

M. John Brodie, P.Eng. (B.C, Yukon & NWT/NU)**Education**

B.A.Sc. Geological Engineering, University of British Columbia, 1982

Experience

Jan '95 -

Geotechnical Engineer, Brodie Consulting Ltd.

Brodie Consulting has provided geotechnical and environmental services relating to mine activities on numerous sites in Canada and Mexico. This work has included:

- Mine waste management and water balance design/review for numerous proposed and operating mines,
- Evaluation of closure plans and reclamation liability for new and existing mines,
- Review of mine closure plans for abandoned mines,
- Technical management of abandoned mines under government control,
- Preparation of guidelines on mine closure planning and reclamation standards,
- Risk characterization of mine closure hazards.

Since mid-1990's I have prepared mine closure reviews and reclamation cost estimates for the Federal Government for nearly every mine in Northern Canada. I am currently lead engineer for closure planning for the proposed Casino Mine in Yukon. EA documents were submitted in Jan. 2014.

Working with RGC, I am the lead engineer for closure planning for 3 Anglo-American sites in Chile. This project involves development of new closure plans to comply with the recently amended closure regulations in Chile.

I have been involved in the mine closure planning for the abandoned Faro Mine in Yukon since 2004. Work on this project has involved: technical lead – engineering studies, chief engineer for care and maintenance (2009/10), senior reviewer of closure.

I have been involved in the mine closure planning for the Giant Mine in NWT since 1998. Work on this project has involved: review of technical closure studies, key resource on site risk assessment, lead engineer for design and construction of bulkheads and B2 dam construction, ongoing oversight of mine closure design.

Other current and recent projects include: design modifications for 4 tailings dams at Rofomex Mine, Mexico, design modifications for 2 tailings dams at La Negra Mine, Mexico, concept development of water management plans for Gibraltar Mine, pre-feasibility design of tailings dams in Texas and New Brunswick, design team and lead field engineer for reconstruction of B2 Dam in Yellowknife.

July '93 - Jan. '95

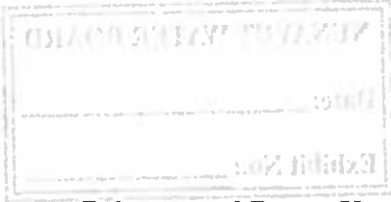
Manager of Engineering, Reclamation Management Limited (RML)

1987 - 1993

Senior Geotechnical Engineer, Steffen Robertson And Kirsten Inc. (SRK)

1983 - 1986

Mine Geotechnical Engineer, Westmin Resources Ltd., Campbell River, B.C.



Relevant and Recent Key Project Experience

AANDC/GNWT, NWT

- Jericho Mine, Doris North Mine, Meadowbank Mine, review of closure plans and closure security
- Snap Lake project, geotechnical review for Environmental Assessment,
- Estimation of mine closure costs for Diavik, Ekati, Cantung, Colomac, Giant & Ptarmigan mines.
- Training government staff in method of estimating mine closure liability.
- Project manager/technical advisor for water management and site maintenance of the Colomac Mine.

AANDC, Ottawa

- Design engineer partner and lead field engineer for re-construction of the B2 Dam in Yellowknife
- Ongoing Peer Review of Giant Mine remediation planning process

Indian & Northern Affairs Canada, Yukon

- Pre-feasibility closure plan development, Mt. Nansen Mine,
- Estimation of mine closure costs on Brewery Creek, Mt. Nansen, Western Copper & Dublin Gulch mines.
- Preparation of guidelines on mine closure and discussion paper on reclamation security issues.

Public Works & Government Services

- Giant Mine, ongoing engineering relating arsenic storage bulkheads and chamber water management
- Design and construction supervision of bulkhead 14A for containment of arsenic waste
- Discovery Mine, review of sediment management options for clay borrow pit.

Rofomex – phosphate mine, La Paz Mexico

- Design of repairs to 2 major tailings dams and modifications to tailings management strategy
- Design of new tailings areas for future production.

Casino Mining Corporation

- Lead engineer for closure planning for Casino Project, Yukon

Chieftain Metals Corp.

- Input to waste & water management aspects of feasibility study update, Tulsequah Mine project, B.C.

Faro Mine Closure Planning Office

- Technical manager for ongoing closure planning studies.
- Chief Engineer for ongoing care & maintenance of the Faro site (2009/10)

Aurcana Resources Inc.

- Design of drainage systems and dam raising methodology for 2 dams in central Mexico,
- Pre-feasibility design of tailings dam and impoundment liner for silver mine in Texas.

Silver-Mex Resources Inc.

- Conceptual design of expanded tailings facility near Mazatlan Mexico,

Geodex Resources Inc.

- Pre-feasibility design of tailings and waste management plan for Sisson Brook mine in New Brunswick,

NovaGold Resources Inc.

- Preparation of mine closure plan and reclamation security for submission to B.C. government.

Canada Environmental Assessment

- Conceptual design and costing of alternative mine waste disposal strategies for the Kemess North Mine for consideration by the CEAA Panel and stakeholders

Vannessa Ventures Ltd.

- Preparation of mine closure plan – Las Crucitas Project, Costa Rica

CIDA – PERCAN

- Preparation of mine reclamation costing methodology for Peru Ministry of Mines
- Technical training sessions on mine reclamation costing for Peruvian industry and government engineers.

Publications

Brodie, *Considerations in Mine Reclamation Costing*, BC Mine Reclamation Symposium, Sept 2013

Brodie, Rykaart, Cronk, Mitchell, *Reconstruction of B2 Dam, Yellowknife*, Canadian Dam Association Conference, 2010

Brodie, M. J., *Issues & Methods In Mine Reclamation Costing*, Canadian Institute, Vancouver, 2005.

Brodie, M. J and Cronk, M. *Management of Arsenic Confining Bulkheads at Giant Mine*, 2003, Assessment and Remediation of Contaminated Sites in Arctic and Cold Climates, Edmonton, Alta.

Brodie, M. J. and Milburn, D. (2001), *The "RECLAIM" Model*; Northern Latitudes Mining Reclamation Workshop, Whitehorse, Yukon

Brodie, M. J. and Thompson, N. (2001), *Colomac Mine Site Maintenance & Closure Planning of an Orphaned Site*; Assessment and Remediation of Contaminated Sites in Arctic and Cold Climates, Edmonton, Alta.

Brodie, M. J. (1998): *"Acquisitions and Mine Closure Liability"*. Canadian Mining Journal, Aug.1998.

Brodie, M. J. (1994): *"Corporate Considerations In Mine Decommissioning"*. Proceedings of District 6 Canadian Institute of Mining Annual General Meeting, Vancouver, B.C., October 11 - 15.

Brodie, M. J. and Chapman, J. T. (1993): *"Development of Rehabilitation Plans For Acid Rock Drainage Control at Two Closed Underground Mines"*. Proceedings of the Seventeenth Annual British Columbia Mine Reclamation Symposium, Port Hardy, B.C., May 4 - 6.

Brodie, M. J. and Healey, P.M. (1993): *"Design and Installation of a Lined Mill-Effluent Containment Facility"*. Geosynthetics '93 Conference, Vancouver, B.C., March, 1993.

Brodie, M. J., Robertson, A. MacG. and Gadsby, J.W. (1992): *"Cost Effective Closure Plan Management for Metal Mines"*. Proceedings of the Sixteenth Annual British Columbia Mine Reclamation Symposium, Smithers, B.C., June 15 - 18.

Brodie, M. J. and Healey, P.M. (1992): *The Design and Installation of an Effluent Containment Facility"*. Geotechnical Fabrics Report , Volume 10 Number 3, April.

Brodie, M. J., Broughton, L. M. and Robertson, A. MacG. (1991): *"A Conceptual Rock Classification System for Waste Management and a Laboratory Method for ARD Prediction from Rock Piles"*. Second International Conference on the Abatement of Acidic Drainage, Montreal.

Chance, A.V. and Brodie, M. J. (1987): *"Rock Mechanics at the Westmin HW Mine"*. CIM Convention.