MANAGING MINING LEGACIES FORUM
16-17 JULY 2012

Report

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SEPTEMBER 2012
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**Appendix A**: Forum program  
**Appendix B**: Participant List  
**Appendix C**: Feedback summary
Executive summary

‘Managing Mining Legacies’ was the title of the forum held at the Centre for Mined land Rehabilitation (CMLR), Sustainable Minerals Institute (SMI) at the University of Queensland (UQ) on 16 and 17 July 2012. Abandoned/legacy mine managers, stakeholders and researchers from a range of disciplines came together to address;

Day 1  Leading practices, implementation and a national hub
Day 2  Inventories and spatial databases to support mining legacy risk management and decision making

Forum highlights included presentations by two Canadian key note speakers. They were Gregg Stewart, Manager of the Crown Contaminated Land Program for British Columbia and Gilles Tremblay from the National Orphaned/Abandoned Mine Initiative within Federal Government (NOAMI) based in Ottawa, Ontario.

Other presentations described mining industry, Commonwealth Government and Abandoned Mine Working Group (AMWG) perspectives on abandoned mine management challenges and opportunities within Australia. A presentation on leading practice inventories and databases was also a valuable starting point for discussion of jurisdictional inventories and risk management processes.

The forum included plenary sessions to capture ideas, questions and suggestions for implementation of the Strategic Framework for Managing Abandoned Mines in the Minerals Industry (MCMPR/MCA, 2010 hereafter referred to as the ‘Strategic Framework’), and to address abandoned mine issues in general.

Key themes that emerged from the two days are;

- Abandoned mine management is a critical social and environmental responsibility in Australia
- Full liability accounting is needed to ensure governments understand the scale of abandoned mine/mining legacies across jurisdictions. This forms the basis for development of policies and well-focussed programs, engaging appropriate expertise and preparing progress reports on performance (improvements and expenditure)
- The same high standard should be applied to abandoned mine regulation as is applied to active mines. Mines, health, environment and heritage departments all have responsibilities for abandoned mines and these departments and their expertise need to be actively engaged by a lead agency.
- As resources are limited for abandoned mine management, it is important to identify and apply common or transferrable information management and operational models across jurisdictions
- The Canadian NOAMI model and Provincial Crown Contaminated Sites program in British Columbia, both provide useful models for Australian jurisdictions and stakeholders to consider.
- Each jurisdiction in Australia would benefit from more frequent and focussed forums to share knowledge and resources as they all face similar issues but may be at a different stage of program maturity.
- A national hub would provide opportunities to collaborate on common challenges and to share findings between participants.
Potential partnership opportunities exist which could support the implementation of the Strategic Framework. However, there is currently no political will to progress with development of an Implementation Plan for the Strategic Framework by SCER (Standing Committee on Energy and Resources) under COAG (Coalition of Australian Governments).

- CMLR and other SMI Centres would be well placed to provide valuable knowledge and expertise to mining legacy challenges via a national hub.
- There is potential for industry as well as governments and other stakeholders to gain an understanding of their roles by the formation of a NOAMI-type hub for coordination of ideas and research, and by learning from MAC, Canada, other jurisdictions in Canada and NGOs.
- We need to explore and more widely promote the possibilities for self-funding of rehabilitation.
- We can learn from successful projects: Fitzroy Basin Association indicated that Mount Morgan has champions inside and outside the host organization who provide site based skills, supported by informed lobbying by community groups with well-defined impacts, consequences and solutions.

There was in principle support for a NOAMI-styled national abandoned mine hub based at the University of Queensland, Sustainable Minerals Institute, Centre for Mined land Rehabilitation. At the final stages of the forum an action plan was drawn up to describe the steps required to progress this concept and make available the resources from this forum.

The action plan included the following;

1) Documentation of this forum report;
2) Uploading this report, photos and presentations to the CMLR website to make information accessible to participants and those who were unable to participate; and
3) Preparation of a business case (or ‘value proposition’) for a national hub based at CMLR in a form that participants can use to communicate within their organisations to gain support.

The formation of a multi-stakeholder advisory committee was discussed as well as the value and/or challenges of a national abandoned mine inventory. These aspects will be followed up once the business case is prepared and distributed so that engagement with jurisdictions is facilitated. Further forums could focus on specific chapters of the Strategic Framework (2010). For example, “Valuing abandoned mines: secondary mining and heritage conservation at abandoned mines”.

Monday 16 July, Managing Mining Legacies forum participants
Background

An Abandoned Mine Workshop in Brisbane (Bell, 2003) recommended Australia develop a national strategy for managing abandoned mines. A working group (AMWG) was formed around 2005/6 comprised largely of state government abandoned/derelict mine managers, Minerals Council of Australia (MCA) and the Commonwealth Department of Resources Energy and Tourism (DRET).

Lead by the NSW government’s AMWG representative, Elise Newberry, a draft strategic framework was released for comment early in 2010. Later in 2010 the AMWG finalised the document entitled ‘Strategic Framework for Managing Abandoned Mines in the Minerals Industry’ (MCMPR/MCA, 2010).

Abandoned mines are defined as: “…mines where mining leases or titles no longer exist, and responsibility for rehabilitation cannot be allocated to any individual, company or organisation responsible for the original mining activities” (MCMPR/MCA 2010).

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Such sites, with incomplete rehabilitation, are also called ‘derelict’, ‘orphan’, ‘former’ or ‘legacy’ mines. In Australia, abandoned mines have accumulated for over a century, mainly, but not always, from times when mining environmental standards and community expectations were much lower than at present. There are also legacy sites managed by mining companies. So the language used to describe these sites for this forum as ‘legacies’ aims to be as broad and inclusive as possible.

When sustainable development principles are applied to abandoned mine management then environmental and socio-economic impacts as well as opportunities for beneficial post-mining land uses must be considered. Furthermore, an understanding of the range of circumstances that have led to the occurrence of abandoned mines can provide useful context and knowledge to help inform current mining regulation and policy to reduce the likelihood of them developing in the future. A lack of current inventories on the magnitude and nature of impacts from abandoned mines makes it more difficult to make decisions at a strategic level on a state/territory wide basis. While states and the Northern Territory have responsibilities for abandoned mine liabilities, there are also national issues to consider where abandoned mines impact values of national significance such as biodiversity (Unger et al, 2012).

The Managing Mining Legacies forum emerged from a recognised need to encourage information sharing between jurisdictions and stakeholders, to learn from the Canadian national and provincial legacy mine management models, and to move toward implementation of the Strategic Framework in Australia.
Introduction to the report

This report provides a summary the Managing Mining Legacies forum held at the CMLR, SMI 16-17 July 2012. An outline of the program is included in Appendix A.

This form report is structured as follows:

1) Purpose
2) Planning and engaging stakeholders
3) Sponsorship
4) Day 1 overview
5) Day 2 overview
6) Summary
7) Acknowledgements
8) References
9) Useful links and further reading
10) Photos
11) Appendices

The website includes the presentations and supporting information. The Program is included in Appendix A and presentations (PDF) are available on the CMLR website at: http://www.cmlr.uq.edu.au/ManagingMiningLegacies.aspx
1 Purpose

The purpose of this forum was to:

1) learn from keynote speakers – on leading practice orphaned/abandoned mine/contaminated land programs in Canada at both national and state (provincial) level

2) engage key government, industry and research stakeholder representatives in shaping an Implementation Plan for management of abandoned mines across Australia, building on and incorporating initiatives to date, including the Strategic Framework (MCMPR/MCA, 2010)

3) gain support from stakeholders, for an Australian national Secretariat for abandoned mines within SMI at CMLR, (based on the NOAMI model)

4) share knowledge and experience while building relationships between stakeholders and jurisdictions,

5) identify steps which need to be taken to develop momentum for implementation of the Strategic Framework (MCMPR/MCA, 2010), and

6) share knowledge about abandoned/orphaned mine spatial databases for decision making.

2 Planning and engaging stakeholders

Planning for this forum commenced early in 2012.

The Life of Mine 2012 Conference hosted by AusIMM (Minerals Institute) and CMLR (Centre for Mined Land Rehabilitation) was scheduled for 10-12 July 2012 so the initial intention was to link these events by holding this forum on Monday or Friday of the same week. When it was decided that two days would be required we settled on Monday 16 and Tuesday 17 July.

Three teleconferences were held over several weeks to engage key stakeholders in planning. Participation through these teleconferences included abandoned mine managers from all states and the Northern Territory, the Commonwealth Department of Resources Energy and Tourism and the Minerals Council of Australia (MCA). These stakeholders were engaged because of their participation in the development of the Strategic Framework (MCMPR/MCA, 2010) as well as their ongoing role in abandoned mine management.

A wider stakeholder list was used to send out invitations to about 70 people in government, one Non-Government Organisation (Fitzroy Basin Association), researchers and the Australasian Institute of Mining and Metallurgy, ‘The Minerals Institute’ (AusIMM) Sustainability Committee. This Committee is leading a process of policy development on abandoned mine management. Engagement with the Sustainability Committee was maintained throughout the process of forum planning and continues to be maintained so that the outcomes are shared with AusIMM members.

A number of researchers from within the Sustainable Minerals Institute were also interested in participating. Appendix B lists all who attended all or part of the two day forum.
3 Sponsorship

In addition to CMLR’s sponsorship of the forum, the Minerals Council of Australia, the Department of Resources Northern Territory government, and AusIMM/CMLR Life-of-Mine 2012 Conference also contributed. The forum organisers offer thanks for this sponsorship which enabled the forum to be accessible to participants at $330 per person for 2 days.

4 Day 1 - Overview

“LEADING PRACTICES, IMPLEMENTATION AND A NATIONAL HUB”

a) Presentations

The first keynote speaker was Gregg Stewart, Manager of the Crown Contaminated Sites program in British Columbia. Gregg outlined how this program is planned and implemented as well as explaining his role as Chair on the NOAMI (National Orphaned/Abandoned Mine Initiative) multi-stakeholder advisory committee.

This was followed by questions and discussion (Section 4c) Chris McCombe presented an overview of the Minerals Council of Australia (MCA) perspective on derelict mines. Oskar Kadletz, from the Queensland government Abandoned Mine Land Program, provided an overview of the role of the Abandoned Mine Working group who prepared the Strategic Framework (MCMPR/MCA, 2010) for the Standing Committee of Officials (SCO) under the Ministerial Council for Mineral and Petroleum Resources (MCMPR). This was followed by a presentation by Virginia Leitch from the Department of Resources Energy and Tourism. She provided a Commonwealth Government perspective on abandoned mines with a focus on funding opportunities through existing grants.

Gilles Tremblay, Manager, Mine Closure and Ecosystem Risk Management (and coordinator of NOAMI) gave the second keynote presentation. He explained the role of NOAMI in providing a national network for stakeholders involved in orphaned/abandoned mines in Canada, bringing together the different jurisdictions and perspectives to address the challenges they have in common.

This was followed by questions and discussion (Section 4c) which progressed into the start of an action plan which was completed on Day 2 (Section 5c).

The Program is included in Appendix A and presentations (PDF) are available on the CMLR website at: http://www.cmlr.uq.edu.au/ManagingMiningLegacies.aspx

b) Discussion of definitions of ‘abandoned’

Terminology regarding abandoned mines and status vary from jurisdiction to jurisdiction. Derelict,
orphaned, abandoned and former mines are all terms used. It was highlighted that the Northern Territory for example, does not have any “abandoned” mines but it does have existing mining legacies on land under current mining tenures. Some of these legacies may be addressed by the current mine operator, however, some may not and these pose a risk to the government where insufficient financial assurance exists to cover closure liabilities. For the purposes of this forum participants agreed to use the widest definition of mining legacy. Irrespective of the definition of the legacy these sites potentially cause negative impacts on environments and communities, with liabilities (costs to manage or rehabilitate) defaulting to governments. While the Crown Contaminated Land Program in British Columbia, Canada includes other types of contaminated sites, abandoned mines comprise the majority of the work (more than 80%).

c) Summary of Plenary Discussion

The following is a summary of the plenary discussion aimed at addressing a series of questions.

**Question 1: What is required to implement a leading practice rehabilitation strategy for abandoned mines?**

**Data collection is critical**

The forum identified that the collection of data on the risks and opportunities of abandoned mines is critical for decision making. These data may be useful for leveraging further funding for addressing abandoned mine issues. Successful data collection requires a well directed strategy with clear ownership of both the data, the strategy and program by one lead agency, a program manager and a team whose members have clearly defined roles.

**There are many factors influencing progress**

When well coordinated, lobbying by independent bodies, such as NGOs, can influence progress on abandoned mine policies and programs. A primary agency is necessary to ensure true liability is identified and quantified and programs are developed and resourced. Canada provides a number of good models at a provincial level. There, NGO lobbying prompted Auditor-General audit reports which were a trigger which focused political accountability on abandoned mines. Significant progress has been made since then. Initial audits have been followed up with progress review audits. Other provinces have also had Auditor-General audits undertaken. When full liability was appropriately quantified under accrual accounting provisions the significant magnitude of that liability was acknowledged (i.e. C$ billions), recognition was given to the need to establish policies, programs and performance measures and action was taken swiftly. Similar audits in Australia are likely to assist prioritisation of abandoned mine policy and programs, particularly in jurisdictions where no policy or program exists.

Of relevance to abandoned mine management and national commitment to action in Australia is the Waste Management Policy supported by all State Ministers as a priority for implementation with delegated lead agencies in each state.

There is little understanding of the impacts of toxic metals in the Australian environment and how these may become political issues that influence decision making. Other pressures may follow e.g.  

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mercury and arsenic contamination in the Murray-Darling Basin may raise the profile along with the recent United Nations protocol\(^4\) being adopted.

**There are varying approaches across Australia: Policy, Priority, Liability**

Each jurisdiction in Australia has a different approach. Some have programs without policies and some have no programs but have specific sites they manage. It is very difficult to achieve coordinated action when there is a total lack of the necessary national leadership. Currently there is no national responsibility so there is no impetus to act at that level. Liability is accepted by state/NT governments as they have a duty of care to protect the interests of communities, human health, economic aspects and the environment. How much should be spent to meet that Duty of Care?

> “In British Columbia Canada, the calculated liability for a site is ‘booked’ (in line with accrual accounting principles). Then the liabilities can be effectively prioritised and sites rehabilitated. The focus should be on ‘liability’ rather than ‘cost’ as a preferred term.” (G Stewart)

There may be many opportunities for self-funded rehabilitation activities which involve new and existing technologies and commercial opportunities. How will these be explored and communicated?

**Dual standards are unacceptable (but do exist)**

In Australia, abandoned mines have little or no perceived political risk. Governments did not create the problem but they are left with the liabilities. It is likely that it will take a significant event or an incident resulting in human loss before political action at a high level will be deemed necessary.

> *In Australia, unlike Canada, abandoned mines are not subjected to the same environmental standards for cleanup as operating mines.*

States have set standards to match their short-term budgetary constraints, rather than complete rehabilitation and sustainable closure and post-closure solutions. Quick fixes in an emergency are an expensive option in the long term. This lack of long term planning, makes it difficult for staff under direction to deal with inadequacies of budget and a lack of political will.

> *There is a need for regulatory standards to be consistently met across Australia.*

Double standards need to be avoided. Each site should be evaluated to determine whether it can be mostly or completely rehabilitated and determine what will provide the best result for the money available.

> “Don’t waste rehabilitation dollars doing a sub-standard job if you do not have the money to do it properly. This temporarily ‘papers’ over the problems which may subsequently become even more expensive to fix.”

There is a need to impose active mining standards to abandoned mine management and rehabilitation. Regulatory tools should be common across jurisdictions. Existing legislation can be

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\(^4\) [http://www.iisd.ca/mercury/inc4/](http://www.iisd.ca/mercury/inc4/)
extended to apply to abandoned mines; e.g., Environmentally Relevant Activities (ERAs) can be applied and addressed. Society will expect stronger controls in the future on industry and on Government. The minimum standard should be based on addressing public risk through safety, health and environmental impacts.

“Governments must maintain high standards (of management of abandoned mines) otherwise they undermine their credibility as Regulators.”

Collaboration & Opportunities for Self-funding

“There is a need to consult with all relevant stakeholders to find the right pathway for each site and use the available resources most efficiently.”

Collaborative agreements have merit. There is funding available from related sources (e.g. Caring for Country) and we need to think creatively to identify and access these sources. Seek a safe, stable, non-polluting, sustainable final land use every time. There are many paths to this goal so priorities need to be set so that the worst problems are addressed first. This may require staged rehabilitation of particular issues on a site. Look for self-funding opportunities via consultants, contractors and entrepreneurs. Industry acknowledges the problem and intends to have no abandoned (unrehabilitated) mine sites in the future however the mining industry does not want to accept responsibility for creating or maintaining existing abandoned sites.

Question 2: What are the needs of the Abandoned Mine Working Group (AMWG)?

The role of the AMWG, currently chaired by Oskar Kadletz, was discussed in the context of a future multi-stakeholder advisory committee based on the NOAMI model. The AMWG are keen to develop a technical manual and leading practice manual (some examples are broader and applicable to active mines too). These outputs will be discussed at the next AMWG meeting when they will discuss the set of tools needed, as well as definitions now that the Northern Territory are involved. The next meeting was scheduled for late August.

Gregg Stewart indicated that it would be best to move ahead to engage other stakeholders rather than just have governments talking to each other.

There is a need to identify the chapters of the technical manual, the breadth of scope to be covered, the sets of tools needed and the definition of abandoned mines now that the Northern Territory government is involved. Communities are exposed to the impacts of abandoned mines so there is a need to be thinking broadly about what should be included in any manuals to be written. How will the AMWG access resources including good practice guides which already exist?

The role of the AMWG was discussed in the context of a future multi-stakeholder advisory committee (based on to the NOAMI model).

Gregg Stewart indicated that it would be best to move ahead to engage other stakeholders rather than just have governments talking to each other.

It was agreed that it was not fruitful to become bogged down in definitions. Greatest value will come from considering “abandoned mines” in the broadest sense. This is how the WA government have approached their draft Abandoned Mines policy. The principles for rehabilitation and water management of current mine sites are the same for abandoned mine rehabilitation, only site history and access to operating equipment and resources are different. Thus, current regulatory
guidelines should be applicable to abandoned mines. University research expertise and resources can contribute to addressing challenges faced by abandoned mine managers.

Is there potential for a database to identify potential secondary mining sites? Not all sites will be suitable for further mining but some are. How can this information be made accessible to the mining industry market? Note the value of the WA database for exploration companies.

**Question 3: How does NOAMI support Canadian jurisdictions and stakeholders? Can this information be used as part of the business case for a national hub in Australia?**

Cooperation of relevant stakeholders to achieve positive outcomes on abandoned mines

Cooperation enables additional resources to be applied to problem solving and improves learning from past mistakes. Once tools and frameworks are developed there is greater efficiency of effort. Every site and jurisdiction is different, however, there are many aspects in common that can reduce duplication (e.g. reviewing and designing risk tools). Valuable rehabilitation dollars can be saved by collaborating. There is a need to identify the common elements in datasets in order to facilitate information exchange and to develop case studies to outline how the multiple values at minesites can best be realised. A knowledge base on world’s best practice can help to benchmark Australian abandoned mine programs.

Business case positives

There is an opportunity to develop a common communication strategy across state and federal governments. Similarly high-level frameworks for a range of critical issues in common can improve efficiency. MCA could liaise with the Mining Association of Canada (MAC) to find out more about NOAMI and their role in supporting that national initiative.

There is a need to focus on prevention of legacy problems now. Quantifying wastes produced and continuing to be produced is part of the Business Case. ‘Social licence’ requires walking the talk with actual outcomes. The NOAMI model provides an example of an empowered multi-stakeholder group. The mining industry is keen for collaboration, efficiency and avoidance of duplication. Reference materials produced by an Australian-NOAMI could be used by individual state/territory governments; however, they would not be bound by output of such an initiative.

Developing a ‘value proposition or business case’ to explain the reasons why an ‘Australian-NOAMI’ is needed and how it would benefit jurisdictions would assist participants in communicating the benefits of this entity up through their governments, industry body and NGO. Draft terms of reference would be needed and this would link the Australian-NOAMI to the Strategic Framework document (MCMPR/MCA, 2010) (Section 5c).

**Barriers/threats**

Initial concerns were centred on the costs and benefits for stakeholders. There must be political advantage and risk reduction for support to be given to a national hub. Discussion identified the need to develop the business case first and develop details of the funding model later, as there is a range of funding sources which have not yet been pursued and cannot be until there is some overall support for a national hub.
If there is a lack of political will, then the Commonwealth government, states/NT may not wish to support an Australian-NOAMI. Ideally, there needs to be consensus across jurisdictions plus support from industry with key industry players engaged (including state/NT mining peak bodies). Travel obligations from state government representatives need to be minimised, but communication and engagement maintained. It is recognised that there is limited capacity within government on the part of junior staff and geologists who are focussed on exploration.

In Canada NOAMI does not require every province to participate, as some provinces do not have a large or active mining sector.

For successful outcomes the energy and momentum from this forum need to be harnessed and connections made with key stakeholders and “champions”. Eventually all stakeholders (representatives of key stakeholder groups) need to be identified and invited to participate.

**Question 4: How can we apply the NOAMI model to Australia?**

Regular forums to share knowledge using web-based communication and teleconferencing with some face-to-face meetings would engage a multi-stakeholder advisory group to address specific challenges and prioritise effort. An Australian-NOAMI 'secretariat' would enable the planning for these interactions to be undertaken so that valuable and limited resources (time) of abandoned mine managers and other stakeholders are used as effectively as possible.

Data on liabilities as well as progress in the reduction of liabilities could be provided via a web-based portal. Identifying stakeholders for engagement could also be included here and regularly updated. Later a reliable spatial data management system could be developed, with the first steps towards this being common classification of sites, standardising definitions and sharing methodologies and knowledge. These high-quality datasets are needed for good decision making.

There is a need to articulate both barriers and opportunities for reducing liabilities. This includes addressing legal obstacles which prevent improved management such as legislative impediments to existing mining operations removing wastes from nearby abandoned mines to be reprocessed on an their active mining lease. Thus by identifying such opportunities the value of a national abandoned mine hub may be elevated and support gained through the Standing Committee for Energy and Resources (SCER) under the Council for Australian governments (COAG).

A national hub can coordinate the production or distribution of tools, frameworks, collaborative research and recommendations. This entity can also influence funding and resourcing in a broad sense by credibly raising issues to support full disclosure by governments of existing rehabilitation liability. An important starting point is the collation of information from across Australia and globally. From CMLR experience, developing countries and other stakeholders globally are also interested in learning about Australian progress on abandoned/legacy mines.

**Chapter 8** includes a list of useful links and references for further reading as a starting point.

Who will provide leadership for a national abandoned mine hub? CMLR can provide this role. A national hub would provide a safe place for dialogue, for raising problems for which implications are not fully known and for enabling closed, in-house discussion.

The national hub could also inform policies and strategies to ensure there are no further legacy sites created. A national hub can explore opportunities for ‘low cost and large pay-off’ outcomes via engagement with volunteers and research higher degree students. A national approach to
implementation of the strategic framework, by being strategic and holistic can address key obstacles to progress by supporting jurisdictions collectively. Legislative and funding obstacles are common. All jurisdictions need risk tools and access to the right expertise. The need to balance further mineral exploitation whilst minimising environmental and social impacts is a challenge all jurisdictions face. Industry engagement and leadership is vital.

There is an unequal value placed on abandoned and operating mines which makes critical both reliable risk/opportunity-based data and funding in specific timeframes to prioritise highly impacting and high-value abandoned sites. Understanding and quantifying cumulative impacts strategic planning.

In summary the plenary involved discussion of the following;

- data collection is critical
- there are a range of factors influencing progress
- there are varying approaches across Australia: policy, priority, liability
- dual standards are unacceptable (but are happening)
- collaboration and opportunities for self-funding
- cooperation of relevant stakeholders to achieve positive outcomes on abandoned mines
- business case positives
- barriers/threats
5 Day 2 Overview

“INVENTORIES AND SPATIAL DATABASES TO SUPPORT MINING LEGACY RISK MANAGEMENT AND DECISION MAKING”

The focus of Day 2 was to learn more about how inventories of abandoned mines are compiled and then used to prioritise effort. The role of inventories and spatial databases for strategic planning engaged the keynote speaker Gregg Stewart as well as jurisdictional representatives.

a) Presentations

Presentations were given by Corinne Unger, Glen Corder, Gregg Stewart and Alex Lechner. All four presentations are included on the website.


Corinne Unger (Senior Research Officer, CMLR) introduced the conceptual flow chart for abandoned mine programs which formed the basis for development of a jurisdictional maturity chart where 12 elements are proposed and aligned with the Strategic Framework chapters (Unger et al, 20125). This chart is a risk-based ‘journey model’ and is proposed as a tool to assist with implementation of the Strategic Framework.

![Increasing program maturity](image)

12 elements  5 chapters

The example explored was Element 1, Spatial databases/inventories, to provide context for this day’s theme.

Glen Corder (Development Manager, SUSOP Pty Ltd) introduced the five capitals model as a method for evaluating sustainability options during rehabilitation and closure planning of abandoned mines. Discussion and action planning proceeded after this to capture and consolidate ideas from Day 1 (see Section 5b).

Gregg Stewart presented a keynote presentation on how the Crown Contaminated Land Program (CCLP) developed its inventory, how it is reviewed and updated annually. Gregg also explained the expert review process which takes place annually where the list of sites within the CCLP (supported by a knowledge base) are ranked to create a priority list for works on key contaminated sites. Following completion of the work program performance reports are prepared\(^6\).

Alex Lechner (Postdoctoral Research Fellow, CMLR) discussed the importance of data accuracy and limitations, as well as international and national standards that can be used to develop good quality spatial datasets.

b) Summary of Plenary Discussion

**Question 5:** What were the keys to success of the Crown Contaminated Land Program (CCLP) in British Columbia?

Ingredients contributing to the success of the CCLP are its inventory, active site assessment processes, two-stage evaluation (high level then detailed if needed), and expert review process, an initial risk ranking methodology is applied. These results are given to a selected group of consultants who come together for two days to rank site priorities. Consultants prepare a site characterisation guideline which is used to support information gathering and site prioritisation. Also important is the fact that this program has to meet the same regulatory standards as private enterprise/industry. The standard is applied irrespective of who is undertaking the work.

**Question 6:** how are inventories undertaken and recorded in Australia?

**Western Australia**

Western Australia has abandoned mine datasets available to public: ‘MI\(\text{NEDEX}\)’, a site level database and ‘WABMINES’ a feature level database. The WABMINES database was developed in response to public safety issues and focuses on a subset of all abandoned mines in Western Australia. Sites were prioritised on basis of proximity and accessibility to the public and mine features (e.g. mine pit, shaft) were recorded.

**Northern Territory**

The NT is currently developing a database of legacy mines. Most legacy sites are sitting on current tenures, and hence are not ‘abandoned’. Many sites in the Northern Territory from the 1800’s (older) have more human safety risks and less environmental legacy. However, more recent sites, since the 1980’s have potentially significant environmental legacies.

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New South Wales

The current database was developed by geological survey and is currently being updated. They are reassessing which attributes to record as part of a new process. The current database is not publicly available, but available on request. In parallel with the redevelopment of the database a tool for managing and prioritising sites is being developed.

South Australia

The South Australian geological database SARIG is the basis for abandoned mine planning. There was no representative from SA who could explain in detail the application of the SA abandoned mine database.

Queensland

Abandoned mines can be found within a publicly available map layer online. The database includes abandoned mine name, size, and commodity. Abandoned mines were highlighted during the Queensland Flood Commission inquiry, and several recommendations were made which will be addressed in the (re)development of a database specifically for abandoned mines focusing on estimating risk. The new database will include ‘features’ based information, and aims to be transparent, and compatible with other departmental databases. Queensland is considering using a web form with a field data collection tool.

In the absence of government representatives from Victoria or Tasmania, these jurisdictions were not discussed apart from the availability of the Tasmanian abandoned mine inventory online.

**Question 7: What are the key elements of a good abandoned mine database?**

The first step in developing an abandoned mine database is to clarify the objectives of the database, specifically by identifying the important attributes to be included, their accuracy and how the database will be used. It is important to determine what the fundamental unit of the database will be and thus the unique ID (e.g. polygon of mine lease, mine pit or centroid).

The WA experience suggests that developing a risk assessment method first is important to ensure data on the correct attributes are collected.

The terminology used for classifying the attributes and the data quality need to be defined clearly within the metadata. International and quality assurance and control standards should be followed (e.g. ISO standards). Metadata is required (for both GIS professionals and public) in order to assess fitness for use.

Abandoned mine data can be integrated with other GIS layers such as land, mines, roads, rivers and remote sensing data to derive additional information relevant to addressing abandoned mine issues. However, when sharing and utilising abandoned mine and other spatial datasets provided by other organisations, copyright issues need to be addressed.

**Question 8: What progress has been made within Australia on abandoned mine risk frameworks?**
New South Wales

NSW are reviewing and upgrading their risk review process and are reviewing definitions for a two-stage risk assessment.

South Australia – N/A

Western Australia

WA is currently undertaking a literature review across Australia and globally and are interested in applying a model similar to British Columbia (Canada). They plan to undertake a detailed risk assessment to narrow down the number of high-priority sites. The WA focus is on safety, less on environment. They will consider making the risk methodology available when completed and have adopted the broadest, most generic definition of abandoned mine.

Queensland

QLD Natural Resources and Mines are developing a fine-grained features-based system, combining geographic assessment and free-form risk assessment based on professional assessment using internal government personnel. Risk assessment takes account of broader as well as site-specific issues. There are expert panels for individual sites and they meet when needed, about once every 2-5 years depending upon the project and progress. The department provides broad information to experts, obtains their views, then the experts develop risk management tables to assess options based on the degree to which an option addresses a risk. Evaluation aims to achieve the best management program for sites.

Discussions are also held to plan site monitoring and data management. Desktop studies are done internally and then provided to environmental agencies. Where there are concerns about the standard of rehabilitation community representatives are included in planning. QLD have quarterly meetings with regional bodies.

Northern Territory

Collection of data is the priority for the NT as they have no database yet. The definitions of ‘abandoned mines’ do not fit the NT model where they have mining legacies on active tenure. Defining liability is difficult under current tenure because of the uncertainty of future projects and rehabilitation works. Unlike other states the NT may have many more, recent mining legacies (from the last 20-30 years). Older closed mines may create issues in the near future, however currently all mining legacy sites are included within current mining tenure.

Tasmania

There was interest in learning how abandoned mine rehabilitation prioritisation is undertaken in Tasmania, and in particular, the role of the multi-stakeholder abandoned mine trust fund committee.

**Question 9:** Alex Lechner posed the question 'Is there some value in a national database for abandoned mines?'
There is potential for a national inventory that links to state databases using a consistent classification methods drawing on the NOAMI national inventory model. This portal would be valuable for the general public and others such as researchers seeking this information. A national inventory could be used to evaluate impacts and opportunities on a national scale for values such as environmental, heritage or mineral resources. While the forum participants suggested that it was of potential value, it was more likely to be a later priority.

**Question 10: If there was to be a multi-stakeholder advisory group on abandoned/legacy mines in Australia who would be on it?**

This would need to be a staged process. Stage 1 would involve forming a group similar to this forum composition to develop terms of reference for the multi-stakeholder advisory group and Stage 2 to implement.

**Who would be involved in Stage 1?**
- NT, WA, SA, VIC, TAS, NSW, QLD abandoned/legacy mine program directors/managers,
- Academic/research centre such as CMLR (SMI),
- Regional catchment group representative (Natural Resource Management groups (NRMs) such as Fitzroy Basin Association),
- Minerals Council of Australia (MCA),
- AusIMM (Minerals Institute) – Sustainability Committee,
- Industry representatives/ mining company leaders/champions,
- Commonwealth government departments (RET ‘resources’ and SEWPaC ‘environment and heritage’).

**Which additional stakeholders could be engaged in Stage 2?**
- Indigenous representative (through a national group).
- Other research Centres (e.g. CSRM, CWiMi, MISHC, JKMRC\(^7\) depending upon priorities)
- NGOs (national environmental network representative).
- Heritage – eg. AICOMOS\(^8\) and AusIMM Heritage Committee representative potentially.

**c) Action plan**

The action plan included the following next steps for forum participants to be involved in:

1. Documentation of this forum report;
2. Uploading this report, photos and presentations to the CMLR website to make information accessible to participants and those who were unable to participate; and
3. Preparation of a business case (or ‘value proposition’) for a national hub based at CMLR in a form that participants can use to communicate within their organisations to gain support.

At a later stage, the group could consider the formation of a multi-stakeholder advisory group to develop an action plan for collective priorities. The group could also discuss the value of a national

\(^7\) Centre for Social Responsibility in Mining, Centre for Water in Mining, Minerals Industry Safety and Health Centre, Julius Kruttschnitt Mineral Research Centre – SMI, UQ

\(^8\) Australian branch of the International Council for Monuments and Sites
abandoned mine inventory. Further forums, organised by CMLR, could focus on specific chapters of the Strategic Framework (MCMPR/MCA, 2010), for example, “Valuing abandoned mines: secondary mining and heritage conservation at abandoned mines”.

Some discussion of the content of the business case or ‘value proposition’ for a national abandoned mine hub indicated that the following should be included;

A. Provide context by summarising the present state of affairs
   a. Explain the risks
   b. Identify the problems
   c. Outline the opportunities
   d. Provide logical and credible evidence that this national hub would be well-supported

B. List the alternatives – costs and benefits

C. Outline a high-level explanation of roles of, and benefits to, each stakeholder group;
   Consider the potential role of federal government – which federal and state government departments would be engaged? Are there federal senate committee roles? Is there an opportunity for a partnership agreement between the Commonwealth government and the national hub? What are the state government roles? How can industry bodies and representatives support the entity and be engaged in the process? What are the roles of community organisations? Are ‘Caring for Country’ grants applicable? Are any other funding opportunities available?

**d) Review and Feedback**

At the conclusion of the forum the objectives were revisited to evaluate whether the key indicators of success had been achieved. Five of the six desired outcomes (listed below) were endorsed by the group. It was agreed that Outcome (3) could not be achieved by this group as it requires others (higher up in organisations) to be involved in decision making. Nevertheless a partial tick was given as forum participants developed a process which would enable this to be communicated and progressed through their organisations.

From this forum there was;

1) **Recognition and acceptance of new knowledge from Canadian success stories – keys to success, pitfalls and lessons which have been learned so that we can build success in legacy mine management in Australia**

2) **Acceptance of the need for engagement of stakeholders, primarily from government (ideally from every jurisdiction), industry (Minerals Council of Australia and AusIMM Sustainability committee) and SMI researchers**

3) **Expression of in-principle support from stakeholders for a national legacy mine hub at SMI**

4) **Agreement on the sharing of knowledge and experience, the fostering of stronger working relationships between stakeholders and jurisdictions from meeting face to face, and the expansion of our network;**

5) **Commitment to an action plan that outlines key ingredients for success of the Group and tasks needed to move forward with both a national abandoned mine hub and the Implementation Plan; and**
6) Commitment to a basis for planning or upgrading existing spatial databases on abandoned/legacy mines for the evaluation of impacts and opportunities for rehabilitation to support decision making and prioritisation by governments.

Thirty-one participants registered for Day 1 and 22 on Day 2. Additional researchers joined in from SMI for short periods during the two days. See Participant list in Appendix B. Twelve participants responded to a forum feedback questionnaire at the end of Day 2. A summary of questionnaire responses is included in Appendix C.
6 Summary

Over two days participants explored mining legacy leading practices, implementation and a potential national hub, as well as inventories and spatial databases to support mining legacy risk management and decision making.

Forum highlights included presentations by two Canadian keynote speakers. They were Gregg Stewart, Manager of the Crown Contaminated Land Program for British Columbia and Gilles Tremblay from the National Orphaned/Abandoned Mine Initiative within Federal Government (NOAMI) based in Ottawa, Ontario.

Other presentations described mining industry, Commonwealth Government and Abandoned Mine Working Group (AMWG) perspectives on abandoned mine management challenges and opportunities within Australia. A presentation on leading practice inventories and databases was also a valuable starting point for discussion of jurisdictional inventories and risk management processes.

The forum included plenary sessions to capture ideas, questions and suggestions for implementation of the Strategic Framework for Managing Abandoned Mines in the Minerals Industry (MCMPR/MCA, 2010 hereafter referred to as the ‘Strategic Framework’), and to address abandoned mine issues in general.

Key themes that emerged from the two days are:

- Abandoned mine management is a critical social and environmental responsibility in Australia
- Full liability accounting is needed to ensure governments understand the scale of abandoned mine/mining legacies across jurisdictions. This forms the basis for development of policies and well-focussed programs, engaging appropriate expertise and preparing progress reports on performance (improvements and expenditure)
- The same high standard should be applied to abandoned mine regulation as is applied to active mines. Mines, health, environment and heritage departments all have responsibilities for abandoned mines and these departments and their expertise need to be actively engaged by a lead agency.
- As resources are limited for abandoned mine management, it is important to identify and apply common or transferrable information management and operational models across jurisdictions
- The Canadian NOAMI model and Provincial Crown Contaminated Sites program in British Columbia, both provide useful models for Australian jurisdictions and stakeholders to consider.
- Each jurisdiction in Australia would benefit from more frequent and focussed forums to share knowledge and resources as they all face similar issues but may be at a different stage of program maturity.
- A national hub would provide opportunities to collaborate on common challenges and to share findings between participants.
- Potential partnership opportunities exist which could support the implementation of the Strategic Framework. However, there is currently no political will to progress with development of an Implementation Plan for the Strategic Framework by SCER (Standing Committee on Energy and Resources) under COAG (Coalition of Australian Governments).
- CMLR and other SMI Centres would be well placed to provide valuable knowledge and expertise to mining legacy challenges via a national hub.
There is potential for industry as well as governments and other stakeholders to gain an understanding of their roles by the formation of a NOAMI-type hub for coordination of ideas and research, and by learning from MAC, Canada, other jurisdictions in Canada and NGOs.

We need to explore and more widely promote the possibilities for self-funding of rehabilitation.

We can learn from successful projects: Fitzroy Basin Association indicated that Mount Morgan has champions inside and outside the host organization who provide site based skills, supported by informed lobbying by community groups with well-defined impacts, consequences and solutions.

There was in principle support for a NOAMI-styled national abandoned mine hub based at the University of Queensland, Sustainable Minerals Institute, Centre for Mined Land Rehabilitation. At the final stages of the forum an action plan was drawn up to describe the steps required to progress this concept and make available the resources from this forum.

The action plan included the following;

4) Documentation of this forum report;

5) Uploading this report, photos and presentations to the CMLR website to make information accessible to participants and those who were unable to participate; and

6) Preparation of a business case (or ‘value proposition’) for a national hub based at CMLR in a form that participants can use to communicate within their organisations to gain support.

Looking forward

The formation of a multi-stakeholder advisory committee was discussed during this forum as well as the value and challenges of a national abandoned mine inventory. These aspects will be followed up once the value proposition/business case is prepared and distributed so that engagement with, and within, jurisdictions can continue. Future forums could be facilitated by CMLR with a focus on specific chapters of the Strategic Framework (2010). For example, “Valuing abandoned mines: secondary mining and heritage conservation at abandoned mines”.

In 2002, Australian abandoned mine managers and stakeholders learned about the Canadian NOAMI model (Bell, 2003) and there was significant interest at a state level for this to happen. Ten years later there is a Strategic Framework and an opportunity to transform this into action.

The Strategic Framework must be implemented. Connections need to be made with other key stakeholders and “champions” so that prevention of new mining legacies as well as effective management of existing mining legacies takes place, and is sustained in Australia.

All participants in the Managing Mining Legacies forum and abandoned/legacy mine stakeholders who take responsibility for following through on actions have the potential to contribute to a significant step change in Australian abandoned mine management. This will ultimately bring Australia up to a standard equivalent to other developed countries globally.

The opportunity exists now for leadership through a national abandoned mine hub at the CMLR directed by a multi-stakeholder advisory group.
7 Acknowledgements

In addition to the forum sponsors, keynote speakers from Canada, facilitator, Saleena Ham and other presenters already noted in the report, the author would like to acknowledge the following people who helped ensure the success of the forum. They include: David Mulligan, Anand Datar, Mirka Streckhardt, Alex Lechner, Vanessa Glen, Glen Corder, David Doley, Mansour Edraki, Michelle Porter, Tracey Gregg, Gail Kenny, Laurelle Elliot and Jennifer Ebbott.

Thank you!
8 References

Bell L C (2003) Proceedings of the Workshop on management and remediation of abandoned mines, 14 November 2003, Brisbane QLD, Australian Centre for Mine Environmental Research, in association with the MCA, Brisbane

CMLR website http://www.cmlr.uq.edu.au/


9 Related links and further reading

**Canadian Federal Government**
*Chapter 3 - Federal Contaminated Sites and their Impacts* from the the 2012 Spring Report of the Commissioner of the Environment and Sustainable Development. The Full Report is available on their website http://www.oag-bvg.gc.ca/internet/English/parl_cesd_200210_03_e_12409.html#ch3hd3a

**Aboriginal and Northern Development (AAND) Performance report, Canada**
AAND manages the implementation of abandoned mine rehabilitation programs on Federal lands (north of 60 degrees latitude) http://www.aadnc-aandc.gc.ca/eng/1333039716589/1333039805643
management policies and programs http://www.aadnc-aandc.gc.ca/eng/1100100011881/1100100011892

**National Orphaned and Abandoned Mine Initiative (NOAMI) and Mine Environment Neutral Drainage (MEND) programs – Ottawa, Ontario**
http://www.abandoned-mines.org/home-e.htm
NOAMI Publications


**NOAMI 2002-2008 Performance Report, NOAMI 2009**


**Rehabilitating Abandoned Mines in Canada: A Toolkit of Funding Options**

Cowan Minerals Ltd., 2006

**Capacity Building for a National Inventory of Orphaned/Abandoned Mines in Canada**

Cal Data 2005

**Best Practices in Community Involvement: Planning for and Rehabilitating Abandoned and Orphaned Mines in Canada**

NOAMI brochure, 2003

**Guidelines for Legislative Review**

NOAMI 2004

**Lessons Learned on Community Involvement in the Remediation of Orphaned and Abandoned Mines - Case Studies and Analysis**

2003

**Potential Funding Approaches for Orphaned/Abandoned Mines in Canada**

Castrilli and C.N. Watson and Associates, 2003

**Barriers to Collaboration: Orphaned/Abandoned Mines in Canada**

Castrilli, 2002

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**Provincial programs - British Columbia**

British Columbia, Crown Contaminated Sites program

http://www.agf.gov.bc.ca/clad/ccs/

Biennial Report 2012 and other related performance reports, Auditor-General audit reports and recommended principles on Contaminated sites liability.


Auditor General 2004 (PDF)

Auditor General 2002 (PDF)

2012 CLORB Biennial Report (PDF 7.04MB)

2010 CLRB Biennial Report (PDF 3.70MB)

2008 CLRB Biennial Report (PDF 5.88MB)

2006 CLRB Biennial Report (PDF 5.055MB)

CCME Report (PDF 109KB)

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**Crown Contaminated Sites policy**

Introduction

http://www.agf.gov.bc.ca/clad/ccs/policy.html

Policy


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**Britannia abandoned mine clean up, BC**

Public private partnership agreement – case study Britannia water treatment plant

http://www.partnershipsbc.ca/files/project-britannia.html

Fish return to Britannia Creek

http://www.youtube.com/watch?v=TDeeqM7-5cl&feature=em-share_video_user
Manitoba, Canada
Office of the Auditor General
Review of the Province of Manitoba’s management of contaminated sites, 2005
http://www.oag.mb.ca/reports/ENVAUDITS_NOV05.pdf

Ontario, Canada
Office of the auditor General
Review of mines and minerals programs p 197-199 addresses abandoned mines

Saskatchewan, Canada
Post Closure management of decommissioned mine/mill sites on Crown Land
http://www.er.gov.sk.ca/Institutional_Control-Decommissioned_Mines/Mills

Laval University, Quebec
Research on bonds

United States of America
Bureau of Land Management – abandoned mine lands program
Environmental Management - Uranium Mill Tailings Remedial Action (UMTRA)
http://www.em.doe.gov/bemr/bemrsites/umtra.aspx
Surface Mining Control and Reclamation Act of 1977 (SMCRA), Office of Surface Mining
http://www.osmre.gov/topic/SMCRA/publiclaw95-87.shtm
Abandoned mine land rehabilitation
http://www.osmre.gov/aml/AML.shtm
Government lead community-based abandoned mine rehabilitation initiative, Office of Surface Mining
http://www.osmre.gov/aml/vista/vista.shtm

Nevada, USA
Prevention of mining legacies
Nevada standardised reclamation cost calculator
http://www.nvbond.org/about.htm

The International Atomic Energy Agency (IAEA) Vienna, Austria
http://www.iaea.org/
Global perspective of abandoned uranium mine rehabilitation

Germany
Wismut uranium mine rehabilitation project (post-reunification of Germany) near Chemnitz,
http://www.wismut.de/index_english.htm

IBA-SEE conference and project summary
Highlighting the new landscape and new economies of the lignite (brown coal) mining area of Lusatia in eastern Germany, http://www.iba-see.de/en/index.html
Post-Mining Alliance Eden Project, Cornwall England with reference to projects within Cornwall
http://www.postmining.org/


Churchill Fellowship Report
Abandoned Mines and Post-Mining Land Use, Churchill Fellowship Report

Australia
AusIMM (Minerals Institute) Sustainability Committee
Abandoned mines discussion Paper
Abandoned Mines Member survey report

Northern Territory, Australia
Rum Jungle mine rehabilitation

Western Australia
Environmental guidance
Guidelines for preparing Mine Closure plans

Tasmania
Abandoned mine program including trust fund

South Australia
Brukunga rehabilitation project
http://outernode.pir.sa.gov.au/minerals/mines__and__developing_projects/former_mines/brukunga__mine_site
Port Pirie Treatment Plant remediation
Radium Hill abandoned mine rehabilitation project

Commonwealth Government
Department of Resources Energy and Tourism – strategic framework
Standing committee for Energy and Resources
Global legacy mine survey


Worrall, R, Neil D, Brereton, D, Mulligan D (2009) Towards a sustainability criteria and indicators framework for legacy mine land, Journal of Cleaner Production 17 (2009) 1426–1434 (authors from Centre for Mined Land Rehabilitation, Social responsibility in Mining (SMI) and School of Geography, Planning and Environmental Management, University of QLD)
10 Photos
11 Appendices
APPENDIX A

MANAGING MINING LEGACIES FORUM
16-17 JULY 2012
PURPOSE

The purpose of this forum is to:

1) learn from keynote speakers - leading practice orphaned/abandoned mine/contaminated land programs in Canada at both national and state (provincial) level

2) engage key government, industry and research stakeholder representatives in shaping an Implementation Plan for management of abandoned mines across Australia, building on and incorporating initiatives to date, including the Strategic Framework (2010, MCMPR/MCA)

3) gain support from stakeholders, for an Australian national Secretariat for abandoned mines within SMI/CMLR, (based on the NOAMI model)

4) share knowledge and experience while building relationships between stakeholders and jurisdictions,

5) identify steps which need to be taken to develop momentum for implementation of the Strategic Framework for management of abandoned mines in the Minerals Industry (2010), and

6) share knowledge about abandoned/orphaned mine spatial databases for decision making.

OUTCOMES

A successful forum will have the following outcomes;

1) new knowledge from Canadian success stories – keys to success, pitfalls and lessons which have been learned so that we can build success in legacy mine management in Australia

2) engagement of stakeholders, primarily from government (ideally from every jurisdiction), industry (Minerals Council of Australia and AusIMM Sustainability committee) and SMI researchers

3) in-principle support from stakeholders for a national legacy mine hub at SMI

4) sharing of knowledge and experience, fostering of stronger working relationships between stakeholders and jurisdictions from meeting face to face, and expanding our network;

5) an action plan outlines key ingredients for success and tasks needed to move forward with both the hub and Implementation Plan; and

6) a basis for planning or upgrading existing spatial databases on abandoned/orphaned mines for impact and opportunity evaluation to support decision making and prioritization by governments.

KEYNOTE SPEAKERS
Gregg Stewart
Manager, Crown Contaminated Sites Program
Ministry of Forests, Lands and Natural Resource Operations,
Provincial Government of British Columbia, Victoria, BC Canada

Gregg Stewart is an environmental geologist and senior integrated resource management specialist with over 25 years of experience in both the public and private sectors. Particular focus and knowledge include remediation of orphaned and abandoned mine sites, contaminated site investigation and remediation, environmental liabilities, land management and land use planning and regulatory and environmental issues related to natural resource management. He is the current Chair of the National Orphaned/Abandoned Mines Initiative (NOAMI) in Canada. NOAMI has the role of assessing key abandoned mine issues and recommending to the Mines Ministers of Canada actions, collaborative approaches and partnerships toward remediating existing abandoned mines and preventing/minimizing the accrual of further abandoned mines liabilities in Canada.

Gilles Tremblay
Acting Director / Green Mining Initiative
Mining and Mineral Sciences Laboratories (MMSL) CANMET
Natural Resources Canada
Ottawa, ONTARIO, CANADA

Gilles Tremblay is currently the Acting Director for the Green Mining Initiative. His substantive position is the Manager of the Mine Closure and Ecosystem Risk Management Program in MMSL-CANMET of Natural Resources Canada (Government of Canada) in Ottawa. He has over twenty-five years’ experience coordinating large multi-party R&D consortia related to environmental issues affecting the mining industry. At present, key activities include managing the Mine Environment Neutral Drainage (MEND) Program on acidic drainage and the National Orphaned/Abandoned Mines Initiative (NOAMI). His office also provides Secretariat services for the Global Acid Rock Drainage (GARD) Guide. Mr Tremblay has participated in many international capacity building missions for the Canadian International Development Agency and has presented on the Canadian partnership model of cooperation at numerous events.

LOCATION
Level 4 Seminar Room, Sir James Foots Building (No. 47A) on College Road at The University of Queensland's St Lucia campus (Please see attached Map for further details).
COLLABORATION AND SPONSORSHIP

Thank you to the Abandoned Mine working group (state abandoned mine coordinators/ commonwealth RET and MCA) for participating in planning teleconferences prior to this forum.

CMLR is sharing travel costs for Gregg Stewart with the NT government Department of Resources. AusIMM (Minerals Institute) /CMLR Life-of-Mine 2012 Conference will share costs for Gilles Tremblay. The MCA (Minerals Council of Australia have provided sponsorship for this forum.

We thank these sponsors very much!

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Email: c.unger1@uq.edu.au

PAYMENT PROCESS

The workshop will cost 330 AUD (incl. GST). You can pay by credit card or cash. Please find the details in the attached registration form.

FACILITATION

Professional facilitator Saleena Ham will lead Day 1.
PROGRAM

MANAGING MINING LEGACIES FORUM

16-17 JULY 2012
## “LEADING PRACTICES, IMPLEMENTATION AND A NATIONAL HUB”

<table>
<thead>
<tr>
<th>TIME</th>
<th>THEME</th>
<th>OBJECTIVES</th>
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<tbody>
<tr>
<td>8.00</td>
<td>Registration</td>
<td>Name tag, meet/greet</td>
</tr>
<tr>
<td>8.30</td>
<td>Welcome</td>
<td>Welcome to SMI, CMLR – Professor David Mulligan</td>
</tr>
<tr>
<td>8.35</td>
<td>Welcome to forum – C Unger</td>
<td>Purpose of forum – context</td>
</tr>
<tr>
<td>8.45</td>
<td><strong>State Perspective</strong></td>
<td>To share a success story of a leading practice Provincial (state) abandoned mine program</td>
</tr>
<tr>
<td>9.30</td>
<td><strong>Morning Tea</strong></td>
<td></td>
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<tr>
<td>10.00</td>
<td><strong>The Australian abandoned mine program experience – facilitated workshop</strong></td>
<td>Share information on Australian jurisdictions and their management of mining legacies, mining industry as well as the commonwealth govt – identifying how they are similar/different to the Canadian case study presented. Capture key features of successful programs.</td>
</tr>
<tr>
<td>11.00</td>
<td><strong>Commonwealth government perspective and Minerals Council of Australia – panel, 10 mins each and questions</strong></td>
<td>Learn from DRET (C’wealth govt - Virginia Leitch), and MCA (Chris Mc), their perspectives on abandoned mines and the Strategic Framework implementation for Australia, and the role of the working group (Oskar K)</td>
</tr>
<tr>
<td>12.00</td>
<td><strong>Lunch</strong></td>
<td></td>
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<tr>
<td>1.00</td>
<td><strong>Reflection</strong></td>
<td>Observations, questions, ideas, implications</td>
</tr>
<tr>
<td>1.15</td>
<td><strong>Keynote speaker, National Orphaned/Abandoned Mine Initiative, Gilles Tremblay NOAMI Secretariat - how NOAMI works; what has been learned over the last decade? List achievements, comment on rate of progress, stakeholders, role of MAC (Mining Association of Canada), integration with MEND and other programs</strong></td>
<td>Gain insights into a national hub /secretariat for orphaned/abandoned mines in Canada</td>
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<tr>
<td>1.45</td>
<td><strong>Questions and Discussion</strong></td>
<td></td>
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<tr>
<td>2.00</td>
<td><strong>How can we develop a NOAMI-modeled hub in Australia?</strong></td>
<td>Define the Research Focus and Deliverables of an A-NOAMI hub, what do we need the A-NOAMI hub to deliver? What would be useful outputs? How can the A-NOAMI support the states/NT?</td>
</tr>
<tr>
<td>3.00</td>
<td><strong>Afternoon Break</strong></td>
<td></td>
</tr>
<tr>
<td>3.30</td>
<td><strong>How might we progress an Implementation Plan for Strategic Framework</strong></td>
<td>What will an Implementation plan aim to achieve, what will it comprise? Identify actions needed to develop a national hub, and progress implementation of Strategic Framework; steps, stages, who else needs to be engaged? What is the role of industry?</td>
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**PROGRAM - Monday 16 July 2012**
DINNER - Monday 16 July 2012 6.30 pm  
Mariosarti Toowong (Address: 41 Sherwood Rd, Toowong)

PROGRAM - Tuesday 17 July 2012

“INVENTORIES AND SPATIAL DATABASES TO SUPPORT MINING LEGACY RISK MANAGEMENT AND DECISION MAKING”

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<thead>
<tr>
<th>TIME</th>
<th>THEME</th>
<th>OBJECTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.30</td>
<td>Action plan list – hub and implementation plan</td>
<td>Develop the action plan following Day 1. Capture any new ideas, solutions and challenges after reflecting.</td>
</tr>
<tr>
<td>10.30</td>
<td>Morning tea</td>
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<tr>
<td>11.00</td>
<td>Keynote speaker, The British Columbia experience - Gregg Stewart</td>
<td>Focus on BC inventory development – share a success story, Intro + Q&amp;A</td>
</tr>
<tr>
<td>11.30</td>
<td>Inventory panel: NSW, QLD, TAS, NT, WA, SA, VIC, RET.</td>
<td>Learn how governments have undertaken inventories, what was learned from them, and where do you start when you don’t have one? What information do good inventories provide? How do you update and maintain spatial datasets? What information is important for decision making?</td>
</tr>
<tr>
<td>12.15</td>
<td>Lunch</td>
<td></td>
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<tr>
<td>1.15</td>
<td>Introduction to Spatial databases for prediction of impacts – CMLR, Alex Lechner</td>
<td>Learn about data accuracy and limitations as well as standards to develop good quality spatial datasets for modeling. Is there value in a national inventory?</td>
</tr>
<tr>
<td>1.45</td>
<td>Leading practice inventories – workshop plenary session</td>
<td>Identify the key elements of a leading practice inventory – content and process, strategy and implementation. What tools would assist jurisdictions? Technical manuals, standards or other guidance?</td>
</tr>
<tr>
<td>2.30</td>
<td>Afternoon tea</td>
<td></td>
</tr>
<tr>
<td>3.00</td>
<td>Leading practice inventories – workshop plenary session continued</td>
<td>Cont.</td>
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<td>3.30</td>
<td>Summing up</td>
<td>Summarise forum outcomes and outline what follow up will occur – forum report, action plan, advisory group, tools etc</td>
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APPENDIX B

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16-17 JULY 2012
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APPENDIX C

QUESTIONNAIRE RESPONSES

MANAGING MINING LEGACIES FORUM
16-17 JULY 2012
Thank you for taking the time to participate in this evaluation of the Managing Mining Legacies Forum. Your comments will enable us to better plan and execute future forums and tailor them to meet your needs.

Sincerely,

Corinne Unger

Was the purpose of the forum met?

☐ Yes – Absolutely (7)
☐ Yes – Mostly (5)
☐ No (0)

Comments:
- No comment
- ? value of comment, as I only attended Day 2
- No comment (x8)
- I left without a definitive vision of what an Australian NOAMI is seeking to achieve
- Assisted in my general knowledge and network of other industry

Which speaker(s) did you get most value from?

- Gregg, Gilles, Alex
- Accordingly, NA (absent Day 1)
- Gregg Stewart and Gilles Tremblay
- Gregg Stewart
- Giles and Gregg
- Gregg and Gilles
- Greg Stewart
- Greg Stewart
- Gregg Stewart
- No comment
- Greg
- Gregg, Gilles, Oskar, and Chris from MCA

Please indicate your overall satisfaction with this forum

<table>
<thead>
<tr>
<th></th>
<th>Very Satisfied</th>
<th>Somewhat Satisfied</th>
<th>Neutral</th>
<th>Somewhat Dissatisfied</th>
<th>Very Dissatisfied</th>
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<tbody>
<tr>
<td>Workshop Content</td>
<td>(10)</td>
<td>(2)</td>
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<tr>
<td>Registration Process</td>
<td>(11)</td>
<td></td>
<td>(1)</td>
<td></td>
<td></td>
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<tr>
<td>Length of forum</td>
<td>(7)</td>
<td>(4)</td>
<td>(1)</td>
<td></td>
<td></td>
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<tr>
<td>Balance of listen vs. interactive</td>
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<td>(2)</td>
<td></td>
<td>(1)</td>
<td>(1)</td>
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<tr>
<td>Food &amp; Beverage</td>
<td>(11)</td>
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<td>(1)</td>
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<tr>
<td>Venue</td>
<td>(11)</td>
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Did the forum fulfil your reason for attending? (Were your personal objectives met?)

☐ Yes – Absolutely (8)
☐ Yes – Mostly (4)
☐ No

Comments:
- No comment (1x0)
- Yes, but ? value of comment, as above
- Good ideas to take back- highlighted issues nationwide

Was the forum helpful to your organisation?

☐ Yes – Absolutely (8)
☐ Yes – Mostly (4)
☐ No

Comments:
- Can support re: ? programs
- Yes, as far as I was present and familiar with forum outcomes
- No comment (x9)
- Will depend on how the outcomes are framed
What role do you think CMLR/SMI could/should have going forward?

- It could host the national inventory/process/coordinate
- Information centre/resource centre/research centre eg extended and well-maintained global perspective website! Especially extend their roles to developing countries (as not currently covered by North American focus/UK)
- No comment (x4)
- Difficult to say- but as the issue continues to build in importance, the chances for collaboration appear great
- Coordinator for forum outcomes/web hub for future info share/future meetings
- Facilitate academic research, review process
- Assisting in pushing forward the NOAMI program – providing forums/workshops/web
- Secretariat to a National Hub
- Initially, research work and in future coordination role

Do you support an Australian NOAMI at CMLR?

<table>
<thead>
<tr>
<th></th>
<th>Extremely</th>
<th>Very</th>
<th>Moderately</th>
<th>Slightly</th>
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<td>Yes</td>
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<td>(3)</td>
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<tr>
<td>Requires further consideration</td>
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<td>Requires affirmation of support from gov’t agencies for future progress</td>
<td>(1)</td>
<td>No comment</td>
<td></td>
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</tbody>
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Is there anything else you like to share with us?

- Happy to remain involved: MB
- “Teaching role and capacity-building role as well as “1” (Information centre/resource centre/research centre eg extended and well-maintained global perspective website! Especially extend their roles to developing countries (as not currently covered by North American focus/UK)
- No comment (x6)
- Requires affirmation of support from gov’t agencies for future progress
- Thanks
- Ongoing funding is critical