

INFLUENCE OF PHYSICOCHEMICAL PROPERTIES OF LOOSE-DUMPED GREY, BROWN AND MIXED SANDSTONE SPOILS ON SURFACE MINE REFORESTATION IN KENTUCKY¹

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Abstract. Since the implementation of the Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87) in May of 1978, many opportunities have been lost for the reforestation of surface mines in the eastern United States. Excessive compaction of spoil material in the backfilling and grading process is the biggest impediment to the establishment of productive forests as a post-mining land use. Cultural barriers that exist within the mining industry and the Federal and State regulatory authorities, contribute to the failure of reforestation efforts under the federal law over the past 26 years. Efforts are being taken to change the perception that the federal law and regulations impede effective reforestation techniques and interfere with bond release. The results of reclamation research have generated the following recommendations toward successfully establishing productive forests of reclaimed surface mines: (1) Create a suitable rooting medium for good tree growth that is no less than 4 feet deep and comprised of topsoil, weathered sandstone and/or the best available material; (2) Loosely grade the topsoil or topsoil substitutes placed on the surface to create a non-compacted growth medium; (3) Use native and non-competitive ground covers that are compatible with growing trees; (4) Plant two types of trees – early succession species for wildlife and soil stability, and commercially valuable crop trees; and, (5) Use proper tree planting techniques. Research plots have been established on a mountaintop removal operation in Pike County Kentucky for the purpose of evaluating tree performance on loose-graded spoils. Loose graded spoil that is predominately grey un-weathered sandstone will be compared with loose graded spoil that is predominately brown weathered sandstone in regards to mineralogical composition, chemical and physical analysis, water infiltration characteristics, and tree performance.

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