

# **Mine Environment Neutral Drainage** (MEND) Initiative

#### **Gilles Tremblay and Charlene Hogan MEND3 – Secretariat**

#### 10<sup>th</sup> Annual BC/MEND ML/ARD Workshop December 2003



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#### Key Message

MEND is a Canadian partnership with industry, the federal and provincial governments and nongovernmental organizations to cooperate in technology development and to transfer knowledge to improve environmental management









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#### **MEND3 Steering Committee**

- Kim Bellefontaine BC
- Gilles Tremblay (Secretariat) -CANMET, NRCan
- Christine Kaszycki Manitoba
- Louis Bienvenu Québec
- Dick Cowan Ontario
- Ross Gallinger BHP Billiton
- Bill Price NRCan
- John Martschuk Barrick

- Elizabeth Gardiner MAC
- Mike Aziz Placer Dome
- Patrick Finlay EC
- Catherine Coumans -MiningWatch Canada
- Denis Kemp Noranda Falconbridge
- Amy Crook Environmental Mining Council of BC
- Charlene Hogan (Secretariat) -NRCan





# **Presentation Highlights**

- Background
- Budget
- MEND3 Projects
- Technology
  Transfer
- Program Plans for 2004
- NOAMI

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# **MEND3 Background**

- Gaps analysis and opportunities study completed by SRK in early 2002.
- MEND3 Strategy Session, Ottawa, April 2002
  - Focused list of research priorities developed under 4 themes
- Gaps and Strategy Session Reports available
- Questionnaire developed and distributed in Fall 2002
  - Nine areas of research identified for ranking
  - Guidelines, Technology Transfer and Emerging Technologies cross-cutting themes





# **MEND3 Background**

Program developed for 2003 was based on identified high/medium ranking priorities.

- High Priorities
  - Closure Management
  - Verification of Technologies
  - Case Studies
  - Metal Leaching Neutral pH







# **MEND3 Background**

#### Medium Priorities

- Early Prediction
- Passive Treatment (Biological and Other Innovative Secondary/Tertiary Treatment Methods)
- Sludge Management
- Cold Temperature Effects

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– Paste Backfill

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Louvicourt

# **MEND3 Budget**

#### Budget of \$350.5K for 2003/2004.

- \$250.5K for research projects
  - \$125K from MAC
  - \$75K from Environment Canada
  - \$50.5K from CANMET in kind
- \$100K for Secretariat (MAC \$50K; **CANMET \$50K in kind**)





#### **MEND3** Projects to be presented at Workshop

- Disposal Options for Lime Sludges
  - State-of-the-art review and assessment of available disposal options – J. Zinck, NRCan

#### • Neutral Leaching

- Scoping exercise to review the Canadian experience with metal leaching and develop a list of priorities for the industry to address – R. Nicholson, Stantec – Brampton
- Underground Paste Backfill
  - Compilation of available information on paste backfill and its use in prediction of long-term effects -P. Mehling, Mehling Environmental Management



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#### **Case Studies in BC**

**Objective:** Case studies that illustrate site specific application of metal leaching/acidic drainage migration and assessment. (Bill Price, NRCan/CANMET)

#### • Sites under review:

- 1. Bell Mine
- 2. Equity Silver
- 3. Duthie Mine
- 4. Huckleberry Mine
- 5. Johnny Mountain Mine
- 6. Kemess Mine
- 7. Sulphurets Mine
- 8. Eskay Creek Mine
- 9. Snip Mine







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# **Dry Covers Manual**

- **Objective:** To update the U of S Manual (April 2000) on the design, construction and monitoring of earthen covers for waste rock and tailings. (O'Kane Consultants)
- Status: Information contained in the following volumes:
  - Volume 1: Summary (~ 50 pages)
  - Volume 2: Theory and Background
  - Volume 3: Site Characterization, Conceptual Cover Design, Approach to Numerical Modelling
  - Volume 4: Field Performance Monitoring, Sustainable Performance of Cover Systems
  - Volume 5: Case Studies (including INAP, CETEM)





#### **Covers for Permafrost**

- Objective: Review of covers for reactive tailings in permafrost regions (I. Holubec Consulting Inc.)
- Status: Case study review on existing and proposed tailings cover concepts in permafrost. **Emphasis on field test work and monitoring. D**raft expected December 10, 2003.





#### **Case Study Assessment**

- Objective: To assess and verify the effectiveness of AD pollution prevention and control techniques.
  - Phase I: Collect and assess information for five Canadian sites. Two sites selected for further studies. The sites are:
    - Dona Lake, Placer Dome\*
    - Heath Steele, Noranda-Falconbridge\*
    - Schist Lake / Mandy Lake, HBMS
    - East Sullivan, Province of Québec
    - Lorraine, Province of Québec
  - Phase II: Conduct field investigations at the two sites\*





#### **Case Study Assessment**

- Contractor: SNC-LAVALIN Environmental
- Cost: \$73.9K (sponsored by Environment Canada)
- Status:
  - Work began in early October.
  - Case studies underway for all sites.
  - Dona Lake and Heath Steele selected for field work.
  - Final work program under discussion, field program may be delayed until next fiscal year. Final Phase I report due March 31, 2004.





# **Peer Review of MEND3 Reports by CEN**

- Objective: Provide funding for peer review of **MEND3** project final reports by the Canadian **Environmental Network.**
- Status: CEN has identified possible reviewers. **The Center for Science in Public Participation** (USA) has shown interest in reviewing some documents.





# **Technology Transfer**

- **FTTP Award**
- **The MEND Monitor** •
  - July 2003
  - October 2003
  - December 2003
- **Presentations (9)** 
  - ICARD, McGill
- **Global Alliance**
- **BC/MEND** Workshop ۲
- **MEND** Website at: mend.nrcan.gc.ca •
- **Environment and Mine Wastes** • **Management – Industrial NSERC Chair**
- NOAMI MEND Link



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The MEND Monitor





October 2003

Developing an Operation, Maintenance and Surveillance Manual for Tailings and

#### Sixth International Conference on Acid

Rock Drainage (ICARD)

The 6<sup>th</sup> ICARD was held in Carns, Australia from July 14 - 17, 2003. With its theme of "Application and Statanabity of technologies" the conference continued the tradition of previous ICARDs in providing an outlock of cutting-odge research and innovative technologies relevant to actic drainage.

#### 2003 Federal Partners in Technology Transfer (FPTT) Award to MEND Team

• MEND received a FPTT award for "successful transfer of knowledge and technology developed in federal research laboratories in support of the regulatory and public good mandates that have a significant impact on socio-economic well-being of Canadians"





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# **Environment and Mine** Wastes Management Chair

- École Polytechnique/UQAT (Québec)
- Supported by NSERC, 6 mining companies, 3 consulting firms, and 4 provincial agencies
- Project areas include:
  - 1. Integrated solid and liquid wastes management during operation
    - Tailings disposal
    - Rock waste disposal
    - Disposal of treatment sludge
    - Re-use and recycling
    - Backfill-rock mass interactions





#### École Polytechnique/UQAT Chair

- 2. Reclamation of Mining Sites with AMD

- Control of AMD production using covers
- Use of water to limit production of AMD
- Prediction of AMD
- Passive treatment of AMD
- http://www.polymtl.ca/enviro-geremi/





# Program Plans for 2004/2005

- Budget of \$225 K approved for 2004
  - \$125K from MAC for research
  - \$100K for Secretariat (MAC \$50K; CANMET \$50K in kind)
- Emphasis on priority issues and recommendations from existing studies:
  - Cold temperature studies
  - Case study reviews
  - Field pilot programs
  - Workshops for 2004 (11th BC/MEND; Eastern Canada)





# **Program Plans for** 2004/2005

- Details to be discussed at the next MEND3 **Steering Committee meeting on December 4.**
- One possibility could be to send out a general request for a two-page outline on key priority issues. Selection criteria and budgets would be identified. Projects would be short-listed, and proponents requested to submit detailed proposals (up to a max of 5 pages).





#### National Orphaned and Abandoned Mines Initiative (NOAMI)

- Issue identified for the Global Alliance
  - Launched in 2002, ~\$100K per year
  - Acidic drainage and metal leaching are key issues for orphaned and abandoned mines
  - Four multistakeholder task groups overseeing prioritized projects



#### **NOAMI Partners**

- Partnership of:
  - -Government of Canada
  - Provinces and Territories
  - Aboriginal and First Nations
  - -NGOs
  - Industry





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# **Projects / NOAMI**

- Four projects:
  - Information Gathering
  - Community Involvement
  - Barriers to Collaboration
  - Funding Approaches





Planning For and Rehabilitating Abandoned and Orphaned Mines in Canada



# **Major Deliverables**

- A report on case studies examining issues related to **community involvement** and the development of guidelines (pamphlet) for meaningful community engagement
- A report, workshop and summary recommendations on legislative and institutional barriers to voluntary remediation
- A report and summary recommendations on funding approaches for orphaned/abandoned mines





#### **Web Sites**

Mine Environment Neutral Drainage (MEND) Initiative mend.nrcan.gc.ca



#### National Orphaned and Abandoned Mines Initiative (NOAMI)

www.abandoned-mines.org

National Orphaned/Abandoned Mines Initiative

