

Tree Growth and Regeneration on Reclaimed Oil Sands Mine Sites in Northern Alberta¹

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Abstract: A guiding principle of land reclamation after industrial developments in Alberta is that reclaimed sites must have an “equivalent land capability” to pre-disturbance conditions. In the mineable oil sands region of the boreal forest, this means that establishing trees and forests on upland reclamation sites is a key priority. Reclamation operations, in particular the choice and placement of cover soils, fertilization, and competition control, have the potential to control the future composition and productivity of these reclaimed forests. Early results for trembling aspen and white spruce establishment and growth will be compared with similar aged fire-origin forests as a natural benchmark. In general, natural aspen seedling regeneration is greatest on lowland origin peat-based reclamation soils due to high water holding capacity and low competition while upland forest-based reclamation soils favour the development of native and non-native vegetation, which can act as competition for trees. The use of stockpiled soil in reclamation can also have negative impacts on tree establishment, particularly if physical soil properties are altered during stockpiling and reclamation. Early fertilization with nitrogen based fertilizers increases competition with no, or only limited, increases in tree growth. In the longer term, aspen and spruce growth on reclamation sites is similar to natural forests in the region with current research focusing on modeling tree growth on different reclamation soil types into the future. Given the long timeframe for oil sands mines, the next phase of related research will address final land uses for these forest reclamation sites.³

Keywords: oil sands, mine reclamation, boreal forest, trembling aspen, white spruce, tree growth

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 3. This work took place in the mineable oil sands region of northern Alberta near 57.2°N 111.6°W.