

Vegetation Response to Surface Soil Undulation Height¹

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Abstract: This case study examines and compares the variation in plant species, height and type within a reclaimed tailings pond that was subject to two different reclamation strategies; one reclaimed with the addition of limestone and organic material and then a surface undulation of furrows 0.7 m high and 1.0 m wide and the other strategy included the addition of limestone and organic material but a minimal surface undulation of approximately 0.1 m high and 0.1 m wide. During the extraction and processing of kyanite ore from the Graves Mountain mine, Lincoln County, Georgia, fine grained tailings were produced. The tailings were transported by slurry pipeline to various tailings ponds which were created by the construction of dams using on-site materials. The tailings pond in this study, referred to as the West Tailings Pond (WTP), was constructed and filled in the 1970's and early 1980's and was reclaimed in 1995-98, by surface reconfiguration and the addition of soil amendments. Approximately 75% of the 12 ha (30 ac) site was reclaimed initially with a thin soil cap. Subsequently, amendments were added but the amendments were only harrowed in 0.1 m (4 in.) and then site seeded. The 25% eastern end of the tailings pond was filled, amendments added and harrowed to create ridge and furrow undulations 0.7m by 1.0m and then seeded. Similar seed mixes were used for the entire tailings pond. Over the course of 20 years, the eastern, 25% of the tailings pond with greater undulations, succeeded quickly from grass to shrub and now has a significant tree population. The 75% of the pond with only a 0.1m undulation has not succeeded beyond low grasses and mosses. Some of this diversity is attributed to higher moisture levels measured in the greater undulations and some is attributed to wind born seed species of trees captured in the greater undulations. Comparisons will also be made to a second tailings pond (ETP) which also had surface undulations of furrows 0.7 m high and 1.0 m wide.³

Additional Key Words: Acid soils, reclamation, tailings

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 3. Work reported here was conducted near 33° 44' 11" N; 82° 31' 25" W.