

Investigation Acidic Discharges at the Monahan Abandoned Mine Lands Site, Kansas¹

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Abstract: Pittsburg State University Monahan Outdoor Education Center is located at the site of several pre-SMCRA coal mining and processing facility. The 80-acre site is located in Crawford County, approximately 1 mile north and 1.5 miles east of Cherokee, Kansas in the southern part of the state's historic coal mining area. Mining at the Monahan AML Site included: 1) underground mining of the Weir-Pittsburg coal bed (Commercial Fuels Co. #2 Mine -1910's-1920's); 2) surface mining of the Mineral coal bed in (Commercial Fuels Co # 10 Mine -1930's -1940's); and 3) processing of coal from various Commercial Fuels Co. mines with on-site coarse (gob) and fine (slurry) coal waste disposal (1920's -1940's). Over 40 years later the Abandoned Mine Land (AML) Fund provided support for a site investigation and surface mine reclamation by U.S. Dept. of Agriculture, SCS (now NCRDS; 1981-1985). Reclamation of the site focused on eliminate hazards (burning coal waste) and remediation by land reclamation of severe environmental problems [acid mine drainage (AMD) and offsite sedimentation]. However, a significant amount of oxygen-bearing water and ferric iron apparently continues to infiltrate into the pile allowing continued oxidation of pyrite, which is abundant in the coarse refuse. A series of AMD seeps have coalesced to form a barren northern slope of reclaimed gob pile, which will continue to erode unless measures are taken within the next few years to collect the AMD in a subsurface drain system and re-establish vegetation. This paper describes the result of a series of post-reclamation site investigations initiated by Pittsburg State University which more recently updated by the Kansas Dept. of Health and Environment (KDH&E) with support from students and technical staff of the college and Office of Surface Mining's Mid-Continent Region. This information will form the basis for proposed remediation of the Monahan site AMD though additional land reclamation and the application of passive treatment of the Monahan Gob Pile AMD. This paper will present the current plans, which inched use of low-pH iron oxidation. Although a high aluminum and acidity of AMD which seeps from the gob pile suggests that the construction of a sulfate-reducing bioreactor is necessary, there are concerns of the potential for periodic amounts of hydrogen sulfide gas will provide a hazard at a public use area. The current remediation plan includes the use of low-pH iron oxidation and dilution water to lower iron, aluminum, and acidity to levels that are more appropriate for traditional limestone-based VFP, which will be followed by oxidation pond and aerobic wetland for metal precipitation.

Additional Key Words: low-pH iron oxidation, sulfate-reducing bioreactors, acid-forming materials.

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1. Poster paper presented at the 2018 National Meeting of the American Society of Mining and Reclamation, St. Louis, MO: The Gateway to Land Reclamation, June 3 - 7, 2018. Published by ASMR; 1305 Weathervane Dr., Champaign, IL 61821.
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