Conference: Mine Waste and Tailings

Theme: Tailings and Foundation Characterisation

Paradigm shifts in geotechnical in situ testing equipment and methods - to make them "work" in tailings materials – especially the very soft stuff

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ABSTRACT

Most in situ testing tools and methods evolved originally for use in testing natural soils. But tailings are not natural soils. The authors will highlight, explain and discuss significant shifts in equipment and test methodology that have taken place for three of the most popular in situ tests used to characterise tailings materials: (1) The most-used test, the CPT, evolved in the 1950s to 1990s, originally in Holland and is the subject of detailed, in places very rigorous, international standards; (2) The in situ Vane Shear Test, deemed by some geotechnical practitioners as the basic, almost picture-perfect way to determine undrained shear strength of cohesive soils, appeared in geotechnical practice in 1948 and has changed little since, and is also governed by international standards; and (3) the Flat Plate Dilatometer – the DMT – that first appeared in 1977 and evolved into a meaningful tool by 1980; in its original form it is described in an ISSMGE Committee TC16 Report in 2001, and it is covered by international standards. These three tests, the equipment and the test methodologies, have evolved significantly in the past decade as they were adapted to give better data for use in tailings characterisation; in some cases involving significant design, calibration, or test method paradigm shifts. Certainly simply, or even rigorously, "following the standards" does in many instances lead to useless or near-useless data. This can cause problems – old practices are hard to break – what is the proper practice? – much of this is not written in the standards. Much of this is a work in progress.