



# Update on INAP & GARD Guide

Terrence Chatwin & Keith Ferguson

Presented at 15<sup>th</sup> Annual BC MEND Workshop

Vancouver BC

4 December 2008



# Members of INAP

KINROSS



RIO  
TINTO



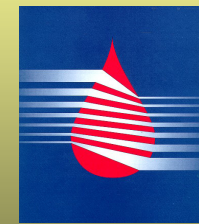


# Supported by the Global Alliance

## Acid Drainage Technology Initiative



Water Research Commission



MEND



# INAP Activities

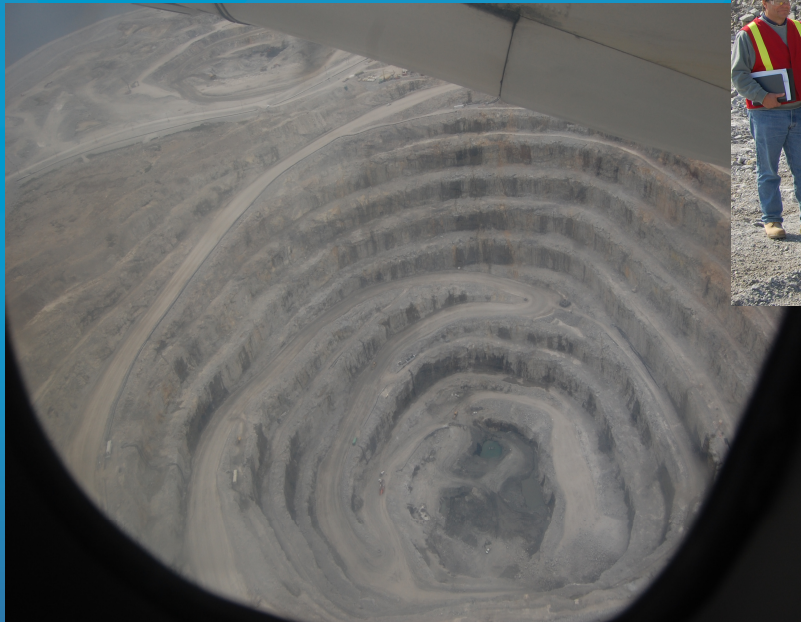
- GARD Guide
- Strategic Planning Meeting
- ICARD
- Membership
- Workshops
- Global Alliance
- Tours

# Value to INAP Members

- Networking
- Collaborative Research
  - Diavik Country Rock Scale-up
  - Store & Release Covers
  - Past Projects
- Technology Transfer
  - Water Treatment Workshop – Oct 2009
- Capacity Building



# Tour of Diavik Test Facility



# Water Treatment Workshops

- Expanding Technology Transfer
- Preparatory Workshop - October 2009 – Tucson, AZ
- Developing Presentations on Innovative Water Treatment & Sulfate Removal Technologies
- Water Treatment Presentations will be made available to Global Alliance Members and Others
- Contact [terrence.chatwin@inap.com.au](mailto:terrence.chatwin@inap.com.au) with innovative water treatment technologies



# The GARD Guide Objective

An international guide for facilitating world-wide best practice in prediction, control, and mitigation of acid-rock drainage.

*The guide will become a reference document for all stakeholders involved in ARD and waste management issues*



# GARD Guide Characteristics

- Flexible to accommodate site-specific issues
- Avoid duplication and build on existing guidelines and compendia
- Be consistent and promote a systematic approach
- Founded on a risk-based approach
- Endorse a pro-active approach and encourage reduction and control at the source
- Be a “how to” guide and not a regulatory tool or a design manual
- Be based on proven, field tested technologies
- Cater to the life cycle of a mine (cradle to cradle)

# Target Audience

- Companies, governments, consultants, researchers, educators, communities, bankers and NGO's
- Primary target audience is a scientist or engineer with a reasonable background in chemistry and the basics of civil engineering, but not necessarily specifically related to acidic drainage

# GARD Guide Development Plan



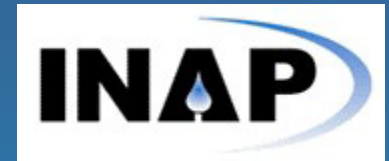
- First Phase
  - Beta version prepared by Golder Associates and undergoing review
  - Wiki structure developed for Guide
  - Further expert input and targeted workshops planned for remainder of 2008
- Second Phase
  - Broad stakeholder review of draft through INAP website (starts February 2009)
- Third Phase
  - Update, publish and rollout by June 2009
- Fourth Phase
  - training sessions on use of Guide
  - updates and continuous improvement of Guide

# The Beta Version - Golder Team



Chapter	Contributions
Project Management	Dr. Rens Verburg (Golder, Redmond), Mr. Nico Bezuidenhout and Ms. Shareen Khamisa (Golder, Jo'burg)
1. GARD Guide	INAP
2. ARD Process	Dr. Rens Verburg
3. Corporate, Regulatory and Community Framework	Mr. John Wates (Fraser Alexander, Johannesburg)
4. Characterization	Dr. Devin Castendyk (SUNY Oneonta)/ Ms. Cheryl Ross (Golder, Redmond)
5. Prediction	Dr. Kirk Nordstrom (USGS Denver)/ Dr. Rens Verburg
6. Prevention/Mitigation	Dr. Ward Wilson (UBC, Vancouver)/ Dr. Ben Wickland (Golder, Vancouver)
7. Treatment	Dr. Andre van Niekerk (Golder, Jo'burg)
8. Monitoring	Dr. Peter Chapman (Golder, Vancouver)/ Ms. Cheryl Ross
9. Management and Performance Assessment	Dr. Andrew Robertson (RGC)/Dr. Dirk van Zyl (UBC)
10. Communication and Consultation	Mrs. Tisha Greyling (Golder, Jo'burg)

# Steering & Advisory Committees & Secretariat



- Clive Bell - ACMER (Australia)
- Rich Borden - Kennecott (USA)
- Charles Bucknum - Newmont (USA)
- Rodolfo Camacho - Freeport McMoRan (Chile)
- Dave Chambers - Center for Science in Public Participation (USA)
- Meiring du Plessis - Water Research Commission (SA)
- Linda Figueroa - Colorado School of Mines/ADTI (USA)
- Ross Gallinger - IAMGOLD/INAP (Canada)
- Elizabeth Gardiner - Mining Association of Canada/MEND (Canada)
- Charlene Hogan - NRCan (Canada)
- Zhenqi Hu - China University of Mining and Technology (China)
- Adam Jarvis - U of Newcastle (UK)
- David Jones - Australia Department of Environment and Health (Australia)
- Lars-Ake Lindahl - Swedish Mining Association (Sweden)
- Glenn Miller - University of Nevada (USA)  
Peter Moore - Export Development Canada (Canada)
- Bill Price - Natural Resources Canada/MEND (Canada)
- Jos Schaekers - Consultant (SA)
- Gilles Tremblay - NRCan (Canada)
- Harvey Van Veldhuizen - World Bank - MIGA (USA)
- David Williams - US Bureau of Land Management/ADTI (USA)
- Christian Wolkersdorfer - PADRE/IMWA/TU Bergakademie Freiberg (Germany)
- Jennifer Yang - International Copper Association (China)
- Paul Ziemkiewicz - University of West Virginia/ADTI (USA)

# Other Contributors

- Stephen Day – SRK Consultants
- Janice Zinck – NRCan
- INAP OpCom
- Terry Chatwin – INAP Technical Manager
- Denis Kemp – Denis Kemp Consulting
- Les Hulett – Consultant
- Gilles Tremblay – NRCan/MEND
- Paul Ziemkiewicz - University of West Virginia/ADTI
- Attendees at Denver, Vancouver & Johannesburg Workshops
- You!

# Opportunities

- Relating Regional and Commodity-Focused Data
- Integrating New & Innovative Technologies
- Integrating the ARD Prevention with Mine Planning and Operations
- Continual Updating of ARD Treatment and Mitigation Costs
- Defining the “How To” that applies to any situation
- Adding Flow Charts and Implementation Tables
- Supporting Best Practices with Case Studies & Examples

# What Can You Do?

- Participate in Workshops in your Area
- Make Others Aware of the GARD Guide
- Vet the GARD Guide on the Website
- Use the GARD Guide