

## *Jessa Vatcher*

---

### **Geomechanics Engineer**

#### *Expertise*

Mining Engineering, Rock Mechanics, Numerical Modelling

#### *Education*

Doctor of Philosophy (Rock Mechanics), 2017  
Luleå University of Technology, Luleå, Sweden

Licentiate of Engineering (Rock Mechanics), 2015  
Luleå University of Technology, Luleå, Sweden

M.A.Sc. Mining Engineering (Rock Mechanics), 2012  
Queen's University, Kingston, Canada

#### *Professional Experience*

2017 – Present

*Itasca Consultants AB, Luleå, Sweden*  
*Rock Mechanics Consultant*

2013 – 2017

*Itasca Consultants AB, Luleå, Sweden*  
*Rock Mechanics Consultant, Part-time*

2012 – 2017

*Luleå University of Technology, Luleå, Sweden*  
*Doctoral Student, Division of Mining and Geotechnical Engineering*

2007 – 2011

*Queen's University, Kingston, Canada*  
*Teaching Assistant, Robert M. Buchan Department of Mining*

2008

*Stantec, North Bay, Canada*  
*Engineering Intern*

2007

*Vale, Sudbury, Canada*  
*Engineering Intern, Creighton Mine*

#### *Project Experience*

##### *Mining:*

Evaluation of production associated risk factors of seismicity in LKAB's Kiirunavaara Mine. A three-dimensional numerical analysis that evaluated the influence of different realisations of production and unplanned remnants by including all production fans in the analysis volume.

Three-dimensional continuum analysis of LKAB's Kiirunavaara Mine (sublevel caving) as part of the permit application submitted to the Environmental Court of Sweden (Mark- och miljödomstol). The purpose of the analysis was to 1) evaluate correlations between vibrations on the ground surface, mining induced seismicity, and production, and 2) use these correlations to evaluate if ground vibrations are expected to be different with continued production to Level 1365 m.

Three-dimensional continuum analysis of the LKAB's Malmberget Mine (sublevel caving), to evaluate the influence of alternative mining sequences on cavity growth and seismicity for a specific set of orebodies.

---

*Page 2 of 2*

Three-dimensional continuum analysis for the prefeasibility study for a potential underground mine. The purpose of the analysis was to evaluate mine scale stress fields and likely behaviour with production alternatives.

Recommendation of suitable mining methods for a potential underground mine as part of a prefeasibility study.

Two-dimensional continuum analysis to evaluate if a potential discontinuity contributed to observed deformations on the ground surface above and underground mine.

*Infrastructure (Tunnelling):*

Three-dimensional continuum analysis of the planned bus terminal which will be located in the rock slope at Slussen in Stockholm. The purpose of the analyses included: sensitivity of planned geometry to variation in the stress field, stability analysis of a planned tunnel under pre-existing tunnels with sequenced installation of concrete liner, stability analysis of a planned thin pillar, and stress analysis for a stretch of tunnel with complex support design.

Three-dimensional continuum analysis of planned additional tunnels to a subway station in Stockholm. The purpose of the analysis was to evaluate stability and expected displacement of the excavations with consideration of the shallow rock cover in some areas, variation in the stress field, and loads on the ground surface from buildings and roads.

Three-dimensional continuum analysis of the planned building construction above pre-existing road tunnels at Åstrastråket in Stockholm. The purpose of this analysis was to evaluate the potential influence of the buildings and their complex foundations on the pre-existing tunnels.

*Research:*

Exploration of the rock damage process using Bonded Block Modelling (BBM). Particular focus was given to spalling behaviour and expanding our fundamental understanding of BBM application and techniques. Calibration of parameters was achieved through BBM representations of laboratory testing and then applied to theoretical mining and tunneling problems.