program Update

January–March 2013

Welcome to the January–March 2013 issue of the U.S. Department of Energy (DOE) Office of Legacy Management (LM) Program Update. This publication is designed to provide a status of activities within LM. Please direct all comments and inquiries to lm@hq.doe.gov.

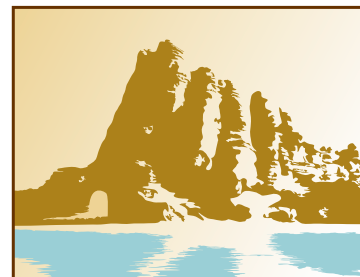
Goal 4

Abandoned Uranium Mines Report to Congress: LM Wants Your Input

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) is seeking stakeholder input on an abandoned uranium mines report to Congress. On January 2, 2013, President Obama signed into law the National Defense Authorization Act for Fiscal Year 2013, which requires the Secretary of Energy, in consultation with the Secretary of the U.S. Department of the Interior (DOI) and the Administrator of the U.S. Environmental Protection Agency (EPA), to undertake a review of, and prepare a report on, abandoned uranium mines in the United States

that provided uranium ore for atomic energy defense activities of the United States. The Act also requires consultation with other relevant federal agencies, affected states and tribes, and the interested public.

LM was selected to develop the report to Congress because of our expertise in uranium milling and mining. LM currently manages postclosure activities at 89 sites, and 27 of those are uranium mill sites remediated under Title I or Title II of the Uranium Mill Tailings Radiation Control Act (UMTRCA). UMTRCA sites once processed ore used for atomic energy defense activities from many of the known abandoned uranium mines. Most of these abandoned mines are located in the southwestern part of the country within the area known as the Uravan Mineral Belt. Other LM activities include the reclamation of uranium at a select number of abandoned uranium mines that were a legacy of the DOE Uranium Leasing Program, reclamation of uranium mines through DOI's Bureau of Land Management (BLM) Work-for-Others



Report to Congress

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C-SR-10 Uintah Mine, Colorado
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Visit us at <http://energy.gov/lm/>



Goal 2

LM Discusses Management of LTS&M Records

The U.S. Department of Energy Office of Legacy Management's (LM) efforts to maintain long-term surveillance and maintenance (LTS&M) records were highlighted during the 2013 Waste Management Symposia held February 24 through 28, in Phoenix, Arizona.

John Montgomery, LM Archives and Information Management Team Leader, discussed challenges in maintaining records regarding the Cold War–era nuclear weapon production sites. These challenges include understanding the contents of record collections, organizing access to the records, and incorporating new records to maintain comprehensive information about each site.

Maintaining access to the knowledge contained in LTS&M record collections is one of LM's primary responsibilities. To fulfill its responsibilities, LM established a consolidated records storage facility at the LM Business Center in Morgantown, West Virginia. The facility is certified by the National Archives and Records Administration as an official repository for federal government records.

Montgomery explained LM's efforts to replace an obsolete electronic recordkeeping system. The new system institutes and enforces controls to maintain information authenticity. The system is used to research stakeholder requests made via the Freedom of Information Act, the Privacy Act, and other formal request processes.

The session also emphasized LM's work to maintain information about the sites for current and future uses. Historical and current information is needed to perform surveillance and maintenance activities and will provide the framework to tell each site's story to future generations.

The 2013 Waste Management Symposia attracted nearly 2,000 registrants from around the world. The conference is organized in cooperation with several organizations and government agencies, including the U.S. Department of Energy. ❖

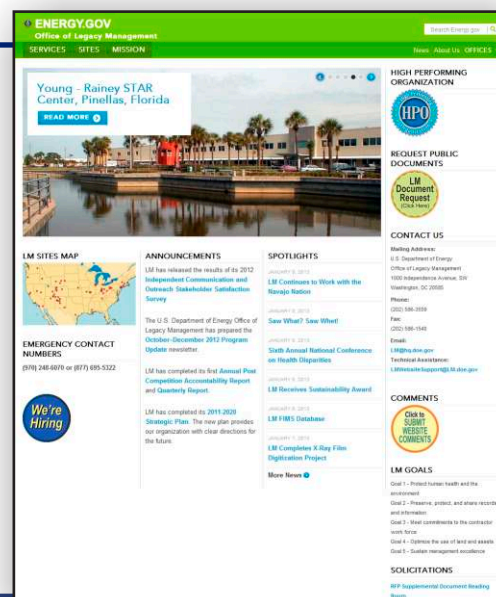


Mr. Montgomery explains LM's efforts in the management of LTS&M records at the 2013 Waste Management Conference.

Goal 2

LM Launches New Website Under energy.gov

On March 22, 2013, the Office of Legacy Management (LM) launched a new website at <http://energy.gov/lm/>. A video, *A Legacy of Stewardship*, is posted on the About Us page of the new website and provides information about LM's commitment to managing its responsibilities associated with the legacy of World War II and the Cold War. ❖





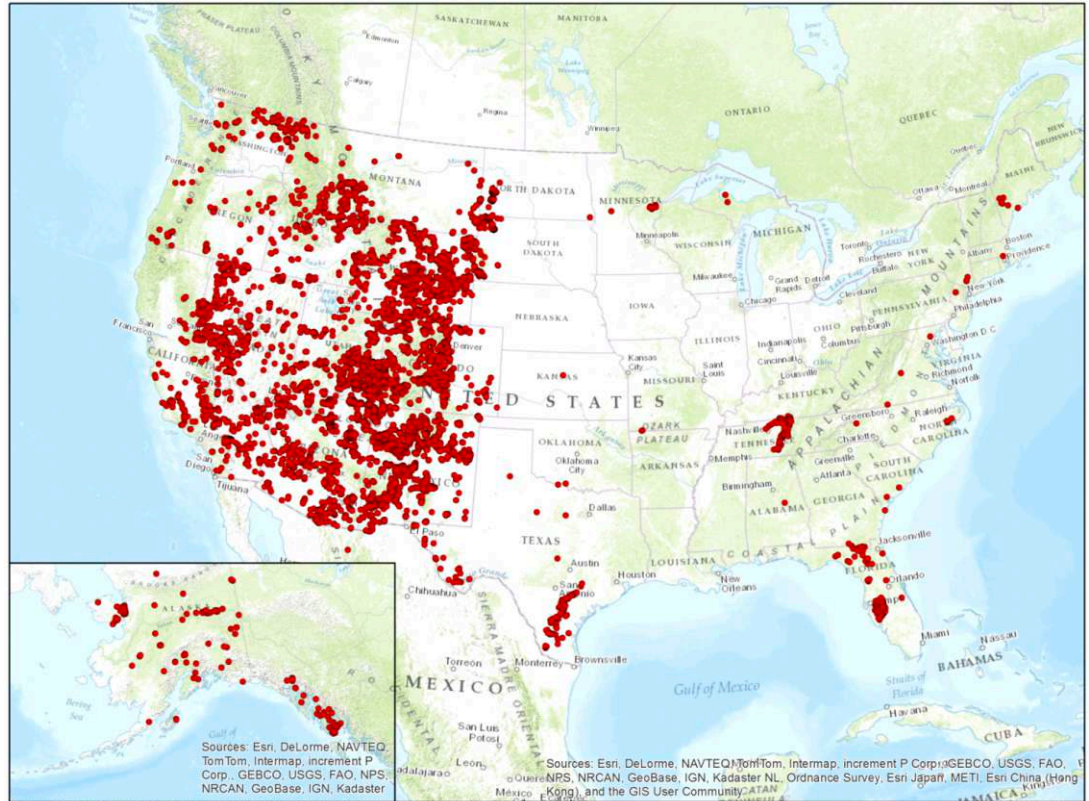
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Abandoned Uranium Mines Report to Congress: LM Wants Your Input

Program, and involvement in an EPA-led interagency work group reviewing the design of a repository to contain waste from the largest underground uranium mine on Navajo Nation land.

About the Abandoned Uranium Mines Report to Congress

DOE is required to submit the Abandoned Uranium Mines Report (AUM report) concerning abandoned uranium mines that provided uranium ore for atomic energy defense activities of the United States to Congress by July 2014. LM is focusing its review of abandoned uranium mines on



U.S. Environmental Protection Agency's Uranium Location Database Compilation.

- the location of abandoned uranium mines on federal, state, tribal, and private land, taking into account existing inventories held by federal agencies, states, and Indian tribes, and any additional information available to the Secretary;
- the extent to which abandoned uranium mines pose, or may pose, a significant radiation hazard or other public health and safety threat, and have caused, or may cause, water or other environmental degradation;
- a ranking of priority category for the remediation and reclamation of abandoned uranium mines;
- the potential cost and feasibility of remediating and reclaiming, in accordance with applicable federal law, each category of abandoned uranium mines; and
- the status of any efforts to remediate and reclaim abandoned uranium mines.

LM's approach to conducting the review and preparing the AUM report is to maximize the use of existing information on abandoned uranium mines, including shared databases from federal, state, and tribal agencies. Cleanup standards and costs of reclamation and remediation efforts performed by other agencies and the private sector also will inform the report.

LM Consultation with EPA, DOI, and Other Federal Agencies

Dr. David Shafer of LM's Office of Site Operations is organizing consultation with DOI and EPA officials on abandoned uranium mine efforts. The three agencies will serve as a steering committee to determine the best approach to complete the AUM report. LM is also engaging other relevant federal, state, and tribal agencies by participating in teleconferences with senior abandoned mine lands experts.

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Abandoned Uranium Mines Report to Congress: LM Wants Your Input

LM Consultation with Affected Stakeholders

So, how can affected stakeholders provide input on the AUM report? LM plans to present information at stakeholder forums listed in the table at right.

LM will consult with affected states and tribes and the interested public at these events, as well as at other existing forums recommended by abandoned mine lands experts and organizations.

LM Information Needs

To fulfill Congress's mandate, LM needs to obtain information unique to abandoned uranium mines, including

- environmental data associated with abandoned uranium mines (i.e., radiological readings, water quality, radon levels);
- locational data of abandoned uranium mines (GIS mapping, longitude/latitude);
- photographs or drawings of abandoned uranium mine attributes;
- data pertaining to abandoned uranium mine cleanup prioritization efforts;
- reclamation and remediation cost information;
- awareness of any notable community and private sector interest; and
- regulations/requirements in place or being considered for uranium mine cleanup.

Interstate Mining Compact Commission (IMCC) Western Region Hardrock/Noncoal Symposium http://www.imcc.isa.us/Conference.htm	March 27 and 28	Salt Lake City, Utah
EPA Navajo Nation Uranium Contamination Stakeholder Workshop http://www.epa.gov/region9/superfund/navajo-nation/stakeholder.html	April 16 and 17	Gallup, New Mexico
Annual National Mining Association/Nuclear Regulatory Commission Recovery Workshop http://www.uraniumrecoveryworkshop2013.myevent.com/	May 1 and 2	Denver, Colorado
2013 National Association of Abandoned Mine Land Programs Conference http://www.naamlp2013.com/	September 22 through 25	Daniels, West Virginia
U-2013 Global Uranium Symposium http://u-2013.org/	September 29 through October 3	Corpus Christi, Texas

Forums where LM will consult with stakeholders.

If you have information to share, please submit it by e-mail to AUM@lm.doe.gov. Any input is welcome and appreciated.

We also encourage you to submit comments, questions, and suggestions about the AUM report on LM's Abandoned Uranium Mines webpage at www.lm.doe.gov/AUM. A fact sheet about the AUM report, updates about the review of abandoned uranium mines, and other helpful materials can also be found here. Please click on the button on the right-hand side of the webpage to submit your comments. Thank you for your interest in this important effort. ❖



Goal 1

Biological Monitoring at Amchitka Appears to Show Impacts from Fukushima Dai-ichi Incident

The U.S. Department of Energy Office Legacy Management (LM) has a long-term stewardship mission to protect human health and the environment from the legacy of underground nuclear testing conducted at Amchitka Island, Alaska, from 1965 to 1971. As part of its mission, LM collected biological and seawater samples from Amchitka and Adak Islands, for background comparison, and the surrounding waters of each island during the summer of 2011. The biological samples were analyzed for seven radionuclides, including cesium-137, americium-241, plutonium-239 and 240, and uranium-234, 235, and 238. Seawater samples were analyzed for tritium.

A magnitude 9.0 earthquake and subsequent tsunami struck Japan on March 11, 2011, just 3 months before LM's biological sampling event near Amchitka. Several reactors at the Fukushima Dai-ichi Nuclear Power Plant were severely damaged, releasing radioactive materials into the environment. Atmospheric monitoring in the United States showed elevated cesium activities shortly after the nuclear incident. LM scientists anticipated that atmospheric transport of cesium would potentially increase the cesium activities in the 2011 biological samples collected near Amchitka. Because cesium-134 has a relatively short half-life of 2 years and indicates leakage from a nuclear reactor, it is a clear indicator of a recent nuclear accident and, if present with cesium-137, which can come either from a leaking reactor or a weapons test, would help LM explain the source of elevated cesium levels measured near Amchitka. This is because cesium-137, whose half-life is 30 years, could mistakenly be interpreted as leaking from an underground nuclear test that occurred more than 50 years ago, were it not for the confirmed presence of cesium-134 in the sample. LM decided to add cesium-134 to the list of radionuclides that would be monitored during the 2011 sampling event to help explain the elevated cesium-137 levels that were anticipated after the Fukushima Dai-ichi incident.

Lawrence Livermore National Laboratory performed the radioisotopic measurements for the Amchitka biological sampling event. Results of the monitoring



An LM scientist points to star reindeer lichen on Adak Island, Alaska.

showed that Dolly Varden (a type of freshwater char, a trout-like fish), rockweed (littoral-zone algae), and to a lesser extent, Irish Lord (a small near-shore fish), appear to contain an isotopic signature from Fukushima. Star reindeer lichen, which absorbs moisture and particulates from the atmosphere, was also found to contain elevated cesium activities, with cesium-134 constituting a large percentage of the total cesium results. The monitoring results showed that the cesium content was larger at the reference area (Adak Island) than on Amchitka Island. Apparently, the reference area was aligned more closely along wind directions emanating from Fukushima.

Because the Amchitka 2011 sampling event occurred soon after the Fukushima nuclear accident, the biota impacted by atmospheric precipitation showed the greatest impact (e.g., species that live in freshwater or shallow ocean waters) when compared to marine biota living in deeper water. This is because ocean currents are a slower transport process than wind currents. LM scientists anticipate that the marine biota will show the impacts of Fukushima during the next sampling event, currently scheduled to occur in 2016. A documentary video that describes the 2011 monitoring event may be viewed from the following link:

<http://www.lm.doe.gov/Amchitka/Sites.aspx>. ❖



Goal 1

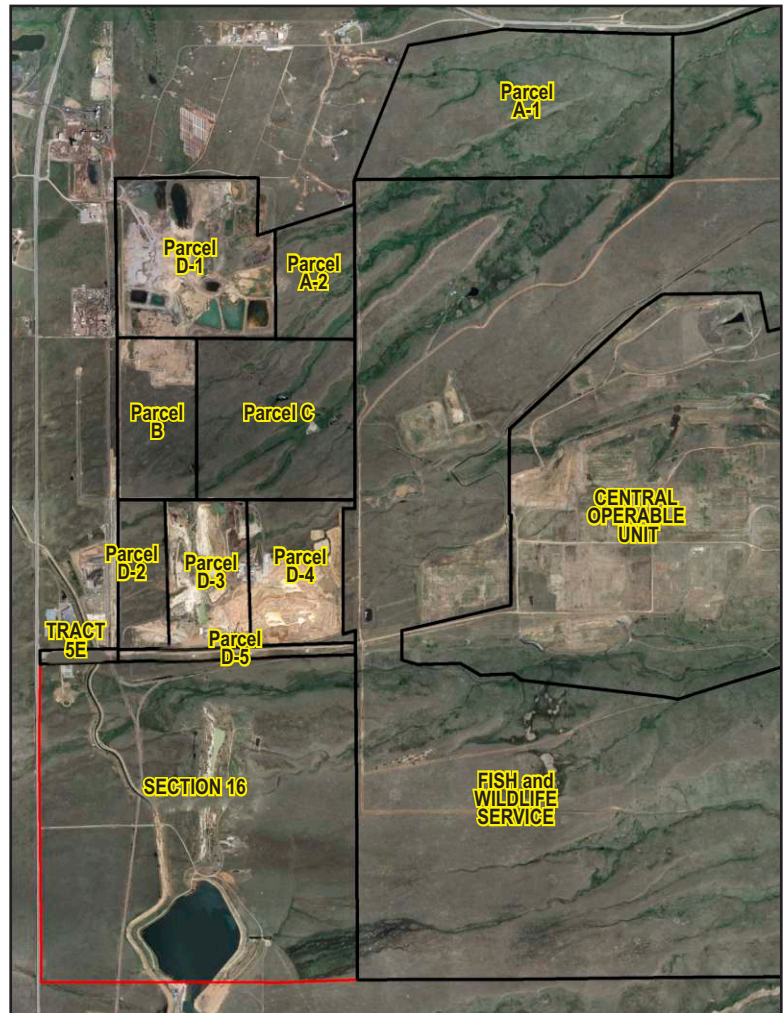
Completion of the CERCLA Natural Resource Damage Process at the Rocky Flats Site

Discharges of hazardous constituents to the soil and water at the Rocky Flats, Colorado, Site during nearly 50 years of nuclear weapons component production resulted in residual contamination in the soil and groundwater. The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) places liability on the discharger of hazardous constituents for damages to natural resources due to those discharges. DOE is responsible for those damages at the Rocky Flats site.

In keeping with the effort to close the site ahead of schedule, DOE secured an agreement with the U.S. Fish and Wildlife Service (USFWS), the State of Colorado, and Colorado's U.S. Congressional delegation to extinguish any claim to natural resource damages (NRD) by the state. In exchange for extinguishing potential NRD claims, \$10 million dollars was provided to protect critical upland prairie habitat on the western portion of the site that contained privately owned mineral rights, as shown in the figure at right.

The funding was secured for DOE by Congress under the National Defense Authorization Act for Fiscal Year 2006 in what became known locally as the Minerals Act. DOE, USFWS, and three agencies of the State of Colorado then formed the Rocky Flats Natural Resource Trustee Council to manage the use of the money. Normally, a typically long and contentious assessment of the scope and cost of the NRD is conducted before funding is sought and provided for projects to offset those damages.

However, in this case, DOE was quick to use the funding by purchasing three separate parcels of minerals underlying the surface lands already owned by the U.S. government in 2007. These parcels are labeled A-1, A-2, and C on the figure at the right. The remaining funds were subsequently transferred to an interest-earning account controlled by the Colorado Department of Public Health and the Environment. The trustee council approved several other projects, including contributing to a local municipality a percentage



The western portion of the Rocky Flats, Colorado, Site.

of the purchase price of a property to the east of the site for inclusion within their protected open-space program. Another project completed in 2009 involved purchasing the minerals underlying a portion of the property to the northwest of the site, while gaining a donation of the remaining minerals underlying Parcel D-1.

Just recently, the trustees were involved in a very complex deal with the USFWS, several agencies, and many municipalities adjacent to Rocky Flats that completed the 10-year effort to purchase mineral estates and extinguish mining leases and permits on all the western mining parcels. The deal included the purchase of mineral rights underlying Parcels B and D-2, the last of the parcels containing the critical habitat identified by the Minerals Act. The deal also

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Goal 1

Environmental Justice Activities

Bolton Community Leaders' Institute Conference

The Bolton Community Leaders Institute (CLI) held a conference on February 22 and 23 at the Southeastern Community College in Whiteville, North Carolina. The conference was sponsored by the Medical University of South Carolina, U.S. Department of Energy, Southeastern Virtual Institute for Health Equity and Wellness, U.S. Department of Defense, South Carolina State University, Southeastern Community College, Town of Bolton, Countywide Community Development Corporation, and Town of Navassa. The CLI continues to build on the theme Building and Sustaining Healthy Communities. A critical factor in the success of community development programs is a well-informed community. Action occurs when those with authority assume an informed and active leadership role.

The purpose of the CLI is to help these leaders know how to access and obtain information necessary for making good decisions and communicating that information to the citizenry. The focus of the CLI is on the unique relationship between environmental protection, human health, environmental justice, and economic development. Sessions for this CLI included the intergovernmental relationship between federal, state, and local governments; youth issues and challenges experienced by youth in the community; the development of resources needed to meet these challenges; economic development; housing and transportation focusing on creating a plan to stimulate the retention, expansion, and attraction of businesses and economic development to the community; and health disparities, especially the combined effects of diabetes, hypertension, and obesity known as metabolic syndrome. One of the many highlights of the CLI was a presentation by Eboni Smith, a senior at East Columbus High School in Lake Waccamaw, North Carolina. Eboni was invited and has agreed to also present at the National Environmental Justice Conference and Training Program, which is scheduled to take place April 3 through 5, 2013, in Washington, DC. ❖



Dr. Kathy Matlock speaks at the Community Leaders' Institute in Bolton, North Carolina, while Dr. David Rivers (left) and Mayor Terry Mann (right) listen.

New York Power Authority – DOE EJ Partnership

The U.S. Department of Energy's (DOE) Environmental Justice (EJ) Program and Tennessee State University (TSU) have entered into a partnership with the New York Power Authority (NYPA) to address EJ awareness and concerns within the NYPA. NYPA addresses community engagement activities in its EJ Plan by partnering with EJ communities and all stakeholders to strengthen environmental protection in low income and minority communities. NYPA has partnered with community groups and organizations such as United Puerto Rican Organization of Sunset Park in Brooklyn, New York, and the Community Foundation for Greater Buffalo to address EJ and similar concerns in disenfranchised and affected areas collaborating in community projects and services. NYPA intends to continue and expand such efforts to promote and achieve EJ as part of its commitment to its neighboring communities.

DOE and TSU are involved in the training aspect of NYPA's Implementation Plan. DOE and TSU will provide EJ training to selected NYPA managers and employees, consistent with similar training that was provided to DOE. This training will consist of an interactive classroom type setting with PowerPoint presentations, as well as printed handouts. ❖

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Environmental Justice Activities

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Atlanta Community Leaders' Institute Conference

The Atlanta Community Leaders Institute (CLI) held a conference on February 8 and 9 at Morehouse School of Medicine, in Atlanta, Georgia. The conference was sponsored by the Medical University of South Carolina, U.S. Department of Energy, Southeastern Virtual Institute for Health and Wellness, U.S. Department of Defense, DeKalb County, Morehouse School of Medicine, U.S. Department of Housing and Urban Development, Georgia Women for a Change, Urban League of Greater Atlanta, and Atlanta Community Food Bank. The CLI continues to build on the theme Building and Sustaining Healthy Communities. A critical factor in the success of community development programs is a well-informed community. Action occurs when those with authority assume an informed and active leadership role.

The purpose of the CLI is to help these leaders know how to access and obtain information necessary for making good decisions and communicating that

information to the citizenry. The focus of the CLI is on the unique relationship between environmental protection, human health, environmental justice, and economic development. Sessions for this CLI included the role of government, focusing on the intergovernmental relationship between federal, state, and local governments; issues and challenges experienced by youth in the community and the development of resources needed to meet these challenges; economic development; housing; and health disparities and health issues, especially the combined effects of diabetes, hypertension, and obesity known as metabolic syndrome. Dr. David Satcher, former U.S. surgeon general and current president of the David Satcher Institute at Morehouse College of Medicine, provided the keynote address. The Atlanta CLI was one of the largest ever held, with approximately 300 participants and attendees. ❖



Dr. David Satcher speaks at the Community Leaders' Institute at Morehouse School of Medicine in Atlanta, Georgia.



Goal 1

Mound Museum Volunteers: Preserving a Laboratory's Legacy

The Mound Science and Energy Museum (MSEM) owes its success to dedicated volunteers and supporters. The MSEM currently has 40 active volunteers and 200 dues-paying members.

After the decision to close the U.S. Department of Energy (DOE) Mound site was finalized in 1992 and site cleanup efforts were underway, four volunteers stepped forward in 1998 to start a museum as a way to preserve the heritage of the Mound site. Their goal was to document a sense of the people and environment that led to a half-century of scientific and technical accomplishments. Monthly meetings were originally held in these volunteers' homes as they formulated their initial preservation efforts. The numbers of volunteers gradually grew to approximately one dozen. As their organizational efforts progressed, planning meetings were held at various locations at the Mound site and around the City of Miamisburg. In 2005, Mound Development Corporation (MDC), formerly Miamisburg Mound Community Improvement Corporation, offered the use of a small building onsite that had previously been transferred to them. A protocol was worked out to allow the MSEM (formerly Mound Museum Association) to request from DOE known excess historical documents and artifacts being discarded as part of the remediation efforts at the site. MDC acted as an intermediary between DOE and MSEM. Following approval of the request, the items were transferred to the museum. A number of privately held historical articles and collections were also generously donated by museum supporters.

The MSEM collection currently contains 70,000 declassified photographs, 5,000 unclassified/declassified reports, and 1,400 technical books and journals. The collection also contains numerous items from the site's production days, including declassified nuclear weapons components and heat-source components and models. The heat sources were assembled at Mound by skilled technicians to provide electricity for NASA's deep space flights. Many of the heat sources are still functioning on missions such as Pioneer, Voyager, and Galileo.

The MSEM recently became a member of the American Association for State and Local History and has developed relationships with the National Atomic Museum, the Rocky Flats Cold War Museum, and the Carillon Historical Park in nearby Dayton, Ohio.

After being housed in several facilities both onsite and offsite, in 2011, the museum relocated to its present location in a former Mound site building.

Local high school groups tour the facility as an educational experience, and the museum has been visited by people from around the country. Educational seminars are conducted monthly on a variety of scientific and historical ventures by former employees and other experts. The seminars, which are open to the public, are held on the fourth Wednesday of each month at 7:00 p.m. The MSEM is open to the public Tuesdays 1:00 p.m. to 3:00 p.m. and Saturdays 9:00 a.m. to noon.

For more information call (937) 353-4457 or visit moundmuseum.com. ❖



Ray Seiler, Mound Science and Energy Museum President, is one of the many museum volunteers who routinely talks to visitors, such as this group from Iowa who are interested in the history of the Mound site.



Goal 4

DOE Evaluates Environmental Impacts of Uranium Mining on Government Land in Western Colorado

On March 15, 2013, the U.S. Department of Energy (DOE) released the *Draft Uranium Leasing Program Programmatic Environmental Impact Statement* (ULP PEIS) for a 60-day public review and comment period. This document completed the first major component of an evaluation of the potential environmental impacts of its Uranium Leasing Program (ULP), a program that leases specific tracts of land in western Colorado for uranium mining.

The draft environmental impact statement can be found on the ULP PEIS website, <http://ulpeis.anl.gov>, and on the DOE National Environmental Policy Act (NEPA) website at <http://energy.gov/nepa>.

DOE's Office of Legacy Management administers the ULP, which consists of 31 tracts of land covering an area of approximately 25,000 acres in Mesa, Montrose, and San Miguel counties. The tracts are leased to private entities to mine uranium and vanadium. No mining operations are active on the ULP lands at this time.

DOE is preparing the ULP PEIS to analyze the reasonably foreseeable potential environmental impacts, including the site-specific and cumulative impacts, of a range of selected alternatives for managing the program.

DOE evaluated five alternatives, ranging from cancelling the program to the no-action alternative of continuing the program as it was managed prior to this evaluation for the remainder of the 10-year period. DOE identified the preferred alternative as continued management of the program with exploration, mine development and operations, and reclamation at the 31 lease tracts for the next 10-year period or for another reasonable period of time.

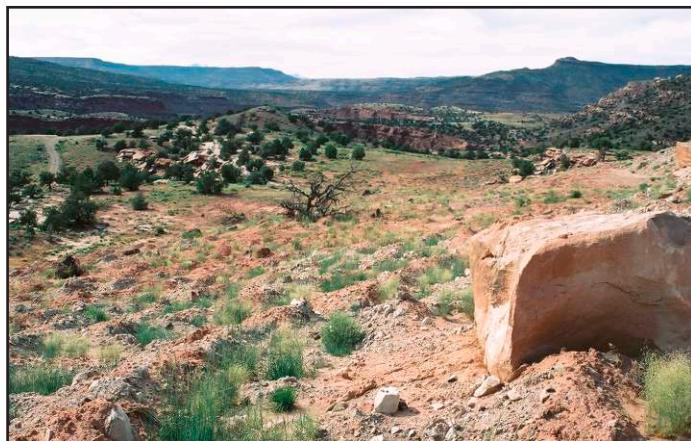
DOE will host four public hearings during the week of April 22, 2013, to take public comments on the ULP PEIS in the following Colorado communities.

- Grand Junction: April 22, 2013, from 6:30 p.m. to 9:00 p.m. at the Colorado Mesa University, University Center Ballroom, 1455 N. 12th Street, Grand Junction, Colorado
- Montrose: April 23, 2013, from 6:30 p.m. to 9:00 p.m. at the Johnson Elementary School, 13820 67.00 Road, Montrose, Colorado
- Telluride: April 24, 2013, from 6:30 p.m. to 9:00 p.m. at the Telluride Middle/High School, 725 W. Colorado Avenue, Telluride, Colorado
- Naturita: April 25, 2013, from 6:30 p.m. to 9:00 p.m. at the Naturita School, 141 W. Main Street, Naturita, Colorado

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C-JD-8 Mine: The mine ceased operations in November 2005 and the lessee placed the operation on standby status. The lessee continues to maintain the mine in standby status, pending the outcome of the PEIS.



C-SR-13A Mine: The mine site was reclaimed by the lessee in February 2003; however, the mine could be reopened by the lessee in the future, pending the outcome of the PEIS.



Goals 1 and 4

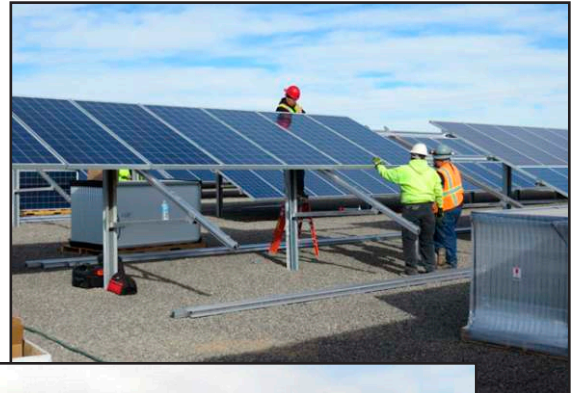
Solar Photovoltaic System at Tuba City Site

In March 2013, the U.S. Department of Energy (DOE) Office of Legacy Management (LM) completed construction of a 285 kilowatt solar photovoltaic system at the Tuba City, Arizona, Disposal Site. This project expanded upon an existing solar photovoltaic array, bringing the site-wide capacity to 335 kilowatts. Annually, it is expected to produce about 615,000 kilowatt hours of electricity, which is enough to power about 50 average American homes for an entire year. The site also hosts a concentrating solar power assembly to preheat water to be treated in the disposal site's groundwater treatment plant.

The electricity generated will power the groundwater treatment facility located onsite. Under normal operating conditions, the facility consumes 250 to 300 kilowatts per hour to pump and treat approximately 90 to 100 gallons per minute of groundwater. Since the plant typically operates day and night, the solar array will not be able to provide 100 percent of the electricity required. However, during periods of peak sunlight, generation will exceed consumption and the array will feed the excess electricity back to the utility grid; LM will then receive credit for this electricity from the utility provider.

The project contributed greatly to meeting DOE sustainability goals. With the added capacity, DOE is not only able to meet its renewable energy goals of 7.5 percent of electricity from renewable sources, but it also helped work toward greenhouse gas reductions of 28 percent. Previously, LM had to rely on the purchase of renewable energy credits to meet these goals, but with the new solar photovoltaic system online, this will no longer be necessary. ❖

Workers mount solar modules to a rack, which positions them at the ideal angle to maximize efficiency.



The inverter, which converts the electrical output from the array from direct current (DC) to alternating current (AC), arrives and is staged onsite.



The solar photovoltaic array nearing completion.

Continued from page 6

Completion of the CERCLA Natural Resource Damage Process at the Rocky Flats Site

included the purchase of the lands and minerals of the adjacent Section 16 State Land Board property and extinguished the associated mining lease.

As was envisioned in the Minerals Act, the Rocky Flats NRD trustees have now protected all critical upland prairie habitat on the Rocky Flats site for future incorporation into the Rocky Flats National Wildlife Refuge and supplemented these almost 5,000 acres with the additional 640 acres of Section 16. These parcels are expected to transfer from the Office of Legacy Management to USFWS jurisdiction before the end of 2013. ❖



Goals 1 and 2

2012 LM Independent Communication and Outreach Stakeholder Satisfaction Survey



The results of the U.S. Department of Energy Office of Legacy Management (LM) 2012 Communication and Outreach Stakeholders Survey have been posted to the LM website. The survey consisted of three types of data gathering: in-person interviews, a telephone survey, and a web-based survey. We are pleased that the survey suggests stakeholders are satisfied overall with the job LM is doing and the communication efforts we currently employ.

LM recognizes the importance of communicating effectively to the communities and stakeholders impacted by our sites. To this end, LM periodically surveys our stakeholders to collect their feedback on our performance at both a local and national level.

The results of the independent survey are posted on the new LM website at <http://energy.gov/LM>. ❖

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DOE Evaluates Environmental Impacts of Uranium Mining on Government Land in Western Colorado

In addition to the public hearings, comments may also be submitted by mail or electronically via the website or e-mail at the addresses listed below:

U.S. mail:
Ray Plieness, PEIS Document Manager
Office of Legacy Management
U.S. Department of Energy
11025 Dover Street, Suite 1000
Westminster, CO 80021

Website: <http://ulpeis.anl.gov>

E-mail: ulpeis@anl.gov

Additional information on the DOE ULP is also available on the DOE Office of Legacy Management website at <http://energy.gov/lm/services/property-management/uranium-leasing-program/uranium-leasing-program-program-summary>. ❖

As environmental stewards, LM is continually seeking opportunities to protect tomorrow's future. One simple step we can take toward improving environmental consciousness is to distribute the *Program Update* newsletter via e-mail instead of sending a printed copy.

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

Thank you for your assistance.





Goal 1

Rocky Flats Site Expands Solar Power for Treating Groundwater

The U.S. Department of Energy (DOE) recently added a 6 kilowatt solar photovoltaic system to provide power to operate an enhanced treatment system that removes volatile organic compounds (VOC) from contaminated groundwater at the Rocky Flats, Colorado, Site.

The East Trenches Plume Treatment System (ETPTS) utilizes a collection trench to capture contaminated groundwater and route it to treatment cells, where the water flows through a media that removes the VOC contaminants. However, experience has shown that over time the zero-valent iron (ZVI) media oxidizes and inhibits flow, which reduces the treatment effectiveness and requires costly periodic media changes.

In March 2011, DOE installed a prototype air-stripping component in a similar treatment system and determined that system efficiency was enhanced significantly by air stripping. The air stripping is accomplished by pumping the contaminated water through multiple helical spray nozzles that are located in a manhole.

Once testing determined that the air-stripping concept was viable, DOE had to develop the power supply to operate the 20-gallon-per-minute pump required to supply water to the air stripper. Since the Rocky Flats site has no line power available, every electrical system onsite depends on solar power.

The ETPTS is located within the habitat boundary of the Preble's meadow jumping mouse, which is protected by the Endangered Species Act. In order to minimize disruption to the mouse habitat, the solar array was initially going to be placed on a concrete pad located on a closed access road approximately 500 feet from the ETPTS influent manhole where the air-stripping components are installed. However, that would still require trenching for the conduit that would convey the electrical power from the solar panels to the air-stripper equipment.

A vendor proposed utilizing a 40-foot conex box as the mounting structure for the solar panels and to house the 72 heavy-duty two-volt marine-style batteries and associated electrical equipment required to provide 24-hour power to the system. In addition to further minimizing the impact on the



Subcontractor personnel install solar panels and other infrastructure on a 40-foot conex box that houses the batteries and control equipment for the 6 kilowatt photovoltaic system that powers the ETPTS groundwater treatment system.



DOE was able to minimize impacts to the habitat of a federally protected mouse and provide the potential for relatively easy relocation by mounting the solar panels on the side of the conex box that houses the batteries and other system equipment.

protected habitat, the conex box installation also affords the opportunity to relocate the entire solar system should that become desirable.

The ETPTS air stripper went on line on February 22, 2013, and Rocky Flats site staff are continuing to monitor and evaluate the results of the air-stripper component to determine if the system will continue to simply enhance the treatment or extend the life of the ZVI media, or if it could replace the ZVI component altogether. ❖



Goal 1

LM Receives an Award for the Grand Junction Disposal Site Asphalt Road Reconstruction

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) recently reconstructed the asphalt access road at the Grand Junction, Colorado, Disposal Site (GJDS). In order to realize a cost savings and allow a complete reconstruction rather than spot repairs, as has been done in the past, unique recycling methods and materials were used. Asphalt roof shingles and reclaimed asphalt pavement were recycled and added to the new asphalt mix, and the existing roadway material was reused by grinding and mixing it with the subgrade to allow a full-depth reconstruction of the roadway.

When the disposal cell access road was constructed, it was only designed to last until the construction of the cell was complete. In 1996, stakeholder concerns with the low-level residual radioactive material (RRM) that remained on vicinity properties, under streets, and buried with utilities prompted Congress to authorize the GJDS to remain open to receive RRM until the cell is full or 2023, whichever comes first. As a result of its inadequate design, the road requires regular costly repairs to carry the traffic loads associated with long-term operation.

The work that was initially planned in 2012 only included spot repairs and removal and replacement of some of the most severely damaged areas of the asphalt using conventional repair methods. Conventional road reconstruction includes removing the existing asphalt and substandard subgrade soils, transporting the material to a landfill, importing new subgrade material, placing, compacting, and then paving with new asphalt. This method incurs a great deal of labor, equipment, material, and transportation costs. The high cost of reconstructing the road using this method limited the quantity of road that could be repaired under the current budget.

As environmental stewards, LM is continually seeking opportunities to recycle materials and reuse existing materials. Alternatives to conventional repair methods were researched and solicited from the paving companies bidding on the work to lower the cost and to recycle and reuse existing materials to enable LM to reconstruct more of the road.



*Top: Deteriorated asphalt at the road entering the disposal cell.
Bottom: New asphalt pavement at the road entering the disposal cell.*

After careful consideration, it was determined that full-depth reclamation would be the most cost-effective method and the existing asphalt and subgrade would be reused in the process. Full-depth reclamation mills the existing asphalt into a granular consistency. The milled asphalt is mixed into the existing subgrade to a specified depth while adding portland cement and water. The mixture is graded, rolled, and compacted to achieve a specified density creating a stable base for the expected traffic load. The cost effectiveness of full-depth reclamation enabled LM to reconstruct more of

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LM Receives an Award for the GJDS Asphalt Road Reconstruction

the road than originally budgeted. Taking advantage of the cost savings, LM authorized additional budget to completely reconstruct all the asphalt roads at the GJDS.

In addition to reusing the existing asphalt and subgrade, LM authorized the use of 10 percent reclaimed asphalt pavement and 5 percent reclaimed asphalt shingles in the new asphalt pavement mix. Adding the reclaimed asphalt and shingles is well within the current Colorado Department of Transportation (CDOT) specifications that allows for up to 30 percent binder replacement. The specifications also require that the shingles are tested and documented to be asbestos free. Adding reclaimed asphalt to a mix is not a new process, but this is the first time reclaimed asphalt shingles were used in an asphalt pavement mix on the western slope of Colorado.

The paving company that performed the work submitted the project for a Quality in Construction Award to the National Asphalt Pavement Association (NAPA). The consistent test data for the mix during production and meeting the specified densities during placement, while keeping with current CDOT specifications and using reclaimed material, earned an award. The paving contractor and LM, as the owner, received a plaque from the NAPA.

The long-term benefit of reconstruction of the entire road is the elimination of repeated costly small repairs, and in the event it is decided to keep the cell open past the 2023 closure date until the cell is full, the road will fulfill DOE's mission until the cell is closed. ❖



Award ceremony (left to right): Jarrett Welch, Oldcastle Southwest Group, paving contractor; Mickey Bryan, Oldcastle Southwest Group, paving contractor; Gary K. Baur, Site Lead, Grand Junction Disposal Site (GJDS), U.S. Department of Energy Office of Legacy Management (LM) contractor; Daniel W. Nordeen, Project Engineer, LM contractor; Tracy Ribeiro, Environmental Management System Coordinator, LM; Julie M. Hendricks, Contract Administrator, LM contractor; Rich Bush, Site Manager, GJDS, LM.

Statistics

Full-Depth Reclamation Materials Reclaimed:
4,880 cubic yards

New Asphalt Pavement Total:
6,580 tons

Reclaimed Asphalt Pavement at 10 Percent:
658 tons

Reclaimed Asphalt (Roof) Shingles at Five Percent:
329 tons



Goal 5

LM's First High Performing Organization Report

On June 22, 2012, the Deputy Secretary transmitted the U.S. Department of Energy Office of Legacy Management's (LM) May 2012 proposal to the Office of Management and Budget (OMB) to sustain LM's High Performing Organization (HPO) designation for a second 5-year period (fiscal years 2012 through 2016). The proposal included measures in two areas: Management Excellence and Program Performance. Under each area we identified goals and actions using a structure that reflects the President's six key management strategies: 1) driving top priorities; 2) cutting waste; 3) reforming contracting; 4) closing the information technology gap; 5) promoting accountability and innovation through open government; and, 6) attracting, motivating, and retaining top talent.

While OMB has not yet formally approved the HPO proposal, they recommended LM begins reporting on the new set of commitments and performance measures. LM has posted the first Post-Competition Accountability Report (PCAR) associated with the May 2012 proposal to the LM website. The report includes a status of all the goals and actions contained in LM's HPO proposal.

LM recognizes the importance of communicating regularly with the stakeholders and communities impacted by its mission, and will also post the quarterly PCARs on the LM website. The quarterly reports contain the status of a subset of the goals and actions from the annual PCAR that warrant more frequent reporting. The first quarter PCAR for fiscal year 2013 is now available on the LM website at <http://energy.gov/lm/downloads/post-competition-accountability-report-first-quarter-fy2013>. ❖

Goal 1

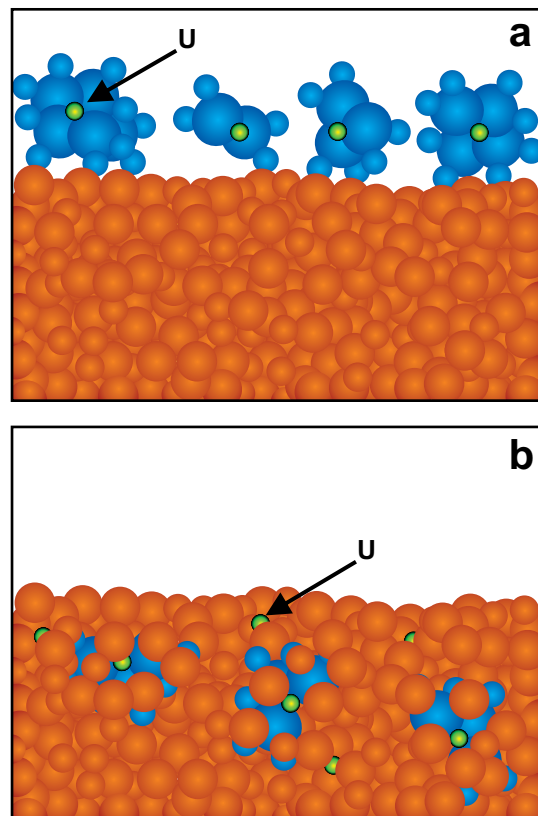
Have You Digested That?

Conducting environmental work often requires analysis of solid geologic materials (soil and rock). When faced with a need for analysis of solids, it may not be as simple as just sending a sample to the laboratory for analysis. Typically, the resulting concentrations are dependent on the sample digestion. Digestion means the method by which a constituent is removed from a soil or rock sample and dissolved in a water solution so that it can be analyzed with standard laboratory analytical equipment.

In the Plume Persistence Project, which is being done at the Grand Junction, Colorado, Site, several digestion methods are being employed to help understand where the uranium and other constituents are located within the clays, sands, and gravels of an aquifer. Does uranium reside on the surfaces of mineral grains where it is readily accessible to groundwater (section a)? Or is it more tightly embedded within the crystalline matrix of the grains (section b), where it may gradually be released by mineral dissolution and diffusion processes? (See the figures at right.) The difference between these two scenarios has significant implications in groundwater cleanup times.

When environmental soil and rock samples are submitted to a laboratory for analysis without a digestion method specified, typically a relatively harsh digestion method with strong acids and heat is used. This method removes the loosely held uranium and

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Uranium atoms (U) are hydrated with water molecules (blue) at the surface in section a and embedded within atoms (orange) of the mineral grain in section b.



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Have You Digested That?

some, but not all, of the tightly held uranium. Even under these harsh conditions, only a small portion of the solids actually dissolve. To determine the total concentration of uranium in the sample, the entire sample must be dissolved. One way to accomplish this is to first dissolve the sample in another solid, called a flux, at very high temperature (900° C). The solid solution of flux and sample can then be dissolved completely and analyzed.

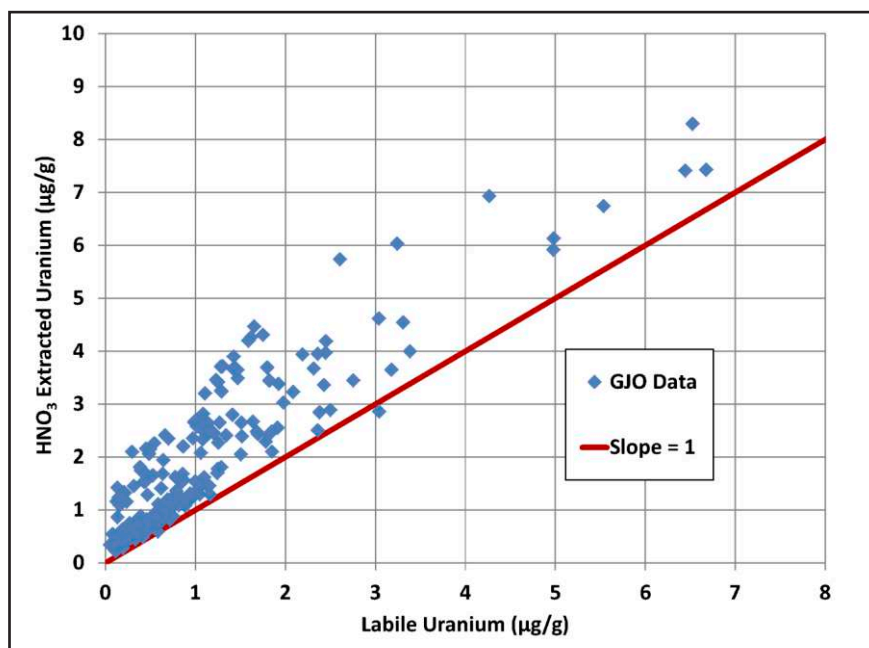
In contrast to these harsh digestion methods, groundwater researchers are often more interested in the “labile” fraction of uranium in a sample, which is defined as that portion that is readily released to solution and is usually assumed to be the portion that is weakly adsorbed at mineral surfaces. The concentration of labile uranium is a crucial input to predictive groundwater transport models. This labile portion of the uranium in a sample may also be more bioavailable to organisms, so is of particular importance in a risk analysis. Groundwater scientists have devised many digestion methods to determine the labile fraction. One extraction method that has been cited in many journal articles over the last few years was described by U.S. Geological Survey personnel and involves subjecting the sample to a strong carbonate solution.

Over the last few decades, many researchers have used digestions in the form of “sequential extractions” that attempt to determine the various forms of uranium (and other constituents) by subjecting the solid samples to a series of solutions, each designed to remove a specific mineral phase. For example, solutions of hydroxylamine-hydrochloride and citrate-bicarbonate-dithionite target poorly crystalline and highly crystalline iron oxides, respectively. While these approaches are attractive in theory, there are numerous complications and the analytical results must be carefully interpreted by groundwater professionals.

In summary, when evaluating solid-phase analytical data, it is useful to know and understand the implications of the digestion method that was used. The selection of a digestion method depends on the analysis objectives and goals, which vary among sites. ❖



A soil sample is dissolved in a flux at high temperature.



Comparison of digestion methods for samples recently collected from LM's Grand Junction, Colorado, Site Office. Labile uranium is less than acid-digested uranium, as indicated by points above the red line.



Program Update

Anticipated Legacy Management Sites Through FY 2020





Legacy Management Goals and Objectives



Goal 1. Protect human health and the environment

Objectives

1. Comply with environmental laws and regulations.
2. Reduce health risks and long-term surveillance and maintenance (LTS&M) costs.
3. Partner with other Federal programs to make environmental remedies better and last longer.
4. Oversee DOE implementation of Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*.



Goal 2. Preserve, protect, and share records and information

Objectives

1. Meet public expectations for outreach activities.
2. Protect records and make them accessible.
3. Protect and ensure access to information.



Goal 3. Meet commitments to the contractor work force

Objectives

1. Safeguard contractor pension plans.
2. Fund contractor health and life insurance.



Goal 4. Optimize the use of land and assets

Objectives

1. Optimize public use of Federal lands and properties.
2. Transfer excess government property.
3. Improve domestic uranium mining and milling operations.



Goal 5. Sustain management excellence

Objectives

1. Renew LM's designation as a high performing organization (HPO).
2. Implement LM's *Human Capital Management Plan*.
3. Operate in a sustainable manner and reduce LM's carbon footprint.