



Rheology for Tailings Flow Simulation

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Abstract: The rheological parameters of tailings are important to design of pipeline transport, dam breach consequence simulation, and, for certain types of deposits, impoundment geometry and mine closure. There are, however, many experimental methods that can be (and have been) used to characterize tailings rheology. The presentation reviews past investigations of tailings rheology, and discusses what techniques are most appropriate to different applications. Some generic numerical modelling simulations of tailings runout, during deposition and post-breach, are used to illustrate the sensitivity of runout predictions to how the rheology of a specific tailings is characterized. Examples from hard rock and oil sands mining are discussed.

Speaker biography: Dr. Paul Simms is a Professor at Carleton University, who has specialized in research on various aspects of tailings management for 17 years. Paul has published papers on geochemistry, rheology, unsaturated behaviour, consolidation, and shear strength related to tailings. Paul's work originally focused on thickened and related dewatering technologies applied to hard rock tailings, that work is summarized in his 2017 Colloquium paper in the CGJ "Geootechnical and Geoenvironmental behaviour of high-density tailings". Paul has recently led two large research projects (~\$3 million) supported by the oil sands industry, focusing on desiccation, rheology for surface deposition, and long term consolidation behaviour. Paul's more recent work includes projects on tailings flowability.