



MEND Update - 2018

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MEND Secretariat

BC MEND 2018

MEND Study - In Progress



In-situ Application of In-pit Treatment for Water Management at Closed Mine Sites: Literature Review and Field Trial

- Contractor: EcoMetrix
- Research Partners: Goldcorp, McEwen Mining and Envirobay
- In-pit treatment of metals has been used at several mines in Canada
 - Highland Valley Copper, BC
 - Selbaie, Quebec
- Removal of arsenic with ferric sulphate has not yet been applied in situ
- Batch treatment of arsenic and other constituents in an open pit may represent a low-cost alternative to conventional treatment.

In-Pit Treatment - Ongoing Study

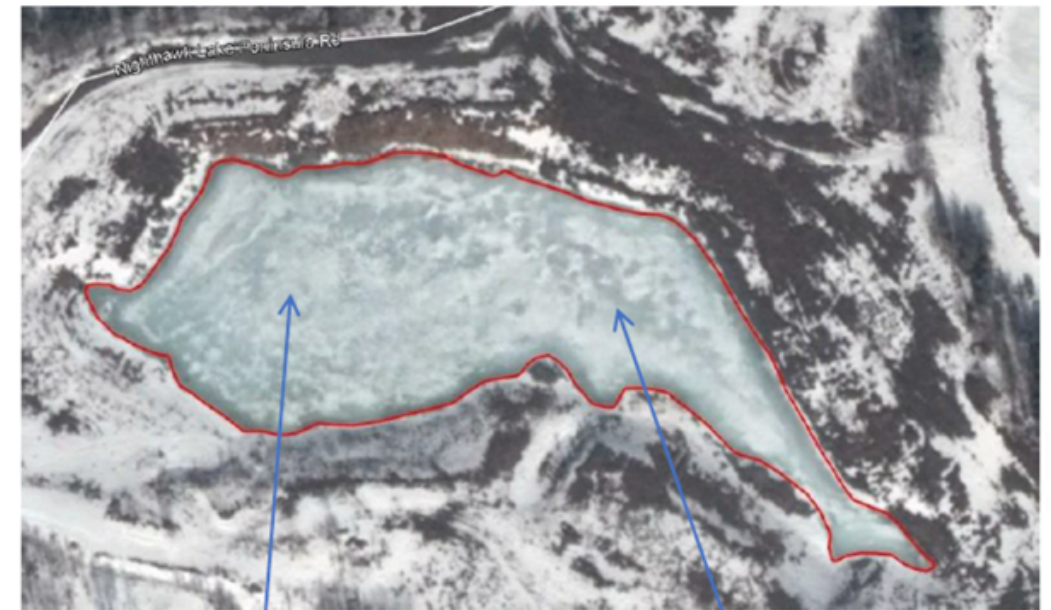
- Study underway at the Nighthawk Pit, ON
- Bench-Scale studies are completed
- Field study completed mid-November
- Two water cannons used to apply dosage of ferric sulphate
- 10% of the pit volume was recirculated while applying a 20:1 dosage of ferric sulphate in the recirculated water.
- Approach required <time & smaller process equipment: <capital & lower operating costs when scaled to larger pits.



In-Pit Treatment: *Next Steps*



- Waiting on laboratory results post-treatment
- Ongoing monitoring campaign
 - Goldcorp to sample profiles within the pit quarterly (2 Locations)
 - Will help to ascertain performance and batch frequency required based on the ongoing loadings to the pit.
- Sludge stability test work suggested as part of this follow-up as the treatment solids settle.



NHP2
(max depth 23 m)
(48°29'46.3"/80°58'05.6")
S (0.5 m)
M (10 m)
D (22 m)

NHP1
(max depth 18 m)
(48°29'46.4"/80°58'01.8")
S 0.5 m
M (10 m)
D (17 m)

MEND - Completed Project



How to Assess Potential Biological Effects of Subaqueous Disposal of Mine Tailings: Literature Review and Recommended Tools and Methodologies (MEND 2.19.1)

Authors: Dr. Peter Campbell, Institut national de la recherche scientifique
Dr. W.A. Price, CanmetMINING, NRCan

Report provides update on previous literature reviews on biological aspects of SAD
► MEND 2.12.1a (1993) and MEND 2.11.2b (2009)

Information provided on:

- potential diagenetic changes in submerged tailings
- biogeochemical interactions between submerged tailings and overlying aquatic communities
- guidance regarding recommended tools and methodologies that could be used to predict and/or monitor the biological effects of submerged tailings.
- Now Available on the MEND website



MEND - Future Work - Field Study

- ▶ Ecology of Subaqueous Tailings Storage Facility at Louvicourt
- ▶ Campbell & Price report to provide guidance on methodologies and tools to be used to assess biological effects of submerged tailings

Ecology of Subaqueous Tailings Storage Facility at Louvicourt



Field Study: To increase understanding of natural colonization of TSF

- Assess diversity and productivity of established flora and fauna
- Examine relationship between these communities and the sediment/water chemistry

Two stages:

1. Reconnaissance study to establish existence of vegetative growth and its spatial extent
2. Field study



Ecology of Subaqueous Tailings Storage Facility at Louvicourt



Reconnaissance Study (Spring 2019)

- Surface area TSF, 0.9 km²
- Bathymetric study
- Extent of coverage by submerged and emergent aquatic vegetation
- Identification of aquatic plants
- Document other relevant flora and fauna

Go or No-Go Decision (Spring 2019)

Field Study (Summer-Fall-Winter 2019/2020)

BC-MEND ML/ARD Workshop Proceedings

www.bc-mlard.ca

25th BC-MEND Workshop Proceeding to be posted in Spring 2019




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Equity Mine, photo courtesy of M Aziz.



Canadian Green Mining Innovation Network

Developed to:

- ▶ Improve organization and communication
- ▶ Optimize available resources
- ▶ Build a culture of innovation

<https://ami-aim.ca>

MEND now part of this digital network



Mine Environment Neutral Drainage (MEND) Program

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Areas of expertise

- Verification of full-scale mitigation technologies
- Mine closure management
- Early prediction and modelling
- Neutral and alkaline pH drainage
- Sludge management
- Passive treatment
- Cold temperature effects & climate change
- Monitoring
- Technology transfer and case studies

Key Projects, Programs and Initiatives

Cold temperature effects & climate change

Active

With the large number of mines opening in Northern Canada, the effect of cold temperature on various technologies is of increasing importance. The report *Cold Regions Cover System Design Technical Guidance Document* (MEND 1.61.5c, 2012) outlines the current state-of-knowledge of soil cover system design in cold regions, best practises on how a cover system design should be conducted, and a summary of information that should be provided during the design process.

A high-level risk analysis on the risks that climate change poses to mining operations is provided in *Climate Change and Acid Rock Drainage – Risks for the Canadian Mining Sector* (MEND 1.61.7, 2011). Climate change risks related to acidic drainage arise from the impacts of a changing climate on water-management structures and activities, on waste-impoundment structures, and on the hydrologic / hydrogeologic conditions affecting the flow of water and contaminants at mine sites. The assessment examines the impacts for specific infrastructure elements and determines which are most probable and significant for mining operations and for society.

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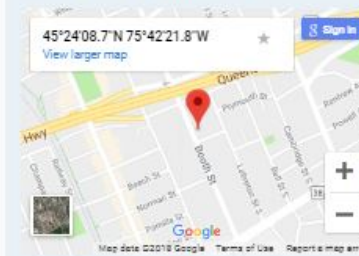
Best management practices

Active

The *Study to Identify BATEA for the Management and Control of Effluent Quality from Mines* (MEND 3.50.1, 2014) identified the best available technologies economically achievable (BATEA) to manage and control effluent from metal, diamond, and coal mines in Canada. Effluent management and treatment technologies employed at mine operations were described, and then screened against a set of criteria for consideration as BATEA.

Organization type

Multi-stakeholder partnership



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Primary contacts

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Comparable Organizations

- Research Institute on Mines and Environment (RIME) UQAT-Polytechnique
- Yukon Research Centre - Yukon College
- Hazards, Adaptation and Operations Branch - Lands and Minerals Sector, NRCan



For more Information



- To download reports, newsletters, or workshop proceedings please visit:

Mine Environment Neutral Drainage (MEND)
www.mend-nedem.org

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