

# INNOVATIVE TECHNOLOGY APPLICATIONS TO MINE RECLAMATION USING NEUTRALIZED RED MUD AND RECYCLED SOIL MANUFACTURING TECHNOLOGIES<sup>1</sup>

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**Abstract:** Red mud is the fine-grained residue remaining after the NaOH extraction of aluminum from bauxite using the Bayer process. For each 5 tons of bauxite refined approximately 3 tons of waste spent bauxite is also produced. This residual material possesses a naturally high pH of about 13. This red mud can be processed into a number of neutralizing products for use to solve environmental problems with acid or toxic metal contamination. Neutralite Technologies, Inc. (NTI) processes the red mud by neutralizing the pH from 13 to 8.6 using a propriety blend of reagents to produce NeutraTreat-NRM<sup>TM</sup> that has retained its pH buffering ability of 2.5 – 7.5 moles of acid/kg of NRM. Its trace metal trapping capacity is greater than 1,000 milliequivalents of metal/kg and it possesses a high capacity to trap and bind phosphates and arsenates. The qualities of NeutraTreat-NRM<sup>TM</sup> include exceptional ability to neutralize acidic water and soil and absorb toxic heavy metals, phosphates and arsenates. Uses of NeutraTreat-NRM<sup>TM</sup> include cleansing acidic heavy metal laden toxic mine water, permanent solution to treating acidic heavy metal laden mine tailings and waste rock, treating acid rock drainage (ARD) and acid mine drainage (AMD) mine sites, capping former mine sites, treating phosphate from phosphate mining activity, treatment of acidic soil, revegetation and erosion control as well as being a solution to countless other environmental problems. Recycled Soil Manufacturing Technology blends artificial topsoil from waste residuals such as dredged material, cellulose, biosolids and liming materials such as processed red mud and has been applied to a 35 acre abandoned acid coal mine site to form the Vintondale, PA AMD & ART recreation/education park.

Additional Key Words: Neutralizing Acid Soils, AMD treatment, AMD restoration

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