

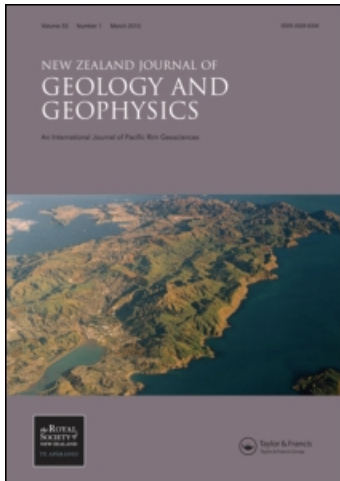
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### Current New Zealand mine drainage research

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## INTRODUCTION

### Current New Zealand mine drainage research

The mining sector in New Zealand is historically rich, currently very active and likely to grow in the future. Historic and closed mines often leave a legacy of poor water quality within and downstream of worked areas, whereas in general our current mine sites meet water quality guidelines set for various levels of aquatic ecosystem protection. Current and future mines will meet increasingly stringent water quality targets and provide systems to mitigate water quality impacts after mine closure.

The water quality issues at our historic mine sites are diverse and include classic acid mine drainage, As-enriched neutral drainage and mine drainages that contain a suite of other trace elements including Hg, Sb, Cu, Pb, Mn Zn that occur with or without acid. These historic sites demonstrate that the mining sector can cause significant environmental impact when poorly managed or when mines are operated without consideration of the downstream environment. However, these impacted sites also provide useful targets for research to predict mine drainage chemistry or identify optimal mine drainage remediation strategies.

High quality environmental research into mine drainage chemistry, impacts on ecosystems and innovative remediation technologies has been conducted by New Zealand based researchers throughout the last 20 years or more. Some of this research has been published in peer reviewed media or at conferences but much has remained as in-house documents for mining companies. This mine drainage special issue of *New Zealand Journal of Geology and Geophysics* collects current research in several areas:

- Geochemical processes control acid release from oxidising rocks and minerals
- Regional patterns and controls on mine drainage geochemistry
- Case studies
- Passive mine drainage treatment systems

- Development and optimisation of innovative systems for mine drainage remediation

The objective of this special issue is to provide a benchmark volume that identifies and highlights previous work, some of which is obscure and difficult to find. In addition, this issue captures the current status of mine drainage research in New Zealand with a view to spawning new projects and collaborations. This special issue has not originated from a workshop or symposium on mine drainage environmental issues, rather, it is a sample of background research that is conducted continuously in New Zealand and which would normally be published in diverse media. This issue captures the diversity in scale and scope of international mine drainage research within the unique setting of New Zealand geology, climate and mine environments.

Thank you to *New Zealand Journal of Geology and Geophysics* for agreeing to publish a special issue on mine drainage; to all the authors and co-authors for their high quality work as well as additional effort required to publish in the timeframe required, and, to all the reviewers for their time and perspicacious comments. The data collected and interpretations made in this issue are high quality and often have implications beyond the immediate study that extend into other current research areas. Funding and support for research presented in this issue has come from a variety of sources including FRST, mining companies, regional councils, DOC, Coal Association of New Zealand and Universities.

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