

Managing long-term orphaned mine liabilities: exploring the relinquishment of closed sites

E.J. Gardiner *NOAMI, Canada*

W.R. Cowan *Cowan Minerals Ltd., Canada*

G.A. Tremblay *Natural Resources Canada, Canada*

C.M. Hogan *Natural Resources Canada, Canada*

Abstract

The National Orphaned/Abandoned Mines Initiative (NOAMI) was launched in 2002 in Canada in response to a request by federal, provincial and territorial mines ministers. It is a national multi-stakeholder initiative that addresses issues related to orphaned and abandoned mines in Canada. One of the guiding principles of NOAMI is that “work toward eliminating future abandonment must continue, including the tightening of regulatory approaches.” Recently, NOAMI discovered that while processes of closure planning and the provision of financial assurance are well-developed and consistently applied across Canada, policy and regulatory approaches focusing on long-term management of sites beyond closure, including potential methods of returning mining lands to the Crown, are almost non-existent. This paper will describe various initiatives undertaken by NOAMI during the past four years that explore this issue in detail and offer recommendations for change.

A 2010 NOAMI report entitled “The policy framework in Canada for mine closure and management of long-term liabilities: a guidance document” presents a policy framework and recommendations for preventing further accrual of abandoned mine liabilities. Subsequently, a 2011 multi-stakeholder workshop, Exploring the Management of Long-term Liabilities and the Return of Mining Lands to the Crown, resulted in the development of a roadmap for managing long-term liabilities. In 2013, Cowan Minerals Ltd. produced a report for NOAMI based on a two-part study. The first part examined six case studies from different Canadian jurisdictions that describe closed sites that either were returned to the Crown or were in the process of making such an application. The second part, a decision tree or process, identified key issues and questions that need to be addressed in order to determine whether a site should be brought under government jurisdiction or remain the responsibility of the operator. The report, “Case studies and decision-making process for the relinquishment of closed mine sites” (2013), lays out a five-step approach for regulators and industry to consider when determining if a site could, or should, ultimately be returned to the Crown. Finally, in 2014, NOAMI commissioned a study that describes key criteria for the effective long-term stewardship of closed mine sites. The purpose of the key criteria is to provide a summary of site aspects that will aid the user in identifying, analysing, and evaluating potential site hazards, including those that may pose a risk to public health and safety, to the environment, to ecosystem services and to future land use.

1 Introduction

The legacy of orphaned and abandoned mines, including environmental liability, human health concerns, and the cost of clean-up and long-term monitoring and maintenance is a serious issue facing all Canadians. Orphaned or abandoned mines are those for which the owner cannot be found, or is financially unable or unwilling to remediate the site. These mines can pose environmental, health, safety and economic problems for communities, the mining industry and governments in many countries, including Canada.

The National Orphaned/Abandoned Mines Initiative (NOAMI) was formally established in 2002 at the request of the federal, provincial and territorial mines ministers in Canada. The groundwork for the initiative was laid out in 1999 when a number of stakeholders put forward requests to the Canadian mines ministers to

establish a multi-stakeholder working group to review the issue of orphaned and abandoned mines. Ministers supported the establishment of an industry-government working group that would examine the steps to be taken to facilitate action in this area. They requested that a multi-stakeholder workshop be organised to identify key issues and discuss priorities for action.

This workshop, which was held in Winnipeg in 2001, determined the key issues associated with orphaned/abandoned mine sites, identified common ground among various communities of interest, and identified processes and procedures for moving forward. Operating principles and a series of guidelines were laid down at the workshop, which ultimately would apply to NOAMI as it exists today.

NOAMI is guided by a multi-stakeholder advisory committee that brings together representatives from the Canadian mining industry, federal, provincial and territorial governments, non-governmental organisations and Aboriginal Canadians. Together, they assess issues and make recommendations for collaborative implementation of remediation programs and policies for orphaned and abandoned mines across Canada. The NOAMI Advisory Committee takes direction from the federal, provincial and territorial mines ministers and in turn, reports progress annually to the Energy and 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 and are administered by a secretariat at 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 in more than a decade, in fulfilling this mandate.

2 Return of mine lands project

One of the key guiding principles of NOAMI is: "Work toward eliminating future abandonment must continue, including the tightening of regulatory approaches." In 2009, the NOAMI Advisory Committee, recognising that there is a policy void in the area of long-term closure, began to examine the legislative tools and policy approaches across Canada to ensure that current operating mines can be closed properly so that they do not become abandoned mines in the future. Related to this, members of the committee 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 the Crown. It is believed that such a framework would address ultimate closure of mine sites and long-term management and related liabilities, in a manner that clearly sets out the responsibilities of the mine owner/operator and government regulatory agencies. The policy framework would also examine the questions surrounding the transfer of mining lands back to the Crown through the issuance of a release, including questions of when and under what conditions such a return would be appropriate (Holmes and Stewart, 2011).

2.1 Guidance document for mine closure and management of long-term liabilities

In 2010, Cowan Minerals Ltd. of Sudbury was commissioned to conduct a survey that found that while processes of closure planning and provision of financial assurance are well-developed and consistently applied across Canada, policy around long-term management of sites beyond closure, including methods of returning mining lands to the Crown, is almost non-existent. Cowan Minerals proceeded to produce a report, "The policy framework in Canada for mine closure and management of long-term liabilities: a guidance document" (Cowan et al., 2010). The document examined major components related to mine closure and post-closure site management, which can include long-term maintenance and monitoring, financial assurance, relinquishment and institutional care. A valuable reference tool, the report presents a policy framework, together with recommendations for preventing further accrual of abandoned mine hazards. A key message of the report is that jurisdictions should have a managed relinquishment process, which is clear and unfettered and is specific about what will not be accepted. The report notes that closure plans are normally prepared on a "design for closure" basis, and it suggests that a more forward-looking approach be embraced in the form of a "design for relinquishment" (Cowan et al., 2010).

2.2 Multi-stakeholder workshop and strategy session

Building on the “Cowan Report” of 2010, a multi-stakeholder workshop, Exploring the Management of Long-term Liabilities and the Return of Mining Lands to the Crown, was held in 2011 (Tunis and Associates, 2011). Advice and guidance was obtained from representatives of various communities of interest that assisted NOAMI in developing a roadmap for managing long-term liabilities and issues relating to the return of lands to the Crown. The themes of risk management, funding and legislation, and policy and regulation are discussed fully in the workshop proceedings, which are available on the NOAMI website, <http://www.abandoned-mines.org>. While several recommendations were formulated by the workshop participants, a key recommendation was that NOAMI create a decision tree for the return of mining lands to the Crown.

Following the workshop, the NOAMI Advisory Committee held its Annual General Meeting, which included a strategy planning session to analyse the results of the workshop and to develop the next steps for the return of mining lands to the Crown project.

The committee believed that the creation of a decision tree for considering the return of mine lands to the Crown would be a useful tool, and would provide information and options for Canadian jurisdictions to consider in planning to develop legislation or to revise current legislation. Case studies have been used in the NOAMI program to examine factors involved in successful approaches for dealing with orphaned and abandoned mines, such as funding, regulatory and policy frameworks, and engagement with communities. Examination of several mine sites in Canada that were successfully returned to the Crown would provide information on processes involved and some lessons learned. The information collected from the case studies, along with other relevant documents, could be used to establish the decision tree.

Based on these discussions, a new Return of Mining Lands to the Crown Task Group was formed in 2011, and a research plan was developed for the next steps in the return of mining lands project.

2.3 Case studies and decision-making process for the relinquishment of closed mine sites

Cowan Minerals Ltd. conducted a two-part study, Case Studies and Decision-Making Process for the Relinquishment of Closed Mine Sites. The first part examines case studies from different Canadian jurisdictions that contribute information towards relinquishment. The second part, a decision tree or process, identifies 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 five-step approach was laid out for regulators and industry to consider when determining if a site could, or should, ultimately be returned to the Crown.

2.3.1 Case studies

Initially, case studies were to be examined from different Canadian jurisdictions that describe closed mine sites that are being returned, or have made application to be returned to the Crown. Upon further investigation, few sites in Canada were found that were both available for study and would contribute information towards the development of a decision tree (Cowan et al., 2013). To complete the study, the criteria for case studies were amended to include closed mine sites that illustrated relevant information and lessons learned towards their potential return.

Case studies were undertaken for sites in multiple jurisdictions: Quebec Lithium Mine, Quebec; Renabie Gold Mine, north-central Ontario; Gregg River Coal Mine, Alberta; Contact Lake Gold Mine, northern Saskatchewan; and Farley East Tailings Management Area, northern Manitoba. The sites displayed a diverse range of information due to age of projects; changes in ownership, management and operational personnel; regulatory regimes and reporting requirements; and variable accessibility to information (Cowan et al., 2013).

The six case studies gave rise to a series of lessons learned. The most salient are noted below (Cowan et al., 2013):

1. Jurisdictions must have clear and well-written legislation and policies in place to facilitate the return of lands. It is necessary to have a system to receive and manage funds to ensure the viability needed to address long-term issues.
2. Where planning and procedures for relinquishment are not in place, defaulting will eventually occur at taxpayers' expense. This can occur in several ways including forfeiture of corporate charters and seizure by municipalities for unpaid taxes.
3. Few jurisdictions have a satisfactory funding regimen in place to deal with surrendered, or about to be surrendered lands.
4. Most jurisdictions providing for rehabilitation releases and/or relinquishment of lands do not have complete releases for environmental responsibility or liability.
5. It appears that only some jurisdictions have institutional control plans for relinquished lands, i.e. there is no administrative unit with direct responsibility for institutional issues following surrender, e.g. records maintenance, land use planning inputs.
6. Public consultation requirements/efforts are generally considered inadequate relative to current expectations, especially with regard to aboriginal communities. The mines reviewed for this project came into production prior to comprehensive consultation becoming either an expected practice or mandated by government. Consultation with community and First Nation Stakeholders in the Lynn Lake area of Manitoba was well planned and carried out with regard to the Farley East Tailings Management Area. Consultation requires good information on the issues and needs of impacted communities.
7. Third-party involvement by concerned special interest groups and others is becoming common; there is a lack of perceived government credibility.
8. The length of post-closure monitoring periods needs greater evaluation especially where documentation/identification of features is lacking.
9. Well-defined risk assessment procedures for property returns are not available for many situations. More information on quantitative risk assessment is required to support chemical and physical stability determinations.
10. It appears that many technical assessments are accepted at face value and that peer review by qualified persons is not commonly used. Peer review was used in the review of the Human Health and Environmental Risk Assessment at Lynn Lake Manitoba.
11. Where cutting-edge technology is involved, longer-term monitoring and scientific assessment may be expected, e.g. new schemes related to permafrost or climate change issues.
12. Effective cost-estimation procedures for long-term care and maintenance need development.
13. Storage and maintenance of mine plans and records are essential for technical assessment. Several of our case studies were hindered by the loss of or unavailability of documentation.
14. Provision of a final closure report detailing all completed decommissioning and reclamation work is an excellent best practice.
15. There is no protocol for the public to inform jurisdictions of observed reclamation issues.

2.3.2 Relinquishment and the five-step process

As stated earlier, a principal recommendation of Cowan et al. (2010) was that:

... 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.

The authors go on to state that it is not intended that relinquishment be the only option, but rather that it be an important option or objective because of its role in protecting the public from the inadvertent accumulation of abandoned mine environmental and financial risks (Cowan et al., 2013).

The simplest form of relinquishment would be for fully reclaimed sites that are physically and chemically stable, and require little or no further monitoring, care or maintenance. More complex forms of relinquishment would be needed for reclaimed sites that will require ongoing monitoring, care and maintenance. Future care of these sites would need to be fully funded by the proponent and managed by the jurisdictions through some form of institutional care. In general, relinquishment is unlikely for sites where risks are too high, or if there are specific no-go conditions, such as water treatment (Cowan et al., 2013). One important aspect of relinquishment is whether liability would be transferred or not. The proponent maintains the liability in the Saskatchewan “institutional control program”, while under the Ontario “surrender by agreement” legislation, if applied, the liability would be transferred to the jurisdiction.

To determine if a site would be acceptable for relinquishment, a decision tree or process could be put in place that outlines key factors that need to be assessed or developed. As discussed at the NOAMI 2011 workshop, there are many elements to consider when developing a process for relinquishment. In addition, each jurisdiction would have its own set of elements. However, many of the elements could be considered at different stages of the process, and would be amenable to a step-wise approach for planning.

These steps would ultimately determine whether responsibility for the site should remain with the operator or be transferred to the Crown. The five-step process developed by Cowan Minerals (2013) provides a starting point for jurisdictions developing or revising a program for relinquishment. Although national consistency would be beneficial and a desired goal, each jurisdiction would need to establish a decision-making process that met its own regulatory regime and policies.

A five-step decision-making process has been created following the natural progression from “submitting the application” through to “implementation” (Figure 1). For each step, consensus must be reached by the review committee prior to moving to the succeeding step, i.e., before proceeding from one step to the next all “yes” components must be met. It is suggested that an appeal process be available through every step.

The five-step decision-making process provides guidance on whether a mining property has been closed out as per requirements and closure plan, and on whether technical and financial long-term monitoring and maintenance needs have been addressed sufficiently (Cowan et al., 2013). The steps are briefly summarised:

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.

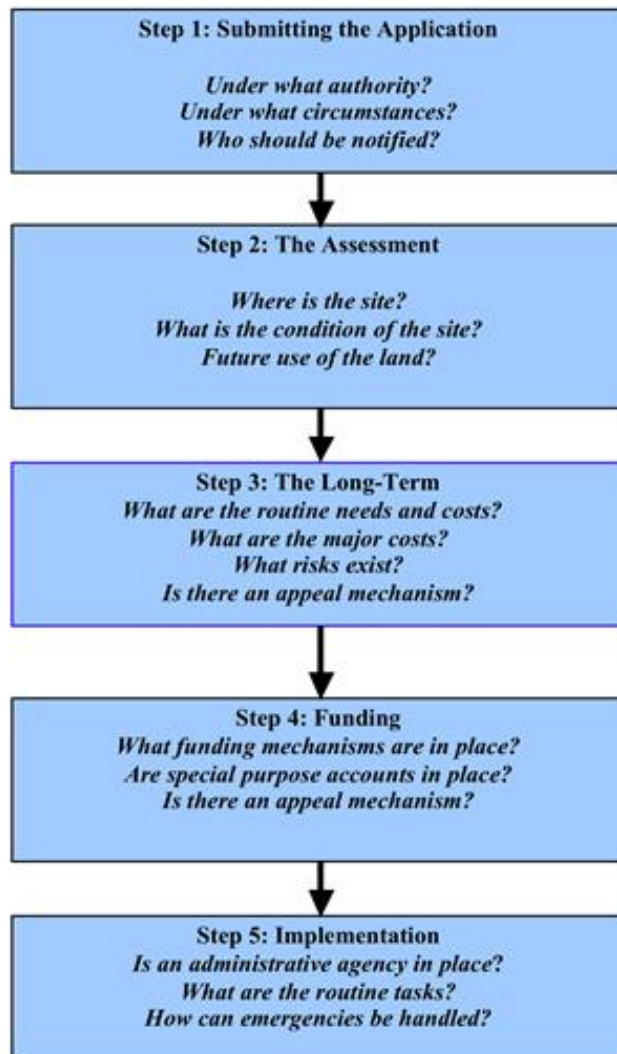


Figure 1 Five-step decision-making process (Cowan et al., 2013)

The report concludes that mining projects should be designed with the objective of reclaiming the site for relinquishment and future beneficial use. It is clear that relinquishment will not be possible where the environmental, social, political or financial risks/costs are too great. However, Cowan Minerals believes that a well-designed and well-managed relinquishment policy and program can lead to a win/win situation in many instances. The five-step decision-making process proposed herein should assist jurisdictions in developing policies and procedures for relinquishment that reflect the regulatory environment of the jurisdiction within the context of mining as an economic development instrument for the jurisdiction.

2.4 Key criteria for effective long-term stewardship

An effective long-term monitoring and maintenance program at closed/post-closure, orphaned/ abandoned mine sites and mineral exploration sites presents a number of challenges. A strategy needs to be in place to address the aspects involved in management of these sites. This would provide an additional tool that could be utilised in the ongoing effort to eliminate future mine abandonments in Canada.

Kingsmere Resource Services Inc. has undertaken a study for NOAMI entitled “Key criteria for the effective long-term stewardship of closed, orphaned/abandoned mine and mineral exploration sites” (2015) to develop criteria to assess these sites in order to evaluate their condition. A list of site attributes was developed, along with a review of national and international best practices of the management of post-closure mine sites. The report notes that effective stakeholder engagement at every stage of the assessment is important and can result in significant benefits.

The initial step toward long-term stewardship is to assess the current state of the site. The report provides a summary of features that could exist at the site, with a focus on identifying the hazards. Before the inspection, research needs to be carried out to collect information on the site, and a site visit safety plan should be developed, containing potential hazards and mitigation controls, logistical details, and safety rules. The site inspection aspects are numerous, and include site access and condition, mine type, facilities and infrastructure, and physical and chemical hazards. To assist in this, a field report was created that can be used to record observations during the site visit.

The next step is an assessment of the level of risks posed by the identified hazards. Various types of risk are considered in the report: public safety risk and ecological and human health risk. Subsequently, a decision can be made as to whether remediation is required, and to what level. Reaching consensus on the level of risk posed by a hazard is a difficult process, and must take into account the concerns of all the stakeholders.

An effective stakeholder engagement plan must be in place to address site risks and possible remediation of that risk. The next step is site remediation; a difficult stage, as a balance must be achieved between the level of risk reduction desired by the stakeholders and the cost to achieve that level. The last step for long-term stewardship involves data keeping of the activities on the site and regular inspections by qualified personnel. To ensure the long-term stewardship of closed, orphaned and abandoned mine sites, an institutional control program is recommended.

2.5 Conclusion

The return of mine lands project has produced several important tools and guidance documents that contribute to the prevention of future abandoned mines. The report “The policy framework in Canada for management of long term liabilities: a guidance document” provides a robust policy framework for mine closure, with recommendations towards prevention of future abandonments. A key recommendation was that projects should be designed for relinquishment – a higher standard. The report “Case studies and decision-making process for the relinquishment of closed mine sites” lays out a five-step process for jurisdictions to follow in moving through the steps to possible relinquishment. Consensus must be reached at each step along the path. It is recognised that relinquishment may not always be possible due to environmental, social, political or financial risks or costs. Regardless of whether a site remains with a company or not, the company must provide necessary funding to carry out any required long-term monitoring and maintenance.

An effective long-term monitoring and maintenance program at orphaned and abandoned mines sites and post-closure/decommissioned mine sites is an important part of achieving the goal of effective long-term stewardship. A list of criteria has been developed to assess these sites, in order to evaluate their condition and provide direction for the planning and delivery of long-term stewardship. This will be an additional tool to be utilised in the ongoing effort to eliminate future mine abandonments in Canada.

Taken together, these projects constitute important tools that will make a major contribution towards the development of a pan-Canadian policy framework that would address all aspects of managing orphaned mine liabilities in the long term, and preventing future abandonments. Recommendations from this work will be reported in full to the federal, provincial and territorial mines ministers during the 2015 Energy and Mines Ministers Conference.

3 NOAMI in 2015

3.1 National inventory

One of NOAMI's most important projects is the development of a national inventory of orphaned and abandoned mines based on compatible inventories from each province and territory. The level of detail and completeness of these inventories varies from jurisdiction to jurisdiction. A national inventory has been designed that would introduce standardisation of information, provide a single-window, web-based access to information, and facilitate the addition of more detailed information in the future. The feature-based inventory has been completed for all jurisdictions across Canada, except for Quebec. The NOAMI Secretariat is working with Quebec provincial staff to determine if the Quebec database can be incorporated into the web portal. A beta test of the site is currently underway in preparation for its launch this year. Due to the immense importance of this work, NOAMI determined the best venue to launch the inventory website would be at the Energy and Mines Ministers Conference 2015, to be held in Halifax, NS in July.

3.2 First Nation pilot study workshop

NOAMI recognises the need for tools to help communities understand the legacy issues associated with orphaned and abandoned mines, and to build their capacity to deal with these sites in an effective, practical and meaningful way. NOAMI sponsored two training workshops organised by the First Nations of Quebec and Labrador Sustainable Development Institute. The workshops will ensure that environmental representatives of First Nation (FN) communities are familiar with the regulations and tools for rehabilitation in Quebec, and identify best practices in the management of abandoned mines. The first workshop was held in Val-d'Or, Quebec, on 17–18 December, 2014; the second is planned for 17–18 March, 2015 in Sept-Îles, Quebec. The first workshop was a success, with twenty participants from different organisations, including seven FN communities. Participation of FN communities in partnership-based approaches for the rehabilitation of abandoned mine sites was discussed, with a presentation on the FondsRestor-Action-Nunavik (FRAN). The FRAN project concept was of much interest; the First Nations participants eventually would like to develop similar projects.

This pilot study will provide an opportunity to evaluate NOAMI findings at the First Nations community level, and in turn, for NOAMI to share the results of these workshops with other communities across Canada.

3.3 Performance report 2009–2014

NOAMI's first Performance Report, covering the years 2002–2008, was a major undertaking and described the activities and infrastructure of the initiative in considerable detail. It was widely distributed in Canada and abroad, in English and French, and effectively promoted NOAMI itself, while showcasing the activities of Canadian jurisdictions in the remediation of orphaned and abandoned mines sites.

NOAMI has made further progress in the last few years and plans to release a second performance report in 2015 that will cover the period 2009–2014. While the format is more focussed than that of the first report, it will once again highlight both NOAMI's major achievements, and the efforts of Canadian jurisdictions to address the potential legacy issues associated with orphaned and abandoned mines across the country. The report will be distributed at the Mines Ministers Conference 2015, as part of NOAMI's continual commitment to update Canadian mines ministers on activities across Canada on the status of orphaned and abandoned mines.

References

- 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. Prepared for the National Orphaned/Abandoned Mines Initiative, viewed 26 February 2015, <http://abandoned-mines.org/publications-e.htm>
- Cowan, W.R., Mackasey, W.O. and Robertson, J.G.A. (2010) The policy framework in Canada for mine closure and management of long-term liabilities: a guidance document. Prepared for the National Orphaned/Abandoned Mines Initiative, viewed 26 February 2015, <http://abandoned-mines.org/publications-e.htm>

- Holmes, R. and Stewart, G. (2011) A guidance document for mine closure and management of long-term liabilities: examining a policy framework in Canada, in Proceedings Sixth International Conference on Mine Closure, 18–21 September 2011, Alberta, Canada, pp. 21–28.
- Kingsmere Resource Services Inc. (2015) Key criteria for the effective long-term stewardship of closed, orphaned/abandoned mine and mineral exploration sites, viewed 27 March 2015, <http://abandoned-mines.org/publications-e.htm>
- NOAMI (2009) National orphaned/abandoned mines initiative 2002–2008 Performance Report, viewed 26 February 2015, <http://abandoned-mines.org/publications-e.htm>
- Tunis, E.S. and Associates. (2011) NOAMI Workshop Proceedings – Exploring the management of long-term liabilities and the return of mining lands to the Crown in Canada. 31 May – 1 June, 2011. Ottawa, ON, viewed 26 February 2015, <http://abandoned-mines.org/workshops-e.htm>