

**Environmental Engineering**

**and Earth Sciences**

**EEES Department Seminar**

**2024 AAEES Kappe Lecture**

**Elevated Temperature Landfills: Causation, Impacts, and Best Management Practices Learned from the Field**

**Dr. Craig Benson, Ph.D.**

*Wisconsin Distinguished Professor Emeritus*

*University of Wisconsin, Madison*

Elevated temperature landfills (ETLFs) are municipal solid waste landfills (MSW) with waste temperatures substantially in excess of 65 oC that persist over a large area for a sustained period of time. Phenomena commonly associated with ETLFs include substantial and rapid settlements; strong leachate with high BOD and COD, high VOC concentrations, and high total suspended solids; landfill gas depleted in methane and rich in carbon monoxide and hydrogen, and very strong odors that often result in strained relationships with the local community. Remedial measures to address ELTFs can cost in the $100Ms. When the first ETLFs were encountered, they were poorly understood and perceived as an “existential threat” to the solid waste industry. The mechanisms responsible for ELTFs were unclear and a subject of intense debate, as were the appropriate remedial actions. Extensive research and field experience derived through industry-academic partnerships over nearly two decades have clarified the mechanisms that cause ETLFs as well as identified appropriate best management practices (BMPs) to address impacts and return the landfill to a stable equilibrium state. BMPs have also been developed for landfill operations, including characterization of heat generating potential of different waste streams, pre-treatment approaches for heat generating wastes, and disposal strategies to manage the accumulation of heat. This presentation will provide the historical evolution of our understanding of ETLFs and illustrate how BMPs developed from field experience result in successful outcomes at actual MSW landfills. Recommendations are provided that are important to current students as well as seasoned professionals.

**About the speaker:**

Dr. Craig Benson is Wisconsin Distinguished Professor Emeritus at the University of Wisconsin-Madison and Dean of Engineering and Hamilton Professor Emeritus at the University of Virginia. Dr. Benson is a geoenvironmental engineer with expertise in waste management, waste containment systems, recycling and beneficial reuse, and sustainability. He served as Dean of Engineering at the University of Virginia and as a Department Chair and Director of Sustainability Research and Education at the University of Wisconsin-Madison. Benson has a BS from Lehigh University and the MSE and PhD from the University of Texas at Austin, all in Civil Engineering with an emphasis in geoenvironmental engineering. He is a member of the US National Academy of Engineering (NAE) and the National Academy of Inventors (NAI), as well as a Fellow in the American Association for the Advancement of Science (AAAS). Dr. Benson’s research experience involves laboratory studies, large-scale field experiments, and predictive modeling. He has published more than 300 refereed articles based on his research and has received numerous research awards, including the Karl Terzaghi Award, Ralph Peck Award, Huber Research Prize, Alfred Noble Prize, Croes Medal (twice), Middlebrooks Award (twice), Collingwood Prize, and Casagrande Award from the American Society of Civil Engineers and the Award of Merit, Ivan Johnson Award for Outstanding Achievement, and the Best Practical Paper Award (twice) from ASTM International.

**2:30 PM**

**Thursday, October 10, 2024**

***Please note the change of day***

**Rich Lab Auditorium**

***Attendance is mandatory for graduate students enrolled in EES 8610, EES 9610, and, EES 8910, GEOL 8610.***

***Refreshments after the seminar.***

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