

Beneficial Use of Dredge Sediment for Reclamation of Mining Sites ¹

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Abstract: Between 2011 and 2019 fine grained dredge sediment from the Duluth Superior Harbor has been transported and placed on three different mining sites in northeastern Minnesota to evaluate the beneficial use of the material for revegetation. Each demonstration project is located in a different mine-related setting. Sites included use of 30,000 cubic yards (cy) on a barren tailings basin at Keewatin Taconite (2011-2012), 3,700 cy at a Hibbing Taconite gravel pit (2012-2014), and 4,500 cy on a historic waste rock stockpile (2014-2019) located at the Virginia Landfill. At each site, sediment was placed at varying thicknesses between 6 and 12 inches and in different plot configurations, then a variety of tree and/or shrub seedlings were planted. Sediment was placed at the first two tailings basin and gravel pit sites and planted without follow up evaluation until 2019. Harbor dredge sediment promotes vegetation growth on disturbed land in areas of low soil fertility. In general, a thicker sediment layer can have a positive effect on survival rates for some tree species. However, evidence of overgrowth of grasses and weeds was observed at the sites. Trees were found “buried” by thick vegetation that had caused stress, deformation, and sometimes death. This competition from other vegetation likely affected the survival and growth of tree seedlings at all three sites. Application of dredge sediment enhances re-establishment of grassy type vegetation.

Additional Key Words: revegetation, soil fertility, tree growth.

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 3. Work reported here was conducted across the Mesabi Iron Range in Northeastern Minnesota, USA.