

STOCKMAN BASE METALS PROJECT

ASSESSMENT

under

ENVIRONMENT EFFECTS ACT 1978

Minister for Planning

October 2014

GLOSSARY

AH Act	<i>Aboriginal Heritage Act 2006</i>
AMD	Acid and metalliferous drainage
C&LP	<i>Catchment and Land Protection Act 1994</i>
CFA	Country Fire Authority
CHMP	Cultural Heritage Management Plan
CRG	Community Reference Group
DEPI	Department of Environment and Primary Industries
DoE	Commonwealth Department of the Environment
DPI	former Department of Primary Industries
DSDBI	Department of State Development, Business and Innovation
DSE	former Department of Sustainability and Environment
EE Act	<i>Environment Effects Act 1978</i>
EES	Environment Effects Statement
EMF	Environmental Management Framework
EMS	Environmental Management System
EPA	Environment Protection Authority
EP Act	<i>Environment Protection Act 1970</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EQO	Environmental Quality Objective
ERR	Earth Resources Regulation
ESD	ecologically sustainable development
EVC	Ecological Vegetation Class
FFG Act	<i>Flora and Fauna Guarantee Act 1988</i>
GDE	Groundwater Dependant Ecosystems
GMW	Goulburn Murray Water
Ha, Hha	hectare, Habitat hectare
ITR	Independent Technical Review
km	kilometre
LOT	Large Old Tree
MLA	Mining Licence Area
MOU	Memorandum of Understanding
MRSD Act	<i>Mineral Resources (Sustainable Development) Act 1990</i>
NAF	Not acid forming
NECMA	North East Catchment Management Authority
NVMF	Victoria's Native Vegetation Management Framework
PAF	Potentially acid forming
P&E Act	<i>Planning and Environment Act 1987</i>
PCMP	Post-closure Monitoring Plan
PCTF	Post-closure Trust Fund
PMF	Probable maximum flood
PSA	Planning Scheme Amendment
SEPP	State Environment Protection Policy
SMZ	Special Management Zone
SPZ	Special Protection Zone
SRW	Southern Rural Water
TSF	tailings storage facility

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1 INTRODUCTION

1.1 Purpose of this document

This is the assessment of environmental effects (Assessment) under the *Environment Effects Act 1978* (EE Act) for the Stockman Base Metals Project (the 'Project'). It represents the final step in the Environment Effects Statement (EES) process under the EE Act by which the Minister provides advice to decision-makers on the likely environmental effects of the proposal, their acceptability and how they should be addressed in relevant statutory decisions. The Assessment is informed by the report of the Inquiry together with the EES and public submissions.

This Assessment will inform the decisions required under Victorian law for the proposal to proceed, in particular under the *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act) and *Planning and Environment Act 1987* (P&E Act). It will also inform the approval decision under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.2 Project Description

Stockman Project

Stockman Project Pty Ltd, a wholly owned subsidiary of Independence Group NL, proposes to recommission an existing underground mine (Wilga) and develop a new underground mine (Currawong) within State Forest, approximately 19 kilometres (km) south-east of Benambra in East Gippsland (see Figure). Approximately nine million tonnes of ore are proposed to be mined from underground to produce about 150,000 tonnes per year of copper-zinc-silver-gold concentrates for export over a projected nine year operating life. Tailings from ore processing would be returned underground as backfill and stored above ground in a dedicated tailings storage facility (TSF) with a permanent water cover. The preferred location for the TSF is the site previously used by Denehurst Ltd when it operated the Benambra Project, now known as Lake St Barbara.

The Project would require a range of on- and off-site ancillary infrastructure to support the mine operation, including a processing plant, access roads, pipelines, water supply infrastructure, electricity supply infrastructure, road upgrades and worker accommodation village. A detailed description of the Project is provided in Chapter 4 of the EES.

Previous Benambra Project

Legacy issues remain within the project area due to a previous mining project (Benambra Project). As this significantly influenced some of the existing conditions within the project area, it is beneficial to outline the history of this previous project.

The Benambra mine, operated by Denehurst Ltd from 1992 to 1996, involved the partial mining of the Wilga deposit. In 1996, the mine was placed into administration and mining operations ceased prior to the undertaking of any environmental rehabilitation. Following this, in 1998 the company went into administration. In its four years of operations, the mine processed 927,000 tonnes of ore producing copper and zinc concentrates along with nearly 700,000 tonnes of sulfidic tailings that were deposited to the TSF via a single spigot point located in the north-eastern section of the TSF. Due to the uneven distribution of tailings in some areas of the TSF, tailings became exposed above the supernatant water during prolonged periods of dry weather¹. In addition, it is understood that in March 1996, approximately 17 tonnes of sulphuric acid was added to the TSF supernatant water to lower the pH and enhance copper recoveries, as the supernatant water was recycled back to the processing plant via a closed loop. This resulted in the pH dropping rapidly to approximately 3 by November 1996².

¹ EES Appendix B1, p. 17

² EES Appendix B1, p. 18

In 2004, the mining lease expired and the site reverted to the State Government of Victoria. The then Department of Primary Industries (DPI) commissioned work to rehabilitate the site. Rehabilitation as described in the EES³ was successfully implemented in 2006 such that the TSF was renamed Lake St Barbara to reflect its changed status⁴.

In addition to this, the former processing site was decommissioned with all infrastructure removed with the exception of concrete foundations, however this site is also known to have some contamination from previous operations.

Monitoring at the Wilga mine post closure has confirmed a low rate of groundwater inflow into the discussed mine⁵.

Whilst rehabilitation efforts have been quite successful, the following issues remain features of the existing conditions, which will remain regardless of whether the Stockman Project proceeds:

- Ongoing risk to environment presented by existing TSF/Lake St Barbara
- Remediation required at the former processing plant site to clean up land contamination
- Current seepage from TSF at approximately 0.6 L/s⁶.

1.3 Structure of this Assessment

Section 2 of this Assessment outlines both the EES process and statutory approvals required for the proposed development. Section 3 provides an outline of the key conclusions of the assessment.

The core part of this Assessment is found in Section 4, which assesses the environmental effects of the project based on the applicable legislative and policy framework. Section 4 also outlines the evaluation objectives for this Project, including the relevant objectives and principles of ecologically sustainable development (ESD), which are used to structure the integrated evaluation of the environmental effects within this document.

Section 5 provides responses to the recommendations of the Inquiry.

³ EES Appendix B1, p. 21 to 22

⁴ EES Appendix B1, p. 21 to 22

⁵ Inquiry Report p. 44

⁶ EES p. 10-5

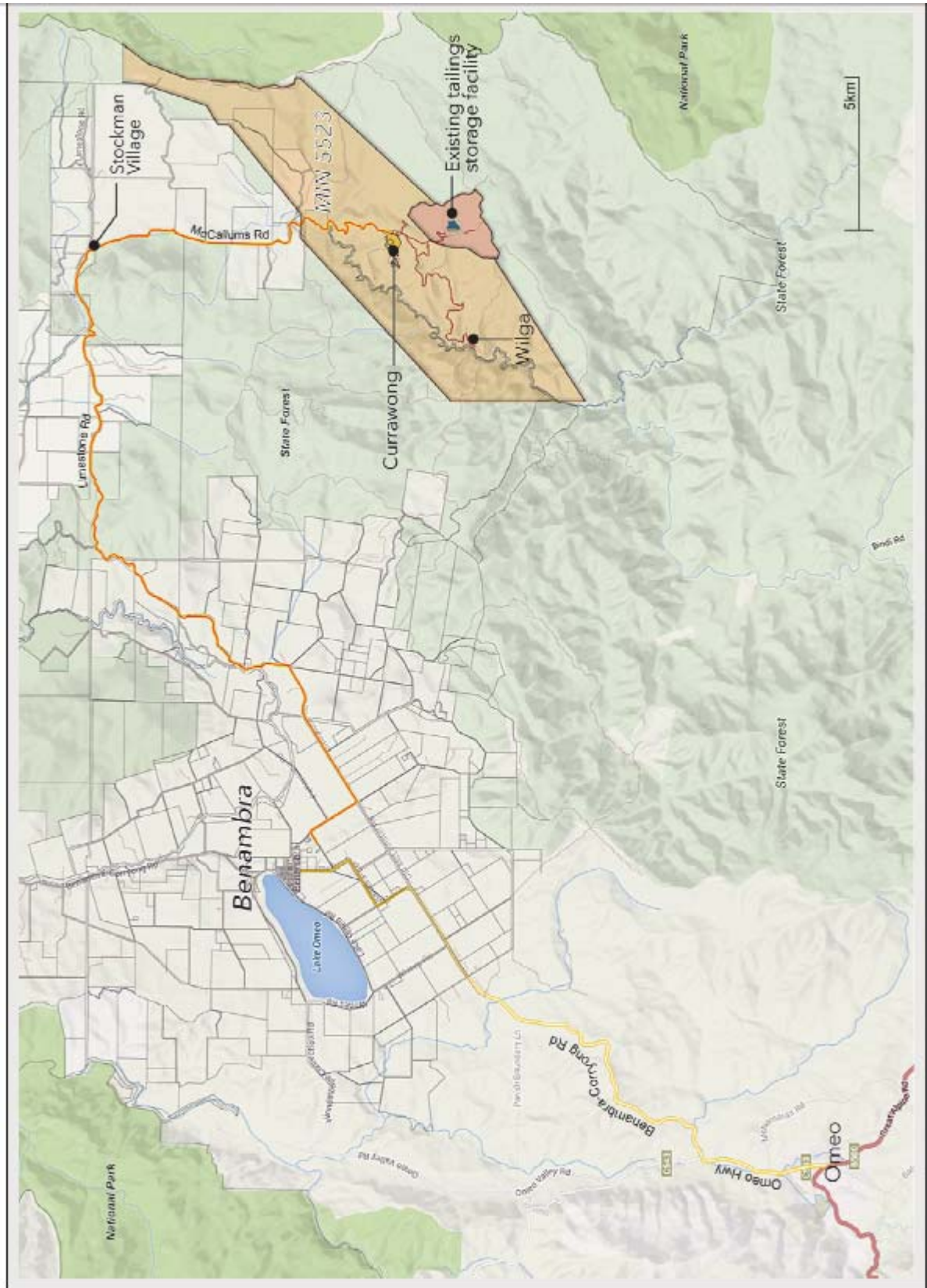


Figure 1. Stockman Base Metals Project location

2 STATUTORY PROCESSES

2.1 *Environment Effects Act 1978*

On 16 August 2010, the former Minister for Planning determined that an EES was required for the project under the EE Act. The EES has been prepared by the proponent in response to Scoping Requirements issued by the Minister for the proposal in March 2011.

The EES was placed on public exhibition, together with draft amendment to the East Gippsland Planning Scheme and draft Work Plan, from 25 March 2014 until 8 May 2014. Thirty six submissions were received, ten of which were from state and local government bodies. Details of submitters are included in Appendix B of the Inquiry Report.

The Minister appointed an Inquiry under the EE Act to review submissions and inquire into the environmental effects of the Project, in accordance with terms of reference issued by the Minister on 15 April 2014. The Minister also appointed the Inquiry members as an Advisory Committee under section 151 of the P&E Act to consider the draft planning scheme amendment (PSA) and related matters raised in submissions.

The Inquiry held a directions hearing on 20 May 2014, followed by its public hearing over six days from 23 to 30 June 2014. The Inquiry provided its report to the Minister on 2 September 2014. The report has informed the preparation of this Assessment of the environmental effects of the Project under the EE Act.

The next step is the provision of this Assessment to statutory decision-makers, who must consider it before deciding whether to grant approval to the Project.

2.2 Victorian Statutory Approvals

The Project requires a number of Victorian statutory approvals, including:

- A Mining Licence or mining infrastructure licence under the MRSD Act for the area currently excluded from the current Mining Licence area (MLA). The excluded area includes the existing TSF known as Lake St Barbara. Despite this distinction, for ease of reference the rest of this assessment will treat the "Stockman MLA" as including Lake St Barbara as it is certain that if the project goes ahead, this area will be regulated under the MRSD Act.
- Work Plan and Work Authority under the MRSD Act⁷.
- Amendment to the East Gippsland Planning Scheme under the P&E Act for project infrastructure located on land outside the Stockman MLA.
- Permits under the *Water Act 1989* to take and use water and for works on a waterway.
- Works Approvals for a proposed power generation facility and sewage treatment plant under the *Environment Protection Act 1970* (EP Act).
- Permits/licences to remove native vegetation under the *Flora and Fauna Guarantee Act 1988* (FFG Act).
- An approved Cultural Heritage Management Plan (CHMP) under the *Aboriginal Heritage Act 2006* (AH Act).

Exhibition of draft PSA and draft Work Plan was coordinated with the exhibition of the EES for the Project.

2.3 Commonwealth Statutory Approval

On 29 November 2010, the delegate of the Australian Government Minister for Environment, Water, Heritage and the Arts decided that the proposal is a 'controlled action' (EPBC 2010/5717) and therefore requires assessment and approval under the EPBC Act. The controlling provisions under the EPBC Act relate to listed threatened species and communities (section 18 and 18A).

The Victorian EES process is accredited as the necessary Commonwealth assessment process through a Bilateral Agreement between Victoria and the Commonwealth, made under Section 45 of the EPBC Act. Therefore, the EES for

⁷ The present requirement for a work authority will no longer apply when the repeal of the relevant provisions of the MRSD Act comes into effect on 1 November 2014.

the Project and this Assessment evaluate potential impacts on matters of national environmental significance as defined under the EPBC Act, and will inform the Australian Government's approval decision under the EPBC Act.

3 SUMMARY OF KEY FINDINGS

During the EES process it became apparent that the key risks to and effects on environmental assets from the Project arose primarily due to the potentially acidic nature of the tailings material to be generated and needing to be managed and stored, as well as the proposed footprint of the TSF. These hazards give rise to potentially significant effects and risks for biodiversity and downstream catchment values in particular. The tailings management strategy, including alternative locations for the TSF, were therefore identified as key matters to be examined during the EES and have shaped the Inquiry report and the structure and focus of this Assessment.

The Stockman Project will result in significant direct and indirect effects on biodiversity, primarily through clearing almost 70 hectares (ha) of native vegetation and 600 large old trees (LOTs) of which 90% is of very high or high conservation significance, supporting habitat values of a number of listed threatened and endangered species. However, as concluded by the Inquiry, the losses are considered acceptable in the context of the policy framework with appropriate offsets and mitigation in place. Provided the findings of this Assessment, as set out in the following sections, are implemented and offsets and mitigation are effective, the biodiversity effects of this Project should be acceptable.

Other significant environmental risks, in particular for catchment values, are associated with acid and metalliferous drainage (AMD) and the TSF. These risks should be managed with the assistance of a robust governance framework, including independent technical review of key aspects of the Project. However, as noted in the sections below, AMD represents a significant environmental challenge for the project that necessitates best practice engineering and design which, together with ongoing risk management, needs to be effective to address environmental security, including following closure of the mine and the TSF. This Assessment concludes that AMD-related risks are indeed significant, although they should be appropriately managed and will be subject to careful consideration by independent reviewers and regulators in assessing final applications, for the TSF construction in particular.

4 INTEGRATED ASSESSMENT

4.1 Approach to this Assessment

To provide a coherent and integrated structure for this Assessment of likely adverse environmental effects, the key aspects of relevant legislation, statutory policy and the principles and objectives of ESD⁸ have been synthesized into a set of evaluation objectives that are pertinent to the Project. A draft set of evaluation objectives was included in the Scoping Requirements for this EES, which were used by the proponent in their assessment of alternatives and effects within the EES.

Table 1 lists the final set of evaluation objectives used in this Assessment and the core legislation that underpins them.

Table 1. Assessment Evaluation Objectives

Evaluation Objectives	Key Legislation
Best use of mineral resources - To enable an economically viable mining project that makes the best use of mineral resources.	MRSD Act
Biodiversity and habitat - To avoid, minimise and mitigate effects on flora and fauna species and ecological communities, in particular those listed under the FFG Act and/or the EPBC Act, as well as to comply with the requirements for native vegetation under <i>Victoria's Native Vegetation Management – A Framework for Action</i> .	P&E Act FFG Act EPBC Act <i>Wildlife Act 1975</i>
Catchment values - To protect catchment values and beneficial uses, in particular surface and groundwater quality, stream flow and aquatic health including through the provision of appropriate long-term management and storage of waste rock and tailings and optimising water use.	EP Act Water Act P&E Act C&LP Act
Rehabilitation and post-closure - To provide appropriate measures to ensure the effective rehabilitation of the project site and to ensure the ongoing protection of environmental values in perpetuity.	MRSD Act P&E Act C&LP Act EP Act
Planning, Land use and Amenity – To deliver a project that addresses the planning objectives of the region and to avoid or minimise adverse effects on amenity and present and future land uses.	P&E Act EP Act MRSD Act
Socio-economic effects - To minimise potential adverse social and economic effects and maximise potential socio-economic benefits, including in relation to affected townships, residents, community services and infrastructure both during project operations and following closure.	P&E Act MRSD Act
Cultural heritage - To protect Aboriginal and historic cultural heritage values.	AH Act <i>Heritage Act 1995</i> P&E Act
Environmental management framework - To provide a transparent framework with clear accountabilities for managing environmental effects and hazards associated with the project in order to achieve acceptable environmental outcomes.	MRSD Act P&E Act EP Act AH Act EPBC Act
Governance framework – to establish a transparent and robust framework for the governance and oversight of the project from pre-approval to post-construction.	MRSD Act P&E Act EP Act
Ecologically sustainable mining - Overall, to enable a mining development that contributes to the economic, social and environmental objectives of the State, consistent with the principles of ecologically sustainable development and environment protection.	MRSD Act P&E Act EP Act EPBC Act

⁸ See *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978* made under section 10 of the EE Act, pp. 19 and 27.

4.2 Project Alternatives

As set out in the Scoping Requirements and the procedures and requirements the former Minister issued under the EE Act for the Project, this EES was required to describe and assess relevant alternatives for particular project components, identify the environmental effects of each alternative and explain why the preferred alternative was selected. As with the study of environmental effects, the assessment of alternatives was necessarily risk-based⁹ in nature. Many alternatives were considered for different aspects of the project, as described in Chapter 5 of the EES. This assessment will focus on the alternatives that relate to the key environmental risks, in particular those aimed at reducing the most significant effects (AMD and broad scale clearing of significant vegetation), which were flagged as priorities in the initial referral of the project and the Minister's decision to require an EES:

- A. (i) Tailings management and storage, including (ii) location of a TSF;
- B. Location(s) for other main project elements, including processing facility and accommodation village; and
- C. Project water and electricity supply sources and infrastructure locations.

A(i) Tailings Management

In total, 25 options for tailings management, which fit within the Environment Protection Authority's (EPA) waste management hierarchy principles, were considered by the proponent, firstly by a semi-quantitative multi-criteria analysis. This resulted in 5 options being identified as feasible and worthy of further consideration through a detailed risk assessment¹⁰.

The recommended management measures¹¹ for avoiding AMD¹² resulted in the preferred tailings management strategy being identified, comprising of a combination of "reuse of tailings for structural stability of underground mining voids" and "storage of raw tailings in the existing TSF (to be expanded) under saturated conditions below a permanent minimum 2 metre (m) water cover post-closure"¹³.

The final project description included two scenarios: firstly for tailings to be stored 50% above and 50% below ground; and secondly, a worst case scenario in terms of above ground footprint for 100% tailings to be stored above ground. The proponent seeks approval for the ability to develop both of these scenarios, as the ability to develop the appropriate paste for underground storage and the final volume that could be stored underground is somewhat uncertain.

Provided water supply is assured, a permanent water cover for tailings is recognised as the best practice method to restrict exposure of these reactive wastes. This may be in an above ground storage facility or underground mine voids depending on site characteristics and the potential for underground storage to sterilise future ore¹⁴.

The Inquiry accepted the evidence provided that this is the most appropriate storage method for the Stockman Project¹⁵. They also concluded that the volume of tailings stored underground should be maximised given it is preferential to have long term storage of tailings underground rather than above ground, as advised by Dr Taylor¹⁶ and illustrated by the project-wide risk assessment, which showed post-closure risk of AMD from mine voids is significantly smaller than risks associated with the above-ground TSF¹⁷. The feasible means by which this can be achieved requires further investigation, including to ensure long term risks to groundwater quality are acceptable.

⁹ The Ministerial Guidelines define 'environmental risk' as the potential of negative change, injury or loss with respect to environmental assets. The level of environmental risk will reflect the combination of likelihood and magnitude, as well as extent and duration, of potential environmental effects. EES documentation should be prepared in the context of the principle of proportionality to risk. 'A risk-based approach should be adopted in the assessment of environmental effects so that suitable, intensive, best practice methods can be applied to accurately assess those matters that involve relatively high levels of risk of significant adverse effects and to guide the design of strategies to manage these risks'

¹⁰ EES Appendix B1, p. 27

¹¹ as described in section 7.0 Appendix A to Appendix B1

¹² **Acid and metalliferous drainage (AMD):** Soil and rock is often classed as either potentially acid forming (PAF) or not acid forming (NAF) due to the presence or absence of sulphate. Where PAF material is present, there is a risk of AMD. AMD refers to problematic drainage related to the oxidation of sulphides in materials that are either exposed rock face or a by-product of mining (tailings). The AMD can display one or more of the following chemical characteristics (fn DITR, 2007, section 2.2): low pH (from 1.5 to 4), high soluble metal concentrations (e.g., iron, copper, lead), elevated acidity values, high (sulphate) salinity, low concentrations of dissolved oxygen, low turbidity or total suspended solids.

¹³ Appendix B1 p. 74

¹⁴ DITR, 2007 p. 56 – 57

¹⁵ Inquiry Report p. 50

¹⁶ EW, Inquiry Report p. 48

¹⁷ EES Appendix C to Appendix U

A (ii) Location of Tailings Storage Facility

A total of seven possible sites for the TSF were considered, as described in section 5.5.2 of the EES. The seven locations were the subject of a risk assessment (Appendix B2 of the EES). The risk assessment considered the following eight risk events to be significant differentiators between the options¹⁸:

- Loss of water cover
- Excessive seepage of poor quality water
- Tailings or return water pipeline failure
- Seismic event
- Embankment overtop
- Embankment piping
- Amenity
- Vegetation removal.

The report identified two sites¹⁹ that had the lowest overall risk with the main differentiator being the risk associated with the removal of 0.34 ha of endangered Sub-Alpine Wet Heathland being required at Lake St Barbara²⁰. In addition to risk, estimated construction costs including contingencies were compared. Augmenting the existing TSF had a lower construction cost and less contingency on account of the greater amount of historical and detailed data relating the underlying geology of the site. Although there was no detailed investigations of the alternate site, it was considered that calcareous materials, and therefore cavities, may be present. The report concluded that augmenting Lake St Barbara was the preferred option mainly due to the significant amount of historical information already available regarding the site and how it operates as a system. This was seen as consistent with principles of risk management²¹.

No submissions raised the chosen location of the TSF as an issue. Although some raised concern about the native vegetation to be affected by the footprint (which is dealt with in section 4.4), the Department of Environment and Primary Industries (DEPI) indicated the consideration of alternate configurations helped the proponent to adequately address the three step approach under the Native Vegetation Management Framework.

B. Locations for Main Project Elements

Processing Facility

Three possible locations for the processing facility were considered including Waxslip Spur, the location of the former processing facility, cleared farmland to the north of the mine site and a new location close to the Currawong mine. The Waxslip Spur site is surrounded by very steep slopes and so the large amount of cut and fill earthworks required to create a sufficiently safe and level area caused this site to be discounted at the screening stage. The proponent however intends to use the existing cleared land at this site for a helipad and potentially for temporary soil stockpiles²².

The northern farmland option was located approximately 19.8 km from Wilga and 8 km from Currawong. Although the site had the advantage of being almost entirely void of LOTs and a reduced bushfire risk, the additional haulage costs and risks of pipeline failure for the tailings to the TSF caused this site to be discounted as well.

The preferred location at Currawong has the advantage of being close to the mine, reducing haulage costs and, due to its terrain, requires considerably less cut and fill than Waxslip Spur. This location will however require significant amounts of native vegetation to be cleared including many LOTs and very high quality habitat²³, which is examined further in section 4.4.

¹⁸ EES Appendix B2 p. 11

¹⁹ Lake St Barbara and a new site to the north-east of Lake St Barbara

²⁰ EES Appendix B2, p. 19

²¹ AS/NZS ISO 31000:2009

²² EES Main Report p. 5-9

²³ EES Main Report p. 5-10

Accommodation Facility

The location of the worker's accommodation village was carefully examined by the proponent during the EES process, including in relation to the Project achieving social benefits for the region. Two locations were considered, one near the town of Benambra and one as close to the mine as possible. A comparative study of the two sites concluded that locating the village near Benambra was comparatively more consistent with planning policy, would reduce risks related to bushfire, and had more chance of avoiding potential impacts on native vegetation and cultural heritage. It also had greater potential to generate associated economic benefits for local businesses. From an operational perspective however, the site closer to the mine performed better, providing easy access to the mine site allowing a 2 x 12 hour shift rotation without impacting on worker attraction, as well as providing the opportunity to control alcohol use to ensure 'fitness for work'. This site also provided additional occupational health and safety benefits, reducing the potential for fatigue, fatigue-related incidents and road accidents.

Council's presentation to the Inquiry²⁴ identified the location of the workers village as one of the more difficult and contentious matters to decide upon. Indeed, while the Council now broadly supports the location close to the mine, it initially strongly supported the Benambra location, believing it would provide superior social and economic benefits to the local area. In the end, the Council accepted the operational imperatives of the mine and acknowledged the real 'issue' being to ensure 'company operating policies and procedures for managing and encouraging appropriate community interactions that would determine successful outcomes for both the mine and the community'²⁵.

Whilst acknowledging 'conventional wisdom would support town based accommodation' the Inquiry accepted the considered analysis of the merits in the EES documentation and endorsed the ultimate location²⁶.

The conclusions reached by the EES are based on the ability to enable the mine to operate on a 2 x 12 hour shift basis and that 12 hours in the maximum shift length recommended by WorkSafe²⁷, and that where manual tasks are required, the risk of injury occurring is significantly higher during a 12 hour shift than normal eight hour shifts.

The Country Fire Authority (CFA) presentation to panel identified the preferred location for the accommodation facilities being 'within a relatively remote location at an extreme risk of bushfire'²⁸. Considering this risk, the CFA would not usually support accommodation of the scale proposed at this location. In this case, the CFA only supports the location on the proviso that it is used solely in association with the mine and is decommissioned at closure²⁹. The risk of bushfire is considered further in section 4.7 of this Assessment.

In its submission, Goulburn Murray Water (GMW) highlighted the additional environmental issues related to the selected site, including its location in the Lake Hume Special Water Supply Catchment³⁰. This is considered further in section 4.5.

C. Project Water and Electricity Supply

Water Supply

The four water supply options considered were:

- Harvesting from Spotted Bull Creek catchment
- Extracting from Tambo River
- Piping from Dartmouth dam
- Developing a new borefield near Benambra.

²⁴ Tabled document 17

²⁵ Tabled document 17, p. 14

²⁶ Inquiry Report p. 130 and p. 42

²⁷ WorkSafe Victoria, Fatigue, Prevention in the Workplace June, 2008, p. 12 accessed at http://www.vwa.vic.gov.au/data/assets/pdf_file/0008/9197/vwa_fatigue_handbook.pdf on 12 September 2014

²⁸ Tabled document 11, p. 6

²⁹ Tabled document 11, p. 6

³⁰ Submission 29, p. 2

Initial investigations indicated that the first two options would not deliver a sufficiently reliable water supply. A multi-criteria assessment was then undertaken for the remaining two options³¹. Although reliable, the Darmouth dam option would have required a nominal 100 km pipeline to the plant site compared to 35 km for the borefield. This would have resulted in significantly more vegetation clearance, construction and operating costs and may not have been permitted by the land manager. Development of the borefield was therefore the preferred water supply option.

Conclusion on Project Alternatives

The EES and supporting documentation provided a generally thorough analysis of the potential effects of each alternate aspect and a transparent basis for the proponent to select its preferred project description in light of potential environmental effects and risk. The effects and risks of the final project description are examined within the following sections.

4.3 Best Use of Mineral Resources

Evaluation Objective - *To enable an economically viable mining project that makes the best use of mineral resources.*

Key Issues

A key concept behind the purpose of the MRSD Act is to make the best use of resources. Mineral resources are the property of the Crown.

Discussion and Findings

In the mining context, resources represent the total mineral deposit, reserves are an economic sub-set of the resource. Following mining from the Stockman Project it is anticipated that resources will still be left in both the Wilga and Currawong mines. That is, there will be remaining resources within the mine that are not currently economically viable but may be in the future. Making the best use of resources ensures that access to potential future reserves are not prevented as a result of current mining operations.

The EES investigated the viability of re-processing existing tailings in the TSF, however this option did not rate highly in the multi-criteria assessment and would not have had significant benefits in terms of significantly reducing the footprint of the proposed enlargement of the TSF³².

The key consideration that remains in terms of the best use of materials is the need to balance the desire to maximise underground storage of tailings and reduce the footprint of the TSF with the need to prevent sterilisation of future underground mineral reserves. In addition, there are benefits to maintaining easy access to these reserves for future mining (the benefit of which is demonstrated by the proposed re-use of the existing mine workings at Wilga).

In balancing these considerations, the Inquiry determined that, in the interests of minimising environmental impact of the surface storage TSF, all stope voids and redundant tunnels within Wilga and Currawong be backfilled³³. It was suggested that an assessment be undertaken prior to closure to identify any tunnels that should be retained to provide future access to ore bodies (i.e. not redundant)³⁴.

Conclusion

Having regard to the EES, submissions and the Inquiry Report, it is my assessment that in the interests of minimising the footprint of the TSF and therefore maximising underground storage of tailings, an assessment be undertaken to identify the most likely access requirements to future ore reserves and the workings that may reasonably be backfilled to the satisfaction of the Department of State Development, Business and Innovation (DSDBI).

Further, it is my assessment that such a study should be required by the Work Plan prior to construction of the fourth TSF dam lift.

³¹ EES Main Report p. 5-21

³² Appendix B1 section 6.2.1

³³ Inquiry Report p. 48

³⁴ Inquiry Report p. 49

4.4 Biodiversity and Habitat

Evaluation Objective – *To avoid, minimise and mitigate effects on flora and fauna species and ecological communities, in particular those listed under the FFG Act and/or the EPBC Act, as well as to comply with the requirements for native vegetation under Victoria's Native Vegetation Management – A Framework for Action.*

Key Issues

In the context of the relevant legislation and statutory policy, the evaluation of potential effects on biodiversity and native vegetation needs to address the following issues:

- Whether the potential effects on native vegetation are acceptable, including whether the removal of native vegetation of high conservation significance is acceptable in the context of the relevant policy framework.
- Whether the potential direct and indirect effects on threatened species of flora and fauna and listed ecological communities under the Commonwealth EPBC Act and/or under the FFG Act and their habitat are acceptable.
- Where impacts are considered to be acceptable, whether appropriate and adequate offsets have been identified and can be secured in accordance with the appropriate policy³⁵.
- Whether potential effects on downstream aquatic ecology, such from potential changes to surface hydrology, and groundwater dependent ecosystems (GDEs) from mine dewatering and are likely and acceptable.

Discussion and Findings

Native Vegetation

The project requires vegetation to be cleared in order to establish the mine and related infrastructure, totalling about 70 ha, including approximately 600 LOTS, from across 12 to 14 Ecological Vegetation Classes (EVCs) of varying quality and conservation significance. The project straddles three bioregions, which factors into the classification of EVCs in terms of conservation status and significance. It should be noted that much of the vegetation across the area was affected by the 2003 alpine bushfires and is still at various stages of recovery.

The identified EVCs are listed in Table 11-2 of the EES along with their conservation status in each of the three relevant bioregions. The EES also categorises native vegetation to be removed, expressed in ha, habitat ha and LOTS with respect to each project component (Table 11-5), as well as conservation status (Table 11-6) and conservation significance (Fig 11-7). It is notable that while most of the vegetation to be removed has a "Least concern" conservation status, almost 90% is of high or very high conservation significance, due to its high quality and/or potential habitat for listed species. Under the former policy framework, which was agreed to be applied by DEPI and the proponent (NVMF³⁵), clearing of this vegetation would only occur under exceptional circumstances approved by the Minister for Environment and Climate Change.

A significant proportion of the native vegetation to be cleared is for the Currawong mine and plant site. Two alternatives to this location were considered, but other key factors saw them ruled out (see section 4.2). Following selection of this preferred location at Currawong, design and layout considerations reduced the required clearing from 55 ha to 24.78 ha.

DEPI has advised that the proponent has sufficiently adopted measures to avoid and minimise the loss of native vegetation to acceptable levels, including project reconfigurations that reduced removal from 134 ha to 70 ha³⁶.

The project area and its environs provide habitat or potential habitat for a number of significant flora species, in particular two species listed under the EPBC Act: Purple Eyebright (listed as Endangered, and also listed under the FFG Act) and Kiandra Greenhood (listed as Critically Endangered). Indeed there are past records of both species in the project area.

While it is not possible to be definite about the absence of these listed threatened flora species across the whole project area, none have been identified by the targeted field surveys undertaken for the EES, including within the significant area proposed to be cleared at Currawong. Following surveys undertaken between 2007 and 2011, which failed to detect the two species, the proponent's expert witness, Ms Spencer concluded that impacts on these species are highly

³⁵ The NVMF was replaced in December 2013 by the Permitted Clearing Regulations, which are now referenced in all Victorian planning schemes. However, DEPI and the proponent have agreed that the project can be assessed and offsets provided, if appropriate, in accordance with the NVMF, under which field habitat assessments were conducted and offsets were calculated for the EES.

³⁶ Inquiry Report p. 97

unlikely³⁷. However, further pre-construction surveys are proposed and should enable avoidance of any specimens that are discovered in the project area. If Kiandra Greenhood still occurs downstream of the TSF in the vicinity of Straight Creek (where it has been recorded in the past), it may also require monitoring of the hydrological regime to ensure hydrological changes are minimised and impacts on this habitat are prevented.

In the event that Kiandra Greenhood is identified in the project footprint or other areas affected by it and can't be avoided, the potential impacts on the population may need to be re-considered (in the context of a total population estimated to be between 200 and 300 plants³⁸).

Individuals of a number of the species on the DEPI advisory list will be destroyed, notably over 300 plants of the rare Mountain Banksia, but the EES has concluded that the losses will in no case impact on the viability of local populations.

Of the seven TSF locations considered, the preferred location requires the third lowest amount of native vegetation to be cleared. The EVC Sub-alpine Wet Heathland, which occurs on this site, is analogous with Alpine Sphagnum Bogs and Associated Fens (listed as Endangered under the EPBC Act) and Montane Swamp Complex (listed as threatened under the FFG Act). A small area of this EVC is proposed to be removed for the expanded TSF. No Action Plan or Recovery Plan exists for the listed community under either EPBC Act or FFG Act. The EVC has been identified as habitat for Kiandra Greenhood³⁹. The continued survival of remnants of the EVC (other than the area proposed to be cleared) is likely to be minimised by avoiding changes to the hydrological regime (and groundwater) on which the EVC depends.

Potential effects on GDEs from mine dewatering are not considered likely. The proponent's hydrogeological expert (Mr Middlemis) confirmed that modelling results showed drawdown effects, such as along Straight Creek, are unlikely and would not impact on the Montane swamps.

Native Vegetation Offsets

Given that native vegetation losses have been minimised, consistent with the NVMF, the proponent must then ensure suitable offsets for unavoidable vegetation removal, assuming the project is to proceed. DEPI has indicated its satisfaction with the proponent's calculations of the offset requirements for removal of native vegetation and LOTs. Further to this, DEPI has concluded that the proposed offset sites at One Hut, Prendergast, Spotted Bull and Dinner Plain (for Sub-alpine Wet Heathland) meets the relevant offset requirements as calculated under the NVMF, having made due allowance for the additional habitat offset requirements for rare or threatened flora and fauna species. The Commonwealth has also provided advice that the Dinner Plain site meets offset (compensation) requirements associated with clearing Alpine Sphagnum Bogs and Associated Fens under the EPBC Act Offsets Policy.

The area to be cleared includes State Forest currently mapped in the Special Protection Zone (SPZ) and the Special Management Zone (SMZ) under the Gippsland Forest Management Plan, which identifies the following values within SPZ and SMZ: EVC protection values for Montane Riparian Thicket; Old Growth values within Montane Dry Woodland and Montane Herb-rich Woodland; significant flora values (for Purple Eyebright, Blue-tongue/ Kiandra Greenhood and Spreading Knawel). As indicated by DEPI's submission, impacts on Forest Management Zones have been considered in the EES and the above-mentioned offset requirements will be a key means of addressing this. However, consideration of the original values that underpinned the siting of the SPZs and SMZs affected by this project will need to be factored into the future review of the regional Forest Agreement, albeit that some of these values are in an impaired state, due to the project and the 2003 alpine bushfires.

Terrestrial Fauna

The primary impact of the project on terrestrial (including arboreal) fauna will result from removal of vegetation (habitat), although some potential impacts for some species might also result from soil compaction, reduced water quality and degradation of the habitat quality of remaining vegetation, for example due to fragmentation and edge effects. Much of the vegetation across the site was affected by the 2003 alpine bushfires and is still recovering, so (in the absence of further disturbance) habitat condition and suitability for various species would be likely to continue changing for some time to come.

³⁷ Inquiry Report p. 93

³⁸ Ibid.

³⁹ Approved Conservation Advice for *Pterostylis oreophila* (Kiandra Greenhood), approved by the Commonwealth Minister for the Environment, 3 April 2012.

The Inquiry⁴⁰ referred to the proposed terrestrial fauna monitoring strategy and part of the proposed mitigation measures. While monitoring will be essential to measure the extent of impacts relative to predictions, and to identify the need for contingency mitigation actions as early as possible, it should be clearly understood that monitoring is not of itself a mitigation action.

A number of significant fauna species are known to occur on or near the site, and the potential presence of others, while not detected in the EES field surveys, cannot be completely ruled out. Terrestrial fauna species of national or State significance of key interest for the purposes of this assessment are noted in Table 2.

Table 2. Significant fauna species potentially impacted by the project

Species	EPBC	FFG	Presence (EES)	Comment
Giant Burrowing Frog	V	T	Highly likely	Previously recorded
Spotted Tree Frog	E	T	Moderately likely	Some potential habitat
Alpine Tree Frog	V	T	Moderately likely	Suitable habitat present
Lace Monitor		(A)	Recorded	Site within known stronghold area
Alpine Bog Skink		T	Moderately likely	Some potential habitat
Alpine Water Skink		T	Moderately likely	Some potential habitat
Diamond Firetail		T	Highly likely	Suitable habitat present
Powerful Owl		T	Nearby	Habitat and known prey species present
Sooty Owl		T	Not recorded	Potential but possibly marginal habitat
Masked Owl		T	Not recorded	Potential habitat present
Barking Owl		T	Not recorded	Potential but possibly marginal habitat
Spot-tailed Quoll	E	T	Moderately likely	Suitable habitat present
Greater Glider		(A)	Present	Known prey species for Powerful Owl
Smoky Mouse	E	T	Moderately likely	Suitable habitat present
Broad-toothed Rat		(A)	Not recorded	Previously recorded from the project area

A = Victorian advisory list (but not listed as threatened under FFG). E = Endangered. T = Threatened. V = Vulnerable.

A number of other species on advisory lists also occur, or may occur, but the species listed in Table 2 are considered to be representative of the significant fauna values to be considered for the purposes of this assessment.

Further survey work for some species may be useful prior to the commencement of development works where that could clarify the likely presence or absence of the species, or provide information that could enhance adaptive management of fauna values (for instance by enabling detailed design modifications).

While the EES proposes offsets (in accordance with existing policy) for habitat that will be cleared, no systematic field surveys of the proposed offset sites has been completed to determine whether they currently support populations of relevant fauna species likely to be significantly affected through the clearance of habitat/ native vegetation. The peer review also identified the need for further assessment of proposed linear infrastructure easements, given field assessments had not been completed for these areas. While vegetation losses arising from such works are obviously factored into offset calculations, there remains uncertainty about the faunal values⁴¹.

The nature of the project is such that it will potentially involve a number of listed threatening processes under the FFG Act, most notably the 'Loss of hollow-bearing trees from Victoria's native forests and woodlands'. Obviously, it is not possible to completely offset the removal of mature, hollow-bearing trees with "new" trees of similar age and hollow-bearing capacity. However, the offset calculations reflect the need to compensate for this by seeking to protect approximately six times as many existing LOTs as the number identified for destruction.

⁴⁰ Inquiry Report p. 101

⁴¹ Inquiry Report p. 104

In this context, it is noted that many of the species identified through fauna survey work on the project site are hollow-dependent: 17 of 28 native mammal species (61%) and 17 of 99 native bird species (17%), including the threatened (FFG) Powerful Owl⁴². The State-significant Lace Monitor also uses tree hollows for shelter. Five additional significant bird species, that are predicted with low to moderate likelihoods to potentially occur on the site,⁴³ are also dependent on tree hollows. While not listed as nationally or State significant in their own right, hollow-dependent possums and gliders provide preferred prey species for large forest owls, especially Powerful and Sooty Owls.

It is also likely that some of the hollow-bearing LOTs to be removed will be occupied by fauna at the time the trees are felled. While rescue of individuals of common fauna species might not be an ecological imperative, there is a clear issue to be addressed, as far as practicable, such that destruction of hollow-bearing trees takes place during times they are least likely to be in active use for breeding or hibernation (torpor).

Aquatic Ecology

Two fish species of national and State significance, Australian Grayling (vulnerable under EPBC, listed under FFG) and Macquarie Perch (endangered under EPBC, listed under FFG) could be affected by reduced water quality in the Tambo and Mitta Mitta catchments respectively. See Section 4.5 for discussion and assessment of water quality risk pathways and measures necessary for appropriate mitigation of those risks.

However, neither species has been recorded within the project area or in close proximity downstream. Australian Grayling is known to occur in the Tambo River, but the closest record is a single observation several kilometres downstream of the project area. Although only minor infrastructure works associated with the Project will occur in the Mitta Mitta catchment, Macquarie Perch could occur in Morass Creek near the western end of the water pipeline alignment.

Given the effective implementation of water quality mitigation measures endorsed in Section 4.5, and with the objective of protecting beneficial uses through establishment of appropriate Environmental Quality Objectives (EQOs), impacts on both species are unlikely and do not require further special mitigation or offset responses.

One aquatic invertebrate of State significance, Alpine Spiny Crayfish (listed under FFG), occurs within the project area. Due to its habitat preferences, any works (e.g. roads, easements, TSF expansion) in the vicinity of streams and drainage lines could directly kill individuals, crush burrows or compact soil to prevent burrowing. Therefore, detailed site planning should seek to avoid the placement of all such works within the area likely to be occupied by Alpine Spiny Crayfish wherever possible. While salvage and translocation of fauna is problematic due to the likelihood that suitable habitat is already occupied, if it proves impossible to site all works away from known or suspected occurrences of Alpine Spiny Crayfish, salvage and relocation should be attempted.

Matters of National Environmental Significance

The listed threatened species and communities under the EPBC Act that could be significantly affected by the Project have been discussed in detail above. However, specific assessment conclusions with respect to each of the key matters of national environmental significance are presented below.

Australian Grayling *Prototroctes maraena*

The species is known to occur in the Tambo River, but the closest record to the project site is from a point about ten kilometres downstream. Expert advice indicates that, due to the morphology of the river, it is highly unlikely that Australian Grayling would occur in numbers within or close to the project site.

Macquarie Perch *Macquaria australasica*

The species is known to occur within the Mitta Mitta catchment, within which relatively minor project works will be located. It is not expected that Macquarie Perch will utilise waterways in the catchment close enough to the site to be affected by the project. Pre-construction inspections of Morass Creek near the western end of the water pipeline alignment will clarify the potential presence of the species. If detected, it is proposed that works in the vicinity not proceed until further evaluation of appropriate avoidance, management and mitigation is undertaken in consultation with DEPI and the Commonwealth Department of the Environment (DoE).

⁴² EES Technical Appendix D3, Attachment A

⁴³ EES Technical Appendix D3, Attachment B

Purple Eyebright *Euphrasia collina muelleri*

Although this subspecies has previously been recorded in the vicinity, previous records date back to the 1980s, and it has not been detected in a series of more recent seasonal targeted searches (between 2007 and 2011) within the areas to be cleared or disturbed by the project. The historical records of the subspecies are all outside the proposed footprint of project works. The unlisted (common) subspecies *Euphrasia collina collina* was recorded by the EES field surveys, and its identity confirmed by the Victorian Royal Botanic Gardens. Given extensive surveys have failed to detect the species, the proponent's expert witness concluded that impacts are highly unlikely. However, further pre-construction surveys are proposed and should enable avoidance of any specimens that are discovered in the project area.

Kiandra Greenhood *Pterostylis oreophila*

Although this species has been previously recorded in the vicinity of Straight Creek, targeted searches conducted for the EES (between 2007 and 2011) have failed to detect it within the proposed development footprint. However, like many terrestrial orchids, the species may be difficult to find or identify⁴⁴. The species favours damp and boggy habitats, including riparian vegetation and the EPBC Act-listed Alpine Sphagnum Bogs and Associated Fens community. Following consideration of the peer review report and the expert evidence of the proponent's consultant, the Inquiry has endorsed further targeted surveys for the species to confirm it is not present. If Kiandra Greenhood still occurs downstream of the TSF in the vicinity of Straight Creek (where it has been recorded in the past), modification to works could avoid impacts, and monitoring of the hydrological regime would help ensure hydrological changes are minimised to prevent impacts on this habitat.

In the event Kiandra Greenhood is identified elsewhere in the project footprint or other areas affected by the works and cannot be avoided, the potential impacts on the population may need to be reconsidered (in the context of a total population estimated to be between 200 and 300 plants⁴⁵) and advice sought from the Commonwealth DoE.

Giant Burrowing Frog *Heleioporus australiacus* & Spotted Tree Frog *Litoria spenceri*

Although Giant Burrowing Frog has been recorded in the vicinity of the project site in the past, these previous records date back to the 1980s. Further, it was not detected during targeted searches undertaken for the EES, although ideal weather conditions for seasonal searches unfortunately did not occur at the time. The species is cryptic and, in the absence of weather conditions prompting breeding behaviour, occurs at relatively low densities in the non-breeding habitat where individuals spend most of their time.

Spotted Tree Frog has not been recorded on the site, but potentially suitable habitat has been identified along the Tambo River. Potential impacts of the project that could affect Spotted Tree Frog, if present, include potential degradation of water quality, riparian habitat and potential introduction of Chytrid fungus.

The Inquiry has recommended targeted pre-construction surveys be undertaken for both species. If either species is detected, the significance of impacts on the species would need to be reassessed in the context of the possible avoidance and the residual effects on the population size occurring on the site or within potentially affected areas downstream of project works. Options for modifications to project delivery and/or design to avoid residual impacts on either species should be fully explored in the first instance, before consideration is given to offsets for unavoidable impacts.

Provided the measures endorsed in this assessment are implemented, and subject to the results of further targeted surveys for the species, impacts on the species should be regarded as acceptable and manageable.

Alpine Tree Frog *Litoria verreauxi alpina*

Litoria verreauxi has been detected within the project site in the past and it is possible, though perhaps unlikely, that some of those animals might have been *L. v. alpina*. At some of the possible locations, Common Froglet (which is present and can act as a relatively immune carrier of Chytrid fungus) may have already exposed *L. verreauxi* populations, of whichever subspecies, to the fungus, to which the species is known to be susceptible.

While there is no definitive evidence that Alpine Tree Frog has occurred or still occurs within the development footprint of the project, potentially suitable habitat does occur and it would be prudent to assume that Alpine Tree Frog could be present. The broader range of this species however is such that the loss of 70 ha should not pose a risk to the

⁴⁴ EES Technical Appendix D1 Attachment 1 lists field survey records of unidentified members of seven orchid genera, one of which is *Pterostylis*.

⁴⁵ Ibid.

species⁴⁶. Therefore, the most important action to protect any surviving populations will be to minimise the potential risk of further exposure to Chytrid fungus. The Inquiry's recommendation (53) is supported in relation to this matter.

Spot-tailed Quoll *Dasyurus maculates* (south-eastern mainland population)

Despite targeted searches, Spot-tailed Quoll was not detected on the project site, although records exist within 20-30 km of the site. However, Spot-tailed Quolls are top-order predators, known to occur at very low densities across the landscape and to occupy very large individual home ranges. Recent remote camera programs have detected Spot-tailed Quolls in western Victoria (in the Otway Ranges and in the Grampians), where the species has been known historically to have occurred, but where there had been no other recent records.

While the presence of the species within the project site cannot be ruled out, the proponent's expert considers it unlikely to be impacted, particularly given the broader range of this species. Further, implementation of the Inquiry's recommendations (48-50 and 53) will help ensure the potential impacts on Spot-tailed Quoll are minimised and acceptable.

Smoky Mouse *Pseudomys fumeus*

Despite targeted searches, Smoky Mouse was not detected on the project site, although potentially suitable habitat occurs. The species may respond to successional vegetation changes following fire, which is relevant given the impact of the 2003 alpine bushfires on the project area and its environs. The presence of the species within the project site cannot be ruled out.

While the presence of the species within the project site cannot be ruled out, the proponent's expert considers it unlikely to be impacted. The broader range of this species is such that the loss of 70 ha should not pose a risk to the population in the region. Further, implementation of the Inquiry's recommendations (48-50 and 53) will help ensure the potential impacts are minimised and acceptable.

Alpine Sphagnum Bogs and Associated Fens

The project will require removal of 0.36 ha of the listed vegetation community. There may be potential for additional indirect impacts on other patches of the community (which typically occurs in small patches due to its limiting environmental requirements) if hydrological impacts of redirecting or otherwise managing water flows are not successfully mitigated.

The community is also listed (as Montane Swamp Complex) under the FFG Act. It is understood that an offset site to meet both the Commonwealth and DEPI requirements has been identified at Dinner Plain for the unavoidable removal. The Dinner Plain offset site is considered to meet the minimum requirements associated with the EPBC Act Offsets Policy. As noted below, the offsets should be both identified and secured before removal of protected vegetation may commence, consistent with current requirements under the Permitted Clearing Regulations introduced into all Victorian planning schemes in December 2013. The project's impacts on Alpine Sphagnum Bogs and Associated Fenland is considered acceptable and does not pose a risk to this ecological community, particularly in light of the proposed offset arrangements.

Conclusions

Having regard to the Inquiry's analysis, the EES and submissions, it is my assessment that:

- The Project will result in significant effects on native vegetation in a remote area that has significant biodiversity values, including the clearing of almost 70 ha and 600 LOTs, of which approximately 90% is of very high or high conservation significance due to its habitat values.
- However, these losses are considered acceptable in the context of the policy framework, particularly given the proponent has sufficiently adopted measures to avoid and minimise losses through the EES process, and the losses will be appropriately offset, consist with the relevant State and Commonwealth requirements.
- The Project is not likely to have significant effects on the listed endangered floral species Purple Eyebright and Kiandra Greenhood. While these listed FFG Act and EPBC Act floral species were not recorded within the proposed footprint, there are also measures in place to help ensure effects are not significant in the event they are discovered through pre-construction surveys.

⁴⁶ EES Main Report, p. 14-10

- Effects on the FFG Act-listed ecological community Montane Swamp Complex (or Alpine Sphagnum Bogs and Associated Fens listed under the EPBC Act), will be limited to a small area of this EVC (Sub-alpine Wet Heathland) being removed for the TSF. This is not considered a significant risk to this ecological community.
- Effects on GDEs, such as along Straight Creek, from mine dewatering are not likely, particularly if natural hydrological regimes are maintained to support the wetland communities (during construction and operation).
- Through the loss of a large amount of significant native vegetation, the Project will have direct effects on terrestrial fauna through the loss of habitat, which includes habitat for a number of significant species listed under the FFG Act and EPBC Act, in particular Giant Burrowing Frog, Alpine Tree Frog, Spot-tailed Quoll, Alpine Bog Skink, Alpine Water Skink, although those that could be significantly impacted will be offset.
- The proposed offset sites are considered to provide suitable vegetation/ habitat for the species to be impacted, indeed allowance was made for the additional habitat offset requirements for rare or threatened flora and fauna species. However, as noted by the Inquiry, it needs to be confirmed whether it is sufficient for some key species (Giant Burrowing Frog, Alpine Tree Frog in particular), in light of the further targeted pre-construction surveys - these will help confirm the extent of effects and the acceptability of offsets.
- It is appropriate to take a precautionary approach to significant listed terrestrial fauna species which have not been detected, but for which both older records exist within the project area and potentially suitable habitat is known to occur in the project area.
- Effects on listed aquatic species, including the Australian Grayling and Macquarie Perch, are likely to be negligible and do not require further mitigation or offset responses, particularly in light of the measures recommended elsewhere in this assessment to help protect downstream water quality.
- The potential effects on the FFG Act listed Alpine Spiny Crayfish, which is known to occur in the project footprint, would be affected by works in the vicinity of streams and drainage lines, but should be acceptable.

Further, in my assessment that:

- The commitments in the EES for avoiding, managing and offsetting potential impacts on native vegetation and flora are to be implemented.
- The opportunity to integrate Victorian requirements for offsets and ecological management with any equivalent requirements that may be applied under the EPBC Act, should be further progressed.
- Ms Spencer's recommendations (in her expert witness statement) regarding mitigation, offsets, rehabilitation, as well as monitoring and management of potential edge effects along new remnant vegetation edges be implemented through the Work Plan.
- The use of the NVMF for the assessment of losses and offset requirements is accepted. However, given the new existing requirement in this State under the Permitted Clearing Regulations for offsets to be identified as well as secured prior to native vegetation being removed, this principle should also be applied to this project.
- The native vegetation offset strategy be finalised in consultation with DEPI and DoE, and be required and implemented through the Work Plan, to the satisfaction of the Secretary DEPI.
- Detailed offset management plan(s), once approved by DEPI, should be published along with regular progress reports on the management measures that have been undertaken to implement the plan(s). This provision should be included in the final Work Plan and/or in the security agreement under s. 69 of the *Conservation, Forests and Land Act 1987* or the agreement under s. 173 of the P&E Act that applies the requisite protection for each of the offset sites, whichever is the more appropriate.
- Implications of alternative spillways with respect to potential effects on hydrology of Straight Creek and downstream of the TSF be considered, before a final commitment to constructing the works is made through the Work Plan.
- DEPI and Forests Victoria consider the possible designation of alternative SPZs and SMZs that support equivalent values to those for which the SPZs and SMZs on the site were original designated.
- Targeted faunal surveys should be undertaken along proposed infrastructure easements, to account for the uncertainty associated with potential impacts on fauna (and other biodiversity) values that could stem from clearing these easements and where appropriate, consider alignment or design refinements to avoid effects.
- Development and implementation of a faunal survey/ monitoring program, to the satisfaction of the Secretary DEPI, be undertaken as soon as practicable (in the context of relevant seasonal factors), to assess: i) utilisation of offset sites by significant fauna species (see Table 2) as identified by AECOM; and ii) the presence of Giant Burrowing Frog, Alpine Tree Frog in particular within the project footprint.

- Should these surveys confirm the presence of Giant Burrowing Frog, Alpine Tree Frog in particular, within the project footprint, refinements to alignment and/or design be implemented where practicable to avoid effects.
- Should the faunal survey/ monitoring program conclude that initial offset sites do not provide habitat for all the significant species of concern, additional offset requirements should be identified and secured in consultation with DEPI.
- The environmental monitoring program and the environmental management plan, including contingency plans for response to foreseeable adverse environmental effects, should recognise and provide for potential exacerbation of listed threatening process (see below), particularly given the feral species below were all recorded by the field survey work for the EES - this should be addressed in the context of the Feral Animal Management Plan recommended by the Inquiry.
 - Degradation and loss of habitats caused by feral Horses (*Equus caballus*).
 - Habitat fragmentation as a threatening process for fauna in Victoria.
 - Increase in sediment input into Victorian rivers and streams due to human activities.
 - Infection of amphibians with Chytrid Fungus, resulting in chytridiomycosis.
 - Input of toxic substances into Victorian rivers and streams.
 - Invasion of native vegetation by 'environmental weeds'.
 - Predation of native wildlife by the cat, *Felis catus*.
 - Predation of native wildlife by the introduced Red Fox *Vulpes vulpes*.
 - The spread of *Phytophthora cinnamomi* from infected sites into parks and reserves, including roadsides, under the control of a State or local government authority.
- Proposed pre-construction inspections clarify the potential presence of Macquarie Perch, particularly in Morass Creek near the western end of the water pipeline alignment and, if detected, works in the vicinity not proceed until further evaluation of appropriate management and mitigation is undertaken in consultation with DEPI and DoE.
- Should Alpine Spiny Crayfish be encountered in pre-construction surveys, and effects are unavoidable, salvage and relocation should be attempted, in accordance with a strategy to be developed in consultation with DEPI.

4.5 Catchment Values

Evaluation Objective – *To protect catchment values and beneficial uses, in particular surface and groundwater quality, stream flow and aquatic health including through the provision of appropriate long-term management and storage of waste rock and tailings and optimising water use.*

4.5.1 Water Quality Objectives

Key Issues:

The key issue is the need to establish parameters for good water quality (EQOs) to enable compliance to be monitored, such that beneficial uses of these water environments are protected.

Discussion and Findings

Establishing appropriate parameters for acceptable water quality (Environmental Quality Objectives (EQOs)) that protect beneficial uses under the State Environment Protection Policy (SEPP), and ensuring compliance can be monitored during the project life and post-closure are central issues to protecting catchment values.

The project area is subject to particular geochemical characteristics (e.g. as illustrated by Wilga Spring) and existing conditions (e.g. existing TSF and wetland) which currently affect groundwater and surface water quality.

Due to the significant influences of the Wilga Spring and other existing conditions on downstream water quality, the application of standard trigger values⁴⁷ is not an appropriate means of determining EQOs. Specific EQOs still need to be developed, to meet *State Environment Protection Policy Waters of Victoria (SEPP WoV)* and *State Environment*

⁴⁷ as described in ANZECC, 99% being the highest protection level.

Protection Policy Groundwaters of Victoria (SEPP GoV) and ensure downstream triggers are in place to enable ongoing monitoring of water quality and protection of beneficial uses. Due to the high toxicity of copper and zinc to freshwater aquatic organisms, it is essential that EQOs are derived using a robust and defensible method⁴⁸. In order to achieve this, it is considered important that independent third party review of the development and implementation of such an approach is undertaken and provided for regulators to consider.

The Inquiry concluded that undertaking further baseline monitoring to determine appropriate water quality criteria and trigger points was a key element of any strategy to protect downstream environments⁴⁹. Indeed, robust and clear EQOs downstream of the TSF are particularly important for surface water. The criteria to be met are especially necessary to enable supernatant water overflows to be discharged into Straight Creek. This is relevant to determine whether discharges will be permitted during construction and the timing of the decommissioning of the diversion channels and return of the TSF to a flow-on system at closure. During construction and operations, upstream water quality may be used as a baseline to enable the detection of impacts which, in the absence of discharges, are anticipated to mainly relate to sediment.

For groundwater in the vicinity of the TSF and mine voids, as advised by the EPA 'the current level of groundwater quality information is insufficient to determine an appropriate baseline that would enable the detection of impacts of the Project during operations and post-closure'⁵⁰. The development of an appropriate baseline through further monitoring activities is therefore required prior to any construction activities which may impact on the groundwater quality.

The Inquiry recommended the development and implementation of a detailed monitoring program to be included in the Work Plan and commenced prior to construction starting. The Inquiry also recommended this monitoring program identify all relevant quality and quantity parameters for the discharge of water to the environment in the vicinity of relevant project activities, and be independently peer reviewed and prepared to the satisfaction of DSDBI⁵¹. These recommendations are supported.

Conclusion (Water Quality Objectives)

The following uncertainties remain in relation to establishing water quality parameters in accordance with SEPP, which need to be addressed prior to the approval of the mine Work Plan:

- Appropriate baseline for groundwater quality within the project area, which would enable the detection of impacts of the Project.⁵²
- Appropriate baseline for surface water in Straight Creek and the Tambo River, which would enable the detection of impacts of the Project, with the key point of compliance being in the Tambo River downstream of Straight Creek⁵³.

Therefore, it is my assessment that, in order to address these uncertainties, the mine Work Plan:

- Set out methods to derive environmental quality objectives and criteria to determine compliance for overflow discharges of supernatant water.
- Set out methods to derive environmental quality objectives and criteria to determine compliance for potential effects to groundwater in the project area.
- Include a monitoring program that should include detail of trigger levels for water quality at EPA approved monitoring points, which initiate immediate remedial actions and actions which may be implemented to remediate any exceedance of the trigger levels.⁵⁴
- The monitoring program is to be independently peer reviewed and developed in consultation with the EPA and DSDBI and to the satisfaction of DSDBI⁵⁵.

⁴⁸ EPA submission p. 5

⁴⁹ Inquiry Report p. 9

⁵⁰ EPA submission p. 7

⁵¹ Inquiry Report, recommendation 4.

⁵² EWS Bryan Chadwick, Inquiry recommendation 19

⁵³ Inquiry Report p. 9 and recommendation 23

⁵⁴ EPA submission 1.4, Inquiry recommendation 23, DSDBI requirements for a "trigger action response plan"

⁵⁵ Inquiry Report, recommendation 4

4.5.2 Acid Mine Drainage

Background

As noted by the Inquiry, the view of Dr Taylor⁵⁶, that AMD¹² represents the single biggest environmental challenge' for the Stockman Project⁵⁷.

In the case of the Stockman Project, the key vectors for AMD are from: waste rock generated from accessing ore; exposed rock in the mine void; ore stockpiles; and tailings generated from processing ore. In addition, the existing conditions from the previous mining project include sulfidic tailings and waste rock located in Lake St Barbara and existing contamination at the previous processing facility site known as Waxslip Spur.

The potential oxidation of reactive tailings is mainly driven by diffusion of oxygen through the dried out surface of the tailings. The harmful products of this oxidation may then be transported by water either as runoff of stockpiles or mine void walls or seepage which may travel through the tails or through the containing structure⁵⁸.

Existing tailings located in Lake St Barbara are predominately pyrite (FeS₂ at 65 percentage by mass of the total solid mass⁵⁹) and have a high potential for AMD if exposed to oxidising conditions (exposed to air and/or water) and thus pose a significant environmental risk.

Future tailings are anticipated to have a higher pyrite concentration (80 percentage by mass) with leachate from unsaturated tailings likely to have low pH, elevated (sulphate) salinity and elevated dissolved metal concentrations. Tailings mixed into a paste for the backfilling of voids will also have significant AMD potential, although slightly lower due to the presence of a binder⁶⁰.

The significance of the risk of AMD to the environment warranted additional attention being paid to the tailings management strategy and siting options as discussed in section 4.2 above. In addition, potential impacts to catchment values have also been paid particular attention.

Key issues

The key issues and risks for AMD in relation to the proposed tailings management strategy are:

- Dam failure (embankment, piping or overtop).
- Seepage of poor quality water from the TSF (either through the wall or through the tails)
- Loss of/inadequate water cover over the tailings in the TSF or mine void.
- Potential for AMD in mine void (tailings paste or wall rock).
- Potential for potentially acid forming (PAF) sediment runoff from above-ground structures and stockpiles.
- Inadvertent use of PAF material in structures.

Dam Failure

The failure modes considered in the EES were embankment failure from a seismic event, embankment piping and overtop. According to the EES, the consequence of dam failure ranges from major to extreme with an "extreme" consequence being defined as the permanent damage to a high value asset or widespread significant damage⁶¹. The EES included a preliminary dam break assessment which concluded that, due to the very high specific gravity of the tailings and additional cover layer to be placed over the top, it would be very unlikely for a sunny day failure (failure by piping not associated with a probable maximum flood (PMF)) to result in the downstream mobilisation of tailings⁶². In the case of a dam break during a PMF it was indicated that the maximum possible extent of tailings deposition would be between 26 and 28 km downstream of the TSF. Further, it was estimated that this would involve the mobilisation of 20%

⁵⁶ EW, Geochemistry

⁵⁷ Dr Taylor EWS p. 5

⁵⁸ DITR p. 52

⁵⁹ Appendix B1 p. 17

⁶⁰ Appendix B1, p. 4

⁶¹ Appendix U Table 3-2 and Appendix A

⁶² EES Appendix G to Appendix B3, p. 1

of the tailings (or 1.4 Mt). This was based on very conservative assumptions and considered to be the worst case scenario⁶³.

The key activities proposed for expanding the current TSF over a number of stages are summarised in the Inquiry Report⁶⁴ and EES Main Report⁶⁵ and detailed in EES Appendix B4.

The Dam Failure Consequence Category, which informs the design standards, should be established using methodology described in ANCOLD Consequence Guidelines. The existing TSF was essentially designed to the “extreme” consequence category which is the highest possible standard (EWS Mr Newman, p. 11, ANCOLD Guidelines p. 14). Mr Newman noted that in accordance with ANCOLD, the expanded TSF would be classified to be of a ‘High C’ consequence category based on worst case of the severity level of damage and loss, combined with the population at risk and would be designed consistent with this category. There are seven categories of consequence according to the ANCOLD Guidelines, ‘High C’ is the fourth. It seems the Inquiry was of the understanding that the embankment was to be built to the “highest category” (see Inquiry recommendation 26 and section 5.6.2 of Inquiry Report). Assessment of the consequences of failure is the “critical input” to determining the consequence category and involves a dam break simulation. The complexity of a dam break analysis can vary. A preliminary dam break analysis has been undertaken for the Stockman Project. Considering the importance of the consequence category in determining the design standard, it is recommended that the analysis be subject to independent peer review prior to finalising the appropriate design category for the TSF embankment.

Earth Resources and Regulation (ERR) noted the identified risks with potentially catastrophic consequences and expressed their satisfaction that the proposed measures to mitigate these risks, in particular compliance with ANCOLD guidelines, are adequate. Prior to approving construction of the mine, ERR will require the proponent to demonstrate that the final detailed design is consistent with these guidelines⁶⁶.

The Inquiry accepted evidence that design and management options are available to minimise the short and long term risks posed by the TSF to the downstream environment such that it is ‘feasible to achieve acceptable environmental outcomes’⁶⁷. The Inquiry concluded that the long term risk of failure of the dam embankment will be minimised if ANCOLD design and operational standards for both water supply dams and tailings dams are met and independently monitored⁶⁸. In their opinion, the importance of ensuring the risk of failure is absolutely minimised was such that independent expert review and monitoring is essential for all stages (the design, construction, operation and rehabilitation). This is consistent with the ANCOLD Guidelines on Tailings Dams and is accepted by the proponent⁶⁹. The Inquiry emphasised the importance of having ‘a robust independent management, monitoring, *funding and governance regime*’⁷⁰ and to this end the Inquiry accepted the desirability of appointing Independent Technical Reviewer(s) in accordance with a set framework (refer to section 4.11). This clearly needs to be established through the imminent approvals phase and remain in place for rehabilitation to post closure.

In addition to dam integrity, the Inquiry identified a number of key issues which they concluded required additional technical oversight⁷¹. An appropriate governance regime, together with a rigorous design process, is indeed crucial to ensuring long term environmental security and is addressed further in section 4.11.

⁶³ EES Appendix G to Appendix B3, p. 8

⁶⁴ Inquiry Report p. 52

⁶⁵ EES Main Report p. 4-21

⁶⁶ EER Submission 25, p. 7

⁶⁷ Inquiry Report p. 13

⁶⁸ Inquiry Report p. 64

⁶⁹ Inquiry Report p. 63

⁷⁰ Inquiry Report pp. 58 – 59

⁷¹ Inquiry Report pp. 145-148

Conclusion (Dam Failure)

Having regard to the EES, submissions, and the Inquiry's analysis, it is my assessment that:

- Whilst the detailed design of the TSF is not known at this stage, the proponent has agreed to design the enlarged TSF consistent with the relevant ANCOLD consequence category, and DSDBI has indicated that Work Plan approval will be dependent on detailed design being provided that demonstrates compliance with the ANCOLD Guidelines and all practical features to achieve consistency with SEPP, including a geotechnical stability analysis⁷².
- Ensuring best practice design and construction of the TSF will reduce the risk of failure as low as reasonably practicable in the short and long term. While there is no guidance for the acceptability of residual risks to the environment for a TSF, the proposed measures to mitigate these risks are considered acceptable by the key regulator.
- Acceptable environmental outcomes are able to be achieved, particularly with appropriate independent expert review of the design, construction, operation and rehabilitation of the TSF.

Further, it is my assessment that:

- A final dam break analysis should be undertaken and independently reviewed, to inform the determination of the appropriate consequence category and therefore the detailed design standards of the TSF.
- Prior to approval of the Work Plan, it be demonstrated that the upgrade and enlargement of the TSF embankment has been designed and will be constructed according to best practice⁷³, and based on independent expert advice – relevant guidelines for best practice are outlined in Appendix A to this Assessment.
- The Work Plan require the creation and implementation of an Operations, Maintenance and Surveillance Manual as per the ANCOLD Dams Safety Management Guideline – 2003.⁷⁴
- The Work Plan require the development of a Dam Safety Emergency Plan in conjunction with relevant emergency authorities and regulators and consistent with section 8.6 of the ANCOLD Guidelines.⁷⁵

Seepage of poor quality water from the TSF

As highlighted by Mr Newman⁷⁶, a critical issue during the TSF enlargement is its effect on seepage.

The current TSF is known to seep at an estimated rate of 0.6 L/s⁷⁷. Investigations have indicated that the source of the seepage is most likely supernatant water⁷⁸ travelling through exposed fractured rock at the margins of the TSF rather than through the tailings mass and out the bottom or out the embankment at depth⁷⁹. The current water characteristics of this seepage are managed through a constructed wetland at the toe of the dam. During operations it is intended to retain the wetland for as long as possible. Eventually however, downstream construction of the enlarged embankment will require removal of the wetland. Should ongoing monitoring indicate water characteristics through the seepage are problematic then the wetland could be reinstated post-closure⁸⁰.

⁷² EER Submission p. 5

⁷³ Inquiry recommendation 26 and 28

⁷⁴ DSDBI Submission, EW Stephen Newman

⁷⁵ DSDBI Submission, EW Stephen Newman

⁷⁶ EW, Inquiry rep p. 62

⁷⁷ See EES p. 10-5. Note that due to a limited supply of local clay, the existing TSF embankment was largely constructed of rockfill with only the upstream face of the dam being covered by a 1.5 m layer of clay overlain by a geomembrane liner to enable water storage in the facility (Appendix B1, p. 14). Current concerns regarding the existing design include the extent of the liner (it was not extended past RL1173 m when the embankment was raised), liner connection and quality of the 1.6 m raise and the use of PAF rock to sheet the crest surface (Appendix B3, p. 27). In addition to this, the EPA has raised concerns that the underlying thickness of low hydraulic conductivity clays is insufficient by today's standards being built to a minimum requirement of 0.5 m thickness of low hydraulic material compared to the equivalent standard of 1 m today.

⁷⁸ water that sits above the tailings

⁷⁹ EWS Bryan Chadwick p. 4

⁸⁰ Inquiry Report p. 67

The proposed expansion of the TSF has the potential to increase the rate of seepage at this identified location from 0.6 L/s to approximately 1.2 L/s⁸¹ and it is likely the quality of the supernatant water will deteriorate⁸² due to inputs from the Wilga mine dewatering and recycled process water⁸³. Further, the expansion of the TSF (Stages 3 and 4) will involve a saddle embankment at the northern abutment (Monkey's Knob) of the TSF where the topographic elevation is lower compared to the ridge lines in the east and south, such that seepage out of the TSF is considered likely⁸⁴. Agencies and community submissions expressed concern relating to the potential quantity and quality of seepage in the future as the TSF is expanded (up to ten-fold). Both agencies and the proponent's expert witness considered there to be uncertainty regarding the potential for seepage out the northern abutment. This could significantly affect adjacent water quality⁸⁵ or indeed to affect the security of the 2 m water cover required over the TSF to minimise the potential for oxidation of the tailings⁸⁶. Mr Chadwick recommended assessment of local seepage pathways be undertaken during initial hydrogeological investigations to determine whether additional engineering works are required in the design of the TSF to ensure seepage rates do not pose a risk to water quality objectives and/or the longer term integrity of the water cover⁸⁷.

In order to reduce seepage, it is proposed to identify and seal fractures (or zones of fractures) in the underlying rock⁸⁸. As the underlying rock has low / no permeability, it is not proposed to line the entire embankment⁸⁹. The EPA however recommended further assessment of the feasibility of lining the underlying rock as well as the embankments in order to meet SEPP GoV⁹⁰.

The Inquiry accepted that, while there were considerable concerns raised about the rate of seepage increasing due to the TSF's expansion, monitoring and staging of the TSF's development provide for the necessary management of this risk⁹¹. It was the Inquiry's view that before each increase in the TSF embankment be permitted to occur, it must be confirmed that the seepage rate is being contained and appropriate management is in place⁹².

Conclusion (Seepage of poor quality water from TSF)

It is my assessment that:

- The information provided in the EES and at the Inquiry provides a basis for furthering understanding of the potential pathways and rates for seepage outside of the existing TSF.
- The proponent has identified measures that can be employed to identify existing fractures, undertake improvement works and reduce existing seepage rates.
- There is potential for improvement in the proposed measures to improve the existing structure.
- There is uncertainty regarding the potential for seepage pathways to be created through the northern abutment and the implications this may have on groundwater quality and the integrity of the water cover, which need to be addressed through monitoring and the approval of the design.

⁸¹ EES p. 10-12

⁸² Current water quality in the TSF has improved such that in the absence of further works (i.e. the proposed expansion) it is unlikely that groundwater would be impacted by this seepage (EPA submission p. 7).

⁸³ EPA Submission p. 3

⁸⁴ EWS Bryan Chadwick p. 4

⁸⁵ EWS Bryan Chadwick p. 5 and EPA submission p. 7

⁸⁶ EWS Bryan Chadwick p. 5

⁸⁷ EWS p. 4-5

⁸⁸ EWS Stephen Newman, p. 8

⁸⁹ EWS Stephen Newman p. 8

⁹⁰ clause 12 of SEPP states that 'All practicable measures must be undertaken to prevent pollution to groundwater', see EPA submission p. 7

⁹¹ Inquiry Report p. 68

⁹² Inquiry Report p. 68

- The groundwater monitoring program to be established to determine appropriate baseline conditions will be relevant to monitoring effectiveness of seepage control measures⁹³.

Further, it is my assessment that the Work Plan:

- Require all practicable measures to be implemented to prevent seepage (in the long term) from areas within the TSF footprint, consistent with Inquiry recommendations 28 and 29.
- Detail groundwater and surface water monitoring programs (including to verify predictions prior to each lift of the embankment) specifically designed to monitor the performance of the proposed methods to minimise seepage including appropriate trigger points and remedial actions⁹⁴.
- Outline methods and criteria that will be used to determine whether under toe seepage must be treated prior to entering into the environment, to ensure SEPP WoV objectives can be met at the Tambo River post closure⁹⁵.

Inadequate water cover of TSF

As identified in the EES and discussed above, the tailings management strategy for the TSF relies on maintaining a sufficient water cover in perpetuity. During operations there is an ability to quickly implement remedial action, so a minimum water cover of 1 m has been identified as appropriate. However, it is proposed this be reduced to 0.5 m during the construction phase. Post-closure, it has been proposed to increase this minimum water cover to 2 m, although it has been suggested that this is conservative and further work may indicate that this minimum can be reduced further⁹⁶.

A loss of water cover (through evaporation or seepage) below the minimum set could compromise the tailings management strategy by allowing for the oxidation of the tailings and creating a greater potential for AMD, which needs to be avoided to ensure acceptable short and long term environmental outcomes.

The project risk assessment considered it was highly improbable the water cover would dip below 0.5 m during the construction period. During operations it was considered very unlikely that the 1 m water cover would be compromised, and post-closure it was considered unlikely that the 2 m post-closure water cover can not be self-maintained⁹⁷.

The EES included a conceptual water balance including running models for natural climate variability (historical data) and worst case climate change conditions of 2030 and 2060 as estimated in the *Gippsland Region Sustainable Water Strategy*⁹⁸. These models indicated that the risk of evaporation post-closure under the impacts of natural climate variability were such that a buffer of 1 m at closure (i.e. total water cover 3 m) should ensure that the designed 2 m water cover is retained⁹⁹.

Modelling of the climate change scenarios indicated that the water level in the TSF may, for brief and temporary periods of time, drop below the 2 m minimum cover (to 1.6 m). It was concluded that predicted impacts of climate change were unlikely to jeopardise the long term stability of the water cover¹⁰⁰, due to the short period of time these conditions were modelled to persist, and the assumed accumulation of organic matter above the tailings.

It has been identified in various documents by the proponent that the 2 m cover is conservative and may be revisited. Considering however the theme in the Inquiry Report of aiming to have a TSF that adopts best practice, and in particular meets the requirements of ANCOLD, it is considered that further effort would be better placed ensuring this minimum can be met as opposed to detailed research effort required to establish a reduction in the 2 m threshold¹⁰¹.

⁹³ Inquiry recommendation 33

⁹⁴ EER Submission, Inquiry recommendation 32

⁹⁵ EPA Submission, 3.8

⁹⁶ EWS Stephen Newman, p. 4

⁹⁷ Appendix U p. 36

⁹⁸ DSE, 2010

⁹⁹ EES Appendix C3, p. 37

¹⁰⁰ EWS Dr Fuller and Appendix C3 Figure 18, p. 36

¹⁰¹ DITR, 2007 p. 57 indicates water cover of minimum range 1.5 to 2 m 'preferably more', ANCOLD was prepared to support the DITR publication

Rainfall and evaporation are the key drivers of the water balance modelling with seepage rates a secondary factor. Whilst the model used for the surface water balance accounted for seepage losses through calibration of 'net losses'¹⁰², as identified above, the impact of potential for seepage out the northern abutment has not been accounted for in the groundwater model. Presumably this could not be determined through the calibration process undertaken for the surface water balance, considering the embankment does not yet exist. Nevertheless, the Inquiry was informed that even a three-fold increase in seepage would not compromise the water cover¹⁰³.

Despite this, monitoring of local conditions and the assessment of changes in seepage rates adjacent to Monkey's Knob are important, in order to verify the assumptions of the water balance, assist with detailed design of the TSF and help determine the appropriate water cover to be installed at closure¹⁰⁴. Potential impacts of this seep on groundwater quality are discussed below.

Conclusion (Inadequate water cover)

Having regard to the Inquiry Report, EES and submissions, it is my assessment that:

- Whilst the 2 m water cover has been said to be conservative, it is consistent with best practice and it is therefore appropriate that it be met.
- The information provided has demonstrated that it is unlikely that the 2 m water cover will be compromised and as such risks of AMD are considered acceptable. However, it is recommended that allowance for means to maintain this water cover in perpetuity be provided in post-closure arrangements¹⁰⁵.
- Despite this, there is uncertainty as to the potential impact of the seepage rates at the northern abutment. The initial groundwater monitoring program will assist in resolving this uncertainty.

Further, it is my assessment that:

- The Work Plan provide for ongoing monitoring of conditions to verify the water balance model assumptions prior to the final design and construction of each of the TSF dam lifts¹⁰⁶.

Potential for AMD in mine voids

It is proposed that mine voids will be backfilled with tailings paste and flooded at closure to create a water cover such that AMD is prevented.

AMD in the mine voids may develop from either the tailings paste or the exposed wall rock. The Wilga mine already includes an existing portal and mine workings. The current wall rock in the existing Wilga mine workings is estimated to be producing 5 to 10 tonnes of acidity per year¹⁰⁷. The existing Wilga mine was not appropriately designed for mine closure as the main decline portal and exploration portal are located below the baseline groundwater level¹⁰⁸. This presents some challenges for the proposal of flooding the mine at closure in order to prevent AMD. As a new mine, Currawong will be developed with closure in mind, including ensuring all portals are above the baseline groundwater level.

In order to prevent groundwater from discharging to the surface through the former portals at Wilga, it is proposed to plug the portals such that the natural flow system will be re-established including the re-emergence of natural springs, such as the Wilga Spring, which could influence surface water quality as discussed above.

The use of plugs is relatively new technology and the final design and success of the portal plugs is unknown at this stage. The design of the plugs will need to account for the importance of maintaining a seal in perpetuity or over a reliable time period so that plugs can be replaced, and will need to take into account the potential for poor water quality

¹⁰² see p. 1 Appendix C3 and Peer review C5 - rate of 0.5 +/-0.1L/s was identified as appropriate

¹⁰³ Inquiry Report p. 68

¹⁰⁴ EWS D. Fuller p. 15, EWS B, Chadwick p.5

¹⁰⁵ Inquiry recommendation 12

¹⁰⁶ Inquiry Report p. 9

¹⁰⁷ Appendix C7, p. 268

¹⁰⁸ EWS Bryan Chadwick p. 5

to affect their longevity¹⁰⁹. The proponent proposed that options for closure of the portals will be reviewed in consultation with DSDBI and that plug design would be subject to independent technical review¹¹⁰.

The Inquiry noted evidence that indicated the potential to vary the composition of the paste in order to increase strength or minimise sulphate production prior to flooding¹¹¹.

Conclusion (mine voids)

In light of the Inquiry Report, EES and submissions, it is my assessment that:

- The overall post-closure risks and environmental security of underground storage of tailings are significantly lower than those associated with storage of all tailings above ground and therefore, efforts should be aimed at maximising underground storage of tailings.
- Whilst information was presented on how underground storage can be achieved, there remains some uncertainty regarding the constituents of the paste and its properties in terms of lag time available prior to mine flooding and ability to prevent leachate.
- The reliance of the new plug technology should be subject to independent review and, should a plug be used, then post-closure arrangements should allow for ongoing monitoring and maintenance of the plug (discussed further below).
- The surface and groundwater monitoring programs to be established to determine appropriate baseline conditions will be essential to effectively monitor both groundwater (level and quality) surrounding the mine voids and surface water (level and quality).

Further, it is my assessment that the Work Plan:

- Require measures for further static and kinetic geochemical test work to identify the appropriate paste constituency, water source and timing of flooding of underground workings to ensure SEPP objectives can be met¹¹².
- Ensure an appropriate buffer for natural fluctuation in groundwater levels is factored into the filling of the voids with paste to ensure they will remain under the groundwater level at all times¹¹³.
- Adopt best practice to prevent the onset of AMD prior to flooding, including adding neutralizer to the paste¹¹⁴.
- Outline measures to maximise the amount of tailings to be stored underground (in saturated conditions) whilst ensuring the main decline and other useful tunnels remain vacant to support potential works in the future¹¹⁵.
- Detail groundwater and surface water monitoring program (including trigger points and remedial actions) to monitor water quality and water level during operations (where Wilga is filled prior to closure) and up until closure¹¹⁶. In addition, a long term monitoring program should be developed and included in post-closure arrangements outlined section 4.6¹¹⁷.
- Include in the rehabilitation plan the requirement to rehabilitate Wilga in accordance with a closure design to be developed to the satisfaction of DSDBI¹¹⁸. The design of the plugs and any proposed post-closure monitoring program are to be subject to independent expert review.

¹⁰⁹ EWS Stephen Newman Section 4.1.5 and Inquiry Report p. 51

¹¹⁰ Tabled document 34

¹¹¹ Inquiry Report p. 51

¹¹² EPA Submission 3.9, p. 8 and EWS Dr J. Taylor p. 10

¹¹³ EWS Mr Chadwick, p. 10

¹¹⁴ Inquiry recommendation 14

¹¹⁵ Inquiry recommendations 15 to 17

¹¹⁶ Inquiry recommendation 18, EER Submission p. 6

¹¹⁷ Inquiry recommendation 24

¹¹⁸ Tabled document 34, Issue 19

Inadvertent use of PAF in structures

As identified above, PAF rock was used in the original TSF embankment. The project risk assessment considered the risk of the inadvertent use of PAF in structures as ranging from possible to unlikely and the environmental consequence was considered moderate.

An initial assessment of the availability of suitable (NAF) material for the TSF embankment construction has indicated the identified borrow pit is likely to provide sufficient, suitable material however as some PAF exists this will need to be identified and managed (disposed of in the TSF)¹¹⁹. Despite the expected ability to visually identify PAF material, field Net Acid Generating testing was recommended to be carried out.

Conclusion (Inadvertent use of PAF in structures)

It is my assessment that the proponent has demonstrated that an adequate volume of appropriate borrow material should be available. Further it is my assessment that the Work Plan should include measures to confirm visual identification of PAF in field, during construction¹²⁰.

4.5.3 Surface Water

Key issues

Key issues for downstream water environments include:

- Potential discharge or overtopping of poor quality supernatant water from TSF
- Potential for changes in surface water flows downstream of the TSF during operation.

Supernatant water discussion and findings

As identified by the Inquiry, the "management of discharges to the environment from the TSF is the most critical element of this project, both during operation and post closure"¹²¹. The potential for discharge or overtopping of supernatant water from the TSF varies at each phase of the project but is most pronounced from the end of operations to closure (under the scenario where 100% of tailings are deposited into the TSF i.e., worst case)¹²².

The proponent has committed to not discharging supernatant water at any stage of the project unless EQOs can be met¹²³. The EPA raised concerns that information available did not indicate potential means that could be implemented in order to ensure this can be achieved prior to overflow¹²⁴. The Inquiry adopted EPA's recommendation that a feasibility study be undertaken to identify a variety of suitable treatment technologies that may be used to treat the supernatant water to ensure EQOs can be met prior to the first overflow¹²⁵.

Conclusion (Supernatant water)

It is my assessment that there are available opportunities to manage the risk of poor quality supernatant water being discharged from site.

Further it is my assessment that the Work Plan:

- Include as a contingency if the water level of the TSF warrants (i.e., relative to the risk of overtopping prior to the achievement of EQOs) the undertaking of a feasibility study to identify suitable treatment technologies that may be implemented prior the first overflow.

¹¹⁹ EES Appendix B5

¹²⁰ EES Appendix B5, Recommendations

¹²¹ Inquiry Report p. 77

¹²² EES Appendix C7, p. 40

¹²³ Draft work plan pages 6-7m 6-16 and 9-12 and Tabled document 34 issue 12

¹²⁴ EPA Submission, p. 6

¹²⁵ Inquiry recommendation 21

4.5.4 Groundwater

Key issues

The key issues for groundwater include:

- Potential for groundwater extraction at Benambra borefield to affect beneficial uses
- Potential for groundwater drawdown to affect beneficial uses

Groundwater Extraction, Benambra Bore Field

Additional water required for the Project is proposed to be extracted from a borefield to be developed in Benambra and pumped to site. Due to the poor connectivity between aquifers the EES concluded that no unacceptable impacts on other groundwater users or GDEs are expected as a result of Stockman's water use from this site. Nevertheless, a monitoring program for the borefield including trigger points has been proposed to provide early detection of any unexpected impacts on existing users or the GDEs. The North East Catchment Management Authority (NECMA) suggested a more conservative approach to proposed trigger levels was required, considering the nearby GDE¹²⁶. Whilst GMW indicated initial satisfaction with the proposed monitoring regime for a period of 12 months, it is noted that relevant matters will be further considered in assessing the application for a licence from the proponent¹²⁷.

One submission raised concerns that locals had bores currently intercepting the deeper alluvial aquifer and that these may be affected by Stockman's bores. However, the proponent confirmed that all registered bores within a 5 km radius had been considered in the impact assessment.

Conclusion (Groundwater extraction)

It is my assessment that the licence process under the *Water Act 1989* will be sufficient to further examine residual uncertainties and potential residual detrimental effects on other local registered users.

Further, it is my assessment that in assessing the application for a licence, GMW consult with NECMA and the EPA regarding potential trigger levels for the monitoring program to ensure environmental impacts are acceptable.

Mine Dewatering

Details provided in the EES indicate significant effects from mine dewatering are unlikely¹²⁸. A groundwater extraction licence will be required under the Water Act and Southern Rural Water (SRW) has indicated that potential impacts on existing water users and the environment are key considerations in the decision to grant a licence¹²⁹. SRW have also indicated that a detailed monitoring program will be required to ensure detrimental impacts can be identified and remedied.

Conclusion (Mine Dewatering)

It is my assessment that impacts from mine dewatering are unlikely to be significant. The licence process under the Water Act provides a sufficient basis to further examine potential residual effects on the environment and ensure an appropriate monitoring program is implemented to verify predictions from the model.

Accommodation Village Storage Dam

The EES and draft Incorporated Document indicate there will be a wastewater winter storage dam located at the accommodation village¹³⁰. The draft Incorporated Document indicates this dam will be lined and used to store treated wastewater during winter months prior to use for irrigation of pasture during summer months¹³¹. At closure it is proposed

¹²⁶ Submission 19

¹²⁷ GMW response to queries from the Panel

¹²⁸ EES Appendix C1 and p. 10-15 of Main Report

¹²⁹ SRW Submission 24

¹³⁰ EES Figure 4-22 and Appendix X p. 10

¹³¹ Appendix X p. 10

the wastewater winter storage dam and effluent disposal areas will be 'decommissioned, checked for residual contamination and backfilled'. These activities are to be undertaken in accordance with a rehabilitation plan prepared to the satisfaction of the Responsible Authority¹³². In addition to provisions in the Incorporated Document, an EPA Works Approval will be required for the wastewater winter storage dam. If it is proposed, the dam will also collect catchment runoff then a licence under the *Water Act 1989* would also be required.

In its submission, GMW raised concerns regarding the capability of the land to receive wastewater, the potential impacts on the environmentally significant Morass Creek sub-catchment of the Mitta Mitta River Catchment and the need to address *Ministerial Guidelines for planning applications in Open Potable Water Supply Catchments* (DSE, 2012).

The EES included a broad land capability assessment of the suitability of the proposed wastewater storage and disposal area¹³³ and demonstrated that key criteria would be complied with¹³⁴. This further indicated that proposed soils appear suitable for low rate and low annual depth of irrigation of treated wastewater. A summary of potential environmental impacts and measures is provided in the EES and it is proposed that an Environmental Improvement Plan, which addresses the *EPA Guidelines for Environmental Management – Use of reclaimed water* be completed prior to the commencement of irrigation and provided to the EPA. A draft EPA Works Approval Application was exhibited with the EES¹³⁵. A preliminary analysis of draft the works approval by the EPA has not identified any major issues which would prevent the timely acceptance of a final application for assessment¹³⁶. GMW would be consulted as part of the final application process¹³⁷.

Whilst consideration of the *Ministerial Guidelines for planning applications in Open Potable Water Supply Catchments* would be required by the Responsible Authority for a permit application¹³⁸, there is no equivalent provision for a planning scheme amendment. It is therefore recommended that the PSA include consideration of these Guidelines in the planning for the wastewater winter storage dam and consultation with GMW.

Conclusion (Accommodation Village Storage Dam)

It is my assessment that there are unlikely to be significant effects in relation to the wastewater winter storage dam at the accommodation village, and that the works approvals process under the EP Act will ensure the proposal is further refined in the context of potential effects including referral to GMW.

Further, it is my assessment that the Incorporated Document include a requirement to:

- Consult with GMW in relation to the accommodation village prior to submitting plans to the Responsible Authority for approval.
- Address the requirements of the *Ministerial Guidelines for planning applications in Open Potable Water Supply Catchments*.
- Consult with the EPA and GMW in preparing the rehabilitation plan for the accommodation village site prior to it being provided for approval by the Responsible Authority.

¹³² Incorporated document, s. 3.1 s. 11

¹³³ Appendix V section 4.3

¹³⁴ Appendix V section 4.3 and Table 4.3

¹³⁵ Appendix Y

¹³⁶ EPA Submission p. 8

¹³⁷ See Environment Protection Act 1970 s. 19B(3)

¹³⁸ See Planning and Environment Act 1987 s. 60(1A)(g)

4.6 Rehabilitation and Post-Closure

Evaluation objective – *To provide appropriate measures to ensure the effective rehabilitation and closure of the project site ensuring the protection of environmental values in perpetuity, downstream of the TSF in particular.*

Key Issues

The key issues related to project rehabilitation and post-closure to be considered are whether:

- The proposed approach to rehabilitation is appropriate and feasible.
- Successful rehabilitation and closure by the proponent will avoid adverse effects and minimise post-closure risks.
- Sufficient contingencies and post-closure arrangement are in place, including rehabilitation bond and post closure funds and governance, in the context of uncertainties and risk.
- Following closure and return of the site to Crown land, the State will inherit an acceptable risk or liability, that has been managed effectively prior to transfer.

Discussion and Findings

Rehabilitation Plans

A rehabilitation plan for the MLA is required to be included in the Work Plan¹³⁹. Requirements for rehabilitation plans are set out in the MRSD Act¹⁴⁰ and include the need to account for any special characteristics of the land and the need to stabilise the land and any potential long term degradation of the environment. A rehabilitation plan is to be prepared in consultation with the landowner (in this case the Crown), to the satisfaction of the Secretary of DSDBI in approving the Work Plan¹⁴¹.

A draft conceptual rehabilitation plan was exhibited with the EES,¹⁴² which will be further revised prior to a final Work Plan being submitted for approval. Subsequent to this, Stockman propose to develop a detailed Mine Rehabilitation and Closure Plan two years after the commencement of works¹⁴³. Further revisions of this Plan would occur as necessary during the later stages of the mining project.

The draft conceptual rehabilitation plan exhibited with the EES outlines the rehabilitation and closure requirement proposed¹⁴⁴ for the Wilga and Currawong mines, processing plant, stockpiles, services, TSF, drainage works and fire management zones, as well as indicative timeframes for rehabilitation measures associated with each project component. The Inquiry was satisfied with the content and level of detail provided in the draft plan and that further sufficient detail could be developed within the proposed timing for the Plan's finalisation and approval¹⁴⁵.

In its submission and further evidence, DEPI expressed support for the 'broad approach' proposed for rehabilitation, as well as support for the proposed monitoring program. In addition, DEPI accepted the risk-based approach applied in setting objectives. As current Crown land manager, DEPI will be consulted on the draft rehabilitation plan prior to it being approved by DSDBI. DEPI was comfortable that this process would allow an appropriate avenue for DEPI to ensure portfolio interests are subject to relevant monitoring programs and that further minor revisions would be addressed¹⁴⁶.

Rehabilitation of the proposed Stockman accommodation village, the proposed Benambra car park and linear infrastructure outside the MLA is not covered under the rehabilitation plan required through the MRSD Act approval. The provisions of the proposed Incorporated Document, to be introduced through an amendment to the East Gippsland Shire

¹³⁹ section 40(3)(b) of MRSD Act

¹⁴⁰ section 79 of MRSD Act

¹⁴¹ section 40(4) of the MRSD Act

¹⁴² EES Appendix B to Appendix W

¹⁴³ Tabled document 30, p. 56

¹⁴⁴ EES Appendix W, Appendix B, Table 2.1

¹⁴⁵ Inquiry Report p. 145

¹⁴⁶ DEPI Letter to PPV dated 17 July 2014 in response to verbal request made 26 June 2014

Planning Scheme, set out the requirements for rehabilitation of these areas. This essentially involves a rehabilitation plan, needing to be approved by the Responsible Authority, prior to commencing rehabilitation works. The EES describes the proposed approach to rehabilitation of these areas, including decommissioning and removing buildings, services and infrastructure from used sites and corridors. Then re-contouring, ripping, topsoiling and revegetating these areas, in consultation with landowners and to the satisfaction of the Responsibility Authority¹⁴⁷.

The Inquiry was satisfied that the proposed Incorporated Document includes a framework and appropriate conditions to ensure such issues as rehabilitation are sufficiently addressed.

Rehabilitation Bond

In evidence it was acknowledged that the rehabilitation bond for the previous project on the site was inadequate. Further it was explained that the current method for calculating rehabilitation bonds is different from that which existed for the previous mine¹⁴⁸. A review of the then DPI's bond policy was undertaken in 2004, which put forward a number of principles including that bonds must ensure the cost of rehabilitation is borne by the company and cover the actual and foreseeable liability based on the works required by the approved Work Plan¹⁴⁹. The Stockman Project is entirely separate from the previous mine and thus, specific legacy issues from the previous operations will not be included in the rehabilitation bond.

The Inquiry was not reassured that the proposed use of the generic bond calculator generates a sufficient bond to be set by government, to ensure adequate cover of the likely and foreseeable liability associated with the project described and assessed in the EES. Further, the Inquiry did not obtain any comfort in the suggestion that as a contingency, 'the government would, if necessary, meet any costs to resolve environmental issues not covered by the bond'¹⁵⁰. The Inquiry therefore recommended that calculation of the bond pay particular regard to the specific risks of the project, including the need to manage PAF material, including in the longer term (fn Inquiry Report p. 151).

In addition to the bond calculator, the MRSD Act provides the Minister for Energy and Resources with the ability to require a proponent to undertake a rehabilitation liability assessment for the purpose of determining the amount of rehabilitation bond (see Section 79A MRSD Act). This approach has clear merit in circumstances such as exists for this project.

Post-closure Arrangements

In addition to rehabilitation there will be a stage of site closure during which the proponent will be ensuring the site is stable and EQOs can be maintained (i.e. for supernatant water quality, discharging to ground and surface waters). DPI Guidelines indicate that demonstration of the success of the method of closure and cover design for a large TSF will usually take 5 years following the completion of mining¹⁵¹. Once closure objectives have been achieved and demonstrated, the site will be relinquished to the State and the post-closure phase will commence.

As identified in section 4.5.2, some risks posed to the environment from AMD will remain post-closure. In order to mitigate these risks ongoing monitoring and maintenance of the decommissioned project aspects may be required. Consistent with the DPI Guidelines¹⁵², proponents should make provision for the long term costs associated with the up-keep and maintenance of the TSF. In recognition of the ongoing monitoring requirements for the rehabilitated enlarged TSF, Stockman has agreed to co-contribute with government to a Post-closure Trust Fund (PCTF). In its submission to the Inquiry, DSDBI indicated that the proponent would be required to contribute to such a fund which would be established and administered by the State¹⁵³. In terms of the scope of the PCTF, DSDBI indicated the fund would

¹⁴⁷ EES Appendix X

¹⁴⁸ DSDBI, John Mitas

¹⁴⁹ DPI Targeted Discussion Paper – rehabilitation and bonds, p. 4

¹⁵⁰ Inquiry Report p. 150.

¹⁵¹ *Environmental Guidelines – Management of Tailings Storage Facilities* (DPI, 2004) p. 24

¹⁵² *Environmental Guidelines – Management of Tailings Storage Facilities* (DPI, 2004) p. 25

¹⁵³ Submission 26

provide for the ongoing monitoring and maintenance of the enlarged TSF. An independent assessment of the net present value for these requirements has been undertaken and estimated to total approximately \$5.5 million¹⁵⁴.

The Inquiry considered the establishment of an 'adequate' post-closure trust fund a 'critical' part of the project planning, and that submissions received from DSDBI indicated the scope and approach to the fund are 'reasonable'¹⁵⁵; although the Inquiry did go on to specify some items which should be covered by the PCTF¹⁵⁶. In particular, the Inquiry considered that the construction standard and monitoring requirements proposed were such that the risk of catastrophic failure of the TSF is minimal and therefore the Inquiry accepted that 'the trust fund does not need to account for that possibility'¹⁵⁷.

In further information provided to the Inquiry, DEPI supported the need for a PCTF and indicated acceptance of the third party advice provided to DSDBI regarding the quantum of the trust fund and its administration¹⁵⁸. DEPI however noted the need for some flexibility to be built into the administration of the fund to ensure that future risks and impacts to portfolio aspects (biodiversity, water and land) can be identified and adequately addressed.

Conclusions

In light of the EES, submissions and the Inquiry Report, it is my assessment that:

- The draft plan and proposed approach to rehabilitation and closure for both the mining related areas and the infrastructure outside of the Mining Licence are appropriate and feasible, in the context of the advice and requirements of relevant regulatory agencies.
- Development of contingencies and post-closure arrangements have progressed during development of the EES and draft Work Plan, although at this stage there is not sufficient confidence in the adequacy of the rehabilitation bond. Further to this, post-closure governance/ arrangements need to be refined to ensure they are adequate in the context of risks.
- Providing the proponent maintains effective monitoring and risk management during the project life, prior to transfer, the return of the site should be able to meet approved requirements, such that the State inherits acceptable ongoing risks/ liability without the need for contingency to be included in the PCTF.

Further, it is my assessment that:

- The Minister for Energy and Resources consider requiring the proponent to undertake a rehabilitation liability assessment subject to appropriate oversight¹⁵⁹ prior to setting the appropriate amount for the rehabilitation bond.
- Prior to refunding the rehabilitation bond, the Minister for Energy and Resources consider requiring the proponent appoint an independent auditor¹⁶⁰ in accordance with the MRSD Act, to certify the MLA has been rehabilitated as required. The Minister for Energy and Resources should encourage the proponent to either engage an Independent Technical Review (ITR) Panel (or members of) to undertake this audit or consult with the ITR Panel in appointing an external auditor.
- Design and construction of the TSF is to meet requirements of ANCOLD Guidelines. This coupled with proposed monitoring and maintenance program is such that the risk of catastrophic failure post-closure is considered acceptable, and that at this stage additional contingency does not need to be allowed for in the PCTF.

¹⁵⁴ *Department of State Development, Business and Innovation, Assessment of Proposed Post Closure Design for Stockman Tailings Storage Facility Report* (GHD, 2014)

¹⁵⁵ Inquiry Report p. 151

¹⁵⁶ Inquiry recommendation 12

¹⁵⁷ Inquiry Report p. 151

¹⁵⁸ DEPI Letter to Panel dated 17 July 2014

¹⁵⁹ such oversight may be to require an auditor as per section 79A(3) and/or review by the ITR Panel described in section 3.12

¹⁶⁰ consistent with section 81A of the MRSD Act

Based on the suggestions and proposals from the proponent, relevant agencies and the Inquiry, it is my assessment that post-closure arrangements be managed as set out below:

Post Closure Management Plan

- Applying a risk-based approach¹⁶¹, a post-closure risk assessment should be undertaken and reviewed in order to inform a post-closure management plan (PCMP). The risk assessment should use the project wide risk assessment and issues arising from this assessment as a starting point, initially for submission with the final Work Plan. The risk assessment should then be subject to regular (e.g. annual) review/ updating during prior to closure. The PCMP should also be revised as required, as influenced by updated risk assessments. To be clear, the PCMP is only intended to address risks relevant to the post-closure phase, but these are not limited to the risks related to the enlarged TSF (e.g. risks relating to AMD from mine voids may also be considered key risks at the point of closure).
- The development of these documents is to be the responsibility of the proponent (required either as a condition of the Mining Licence or the legally binding PCTF agreement with the State). A 'final' update of the risk assessment and PCMP is to be undertaken prior to hand back of site and is to be informed by rehabilitation and closure outcomes (undertaken by the proponent). Both the risk assessment and PCMP shall be subject to ITR prior to finalisation and sign-off.

Post Closure Trust Fund

- A legally binding agreement between the proponent and the State, represented by DSDBI, shall require the proponent to contribute to the PCTF. The amount to be held in the PCTF shall be determined based on the requirements to avoid, mitigate and manage key residual risks identified in the PCMP. It is recommended that an initial amount be required to be contributed to the PCTF prior to commencing works, with allowance in the agreement for review of the adequacy of this amount consistent with the risk assessment - the 'final' risk assessment and PCMP should be undertaken prior to hand back. The ability to review the fund amount and require additional contributions is consistent with similar mechanism available for rehabilitation bonds (see s. 80(4) MRSD Act). The PCTF should also account for any funds required to retain independent technical advice as required by the State (land manager) for the post closure period.

Post Closure Governance and Land Management

- To support the governance of the post-closure arrangements over the life of mine and post-closure, the Minister responsible for the MRSD Act needs to establish governance arrangements, including perpetual funding, to manage any residual liabilities post closure.

4.7 Planning, Land Use and Amenity

Evaluation Objective - *To deliver a project that addresses the planning objectives of the region and to avoid or minimise adverse effects on amenity and present and future land uses.*

Key Issues

The key planning, land use and amenity-related issues associated with construction and operation of the mine are whether:

- the risk of/from bushfire has been effectively addressed.
- the project will have significant effects on other current or future land uses in the project area and surrounds.
- the project will have significant effects on amenity.

¹⁶¹ A risk-based approach to closure and post-closure is consistent with *Strategic Framework for Tailings Management* (MCMPR, MCA, 2003) Section 5.2 and *Environmental Guidelines – Management of Tailings Storage Facilities* (DPI, 2004)

Discussion and Findings

Bushfire

The whole project risk assessment considers three bushfire-related risks being a bushfire caused by an unplanned ignition source from any form of mobile or fixed plant (two separate risk events) and bushfire caused by the loss of control of planned land management activities undertaken by Stockman¹⁶². The greater risk to workers from a fire of unknown source (unrelated to the Project) has not been assessed. At the Inquiry, the CFA provided that 'at a landscape scale...there is a real and significant threat of high intensity bushfires reaching the locations of the project accommodation and works sites'¹⁶³. Further, the CFA stressed the limited resources with which they could respond to such an incident and the need for the mine operator to recognise their significant role as first responder.

Despite acknowledging the relevant methodology had been applied for determining construction requirements and defensible space, the Inquiry considered 'the assessment did not fully recognise the extreme fire risk of this landscape.' The Inquiry noted that in determining defensible zones, too much reliance was had on the nature of the workforce, the ability to transport them and the proposed use of the mine site as a refuge¹⁶⁴. In submissions, the CFA raised a number of concerns with the proposal to rely on the mine, or in-mine refuges for shelter noting their portable nature could present challenges for accessing the refuge, such as potential loss of power and need to assure appropriate ventilation¹⁶⁵. In particular, the CFA rejected the proposal to transport workers from the accommodation village to mine site for refuge due to the location and distance, instead preferring a purpose-built structure at the village site¹⁶⁶. The CFA and Inquiry also noted the material before them failed to address specific responses for work during periods of high fire risk. Although the risk assessment did refer to procedures for high fire danger days to manage risk of fire ignition from project activities, this was not addressed in the context of fires ignited from external sources which pose risk to workers. Such protocols could impose 'significant constraints on operations'. The Inquiry further noted the need for the proponent to assume a high level of 'self-reliance' in developing emergency response, and the need for a specific management plan to be prepared to the satisfaction of the CFA and DEPI as a condition of the relevant approvals.

Land Use

The land use impact assessment found that proposed mining activities were not expected to have a significant effect on existing land uses (including forestry and recreational uses) inside or adjoining to the MLA.

For infrastructure outside the MLA, the land use impact assessment undertaken for the EES concluded:

- The car park would be permissible under the current zone.
- Where infrastructure is to be developed in the farming zone, the proposed uses are permissible and in some cases, permits are not required.
- The borefield, road widening, and linear infrastructure will not adversely effect environmental values of the environmental significance overlays that affect some of the land for this infrastructure, provided the activities are undertaken in a manner consistent with native vegetation requirements and meets bushfire management requirements, as discussed above.
- The use of a residential village at the preferred location is currently prohibited under the existing zones. In addition, the bushfire risk at this location is extreme. This has been discussed above.

Amenity

The noise assessment modelled potential effects from construction of the TSF, accommodation village and processing plant. Due to the distance from the mining activities to sensitive receptors, significant effects on sensitive receptors due to vibration or noise were considered highly unlikely. Standard procedures to mitigate on-site dust and noise and vibration for occupational health and safety requirements are proposed and considered acceptable.

¹⁶² EES Appendix U, p. 23

¹⁶³ Tabled document 11

¹⁶⁴ EES, Appendix X, p. 53, Inquiry Report p. 114

¹⁶⁵ Inquiry Report p. 114, CFA submission

¹⁶⁶ Tabled document 11

Predicted noise from the proposed borefield, project-related traffic and the car park were not modelled, however some mitigation is proposed for the borefield and traffic. Although not considered by the EES, due to the likely early hours of operation, the Inquiry was concerned regarding potential noise impacts from the car park on nearby residents and recommended mitigation measures including noise attenuation to bedrooms be considered¹⁶⁷.

Pollutant emissions and dispersion were modelled for emissions from mining, processing and power generation during a worst case operational scenario. Modelling indicated no exceedances of relevant criteria are to be predicted for any of the modelled pollutants. In consultation with the EPA other aspects of the project including transport were not modelled. The EES outlines various management and mitigation measures to reduce effects of dust emissions from the project and it is expected these will be implemented as part of the dust controls included in the Incorporated Document. The Inquiry noted that 'impacts from noise, dust and blasting were not identified in the EES or submissions as issues of concern'¹⁶⁸.

Conclusions

It is my assessment that:

- The risk posed to the workforce from bushfire has not been completely addressed and requires further consideration to ensure it is appropriately managed.
- The successful management of key environmental risks identified in other sections will be integral to ensuring long term land use effects do not occur as a result of the project.
- Provided successful management can be achieved, the predicted effects on land use are considered acceptable.
- With the exception of the car park, predicted impacts on amenity are likely to be low and acceptable and proposed management measures are appropriate.
- The likelihood of potentially unacceptable noise effects on sensitive receptors in the vicinity of the car park is unknown, although appropriate management and mitigation should address this.

Further, it is my assessment that:

- Additional work be undertaken by the proponent in consultation with the CFA and DEPI, as appropriate, during the finalisation of the PSA and Work Plan to ensure the risk posed to the workforce from bushfire is adequately addressed.
- The Incorporated Document and Work Plan include a condition that prior to construction or the commencement of works, an integrated Fire and Emergency Response Plan be developed to the satisfaction of the CFA and DEPI, as appropriate. The Fire and Emergency Response Plan should address matters raised in submissions and adopted by the Inquiry¹⁶⁹.
- The Incorporated Document include a condition for a car park management plan and driver code of conduct, aimed at minimising safety and amenity effects, prior to the use of the car park commencing. As part of this plan, the potential for significant noise effects on residences adjacent to the car park during night-time hours (as identified by the Inquiry) should be considered and addressed (as appropriate) by Stockman, prior to commencement of works, and in consultation with East Gippsland Shire Council.
- The Incorporated Document include an expiry control specific to the accommodation village to ensure its use is only permitted in association with the mine and on the basis that bushfire mitigation measures are implemented.
- The Incorporated Document include the requirement to monitor and maintain the implementation of bushfire mitigation measures to the satisfaction of the Responsible Authority on a continuing basis and to exempt the Bushfire Management Overlay permit triggers¹⁷⁰.

¹⁶⁷ Inquiry recommendations 63 and 64

¹⁶⁸ Inquiry Report p. 49

¹⁶⁹ see p. 115 of the Inquiry Report

¹⁷⁰ standard condition under BMO; see CI 44.06-3 of BMO

4.8 Socio-economic

Evaluation Objective – *To minimise potential adverse social and economic effects and maximise potential socio-economic benefits, including in relation to affected townships, residents, community services and infrastructure both during project operations and following closure.*

Key Issues

The key socio-economic issues to be considered are whether:

- The Project will have overall economic benefits for the region and State (including employment, income, local/regional investment, royalties etc.).
- The social benefits for the region outweigh the adverse effects on the local and regional communities.
- The Project will significantly impact traffic, road safety or road maintenance in the project area.

Discussion and Findings

Social

Community consultation and the Social Impact Assessment identified potential effects including:

- Changes to local demographic, social and recreational networks from influx of workforce.
- Increased competition for local housing negatively impacting on affordability and availability.
- Increased competition for community services, which in some cases are already strained.

Submissions from the local community in support of the Project were generally supportive of an increase in population and the increased opportunities the mine may bring for the local workforce and businesses. Members of the local community who were opposed to the Project were predominately concerned with the potential for significant environmental effects from the mining operations and post-closure.

The EES identified a number of measures aimed at ensuring potential social effects are appropriately mitigated and/or benefits realised to their full potential. Measures included: establishing a community fund, implementing a worker code of conduct and developing company policies to encourage local employment and procurement¹⁷¹. The EES identified the Memorandum of Understanding (MOU) entered into with Council as a 'key mechanism for implementing and managing mitigation actions'¹⁷².

The Inquiry commended the proactive approach by Council in facilitating the joint management of some of the key issues through the MOU, which aims to provide, maintain and enhance physical infrastructure, optimise social and economic outcomes at the local scale and build relationships to support the implementation of the Project¹⁷³.

Whilst holding a high level of confidence for the resolution of local government issues through the approval process, Council submitted there is a need for ongoing monitoring and evaluation of actual effects and the effectiveness of proposed mitigation measures. The Council also queried the best mechanism to achieve this oversight within the existing approvals and governance framework(s)¹⁷⁴. The Inquiry agreed with Council that monitoring and evaluation of the effectiveness of mitigation measures should occur and in particular recommended the 'a framework for 'scanning' local housing, services and employment conditions and impacts of the Project'¹⁷⁵.

In making its submission, Council noted the recent adoption of Amendment C117 in the East Gippsland Planning Scheme, which has the effect of requiring applications for development, infrastructure and land use to include a social impact assessment in accordance with the *East Gippsland Shire Council Social Impact Assessment Guidelines*. These Guidelines outline the role of applicants including the need to prepare an Implementation Plan to address social impacts (both positive and negative) and to contribute to monitoring of those impacts as appropriate. Whilst it is acknowledged that this Amendment commenced operation after the exhibition of the EES, it is considered appropriate that, in

¹⁷¹ EES Section 19.5

¹⁷² EES Section 19.8 and Appendix R, Section 11.1

¹⁷³ EES p. xviii, Inquiry Report p. 39

¹⁷⁴ Tabled document 17, p. 16

¹⁷⁵ Inquiry Report p. 42-43

implementing the Project, the proponent strives to address standards set by these guidelines for management and monitoring of potential socio-economic effects¹⁷⁶. It is noted that the proposed Environmental Management System includes a specific social / community issues management plan, which identifies consultation with Council regarding monitoring of impacts as a key management action¹⁷⁷.

The Inquiry raised concerns regarding the perceived lack of opportunities for input into the process from local environmental groups and recommended such groups be included in a Community Reference Group (CRG).

Under the MRSD Act, a proponent has a duty to consult through all stages of the mine life and a community engagement plan forms part of the required aspects of the mining Work Plan¹⁷⁸. The MRSD Act sets out what is required in a community engagement plan¹⁷⁹. A CRG is often a forum for community engagement and in this case a CRG was established in 2011 to serve a forum for information disclosure and feedback. The continued operation of the CRG encompassing a range of stakeholders is supported.

An Environmental Review Committee is a separate body set up to review a mine's performance against legislation including the Work Plan, environmental management plan and other commitments including offsite impacts¹⁸⁰. Such a committee is generally made up of site representatives, local council, relevant government and non-government organisations and representatives from the local community.

Economic

The EES estimates the project will result in an increase of the State's Gross State Product by \$1,239 million (3.4%), provide \$80 million in revenue for the government and an average annual increase in total employment by 265 jobs over the project life.

The Inquiry concurred with the EES assessment that 'the mine will generate significant net economic and employment benefits for the State, regional and local economies'¹⁸¹

The EES identified a definite increase in traffic most noticeable between Omeo and Benambra with impacts on movements from Bairnsdale to Geelong being insignificant¹⁸².

Council's submission identified discussions with the proponent for them to upgrade sections of Limestone Road and McCallums Road to ensure a minimum width of 6.0 m plus 0.5 m wide shoulders¹⁸³. The proponent indicated it's agreement with Council to undertake these upgrades in its submissions¹⁸⁴. The Inquiry noted the Traffic Impact Assessment accompanying the EES recommended a 1 m unsealed shoulder and the Inquiry adopted this as the recommended width, and further recommended the shoulders be provided to the same standard as the pavement area¹⁸⁵.

In addition, Council was of the view that any maintenance requirements due to the project (i.e. beyond historic average) should be borne by the proponent and it is noted that this is included in the MOU¹⁸⁶.

VicRoads provided detailed submissions seeking a road maintenance contribution as a result of the damage that will occur during the Project on VicRoads Class 'B' and 'C' roads¹⁸⁷

¹⁷⁶ Whilst it is noted that a mining project which triggers an EES would not ordinarily require a SIA under the guidelines (see Table 1 on p. 11) it is considered that this "exemption" is to avoid duplication of process as opposed to holding such applications to a lesser standard.

¹⁷⁷ EES Figure 20-3, Table 20-11

¹⁷⁸ see section 40 MRSD Act

¹⁷⁹ see schedule 13

¹⁸⁰ *Environmental Review Committee Guidelines* p. 1 of guidelines

¹⁸¹ Inquiry Report p. 43

¹⁸² EES Section 19.8

¹⁸³ Tabled document 17, p. 18

¹⁸⁴ Tabled document 30, p. 38

¹⁸⁵ Inquiry Report p. 120

¹⁸⁶ Appendix S, p. 10

Whilst rejecting the notion that it should contribute to upgrading of roads required as a matter of course, the proponent accepted the principle that it should undertake or contribute to costs of road upgrade or maintenance works that are necessitated as a direct consequence of the Project¹⁸⁸. This position is supported.

In terms of traffic safety, the project Environmental Management System (EMS) includes a traffic and transport management plan, which the Inquiry recommended should be included as a condition of both the Work Plan and Incorporated Document¹⁸⁹. The implementation of a traffic management plan is supported as is the inclusion of specific operating protocols with school bus operators as identified by Council¹⁹⁰.

Conclusions

It is my assessment that:

- The Project has the potential to deliver significant social and economic benefits to the local community.
- There is a need for ongoing monitoring and evaluation of identified social impacts to ensure negative impacts are appropriately mitigated and positive impacts are realised to their full potential.
- The approach of the proponent to contribute to traffic works required as a direct consequence of the Project is appropriate.

Further, it is my assessment that:

- The Incorporated Document include a requirement for a social management plan which consolidates proposed mitigation measures and outlines a framework for monitoring social impacts on housing, services, employment conditions and the community. The contents of this plan should be developed to the satisfaction of East Gippsland Shire Council and in consultation with DSDBI.
- The Work Plan include a condition that an Environment Review Committee be established prior to construction - this is the appropriate forum to monitor social performance of the mine as needs.
- Consistent with the *Environmental Review Committee Guidelines*, community representatives should be selected by the local council. In selecting members it is recommended the Council include representatives of regional environmental groups.
- The traffic management plan be included as a condition in the Incorporated Document and Work Plan and should include specific operating protocols with school bus operators.

4.9 Cultural Heritage

Evaluation Objective – *To protect Aboriginal and historic cultural heritage values.*

Key Issues

The key issue to be considered for this section is whether the Project would have a significant effect on Aboriginal or historic cultural heritage sites and values.

Discussion and Findings

Aboriginal Cultural Heritage

Investigations of the Victorian Aboriginal Heritage Register identified 36 sites of Aboriginal cultural heritage, including 34 artefact scatters, one quarry and an earth feature. None of these sites will be impacted by the Project. Field surveys identified a further 37 sites in the project area. Of these, only 11 occur within areas currently proposed to be disturbed and all of these were isolated surface artefacts along Limestone-McCallums Road which will require widening. Two of the

¹⁸⁷ Tabled document 27, p. 1

¹⁸⁸ Tabled document 30, p. 39

¹⁸⁹ Inquiry recommendation 59

¹⁹⁰ Tabled document 17, p. 18

sites are of moderate scientific significance with the rest being of low scientific significance.¹⁹¹ Whilst no sites were detected at the proposed Currawong processing facility site, it was considered that there was a low to moderate archaeological potential, as vegetation may have masked sites during the field survey.

The draft Cultural Heritage Management Plan (CHMP) indicates that all of these sites will be directly impacted and that harm cannot be avoided or minimised¹⁹². It is considered that all of the sites of low scientific significance have been thoroughly investigated and no further archaeological material is associated with them. Specific measures to manage these sites will be determined prior to finalising the CHMP.

In addition to this, procedures for chance finds are included in the draft CHMP to reduce the potential of additional impacts.

The Inquiry was satisfied that potential residual impacts on Aboriginal cultural heritage values were capable of being managed through a finalised CHMP. Where an EES is required, a CHMP must be prepared prior to the commencement of works¹⁹³. An approved CHMP is required prior to the grant of a work authority¹⁹⁴. Whilst an approved CHMP is required prior to the grant of a planning permit, there is no equivalent provision for a PSA. It is therefore recommended that the PSA not be granted until an approved CHMP has been obtained by the proponent.

Historic Cultural Heritage

Desktop and in-field surveys did not identify any historic cultural heritage sites in the impact areas. The low number of historic cultural heritage sites located in the surround areas coupled with the severe bushfires of 2003 have diminished the likelihood of locating any previously unrecorded sites. Further investigations, mitigation and management measures are therefore not recommended¹⁹⁵.

Conclusions

It is my assessment that the predicted impacts on Aboriginal and non-Aboriginal cultural heritage values will not be significant and that residual effects can be readily managed through the CHMP.

Further, it is my assessment that the PSA not be approved prior to the proponent obtaining an approved CHMP for the areas beyond the Mining Licence and that this be included as a condition precedent in the Incorporated Document.

4.10 Environmental Management Framework

Evaluation Objective – *To provide a transparent framework with clear accountabilities for managing environmental effects and hazards associated with the project in order to achieve acceptable environmental outcomes.*

Discussion and Findings

The EES outlines an Environmental Management Framework (EMF) based on what Independence Group has in place at its two other mines in Western Australia (Long Mine and Jaguar Mine). This is effectively an EMS developed for the Stockman Project, based on the AS/NZS ISO14001:2004 standard, using an adaptive management and continuous improvement approach¹⁹⁶ - refer to Figure 2.

The EMF/ EMS broadly described in the EES includes an overview of the relationship between approvals, commitments, controls, plans, monitoring and reporting. It also sets out roles and accountabilities for implementation of the EMS and the specific management plans and strategies that are to be in place for the different environmentally significant aspects that stemmed from a whole of project risk assessment, as set out in figure 20-5 of the EES Main Report.

¹⁹¹ scientific significance is assessed using standard criteria

¹⁹² Appendix Q, p. 194

¹⁹³ section 49 of AH Act 2006

¹⁹⁴ section 42 MRSD Act and section 52 AH Act 2006

¹⁹⁵ EES p. 17-10

¹⁹⁶ EES Main Report pp. 20-4 to 20-6

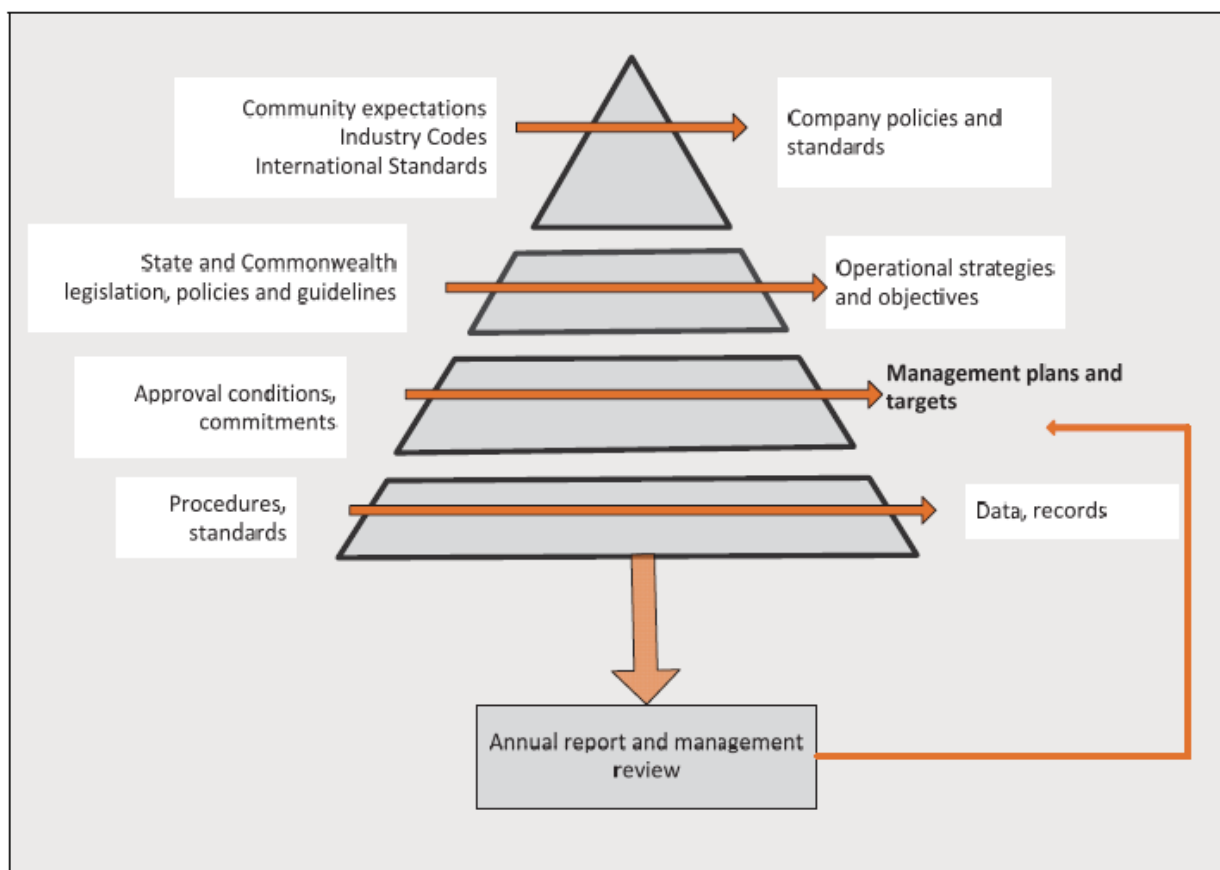


Figure 2. Stockman Project Environmental Management Framework (EES, Figure 20-2, page 20-5)

The EMF described in the EES also encompasses detailed environmental monitoring strategies, addressing various environmental aspects for the different project components¹⁹⁷. These strategies set out the performance evaluation criteria that are to apply to the monitoring and management of an array of environmental parameters.

The EES also refers to the Environmental Review Committee as an important stakeholder engagement mechanism that is an element of the EMF/EMS, to help ensure there is stakeholder participation in the environmental management of the project.

Conclusion

It is my assessment that a refined EMF for the Project, building on that outlined in the EES, will provide a robust and transparent framework for the management of residual environmental effects and achievement of acceptable environmental outcomes.

Further, it is my assessment that:

- The Stockman Project EMS is included in, and/or required through, both the Work Plan and PSA Incorporated Document.
- As much as possible standard whole-of-project management plans are developed to address significant environmental aspects and risks that are not confined to either the Mining Licence or other discrete project areas.
- The Environmental Review Committee is set up and required as a condition of the Work Plan, such that it addresses environmental matters and monitoring in relation to the entire Project, not just those within the Mining Licence(s).
- The following management plans should be addressed through the PSA – Noise, Traffic, Fire Prevention and Social.

¹⁹⁷ refer to Table 20-18 of the EES Main Report

4.11 Governance Framework

Evaluation Objective - to establish a transparent and robust framework for the governance and oversight of the project from pre-approval to post-construction.

Key Issues

The key issue is that due to the complex, technical nature of the Project, the existing regulatory roles need to be supported by a transparent and robust framework for the governance and oversight of the Project.

Discussion and Findings

As mentioned in section 4.5, the Inquiry endorses an ITR framework being set up as a key means of addressing ANCOLD requirements and reviewing the stability of the TSF embankment. The Inquiry raised the issue of availability of resources and/or specific technical expertise within DSDBI (now and/or in future) to provide 'close oversight of plans, operations and closure to ensure the long term environmental risk of mining operations and in particular the TSF, are resolved'¹⁹⁸. In addition, the Inquiry noted the interests of other regulatory agencies in relation to the mine site and its environmental security during operations and post-closure.

During the Inquiry hearing, the notion of an ITR framework evolved and a proposal put forward by the proponent¹⁹⁹. It was proposed that an ITR would be appointed by Stockman and endorsed by DSDBI. In addressing this document, the Inquiry agreed in principle with most of the suggestions and identified an additional list of matters for the ITR to provide additional oversight on²⁰⁰. The notion of ITR for such a project is indeed consistent with ANCOLD Guidelines and is supported by this Assessment. Having an ITR in place will provide significant benefit to both the proponent and regulator(s).

Conclusion (Independent Technical Review)

It is my assessment that, in order to ensure appropriate oversight of key technical matters, a 'panel' of Independent Technical Reviewers (the 'ITR Panel') be set up to advise on aspects of the project as required. The ITR Panel should be in place prior to the approval of the Work Plan to assist with further work required prior to the submission of the Work Plan, including the development of a robust monitoring program. It is anticipated that the role of the ITR Panel may conclude after the mine has been rehabilitated and the required closure standards are reached, such that hand back to the State is permitted. However, if at that time there is perceived merit in retaining the ITR Panel to assist the State (land manager) post-closure, then the ITR shall be appointed for a further period of time (e.g. 1 to 2 years) with annual reviews of the utility of this role by the State (land manager). If it is determined the ITR Panel itself is no longer required, it may still be appropriate to engage independent technical review/ assistance from time to time from the composition of the Panel, which should also be funded from the PCTF.

As concluded by the Inquiry, the proponent should bear the costs of the ITR Panel for the life of the mine, and the PCTF, discussed in section 4.6, shall account for costs of independent technical review as required by the State (land manager) beyond closure. It may be considered appropriate that the proponent's obligations in terms of the use and funding of the ITR Panel, form a condition of the new or varied Mining Licence for the Project.

Further, it is my assessment that it is not necessary for all members of the ITR panel to be EPA-approved auditors. However, the ITR Panel should include at least one EPA-approved auditor, to act as chair and to provide oversight of the Panel's review and advice. It is also suggested that the ITR Panel may, if appropriate, draw on expertise of the existing Technical Review Board set up under the MRSD Act to advise on mine and quarry stability²⁰¹.

It is my assessment that the ITR Panel is to inform, as appropriate, approvals and conditions set under the MRSD Act as well as the dam licence required under the *Water Act 1989*. In all cases, reports of the ITR Panel should also be included as attachments to or available together with regulatory applications (e.g. final Work Plan). It is envisaged the ITR Panel can be used for both final peer review and provision of iterative advice, providing all correspondence between

¹⁹⁸ Inquiry Report p. 145

¹⁹⁹ Tabled document 34, Attachment 1

²⁰⁰ Inquiry Report p. 147

²⁰¹ As described on DSDBI's website at <http://www.energyandresources.vic.gov.au/earth-resources/policy-and-legislation/advisory-councils-and-review-boards/technical-review-board> accessed on 15 October 2014

the ITR Panel, the proponent (and consultants) is documented. The ITR Panel shall set up its own procedures in consultation with DSDBI ERR, including the means of documenting advice.

Further, it is my assessment that the initial scope of work for the ITR panel shall include review of the following:

Prior to Work Plan submission:

- Proposed monitoring, including for surface and groundwater monitoring around the TSF, to ensure an appropriate baseline of existing conditions can be undertaken in order to inform detailed design of the TSF.
- Proposed detailed TSF design including (but not limited to) sealing exposed rock faces, TSF raises, potential life and impacts modelling of failure of grout curtain and liners, spillway and diversion channels for the purpose of both the final Work Plan approval under the MRSD Act and the dams licence application to SRW.
- Proposed monitoring program for TSF, mine and processing plant.
- Aspects of draft environmental management plan relevant to key risks.

Following Work Plan approval:

- Proposed groundwater and surface water monitoring program to be implemented for the project, including to establish a robust baseline and subsequently derivation of EQOs, and monitor the environmental performance of the Project.
- TSF, once constructed and as each stage is complete, to ensure compliance with detailed design and in order to satisfy the requirement for external review as per section 2.6 of the ANCOLD Guidelines.
- Detailed design of the Wilga plugs.
- Annual and other environmental monitoring / performance reports.
- Predicted quality of supernatant discharge during lifts (if proposed) and post-closure.
- Suitability of proposed backfill paste for stability and AMD control.
- Compliance with environmental management plan in relation to key risks.
- Feasibility and options assessment for methods to treat supernatant water post-closure.
- Closure plan for TSF and mine.
- Post-closure risk assessment and post closure management plan as described further in section 4.6.

Post-closure:

- Implementation of the post closure management plan as considered necessary by the State (land manager).

Conclusion (Governance Framework)

It is my assessment that, together with the arrangements for rehabilitation and post-closure, the mechanism for ITR as described above, forms a robust governance framework for the Stockman Project.

The following figure outlines the likely governance arrangements in light of the findings of this Assessment.

PROJECT PHASE				
	Prior to approving Work Plan	Life of Mine from Work Plan approval until hand back of site	At Closure/Hand back	Post Closure
Independent technical review	<ul style="list-style-type: none"> Advisory Panel appointed by Minister under MRSD Act Funding by proponent to be a condition of the Mining Licence 	<ul style="list-style-type: none"> Advisory Panel oversees key stages of mine 	<ul style="list-style-type: none"> Mining Licence is relinquished 	<ul style="list-style-type: none"> Funding to come out of PCTF
Regulation	<ul style="list-style-type: none"> DSDBI as regulator 	<ul style="list-style-type: none"> DSDBI as regulator inside MLA EPA as regulator outside MLA 	<ul style="list-style-type: none"> DSDBI concludes Mining Licence 	<ul style="list-style-type: none"> EPA as regulator
Oversight		<ul style="list-style-type: none"> ERC established as a condition of the Work Plan 	<ul style="list-style-type: none"> ERC role comes to a close 	<ul style="list-style-type: none"> State established governance arrangement
Rehabilitation	<ul style="list-style-type: none"> Proponent undertakes a rehabilitation liability assessment to inform amount required for rehabilitation bond Rehabilitation bond to be paid Requirement to undertake rehabilitation liability assessment & obtain certification of rehabilitation could be a condition of the Mining Licence 	<ul style="list-style-type: none"> Further contributions to bond if required 	<ul style="list-style-type: none"> Auditor to certify rehabilitation Rehabilitation bond to be returned Mining Licence relinquished 	
Post closure	<ul style="list-style-type: none"> Initial Post Closure risk assessment, draft PCMP informing initial amount to be held in PCTF Undertaking risk assessment, updating PCMP & contributing to PCTF to be a condition of the Mining Licence 	<ul style="list-style-type: none"> Regular updates of risk assessment & PCMP Review of PCTF as required 	<ul style="list-style-type: none"> 'Final' risk assessment & PCMP undertaken to inform final amount for PCTF Mining Licence is relinquished 	<ul style="list-style-type: none"> Implement PCMP Regular review of risk assessment & PCMP State oversees & manages implementation of PCMP, administration of PCTF & expenditure

Figure 3. Likely governance arrangements

4.12 Ecologically Sustainable Mining

Evaluation Objective – Overall, to enable a mining development that contributes to the economic, social and environmental objectives of the State, consistent with the principles of ecologically sustainable development and environment protection.

This section focuses on the acceptability of the environmental outcomes of the Project, relative to the economic and social outcomes, including in the context of the principles and objectives of ESD. The Ministerial Guidelines made under section 10 of the EE Act specifically require the assessment of the effects of a project to consider the principles and objectives of ESD and principle of environment protection. The Project's overall consistency with the following objective and principle of ESD are particularly pertinent:

- To provide enhanced individual and community wellbeing and welfare by following a path of economic development that safeguards the welfare of future generations.
- To protect biological diversity and maintain essential ecological processes and life-support systems.
- Decision-making processes should effectively integrate both long and short-term economic, environmental, social and equity considerations.

- Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- The need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised.
- The need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised.

Environmental and Socio-economic Outcomes

In summary, this Assessment has identified the following key environmental and socio-economic outcomes:

- The Stockman Project will result in significant effects on native vegetation in a remote area that has significant biodiversity values, including the clearing of almost 70 ha and 600 LOTS, of which approximately 90% is of very high or high conservation significance due to its habitat values.
- However, these losses are considered acceptable in the context of the policy framework, particularly given the proponent has sufficiently adopted measures to avoid, minimise and mitigate losses through the EES process, and the losses will be appropriately offset consistent with the relevant requirements.
- AMD represents the most significant environmental challenge for the Stockman Project.
- Proposed measures, including maximising underground storage of tailings and best practice design of the enlargement of the TSF consistent with ANCOLD Guidelines, will assist in reducing the risk of AMD from this project.
- Consistent with the ANCOLD Guidelines, additional independent technical oversight is required to assist the existing statutory governance framework for the project.
- Due to the challenges that the management of PAF material presents for site rehabilitation and closure, it is appropriate for additional measures available under the MRSD Act to be enforced, specifically, requiring a rehabilitation liability assessment prior to setting the bond amount and the subsequent independent certification of the rehabilitation.
- Due to the ongoing nature of risks emanating from the TSF structure post-closure and hand back to the Crown, it is appropriate and necessary for robust post closure arrangements to be set out and funded by the proponent.
- The use of the accommodation village site is only acceptable in the context of the mining project and this should be stipulated in the Incorporated Document.
- Further work required to address risks posed to the workforce from bushfire can be undertaken by the proponent in consultation with the CFA and DEPI as appropriate, during the finalisation of the PSA and Work Plan.
- Potential amenity impacts from the car park can be effectively considered and addressed through the PSA process in consultation with East Gippsland Shire Council and relevant landowners/residents.
- There is a need for ongoing monitoring and evaluation of identified social impacts, and it is appropriate for the key approval documents to include a social management plan with requirements for monitoring which should be overseen by the Environmental Review Committee to be established as a condition of the Work Plan.
- The commitment to contribute to consequential traffic works and implementation of a traffic management plan will ensure traffic impacts are acceptable.
- No significant impacts are anticipated on historic or Aboriginal cultural heritage and uncertainties can be addressed through an approved CHMP, a necessary precursor for proceeding with works associated with the Incorporated Document.

Overall Conclusions

Having regard to the EES, the Inquiry Report and matters raised in submissions, it is my overall assessment that:

- In relation to both the relevant legislation and policy framework and the project's overall benefits, the potentially significant environmental effects and risks of the Stockman project are acceptable, provided the appropriate mitigation and management measures, consistent with the findings of this Assessment and the Inquiry Report, are implemented.
- The Stockman Project will provide a net benefit to the State of Victoria, having regard to both long term and short term economic, environmental and social considerations.
- The Stockman Project should proceed in a manner consistent with this Assessment, including the following responses to the recommendations of the Inquiry.



MATTHEW GUY MLC
Minister for Planning

27.10.14

5 RESPONSE TO INQUIRY RECOMMENDATIONS

Table 3. Inquiry's recommendations (in the left column) and the Minister for Planning's general response to the recommendations (in the right column), together with any relevant references to findings within sections of this Assessment.

INQUIRY RECOMMENDATION		RESPONSE
GOVERNANCE AND INDEPENDENT TECHNICAL REVIEW		
1.	Appoint Independent Technical Reviewer(s), funded by the proponent, before the issue of a Works Approval, with the role and functions identified in Section 13 of this report.	Supported in principle - the ITR should be approached as set out in section 4.11.
2.	Establish an independent technical peer review and auditing process prior to the commencement of construction to enable in principle demonstration of achievement of outcomes throughout the life of the mine.	Supported - the ITR should be approached as set out in section 4.11.
3.	Draw on the assistance of the Environment Protection Authority to review and approve the role description for the appointment of an Independent Technical Reviewer, who is to be an Environment Protection Authority approved auditor for all aspects except for the design, construction and monitoring of the TSF dam.	Supported - at least one EPA approved auditor to be included, as chair of ITR Panel, as set out in section 4.11.
4.	Before mining construction starts, develop and implement an independent peer reviewed detailed monitoring program to the satisfaction of the Independent Technical Reviewer(s) and Department of State Development, Business and Innovation. The program should be included in the Work Plan. It must identify and specify all relevant existing and proposed quality and quantity parameters for the discharge of water to the environment in the vicinity of the mining operations and the TSF.	Supported, subject to related findings of this Assessment – see sections 4.5, 4.4 and 4.11.
5.	Prior to the completion of the Mining Licence, appoint an Independent Technical Reviewer(s), funded from the proposed trust fund to be established between the Victorian government and the proponent with role and functions approved by the Environment Protection Authority and Department of Environment and Primary Industries.	Supported in principle – the ITR should be approached as set out in section 4.11.
6.	Department of State Development, Business and Innovation consult the Environment Protection Authority regarding the contingency plans relating to the quality of discharges to the environment from Project, including accidental discharges, before the Work Plan is approved.	Supported.

INQUIRY RECOMMENDATION		RESPONSE
7.	Engage regional environmental groups in ongoing consultative processes, including the Community Reference Group.	Supported in principle.
8.	Formulate and implement with the East Gippsland Shire and the Department of State Development, Business and Innovation, a framework for 'scanning' local housing, services and employment conditions and impacts of the Project and report the outcome to the Community Reference Group.	Supported in principle – refer to findings within section 4.8.
9.	Establish an Environmental Review Committee with relevant parties to oversight the design, construction, operation, closure and post-closure of the Stockman Mine. The ERC's role should also include assisting the Independent Technical Reviewer(s) in identifying expertise for various specialist reviews and to receive and disseminate the ITR's reports.	Supported in principle – refer to findings within sections 4.8 and 4.10.
THE REHABILITATION BOND AND POST-CLOSURE TRUST FUND		
10.	Ensure the calculation of the rehabilitation bond has particular regard to the environmental risks and costs associated with mining and storing PAF material and the specific form and nature of this Project.	Supported – refer to findings within section 4.6.
11.	Establish a Post-closure Trust Fund with sufficient funding from the proponent and the government to ensure adequate monitoring, maintenance and responses to environmental risks posed by the rehabilitated mine, and the TSF in particular.	Supported – refer to findings within section 4.6.
12.	Provide in the Trust Fund for: <ul style="list-style-type: none"> a) The ongoing employment of the Independent Technical Reviewer post-closure of the mine b) Rebuilding of the TSF wetlands periodically after closure, if recommended by the Independent Technical Reviewer c) Any maintenance requirements in accordance with model predictions for failure of the grout curtain, engineered soils and membrane d) Maintenance of emergency water supply system or other means to maintain a water cover of the TSF e) Treatment of supernatant water from the TSF long term f) Monitoring of the surface and ground water flows and quality in the vicinity of the TSF and mine in accordance with the Independent Technical Reviewer recommendations. 	Supported – refer to findings within section 4.6.

INQUIRY RECOMMENDATION		RESPONSE
THE WORK PLAN		
13.	Include the additional matters in the Work Plan or associated Environmental Management Plans that are identified in Appendix D of this report and were agreed by the proponent.	Supported - proponent further discussing and evolving these changes in consultation with EPA and DSDBI.
Tailings and mine back-filling		
14.	Adopt best practice to prevent the onset of acid mine drainage in underground voids prior to flooding, including adding neutralizer to paste.	Supported.
15.	Undertake additional testing and design, to the satisfaction of Department of State Development, Business and Innovation on advice from the ITR, to enable the backfilling of all of the Wilga mine stopes with paste thickened tailings for both supporting the roof of the stopes and which minimises the risk of long term impacts on groundwater quality.	Supported.
16.	Backfill all stope voids and redundant access tunnels in the Wilga mine with paste thickened tailings to minimise the potential environmental impact from this mine and in particular the storage of tailings.	Supported.
17.	Maximise the volume of paste thickened tailings stored in the stopes and redundant access tunnels of the Currawong mine.	Supported.
18.	Implement a long term monitoring program for the early detection of AMD at onset and early impacts in the mining voids.	Supported.
19.	Establish relevant water quality objectives for ground water in the mines, and from the Wilga Spring post mining operations which should be included in the Work Plan.	Supported.
Rehabilitation and Post-closure		
20.	The Independent Technical Reviewer to review and approve the Revised Conceptual Closure and Rehabilitation Plan, Detailed Closure and Rehabilitation Plan and any revisions as developed throughout the life of the mine.	Supported in principle – refer to findings within sections 4.6 and 4.11.
21.	Undertake a feasibility study for the identification of a variety of suitable treatment technologies to treat supernatant water during closure and until such time as a water quality in the TSF and from the seep meets the current discharge standards.	Support in principle – refer to findings within section 4.5.

INQUIRY RECOMMENDATION		RESPONSE
22.	Establish an appropriate long term water monitoring regime funded from the Trust Fund prior to the end of mining of both the Wilga and Currawong deposits. This monitoring regime should be designed to continue post closure of the mine to verify the impact of groundwater recharge in the vicinity of the mines and on water quality in the Tambo River. As part of this monitoring campaign water quality criteria for the various elements which were noted in the pre-Wilga mining water quality monitoring should be used to identify the appropriate targets to be obtained post closure of the mine.	Supported, noting EQOs to be established as set out in section 4.5, to be used as targets.
23.	Establish trigger levels for water quality at Environment Protection Authority approved monitoring points which initiate immediate remedial actions, both during operation and post closure of the mine.	Supported.
24.	Include long term monitoring and maintenance of water cover of any paste thickened tailings in the Wilga and Currawong mine voids in matters funded by the proposed trust fund.	Supported.
Tailing Storage Facility (TSF)		
25.	Further refine the final design of the TSF cover level to confirm the suitability of the design to maintain saturated tailings as the various lifts are developed for the TSF dam.	Supported.
26.	Upgrading the TSF embankment to be in accordance with the highest level of risk for ANCOLD guidelines for dams ('High C' Dam Failure Consequence Category in ANCOLD guidelines (2012)).	Supported in principle – refer to findings within section 4.5.
27.	Prior to the commencement of construction, develop a detailed monitoring and evaluation program for all surface and ground waters, in the vicinity of the TSF, including the northern saddle dam, which is independently reviewed and reported on an to the relevant government departments and the Environmental Review Committee on an annual basis for the life of the mine.	Supported in principle, subject to advice from DSDBI ERR.
28.	Adopt best practice design and construction to prevent lateral seepage of water from the tailings facility.	Supported.
29.	Undertake a full geotechnical and hydrogeological study to demonstrate that the aging of the original grout curtain, clay liner and membrane will not result in under toe seepage.	Supported in principle - refer to findings within section 4.5.
30.	Include in the Work Plan measures to provide passing flows for the 0.75km section of Straight Creek down stream of the TSF post closure.	Supported.

INQUIRY RECOMMENDATION		RESPONSE
31.	Develop a monitoring regime for the TSF dam which is applicable to both operational and post closure phases based on the Guidelines on Tailings Dams ANCOLD (May 2012) and Regulation and Practice for the Environmental Management of Dams in Australia ANCOLD (June 2014) and to better support the detailed engineering design of the upgrading of the TSF.	Supported.
32.	Confirm that the seepage volume from the right abutment is no more than the current seepage rate before each staged increase in the height of the TSF.	Supported.
33.	Establish additional groundwater monitoring bores in the vicinity of the proposed northern saddle dam prior to the commencement of operations to obtain appropriate background water flow and quality parameters for future monitoring.	Supported.
34.	Address environmental aspects associated with the TSF in the Work Plan with review by independent experts prior to issuing the Mining Licence and at appropriate stages during the operation of the mine.	Supported in principle – refer to findings within sections 4.11 and 4.5. ITR of environmental aspects associated with TSF design should be prior to approval of the <i>Work Plan</i> .
35.	Include consideration for a range of potential environmental issues, including catastrophic failure of infrastructure based on AS31000:2009 Risk Management – Principles and Guidelines and the ANCOLD Guidelines on Risk Assessment (2003) in the Emergency Preparedness and Response Plan identified in the Draft Work Plan.	Supported.
36.	Establish an independently peer reviewed monitoring program as part of the Work Plan for all surface waters and groundwater in the vicinity of the TSF which: <ul style="list-style-type: none"> a) Includes monitoring of the upstream water flowing into to the TSF and the water within the TSF. b) Starts before any works on the site and continues throughout the operation of the mine and processing facility. c) Formulates an ongoing post-closure monitoring regime (and management program for the TSF) which would be funded by the proposed trust fund. d) Requires certification by the ITR that the water quality in the TSF is suitable for discharge to Straight Creek before the removal of the diversion channels above the TSF, the biological treatment system and return pump system for all seepage water. 	Supported.
37.	Establish a network of monitoring bores at the Benambra borefield together with trigger levels to enable the monitoring and protection of the available drawdown in all aquifers to the satisfaction of GMW.	Supported in principle – refer to findings within section 4.5.4

INQUIRY RECOMMENDATION		RESPONSE
38.	Monitor the network of bores at Benambra throughout the operating period of the mine, with regular hydrogeological review by an independent specialist and reported to GMW and the ERC by the Independent Technical Reviewer.	Not supported – refer to findings within section 4.5.4
Biodiversity – aquatic ecology		
39.	Establish a pre-construction and operations biological monitoring program in consultation with the Environment Protection Authority and Department of Environment and Primary Industries that: <ul style="list-style-type: none"> a) includes both macro-invertebrate and fish monitoring (including crayfish) b) includes the Tambo River and the Straight Creek system c) includes a minimum of three control points in Straight Creek d) incorporates pre-construction surveys for Alpine spiny crayfish and Mountain Galaxias. 	Supported – refer to findings within section 4.5.
40.	Develop measures to provide steam flows for the 0.75km of Straight Creek adjacent to the TSF to be by-passed post closure.	Supported.
41.	Incorporate into the Work Plan the mitigation measures recommended by Mr Harrow on p8-9 of his expert witness statement.	Supported in principle – refer to findings within section 4.4.
Biodiversity – vegetation and flora		
42.	Implement the vegetation offset strategy at the Spotted Bull, One Hut, Pendergast and Dinner Plain properties to offset the vegetation removal arising from the Project, to the satisfaction of Department of Environment and Primary Industries.	Supported - refer to findings within section 4.4.
43.	Ensure adequate long term protection of the Alpine Sphagnum Bogs and Associated Fens community at the Dinner Plains offset site, including consideration of the implications of the planning scheme provisions and the need for buffering of the significant vegetation.	Supported - refer to findings within section 4.4.
43A	Provide additional offset requirements for the vegetation clearance identified for the alternative overflow spillway.	Supported - note any broader implications of the alternative spillway with respect to hydrology of Straight Creek and downstream of the TSF should be considered before a commitment to construct the works is given effect through the Work Plan.
44.	Undertake pre-construction surveys for the Kiandra Greenhood orchid and avoid impacts where possible. Where impacts cannot be avoided, determine the significance of the impact under the EPBC Act.	Supported – refer findings within section 4.4.

INQUIRY RECOMMENDATION		RESPONSE
45.	In consultation with DEPI, establish a preconstruction and operations wetland and riparian health monitoring program for all Alpine Sphagnum Bogs and Associated Fens sites within the Straight Creek Catchment including at the TSF and immediately downstream along Straight Creek.	Supported – refer to findings within section 4.4.
45A	Implement works to maintain a natural regime to wetland communities and to areas impacted by the construction of the TSF.	Supported.
46.	Mark the limit of works around the TSF on-ground to protect wetland communities from any construction.	Supported.
47.	Incorporate into the Work Plan the mitigation measures recommended by Ms Spencer on pages 14-16 of her expert witness statement.	Supported.
Biodiversity – terrestrial fauna		
48.	Implement a preconstruction and operations fauna monitoring program, to be designed in consultation with Department of Environment and Primary Industries, for the range of fauna identified by AECOM (2014), Section 7.2, and include the monitoring of fauna utilisation of the vegetation offset sites.	Supported, with particular reference to the fauna species listed in Table 2, within section 4.4.
49.	Undertake targeted pre-construction surveys for threatened fauna including along the linear infrastructure easements.	Supported - refer to findings within section 4.4.
50.	Implement a Feral Animal Management plan.	Supported.
51.	Undertake targeted pre-construction surveys for the Giant Burrowing Frog and Alpine Tree Frogs and avoid impacts where possible. Where impacts cannot be avoided, determine the significance of the impact under the EPBC Act.	Supported - refer to findings within section 4.4.
51A	Undertake the additional mitigation measures for the Giant Burrowing Frog, as agreed with DEPI: a) no ground disturbance within 100m of gully lines and watercourses unless authorised; and b) develop procedures for salvage.	Supported in principle - refer to findings within section 4.4.
52.	Conduct a survey of hollow bearing trees at the time of vegetation clearance and at the offset sites to ensure the retained Large Old Trees provide the appropriate compensatory offset for hollow dependent fauna in terms of the number and size of hollows. Design the survey in consultation with Department of Environment and Primary Industries.	Supported in principle - refer to findings within section 4.4.

INQUIRY RECOMMENDATION		RESPONSE
53.	Incorporate into the Work Plan the mitigation measures recommended by Mr Miller on pages 18-19 of his expert witness statement.	Supported in principle – noting that that the recommended mitigation measures in Mr Miller’s expert witness statement (p. 18-19) are derived from but slightly improve upon those given in section 8.3 of EES Technical Appendix D3. For clarity, the mitigation measures endorsed by this Assessment are set out in Appendix B.
BUSHFIRE RISK		
54.	Prepare an integrated Fire and Emergency Response Plan for Stockman operations, to the satisfaction of the Country Fire Authority and Department of Environment and Primary Industries, that recognises the remoteness and landscape scale fire hazard of this area. The Work Plan, the Incorporated Document associated with Clause 52.03 (3.1 Residential Village - condition 5) and other approvals should refer to this plan.	Supported.
55.	Review the role of fire refuges in the fire response plan and the specifications for proposed mine refuges.	Supported in principle – refer to findings within section 4.7.
56.	Identify specific responses and protocols to address times of high fire danger such as Total Fire Ban days and Code Red days.	Supported – refer to findings within section 4.7. Incorporate into the Fire and Emergency Response Plan.
57.	Clarify fire response roles at the mine site (between the proponent, Department of Environment and Primary Industries and the Country Fire Authority).	Supported.
TRAFFIC AND ROADS		
58.	The proponent fund line marking of intersections along the haulage route, where required, and the upgrade of the intersections of the Omeo Highway with Benambra Road and Day Avenue.	Supported.
59.	Develop an Integrated Transport Management Plan that: <ul style="list-style-type: none"> a) Addresses all elements of the Project, including road maintenance b) Includes a Driver Code of Conduct c) Is developed by a working party comprising the proponent, VicRoads, East Gippsland Shire Council and relevant emergency services. d) Is required by the Work Plan and as a condition of the Incorporated Document associated with Clause 51.03 of the East Gippsland Planning Scheme. 	Supported.

INQUIRY RECOMMENDATION		RESPONSE
60.	The Government determine whether road maintenance works to roads managed by VicRoads that are generated by the Project should be funded by government to support economic development strategies.	Supported in principle – refer to findings within section 4.8.
61.	If contributions by the proponent to the maintenance of roads managed by VicRoads are required: <ul style="list-style-type: none"> a) Use the analysis presented by VicRoads at the Inquiry hearing as the basis for contributions. b) Before the Project starts, execute agreements between VicRoads and Council with the proponent to maintain and extend the life of roads used by Project trucks. 	Supported in principle – refer to findings within section 4.8.
62.	Require the proponent to provide for the cost of upgrading the unsealed sections of Limestone and McCallum's Roads to a 6m wide 200mm minimum unsealed pavement plus 1.0m full depth shoulders.	Supported – see recommendation 59.
63.	Add to the proposed Incorporated Document that forms part of the draft Amendment a condition in section 3.2 requiring a car park management plan and Driver Code of Conduct to minimise noise in the car park, before the use starts.	Supported – see recommendation 59.
64.	The proponent offer noise attenuation to bedrooms in the two houses opposite the car park that could be affected by early morning noise in the car park/bus set down area.	Support in principle - refer to findings within section 4.7.

Appendix A

Best practice guidance for TSF design.

The following documents should be referred to in developing a best-practise TSF:

- *ANCOLD Guidelines on Tailings Dams – Planning design, construction, operation and closure (2012)*
- *ANCOLD Regulation and practice for the Environmental Management of Dams in Australia (June 2014).*
- *ANCOLD Dam Safety Management Guidelines (2003)*
- *DPI Environmental Guidelines MAnagemetrn of Tailings Storage Facilities*
- *Leading Practise Sustainable Development Programme for the Mining Industry (DITR, 2007)*
- *Guidelines for Environmental Management in Exploration and Mining: Mine rehabilitation (2004)*
- *Strategic Framework for Mine Closure (2000)*
- *Mine closure and completion – Leading Practise Sustainable development for the Mining Industry*
- *Planning for integrated mine closure: Toolkit (2008)*

Appendix B

Recommended mitigation measures in Mr Miller's expert witness statement, generally supported in relation to Inquiry recommendation 53:

- 1) Retain selected large trees as appropriate within defined Fire Clearing Areas and along water/ electrical supply routes.
- 2) Conduct hollow-bearing tree surveys at the source sites and offset sites to determine whether sufficient hollows will be offset [relative to] the project impacts. If additional hollow-bearing trees are required, conduct assessments at additional potential offset sites.
- 3) Implement offset obligations for the removal of native vegetation representing potential habitat for threatened species. If significant impacts to matters of national environmental significance (MNES) are determined, offset requirements will need to be determined in accordance with the relevant [Commonwealth] Department of the Environment (DoE) offset guidelines and calculator. Habitat quality of the proposed area of each species habitat to be impacted would need to be determined in order to calculate EPBC Act offsets. These areas are currently unknown as none of the species has been found in the study areas, despite having a moderate to high likelihood of occurrence.
- 4) It may be necessary to offset more land specifically to protect hollow bearing trees if current offsets are considered not to replace losses like-for-like. It may be necessary for the proponent to run the EPBC Act offset calculator as part of the approvals process should a residual impact on relevant species listed under the EPBC Act be deemed plausible.
- 5) Avoid or minimise damage to riparian vegetation, especially on Tambo River that supports Giant Burrowing Frog habitat and Straight Creek that could support habitat for Alpine Bog Skink, Giant Burrowing Frog, Alpine Water Skink, as well as Alpine Spiny Crayfish.
- 6) Ground disturbance procedures should be developed and implemented to restrict clearing to within agreed boundaries and to apply a systematic approach. This should take the form of a Ground Disturbance Permit (GDP) system whereby any proposed clearing would be the subject of a written plan requiring authorisation by senior site management, who would be responsible for ensuring that the proposed clearing is compliant with the approved work plan. Under such a system, no land clearing may occur without an authorised GDP.
- 7) Implement weed control activities, weed hygiene and surveillance procedures to control spread of existing weed species and prevent new weed incursions.
- 8) Implement vehicle and soil hygiene procedures to prevent the introduction of *Phytophthora cinnamomi* to the site.
- 9) Implement vehicle and soil hygiene procedures to prevent the introduction of Chytrid fungus to the site. Only import treated water for wash-down and wetting exercises.
- 10) Allow passing flows with unaltered water quality to flow in watercourses such that minimum flow requirements for rivers and streams are maintained.
- 11) Design and implement a feral animal management plan (see Recommendation 50 for reference to key species of concern).
- 12) Avoid construction of new roads and tracks within intact areas of native vegetation, particularly at or near Best or Remaining 50% habitat for threatened fauna species (determining such habitat from information in *Stockman Project: Terrestrial Vegetation Assessment*, Ethos NRM, 2013 or subsequent updated information of comparable quality).
- 13) Design and implement procedures and training for personnel relevant to the protection of native vegetation and floral/ fauna habitat on site.
- 14) Develop a traffic management protocol to minimise impacts on terrestrial fauna. The protocol should include self-reporting of wildlife strike incidents by project personnel, a monitoring program for all project traffic routes and documentation of all traffic incidents involving wildlife injury or death and annual reporting of incidents to DEPI (and, where EPBC-listed species have been affected, to DoE).
- 15) Implement management plans to prevent likelihood of erosion, sedimentation and contamination events.
- 16) Develop an EMP that specifically addresses the production and mitigation of noise, vibration, dust and artificial light.
- 17) Develop appropriate waste management procedures.
- 18) Undertake monitoring of groundwater resources over the operational phase of the mine to ensure groundwater drawdown does not impact GDEs.