Abandoned Mine Lands In The North Magdalena District, Socorro County, New Mexico

Nicholas G. Harrison[1] and Virginia T. McLemore[2]

[1]New Mexico Tech, Campus Station 3342, Socorro, NM, 87801, nicholas.harrison@student.nmt.edu
[2]New Mexico Bureau of Geology and Mineral Resources, 801 Leroy Place, Socorro, NM, 87801

ABANDONED MINE LANDS IN THE NORTH MAGDALENA DISTRICT, SOCORRO COUNTY, NEW MEXICO

Nicholas G. Harrison1 and

Virginia T. McLemore2

1New Mexico Institute of Mining and Technology, Campus Station 3342, Socorro, NM, 87801,nicholas.harrison@student.nmt.edu

2New Mexico Bureau of Geology and Mineral Resources, New Mexico Institute of Mining and Technology, Socorro, NM 87801, virginia.mclemore@nmt.edu

Preferred presentation format: poster

The North Magdalena district in Socorro County, NM contains a number of abandoned mine . Our objective was to examine two features and perform soil petrography and paste pH analyses on collected samples. The two features examined consisted of a pit (NMSO0832) and the Silver Hill mine (NMSO0809), a shaft with collapsed head frame.

Abandoned mine lands (AML) are lands that were excavated, left un-reclaimed, where no individual or company has reclamation responsibility, and there is no closure plan in effect. They include mines and mine features left unreclaimed on Federal, State, private and Native American lands because the current owner was not legally responsible for reclamation at the time the mine was created. Government agencies reclaiming AML sites in the past have just reclaimed the physical hazards without any characterization of the material they use to determine if they have any acid generating potential material or elements of environmental concern that could cause environmental issues, especially to groundwater. This project is part of an effort to test a procedure developed by the AML team at NMIMT to inventory mine features and quickly, effectively, and cheaply characterize mine wastes within the North Magdalena mining district. This district was specifically chosen because it is small enough to perform the inventory and complete the characterization within a reasonable time frame.

Selected waste rock piles at the sites were mapped using a handheld GPS and/or measuring tape. Sketches of selected mines and associated waste rock piles were compiled. Composite samples of waste rock piles were collected and soil petrography and paste pH analyses were measured for each sample. The samples were examined to determine alteration type, any notable weathering features, and overall mineralogy. The grain shape was noted, after which the sample was moistened with distilled water and its color was determined. The samples were then tested to determine their paste pH. Fine grains from the sample were placed in a beaker with distilled water and the mixture was stirred until it formed a paste, the probe from the pH meter was dipped into the paste, and the data was recorded.

Soil petrography revealed that the soil was composed of 75% fine sand, silt and clay, loosely packed. The individual grains were mostly angular and poorly sorted. An acid test revealed the presence of some carbonates, probably calcite. The samples contained a small amount of organic material, such as grass and seeds. Minerals found at the sites included malachite, chrysocolla, calcite, quartz, and iron oxides. Paste pH of the samples revealed an average reading of 8.25, indicating the soil is slightly alkalinic with non-acid forming potential. The Silver Hill mine is an open shaft and therefore presents physical hazard.

Keywords:

2019 New Mexico Geological Society Annual Spring Meeting
April 12, 2019, Macey Center, New Mexico Tech campus, Socorro, NM