The Global Acid Rock Drainage Guide (GARD Guide)

Best Management Practices for Acid Prevention

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

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)

Supported by 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

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

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 Structure and Authors

1. GARD Guide (INAP)
   - Dr. Andre van Niekerk (Golder, Jo’burg)
   - Dr. Devin Castendyk (SUNY Oneonta)
   - Ms. Cheryl Ross (Golder, Redmond)

2. ARD Process – Dr. Rens Verburg

3. Corporate, Regulatory and Community Framework – Mr. John Wates (Fraser Alexander, Jo’burg)
   - Dr. Kirk Nordstrom (USGS Denver)
   - Dr. Ward Wilson (Univ. Alberta, Edmonton), Dr. Ben Wickland (Golder, Vancouver)

4. Defining the Problem – GARD Guide Structure and Authors
   - Dr. Andrew Robertson (RGC), Dr. Dirk van Zyl (UBC)

5. Prediction – Dr. Rens Verburg

6. Prevention and Mitigation – Dr. Ward Wilson (Univ. Alberta, Edmonton), Dr. Ben Wickland (Golder, Vancouver)
   - Ms. Cheryl Ross

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

8. Monitoring – Dr. Andrew Robertson (RGC), Dr. Dirk van Zyl (UBC)
   - Dr. Rens Verburg

9. Management and Performance Assessment – Dr. Andrew Robertson (RGC), Dr. Dirk van Zyl (UBC)

10. Communication and Consultation – Mrs. Tisha Greyling (Golder, Jo’burg)

11. ARD Management in 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