

16 February 2018

The Director  
Resources Policy  
GPO Box 39  
Sydney NSW 2001

Dear Sir/Madam

**Re: Mine Rehabilitation Discussion Paper submission**

Thank you for the opportunity to comment on the review of mine rehabilitation regulation in NSW.

Verterra is Australia's first full service Ecological Engineering Company. Ecological engineering involves the design, construction and management of sustainable ecosystems that integrate society's needs with the natural environment for the benefit of both. We turn risk into value for organisations seeking positive economic, environmental and community outcomes. Verterra combines practical experience with scientific knowledge of soils, vegetation and water to design customised solutions for complex environmental and industrial problems.

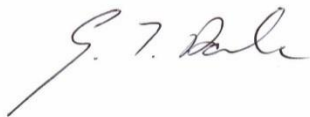
Verterra has integrated capabilities in research, consulting and operational program delivery. We service a wide range of industry sectors including mining, oil and gas, power and energy, water resources, forestry, bioenergy, agriculture, natural and renewable resources. Carbon abatement is a common theme across all sectors.

We work extensively with the mining industry in Queensland, and have provided services on mining projects in the Northern Territory and Western Australia. We have previously been involved in mine rehabilitation research in NSW, but have no current projects.

Among our recent work, we are in the process of finalising an ACARP funded project into rehabilitation of dispersive mine spoil, an issue of considerable significance to the Queensland coal industry. This work was supported by five Tier 1 Queensland mining companies, and has included preparation of a set of Best Management Practices for rehabilitation of dispersive spoil. The work also has direct application to improved rehabilitation practices for non-dispersive spoil.

We welcome the move by NSW to undertake a review of mine rehabilitation regulation, and trust our comments are of value in this process. Should you have any questions, please don't hesitate to call me on (07) 3221 1102.

Yours sincerely



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## Assessment Phase

### *Assessment process*

Verterra supports evaluation of the potential environmental, social and economic impacts associated with mining development applications during the assessment phase. However, we suggest that this is a limited evaluation limited to impacts rather than opportunities for positive outcomes as well. In this regard, we suggest that best practice assessment may include an evaluation of both impacts and opportunities along the lines of the Five Capitals Sustainable development framework<sup>1</sup> or the SUSustainable OPERations (SUSOP) framework<sup>2</sup>. These frameworks provide a more holistic approach to project evaluation, and provide the opportunity to identify and plan for and incorporate positive social, environmental and economic opportunities into new mining developments, in addition to minimising impacts.

### *PROPOSAL 1: Adopt policy principles to guide the regulation of mine rehabilitation*

Verterra supports the proposal to adopt policy principles to guide the regulation of mine rehabilitation provided these establish outcomes (principles), not outputs (prescriptions) on the basis that an outcome-principles based approach to policy will generate innovation.

We support the objective of beneficial post-mining land use on the basis that this will occur where party sees value in the rehabilitated land, is prepared to take over the liability and provide active on-going management. This should be considered an independent, market-based indicator of successful mine rehabilitation. Of course the corollary, that there is no party willing to take on the responsibility for rehabilitated land, suggests that rehabilitation may be unsuccessful, the inherent pre-mining land value has not been restored, or that the risk of future liabilities outweighs the value of the land.

We recognise the significant challenges associated with rehabilitation of and final voids. An additional solution not specifically mentioned is the opportunity to link with solar power generation for pumped hydro storage developments<sup>3</sup>. We also suggest the opportunity may be often missed or not considered to use the mining process to achieve backfilling of final voids by mining along the strike as opposed to the conventional approach of mining down the strike. We appreciate this has many complex implications that require consideration, but suggest that it should be actively considered and evaluated as an option. Moreover, this recognises the importance of planning for closure at the mine development planning stage.

In relation to the specific policy principles outlined in Table 1:

In relation to Point 2(b), we suggest that where a final rehabilitation outcome is some form of natural system, this successful mine rehabilitation should also be self-sustaining/self-annealing, i.e., not require active ongoing maintenance. This expands on the definition of “environmentally sustainable and reflects the nature of natural, as opposed to engineered systems.

In relation to point 3(f), we reiterate the point that assessment of post-mining land use outcomes and risks should also include evaluation of the opportunities that may arise from active, beneficial land management, and should consider application of the Five Capitals<sup>1</sup> or SUSOP<sup>2</sup> frameworks.

<sup>1</sup> Forum for the Future. The Five Capitals (2005) [cited 2014 20 December]. Available from: <http://www.forumforthefuture.org/project/five-capitals/overview>.

<sup>2</sup> Corder, G. (2013). Developing Better Projects through the Early Identification of Sustainability Opportunities and Risks. In: Proceedings of Chemeca 2013 : challenging tomorrow : 29 September – 2 October 2013, Brisbane Convention & Exhibition Centre, Queensland / Chemical College, Engineers Australia.

<sup>3</sup> Blakers, A., Stocks, C., Lu, B., Anderson, K. and Anna Nadolny, A. (2017). An atlas of pumped hydro energy storage. <http://re100.eng.anu.edu.au/research/phes/>

In relation to Discussion Question 1.3, we suggest that the mining rehabilitation policy principles should put greater emphasis on recognising mining as a temporary land use. This would assist in re-setting the public and private culture around perception of mining, drive the principles of mining rehabilitation objectives and provide an improved framework for recognising and addressing externalities in the cost of mine rehabilitation.

*PROPOSAL 2: Develop a policy framework for the assessment of final voids*

In relation to Question 2.1, it is appropriate that retention of final voids with no beneficial use and/or are likely to result in negative environmental impacts, should only be considered as a last resort provided this provision is not abused. Retention of a final void should only be justified in exceptional circumstances. Again, a holistic evaluation framework such as Five Capitals or SUSOP should provide a clearer path to evaluation of this question.

The pathway suggested by Question 2.5 of allowing a number of final landform options for final voids is considered appropriate for the reasons stated above, that it makes use of the Five Capitals or SUSOP holistic framework approach.

*PROPOSAL 3: Improve consideration of rehabilitation and closure in the early stages of mine planning*

Verterra agrees that rehabilitation and closure considerations and plans should be considered and integrated into the early stages of mine planning. This is undoubtedly best-practice, and offers the potential to achieve better outcomes for all parties, mining companies and the community alike, by maximising the opportunity to most efficiently realise positive environmental, social, and economic outcomes that may be identified in the early planning stages through a holistic evaluation framework such as Five Capitals or SUSOP. Retrofitting rehabilitation or beneficial use outcomes at the end of the mining process can only add cost and inefficiency.

*PROPOSAL 4: Ensure rehabilitation requirements are clear and enforceable*

Verterra considers that guidance on the development of more detailed rehabilitation and closure objectives and criteria in management plans would be of value to many mines, who may often be reluctant to engage on closure issues due to uncertainty.

Additional aspects of rehabilitation requirements that may be considered at the assessment phase might include:

Minimising negative impacts and maximising positive impacts that may be identified through a holistic planning framework such as Five Capitals or SUSOP. For example, a development should ensure overall net positive improvements to financial, manufactured, social, human and natural capital.

Clear, unambiguous guidelines should also be able to be provided around water quality (e.g., consistent with ANZECC standards) and erosion (not greater than natural erosion rates (if applicable) for similar landforms).

## **Operational Phase**

We note concerns over adequacy of annual environmental reporting; ability of government to adequately gauge rehabilitation effectiveness; lack of processes to assess rehabilitated areas and verify the quality of rehabilitation. With the capacity of new tools to assess such parameters as vegetation cover, vegetation health, erosion, accretion, many parameters that were historically point sampled in a qualitative manner can now be assessed comprehensively over broad areas on a quantitative basis. Application of these tools also has significant benefits in site characterisation, planning for rehabilitation; and early identification of poorly performing areas for timely remedial works, hence minimising liabilities and cost. It is recommended that rehabilitation criteria be quantitative as far as possible to both provide greater

certainty to mine staff and greater capacity for Government to effectively gauge rehabilitation progress. This should also have the benefit of delivering improved rehabilitation at lower cost.

*PROPOSAL 5: Ensure that regulatory process that occur once a mine has been approved are transparent and deliver consistent rehabilitation outcomes*

In relation to Question 5.2, we suggest other changes to improved performance monitoring during the operational phase should include improved quantitative assessment of key factors that influence KPI's relevant to the Five Capitals of SUSOP frameworks. For example:

- Natural capital: Soil erosion, Water quality targets; Vegetation cover, diversity richness
- Human capital: Expertise and upskilling of environmental staff
- Social capital: Post-rehabilitated land value to regional community
- Manufactured capital: Rehabilitated land use value
- Financial capital: Alignment with commercial expectation

### **Post Closure Phase**

We note the concerns regarding post closure issues, particularly the absence of financial assurance held over the risk of significant unexpected environmental degradation. We suggest this is a key and powerful driver for rehabilitation to productive post-mining beneficial use outcomes where another, independent party assesses the risk and takes over active management of the land, minimising the risk of either significant unexpected environmental degradation, or gradual post-mining deterioration.

In relation to Question 6.1, other regulatory reforms required for the post-closure phase might include qualitative demonstration over a defined period that rehabilitation continues to meet clear, quantitative specified criteria and expected performance trends with a high level of statistical confidence.