

A Pedologic View of Geomorphic Reclamation in Wyoming¹

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Abstract: Mineral commodities generated by surface mining drives much of Wyoming's economy through invasive extraction processes, intensifying the need for vast land reconstruction and reclamation. These activities involve the mass spread of salvaged soil that has been moved, often several times, consequentially homogenizing the soil laid onto the landscape. Complete mixing and transport of soil can disrupt physical structure and the natural order of mature soil horizonation, altering its function to support plant and microbial life. A reclamation project in the Gas Hills of Wyoming, where traditional reclamation practices and geomorphic methods have been implemented concurrently a decade ago, provides an opportunity to observe the outcomes of two different reclamation approaches. This study captures a witness of short-term soil development that has occurred in soils that were, in terms of soil maturity, set back to time-zero. By considering existing morphological features and horizon development, this study evaluates the current state of soils that have been spread and allowed to establish for over ten years using a side-by-side comparison of reclamation methods. Findings from this approach suggest that short-term soil development in semi-arid environments might contribute to the success of reclamation. Through the pedologic lens, this research attempts to offer measures that may aid in determining if geomorphic reclamation can be a suitable practice in Wyoming.

Additional Key Words: mine reclamation, geomorphic reclamation, soil, pedology

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