



MINE WASTE MANAGEMENT

THE CHALLENGE

In recent years, the mining industry has placed increasing emphasis on finding solutions to mine waste management issues that are both environmentally sound and cost effective. Mining companies recognize that long-term, environmentally-acceptable approaches are needed to meet increasingly stringent regulatory requirements, public concerns and to reduce the liability for environmental contamination that may result from a mining project.

NRCan CAN HELP

CANMET-MMSL has established a team of experts in the area of sustainable mine waste management research to address industry challenges. Our objective is to develop and assess long-term, scientifically sound and sustainable options for mine waste disposal, management, and rehabilitation. Our multi-disciplinary approach and wide range of resources enable us to assist Canadian mining companies at all stages of a mining project, from feasibility and planning through operation to final decommissioning.

OUR EXPERTISE

CANMET-MMSL has developed a range of expertise through R&D activities:

- **Acidic drainage: prediction, prevention and treatment**
 - Environmental assessment and water quality issues
 - Development of innovative acidic drainage prediction methods
 - Development and optimization of innovative lime treatment and sludge densification processes
 - Metal recovery from acid mine drainage and mine waste
 - Investigation and evaluation of alternative neutralization reagents
- **Reactive and radioactive mine waste disposal**
 - Fresh water cover studies
 - Benefits and risks of marine tailings disposal
- **Sludge characterization, stabilization and disposal options**
 - Development and evaluation of alternative sludge stabilization technologies
 - Development and evaluation of sludge disposal technologies
 - Revegetation options for lime sludge
- **Hydrochemistry and geochemistry**
 - Contaminant transport and attenuation in the natural environment
 - Evaluation of passive secondary covers
 - Development of monitoring techniques/methods for contaminant transport across the water/tailings interface
- **Independent review and technical advice**
- **Decommissioning and rehabilitation feasibility studies**

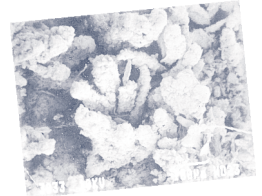


SUCCESSFUL PARTNERSHIPS

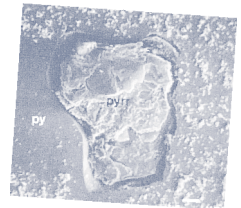
- Decommissioning work in uranium mines at Elliott Lake related to acid mine drainage, mine rehabilitation and pathway analysis. This resulted in lower decommissioning costs and a reduction in potential environmental liabilities.
- Evaluation of sub-marine tailings disposal option in partnership with researchers in the Department of Fisheries and Oceans and the local University. This project involves studying the environmental impacts (chemical and ecotoxicological) of tailings disposed off-shore at two abandoned mine sites. The objective is to provide scientific evidence on the advantages and disadvantages of marine tailings disposal.
- Alternative sludge characterization, acidic drainage treatment and sludge densification technologies to improve the long-term stability and storage of waste sludges. Most recently, the analysis of fresh and aged sludge samples from seven Canadian mines by synchrotron X-ray absorption spectroscopy has revealed detailed zinc speciation in the sludges. The information allows a better assessment of the long-term chemical stability of sludge deposits, and facilitates the design of appropriate decommissioning and alternative treatment strategies at individual sites.



Column testing of various scenarios for subaqueous tailings disposal



Cryoprecipitation: an example of metal attenuation mechanism in northern climates



Galvanic sulphide oxidation: an example of preferential metal leaching

Metal transport and attenuation in the receiving environment



Rehabilitated tailings area



Rehabilitated tailings area



CONTACT US

CANMET-MMSL's goal is to help find sound, science-based solutions to operational challenges.

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