

Biotic Soil Technology for Cost Effective Mine Closure Cover Systems¹

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Abstract: One vexing issue facing successful restoration of disturbed mine sites is lack of available topsoil to create viable environments for establishing sustainable vegetation. In the absence of adequate sources of topsoil, new techniques have been developed to treat and revive depleted soils to render them more capable of accelerating and sustaining vegetative growth. Essentially, on-site soils can be “engineered” to improve their chemical and biological properties. The meticulous introduction of organic matter, agronomic amendments, plant biostimulants, and soil building components can effectively turn marginal soils into productive and sustainable growth media. Biotic Soil Technology (BST) is a generic term to describe the emerging field of manufactured growth media containing biodegradable fibers, biostimulants, biological inoculants, and other components engineered to cost-effectively increase organic content, accelerate sustainable vegetative establishment and promote regeneration of denuded soils. The efficacy of BST is becoming more fully demonstrated with a growing portfolio of successful installations around the world on challenging sites involving civil construction as well as engineered cover systems for mining and waste containment. Beyond the initial mission to cost effectively foster more rapid and complete establishment of vegetation to reduce erosion and improve water quality, there is a need to monitor changes in organic matter levels, soil pH, microbial levels, and other parameters that contribute to sustainable growing environments. This presentation will offer prescribed testing protocol for site assessments to determine suitable Biotic Soil Technologies, agronomic amendments and their rates prior to installation, inspection techniques during installation, monitoring post-installation vegetative species composition, density and cover as well as testing to document changes in soil chemistry and biota over time. Case studies of mining projects in diverse ecosystems will serve as examples to demonstrate the prescribed testing protocol and results obtained to validate BST efficacy.

Additional Key Words: organic matter, erosion control, growth establishment, topsoil, monitoring, inspection, testing protocol.

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1. Oral 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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