

**Principal Geotechnical Engineer**

<b>Position</b>	Principal Geotechnical Engineer, Itasca Australia Pty Ltd
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<b>Education</b>	BSc Mining Engineering, 1993 University of the Witwatersrand  Chamber of Mines Rock Engineering Certificate Chamber of Mines, South Africa
<b>Professional Affiliations</b>	Member, Australian Geomechanics Society (AGS) Member, Australasian Institute of Mining and Metallurgy (AusIMM)
<b>Professional Experience</b>	
2019 - Present	<i>Itasca Australia Pty Ltd, Perth Principal Geotechnical Engineer</i>
2008 - 2019	<i>Newcrest Mining Limited Principal Geotechnical Engineer</i>
2006 - 2008	<i>Barrick Gold Corporation Geotechnical Superintendent, Barrick Kanowna</i>
2004 - 2006	<i>Placer Dome Senior Geotechnical Engineer, Kanowna Belle Gold Mine</i>
2003 - 2004	<i>Gold Fields Senior Geotechnical Engineer, Projects &amp; Junction Gold Mine</i>
2001 - 2003	<i>ISS Pacific Pty Ltd Consultant, Modelling Services; Manager</i>
2000 - 2001	<i>ISS International Ltd. Manager of Modelling Services, Mining Division</i>
1997 - 2000	<i>ISS International Ltd. Project Officer, Numerical Modelling Unit</i>
1994 - 1996	<i>AngloGold. Graduate training; Rock Engineer, Free Gold Mines</i>

***Biographical Details***

Mr. Lachenicht has 25 years' experience in mining geomechanics ranging from consulting, research projects, studies to mine operational experience. Over the course of his experience, positions held include manager, senior geotechnical engineer, geotechnical superintendent and principal geotechnical engineer roles with associated levels of responsibility. A key focus of his experience has been to identify, mitigate and manage geotechnical risks for mining companies within open pit to high stress underground operations encompassing both weak and strong rock mass environments.

***Project Experience*****Mining Project Experience**

1997-2001      ISSI Integration / Numerical Modelling Unit

- Consulting work:
  - AngloGold gold mines – (Project Leader and team member)
  - Cleveland Potash Limited, U.K. (Project Leader)
  - Target Mine, Avgold Limited (Team member)
  - Zinkgruvan Mining AB, Sweden (Project Leader)
  - Western Areas Placer Dome, South Africa (Project Leader)
  - Hartesbeestfontein Gold Mine, South Africa (Project Leader)
  - Map3D / Map3Di courses
- Research Work:
  - SIMRAC Project, GAP 303: Mine Layout, Geological Features and Seismic Hazard (Research project team member)
  - SIMRAC Project GAP 612a: Relationship between ERR, system stiffness parameters and seismic energy release for different geotechnical areas. (Research project leader)
  - SIMRAC Project GAP 603: Fundamental aspects of integration. (Research project team member)
  - Deepmine Project: The effects of the rate of mining on seismicity. (Research project team member)
  - Deepmine Project: Integration of seismic monitoring and numerical modelling. (Research project team member)

2001-2002      ISS Pacific Pty Ltd

- Consulting work:
  - Savuka Gold Mine (Integration hazard assessment analyses)
  - Junction Gold Mine (Integration and quantification of seismic hazard)
  - Kundana Gold Mine (Monthly seismic hazard assessments)
  - Union Reefs Gold Mine (Slope stability project using seismic monitoring)
  - Freeport (On-site seismic data interpretation assistance)

- Seismic system design work (Kundana, Kanowna Belle, Mt Marion, Cosmos, Blackswan and Ridgeway Mines)
- Courses:
  - Co-hosted ISSP Seismic Monitoring and integration course in June 2001
  - Hosted Aurion Gold Basic Seismic Monitoring Course – November 2002

2003-2004 Senior geotechnical role at St Ives Gold Mines

- Open pit inspections and analysis work
- Seismic management
- Routine geotechnical inspections and analysis work
- Pastefill stability analysis
- Project: Insitu dynamic response of Garford Dynamic Cables

2004 – 2007 Senior geotechnical engineer role at Kanowna Belle Gold Mine:

- Ground control management plan
- Seismic management plan
- Flood management plan
- Mine layout design and optimization
- Stope design and optimisation
- Support implementation quality control
- Geotechnical data collection
- Open pit stability

2007 – 2008 Geotechnical Superintendent at Barrick Kanowna:

- Geotechnical pre-feasibility and feasibility studies:
  - Rubicon/Hornet Geotechnical feasibility study – 2007
- Regional development geotechnical budget
- Geotechnical standards and guidelines to Barrick Kanowna sites
- Technical review role to Barrick Kanowna geotechnical engineers
- Geotechnical best practice
- Geotechnical audits
- Identify critical geotechnical risks across Barrick Kanowna
- Long term stability assessments to optimize mining strategy
- Ground Control Management Plans

2008 – 2015 Principal Geotechnical Engineer at Newcrest Mining:

- Geotechnical guidelines
- Operational reviews and support
- Geotechnical organizational structure
- Community of practice leadership

- Newcrest geotechnical research strategy
- Risk assessments
- Study Geotechnical Lead: Toguraci feasibility and Telfer Pre-feasibility studies
- Inspection system development
- FLAC3D numerical modelling (Gosowong, Telfer)

2015 – 2018 Principal Geotechnical Engineer at Newcrest Mining:

- Geotechnical Lead on the Wafi-Golpu Joint Venture Block Cave Feasibility Study (2015 and the 2017 Feasibility update)
- Managing the Wafi-Golpu verification drilling project (2016)
- Managing the Wafi-Golpu Joint Venture Nambonga portal and decline drilling project (2018)
- Managing the geotechnical component of the WGJV Nambonga Portal and Decline design in 2018
- Team participation in the development of geotechnical process safety at Newcrest
- Mergers and Acquisition geotechnical assessment work
- Management plans and managing external review requirements for Wafi-Golpu: Ground Control
- Management Plan, Monitoring Management Plan and Seismic Management Plan.

### ***Publications***

R. J. Lachenicht & G. van Aswegen. 1999. An engineering method to evaluate the seismic potential of geological structures as a function of mine layout. SARES 99, 2nd Southern African Rock Engineering Symposium Proceedings, Editor T.O.Hagan, 1999.

R. J. Lachenicht & T.Wiles, 2001. The integration of numerical modelling with seismic monitoring through the Map3Di boundary element method: Part II Applications, RaSiM5, The Fifth International Symposium on Rockbursts and Seismicity in Mines, 2001.

R.Lachenicht & U.Singh, 2002. Back analysis of a crown pillar at Junction Gold Mine (In 2 parts) Part II: Integrating the rock mass deformation interpreted from seismicity into a numerical solution, First International Seminar Deep and High Stress Mining, ACG, November 2002.

R.Lachenicht & U.Singh, 2007. Back analysis of a crown pillar at Junction Gold Mine (In 2 parts) Part II: Integrating the rock mass deformation interpreted from seismicity into a numerical solution, ACG Deep & High Stress Mining Book, ACG, 2007.

R.Varden, R.Lachenicht, J.Player, A.Thompson, E.Villeascusa, 2008. Development and implementation of the Garford Dynamic Bolt at the Kanowna Belle Mine, Tenth underground operators' conference, Launceston, Tas, 14-16 April 2008.

R. Lachenicht, 2009. Mine design and numerical models. ACG industry workshop on 'Applying numerical models to mining problems'. Oct 2009.

R.Lachenicht, 2011. Ground Support Practices at Ridgeway Deeps. Presentation prepared for the ACG Advanced Ground Support Seminar. Aug 2011.

***Associated Research Publications:***

C.R. Windsor, E. Villaescusa, T. Funatsu & R. Lachenicht, 2007. Measurement of the regional and local stress field along a 10km strike of the Zuleika Shear Zone in the Kundana gold mining province of Western Australia. 1st Canadian US Rock Mechanics Symposium, Vancouver, 27-31 May.

P.M. Cepuritis, E. Villaescusa, and R. Lachenicht, 2007. Back Analysis and Performance of Block A Long Hole Open Stopes - Kanowna Belle Gold Mine. 1st Canadian US Rock Mechanics Symposium, Vancouver, 27-31 May.

K.Fleetwood, E. Villaescusa, R. Lachenicht, J. Todd, 2008. Underground blast monitoring and rock mass anisotropy, 2008. ISEE National Conference Proceedings, New Orleans, LA. Jan 2008.