

Ohio EPA
Division of Emergency and Remedial Response

TECHNICAL DECISION COMPENDIUM

August, 2009

Title: Assessment of Seismic Risks at Remedial Sites

Key Words: Earthquakes, Slope Stability, Seismic

Purpose: When hazardous wastes are contained in-place, the closure design must prevent future releases to the environment, even during earthquakes. Stability analyses must include an evaluation of seismic effects to assure the integrity of the site.

Background While Ohio does not have as high an earthquake risk as some other states, Ohio has experienced several quakes during the 20th century that have resulted in building damage. Three of these have occurred since 1980. The risk of an earthquake in Ohio cannot be ignored. Landfills being constructed under current DSIWM regulations must be evaluated for seismic stability. Thus, it is reasonable that sites being contained under DERR's remedial program should also be evaluated for earthquake risk, especially since these sites often contain wastes that violate current land disposal restrictions, were originally built to much lower standards than applicable today and were sometimes located in environmentally sensitive areas where new facilities could not be permitted.

Decision: Landfills and other sites being closed under the remedial program should be evaluated for seismic, as well as static stability. The seismic risk for a particular location within the state should be determined using the US Geological Survey's Seismic Hazard Map for the central and eastern states. This map gives identifies the peak bedrock acceleration expected to have a ten percent probability of occurrence every 250 years for various regions of the state. In addition, if site specific information (such as actual seismic records) indicates a higher risk for a site than indicated on the USGS map, then the local information must be considered. At a minimum the site should be evaluated considering a pseudostatic analysis with the corresponding local horizontal acceleration (with appropriate adjustments for overburden effects). Local geologic conditions that may accelerate earthquake effects should also be considered.

Rationale: The USGS map represents the latest consensus of seismic experts on earthquake risks for the United States. That map is intended to cover broad regions in general terms. When localized records exist that indicate higher risks (as in the northeastern part of the state) then those risks

should be evaluated regardless of the rating given the site by the USGS map.

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Attachments: Ohio Section of the USGS Seismic Hazards Map, Peak Acceleration, G's, with 2% Probability of Exceedance in 50 Years

