

## **TWO OPEN PhD POSITIONS IN MINING GEOTECHNICS**

### **EFFECT OF CLIMATE CHANGE ON GEOMECHANICAL BEHAVIOR OF TAILINGS**

#### **POSITION OVERVIEW:**

We are seeking TWO (2) highly motivated **PhD students** with a strong background in **geotechnical engineering or mining geotechnics** to participate in a research project, which focuses studying the effect of climate change on the geomechanical behavior of tailings and tailings management in cold regions. The geomechanical constitutive model used for tailings analysis is a critical element in performance-based design of tailings dams. Performance-based design requires sequential forecasting of dam behavior through all construction phases, including displacement, deformation, and pore pressures, and updating the forecasting tools with field data. This requires realistic modeling tools, such as stress-deformation analyses, which have been used for forensic triggering analysis in recent years and are now being widely used in industrial applications.

In this project, we aim to develop further our in-house thermo-elastic-viscoplastic constitutive model for tailings by considering rate effects and freeze-thaw cycles. The model will be implemented in an advanced in-house multiphase FEM numerical code to study the effects of climate change on the stability of tailings dams in cold/northern climates. Our main goal is to provide comprehensive recommendations and guidelines to our industry partner for short-, mid-, and long-term management of tailings by considering the complex effect of climate change.

The project will take place at **Polytechnique Montréal** and will be led by Professor Pooneh Maghoul. The project will be conducted in close collaboration with WSP, which is one of the world's leading engineering and professional services firms.

#### **QUALIFICATIONS:**

**PhD 1: Strong background in constitutive modeling and geotechnical laboratory testing.**

**PhD 2: Strong background in computational geotechnics, numerical modeling, multiphase thermo-hydro-mechanical modeling.**

- Track record of research-based publications in above-mentioned fields.
- Strong technical writing for scientific publications.
- Strong communication skills in English (**a minimum IELTS score of 7.0 is required for international applicants**)
- Strong problem-solving skills.
- Ability to work well with a team and be driven and self-motivated in achieving goals.
- Motivation to work in an interdisciplinary environment.

#### **HOW TO APPLY:**

Interested applicants should send their applications to Prof. Pooneh Maghoul ([pooneh.maghoul@polymtl.ca](mailto:pooneh.maghoul@polymtl.ca)) and Dr. Antoine Jacquey ([antoine.jacquey@polymtl.ca](mailto:antoine.jacquey@polymtl.ca)) using the subject line "**PhD Application – Mining Geotechnics**".

A complete application should include:

- A cover letter including a brief description of research interests relative to the above topics and a motivation of why the applicant's expertise and background is appropriate for the position.
- Curriculum Vitae (CV) including a complete list of international scientific publications.
- Copies of transcripts (BSc & MSc).
- Contact information for two references.



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## **EQUAL ACCESS EMPLOYMENT PROGRAM**

Our institutes are strongly committed to fostering diversity and inclusion. Through its Equal Access Employment Program, our institutes invite women, Aboriginal people, visible and ethnical minorities, as well as persons with disabilities to submit their application. We will confidentially adapt our recruitment mechanisms to the specific needs of people with disabilities who request it. We also welcome applications from candidates of all orientations and sexual identities.