ILLINOIS STATE GEOLOGICAL SURVEY
PRAIRIE RESEARCH INSTITUTE

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ILLINOIS STATE GEOLOGICAL SURVEY SEMINAR SERIES

Development, Progression, and Containment of Elevated Temperatures in Landfills

Dr. Timothy D. Stark

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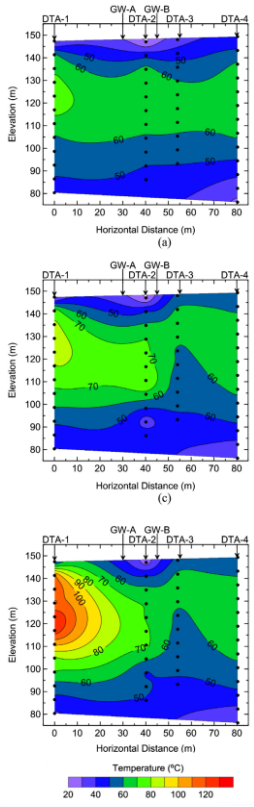

Elevated temperatures in various landfill types can produce obnoxious odors, toxic gases, and aggressive leachates, as well as damage landfill infrastructure. They also can result in expensive remedial measures and warrant permanent closure of the facility. This presentation will discuss mechanisms that can lead to elevated temperatures in landfills using recent case histories and present associated trends in gas composition, leachate collection, settlement, and slope movement. In general, landfill gas composition changes from predominantly methane (50–60% v/v) and carbon dioxide (40–55% v/v) to a composition of carbon dioxide (60–80% v/v), hydrogen (10–35% v/v), and carbon monoxide (>1500 ppmv) as temperatures elevate. As waste temperatures increase, gas and leachate pressures also increase, resulting in odors, leachate outbreaks, and possible slope instability. Based on observed management, operation, and maintenance of elevated temperature facilities, various operational techniques will be presented for isolating and containing the elevated temperatures.

About the speaker:

Dr. Stark is a Professor of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign with an expertise in Geotechnical Engineering. Dr. Stark has been conducting research on the static and seismic stability of landfill liner and cover systems for the last twenty-five (25) years. His research on the static and seismic stability of waste containment facilities has led to a better understanding on geosynthetic durability, design values of geosynthetic interface strengths for stability analyses, the importance of interim slope conditions in landfill operations, the shear behavior of geosynthetic clay liners, and three-dimensional slope stability analyses for the design of slopes underlain by weak geosynthetic interfaces and/or soil layers. In the last ten years he has been studying the effects of elevated temperatures in various types of landfills and the long-term durability of geosynthetics in geo-environmental applications with and without elevated temperatures. Dr. Stark has received a number of awards for his research, teaching, and service activities including: Best Paper in Geosynthetics International Journal, 2016; R.S. Ladd D18 Standards Development Award, ASTM, 2014, 2011, 2002; Thomas A. Middlebrooks Award from the American Society of Civil Engineers (ASCE), 2013 and 1998. He received the Associate Editor Award, from ASCE's Journal of Geotechnical and Geoenvironmental Engineering in 2012, and is now Selected Editor for the journal.

11:00 AM

NATURAL RESOURCES BUILDING
ROOM 101 (LEIGHTON CONFERENCE ROOM)
615 EAST PEABODY DRIVE, CHAMPAIGN IL 61820

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The Illinois State Geological Survey seminar series is organized by the ISGS Seminar Committee.

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