

**Selwyn District Plan
RM185622**

**Bathurst Resources Ltd
Canterbury Coal Mine**

Terrestrial Biodiversity

Supplementary Evidence of

Mike Harding

Environmental Consultant

27 October 2021

Contents

Introduction	1
Extent and Significance of Wetland Loss.....	1
Effects of Clearance	3
Extent of Compensation.....	3
Achievability of Compensation	5
Sustainability of Compensation.....	5

Introduction

1. This evidence is supplementary to the evidence I provided in September 2021¹. Introductory statements, such as my qualifications and experience, are set out in that evidence and are not repeated here.
2. Since preparing that evidence, I have read other evidence, notably that of Dr Bramley² and Dr Grove³, participated in witness caucusing, read the Summary Statement of Dr Bramley⁴, and thought further about the actions that would most effectively compensate for the loss of indigenous biodiversity at Bathurst's Canterbury Coal Mine.
3. In this supplementary evidence I discuss further the extent and nature of the loss of indigenous vegetation and habitat (indigenous biodiversity), and provide further evidence on the achievability and sustainability of compensation for that loss.

Extent and Significance of Wetland Loss

4. My evidence⁵ considered the effects of activities associated with the Northern Final Constructed Engineered Landform (North ELF). I now understand and acknowledge that there are other activities for which retrospective consent is required from Selwyn District Council. These include activities which may have affected seepage wetlands on upper slopes north-west of the Mine Operating Area (MOA) (the NW seepages), and the effects of discharges from the MOA on downstream indigenous biodiversity, notably in Tara Stream. These effects are discussed by Mark Davis⁶, and addressed in the evidence of Dr Meredith⁷ and Dr Grove⁸.
5. In this supplementary evidence, I do not attempt to quantify the downstream effects on wetland habitats, as I am unfamiliar with details of the nature and extent of those effects.
6. The NW seepages have been affected by the loss of the upper slopes, rather than the loss of all parts of the ecosystem (as at North ELF). The remaining downstream parts of those seepage wetlands may be adversely affected by consequent changes in hydrology. I am unaware of any formal baseline survey or subsequent monitoring.

¹ Evidence of Michael Harding, 22 September 2021.

² Evidence of Dr Gary Bramley, 1 October 2021.

³ Section 42A Report, Dr Philip Grove, 21 September 2021.

⁴ Summary Statement of Dr Gary Bramley, 26 October 2021.

⁵ Evidence of Michael Harding, para 8.

⁶ Davis, M. 2020. Canterbury Coal Mine terrestrial ecology peer review, paras 65 and 132.

⁷ Section 42A Report, Dr Adrian Meredith, e.g., paras 48-50.

⁸ Section 42A Report, Dr Philip Grove, para 24.

Adverse effects on these wetlands could be subtle and the manifestation of any changes may take some time.

7. The extent of the loss of seepage wetlands has been calculated to be 1.42ha⁹, 1.17ha¹⁰ or 1.2ha¹¹. I have not independently calculated the extent of loss of seepage wetlands. As stated in my evidence¹² I believe that it is ecologically inappropriate to consider the wetland plant community in isolation from the associated vegetation and habitat with which it is linked by ecological and hydrological processes.
8. It has been stated by Dr Bramley that the ecological values of the seepage wetlands “are expected to have been of low or very low ecological value”¹³. This assessment is based on the Environmental Institute of Australia and New Zealand (EIANZ) Guidelines¹⁴. Dr Bramley does not present the analysis which led to his conclusion that the ecological values of the seepage wetlands were low or very low. Therefore, it is difficult to review his assessment, although I note that there is no “very low” site value in the guidelines¹⁵.
9. The EIANZ Guidelines¹⁶ are non-statutory and have important limitations for the assessment of ecological value. The guidelines are not intended to be used for assessments of ecological significance with respect to RMA s6(c). I do not support the use of the EIANZ Guidelines in this situation.
10. The North ELF and NW seepages have been assessed as ecologically significant by other experts: Dr Grove, Dr Bramley and Mr Davis¹⁷. I concur with those assessments, with one qualification: assessments of ecological significance are of areas, not just plant communities¹⁸. At the MOA, the key attribute with respect to ecological significance was the presence of seepage wetlands. Other ecologically significant attributes were the contributions the wetlands made to the wider hydrological systems (ecological context),

⁹ Section 42A Report, Dr Philip Grove, para 23.

¹⁰ Evidence of Dr Gary Bramley, para 30.

¹¹ Andrew Henderson, S42A Report, para 19.

¹² Evidence of Michael Harding, paras 22-23.

¹³ Evidence of Dr Gary Bramley, para 34.

¹⁴ Dr Gary Bramley, as advised during wetland caucusing.

¹⁵ EIANZ Guidelines: Table 6, Scoring for sites (page 69).

¹⁶ Roper-Lindsay, J.; Fuller, S.A.; Hoosen, S.; Sanders, M.D.; Ussher, G.T. 2018. Ecological Impact Assessment. EIANZ guidelines for use in New Zealand: terrestrial and freshwater ecosystems. 2nd edition.

¹⁷ Section 42A Report, Dr Philip Grove, paras 54-57; Evidence of Dr Gary Bramley, para 36; Davis, M. 2020. Canterbury Coal Mine terrestrial ecology peer review, paras 58-64.

¹⁸ Evidence of Michael Harding, paras 19-23.

other associated indigenous vegetation (such as the scattered *Coprosma dumosa* shrubs), and the habitats that were present (of which there is very little information¹⁹).

11. Therefore, the extent of the loss of significant indigenous vegetation and significant habitats of indigenous fauna, or indigenous biodiversity generally, is greater than the extent of just the wetland plant community. The actual extent is now impossible to calculate. It could have been the whole area of disturbance, or a smaller area more directly linked to the seepage wetlands.

Effects of Clearance

12. Dr Bramley states that, when assessed against the EIANZ Guidelines, the level of effect is “very low”²⁰, based on the contention that the loss of 1.17ha of wetland is of negligible magnitude at the scale of the Whitecliffs ED. The only evidence presented by Dr Bramley on the extent of seepage wetlands in the ecological district is the Land Cover Database²¹. However, that database only reliably captures wetlands greater than 1ha in size²², so is of little value in assessing the extent of seepage wetlands.
13. I believe that a more appropriate scale at which to assess the effects of clearance is the Malvern Hills. That part of the ecological district is biogeographically distinct: it has landform, climate, hydrological, and ecological features that differ from other parts of the ecological district.
14. I am unaware of any comprehensive survey of the past or present extent of seepage wetlands in the Malvern Hills. However, it is evident from aerial photographs that a substantial proportion of that area now supports plantation forest and developed farmland. On that basis, my advice is that the adverse effects of the loss of seepage wetlands (and associated vegetation) at the MOA are more than minor.

Extent of Compensation

15. It has been proposed that the residual adverse effects of the activities associated with mining at the North ELF and NW seepages cannot be remediated. It may be difficult to re-create seepage wetlands, and more difficult to restore the ecological processes upon

¹⁹ For example, there are no data on invertebrate fauna.

²⁰ Evidence of Dr Gary Bramley, paras 40-42.

²¹ Evidence of Dr Gary Bramley, para 28.

²² LCDBv5.0, Manaaki Whenua-Landcare Research website.

which those wetlands depend. However, it appears technically possible, as indicated by re-establishment of rushland at North ELF.

16. As stated in my evidence²³, creation of seepage wetlands should be one of the actions to address the adverse effects of the loss of indigenous vegetation and habitat. If the applicant does not intend to re-create seepage wetlands and their associated ecological processes, the residual adverse effects are appropriately addressed through compensation (rather than offsetting).
17. The compensation proposed by the applicant is outlined in the Wetland Management Plan²⁴ and subsequent evidence of Dr Bramley²⁵. This plan proposes restoration of wetland habitat and associated riparian and dryland habitats at the North Property Wetland, though the values of and restoration proposed at the recently added areas are not yet documented.
18. The proposed compensation would enhance existing wetland vegetation, and enable restoration of associated riparian and dryland vegetation. However, it will be an isolated patch of vegetation/habitat that is separated from the other substantial areas of wetland vegetation by areas of plantation forest and farmland. And, it will be vulnerable to activities elsewhere in the stream catchment, as acknowledged by Dr Bramley²⁶. It will not fully compensate for the loss of the functioning seepage wetland system at North ELF, or any unconsented degradation of freshwater habitats downstream from the MOA.
19. To adequately compensate for this loss, a larger area of indigenous vegetation and habitat, and the ecological processes upon which they depend, should be restored and protected. Ideally, this would be a contiguous area of well-buffered wetland/stream habitat that contributes to the ecological values of the stream tributaries affected by activities associated with the mine.
20. A better compensation option, ecologically, would be protection and enhancement of stream/wetland/riparian habitats along Bush Gully Stream from the MOA at North ELF downstream to and including the North Property Wetland. Another option may be protection of Tara Stream and its associated wetlands downstream from Tara Pond.

²³ Evidence of Michael Harding, para 51.

²⁴ Bramley, G. 2021. Canterbury Coal Mine Wetland Management Plan, Malvern Hills, Coalgate. The Ecology Company. 34p.

²⁵ Summary Statement of Dr Gary Bramley, paras 16-22.

²⁶ Summary Statement of Dr Gary Bramley, para 19.

21. With respect to Bush Gully Stream, I understand that the section just downstream of North ELF is already fenced. And, the applicant's aquatic ecologist, Kristy Hogsden, states that wetland and habitat enhancements in Bush Gully Stream, undertaken as compensation, may improve the habitat for freshwater indigenous species, particularly Canterbury mudfish/kōwaro²⁷.

Achievability of Compensation

22. Achieving the outcomes of the proposed compensation will require a commitment to completion of the proposed restoration actions, and management of the threats that may prevent achievement of those actions and the restoration objectives.
23. Some of these threats are outlined in the Wetland Management Plan. I have identified other threats in my evidence²⁸. Additional threats of grazing and feral animals were discussed during wetland caucusing. Other external threats are likely if the compensation were to cover a larger area and include the wider ecological processes that affect that area.
24. A monetary bond should be lodged to help ensure that the proposed restoration activities are achieved. The bond should be of sufficient value to meet the costs of the proposed restoration actions, and the likely cost of managing threats. I note that a bond is part of the Proposed Land Use Consent Conditions²⁹.
25. An example of the need to ensure that restoration activities are adequately achieved is the lizard habitat restoration work undertaken at North ELF. This restoration work has failed to meet the requirements of the Lizard Rehabilitation Plan, and is at a location where it is most unlikely to achieve the plan's objectives³⁰. I am unaware of a commitment from the applicant to adequately complete this restoration work, or the existence of a bond to ensure that this compensation is achieved.

Sustainability of Compensation

26. Ensuring that the compensation is sustained over the long-term will require full control over the compensation sites to ensure they are securely protected from the adverse effects of land-use change, vegetation clearance and other threats. The most secure

²⁷ Summary Statement of Kristy Hogsden, para 13.

²⁸ Evidence of Michael Harding, paras 34-37.

²⁹ Appendix 9: Selwyn District Council – Proposed Land Use Consent Conditions 30-36.

³⁰ Evidence of Michael Harding, para 45: the proposed 2m-wide belts of tussocks are not present; and the rock piles (created habitat) are located within newly-planted pines.

way to achieve this protection is by ownership of the land and registration of a protective covenant against the property title. If land ownership is unachievable, the next best option is registration of a reputable protective covenant (such as a QEII Open Space Covenant), with a prescribed management plan and monitoring.

27. The Canterbury Regional Policy Statement and the Selwyn District Plan provide only theoretical protection for wetlands; actual protection is dependent on effective implementation of those plans. Despite the protection offered by plan rules, wetlands can be lost, as illustrated by the unconsented clearance of wetlands at the MOA. Secure legal protection is required to ensure that compensation for the loss significant indigenous vegetation and habitat at the MOA is durable.

Mike Harding

27 October 2021