

# Advancing Technological Innovation and Supporting Informed Decision-making in Critical Minerals Monitoring and Recovery from Mine Waste

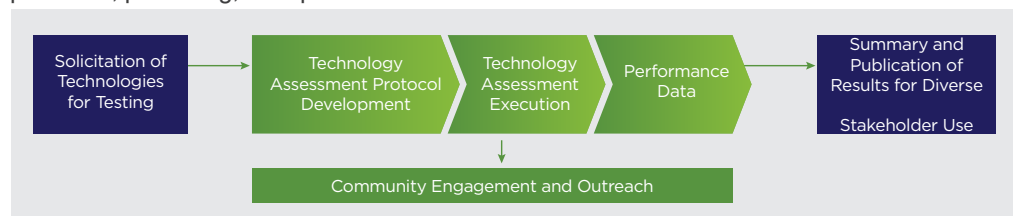
## What is the Environmental Monitoring and Remediation Technology Assessment Initiative (EMRTAI)?

The EMRTAI is a program focused on assessing technologies that can monitor or recover critical minerals from waste materials (i.e., waste rock, tailings, mine influenced waters, sediment, etc.) at hard rock mining and mineral processing sites. Launched in 2024, the EMRTAI supports remediation activities that advance EPA's mission to protect human health and the environment through sustainable materials management (SMM). The EMRTAI supports public entities such as non-profit organizations, states, Tribes, industries, businesses, individuals, and communities in informed decision-making when selecting new or existing technologies to monitor or recover critical minerals from mining-related waste materials during site remediation.

Many of the technology assessments conducted under the EMRTAI will take place at Superfund NPL sites and/or use waste materials from sites as feedstock. The EMRTAI is operated as a public-private partnership through a cooperative agreement between EPA and a private non-profit testing and evaluation organization. The initiative is slated to run for the next three years as SMM momentum in site remediation continues to grow. The monitoring and recovery of critical minerals from mining-related waste materials can positively impact resource use efficiency and reduce greenhouse gas emissions, environmental impacts, and waste generation.

## Technology Assessment Process

Technologies for monitoring or recovery of critical minerals at mid- to advanced technology readiness levels will be assessed using mine waste from legacy mine or mineral processing sites undergoing remediation. Solicitations will be issued semi-annually for interested technology developers and vendors to submit applications to participate in on- and/or off-site assessments. These assessments will be guided by rigorous and transparent testing protocols to generate credible performance data. The resulting data will be compiled in summary reports that can be used by technology developers to advance towards pilot-scale testing or commercialization or by stakeholders to make informed decisions regarding purchase, permitting, or implementation.



*Currently, there are nearly 100 legacy mine or mineral processing sites on EPA's Superfund National Priorities List (NPL), and many more sites throughout the U.S. are in various stages of remediation.*



The EMRTAI's goal is to drive and advance innovation to identify and recover critical minerals from mine waste to support sustainable materials management during site remediation. Technology assessments, conducted under the EMRTAI, will produce credible performance data to accelerate technology implementation for the benefit of diverse stakeholders, including permittees, vendors, financiers, the public, industry, and environmental remediation specialists.

The EPA's mission is to protect human health and the environment and engage local communities in site remediation decision-making. A unique Community Engagement and Outreach Plan will be developed for each technology assessment to engage the local community, informing them of the work being done, its purpose, and potential impacts it could have on the local environment. The EPA's goal is to provide an environment where everyone enjoys the same degree of protection from environmental and health hazards, and equal access to the decision-making process to support and maintain a healthy environment in which to live, learn, and work.

## Guided by Stakeholders

The EMRTAI's stakeholders represent the interests of end-users of the technology assessment information and volunteer their time in applying diverse mining and remediation industry knowledge. These groups provide insight on user needs, assist in prioritizing the type of technologies to be assessed, support development of protocols that will produce credible data to inform decision-making and technology advancement, and contribute to outreach activities to the groups that they represent. The EMRTAI's Stakeholder Group meets quarterly and is always open to membership by interested stakeholders in all parts of mining and legacy mine site remediation.

## Integration with U.S. Federal Agencies

The EMRTAI is guided by a Steering Committee made up of representatives from the EPA and other federal agencies. The Steering Committee will provide oversight to the EMRTAI and integrate its focus of critical minerals identification and recovery technology testing with the activities of other federal agencies, particularly in the areas of geologic mapping of critical minerals and technological innovation in recovery. The Steering Committee meets twice annually for goal setting, progress tracking, exchange of information, and to provide guidance on priorities for assessing technologies for critical minerals recovery from mine waste.

## Outcomes and Impacts

The EMRTAI is focused on driving positive impacts on public health and the environment during remediation. Key outcomes targeted and tracked by the EMRTAI include:

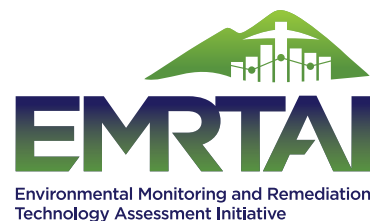
- Reduced risk to human health and/or the environment
- Achievement of water quality standards or soil/sediment clean-up objectives
- Enhanced resource use efficiency through SMM
- Restored land for productive use, including enhanced habitat quality for terrestrial or aquatic species
- Engaged residents and community-centered discussions that can shape the restoration and revitalization of sites undergoing remediation
- Advancement of technologies from pilot to commercial scale so that they can be more readily implemented at sites to promote achievement of remedial action objectives
- Informed decision-making based on datasets that can be incorporated into regulations, guidance documents, or permits

*The EMRTAI intends to create a community of technology practitioners focused on resource monitoring and recovery while reducing risk to human health and the environment.*



Subject Matter Experts in mining, mine remediation, and/or critical minerals monitoring and recovery technologies can also serve on Technical Panels, which will provide guidance in developing assessment protocols that align with key performance criteria. Technical experts also support the development of summary reports for the stakeholder community at large.

**If you are a technology vendor or developer,  
we are interested in talking with you about  
assessment opportunities under the EMRTAI.**



### Benjamin Simes

EPA Project Officer  
EPA/OLEM/OMDP Washington, DC  
Simes.Benjamin@epa.gov

### Dr. John McKernan

EPA Co-Project Manager  
EPA/ORD Cincinnati, OH  
McKernan.John@epa.gov

### Paul Randall

EPA Co-Project Manager  
EPA/ORD/CESER Cincinnati, OH  
Randall.Paul@epa.gov

### Dr. Jana Heisler-White

Battelle Project Manager  
Battelle Memorial Institute,  
Columbus, OH  
heislerwhite@battelle.org

[https://clu.in.org/issues/default2.focus/sec/Characterization,\\_Cleanup,\\_and\\_Revitalization\\_of\\_Mining\\_Sites/cat/Cleanup\\_Technologies](https://clu.in.org/issues/default2.focus/sec/Characterization,_Cleanup,_and_Revitalization_of_Mining_Sites/cat/Cleanup_Technologies)  
[emrtai@epa.gov](mailto:emrtai@epa.gov)