11A - Mining Geotechnics and Reclamation in a Changing Climate

Vincent Boulanger-Martel[1], Pooneh Maghoul[2]

[1]Université du Québec en Abitibi-Témiscamingue, [2]Polytechnique Montréal

There are an increasing number of mining projects being developed in Canada's Arctic regions where continuous permafrost is present. With the development of such mining projects, numerous unique engineering and environmental challenges follow. With respect to geotechnical engineering, mining operations have several critical infrastructures such as tailings dams, tailings, and waste rock storage facilities, which must be designed, operated and reclaimed to ensure optimal mine waste management and minimize environmental risks. The closure of mine waste storage facilities often requires the design and construction of engineered covers which aim to maintain the mine wastes physically and chemically stable.

Such geotechnical infrastructures constructed in continuous permafrost environments require time to freeze-back and reach thermal equilibrium with the natural ground. The aggradation of permafrost conditions within the mine wastes as well as tailings dams and cover systems have the overall beneficial effect of improving their physical stability, reducing water seepage and reducing the potential for the generation and transport of contaminants into the receiving environment. In this context, climate change represents the largest source of uncertainty with respect to the long-term geo-environmental behaviour and performance of mine waste storage facilities and their reclamation strategies.

This session welcomes contributions dealing with the thermal, hydrogeological, and geotechnical behaviour of operating and reclaimed mine waste storage facilities in permafrost regions. Studies focussing on the impact of climate change, extreme events and risk mitigation in mining geotechnics and reclamation are encouraged.

Keywords: Engineered Covers, Tailings Storage Facilities, Waste Rock Piles, Mining Geotechnical Engineering

Contact: Vincent Boulanger-Martel: boulangv@uqat.ca