PRELIMINARY GEOPHYSICAL INVESTIGATIONS FOR THE RESTORATION OF ABANDONED MINE SITES PROGRAM: BROOKLYN MINE, SAN JUAN COUNTY, COLORADO

Kyle Lindsay, USACE Sacramento District, USACE, Sacramento, CA
Bethany L. Burton, USGS Geology, Geophysics, and Geochemistry Science Center, Denver, CO
Lewis E. Hunter, USACE Sacramento District, USACE, Sacramento, CA
John M. Jackson, USACE Explosives & Munitions Center of Expertise, Huntsville, AL

As part of the U.S. Army Corps of Engineers (USACE) Restoration of Abandoned Mine Sites (RAMS) Program, the USACE and U.S. Geological Survey teamed up to perform a geophysical investigation of the Brooklyn Mine. The Brooklyn Mine is situated on U.S Forest Service (USFS) property in the San Juan Mountains in Colorado and is one of 48 mines in the Bonita Peak Mining District Superfund Site. The site was selected by the USFS as a priority site for demonstrating the application of ground-based geophysical investigations for characterizing abandoned mine lands (AML).

This talk will focus on the investigations of the waste rock piles and adit locations associated with the upper two levels of the mine. These adits are the most extensive and are connected by two chambers resulting from stoping as the mining activity followed ore-bearing seams. Three profiles were established to investigate the waste rock piles: two roughly east-west profiles along access roads crossing the piles that extended across the level 2 adit and a third profile oriented north-south that intersects the other two profiles. Various geophysical methods were acquired along these profiles including compressional-wave (P-wave) seismic refraction and reflection, horizontal vertical spectral ratio (HVSR) passive seismic stations, direct-current (DC) resistivity, self-potential (SP), and microgravity.

Results from this survey are being used to help the USFS design remediation strategies for the mine while also helping to provide a template for scoping additional work across the Bonita Peak Mining District Superfund Site.