Planning for Post-Mining Land Uses

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Leanne Bowie and Jonathan Fulcher

Introduction

Mining is a temporary land use; normal mining investment is made on the legal basis that tenements can be relinquished after resource extraction and rehabilitation is complete. If that relinquishment can be effected with a post-mining land use that generates income, risks of relinquishment for the miner and the State are better managed. There have been many examples around the world of successful and innovative post-mining land uses. However, some jurisdictions have struggled more than others with facilitating prompt relinquishment of mining leases and conversion to economically valuable post-mining land uses.

This paper focuses on Queensland as a case study. At the time of this paper, the Queensland Government is currently working through a process of trying to improve its management of mined land rehabilitation,[1] but Queensland is by no means unusual in having some room to improve its system of post-mining land use planning. For example, there have been recent or current reviews about mine rehabilitation issues in every Australian State that has a mature mining industry (noted in an Appendix to this paper).

This paper provides a snapshot of the wide variety of successful and imaginative post-mining land uses around the world and analyses some key drivers for that success. Not surprisingly, these drivers tend to have considerable overlap with the drivers for successful redevelopment of former quarries, landfills manufacturing and other more or less contaminated land sites. Another factor that mining has in common with former quarries, landfills and manufacturing sites is that successful post-mining land uses can be and are developed on land that still has some constraints (including residual voids), provided that the constraints are known, managed and outweighed by the economic value of the land use after mining.

Turning to the Queensland case study, this paper will examine (from a planning perspective) some of the key obstacles that have prevented mining leases from being surrendered and the land converted to economically valuable post-mining land uses during the period of 16 years since the environmental administration of mining was transferred from Queensland's Mines Minister to its Environment Minister. There are additional issues to be resolved about lack of certainty and transparency regarding ongoing constraints, which were particularly highlighted by the Queensland Supreme Court in *Butler v The State of Queensland*,[2] relating to an historic underground colliery at Collingwood Park at Ipswich (known as the 'Collingwood Park case'), where the land had been mistakenly converted to low density residential development and subsequently experienced subsidence. This case was then cited in a landmark report issued by the Queensland Audit Office in 2014, *Environmental regulation of the*

[1] The original version of this paper was presented on 14 September 2017, but the paper has been updated to take account of the introduction of the **Mineral and Energy Resources** (**Financial Provisioning**) **Bill** 2017 to the Queensland Parliament on 25 October 2017. This Bill lapsed upon a warrant having been issued for an election, but, following the re-election of the Australian Labor Party, this paper assumes that a similar Bill will be re-introduced once Parliament resumes. This updated paper is dated December 2017.

[2] [2014] 2 Qd R 423.

resources and waste industries, which made a series of adverse findings about the regulation and administration of mine rehabilitation in Queensland.

Arising from the recommendations of the Queensland Auditor-General, a series of discussion papers were published during 2017, followed by the introduction of the *Mineral and Energy Resources (Financial Provisioning) Bill* to the Queensland Parliament on 25 October 2017, although this Bill lapsed upon a writ having issued for a State election a few days later on 29 October 2017. Further papers and legislative amendments had been proposed to follow.

Summary of key lessons

The key messages to be examined are:

1. In practice, successful and sustainable post-mining land uses around the world have been driven by economics.
2. The return of land to safe, stable, non-polluting landforms with economically productive land uses is in the interests of landowners and local communities.
3. Continuing human presence for economically productive land uses also provides the strongest motivation for post-closure site integrity.
4. From the perspective of the mining industry, key commercial drivers are to reduce (and ultimately remove) liability and ongoing cost, generally the sooner the better, subject to any ongoing operational requirements.
5. Transparency – A convenient searchable system is needed so future landowners and government agencies know about any constraints.
6. Post-relinquishment land use and management are the business of landowners and developers, planners, local governments and State government departments administering planning. In the context of a paper for the Planning Institute of Australia (Qld) annual conference, the point is that this is core business for PIA members, not just a peripheral matter.[3]

A snapshot of some successful case studies around the world

Some examples of successful post-mining land uses around the world are briefly outlined here. This is only a snapshot of the variety available. Many more examples are provided in publications such as Pearman, *101 Things to Do with a Hole in the Ground (2009).*

Example 1 - Rocks Riverside Park, Seventeen Mile Rocks
Although the Brisbane City Council website does not mention it, Rocks Riverside Park was historically mining lease land, held by Queensland Cement & Lime. The authors interviewed a former employee of the company who was involved in the rehabilitation project, who noted that the company had already removed mine and processing plant from the site when the local government asked the company to return a selection of items, so that these could feature as industrial heritage. Among other awards, Brisbane City Council received a Year of the Built Environment Award from the Australian Institute of

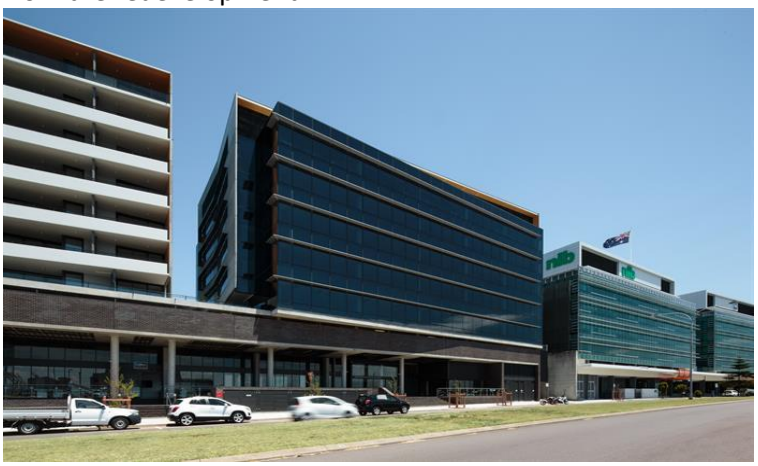
[3] An issue to be outlined later in this paper is that, in Queensland, the assessment, approvals and rehabilitation regime for mining and petroleum is separate from the regulatory and administrative regime for other land uses, so historically planners have generally not worked in the same space as either the regulators responsible for mine rehabilitation or mining company personnel specialising in rehabilitation and environmental management.

Project Management in 2003 (Tupicoff 2004). Other parts of QCL's freehold land were converted to residential and light industrial land.

This mining lease was surrendered while Queensland's Minister for Mines was still responsible for the environmental management of mining in Queensland, before this jurisdiction was transferred to the Minister for Environment on 1 January 2001, by gazettal of Administrative Arrangements that accompanied the *Environmental Protection and Other Legislation Amendment Act 2000* (Qld). There has only been one surrender of a large mine in Queensland since that time (Kidston Mine) and nothing similar to the Rocks Riverside Park redevelopment.

Example 2 – Hunter Development Corporation's Honeysuckle mixed use development, Newcastle, NSW

This land used to be a series of underground coal mines in the 1880s, known as the Delta collieries. Later, parts of the land were used for warehousing and railway workshops but became derelict. The Hunter Development Corporation is a NSW government-owned corporation created in 1992, which has invested in rehabilitation, including backfilling.[4] The cost is recovered through the capital gain arising from the redevelopment.



This site is referenced in Queensland's Collingwood Park case (discussed in further detail later in this paper), where the Supreme Court contrasted Collingwood Park with the Honeysuckle site (called the 'tax office' site in the case, because at that time the Australian Taxation Office was proposing to relocate

[4] http://www.hdc.nsw.gov.au/honeysuckle

there): *Butler v The State of Queensland*.[5] In summary, the Court found that in Newcastle, it was cost-effective to backfill subsided underground colliery land because the land was vacant and well-located for redevelopment. This contrasted with Collingwood Park which was not vacant land and had already been developed for low-density affordable housing; in addition, the mining at Collingwood Park had been at a deeper level than in Newcastle. The Court found that it would not have been reasonable for the Collingwood Park land to have been backfilled, in contrast to the Newcastle land.

A lesson from these contrasting examples is that the extent of rehabilitation work that can reasonably be described as 'cost-prohibitive' is dependent on both site-specific constraints and the ultimate potential for capital gain. In turn, this is often likely to be dependent on mine location relative to existing urban development or other attractions. Another lesson from the Newcastle case study is that the opportunities for redevelopment may change significantly over time, partly as a result of changes in the surrounding neighbourhood and partly as a result of advances in technology. It is a mistake to describe the planned post-mining land use identified during or before mine operations as the 'final land use' (as has been done in many EIS documents, assessment reports and conditions).

Example 3 –South Korea's Kangwon Land tourist resort, Gangwon Province, by Mireco – golf course, casino, hotels, multi-sport complex, ski resort with 18 slopes, theme park, cinema and high-rise residential apartments.

In South Korea, the Kangwon site is similar to Honeysuckle in NSW, but on a larger scale. A casino is surely the ideal post-mining land use to make a capital gain out of rehabilitating mined land, from the perspective of revenue-hungry governments. Mireco was originally established by the South Korean government to redevelop a former coal mining area and has now been so successful that it has become an international services corporation, redeveloping former mining land in other countries.
This has been such a successful model that Mireco has been reported to make about $89 million per annum from its mine rehabilitation industry in South Korea alone, leaving aside what it is now making in other countries.[6]

Example 4 – Rio Tinto's Coal and Allied Mine, Upper Hunter Valley, NSW – Rehabilitated for cropping

There are many places where agricultural cropping was the pre-mining land use and the post-mining land use, most of them in the USA but also in Australia. The Coal & Allied Mine was developed on farming land. As a condition of development consent, it was required to reinstate 65 ha of land to Class 1 or 2 lands suitable for irrigated cropping, with the balance for dry land farming. The performance standard was that Coal & Allied was required to produce Lucerne hay with a productivity yield equivalent to the average crop productivity yields for the Upper Hunter Region for three consecutive yields. Since this was an upfront condition, it was possible for mine planning to accommodate the necessary work from the beginning, including mapping of soil profiles and separate stockpiling or topsoil and subsoil, followed by backfilling to the correct depths, so as to accommodate crops with deep roots such as Lucerne. In 2007, a trial area had successfully demonstrated higher than average yields for 3 consecutive years. After that, RTCA was ready to invite competitive tenders from local farmers for commercial cropping in 2010, and local farmer Peter Nichols was successful and has subsequently

[5] [[2014] 2 Qd R 423.
[6] Kim Da-ye, *Korea aims for share in potentially huge market*, Economics of mine reclamation, 2013.

planted and harvested various crops. Coal & Allied won the New South Wales Minerals Council 2010 Environment and Community Excellence Award.[7]

The Coal & Allied example challenges outdated assumptions about the incompatibility of open-cut mining with rehabilitation for cropping purposes, underpinning legislation such as Queensland's (repealed) *Strategic Cropping Land Act 2011* (now subsumed within the *Regional Planning Interests Act 2014*).This example and similar American examples challenge outdated assumptions about the incompatibility of open-cut mining with rehabilitation for cropping purposes, underpinning legislation such as Queensland's (repealed) *Strategic Cropping Land Act 2011* (now subsumed within the *Regional Planning Interests Act 2014*).

Example 5 – Erlebnisbergwerk Sondershausen, Germany – Former salt mine and potash mine converted to an underground adventure and sports park, with the world's deepest standard bowling alley, world's deepest concert venue, ballroom, boat ride on underground lake, adventure tunnel slide and museum.

A classic example of how it can often be much more innovative, attractive and commercially valuable to leave holes in the ground exactly where they are, is this example from Germany. Stabilising work has been undertaken to ensure underground safety. Part of this site is still an operating mine.

[7] Minerals Council of Australia, *Mine Rehabilitation in the Australian minerals industry* (2016).

Example 6 – Wine!

There are two enormous underground wine cities in Moldova in former mines. The wine cellar depicted here is housed in a former underground limestone mine in Cricova, Moldova and has 120km of underground labyrinths. It has constant 90% humidity and temperatures of 12-14^{o}C. This has become a major tourist attraction. Vladimir Putin celebrated his 50th birthday in this venue and Angela Merkel is a frequent visitor.[8]

A contrasting wine example is in the Czech Republic, which has vineyards on former lignite mining sites at Most, Bohemia. This has also been turned into a tourist attraction, as visitors are taken on a tour firstly of operating coal mines and then of vineyards planted on rehabilitated mine land.[9]

Example 7 – Cattle grazing

If the pre-mining land use was grazing and the neighbourhood is still a grazing neighbourhood at the end of the mine's life, the normal local community expectation is that the post-mining land use ought to be grazing, or at least, primarily grazing. In Queensland, this legitimate community expectation is often evidenced in planning schemes, where the land continues to be mapped as Rural, notwithstanding overlay mapping indicating current mining tenements.

In Queensland, before the environmental management of mines was transferred from the Mines Minister to the Environment Minister, it used to be standard for mining lease conditions to require, as

[8] Hannon, M. A Tour Through Putin's Wine Cellar, 12 January 2017, Paste.

[9] http://www.czechtourism.com/p/uk-travelove-the-forgotten-treasures-of-north-bohemia/

far as reasonably practicable, that the land must be rehabilitated for the same land use as it was pre-mining. Upon the commencement of the *Environmental Protection and Other Legislation Amendment Act 2000 (No. 2) 2000* on 1 January 2001, existing mines were deemed to hold transitional environmental authorities (mining activities) and the deemed conditions included the old special conditions about rehabilitation taken from their mining leases. In most cases, grazing remains the primary post-mining land use identified in environmental authority conditions for those older mines or parts of mines, unlike the normal position for more recent mines or extensions.

Many central Queensland coal mines also agist or lease part of their land to neighbours for grazing, either while waiting for those areas to be disturbed for mining, or if they are buffer areas, or where they have been progressively rehabilitated for grazing.

Below is an example of cattle grazing on a rehabilitated spoil heap at Pit 25 East, at the Dawson coal mine complex in central Queensland. The mine worked in partnership with a local grazier, to trial a rehabilitated spoil area of 165 ha together with a control paddock nearby of 161ha. The rehabilitated area had first been graded to a 1 in 6 grade, access tracks were added, a dam was retained, topsoil was spread and the area was seeded. Cattle were weighed on a quarterly basis to track progress and their health was monitored. Average weight gain is between 0.8kg/day to 1kg/day for the 49 weaners in the rehabilitated paddock.

Post-relinquishment constraints

The very nature of mining is that it unavoidably leaves land in a different condition from when it started. As a bare minimum and in the simplest possible terms, if a mineral is extracted from the ground, transported away and sold, there is logically going to be a space where that resource used to be. Complete backfilling of voids is normally not a common sense rehabilitation option, although considerable landform re-shaping and partial backfilling is common and even complete backfilling can be an option in some limited circumstances. As discussed above (case study 2 on page 3) in the context of the Queensland Supreme Court's analysis of the contrast between the Newcastle Honeysuckle site and the Collingwood Park low-density residential site, sometimes significant backfilling can be justified if there is a sufficient capital gain to be made from the redevelopment and depending on site-specific constraints and opportunities, but otherwise not. This underscores the basic point that economically productive post-mining land uses help to manage risks better than relinquishment criteria alone.

As a simple matter of logic, importing a large quantity of fill from another location impacts on the place from which such a large amount of fill is being imported (such as a quarry), which then leaves another

void that needs to be filled, *ad infinitum*. Open-cut mining is not the only example of this. Similarly, some degree of planned subsidence is a normal consequence of underground coal mining. Frequently, the position argued by anti-mining non-government organisations is that all voids should be completely backfilled, for example, the recent submission by the Australian NGO, Lock the Gate Alliance Ltd (April 2017) to an Australian Senate Committee Inquiry on *Rehabilitation of mining and resources projects as it relates to Commonwealth responsibilities* (July 2017).

This does not necessarily mean that post-mining land uses cannot be just as valuable, or even more valuable, than pre-mining land uses, but merely that it would be illogical to start from a presumption that the landform itself should normally end up exactly the same as before the commencement of mining, unless, in the particular circumstances, there is a greater benefit than cost in creating a corresponding impact on other land when importing fill from elsewhere.

Other common examples of post-mining constraints include fences that should be maintained, or slopes that may be subject to erosion depending on how they are managed in the future, for example, if they were to be over-grazed.

The fact that the landform changes with mining is the same as for many other land uses such as quarrying, landfills and a variety of major public infrastructure. Also, the fact that there are often likely to be some remaining constraints on the land after rehabilitation, which do not prevent the land from being valuable for another use, is not a unique feature of rehabilitated mine land. By way of analogy, it is normal for residential landowners to be constrained by an easement allowing a neighbour's drainage or sewerage pipeline to traverse the property. This is an example of an ordinary constraint that is far from being unmanageable. In terms of normal commercial practice, what matters when potential purchasers are considering whether to buy land is firstly whether the value of the land outweighs the constraint and secondly that the constraint can easily be searched and understood.

Although the total area of land disturbed by mining in Australia is only a tiny proportion of Australia's total land mass (about 0.021%,[10]), some mining leases (including undisturbed land) cover areas comparable with small European countries, and within such large areas it is normal that a variety of third party infrastructure and other development will co-exist with the mine, for example, pipelines, powerlines, grazing and other resource industries. Sometimes, these third party land uses may also operate as ongoing constraints on the land, particularly if the third party development is permanent (or longer term than the mining operation), but this should not prevent mining tenement relinquishment.

This paper is not about mines that have been abandoned without having been rehabilitated, carrying far greater risks than land that is rehabilitated for the purpose of relinquishment. (In Australia and other first-world jurisdictions today, the risk of abandonment without rehabilitation of disturbed land is a risk that is secured by various forms of financial instruments, such as insurance or bank guarantees, although that was often not the case historically). The scope of this paper is about facilitating conversion to successful post-mining land uses where the land has been or is being rehabilitated in the normal way and a government agency is sufficiently satisfied with the outcomes that it is able to approve the surrender of the mining leases.

[10] MCA, *The Whole Story – Mining's contribution to the Australian community in numbers*, Canberra 2015.

Current obstacles to mining tenement relinquishment and conversion to productive post-mining land uses

In Queensland, there has been only one example of approval of a normal application for surrender of rehabilitated land for a major mine (Kidston Mine) since the transfer of the environmental administration of mining from the Mines Minister to the Environment Minister on 1 January 2001. The Kidston surrender was granted only just after the transfer of government administration, so the process was already underway at that time.[11] Before the transfer of government administration, normal surrender processes were not uncommon. Seventeen Mile Rocks (case study 1 above) was an example of the normal historic process.

Why did mine surrenders stop happening in Queensland, while this process continued elsewhere around the world?

Current obstacle 1 – environmental authority conditions and guideline discouraging economically productive post-mining land uses

In Queensland, before the commencement of the *Environmental Protection and Other Legislation Amendment Act (No. 2) 2000* on 1 January 2001, conditions about rehabilitation of mined land used to be set out in mining leases and more detailed commitments used to be set out in plans prepared by the mining company and accepted by the Mines Minister, known as 'environmental management overview strategies' (EMOSs). Normally, the mining lease conditions and EMOS provisions typically used to require that the land should be restored 'as nearly as may be' to its pre-mining use and state, unless otherwise determined by the Minister (or, in some mining lease conditions, the Governor-in-Council). In central Queensland, in effect, this normally meant returning the land to cattle grazing. From 1 January 2001, the rehabilitation conditions of the mining lease and the EMOS commitments were deemed to have become conditions of the mine's environmental authority and the rehabilitation conditions were taken to have been deleted from the mining lease.[12] Provided that older mines have continued to preserve their original conditions since then, they are still able to rehabilitate primarily for pre-existing land uses such as grazing.

However, most of the land in more recent projects is not currently being rehabilitated for economically productive post-mining land uses. To understand why not, the typical conditions being imposed by the Queensland Department of Environment and Heritage Protection (EHP) on many environmental authorities for mines need to be examined. Land that used to be grazing land, forestry, orchards or cropping land pre-mining has, more often than not, been required to be transformed into 'self-sustaining natural vegetation or habitat' post-mining. This is despite the fact that the majority of mined land in Queensland is freehold land, or, where it is government land, it was normally either leased for grazing purposes or State Forest land.

[11] Note that this paper is not suggesting that the assessment of the surrender for the Kidston Gold Mine was a particularly 'successful' example of major mine surrender, but only the most recent. Refer to Edraki, Baumgarl, Mulligan, Fegan and Munawar (2017) in relation to mine seepage issues.

[12] Section 587 (as it is now) of the *Environmental Protection Act 1994* (Qld).

Objectives	Indicators	Completion criteria
Establish self-sustaining natural vegetation or habitat	Abundance and diversity of native plant species	Certification by appropriately qualified person that plants in rehabilitated areas show evidence of flowering, seed setting and seed germination.
	Abundance and diversity of native fauna species	Certification by appropriately qualified person that native fauna species identified in pre-mining baseline studies and the 5 years of reference site monitoring prior to completion of rehabilitation are present or indicators or these species or habitat elements are developing within the rehabilitated areas.

These types of conditions are derived from the current relevant Queensland EHP *Guideline - Rehabilitation requirements for mining resource activities*,[13] which actively discourages rehabilitation that would create an economic value. The following is the relevant hierarchy for determining post-mining land uses in that Guideline:

> *2.2. Rehabilitation hierarchy*
> *In assessing the acceptability of rehabilitation objectives, indicators and completion criteria that may be proposed for a mining project, the administering authority will have regard to a hierarchy for mine rehabilitation that is similar to the waste hierarchy. The strategies listed higher in the hierarchy should be adopted in preference to those listed lower, unless there are significant environmental, economic or social issues that override such a selection. The rehabilitation hierarchy, in order of decreasing capacity to prevent or minimise environmental harm, is:*
>
> *1. avoid disturbance that will require rehabilitation*
>
> *2. **reinstate a "natural" ecosystem as similar as possible to the original ecosystem***
>
> *3. develop an alternative outcome with a higher economic value than the previous land use*
>
> *4. reinstate previous land use (e.g. grazing or cropping)*
>
> *5. develop lower value land use*
>
> *6. leave the site in an unusable condition or with a potential to generate future pollution or adversely affect environmental values.*
>
> *In determining whether it is feasible to achieve levels in the top half of the hierarchy, the applicant and the administering authority should consider the pre-mining land use, any compensation or other agreements regarding the land, the potential uses of likely rehabilitated landforms and existing use or environmental values of surrounding land. Developing a lower value use may be acceptable if that use is acceptable to the relevant stakeholders and all higher strategies are impractical. Leaving the site in an unstable condition or with potential to cause environmental harm will rarely be acceptable.*

[13] *Available at https://www.ehp.qld.gov.au/land/mining/guidelines.html*

> *In general there is a higher risk of future environmental harm after the mine closes if the strategies listed lower in the hierarchy are adopted. However a "lower value" land use may be more sustainable in terms of preventing off-site impacts, especially if the post-mining land use makes an economic return that is sufficient to maintain the rehabilitation. To manage a site so that the potential for on-going environmental harm is kept to acceptable levels, future monitoring and maintenance may be required. For this reason, the acceptance of a rehabilitation strategy involving outcomes lower in the hierarchy may mean that, when progressive or final rehabilitation is assessed, the company may have to make larger payments to cover the remaining residual risk.'*

Assuming that a mining project does tend to involve some disturbance of land in the first place, which would logically be the case or there would never have been a need for rehabilitation, the next line is to '*reinstate a "natural" ecosystem as similar as possible to the original ecosystem'*. Reinstating the land to the previous use, such as grazing, is far down the hierarchy at no. 4 and is described as a 'lower value'. In order to demonstrate that this lower order use is acceptable, it is necessary to demonstrate *significant environmental, economic or social issues that override* the natural ecosystem requirement. All higher strategies need to have been proven to be impractical. Also, in the last line, the mining company is warned that if it does not conform to the hierarchy rules, there is a higher residual risk payment to the government upon relinquishment.

Current obstacles – example 2 – Early rehabilitation currently does not convert to an early ability to surrender and reduce/remove liability for the mining company

Among the many criticisms of the Queensland Government's administration of rehabilitation, the Queensland Audit Office Report of 2014, *Environmental regulation of the resources and waste industries*[14] noted:

> '*EHP advised that many of the level 1 sites would require up to 50 years of post-rehabilitation monitoring for successful rehabilitation before EHP can approve the surrender of the relevant environmental authority and return of financial assurance. It is unlikely that the government, operators and the public were aware of this and the costs associated with the ongoing regulation of these sites.'*

This is beyond the lifetime of all planning schemes and regional plans. It is beyond the lifetimes of shareholders and managers. In particular, it would appear to be a counter-productively long time to be monitoring the self-sustaining native ecosystems before selling the freehold to a neighbouring grazier, who would not normally have an economic interest in preserving the land in that condition.

It is also not readily apparent why there would be a commercial incentive for shareholders to invest in early rehabilitation if they then have to expect to wait 50 years to receive all the benefits of doing that, such as reducing or removing liability and receiving payment for the sale of the freehold land by a purchaser.

Other current obstacles

There have been many workshops in Australia and overseas considering policy obstacles to rehabilitation and a particularly thorough example was Pershke (2017). Leaving aside the key issues

[14] Report 15: 2013-14.

discussed above relating to delays in achieving relinquishment and an associated end-point for company liability, some other current potential obstacles preventing mines from achieving a desired relinquishment, which could vary in their significance from project to project, may include:

- Over-reliance on the closure planning process operated by one government agency, when what is needed is a 'whole-of-government' approach to post-mining land use assessment;
- Gaps in regulation for the transition of various items of permanent infrastructure (such as dams) from mining operation to post-mining land use, or inconsistent regulation;
- The fact that land use planning is 'not core business' for either mining companies or their regulators;
- The procedural difficulty of obtaining necessary and appropriate changes to existing approvals to facilitate more productive post-mining land uses, or to adopt more recent technological advances in rehabilitation engineering;
- Lack of mechanisms to deal with management of ongoing constraints, including constraints from co-existing land uses and infrastructure that will remain;
- Lack of expertise in the assessment process;
- Ambiguity or 'shifting goal posts' in relation to the standards to be achieved;
- Overly risk-averse behaviour of regulators in line agencies that do not directly benefit from the return of mined land to economically productive post-mining land uses;
- Unnecessary complexity and cost of the process itself.

It is beyond the scope of this paper to explore all of these obstacles in detail.

Challenging some assumptions about the universal desirability of earlier rehabilitation and relinquishment

However, before going on to address how mining companies can be incentivised to rehabilitate sooner, so that land can be converted to productive post-mining land uses sooner, it should first be explained that there are many ordinary circumstances in which 'sooner' is not the same as 'better'. Also, a 'widening gap' between the area of land subject to mining disturbance and the area that has been rehabilitated is not necessarily against the public interest, contrary to some sweeping assumptions contained in the series of Queensland discussion papers about mined land rehabilitation issued in 2017. The *Discussion Paper: Better Mine Rehabilitation for Queensland* (May 2017) identifies in its executive summary the key concern that the Queensland Government:

> *'…the QTC Review found a widening gap between the amount of land disturbed by mining and the amount of land rehabilitated. Current estimates indicate that only approximately 9 per cent of disturbed land has been rehabilitated. Reporting by mining companies indicates that, by 2021, the area of disturbed land will be approximately 12 times greater than areas under rehabilitation. By comparison, in 2006, the area of disturbed land was only three times greater than areas under rehabilitation*.'[15]

Based on this analysis, the Discussion Paper concluded that it should be a policy objective to halt '*the increase in the cumulative area of land that is un-rehabilitated or rehabilitated incompletely, and start the process of decreasing the cumulative area*'.[16] The 'QTC Review' referred to in the *Discussion Paper* was part of the *Review of Queensland's Financial Assurance Framework* (April 2017), and the calculation was apparently based on plans of operations submitted by mining companies in 2006 and 2016 and

[15] Page 5.
[16] Page 12.

there were some issues with that methodology.[17] However, leaving that aside, a more important consideration is that an increased area of disturbance can logically be expected during the period shortly after the granting of a series of project approvals for new mines or mine expansions. In the context of a boom in commodity prices and also the encouragement of mine development in Queensland by successive State governments, Queensland experienced a sustained period of intensive granting of new project approvals and expansion approvals approximately from 2004 until the beginning of 2015. Former Queensland Labor Premier Anna Bligh frequently referred to the mining industry as having 'overheated' for the period covering her own term as Premier and that of her Labor predecessor, Peter Beattie.[18] A rapid increase in mining disturbance can be expected immediately following the grant of new approvals, which in turn could reasonably be expected in circumstances including the following:

- High commodity prices;
- High business confidence and low concerns about sovereign risk;
- After having invested in exploration that has yielded successful results;
- After a new region has been opened up to mining or after a new commodity has been introduced to the mix.

A government that is granting a high rate of project approvals might reasonably be expected to do so in the hope of job creation, increased royalties and increased prosperity for the State. These factors would not necessarily be perceived as bad news in terms of the mainstream public interest or the Queensland Treasury interest, although these factors may be perceived as unfortunate by anti-mining activists.

After a short period of reduced commodity prices, during which many Queensland mines temporarily closed, commodity prices then recovered for a range of commodities relevant to the Queensland mining industry. The next major region that has been identified by the Queensland Government as likely to be opened up to mining is the Galilee Basin, starting with Adani's Carmichael Coal Project. If not only the Adani project proceeds but the entire basin opens up, the total area of mining disturbance in the State would be likely to undergo another period of rapid and significant expansion. Mine workers in central and north Queensland who lost employment during the downturn, and the regional communities that indirectly benefit from mining, would not necessarily view this increased mining disturbance as a problem, although it would be likely to lead to an even wider 'gap' than at present, while this new region is being developed, even if the rate of rehabilitation in other parts of the State doubles or trebles during the same period.

This is why the use of raw figures from current operating mines about a 'widening gap' is likely to be misleading and unhelpful, either in terms of identifying the public interest in relation to rehabilitation, or in terms of setting a useful benchmark for achieving improvement in the future (ie, 'narrowing the gap' would not necessarily be a helpful KPI for success). Opening up a new region to mining and associated infrastructure at the same time as judging the success of its rehabilitation policy by raw figures about a widening or narrowing gap, would be likely to set up the government and the industry for perceived 'failure', quite unnecessarily.

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[17] *Discussion Paper: Better Mine Rehabilitation for Queensland* (May 2017) page 10. Plans of operations have been required to be submitted in Queensland prior to carrying out activities on mining leases; consequently these figures do not include rehabilitation of mining leases that have already been surrendered (before the transfer of environmental jurisdiction for the mining industry from the Mines Minister to the Environment Minister on 1 January 2001). Plans of operations are also only required in order to carry out mining activities, not where a site is inactive: Section 287 Environmental Protection Act 1994 (Qld).

[18] For example, https://www.finda.com.au/news/premier-fast-tracks-spending-to-ease-mine-downturn/154453/

It is also not necessarily the case that land should be fully progressively rehabilitated as soon as it becomes 'available', or that if it is rehabilitated, relinquishment should immediately occur. Examples include:

(a) The need for operational flexibility to switch operations from mining area to mining area within the same mine

It is not unusual for a large mining complex to comprise a series of mining areas, with different constraints (including technical and infrastructure constraints) and different quality of the resource, or even more than one mineral the subject of a mining lease. Historically, it has been a competitive advantage in Queensland, compared with some other jurisdictions, that there has been flexibility for companies to make quick commercial and technical operational decisions to switch their focus from one mining area to another in response to a wide range of possible changes in circumstances and then switch back, subject only to making changes to a plan of operations (which may only take 28 days) and any associated changes to financial assurance.

For example, following largescale flooding in early 2011, many central Queensland mines had to use one or more pits to store floodwater, while switching operations to other pits within the same mine, then re-opening the flooded pits after the floodwater had been removed some years later. This was a situation where unnecessarily constraints imposed by Queensland's environmental regulator in standard environmental authority conditions during 2009 meant that '*environmental authorities were not sufficient for mines to deal with the water entering their sites during the 2010/11 wet season*'.[19]

Commercial decisions to switch focus from one mining area to another are more likely to be in response to trade conditions, improvements in technology or commodity prices or both, making it feasible to mine resources that were previously considered not commercially feasible.

Mineral reserves that are economically viable for extraction will not necessarily be extracted within ten years. A pit may have been started and then priorities will have moved elsewhere within the mine before returning to that pit.

Mine planning needs to be kept flexible to adapt to these types of issues.

(b) Re-mining

Re-mining may involve extracting additional ores that were previously thought to be uneconomic, or there may be a different mineral still remaining to be extracted which was not previously in demand. There have been many instances where improvements in processing technology have meant that old spoil dumps could be reprocessed using a more effective recovery method than was known to a previous generation.

> A famous example was the East Rand Gold and Uranium Mining operation in South Africa, near Johannesburg, which was historically a series of gold mine workings dating back to the 19th century. Reprocessing was commenced by Ergo in 1977 to recover not only gold, but also uranium. This operation was originally expected to take no more than 15 years. However, just as the plant was about to be demolished, a joint venture between DRDgold and Australian company Mintails identified that technology enabling more efficient extraction of gold, combined

[19] Queensland Floods Commission of Inquiry Final Report page 359.

with economies of scale, would mean that the waste that had already been reprocessed once was able to be reprocessed again, extending the life of the mine for potentially another 25 years. In the mid-20th century, presumably anyone with relevant expertise would have been able to assess that the waste dumps still contained gold and uranium, but would not have been able to predict the developments in technology that would lead to reprocessing and re-reprocessing, or the periods of time that would be involved. A detailed mine plan with fixed dates would not have been possible.

(c) Examples where mining companies may prefer not to relinquish fully rehabilitated land

Examples of reasons why companies may reasonably choose not to surrender rehabilitated land at the earliest possible moment may include:

- The land is required for interim purposes related to other parts of the mine, such as to provide a buffer from sensitive places or for access to infrastructure;
- To gain greater confidence that risks have been managed, for example, by undertaking ongoing groundwater monitoring for a period of years post-rehabilitation.

However, just because rehabilitated land has not yet been surrendered does not mean that it cannot be used in the meantime for post-mining land uses. It is not unusual in Australia for rehabilitated land that is still subject to mining leases to be agisted or leased for purposes such as grazing or cropping.

What would incentivise mining companies to rehabilitate sooner?

> A point made by Prof Bruce Harvey is that: …*'extractive companies should unashamedly make clear that their motive for local engagement activities is self-interest, not altruism. If transparent self-interest is not at the core of public engagement, proposals will simply not be believed and mistrust will prevail.'* [20]

In summary, this could be described as shareholder value. Translating this point to the broader context of incentivizing mining companies to rehabilitate sooner, it is a common mistake for government agencies or their consultants[21] to assume that broad and general commitments contained in individual company policies or in resource industry organization policies about rehabilitation must mean that the companies are saying they have a pure altruistic interest in rehabilitation that would occur without regard to any differences between jurisdictions in relation to obstacles and incentives.

Anyone familiar with what motivates the average corporate board will not be surprised that shareholder value drives decision-making in the modern corporation: making money, reducing costs, closing out liability and moving on to the next project, all within project timeframes, create and maintain that value. For example, mining companies can be incentivized by the ability to:

[20] Harvey, BE, *The Eye of the Beholder – Utility and Beauty in Mine Closure*, page 21.

[21] An example where the Queensland Government referred to company and organizational commitments in this way was the QTC Financial Assurance Discussion Paper (May 2017) page 2.

- Remove or minimise contingent liability from company balance sheets.[22] Other stakeholders are often unaware of the commercial significance and valuation implications of accounting standards for contingent liability or provision for rehabilitation for mining companies, but there has been considerable analysis, including specifically in Australia.[23] The primary driver for this is to be able to relinquish and move on, within a reasonable period and in the context of clear and reviewable procedures. The topic of managing ongoing liability risks is explored in further detail later in this paper.
- Cease providing financial security (which may be upon having made a final residual risk payment, if there are residual risks).
- Achieve possible other cost reductions, such as through tax or rental systems.
- Make a capital gain upon sale of freehold land. (This is not currently a significant factor that has traditionally been taken into consideration in the Queensland mining context, but capital gains have been achieved elsewhere, as described in some of the case studies above.)

A step forwards in Queensland

Following the Auditor-General's report in 2014, the Queensland Government released a series of discussion papers during 2017,[24] including:

(a) A Review of Queensland's Financial Assurance Framework, prepared by Queensland Treasury Corporation (April 2017);
(b) Financial Assurance Framework Reform Discussion Paper (May 2017);
(c) Better Mine Rehabilitation for Queensland Discussion Paper, prepared by EHP (May 2017).

Further papers and guidelines have been foreshadowed. . Also, on 25 October 2017, the *Mineral and Energy Resources (Financial Provisioning) Bill 2017* was introduced to the Queensland Parliament. This Bill lapsed upon a warrant having been issued for an election, but, following the re-election of the Australian Labor Party, it can reasonably be expected that the Bill will be re-introduced in the first quarter of 2018.

In contrast with the current position, the EHP Discussion Paper *Better Mine Rehabilitation for Queensland* now does propose that:

- *'regional plans and local planning schemes contain valuable information about surrounding uses, values, opportunities and future vision for the land. Rehabilitation outcomes that conflict with these planning strategies are unlikely to constitute an appropriate post-mining use. Rehabilitation may include retaining built infrastructure, such as roads, dams and buildings that will have ongoing value for the landholder or community.'*
- *'An amendment process will be available should the operator need to change the plan due to new rehabilitation methods becoming available, market variations or alternative land uses being identified.'*

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[22] Australian Accounting Standard AASB 137 *Provisions, Contingent Liabilities and Contingent Assets* (as amended); note that entities that comply with AASB 137 as amended will simultaneously be in compliance with IAS 37 as amended.

[23] For example, Ferguson A and Walker A, *Restoration and rehabilitation provisions in the Australian materials and energy sectors; Estimation and valuation implications,* 2011, University of Technology, Sydney.

[24] All of these papers are available at https://www.treasury.qld.gov.au/growing-queensland/improving-rehabilitation-financial-assurance-outcomes-resources-sector/better-mine-rehabilitation-queensland/.

It is pleasing to see from these quotes, indicating a dawning acknowledgement that:

- There may be more appropriate post-mining land uses than converting the land to natural vegetation and habitats;
- It might actually be worth looking at local planning instruments in that regard; and
- Local areas can change over the half-century lifetime of a mine, so planning for post-mining land uses might need to change too.

These are welcome steps in the right direction. Implementing these proposed changes will be important to all stakeholders with an interest in the land:

- For local communities and landowners, there is an interest in land being restored to productive land uses characteristic of the neighbourhood;
- For government agencies that have an interest in achieving revenue from economically productive land uses and minimising liability (including local governments).
- For mining companies, in terms of minimising risk and liability post-relinquishment, as outlined above.

Of course, turning around what has happened in policy terms over the last 17 years is still going to be difficult. Also, the framework for managing this greater variety of post-mining land uses is still under construction. However, it is a start, as we demonstrate below.

An important point made by Harvey (2016) is that: '*what will most determine long-term success is a post-closure use that subsequent users really want and will take ownership of.'* In more detail, he has explained: '*Successful closure scenarios, even those based on environmental values, invariably involve a continuing human presence with economic returns…this continuing human presence provides the best motivation for, and monitoring of, post-closure integrity.'*

In a nutshell, people will buy rehabilitated land if they can make money from it. If people buy land and make money from the land use, that commercial interest is the best guarantee for ensuring day-to-day careful management of the land, exactly the same as with countless redevelopments of former manufacturing land. The new landowner has a vested interest in protecting their property by monitoring for any residual environmental effects of the mining on the post-mining economic land uses.

Obviously, any risks of a catastrophic event (such as an earthquake), causing off-site damage, must be put to one side in this analysis. These are risks which can be covered by the mining company's residual risk payment to the government, for the purpose of the government's insurance cover, which is a mechanism that has already worked successfully overseas, for example, in Canada and New Zealand.[25] (This is similar to the approach proposed to be adopted by the Queensland Government, as foreshadowed in its discussion papers in 2017.)

The Collingwood Park case

Collingwood Park is a residential suburb of the City of Ipswich, located near Redbank in south-east Queensland. A large proportion of the suburb is located on land that was previously an underground

[25] Case studies in jurisdictions such as New Zealand and Canada are provided in Bowden, Lane and Martin (2001).

coal mining area. At the time that a relevant coal mining lease was granted in 1967, the land was owned by the Queensland Housing Commission (QHC), a government-owned public housing developer. QHC objected to the coal mine; conversely, when the land was later proposed to be rezoned and developed for residential purposes, the coal mining company (Westfalen) objected to residential development, stating: '*any residential development which was allowed upon the subject land could be deleteriously affected in the future by underground mining operations already conducted and to be conducted in future years*.'

Critically, when the local government proposed to rezone the land for residential redevelopment, the local government did not have details about the design of underground pillars relevant to subsidence, which was information that the State had, because the mine had provided accurate mine plans to the State and regular mine inspections had been by State officials. The State's mine subsidence report submitted to Council also did not inform Council of the risk. Rezoning in Queensland was a two-stage process, with the second stage being by the Governor-in-Council (ie, at State level).

Land that was developed for residential purposes was subject to major subsidence. The State set up a compensation scheme for residents within subsidence area. Other residents, whose properties were located close to the subsidence, but not directly within the subsidence area, instituted proceedings in the Queensland Supreme Court. The case was *Butler v The State of Queensland,*[26] and it was heard in 2013.

The State contended, in its defence, that the residents could have taken steps to protect themselves, by making enquiries and searches and obtaining geotechnical reports. The State also sought to blame the local government. The Supreme Court did not accept those arguments. In relation to the local government, the Court held that '*local government entities make assessments as to the risk of subsidence to future buildings on that land based on the conditions imposed on any mining grant, having been properly supervised and enforced during mining operation. Local government entities have no* way of *ascertaining whether there has been compliance with the conditions, other than an acceptance the defendant* [ie, the State] *will have complied with its statutory obligations*.' [paragraphs 125 and 126]. In relation to the residents, while the Court noted that they could have undertaken searches showing the fact that there were historic mining leases or commissioned their own reports, there was no reasonable way that they could have obtained information on the 'crucial matters' known to the State about the underground pillar design. Consequently, the Court found that the State had a duty of care to vulnerable future landowners.

The Court found that the State's duty of care was not limited to the land actually the subject of the subsidence event, but that the foreseeable risk of economic loss extended to residents located nearby, provided that there was a sufficient relationship that the damage claimed was not too remote.

Interestingly, the Court did not accept the residents' argument that, just because there was a duty of care, this automatically meant that the duty extended to remedial action. In particular, the Court did not accept that back filling would have been a reasonable rehabilitation option. The Court contrasted backfilling that had been undertaken in Newcastle, New South Wales (outlined in Example 2 on page 3 of this paper) with the situation at Collingwood Park, where the costs would have been 'astronomical' and consequently 'unreasonable' (paragraph [157]]. As noted above, the underground mining at Collingwood Park was at a greater depth than in Newcastle, backfilling would have caused significantly

[26] [2014] 2 Qd R 423.

greater disruption and redevelopment was for different purposes. One reason why this finding was of particular interest is that it has been frequently argued by anti-mining activist groups that backfilling should always be required,[27] which is not only illogical (as explained on page 8 of this paper) but also contrary to the findings of the Queensland Supreme Court after assessing expert evidence on the issue.

The Court found that the State had been negligent and required compensation of those residents whose properties were located closest to the area of subsidence.

The need for a simple, transparent mechanism to alert landowners and local governments to constraints

The Collingwood Park case was heard and decided by the Queensland Supreme Court in 2013. If a similar situation was to arise today, there is still no simple search mechanism for the local governments or subsequent landowners to ascertain post-mining constraints or risks such as subsidence. They would still be expected to have to work through the right to information process in the hope of finding anything relevant in boxes of historic documents and then seek their own expert advice on the relevance of that information, which the Court has already said five years ago was unreasonable. The only alternative to this is that the State would have to be making a mistaken assumption that all land that has been mined, successfully rehabilitated and relinquished in the future would have no constraints at all (for example, that it has been completely backfilled to the original landform, by taking fill from somewhere else), which the Court noted would be an 'unreasonable' approach for sites such as at Collingwood Park.

This is despite the fact that EHP's own rehabilitation guideline set out in a footnote a commonsense way that this could have been achieved. The guideline states: '*the rehabilitated land may need to have constraints placed on its future'* (page 10). Footnote 7 states: '*The administering authority is considering extending the concept of a site management plan to ensure appropriate post-surrender land management where contamination is not an issue. The intent is to require a third party to implement a management plan prepared by the mine operator to minimise future risk. Funding (if not covered by the compensation agreement) and the third party's level of responsibility for the management plan will require further consultation.'* This was from a suggestion that the Queensland Resources Council discussed with EHP's predecessor (the former EPA) in 2005.[28]

All that would be needed is to take Queensland's existing legislative framework for contaminated land and extend it to other constraints such as subsidence and erosion. This legislative framework in relation to contaminated land already applies to contaminated land located on current or former mines in Queensland, but only to the topic of contaminated land.If the framework was to be extended beyond contaminated land, then any additional ongoing constraints, such as whether particular slopes should only be grazed lightly to minimise the risk of erosion, could be articulated in site management plans[29], binding on successors in title, which could then be enforced.

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[27] For example, the submission by Lock the Gate Alliance Ltd to the Senate Standing Committee on Environment and Communications, 10 April 2017.

[28] At a biannual workshop between the former Environmental Protection Agency and the Queensland Resources Council on progressive rehabilitation (Mackay).

[29] Defined in Section 370, Environmental Protection Act 1994 (Qld).

A breach of the site management plan by a future landowner would not mean that the mining company is liable for the landowner's breach. This would give mining companies greater confidence to relinquish and enable beneficial re-uses of the land, in exactly the same way as owners of historic manufacturing sites have put in place site management plans for contaminated land, where that land is nevertheless able to be redeveloped for beneficial subsequent land uses, subject to appropriate management constraints.

Site suitability statements could set out not just the immediate proposed post-mining land use, but any other land uses for which the land would be suitable without further work, and would be binding. If the landowner later decides to develop the land for something not contemplated, the landowner would still have the freedom of choice to do further rehabilitation work, subject to State referral, to process a development application.

Critically, the contaminated land framework, suitably adapted would enable simple, cost-effective searches. We need to have no more Collingwood Park situations. Preventing another Collingwood Park scenario is only going to happen if there is a legislative framework for convenient, searchable transparency.

In summary, this solution would satisfy legitimate interests of a range of stakeholders:

- For local governments - confidence about administering future land uses on mined land - unlike the Collingwood Park situation.
- For the State - jurisdiction to **enforce management** of post-mining risks such as subsidence and erosion.
- For mining companies – confidence to rehabilitate and relinquish sooner with risks managed.
- For future landowners (and neighbours) – a transparent and searchable system, while facilitating further land use changes if the landholder chooses to undertake further work to remove constraints (just as developers can choose to do with contaminated land).

Unfortunately, the *Mineral and Energy Resources (Financial Provisioning) Bill 2017 (Qld)* did not address these issues. It provided for a system of rehabilitation planning to replace the current system of plans of operations, but still failed to provide for a transparent system of post-relinquishment plans and suitability statements. This issue needs to be addressed before the State's rehabilitation objectives can expect to be achieved.

Development assessment and transition mechanisms for post-mining land use

A special problem in Queensland is the mismatch of legislative frameworks and pre and post mine jurisdiction for land use approvals. In most jurisdictions around the world, the same government agencies and courts that administer mining also assess other land uses, but in Queensland, EHP sets out post-mining land uses as part of rehabilitation requirements in EAs under the EP Act, contrasted with the situation post-relinquishment when local governments and State planning agencies are primarily responsible for regulating post-mining land uses under the Planning Act.

Apart from an exception for non-indigenous heritage and a partial exception for building work, the Planning Act does not apply to development authorised under the MR Act under Section 4A. The

exemption is not only for mining as such, but also covers associated activities such as quarrying on the mining lease (section 236 of the MRA) and potentially a variety of additional purposes (section 298 of the MRA).

There are no transitional mechanisms to transfer government administration for a variety of valuable infrastructure to the next landowner, when the freehold land is assigned, after relinquishment of the mining lease. To take a typical example, if the next landholder wants to retain a selection of the mine's clean water dams either for stock watering or for maintaining erosion and sediment control, these would have been regulated dams under the mine's environmental authority (EA). However, once the EA is surrendered, there is an entirely separate regime for farm dams and referable dams administered by the Minister administering the *Water Act 2000* (Qld). Similarly, if the next landowner wants to continue to operate the mine's quarry, which has previously been automatically authorised as part of the mine under Section 236 of the MR Act, under the EP Regulation the quarry is not even listed on the mine's EA, and so normally there are no conditions specific to the quarry. Post-relinquishment, the quarry would be an existing lawful use with no development permit conditions for the local government to administer. Queensland is far from being the only jurisdiction that lacks a simple and transparent framework for the transfer of regulatory administration of infrastructure, when the infrastructure ceases being operated by a mining company but will be retained on the land. Murphy (2016) discusses similar issues in Western Australia, but the Western Australian government has already gone further down the reform path with its Land Administration Amendment Bill 2016 (WA).

However, in Queensland, given that rehabilitation is part of the mining activities under the Environmental Protection Act 1994 (Qld), and rehabilitation is treated as including the transformation to a post-mining land use under EAs, it is also unclear where the demarcation lies between EHP jurisdiction for the mining company's rehabilitation and the local government's jurisdiction to assess post-mining land uses that are not already existing lawful uses or accepted development. For example, if a post-mining land use is going to be an underground adventure park as in Germany, does the local government get to issue the development permit and then EHP adapts its conditioning to the local government requirements, or vice versa? Who gets to "pull rank" and how is this coordinated?

In many ways, the *Mineral and Energy Resources (Financial Provisioning) Bill 2017 (Qld)* (if re-introduced without appropriate corrections) would make this situation even worse. For example, it defines a 'post-mining land use' as meaning the purpose for which the land will be used 'after all environmentally relevant activities carried out on the land have ended'.[30] Absurdly, this would mean that post-mining land would be the only land in Queensland where all 'environmentally relevant activities' are prohibited. Even national parks can have 'environmentally relevant activities' such as sewerage treatment and the like. Grazing land often has these activities, such as small quarries. Much of the infrastructure that future landowners would be likely to wish to retain would be 'environmentally relevant activities'.

The Bill also makes an absurd assumption that land is only in a 'stable condition' if 'there is no environmental harm being caused by anything on or in the land', which ignores the fact that mines often can and should co-exist with third party activities over which the mine has no control (such as powerline easements, substations, railways, roads) and, if more innovative post-mining land uses are developed as outlined earlier in this paper, post-mining land uses could include industrial re-development.

[30] Section 99.

Assessing residual risk and the interface with delays

At present, in the Queensland system, EHP bears the political risk if anything goes wrong with either the relinquishment process or the progressive rehabilitation certification process, potentially long after the original decision-maker signed off. If you have responsibility for signing off on surrender of an environmental authority, which is a prerequisite to mining lease surrender and even if the residual risk is remote, EHP is going to be in trouble if anything later goes wrong. If the relevant risk is only about contaminated land, this is a risk that can still be controlled, because there is a system under EHP jurisdiction in relation to those issues, but this is not covered if the risk is about something else, such as erosion or subsidence, as discussed earlier in this paper.

In Queensland, EHP also is not the agency that stands to benefit directly from the conversion of mined land to other economically productive land uses. Queensland Treasury, maybe line agencies such as Forestry, or local governments might be looking forward to potential revenue from the next land use, but that is not an EHP interest, at least not directly. With no statutory timeframe to process an application for relinquishment or progressive certification, there is little incentive for EHP to ensure a procedurally clear, timely and cost-effective system. The same issue with extreme risk-averseness leading to procedural delays and costs that present a disincentive to companies from carrying out earlier rehabilitation, is an issue that has repeatedly arisen in other jurisdictions where an environmental regulator has the administrative function of deciding whether a site can be relinquished, without a clear framework that includes timeframes and supporting expertise, for example, refer to Pershke (2017). Queensland Treasury Corporation has been doing some work on a proposed system that would involve an expert panel to assess any risks and ensure that the mining company has paid for any necessary ongoing insurance that the government may need to hold, loosely based on a model derived from Bowden, Lane & Martin, and this would be a step forward (that is, a partial solution), particularly for bringing some expertise into the framework. Further papers are expected from the Queensland Government in the future on these issues. They would also need to address some other issues, for mining companies and their local communities to have confidence in the system, such as:

- Statutory timeframes;
- Ensuring that any part of a company's residual risk payment that relates to ongoing constraints on the land that the future landholder will be managing, goes directly to the landholder rather than being held up by the government, and that the landholder is not unreasonably constrained about the use of those funds – bearing in mind that when a developer takes over a contaminated former manufacturing site, the developer is able to deal directly with the former owner in relation to those issues (rather than having to beg for funds from the government).[31]
- A whole-of-government approach to ensuring that the government's interest in converting land to economically productive post-mining land uses is implemented, rather than being constrained by a line agency's risk aversion.
- Mining companies will not be able to achieve their objective of closing off liability post-relinquishment (and consequently, will continue to have an inadequate economic incentive to rehabilitate and convert land to post-mining land uses earlier), unless the Queensland government is able to provide certainty for the companies, their parent companies, investors and management, that they will not be subject to 'chain of responsibility' environmental protection orders post-relinquishment. At present, this remains a concern in Queensland,

[31] This is a complex topic that is beyond the scope of this paper to address in detail.

particularly due to the *Environmental Protection (Chain of Responsibility) Amendment Act 2016* (CoRA) which came into effect on 27 April 2016.

- Third party landowners, purchasers or proposed purchasers of mined land, who will have the responsibility for operating post-mining land uses, should be treated differently by any expert panel than 'the community'. The real expertise of graziers in operating commercial grazing land is not in the same category as a 'community' activist living in a capital city, who has no expertise in either the post-mining land use or local conditions. The same applies to a developer who will be converting land to an industrial estate or some other innovative development. The role of a local government in administering its planning scheme for the land post-relinquishment (or a State agency with responsibility for land use planning in a specific area, such as the Coordinator-General), also needs to be addressed properly, and not just as a factor for the environmental regulator to consider taking into account.

Conclusion

Development of economically productive post-mining land uses requires partnering. Planners, developers, local governments and local communities need to have a system that enables their input into post-mining land use, including commercial opportunities. The long-term successful outcomes that have already been seen elsewhere are only going to be seen in Queensland if there is a seamless interface pre and post relinquishment and genuine partnering.

The Queensland reforms are a work-in-progress, with some positive signs. But to foster and create economic benefits after mining, more changes need to be made than had been reached at the stage of the (lapsed) *Mineral and Energy Resources (Financial Provisioning) Bill 2017*. This paper is an attempt to reframe the legislation and policy beyond the current proposed reforms to ensure that productive land use can occur on post-mine land in a context that manages the risks and encourages investment.

Appendix - The Context – Reviews and reforms around Australia

Around Australia, each of the other jurisdictions that has a significant and mature mining industry is currently undertaking a review, or has recently undertaken a review of its mine rehabilitation and associated financial security arrangements:

(a) In **Western Australia**, the Audit Office released a report in 2011[32] finding that:
'Stronger requirements for mine closure and rehabilitation planning have been introduced to reduce the risk of poor end-of-mine outcomes. However, the State is still exposed to significant financial risks:

- *From 1 July 2011, all new mines need a costed rehabilitation plan. Existing mines will have to comply with this by 2014.*
- *Financial securities held by the State against poor environmental outcomes account for only 25 per cent of estimated total potential rehabilitation costs. Options to reduce this exposure are being considered with a decision on the preferred option expected in 2011.'*[33]

The report also criticised the Department of Mines and Petroleum's monitoring, enforcement and reliability of records.

(b) The **Northern Territory** Government introduced a requirement for rehabilitation to be secured 100% by bonds in 2005 but decided in 2013 that its primary problem was with historic 'derelict' sites and introduced a tax levy on mines and exploration operations in 2013 to raise funds to address those historic sites.

(c) In **Victoria**, the final report from the Hazelwood Mine Fire Inquiry 2015/2016 on *Mine Rehabilitation* (Vol IV), criticised the data available from the government, which made it difficult to assess whether rehabilitation liability was secured adequately or inadequately,[34] and recommended amendments to the government's Bond Policy. In addition, the report noted that:
'*The Board finds that the current regulatory system is ill-equipped to solve complex problems regarding rehabilitation. An effective regulatory system requires:*

- *Transparency*
- *role clarity*
- *systematic processes*
- *clear definitions and criteria (including for progressive and final rehabilitation and closure)*
- *timelines and milestones*
- *stakeholder engagement and community consultation*
- *monitoring and review processes.*

Independent expertise and advice is essential to addressing rehabilitation issues in the Latrobe Valley.'[35]

[32] Western Australian Auditor General's Report, *Ensuring Compliance with Conditions on Mining* (September 2011).
[33] Page 9.
[34] Page 196.
[35] Page 196.

The Board also recommended the establishment of a post-closure fund, with contributions from both mine operators and the State government.[36]

In April 2016, the Victorian Premier announced that bonds would need to be substantially increased.[37] The government also agreed to develop a region-wide strategy for the rehabilitation of the coal mines and to reform state mining laws and establish an independent commissioner to oversee mine rehabilitation and carry out an inquiry to determine the exact costs of cleaning up the mines once they close.

(d) In **South Australia**, the Minister for Mineral Resources and Energy announced a comprehensive review of South Australia`s mining legislation, including in relation to 'financial assurance models that maintain community confidence in mine closure and environmental rehabilitation performance and outcomes' in 2016,[38] and a series of discussion papers have started to be released for public consultation.

(a) The **New South Wales** Audit Office has released a similar report in May 2017, entitled '*Mining Rehabilitation Security Deposits'*, finding that: '*The security deposits the Department holds are not likely to be sufficient to cover the full costs of each mine's rehabilitation in the event of a default.*'[39] A new financial calculator had just been released, but the Audit Office found that this could be further improved by considering planning approvals, insurance options, verification of costs and engaging in stakeholder consultation. The report criticized the fact that there was also no residual risk payment framework to manage any ongoing risks post-relinquishment (unlike Queensland).[40] The report found that the criteria for mine closure outcomes were not sufficiently clear and specific, and noted that the Department had commenced a review to try to improve this situation. While mining companies provided annual reports on the progress of their rehabilitation, the Audit Office criticized the lack of review and monitoring of these reports and the unreliability of the Department's data. Finally, while the report recognized that there can be many valid reasons why a mining company may need to put a mine into 'care and maintenance' temporarily, there was criticism of mines being 'indefinitely' put into 'care and maintenance'.[41]

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