The Global Acid Rock Drainage Guide (GARD Guide)

Best Management Practices for Acid Prevention

Rens Verburg (Golder Associates)
& Terry Chatwin (INAP)

INAP

Golder Associates

Mining Industry Mandate

- Meet the current and future mineral needs
- Create jobs and value without adversely impacting future generation’s opportunities
  - Prevent, minimize, and mitigate potential environmental risks
- Maintain “social license to mine”
- ARD frequently represents greatest challenge
  - ARD impacts can be very long lasting
  - ARD remediation is very costly (US: $5-50 billion)

ARD Issue Recognized by INAP

- International Network for Acid Prevention (www.inap.com.au)
- Consortium of mining companies that “…exists to fill the need for an international body which mobilizes acid drainage information and experience.”
  - Networking and information-sharing
  - Technology transfer
  - Gap-driven research
- Recognized the need for global approach to ARD management
  - Gravity of impacts (duration, cost)
  - Increase awareness that current techniques can prevent and mitigate ARD
  - Focus on prevention: techniques are less effective after ARD generation (legacy sites)

INAP

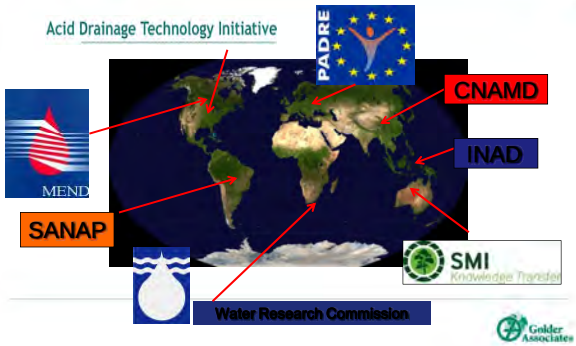
Members:

Anglo American, bhpbilliton, Barrick, Freeport-McMoRan Copper & Gold Inc., LGL, Antofagasta Minerals, Vale Inco, Rio Tinto, xstrata, Kinross

Supported by the Global Alliance

now

The Global Alliance



Global ARD Guide (GARD Guide)

“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

- 2-year effort, awarded to Golder
- Rolled out in Summer 2009 (ICARD, Sweden)
- Flexible to accommodate site-specific issues
- Avoids duplication and builds on existing guidelines and compendia
- Consistent and promotes a systematic approach
- Founded on a risk-based approach
- Endorses a pro-active approach and encourages reduction and control at the source
- A “how to” guide and not a regulatory tool or a design manual
- Based on proven, field-tested technologies
- Encompasses the life cycle of a mine (cradle to cradle)

Scope of GARD Guide

1. **All Mine Phases –** Exploration through Post-Closure
2. **All Mine Facilities -** tailing, waste rock, underground mine, pit walls, pit lakes, spent ore heaps and low-grade stockpiles
3. **All Commodities -** base metals, precious metals, coal, diamonds, iron ore and uranium
4. **Global perspective -**

Target Audience

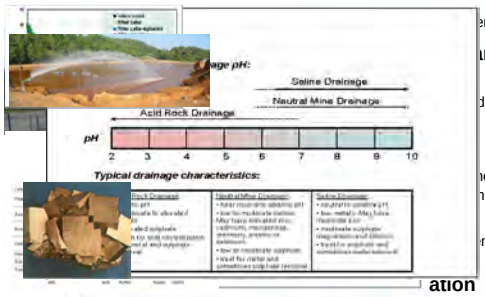
- Companies, governments, consultants, researchers, educators, communities, bankers, and NGOs
- Primary target audience is a scientist or engineer with a reasonable background in chemistry and the basics of civil engineering, but not necessarily specifically related to acidic drainage

GARD Guide Features

- Web based
- Navigate within the Guide via internal links
- Connect to relevant references via external links
- Opportunity to provide comments
- Continual improvement and updates
- Presently no hard copy
- Translations anticipated

GARD Guide Structure and Authors

1. **GARD Guide** (INAP)



erburg

nd

der, Jo’burg)

neonta)
mond)

nver)

ation

– Dr. Ward Wilson (Univ. Alberta, Edmonton), Dr. Ben Wickland (Golder, Vancouver)

GARD Guide Structure and Authors

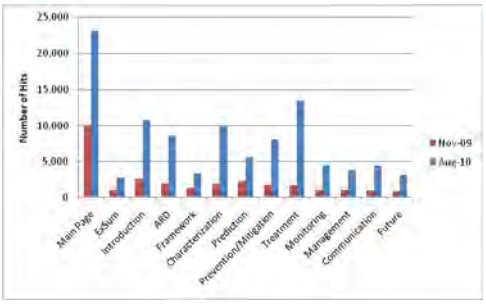
7. **Treatment**
   - Dr. Andre van Niekerk (Golder, Jo’burg)
8. **Monitoring**
   – Dr. Peter Chapman (Golder, Vancouver), Ms. Cheryl Ross

nt

r, Jo’burg)

n the Future
- Keith Ferguson (Sustainability Engineering)

GARD Guide Usage



GARD Guide Updates

- You can participate!
- On-line at www.gardguide.com
- Workshops with support from GA
  - Tailings & Mine Waste (October, Vail, CO)
  - INAP Water Treatment (October, Sudbury)
- 2010 update – 4th quarter 2010
- Next major milestone – Summer 2012 (ICARD, Ottawa)

Thank you

www.gardguide.com