





Hrvatsko Croatian geotehničko Geotechnical društvo Society

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past advances &future directions In geoenvironmental engineering

/ a personal perspective

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Pierottijeva 6, Zagreb velika predavaonica RGN fakulteta

za prisustvovanje predavanju obavezna je prijava do 10.5. na www.hgd-cgs.hr



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Geoenvironmental engineering can trace its roots back to the early days of geotechnical engineering and the work on flow through soil and compaction of soil for in earth dams. Over the past four decades it has evolved considerably but there are still



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significant challenges to be addressed. This highlights some of the advances over the past 40° years which have seen a substantial reduction in the impact to the environment of municipal and hazardous waste and the contaminants of major concern 30-40 years ago and

now in low concentration in landfills – yet but we, as a society keep inventing new materials and potential new contaminants which like those of the past serve a very useful function but ultimately create risks that were unrecognised 20 years ago.

> The lecture examines past 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. It discusses some contaminates of emerging concern and how modern landfills are coping with those contaminants. 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 guality assurance to minimize holes is examined.

Past problems associated with 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) are discussed. 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 is examined. 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.

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. He was appointed as an Officer of the Order of Canada (Canada's highest civilian honour) in 2018.

prof.

ronald

in Geotechnical & Geoenvironmental Engineering,

Professor and Canada Research Chair

Canada Queen's-RMC.

ON,

Queen's University, Kingston,

GeoEngineering Centre at