Time & Location: April 4, 2019 at 1:30 PM in ENG 2 310
Title: Characterization of Florida Landfills with Elevated Temperatures

The occurrence of elevated temperatures within landfills is a very challenging issue for landfill operators to correct. Little is known regarding the causes of elevated temperatures and the number of landfills currently operating under such conditions. Therefore, the goal of this research was to determine which landfills within Florida have been impacted by elevated temperatures and to develop a more complete understanding of the factors that may lead to these landfills becoming elevated temperature landfills (ETLFs).

Historical landfill gas wellhead data, waste deposition reports, and landfill site geometry were collected for 27 landfill cells through the OCULUS database and from landfill operators and owners. These data were evaluated to quantify the statistical characteristics that result in landfills becoming "elevated" in temperature. Gas data included landfill gas temperatures, methane content, carbon dioxide content, and balance gas readings. Waste deposition information was gathered by viewing solid waste reports for each landfill. Landfill site geometry was found through building permits, topographical landfill diagrams, and annual operation reports. Furthermore, landfill maps were created in ArcGIS to observe spatial distribution of elevated temperatures in landfills over time.

Upon analysis of the landfill gas wellhead data, it was discovered that 78% of studied landfill cells reported temperature exceedances; regulatory limits specify a maximum allowable gas temperature of 55°C (131°F). When studying the solid waste reports, it was discovered that 37% of landfill cells contained MSW ash; of these cells, 90% of them are considered ETLFs. Regarding site geometry, it was found that ETLF cells are on average double the site area and over 20 feet deeper than the average non-ETLF cell. Furthermore, results suggest that heat generation and movement in most landfills is limited; however, heat propagation is possible if gas wells are turned off for an extensive time period.

Major: Environmental Engineering

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Approved for distribution by Debra Reinhart, Committee Chair, on March 18, 2019.

The public is welcome to attend.