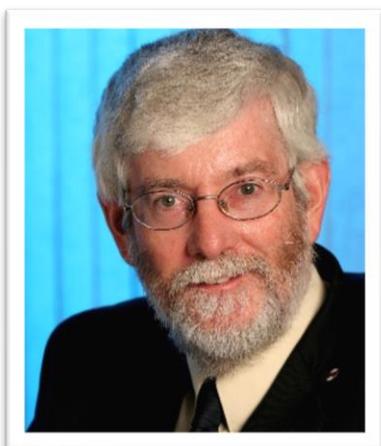


8ICEG Special Distinguished Lecture



Dr. R. Kerry Rowe

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Special Distinguished Lecture Title

Environmental geotechnics: looking back, looking forward

[08:55 - 09:35, Monday 29th Oct. 2018]

Biography

Dr. R. Kerry Rowe was educated and worked as a geotechnical engineer in Australia before emigrated to Canada in late 1978 to take up an academic position. He has published prolifically on, and has extensive research and consulting experience in, geotechnical, geosynthetics, waste management and geoenvironmental engineering including the design and/or peer review of hydrogeology and design of landfills. Recognized by numerous awards, the distinguished lectures he has presented include the Giroud, Rankine, Casagrande, and the ASCE Karl Terzaghi Lectures. In 2013, the International Society for Soil Mechanics and Geotechnical Engineering created the R. Kerry Rowe Lecture. He is a Fellow of the Royal Society (of London, UK), Royal Academy of Engineering, the Royal Society of Canada, the Canadian Academy of Engineering, and a foreign Member of the U.S. National Academy of Engineering. He is a past president of the International Geosynthetics Society, the Canadian Geotechnical Society and the Engineering Institute of Canada and editor of the journal *Geotextiles and geomembranes*.

Abstract

As a discipline within the broader context of geotechnical engineering, Environmental Geotechnics can trace its roots back to the early days of geotechnical engineering and the work on flow through soil and compaction of soil for low permeability (e.g., in earth dams). However, over about the last 35 years, it has evolved considerably and one might wonder if it has now matured or if there are still significant challenges to address? This lecture attempts to highlight some of the advances over the past 35 years in terms of minimizing impact to the environment of waste by containment, collection, and treatment of contaminants as well as minimizing the generation of contaminants.

Looking back, the lecture examines advances in understanding hydraulic conductivity

of soils (both clayey and granular soils) permeated by contaminated fluids. It highlights the, now recognised, importance of diffusion of contaminants in well-designed low leakage, or zero leakage, barriers. Progress with respect to the design and operational implications of drainage layers for contaminated fluids is discussed. Finally, the massive growth in the use of geomembranes in fluid containment and the advances in construction quality assurance to minimize holes is examined.

Looking forward, the lecture highlights the needs and challenges of taking a systems approach to environmental geotechnical design. It highlights how the optimization of some components of a barrier system (e.g., a drainage layer) without appreciating the negative effect that this optimization can have on other components (e.g., a geomembrane liner) in municipal and mining environments. It discusses the often underestimated, and sometimes overlooked, interaction between the waste and the barrier system can have on the long term performance of a geomembrane liner. However, not all interactions are negative! The lecture identifies positive interactions between geomembranes and adjacent materials that can substantially reduce leakage and discusses the factors still requiring further detailed investigation in this area. Finally, the lecture touches on construction issues where there is a need to by far more awareness in the industry because of their implications for system performance.