Abstract

Minimising oxygen ingress from the atmosphere into cover material is the key to avoiding pyrite oxidisation of underlying potentially acid forming waste rock, which could lead to acid and metalliferous drainage (AMD). To optimise cover design using materials available on site, six large columns, of 1 m in diameter and 4 m in height, were constructed on site at the Savage River Iron Ore Mine in north-western Tasmania. The first three columns were constructed as controls, filled with loosely-placed, coarse-grained A-type and B-type wastes, and potentially acid forming D-type waste. The fourth column was filled with loosely-placed D-type waste overlying compacted A-type waste. The fifth column was filled with loosely-placed D-type waste overlying compacted B-type waste. The sixth column was filled with alternating layers of loosely-placed D-type, B-type and A-type wastes. The surface of the filled columns was subjected to local weather conditions monitored by a weather station. A camera was installed on the top of the columns to monitor settlement of the wastes. Drainage was allowed at the column base by installing a U-bend and reservoir for water sample collection. All of the columns were instrumented with sensors designed and manufactured at The University of Queensland, to monitor continuously and in real-time moisture, suction, temperature and oxygen profiles with depth in the columns. This paper will report on the instrumented column set-up and two years of monitoring results obtained to date.