

3. THURSDAY NOVEMBER 7

3.1. INTRODUCTION TO WORKSHOP

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MEND Secretariat**

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THE PREDICTION OF ACID ROCK DRAINAGE

A MEND Prediction Workshop
in Conjunction with
The 4th Annual B.C. Mines ARD
Symposium

November 7-8, 1996



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Objectives

- To present the latest prediction technologies;
- To describe application of these technologies; and
- To discuss research needs and priorities.



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Program

- Mathematical Modelling
- Chemical Prediction
- Discussion - Practice, Requirements,
Priorities
- Prevention & Control



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Coming Attractions

- Fourth International Conference on Acid
Rock Drainage
"Application of Technology"
May 31-June 6, 1997
- Visit MEND on Internet
www.nrcan.gc.ca/mets/mend



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Mine Environment Neutral Drainage (MEND)

- A 9-year cooperative research program, financed and managed by three partners; the Canadian mining industry, the Government of Canada and the provincial governments
- 1996 is year 8



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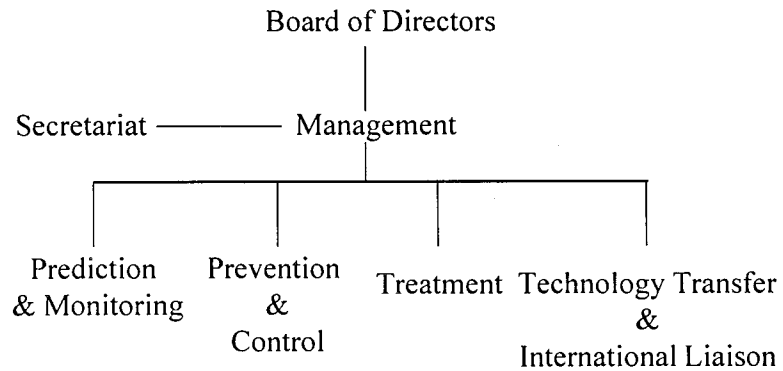
MEND is composed of..

- 20 companies, 5 provinces, Canada
- \$18 million, tripartite funding
- Volunteers
- Defined program for technology development
- Solicited and unsolicited proposals
 - consultants, research organizations, companies



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MEND Organization



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Funding

- Initial commitment
 - 1/3 Industry, 1/3 Canada, 1/3 (5) Provinces
- Annual plan and budget
- Project-by-project basis buy-in
- To date \$15 million
 - Industry 39%
 - Canada 37%
 - Provinces 24%



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What was Needed

- Reduction in liability associated with acidic drainage



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What was Needed

- More accurate prediction techniques
- Cheaper closure methods for tailings and rock and mine sites
- More site-specific options
 - new mines without acid
- Cheaper, widely applicable monitoring tools



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Questions

- Objectives achieved ?
 - Remaining, unachievable ?
- Results credible ?
 - Users, responsible authorities, public
- Liability reduced ?
- Long term ?

MIND/NEDEM

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Prediction Techniques

- Chemical Methods
 - patchwork of options available
 - test results must be linked
 - mineralogy, sites, models
 - state of the art outline needed

MIND/NEDEM

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Prediction - Models

- Complex for rock
 - empirical approach
- Several approaches possible for tails
- Results:
 - verification with time
 - water quality prediction fair
 - improve understanding of processes



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Dry Covers

- | | |
|-----------------------|-----------------|
| □ Soil/tailings | □ Organic |
| ■ Cost | ■ Site specific |
| ■ Installation | ■ Additives |
| • depyritization | ■ Longevity |
| ■ 95-98%
effective | |
| ■ Long term | |



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Long Term Issues for Water Covers

- Maintenance of engineered works
 - monitoring, repairing, financing
- Wave and ice disturbance
- Introduction/generation of surface zones
- Biological uptake
- Transition of land forms



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The bottom line is ...

- Use of water key strategy
 - shallow water covers
 - underwater disposal
 - interface between water and solids important
- Much left to do:
 - site-specific field



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Technology Transfer

- Reports/Publications
 - 180 projects
 - MEND Manual
- Workshops
- MEND on Internet
- International conference - 4th ICARD
- Field demonstrations



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MEND Results

- No magic bullets
- Prevention best strategy
- Existing sites:
 - reduce, treat, monitor
- New mines
 - underwater disposal
 - “walkaway” possible



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Some of MEND successes

- Buy-in by stakeholders
 - commitment to technology only
 - mining industry shares results
 - full disclosure
- Volunteer participation
- Finite program with an end
- Significant R.O.I.



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Other MEND Successes

- Governments working **with** industry
 - *decision-makers at the table*
- Expertise widely available
- Mistakes of the past not repeated
- New mines opening without AMD
- Major reduction in liability



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Focus for MEND 1996-1997

- Development and demonstration of technologies that are:
 - Lower cost
 - Longer lasting with less maintenance
- Technology transfer and documentation
 - 4th Conference on ARD - Vancouver 1997
- International linkages



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Unfinished Business and Challenges

- Predictive techniques for waste rock piles
- Control methods for waste rock on surface
- **Walkaway** technology for old tailings areas
- Control of AMD in mine openings
- Reduce the mountain of information
- Epilogue
 - monitoring of field projects
 - package and deliver the results in 1998



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Post MEND

- Retain Cooperative Spirit
- Monitoring & Reporting Results
- Non-acid Issues
 - umbrella program - metals in the aquatic environment



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MEND

A Successful Canadian
Enterprise



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