
Feet on the Ground:
Site Visits to Uranium Legacy Sites in the U.S.
as part of the
IAEA Regulatory Supervision of Legacy Sites Initiative

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Worldwide Regulatory Challenges of Radioactive Legacy Sites



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Overview of Field Visits and Workshop

- August 2012: first “field” activities for Regulatory Supervision of Legacy Sites (RSLs) IAEA Initiative
- A week of visits to uranium legacy sites in Colorado and Utah and a 3 ½ day workshop in Grand Junction, Colorado
- Jointly sponsored by IAEA and LM
- Twenty countries represented among 30 participants
- Site visits added context for presentations and discussions during the workshop
- Lessons learned from workshop sessions are helping three RSLs working groups
- Visits to Arches National Park in Utah and Colorado National Monument were among the fun activities



Participation of LM in RSLs Initiative

- LM was created in 2003 to manage post-closure responsibility of remediated defense sites in U.S.
 - IAEA recognizing the need for member states to plan post-closure needs of remediated sites
- LM Grand Junction office part of DOE's program to implement the Uranium Mill Tailings Radiation Control Act (UMTRCA)
- LM responsibilities include long-term management of records for sites as well as administrative institutional controls (AICs)
 - AICs include restrictions of types of use after site remediation is complete

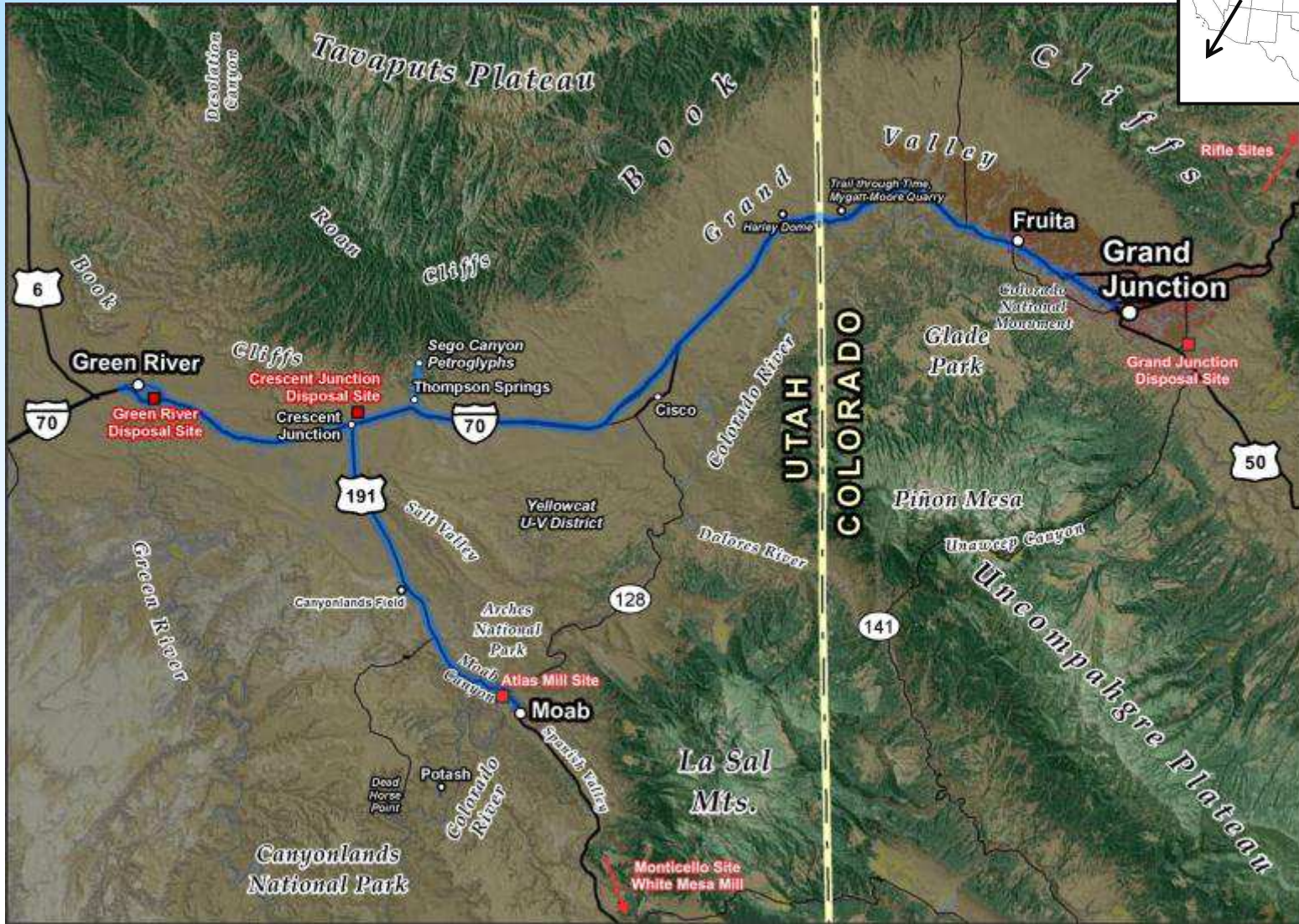
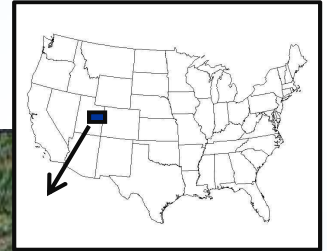


“Feet on the Ground...”

- The site visits and workshop were designed to help member states develop and implement programs for legacy sites. Aspects included:
 - Regulatory framework
 - Environmental Impact Assessment/evaluation of alternatives
 - Stakeholder involvement
 - Remediation planning and implementation
 - Health and safety, including non-radiological
 - Remedial action verification and records management
 - Long-term surveillance and maintenance (LTS&M)—role of LM for uranium legacy sites in U.S.
- Also, avoid the creation of **new** legacy sites.






Field Visits



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Field Visits to Uranium Sites at Three Different Stages

Operating Site		<ul style="list-style-type: none">• White Mesa Uranium Mill, Utah (Energy Fuels Resources Inc. [U.S.]
Site Undergoing Remediation		<ul style="list-style-type: none">• DOE Office of Environmental Management (EM) Moab, Utah, Project—Atlas Mill site and Crescent Junction disposal cell
LTS&M		<ul style="list-style-type: none">• Monticello, Utah, Site (CERCLA site)• Green River, Utah, Disposal Site (UMTRCA site)• Rifle, Colorado, Processing/Disposal Sites (UMTRCA sites)



White Mesa Mill, Utah—Operating Mill



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Moab, Utah—EM Site Being Remediated



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Crescent Junction, Utah--Remediation



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Monticello, Utah, Site—LTS&M



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Green River, Utah—LTS&M



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Who Participated in the Field Visits and Workshop?

- Twenty countries were represented
 - Countries with “mature” legacy site programs (e.g., U.S., Germany, Canada, Australia, France)
 - Countries with maturing programs (e.g., Russia, Ukraine, Brazil, Argentina)
 - Countries with large uranium legacies that are developing programs (e.g., Central Asian Republics)
 - Countries that are sources of uranium for countries that are rapidly developing nuclear energy (e.g., Mozambique, Niger). Avoid new creating new legacy sites.



Who Participated? Regulator and Operator Perspectives

- U.S. for UMTRCA
 - **U.S. Environmental Protection Agency:** set standards for UMTRCA site remediation
 - **U.S. Nuclear Regulatory Commission (NRC):** confirming standards are met and licensing UMTRCA sites
 - **State of Colorado:** an NRC Agreement State
 - **DOE:** operator
 - Remediation: DOE EM
 - LTS&M: DOE LM
 - **University of Wisconsin:** research on new methods of meeting standards



Uranium Legacy Sites in the U.S.

What Came as a Surprise to Visitors?

- The 22 mill tailing sites remediated under Title I of UMTRCA were all abandoned—**licensing chain had been broken**
- Uranium mines not addressed by UMTRCA or explicitly by other laws—**part of nuclear fuel cycle not addressed**
- Success in **beneficial reuse** of sites
- **Interim measures** were and are still being used for remediation of sites in the U.S.
- Importance of and frequency of using **AICs** as part of remedies for sites

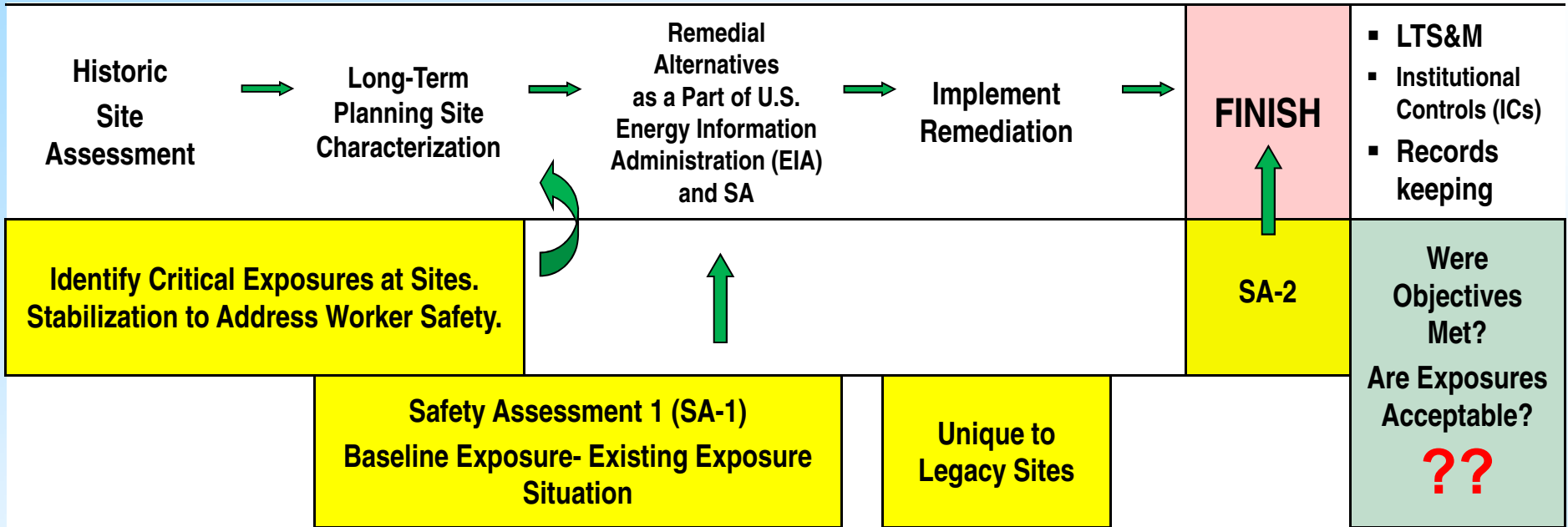


Interim Measures and Phased Approach to Addressing Legacy Sites

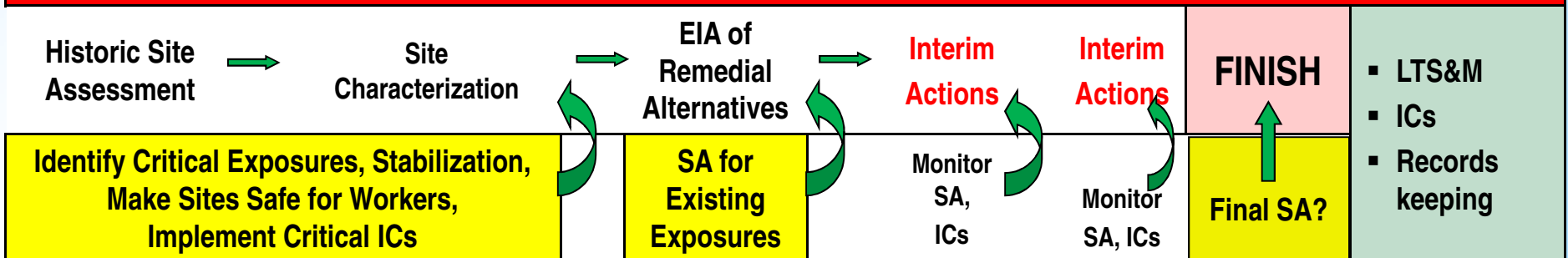
- Why use interim measures?
 - A need to address an immediate risk or to stop an ongoing environmental release from making the problem worse
 - Cleanup goals or standards not established
 - Lack of infrastructure for remediation of sites such as disposal sites/facilities for waste
 - Lack of expertise (technical, regulatory, etc.)
 - Inability to provide for alternative sources of resources impacted by remediation (e.g., water, housing)
 - Lack of funding



Uninterrupted D&D/Remediation of Legacy Site (Remediation Cycle)



Phased (Graded) Approach to Legacy Site Remediation



AICs—Skepticism?

- Use of AICs by U.S. as part of remedies for sites of great interest
 - Many developing countries do not have property laws or means of enforcement
 - There have been failures; will there be more with time as people are farther removed from when facilities operated at legacy sites?
- In countries where AICs are not realistic, and even in countries with mature legacy site programs, **education may be the most important IC**
Examples:
 - Why not to use uranium mill tailings to construct buildings
 - Why not to use certain water sources



Closing and Acknowledgments

- Field visits combined with workshop provided context that is carrying over to the working groups of RSLs
- Visiting sites that are operating, being remediated, and in LTS&M reinforced importance of “cradle to grave” concept
- Value of the mix of participants from countries with mature and developing legacy site programs
 - For countries such as U.S., what may seem obvious may not be so to others
 - Helped reinforce that programs for each country must take into account customs, history, and social values as much as technical criteria
- Thanks to:
 - Stoller LMS Team for logistics, site visits, presentations
 - To participants: **very** engaged throughout
 - To IAEA for the opportunity for LM to co-host the event

