

Contract No.: B2532538
Technology: Time Domain Electromagnetics (TDEM)
Contractor: D'Appolonia

Summary of technology:

An electromagnetic signal is generated using a wire/cable loop antenna on the ground surface and reflected wave energy is measured by a receiver located approximately 15 meters away. Conductive subsurface strata produce electromagnetic waves as current is passed through the source wire loop. The receiver measures the secondary decaying electromagnetic waves which are used to infer the subsurface conditions.

Stated limitations of technology:

Mine workings need to contain some moisture/water. TDEM will not work when the mine workings are dry. TDEM may be able to detect mine workings at a maximum depth of 60 meters.

Field demonstration results:

Field Demonstration Conditions	Goal of Demonstration	Results of Demonstration
Flat to hilly terrain. Void size =5 feet high, 20 feet wide; void depth= 20-60 feet. Target voids were air filled and partially water filled. Ground surface of survey line was relatively clear of trees and vegetation.	Locate mine entries that contain some water at shallow depth around the perimeter of a coal waste impoundment - useful for assessing impoundment breakthrough potential.	Results were mixed. Some of the known workings were identified and others were not. Laser imaging done by a subcontractor was beneficial in identifying a mine entry that was not shown on the mine maps.