

Macroencapsulation: Improving Safety While Increasing Landfill Capacity, Promoting Material Reuse, and Reducing Costs

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ABSTRACT

Macroencapsulation is an innovative adaptation of the Mechanically Stabilized Earthen berm (MSE) concept currently utilized at several landfills; increasing safety and capacity while reducing costs.

Stability and safety of berms may be compromised by the introduction of liquids which may result in an increase in pore pressures and failure due to liquefaction. Alternative berm construction eliminates the potential of moisture infiltration, and offers long-term safety. The technique discussed utilizes macroencapsulation; berms with a geomembrane envelope that completely encapsulates the fill material.

Traditional MSE berms may rely upon the procurement, transport, placement and compaction of fill utilized in construction. Instead, macroencapsulation utilizes revenue-generating beneficial reuse materials. This increases slope stability, offers expansion of capacity with limited or no increase in regulatory footprint, promotes the use and recycling of materials, reduces the cost and timing of permitting / construction, and reduces overall landfill cost per unit capacity. Additionally, effective closure of abandoned waste units ranging from CCR to MSW can be accomplished using macroencapsulation.

The technology has provided static liquefaction management during some of nature's worst events, including an earthquake and the direct-hit of a hurricane. The presentation will address the use of encapsulation technology, and several case studies illustrating its implementation.

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