

IMPORTANCE OF UNDERSTANDING SPATIAL VARIATION OF GEOLOGICAL PROFILES IN OIL SANDS TAILINGS DAM DESIGN

Speaker

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Abstract

Design of the External Tailings Area (ETA) for Imperial's Kearl Mine was based, in part, on seepage analyses that used generalized geologic information combined with discrete boreholes, soil samples and piezometric information. The scale and locations of the available information could not practically describe or account for the geologic variability at the site, which led to discrepancies between the measured seepage rates and the rates predicted in design. This resulted in the installation of "fit for purpose" seepage control measures at locations along the toe of the dam soon after the start of reservoir filling. A series of field investigations and seepage back-analyses were undertaken to better understand the seepage mechanism. The effort focused mainly on how to match the measured and predicted seepage rates and incorporation of important features not initially taken into account. This case study presents a practical approach to evaluate the seepage mechanism, which includes a series of transient seepage back-analyses, establishing relationships for piezometric responses in time and space, and a study on geological borehole locations. The proposed approach substantiated through this case study can be applied to other similar projects

Biography

Dr. Tiequn FENG works currently as Sr. Tailings and geotechnical research expert with Imperial Oil Limited and Adjunct Professor with University of Calgary. He acted as the Design of Records for major mine structures including In-Pit Tailings Dams, Overburden Waste Dumps and Pit walls. Dr. Feng has experience in geotechnical numerical analysis over 30 years and has worked in oil sands industry in the past 16 years.



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