Leading practice abandoned mine management – how mature is Australia?
18 November 2016

Corinne Unger, Senior Research Officer, p/t
Life Cycle of Mining and Metals Program
Sustainable Minerals Institute
c.unger1@uq.edu.au
Overview

1. What are abandoned mines?
2. What does ‘leading practice’ look like?
3. How mature is Australia when compared with global leading practices?
4. Barriers to, and opportunities for, greater maturity

ABANDONED MINES

…are 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.

Source: Strategic Framework for managing abandoned mines (MCMPR/MCA, 2010)
Artisanal mining - globally

... Unregulated activities with human health, safety, socio-economic and environmental impacts

http://lab.org.uk/artisanal-gold-mining-in-peru-blessing-or-curse
1. What are abandoned mines?
2. What does ‘leading practice’ look like?
3. How mature is Australia when compared with global leading practices?
4. Barriers to, and opportunities for, greater maturity

International Legacy Mine Roundtable
International Union for Conservation of Nature/International Council on Mining and Metals (IUCN/ICMM)

Toronto, 2-3 March 2008
Churchill Fellowship
Leading practice abandoned mine rehabilitation and post-mining land use

1. International Atomic Energy Agency – Vienna, Austria
2. Wismut – Chemnitz, Germany
3. Lusatian lignite mining region - IBA-SEE, Germany
4. Eden Project Post-Mining Alliance – Cornwall, England
5. National Orphaned /Abandoned Mine Initiative – Ottawa, Canada
6. Crown Contaminated Sites Program – Victoria, Canada
WISMUT – in-pit tailings remediation

WISMUT POST-MINING LAND USE
WISMUT interpretation Centre and community focal point

Lusatia - brown coal mining region
former East Germany
Former East Germany, coal mining region, Lusatia
IBA-SEE ‘NEW LANDSCAPES NEW ECONOMIES’
Eco-towns

Multi-stakeholder led projects

Beneficial post-mining land use

Eden Project - local ‘wow’ site

Partnerships, collaboration
BC Crown contaminated sites program

- One lead agency
- Full liability accounting
- 2 levels of evaluation
- Risk tool
- External review
- Performance reporting
1. What are abandoned mines?
2. What does ‘leading practice’ look like?
3. How mature is Australia when compared with global leading practices?
4. Barriers to, and opportunities for, greater maturity
Back to 2003.....in Brisbane

A national strategy is needed....

Strategic Framework 2006-2010  MCMPR/MCA
Abandoned Mines Working group

1. Valuing abandoned mines
2. Data collection and management
3. Risk assessment and management
4. Resourcing and partnership opportunities
5. Information sharing and ‘leading practice’
Lechner et al, 2011

National Abandoned Mines Inventory

The following characteristics of mine sites required for risk assessment were not part of any state abandoned mines spatial database:

- Mining and Processing techniques
- History of mining / Start Dates
- Accessibility
- Cultural and heritage record

Data Availability

- Yes
- Incomplete
- No

Physical Size

Commodity Size
Strategic Framework 2006-2010  MCMPR/MCA
Abandoned Mines Working group

1. Valuing abandoned mines
2. Data collection and management
3. **Risk assessment and management**
4. Resourcing and partnership opportunities
5. Information sharing and ‘leading practice’

Extract from; MIRM mine safety maturity chart in Resources, Energy and Tourism, Leading Practice SD in mining 2008 booklet
### Model Evaluative Criteria

<table>
<thead>
<tr>
<th>Mature Program Conceptual Model</th>
<th>Strategic Framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Data Information Management</td>
<td>Chapter 2: Data Collection and Management</td>
</tr>
<tr>
<td>2. Jurisdiction-wide knowledge of health, safety, environment and socio-economic impacts</td>
<td></td>
</tr>
<tr>
<td>3. Site-specific rehabilitation and management plans for high-risk sites</td>
<td>Chapter 3: Risk Assessment and Management</td>
</tr>
<tr>
<td>4. Leadership, legislation, policy and guidance to address abandoned mines</td>
<td></td>
</tr>
<tr>
<td>5. Legislation, policy and guidance to prevent new abandoned mines</td>
<td></td>
</tr>
<tr>
<td>6. Risk assessment and prioritisation of programs</td>
<td>Chapter 4: Resourcing and Partnership Opportunities</td>
</tr>
<tr>
<td>7. Abandoned mine program leadership and capacity/skills</td>
<td></td>
</tr>
<tr>
<td>8. Funding: sources, mechanisms and resources</td>
<td></td>
</tr>
<tr>
<td>9. Focus on beneficial post-mining land/water uses</td>
<td>Chapter 5: Information Sharing and Leading Practice</td>
</tr>
<tr>
<td>10. Heritage conservation — indigenous cultural and industrial</td>
<td></td>
</tr>
<tr>
<td>11. Secondary mining opportunities</td>
<td></td>
</tr>
<tr>
<td>12. Resourcing in partnership</td>
<td></td>
</tr>
<tr>
<td>13. Stakeholder engagement at jurisdiction level</td>
<td></td>
</tr>
<tr>
<td>14. Communication and networks</td>
<td></td>
</tr>
</tbody>
</table>

### Increasing Maturity

<table>
<thead>
<tr>
<th>Maturity Level</th>
<th>Progressive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership, Legislation, policy and guidance to address risks.</td>
<td></td>
</tr>
<tr>
<td>Jurisdiction-wide knowledge of health, safety, environment and socio-economic impacts.</td>
<td></td>
</tr>
<tr>
<td>Site-specific rehabilitation and management plans for high-risk sites.</td>
<td></td>
</tr>
<tr>
<td>Leadership, legislation, policy and guidance to prevent new abandoned mines.</td>
<td></td>
</tr>
<tr>
<td>Risk assessment and prioritisation of programs.</td>
<td></td>
</tr>
<tr>
<td>Abandoned mine program leadership and capacity/skills.</td>
<td></td>
</tr>
<tr>
<td>Funding: sources, mechanisms and resources.</td>
<td></td>
</tr>
<tr>
<td>Focus on beneficial post-mining land/water uses.</td>
<td></td>
</tr>
<tr>
<td>Heritage conservation — indigenous cultural and industrial.</td>
<td></td>
</tr>
<tr>
<td>Secondary mining opportunities.</td>
<td></td>
</tr>
<tr>
<td>Resourcing in partnership.</td>
<td></td>
</tr>
<tr>
<td>Stakeholder engagement at jurisdiction level.</td>
<td></td>
</tr>
<tr>
<td>Communication and networks.</td>
<td></td>
</tr>
</tbody>
</table>

### Evaluative Criteria

<table>
<thead>
<tr>
<th>Evaluative Criteria</th>
<th>Strategic Framework Chapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-earthwork risk assessment and pre-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
<tr>
<td>Pre-earthwork risk management and post-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
<tr>
<td>Pre-earthwork risk assessment and post-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
<tr>
<td>Pre-earthwork risk management and post-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
<tr>
<td>Pre-earthwork risk assessment and post-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
<tr>
<td>Pre-earthwork risk management and post-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
<tr>
<td>Pre-earthwork risk assessment and post-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
<tr>
<td>Pre-earthwork risk management and post-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
<tr>
<td>Pre-earthwork risk assessment and post-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
<tr>
<td>Pre-earthwork risk management and post-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
<tr>
<td>Pre-earthwork risk assessment and post-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
<tr>
<td>Pre-earthwork risk management and post-earthwork rehabilitation and closure.</td>
<td></td>
</tr>
</tbody>
</table>

---

*SMICMLR*

*THE UNIVERSITY OF QUEENSLAND*
2016 web-accessible data

Source: AusIMM, From Start to Finish – A Life-of-Mine perspective
Maturity of jurisdictional abandoned mine programs in Australia based on web-accessible information
1. What are abandoned mines?
2. What does ‘leading practice’ look like?
3. How mature is Australia when compared with global leading practices?
4. Barriers to, and opportunities for, greater maturity

barriers….

- Unclear responsibility
- Unaccounted for liability
- Accounting standards and/or application of...
- Legislative black holes
- Inconsistent enforcement of standards
- Weak/absent performance measures and performance reporting on programs
- Agencies working in silos …
Legislative ‘black holes’

New South Wales Auditor-General’s Report
Financial Audit
Volume Six 2012
Focusing on Environment, Water and Regional Infrastructure

Derelict Mines

Last year, I reported that derelict mines may represent the largest category of contamination liability for the State. The 500 plus derelict mines are not regulated under the Contaminated Land Management Program by the EPA. They are managed by the Department of Trade and Investment, Regional Infrastructure and Services.

The Derelict Mines Program has many thousands of hectares of degraded and contaminated land, where mining companies abandoned mines without cleaning up or stabilising the sites.


New South Wales Auditor-General’s Report
Performance Audit
Managing contaminated sites
Environment Protection Authority
Department of Trade and Investment, Regional Infrastructure and Services

DTIRIS is yet to develop a long-term strategy for its other sites. It has only notified one site to the EPA and is yet to recognise a liability for contamination in its financial report. DTIRIS is aware that seven large scale derelict mines on Crown land are potentially high risk to the environment and public health, and may need to be notified to the EPA. As DTIRIS has known about these mine sites for a number of years, it could be failing its duty to report under the CLM Act as it should have reasonably been aware of the contamination.

P 16, 2014

Apply standards

Clarify responsibility and liability

Gather meaningful data

13.8.2 The abandoned mine land program

The Queensland Government's current estimate is that there are approximately 12,000 abandoned mines located on private land, and 3000 on state-owned land in Queensland. The Queensland Government, through the Department of Employment, Economic Development and Innovation, should assemble all information currently available to the abandoned mine land program into a single database. The Queensland Government should ensure, using whatever information is available, that the list of abandoned mines is as complete as possible. This should include a review of all information held by the Department of Environment and Resource Management and the Department of Employment, Economic Development and Innovation.

Recommendations

13.18 The Department of Employment, Economic Development and Innovation should assemble all information currently available to the abandoned mine land program into a single database. The Queensland Government should ensure, using whatever information is available, that the list of abandoned mines is as complete as possible. This should include a review of all information held by the Department of Environment and Resource Management and the Department of Employment, Economic Development and Innovation.

13.19 The Queensland Government should seek information about the size, features and condition of abandoned mines, including whether the mine or its surrounding environment were adversely affected by flood, from private landholders who have abandoned mines on their properties.

Managing Contaminated Sites

Victorian Auditor-General’s Report

Conclusion

The Department of Planning and Community Development (DPCD), the Environment Protection Authority (EPA) and councils are not effectively managing contaminated sites, and consequently cannot demonstrate that they are reducing potentially significant risks to human health and the environment to acceptable levels.

This is largely because the complex regulatory framework that has evolved to deal with contaminated sites has significant gaps, and key elements lack clarity. In many cases, this has led to a lack of accountability and responsibility, and subsequent inaction.

Regulatory framework gaps

While current mines have increased controls over how they will be rehabilitated, the same is not the case for historical mines. Across the State there are more than 11,000 abandoned mines. Ownership and responsibility is not clear for the great majority of these, especially for rehabilitation. Many exist on land managed by DEC and other agencies; a small number of on current mining tenements. There has been no comprehensive approach to dealing with these sites. DPCD has drafted a policy to guide good practice in managing these mines, which it hopes to finalise this year. DPCD and Government should ensure that this policy is finalised as a priority.
Inconsistent enforcement of standards

Having spoken of the need to speed up approvals for mining lease applications where there are no objections, I now raise the issue of abandoned mines. There is an inconsistent treatment between government managed abandoned mines and those managed by the industry where water is impacted by contamination. While there is a robust regulatory regime in place regarding industry managed active and abandoned mines, this is not the case for government managed abandoned mines. There is a black hole in the legislation which means there is no regulatory tool to manage abandoned mines or their pollution, or a mechanism for a department to be held accountable and penalized for pollution from one of its sites. If there is no legislation, then one government department is limited in what it can do to another.

This appears to be a loophole or black hole in the environmental legislation. This must be frustrating to the neighbouring landholders and graziers to these mines. It is not simply a lack of legislation: there is also no complete inventory of abandoned mines in Queensland to the Queensland government is not fully accounting for its liabilities in this area. There is also no performance reporting by DEEET on its abandoned mine land program, how much is spent each year, how a site is prioritized, whether there are management plans for sites or areas of underground workings, how much is spent where and how much benefit has been achieved.

opportunities….cross-functional integration

Minimata Protocol

NEPM, EPBC, ANZECC/ARMCANZ...

Implement Strategic Framework for managing abandoned mines

Australian government through COAG (BOTH Energy Council + SC Env and Water)
Opportunities…

- States and Territories to lead an Australian NOAMI with multi-stakeholder advisory committee to;
  - Address legislative barriers
  - Identify challenges and opportunities in common
  - Fund collaborative research
  - Share & retain knowledge
  - Learn from case studies
  - Engage stakeholders
  - Develop tools
  - Use resources efficiently
  - Explore funding mechanisms

Conclusions

1. Global case studies demonstrate leading practice
2. Policies, programs and performance reporting are needed in all jurisdictions, in Australia, to progress the maturity of programs
3. Sound legislation and robust accounting standards are important for accountability and good performance
4. Some jurisdictions are making progress - NT and WA
5. Abandoned mines - largely a state/territory responsibility - require national leadership for Australia to support an integrated and strategic approach in the long term
6. Beneficial post-mining land uses can result from effective programs and engagement
7. Social license to mine is influenced by the presence of abandoned mines
ACKNOWLEDGEMENTS

• Churchill Trust - James Love Churchill Fellowship, 2009
• Co-authors of Resources Policy paper (2015) and Spectrum publication (2016) in press
• CMLR for funding research
• Tony Ward, SA DMITRE & Michael Reid, Tasmania, Environment & Land Management Mineral Resources Tasmania, DIER (for self-assessments)