The performance of field applicability with waste mine sludge as a barrier liner

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ABSTRACT

The acid mine drainage sludge (designated as AMDs) is mainly generated through the physicochemical treatment or electrical purification drainage from abandoned mine that is include heavy metals. It can confirm that the harmfulness of the CMDS (Coal mine drainage sludge) which generated from the process to acid mine drainage sludge. The purpose of this study is to determine the proper mixing ratio to meet the criteria of barrier liner conditions (must be less than $1 \times 10^{-7}$ cm/sec) using the CMDS. The main materials (CMDS), bentonite and cement are mixed. The possibility on field applicability of using this mixture as the liner in landfill sites was examined. Site application executes the freeze/thaw Crack experiment which uses a formation freezer. To determine the mixed liner on field applicability, this study conducted temperature/humidity measurement, hydraulic conductivity tests, and compression tests. The experiment initially observes the hydraulic conductivity and the surface of constructs after simulating 1, 2, 3 Cycle. In conclusion, the optimum coefficient of permeability that meets the landfill liner condition was obtained when the ratio of CMDS-cement-bentonite was 1:0.3:0.5 using in lab-scale. If CMDS-cement-bentonite is mixed on field, It can determines whether that is a technical, an economic, and the environmentally safe landfill liner construction or not.

Key Word : Liner, Field Applicability, AMD, Freezing/Thawing, Mixing Ratio, CMDS