

## Techniques to Refine Initial Amendment Selection for Dispersed Mine Tailings Reclamation<sup>1</sup>

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The Waldorf Mine is located in the Argentine Mining District of Colorado<sup>3</sup>. Mining activity in the area began in the 1850's and continued through the 1950's. Dispersed tailings from a now-collapsed mill is located at elevations ranging from 11,300 to 11,400 feet. An Engineering Evaluation/Cost Analysis (EE/CA) indicated that incorporation of lime and organic amendments for in-situ phytostabilization was the recommended reclamation alternative. Further refinement was undertaken through evaluation of various materials to be sourced for reclamation at the site. Due to access difficulties, reducing the material to be hauled to site was important for cost savings. In-house testing included additional lime testing and germination trials to ensure that adequate and sufficient amendment rates for the site. Lime rates were originally estimated based on a single buffering test, a generic test. As lime efficiency varies between sources, a lime rate addition trial with lime sourced for reclamation was undertaken to determine the rate required to reach a target pH of 7.5. Based on this testing, the amount of lime was reduced by 30% from the recommendations of the EE/CA. To ensure sufficient lime was available to neutralize residual acidity, kinetic NAG testing was also undertaken. Germination trials were used with various organic materials at various rates to determine. Based on the results of the trial a composted forest product was utilized that reduced the estimated cost by 20% as well as reduced haulage costs. Following incorporation of the amendments, confirmation sampling was undertaken and tested for pH values to ensure that the amendments were properly incorporated into the dispersed. Despite a poor snow pack and drought conditions, adequate germination was achieved during the first growing season.

Additional Key Words: Phytostabilization

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3. Work reported here was conducted near 39°38'15"N, 105°46'03"W