

**TITLE:** REMEDIATION OF ACTIVE AND ABANDONED MINERAL MINE TAILING MATERIALS USING ORGANIC RESIDUES

**AUTHOR:** NORLAND, M.R., USBM

**CONTACT:** Norland, Michael (612) 725-4573

**ABSTRACT:**

The surface waste materials or tailing discarded from mineral processing activities results in a unique environment which, potentially, can severely inhibit surface and subsurface stabilization. Mineral tailing materials contain residues from metal ore processing operations and are often excessive and/or deficient in chemical, physical, and biological properties necessary for stabilization through revegetation. As a result, there is a need for the development of treatment technologies to remediate active and abandoned mineral waste materials. To investigate the potential of organic residues as a physical agent to ameliorate the chemical, physical, and biological limitations of tailing materials for vegetative stabilization, the USBM has implemented a series of experiments at active and abandoned mineral mine tailing sites in northeastern Minnesota and southeastern Kansas. In each climatic zone, vegetative cover has improved depending on the type of organic residue used and rate of application. Total cover has progressively increased over 5 years at all experimental sites and has not reached steady state conditions. A potential new strategy for reclaiming difficult sites through the use of organic residues is proposed.

**TITLE:** ENVIRONMENTAL INFRASTRUCTURE, AND MINING APPLICATIONS OF TIME DOMAIN REFLECTOMETRY

**AUTHORS:** O'CONNOR, K.M., USBM, W.N. Herkelrath and M.R. Norland

**CONTACT:** O'Connor, Kevin (612) 725-4731

**ABSTRACT:**

This presentation summarizes the Symposium and Workshop on Time Domain Reflectometry (TDR) in Environmental, Infrastructure, and Mining Applications, held at Northwestern University in Evanston, Illinois on September 8-9, 1994, was sponsored by the U.S. Bureau of Mines, Infrastructure Technology Institute at Northwestern University, and Los Alamos National Laboratory. The session on Instrumentation and Basic Physics focused on basic hardware and mechanics of both electrical and optical TDR. Soil Moisture-General concentrated on the application of TDR to measure volumetric water content in porous materials, especially soils. Soil Moisture and Contaminant Transport described the evolving application of TDR to measurement of solutes within pore fluids. Ground Water gathered applications of TDR to measurement of changes in fluid levels and pressures. Soil Moisture and Infrastructure describes applications of TDR to monitor changes in unfrozen and frozen subgrade moisture conditions. Finally, Rock and Soil Deformation presented applications of TDR to monitor displacements induced by mining and construction. Case history summaries of studies conducted by the USBM and U.S. Geological Survey will also be summarized.

U.S. DEPARTMENT OF THE INTERIOR  
CONFERENCE ON THE  
ENVIRONMENT AND SAFETY

APRIL 24-28, 1995

ABSTRACT BOOK

*Sponsored by the U.S. Bureau of Mines*

