

# Oversight Report of Compaction of Coal Mine Waste Slurry Impoundment Embankments Evaluation Year 2011

## I. Executive Summary

The purpose of this study was to investigate quality control procedures employed by operators to verify that construction of slurry impoundment embankments is being conducted in accordance with approved plans and specifications. OSM Engineers became concerned that embankment construction quality control may be inconsistent when they observed cases of material being placed under wet conditions, excessive lift thicknesses, and consultants recording passing test results when visual observations (pumping and rutting) indicate the material may not be adequately compacted.

Our concerns were based on the noted observations, with consideration given to the following:

- Coarse refuse is primarily low plasticity silt with rock fragments and some clay. Materials of this type are typically compactable only within a narrow range of moisture content.
- Coarse coal refuse is separated from coal by wet methods and typically arrives at the impoundment site in a wet condition.
- Refuse is typically placed during all types of weather. Control of moisture may not be possible during wet or cold weather.
- In most cases, the reported compaction equipment is one or more dozers. Dozers are not designed to compact soil. The tracks are designed to allow the dozer to operate on loose ground.

The intent of this study was to determine if the operators were consistently able to adequately compact the coarse refuse under conditions that would appear to be adverse. The study was conducted by employing an independent consultant to perform compaction testing on embankments at selected impoundments in the state. Since the noted observations were made at impoundments at which belt delivery and dozer placement/compaction were employed, all but one of the sites investigated were of this type. Site visits were unannounced so that testing would be representative of typical conditions.

Results of the testing tend to indicate that the coarse refuse is not consistently being compacted in accordance with approved specifications. Failing field density tests occurred at all seven of the sites investigated. Of 73 field density tests performed at the seven sites, only 16 yielded passing results. These results indicate the quality control methods used during embankment construction may not be achieving the desired results.