

Canada's National Orphaned/Abandoned Mines Initiative

The return of mining lands project and looking to the future

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Mining has been central to the Canada's economy for more than 100 years, and supplies mineral commodities worldwide. The long history of mining has left many abandoned mine sites that require varying degrees of rehabilitation. The legacy of orphaned/abandoned mines – with associated environmental liability, human health concerns, and the social and financial cost of clean-up and long-term monitoring and maintenance – is a serious issue facing Canada and other international jurisdictions. Orphaned and abandoned mines are categorised as those mines for which the owner cannot be found or for which the owner is financially unable or unwilling to remediate the site.

In 2002, following stakeholder requests to federal, provincial and territorial mines ministers, the National Orphaned/Abandoned Mines Initiative (NOAMI) was created. NOAMI is guided by an Advisory Committee that brings together representatives from the Canadian mining industry, federal, provincial and territorial governments, non-government organisations (NGOs) and Aboriginal Canadians. The NOAMI Advisory Committee (NOAMIAC) takes direction from the Canadian mines ministers and reports their progress at the national Mines Ministers' Conference. NOAMI's activities are jointly funded by the federal, provincial and territorial governments, The Mining Association of Canada and the Prospectors and Developers Association of Canada. NOAMI is administered by a secretariat in the federal department, Natural Resources Canada.

NOAMI does not directly clean up orphaned and abandoned mine sites. Rather, it examines the legislative, policy and program framework in Canada for addressing issues associated with orphaned and abandoned mines, and makes recommendations for improvement. A pan-Canadian effort, NOAMI has made tremendous progress over 15 years in fulfilling this mandate and

is a good example of how a collaborative approach to the legacy of past mining practices can advance the objectives of sustainable development.

Highlighted below are two of NOAMI's active projects, potential new projects and issues under consideration.

The return of mining lands project

One of the key guiding principles of NOAMI is: 'Work toward eliminating future abandonment must continue, including the tightening of regulatory approaches.' NOAMI recognised that there is a policy void in the area of long-term mine closure, and began to examine legislative tools and policy approaches across Canada to ensure that current operating mines can be closed properly so that they do not become abandoned in the future. NOAMI members have long believed that there is a need for a clear policy framework for mine closure, long-term liabilities and return of mining lands to a custodial authority.

NOAMI established a task group to address this objective, and subsequent work included the 2010 report *The Policy Framework in Canada for Mine Closure and Management of Long Term Liabilities: A Guidance Document*. The first recommendation said that greater emphasis should be placed on the development of post-closure policy, regulations and procedures. In 2011, a workshop titled 'Exploring the Management of Long-term Liabilities and the Return of Mining Lands to the Crown' was held to develop a strategy roadmap. A key recommendation was for a decision tree to be developed for evaluating the return of mining lands. NOAMI undertook a new project to focus on developing material towards this goal.

A two-part study titled *Case Studies and Decision Making Process for the Relinquishment of Closed Mine Sites* examined case studies from different Canadian jurisdictions that contribute information towards relinquishment and

identified key issues and questions that need to be addressed to determine if a site should be brought under government jurisdiction, or remain the responsibility of the operator. A key recommendation of the study was:

... jurisdictions should have a managed relinquishment process, which is clear and unfettered and is specific about what will not be accepted. Hitherto closure plans have been prepared on a 'design for closure' basis. It is suggested that a more forward-looking approach be embraced and that a 'design for relinquishment' approach be adopted (Cowan, Mackasey and Robertson, 2013).

The study laid out a five step approach for regulators and industry to consider when evaluating if a site could, or should, be returned to the Crown. The steps are outlined below.

1. Submitting the application

Ensures that the proponent qualifies for relinquishment, specifically, the closure plan has been implemented, closure and post-closure land use objectives are completed or near completion, the site is physically and chemically stable, and existing permits are fulfilled or transferable to the jurisdiction. All necessary parties, and impacted stakeholder and Aboriginal peoples must be notified of the application.

2. Site assessment

Locational and technical issues are evaluated to determine if the site is appropriately reclaimed to meet legal requirements under the closure plan, and will meet proposed future land use requirements. Any interim monitoring requirements must be identified for evaluation.

3. The long term

Requirements for long-term monitoring, maintenance or capital replacement of rehabilitation works and associated cost estimating are evaluated. A peer-reviewed risk assessment by qualified persons is

required for unforeseen events. This is a critical point, as the proponent for mines with prohibitively high funding requirements for relinquishment may elect to retain the properties.

4. Funding

Considers what future activities will need to be funded, their costs, and the method of fund management. All funds are provided by the proponent.

5. Implementation

Once a site is approved for relinquishment, the regulator must have a management system in place to manage funds, ensure the site is monitored and maintained, and manage data securely. Emergency protocols should be in place.

In addition it should be recognised that relinquishment may not be possible where the environmental, social, political or financial risk/costs are too high. The relinquishment process would be straightforward for fully remediated sites that are physically and chemically stable, and would require little or no monitoring, care or maintenance. The relinquishment process would be more complex for remediation sites that will need ongoing monitoring, care and maintenance. Long-term monitoring and care of more complex sites would need to be funded by the operator, and managed by the jurisdiction or other custodian through some form of institutional control.

The review of Steps 1 and 2 was completed in 2015 with a published report titled *Key Criteria for the Effective Long-term Stewardship of Closed, Orphaned/Abandoned Mine and Mineral Exploration Sites*. The report discusses key criteria for the preliminary assessment of closed and/or orphaned/abandoned mine and mineral exploration sites in Canada in order to evaluate their condition in terms of:

- physical stability
- chemical stability
- public health and safety risks
- ecological risks
- risk to ecosystem services.

The criteria were designed to be field functional for application by a wide range of users such as government agencies, Indigenous organisations, NGOs, communities and the general public. This allows each user to arrive at an informed opinion regarding a site's condition, to identify site specific hazards, provide a preliminary assessment of the level of risk posed by a particular hazard and to assess

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Before: The Yankee Girl Tailings Remediation Project in British Columbia in 2005. Photo courtesy BC Ministry of Forests, Lands and Natural Resource Operations – Crown Contaminated Sites Program.



After: The Yankee Girl Tailings Remediation Project in British Columbia in 2009. Photo courtesy BC Ministry of Forests, Lands and Natural Resource Operations – Crown Contaminated Sites Program.

the need for further remediation to reduce the risk and ensure the effective long-term stewardship of the site. The report provides a sample field report form of potential site aspects that are present at a wide range of site types. This is designed to aid a user in identifying, documenting, and evaluating the potential hazards at a particular site.

In 2016, the review of Step 3 was

approved as the next project. The report *Orphaned and Abandoned Mines: Risk Identification, Cost Estimation and Long-term Management* was released in December 2016 and is a follow-up to the 2015 report. The report is designed to assist users in formally documenting and assessing the following:

- the level of risk posed by the hazards identified on a particular orphaned/

abandoned mine site, assess those risks in terms of the need for remediation (or, in some instances, further remediation)

- methods to estimate the cost of the identified remediation requirements
- the types of costs anticipated, and methods to finance the long-term management of orphaned/abandoned properties once monitoring has demonstrated the site is suitable for transfer into some form of institutional management.

Long-term management of orphaned and abandoned mines, as well as closed mine sites, can involve a wide range of activities depending on post-remediation site conditions and hazards. Key components of the program would include information management, site monitoring and maintenance, responses to unforeseen events, and mechanisms to restrict future land use.

Few jurisdictions in Canada – or the world – have a formal institutional control management framework in place to provide for long-term stewardship once monitoring has demonstrated the site is suitable for transfer into some form of institutional management. The December 2016 report identifies options for funding long-term stewardship costs, and summarises the Institutional Control Program developed in Saskatchewan (Canada) as an example of a long-term management framework and funding mechanism.

A number of options are under consideration as future activities for this project. These include an update to the 2006 report *Rehabilitating Abandoned Mines in Canada: A Toolkit of Funding Options*, which addressed Step 4, and developing a report to address Step 5. The objective of that report would be to investigate global best management practices to develop, operate and fund formal long-term management systems (or institutions) for orphaned and abandoned mines.

The publications listed above may be found at www.abandoned-mines.org/en/document/publication.

Inventory of orphaned/abandoned mines in Canada

Since its inception, NOAMI has recognised the need to develop a Canada-wide approach to bring together the patchwork of inventories currently held by provincial, territorial and federal jurisdictions across Canada.

NOAMI is an example of a unique multi-stakeholder partnership approach to a complex problem of national importance.

The level of detail and completeness of orphaned and abandoned mines inventories varies from jurisdiction to jurisdiction. A primary NOAMI objective was the development of a standardised and integrated inventory. The NOAMI inventory is designed to build on the strengths of these individual inventories and to provide users of this information with a tool that offers single-window, web-based access to data from multiple jurisdictions, and facilitate the addition of more detailed information in the future. A web portal approach is used whenever possible, providing users with a link to the original data source. The site includes an interactive user-friendly map to display the orphaned and abandoned sites from the jurisdictions participating in this inventory. Work continues to integrate information from the remaining jurisdictions.

Users are encouraged to familiarise themselves with the definitions applied in the portal to display the data in the NOAMI inventory, and to make note of the various definitions and specific details associated with each jurisdictional inventory when interpreting the data. NOAMI partners and stakeholders continue to provide Canadians with information relating to orphaned and abandoned mines to enable sound and transparent decision-making, cost-efficient planning and sustainable rehabilitation.

The NOAMI inventory is scheduled to be posted in early 2017 at www.noami.org.

Potential future projects

NOAMI has also identified new initiatives to pursue over the next several years. These include the following:

- Preparing case studies that examine how all the key aspects affecting the approach to orphaned and abandoned mines can come together to work holistically. Such aspects would include funding mechanisms, legislative frameworks, risk assessment and

engagement with the communities and Aboriginal Canadians.

- Studying the effect of climate change on infrastructure related to orphaned and abandoned mines.

- Effective long-term monitoring and maintenance programs at orphaned and abandoned mines in the face of climate change and other social, economic and environmental challenges.

- Examining how climate change is being incorporated into mine closure plans.


- Examining the legislative tools and policy approaches across Canada to ensure that currently operating mines can be closed properly so that they do not become abandoned mines in the future.

- Exploring the effect on 'green jobs' of orphaned and abandoned mine cleanup.

- Investigating best practice standards for remediation at orphaned and abandoned mines, and possibly following up with a workshop illustrating several real examples.

- Identifying linkages between NOAMI and other organisations and initiatives, with the objective being to share information of interest.

NOAMI is an example of a unique multi-stakeholder partnership approach to a complex problem of national importance. Since its inception, NOAMI has made significant contributions to the state of knowledge for orphaned and abandoned mines in Canada and approaches for addressing them. Much leading-edge work has been done, and NOAMI's success has been recognised in the interest and accolades it has received both domestically and internationally, and we hope to sustain this momentum into the future.

For more information and publications visit www.abandoned-mines.org. 

Reference

Cowan W R, Mackasey W O and Robertson J G A, 2013. Case Studies and Decision Making Process for the Relinquishment of Closed Mine Sites [online]. Available from: <http://www.abandoned-mines.org/wp/wp-content/uploads/2015/06/CaseStudiesDecisionMaking2013.pdf>.