

SECTION C.3

MEND 2000


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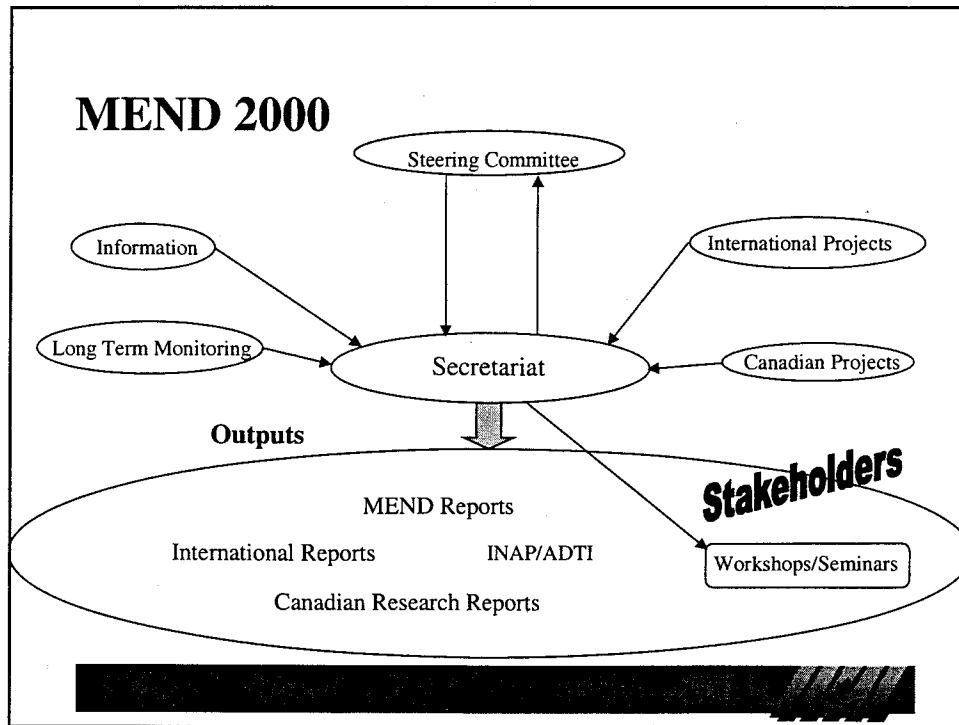
MEND 2000

<http://mend2000.nrcan.gc.ca>



MEND 2000 Summary


- MEND 2000 started January 1998
 - 3 year program with an annual review
 - Major change in focus from MEND, emphasis on:
 - Technology transfer
 - Disseminate national and international information
 - Internet site
 - Proof of performance of technologies through long-term monitoring and case studies
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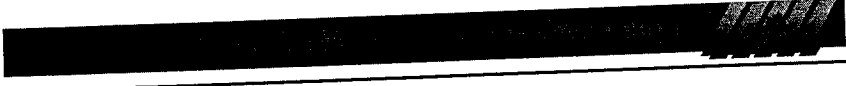
MEND 2000 - Objectives

- Technology transfer of acidic drainage projects
- Monitoring and reporting of large-scale field tests
- Maintaining linkages
 - Canadian industry and government agencies
 - number of foreign government institutes
 - national programs (INAP/ADTI)
 - for information exchange and consensus building


Major Activities for 1998

- Completion of MEND initiated projects and reports
 - Validation of low-cost technology through long-term monitoring has continue
 - Louvicourt, Les Terrain Aurifères
 - List of technologies developed by MEND
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Major Activities for 1998

- Technology transfer
 - MEND 2000 on the Internet
 - MEND Video distribution
 - MEND reports
 - 3 Workshops
 - NB Prospectors and Developers Association
 - NB Environment Industry Association
 - Risk Management (BC)
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MENDING the WEB

- WWW: <http://mend2000.nrcan.gc.ca>
 - List of available reports
 - over 140 reports and workshop notes
 - executive summaries
 - Presentations
 - Upcoming events (workshops/conferences)
 - List of technologies developed by MEND
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Proposed Work Plan for 1999

- Develop case studies by technology area
 - Produce roadmap through acidic drainage technologies
 - Workshops
 - Producing the MEND Final Summary Report
 - Completion of MEND 2000 reports
 - MEND Manual
 - Establishing linkages
 - Information dissemination via the Internet
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MEND 2000: MEND ACTIVITIES CONTINUE UNDER NEW PROGRAM

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Acidic drainage is recognized as the largest environmental liability facing the mining industry and to a lesser extent to the public through abandoned mines. Through the Mine Environment Neutral Drainage (MEND) program, Canadian mining companies and provincial and federal departments have reduced the liability due to acidic drainage by at least \$400 million. This is an impressive return on an investment of \$17.5 million over 8 years.

MEND was a cooperative research organization that was sponsored, financed, and administered by a voluntary consortium consisting of the mining industry, the Government of Canada, and eight provincial governments. MEND was implemented to develop and apply new technologies to prevent and control acidic drainage. Before the establishment of MEND, both industry and governments knew of the existence of acidic drainage, but had no clear idea of how to solve the problem. MEND has since provided an increased and more sophisticated knowledge base that has made it possible to manage the complexity of acidic drainage. A particularly important outcome was the development of a common understanding among participants, inasmuch as it has allowed partners to take actions with greater confidence and to gain multi-stakeholder acceptance more quickly. MEND has essentially developed a toolbox of technologies that is available to all stakeholders, including operators, regulators and consulting engineers.

MEND has been described as a model way for governments and industry to cooperate in technology development for advancing environmental management in the mining industry. Decisions are now being made based on sound science. 1997 was the final year for MEND and to celebrate the success of this cooperative program, the Fourth International Conference on Acid Rock Drainage (ICARD) was held in Vancouver in early June 1997. A total of 650 delegates from around the world attended the conference that showcased the technical results of MEND.

The following quote by an ICARD delegate summarizes the program very well – “MEND has focused the acidic drainage effort, so that now we have a whole series of good options in our toolbox. Without you guys, we would be all over the place”.

Recognizing that MEND would end on December 31, 1997, the MEND partners concluded that additional cooperative work was needed to further reduce the liability and to confirm results of large-scale field tests of MEND-developed technologies.

CANMET proposed three options for a new program to industry, and provincial and federal governments for their comments and recommendations of the best option. The first option or base case was a field test monitoring and technology transfer program for Canada. The addition of international technology transfer to the base case formed the second option. The third option added new concepts and breakthrough technologies, essentially high risk, high return projects. The partners responded by clearly stating that they wanted the base case option. Even so, significant interest in international linkages was expressed. Specifically, many respondents saw linkages to foreign government agencies as a worthwhile role for CANMET.

A proposal was developed for a three-year initiative called MEND 2000. This new program, accepted by the partners, is the base case option in which project management and monitoring of current MEND projects will continue along with various technology transfer initiatives. Technology transfer will include information and analysis of projects not necessarily initiated under MEND and will include an exchange of technology information with mining-related government institutions in several countries. CANMET has

been instrumental in initiating acidic drainage programs in some of these institutes and is therefore well placed to exchange technological information. MEND 2000 is funded equally by the Mining Association of Canada (MAC) and CANMET.

The objective of MEND 2000, which started in January 1998, is to reduce the environmental liability associated with acidic drainage by:

- Transferring the knowledge gained from MEND and other related projects;
- Verification of MEND developed technologies by long term monitoring of large-scale field tests;
- Reporting on the verification of MEND developed technologies in Canada to the mining industry, regulators and other interested partners;
- Maintaining a linkage between Canadian industry and government agencies for information exchange and consensus building; and
- Maintaining linkages with a number of foreign government and industry driven programs.

The MEND 2000 organizational structure includes a Steering Committee, a Technology Transfer ad hoc Committee, a network of stakeholders, and potential project task forces. Except for the MEND 2000 Program Office, all the members and the network of stakeholders are volunteers from the mining industry, the non-governmental organizations, and federal and provincial government departments. Many of these individuals were participants in the previous MEND program as committee members.

The main objective of the Steering Committee is to set objectives, provide strategic directions and to manage the overall program. The first meeting of the Steering Committee took place in Toronto on March 17 and 18, 1998. Meetings will be held on a regular basis. The emphasis of MEND 2000 is on technology transfer and a Technology Transfer Committee will be formed for specific needs. Any research projects identified by the Steering Committee, or other sources during MEND 2000 program, will require a project task force that would exist for the duration of the project only. At present there are no new collaborative research projects identified that could fall under MEND 2000. Members for these task forces will be selected from the "network of stakeholders".

The importance of technology transfer became evident as MEND progressed. MEND 2000 results will be available following the successful MEND approach, that is, through reports, newsletters, seminars and conferences, workshops and via the MEND 2000 Internet site (<http://www.nrcan.gc.ca/mets/mend>). One of the key objectives of MEND 2000 is to transfer the results of ongoing MEND initiated and other related projects to the users. All research results must be effectively communicated to industry, government agencies and the public if the program is to continue to achieve the desired results.

It is also expected that the "network of stakeholders" will keep abreast of new technology and will inform the MEND 2000 Secretariat of such new developments. Reductions in waste management costs are an important objective that will be examined with each technology. It is the requirement of each member to be informed on developments that are relevant to their work and to constantly strive towards better and more cost effective solutions that will allow disposal of mine wastes in a predictable, affordable, timely and environmentally acceptable manner.

Canada is the recognized leader in research and development on acidic drainage. It is now recognized that there is a common understanding in the industry regarding prediction technologies: water is the key element to prevent acidic drainage; and guidelines for various technologies are available. Promising technology areas (wet and dry barriers, underwater disposal and innovative disposal technologies such as in-pit disposal and blending and layering) need further validation to determine the long-term suitability of such disposal, management, and closure alternatives. Improved understanding of the acid generating process, methods to predict if a mine site will or will not produce acidic drainage, and models to simulate

components of the acid generation and contaminant migration process in waste rock are areas of interest.

New mine development projects are emerging in Canada (e.g. Voisey's Bay, Kudz Ze Kayah). MEND 2000 will do its best to keep informed of the various research projects taking place at these sites and will contact the property owners to request access to relevant information. This information can then be put into the public domain as case studies to ensure partners are kept abreast of significant results. Several other research initiatives such as the International Network on Acid Prevention (INAP), the Mitigation of the Environment Impact from Mining Waste (MiMi - Sweden), the Acid Drainage Technology Initiative (ADTI - USA) have also been initiated and MEND 2000 will liaise with these programs to ensure the results are made available.

The international mining community met in Vancouver recently to discuss the formation of an international organization (INAP) capable of bringing together the best expertise in the world in the field of acidic drainage. Their objectives were to identify the state of the science and research activity from a global perspective, as well as research needs and opportunities. This first meeting, attended by 18 multinational mining companies, covered the areas of waste characterization and material management. Recognized experts from the research community, including MEND 2000, were also in attendance. One of the key outputs from this workshop was the need to establish a communication network.

The international component was given a stronger mandate and links to foreign government institutes such as CIMM (Chile), INTEMIN (Argentina), ANSTO (Australia) and CETEM (Brazil) must be well coordinated. Available information on international acidic drainage research projects will be collected, the results reviewed and disseminated to program participants. Establishing and maintaining linkages with these government institutes is a primary objective for the MEND 2000 Program Office.

MEND, and now MEND 2000, continues to be a model for cooperation between industry and various levels of government. The Government of Canada, with mining industry and the provincial governments are pleased to provide a national focus and develop and validate solutions for an environmental problem that faces the mining industry across Canada. The MEND Program has contributed to the long-term sustainability of the industry and the environment. It is now time for MEND 2000 to continue this Canadian success story.

