

Draft Scoping Requirements for Goschen Mineral Sands Project Environment Effects Statement

Environment Effects Act 1978

APRIL 2019

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Public comments invited

Public comments are invited on these draft scoping requirements in relation to matters that should be investigated and documented as part of the environment effects statement (EES) process for the proposed Goschen Mineral Sands and Rare Earths project.

A copy of the draft scoping requirements can be downloaded from the Department of Environment, Land, Water and Planning website at planning.vic.gov.au/environment-assessment/browse-projects.

The draft Scoping Requirements are open for public comment until midnight on 7 May 2019.

Any comments received will be considered during the finalisation of the scoping requirements. Please note that any submissions on the draft scoping requirements will be treated as public documents.

Written comments should be posted to:
Impact Assessment Unit, Planning
Department of Environment, Land, Water & Planning
PO Box 500,
EAST MELBOURNE VIC 8002
or emailed to: environment.assessment@delwp.vic.gov.au

Queries about the Goschen Mineral Sands and Rare Earths project itself should be directed to the proponent:

VHM Limited
Email: community@vhmltd.com.au
Website: vhmltd.com.au/project/project-overview/

Queries about the EES process and Draft Scoping Requirement should be directed to the department:

Impact Assessment Unit
Telephone: 03 8683 0958
Email: environment.assessment@delwp.vic.gov.au

List of abbreviations

| | |
|----------|--|
| DELWP | Department of Environment, Land, Water and Planning |
| EE Act | <i>Environment Effects Act 1978</i> |
| EES | Environment effects statement |
| EMF | Environmental management framework |
| EPBC Act | <i>Environment Protection and Biodiversity Conservation Act 1999</i> |
| FFG Act | <i>Flora and Fauna Guarantee Act 1988</i> |
| GL | Gigalitres |
| ha | Hectares |
| km | Kilometres |
| MNES | Matters of national environmental significance |
| Mt | Megatonnes |
| PASS | Potential acid sulphate soils |
| PEM | Protocol for Environmental Management |
| SEPP | State environment protection policy |
| TRG | Technical reference group |

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1. Introduction

In light of the potential for significant environmental effects, on 10 October 2018 the Minister for Planning (the Minister) determined under the *Environment Effects Act 1978* (EE Act) that VHM Exploration Limited (the proponent) is to prepare an environment effects statement (EES) for the proposed Goschen Mineral Sands and Rare Earths Project (the project). The purpose of the EES is to provide a sufficiently detailed description of the project, assess its potential effects on the environment¹ and assess alternative project layouts, designs and approaches to avoid and mitigate effects. The EES will inform and seek feedback from the public and stakeholders. The Minister will issue an assessment of the project's environmental effects under the EE Act to conclude the EES process. The Minister's assessment will inform statutory decision-makers responsible for the project's approvals.

The *Draft Scoping Requirements for the Goschen Mineral Sands and Rare Earths Project* (draft scoping requirements), set out the specific matters to be investigated and documented in the EES for the project. Final scoping requirements will be issued by the Minister following the consideration of public comments received on this draft.

While the scoping requirements are intended to cover all relevant matters, the EES will need to address other issues that emerge during the EES investigations, especially those relevant to statutory decisions that will be informed by the assessment.

1.1 The project and setting

The project has an approximate disturbance footprint of 8,300 ha, subject to further investigation during the EES process, and is located approximately 20 km south of Swan Hill, in the Murray Mallee bioregion of Victoria (Figure 1). The proponent asserts the Goschen deposit contains approximately 300 Mt of ore and propose to produce a zircon and rutile concentrate, titanium concentrate and a rare earth concentrate.

The project will include the development of a mineral sands mine, mining unit plant, wet concentrator plant, interim tailings storage facility, solar drying beds for tailings, slurry pipelines to transfer ore from pits to the processing facilities and additional site infrastructure (i.e. site office, warehouse and workshop facilities, loading facilities and fuel storage). Proposed mining methods involve open pit mining to extract approximately 5 Mt of ore per annum, increasing to 10 Mt per annum over a projected mine life of 30 years. Mine products are proposed to be transported via road or by rail for export overseas.

It is anticipated that between 3 GL to 5.5 GL per annum of water will need to be supplied to meet project requirements for the first few years of mining. The proponent will consider options for water supply through the EES process including surface water and groundwater and seeking to commercial agreements with the local water authority. Once tailings water is available for reuse the amount of water required is expected to reduce.

1.2 Minister's requirements for this EES

The Minister's decision to require an EES included those procedures and requirements applicable to its preparation, in accordance with section 8B(5) of the EE Act (see Appendix A). The requirements included the following key matters for the EES to examine (*italicised below*).

The EES is to document the investigation and avoidance of potential environmental effects of the proposed project, including for any relevant alternatives (such as for the mining extent, methods for mining and processing, water supply and transport of mining outputs), as well as associated environmental mitigation and management measures. In particular the EES should address:

- a) *effects on biodiversity and ecological values within and near the site, as associated with adjacent road reserves, including native vegetation, listed threatened ecological communities and species of flora and fauna; and other habitat values;*

1. For assessment of environmental effects under the EE Act, the meaning of 'environment' includes physical, biological, heritage, cultural, social, health, safety and economic aspects (Ministerial Guidelines, p. 2).

- b) effects on surface water environments, including local waterways and the broader catchment, as well as groundwater resources (hydrology, quality, uses and dependent ecosystems);*
- c) effects on the land uses and landscape values of the site and surrounding areas, including the implications for agricultural productivity;*
- d) effects on land stability, erosion and soil productivity associated with the construction and operation of the project, including progressive rehabilitation works;*
- e) effects on Aboriginal and non-Aboriginal cultural heritage values;*
- f) effects of project construction and operation on air quality and noise on nearby sensitive receptors (particularly residences);*
- g) both positive and adverse socio-economic effects, at local and regional scales, potentially generated by the project, including increased traffic movement and indirect effects of the project construction workforce on the capacity of local community infrastructure; and*
- h) solid and liquid waste that may be generated by the project during construction and operation.*

These draft scoping requirements provide further detail on the specific matters to be investigated in the EES as required by the *Ministerial guidelines for assessment of environmental effects under the EE Act 1978* (Ministerial Guidelines).

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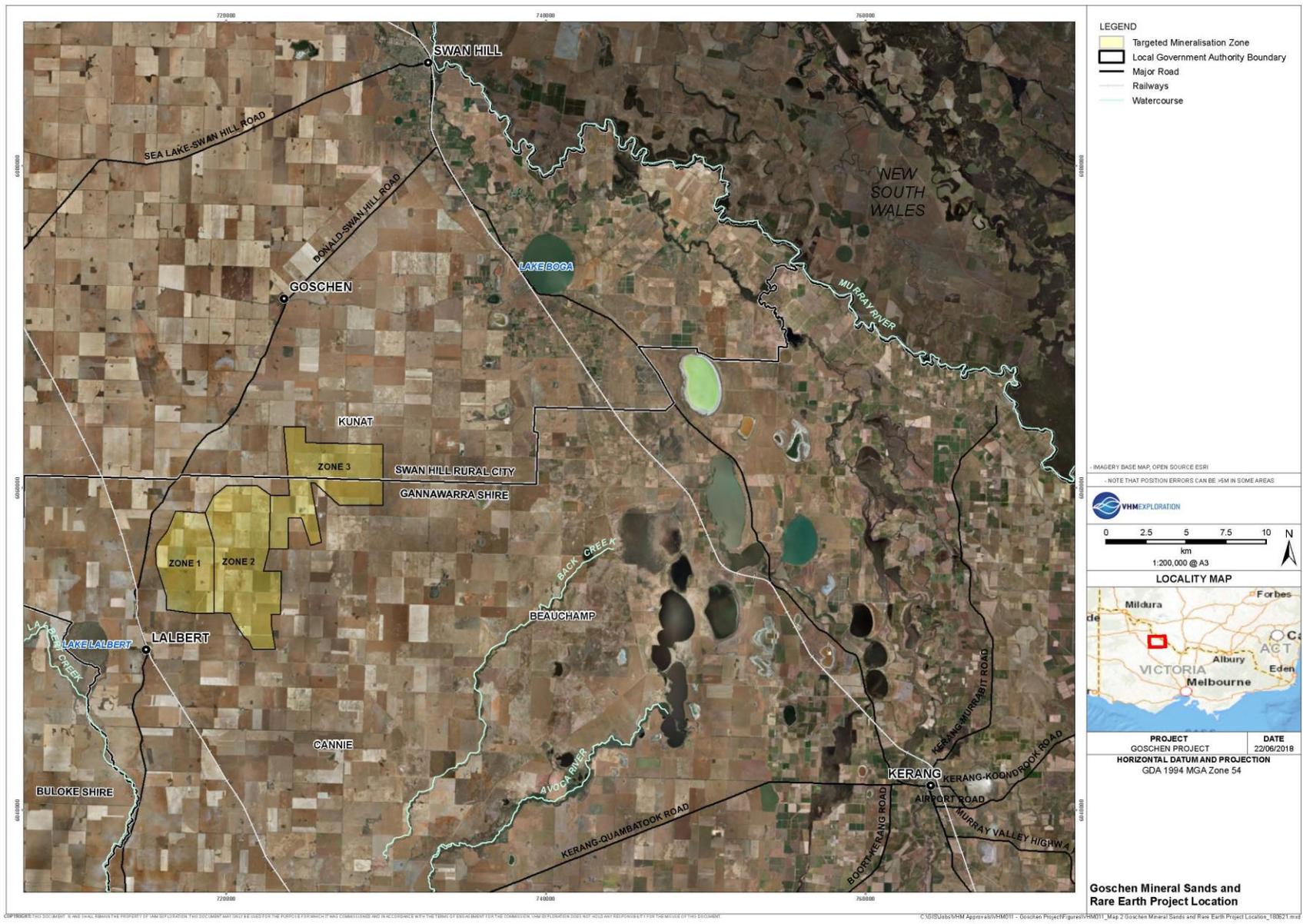


Figure 1: Location of the project with preliminary target mineralised zone (source: VHM Limited, 2018).

2. Assessment process and required approvals

2.1 What is an EES?

An EES describes a project and its potential environmental effects. It should enable stakeholders and decision-makers to understand how the project is proposed to be implemented and the likely environmental effects of doing so. An EES has two main components.

1. The EES main report – an integrated, plain English document that sets out an analysis of the potential impacts of the project. The main report draws on technical studies, data and statutory requirements and should clearly identify which components of the scope are being addressed throughout.
2. The EES technical reports – specialist studies, investigations and analyses that provide the basis for the EES main report. These reports will be exhibited in full, as appendices to the main report.

2.2 The EES process

The proponent is responsible for preparing an EES, including conducting technical studies and undertaking stakeholder consultation. The Planning Group within the Department of Environment, Land, Water and Planning (DELWP) is responsible for managing the EES process. The EES process has the following steps:

- preparation of a draft study program and draft schedule by the proponent (completed);
- preparation and exhibition of draft scoping requirements by DELWP on behalf of the Minister (current step) with public comments received during the advertised exhibition period;
- finalisation and issuing of scoping requirements by the Minister;
- review of the proponent's EES studies and draft documentation by DELWP and a technical reference group²;
- completion of the EES by the proponent;
- review of the complete EES by DELWP to establish its adequacy for public exhibition;
- exhibition of the proponent's EES and invitation for public comment by DELWP on behalf of the Minister;
- appointment of an inquiry by the Minister to review the EES and public submissions received, conduct public hearings and provide a report to the Minister; and finally
- following receipt of the inquiry report, an assessment of the project's environmental effects by the Minister for the consideration of statutory decision-makers.

Further information on the EES process can be found on the planning website³. Figure 2 outlines the steps of the EES process.

2. For critical components of the EES studies, peer review by an external, independent expert may be appropriate.

3. planning.vic.gov.au/environment-assessment/what-is-the-ees-process-in-victoria.

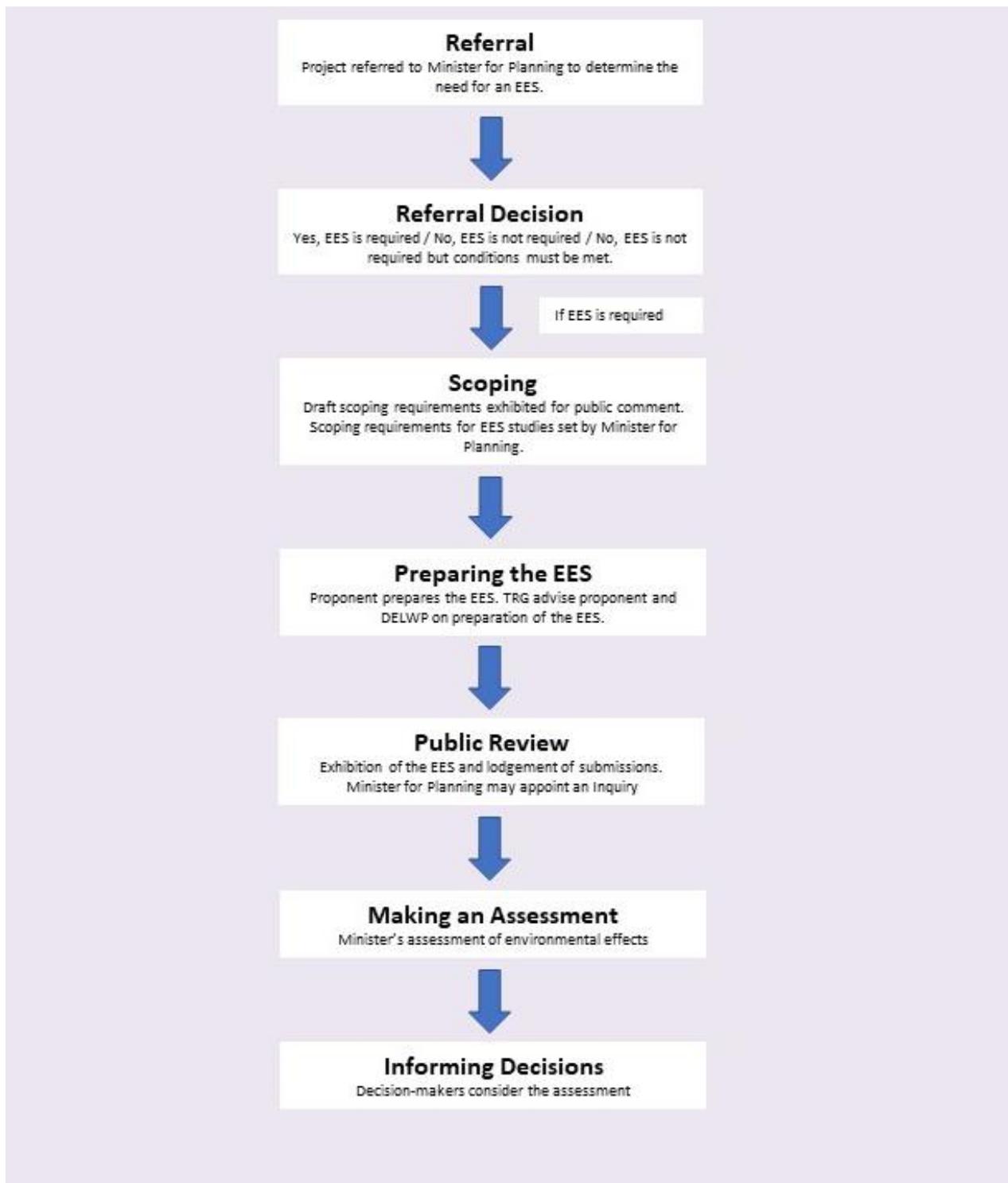


Figure 2: The EES process.

Technical reference group

DELWP has convened a technical reference group (TRG), comprised of representatives of relevant state government agencies and departments, Gannawarra Shire Council and Swan Hill Rural City Council. The TRG will advise DELWP and the proponent on:

- applicable policies, strategies and statutory provisions;
- the scoping requirements for the EES;

- the design and adequacy of technical studies for the EES;
- the proponent's public information and stakeholder consultation program for the EES;
- responses to issues arising from the EES investigations;
- the technical adequacy of draft EES documentation; and
- coordination of statutory processes.

Consultation plan

The proponent is responsible for informing and engaging the public and stakeholders to identify and respond to their issues and keep them informed of the EES studies. Stakeholders include potentially affected parties, interested community organisations and government bodies. Under its consultation plan the proponent informs the public and stakeholders about the EES investigations and provides opportunities for input and engagement during the EES investigations. The consultation plan is reviewed and amended in consultation with DELWP and the TRG before it is published on the planning website⁴. The final consultation plan will:

- identify stakeholders;
- characterise public and stakeholders' interests, concerns and consultation needs, local knowledge and inputs;
- describe consultation methods and schedule; and
- outline how public and stakeholder inputs will be recorded, considered and/or addressed in the preparation of the EES.

Statutory approvals and the EES process

The project may require a range of approvals under Victorian legislation. DELWP coordinates the EES process as closely as practicable with the approvals procedures, consultation and public notice requirements.

To facilitate the integrated consideration of issues and the timely completion of required approval processes, the EES is expected to include a draft work plan that is consistent with the requirements of the *Mineral Resources (Sustainable Development) Act 1990* (MRSD Act) and Regulations. Provided the requirements of section 42(7) of the MRSD Act are fulfilled, no planning permit under the *Planning and Environment Act 1987* will be required.

The key approvals required under Victorian legislation are: an approved work plan and a mining licence under the MRSD Act; and an approved cultural heritage management plan under the *Aboriginal Heritage Act 2006*.

Other approvals are likely to be required and will be determined throughout the course of the EES.

2.3 Accreditation of the EES process under the EPBC Act

The project was also referred to the Australian Government under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The delegate for the Commonwealth Minister for the Environment determined on 19 December 2018 that the project is a controlled action⁵, as it is likely to have a significant effect on the following matters of national environmental significance (MNES), which are protected under Part 3 of the EPBC Act:

- Ramsar wetlands (sections 16 and 17B);
- listed threatened species and communities (sections 18 & 18A); and
- protection of the environment from nuclear actions (sections 21 and 22A).

The EES is an accredited assessment process under the EPBC Act through a Bilateral Assessment Agreement that exists between the Commonwealth and State of Victoria. Therefore, these scoping

4. planning.vic.gov.au/environment-assessment/what-is-the-ees-process-in-victoria.

5. Under the EPBC Act, projects are considered as "actions". For the purposes of this document the term "project" also means "the action".

requirements address the assessment requirements related to MNES. The Commonwealth Minister or delegate will decide on approval of the project after having considered the Minister for Planning's assessment under the EE Act. Note that what are generally termed 'effects' in the EES process corresponds to 'impacts' defined in section 82 of the EPBC Act.

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3. Matters to be addressed in the EES

3.1 General approach

The EES should assess the environmental effects⁶ arising from all components and stages of the project. The assessment should include:

- the potential effects on individual environmental assets —magnitude, extent and duration of change in the values of each asset— having regard to intended avoidance and mitigation measures;
- the likelihood of adverse effects and associated uncertainty of available predictions or estimates;
- further management measures that are proposed where avoidance and mitigation measures do not adequately address effects on environmental assets, including specific details of how the measures address relevant policies; and
- the likely residual effects, including on relevant MNES, that are likely to occur after all proposed measures to avoid and mitigate environmental effects are implemented.

Further advice on the approach to be adopted in preparing the EES is provided in Section 4.

3.2 Content and style

The content of the EES and related investigations is to be guided by these scoping requirements and the Ministerial Guidelines. To facilitate decisions on required approvals, the EES should address statutory requirements associated with approvals that will be informed by the Minister's assessment, including decision-making under the MRSD Act, EPBC Act and other applicable legislation. The EES should also address any other significant issues that emerge during the investigations.

Ultimately, it is the proponent's responsibility to ensure that adequate studies are undertaken and reported to support the assessment of environmental effects and that the EES has effective internal quality assurance in place. Close consultation with DELWP and the TRG during the investigations and preparation of the EES will be necessary to minimise the need for revisions prior to authorisation of the EES for public exhibition.

The main EES report should provide a clear, well-integrated analysis of the potential effects of the proposed project, including proposed avoidance, mitigation and management measures, as well as feasible alternatives. Overall, the main report should include the following:

- an executive summary of the potential environmental effects of the project outlined in Section 4, including potential effects on identified MNES;
- a description of the entire project, including its objectives, rationale, key elements, associated requirements for new infrastructure and use of existing infrastructure;
- a description of the approvals required for the project to proceed, and its relationship to relevant policies, strategies, guidelines and standards;
- a description of feasible alternatives capable of substantially meeting the project's objectives that may also offer environmental or other benefits (as well as the basis for the choice where a preferred alternative is nominated);
- descriptions of the existing environment, where this is relevant to the assessment of potential effects;
- appropriately detailed assessments of potential effects of the project (and feasible alternatives) on environmental assets and values, relative to the "no project" scenario, together with an estimation of likelihood and degree of uncertainty associated with predictions;
- clear, active measures for avoiding, minimising, managing and monitoring effects, including a statement of commitment to implement these measures;
- predictions of residual effects of the project assuming implementation of proposed environmental management measures;
- any proposed offset measures where avoidance and mitigation measures will not adequately address effects on environmental values, including the identified MNES, and discussion of how any offset package proposed meets the requirements of the Victorian Guidelines for the Removal, Destruction or Lopping of Native Vegetation and the EPBC Act Environmental Offsets Policy as it relates to MNES;

6. Effects include direct, indirect, combined, facilitated, consequential, short and long-term, beneficial and adverse effects

- documentation of the process and results of the consultation undertaken by the proponent during the preparation of the EES, including the issues raised by stakeholders or the public and the proponent's responses to these issues, in the context of the EES studies and the associated consideration of mitigation measures;
- an outline of a program for community consultation, stakeholder engagement and communications proposed for implementation during the construction and operation of the project, including opportunities for local stakeholders to engage with the proponent to seek responses to issues that might arise during project implementation;
- evaluation of the implications for the project and feasible alternatives from the implementation of legislation and policy;
- evaluation against the principles and objectives of ecologically sustainable development; and
- conclusions on the significance of impacts on regional, state and federal matters.

The proponent must also prepare a concise non-technical summary document (hard copy A4) for free distribution to interested parties. The EES summary document should include details of the EES exhibition, public submission process and availability of the EES documentation.

3.3 Project description

The EES is to describe the project in sufficient detail both to allow an understanding of all components, processes and development stages, and to enable assessment of their likely potential environmental effects. The project description should cover the following.

- An overview of the proponent and their environmental performance credentials, including experience in developing and operating projects and their health, safety and environmental policies.
- Contextual information on the project, including its objectives and rationale, its relationship to statutory policies, plans and strategies, including the basis for selecting the proposed project location and implications of the project not proceeding.
- Land use activities (including beneficial and sensitive uses) in the project area and vicinity, supported by plans and maps where applicable.
- Information on the project's operational life and any decommissioning and rehabilitation arrangements (where relevant).
- Other necessary works directly associated with the project, such as road upgrades and/or connections, and infrastructure and services relocation.
- Details of all the project components, to the extent practicable yet sufficient to inform assessment, including:
 - location, footprint, layout and access arrangements during site establishment, construction and operation;
 - design, methods, staging and scheduling of the proposed mining, including direction and timing of mining across the site and its operational life, volumes to be mined (overburden, ore, mining by products), total production and production rate and timing of expected decommissioning, closure and rehabilitation;
 - function, operation and design principles and capacity of main components of works, including overburden handling, ore extraction (including reagents to be used), mineral separation, tailings and mining by-products management, handling of products from processing and electricity supply and use;
 - water resources for construction and operational use, including details on storage provisions, daily and annual use (including an operation and post-closure water balance);
 - necessary works directly associated with the project, such as an infrastructure and services upgrade and relocation, or augmentation of existing plant and facilities, including potential construction of roads and other linear services required for transporting ore and heavy mineral/rare earths concentrate on and off-site;
 - proposed construction techniques and extent of areas to be disturbed during site establishment and construction, including total area expected to be cleared, particular requirements for traffic and floodwater management, dust and noise management, as well as for sensitive environmental locations;

- solid waste, wastewater and hazardous material generation and management during construction, operation and decommissioning, including transportation and storage of hazardous material on-site and off-site;
- transport type and route of product from the mine;
- lighting, safety and security requirements during site establishment, construction, operation, decommissioning and site rehabilitation;
- hours of operation, workforce requirements (total work force) and recruitment policies during construction, operation, decommissioning and site rehabilitation; and
- approach to be taken regarding mine site rehabilitation, including progressive rehabilitation and mine-closure.

3.4 Rehabilitation

The EES is to document the proponent's approach to progressive rehabilitation and rehabilitation post-closure to ensure stable rehabilitated landforms capable of supporting future use of the project site. The description of rehabilitation should canvass changes in topography, groundwater conditions, drainage and vegetation cover during mining operations and at the end of the mine life. The EES should include a draft rehabilitation framework that incorporates:

- proposed depth of topsoil to be extracted, storage and management of stockpiled topsoil and subsoils and treatment measures;
- proposed methods for restoring soil profiles, drainage and productivity, as well as landscape rehabilitation in the context of the mine path and decommissioning of structures/facilities
- assessment of residual geotechnical risk of rehabilitated areas;
- proposed management of surface water and groundwater flows, including flood risks, and consideration of site drainage;
- proposed rehabilitation and closure criteria for all environmental, geophysical and structural elements of the rehabilitation framework;
- proposed design criteria relating to landform and geology;
- proposed design criteria for landscape and visual values
- approach to identifying potential end land uses of the project site;
- approach for establishing sustainable vegetation cover (consistent with end land uses);
- proposed fire and emergency management measures;
- proposed rehabilitation monitoring and maintenance methods including contingency measures for unplanned/forced closure; and
- planning for progressive rehabilitation and mine closure.

3.5 Project alternatives

The EES should document the proponent's consideration of feasible alternatives and include an explanation of how specific alternatives were shortlisted for evaluation within the EES. The EES should investigate and document the likely environmental, social and economic effects of the alternatives, particularly where these offer a potential to achieve beneficial outcomes and can meet the objectives of the project. The discussion of feasible alternatives should include:

- the basis for selecting the area proposed to be mined within the broader exploration licence(s), in the context of the concept mine plan and alternative mine layout and staging;
- the site selection process for any ancillary infrastructure, including the processing facilities;
- the technical feasibility and environmental implications of alternative construction, mining, ore processing, tailings management and site rehabilitation methods; and
- alternatives for electricity, water, gas and fuel supply, transport of products and workers and solid and liquid waste disposal.

Where appropriate, the assessment of environmental effects of design alternatives is to address the matters set out in the subsequent sections of this document. The depth of investigation of alternatives should be proportionate to their potential to minimise potential adverse effects as well as meet project objectives.

3.6 Applicable legislation, policies and strategies

In addition to the EE Act and the EPBC Act, the EES will need to identify relevant legislation, policies, guidelines and standards, and assess their specific requirements or implications for the project, particularly in relation to required approvals.

3.7 Draft evaluation objectives

Draft evaluation objectives are provided in Section 4 for each of the topics to be addressed in the EES. The draft evaluation objectives identify desired outcomes in the context of key legislative and statutory policies, as well as the principles and objectives of ecologically sustainable development and environment protection, including net community benefit. In accordance with the Ministerial Guidelines, they provide a framework to guide an integrated assessment of environmental effects and for evaluating the overall implications of the project. These objectives may be refined by the proponent or DELWP as the EES is prepared.

3.8 Environmental management framework

Inadequate management of environmental effects during project construction, operation, rehabilitation and closure will not realise the necessary environmental outcomes, statutory requirements or stakeholder confidence. Hence, the proponent will need to provide an environmental management framework (EMF) for the project within the EES. The EMF will articulate clear accountabilities for managing and monitoring environmental effects and hazards associated with construction, operation, and site reinstatement phases of the project.

The EMF should describe the baseline environmental conditions to be used to monitor and evaluate the residual environmental effects of the project, as well as the efficacy of applied environmental management and contingency measures. The framework should include the following.

- The context of required approvals and consents.
- Any existing or proposed environmental management system to be adopted.
- Organisational responsibilities and accountabilities for environmental management.
- A register of environmental risks associated with the project which is to be maintained during project implementation (including matters identified in preceding sections in these directions as well as other pertinent risks).
- The environmental management measures proposed in the EES to address specific issues, including commitments to mitigate adverse effects and enhance environmental outcomes.
- Arrangements for management of and access to baseline and monitoring data, to ensure the transparency and accountability of environmental management and to contribute to the improvement of environmental knowledge.
- The proposed objectives, indicators and monitoring requirements for managing (at least):
 - biodiversity (including MNES) values on and near the project site;
 - biodiversity (including MNES) offsets to be established and managed offsite;
 - noise, vibration, and emissions to air, including dust and greenhouse gases;
 - public health and safety;
 - potential impacts on downstream surface water and groundwater beneficial uses and sensitive receivers;
 - monitoring of water quality and water table level;
 - ongoing protection of relevant cultural heritage values;
 - groundwater and surface water functions, behaviour and quality, and stormwater runoff;
 - solid and liquid waste, including recycling and handling of potentially hazardous or contaminated waste, potential acid sulfate soils (PASS), radioactive material and other excavated spoil;
 - Aboriginal and cultural heritage values;
 - traffic during construction, including managing temporary disruption and changed accessibility;
 - disruption of and hazard to the existing infrastructure;
 - social impacts;
 - land use;

- landscape and visual values;
- landform and slope stability;
- traffic and road management measures;
- site rehabilitation, including handling of topsoil, overburden, tailings and mining by-products
- emergency management; and
- rehabilitation.

The EMF should outline auditing requirements to review and continuously improve the effectiveness of environmental management and to ensure compliance with statutory conditions. The EMF will set the scope for later environmental management plans for construction, operation, closure and rehabilitation phases of the project. Similarly, the EMF will outline a program for community consultation, stakeholder engagement and communications for the project, including opportunities for local stakeholders to engage with the proponent to seek responses to issues that might arise when the project is undertaken.

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4. Assessment of specific environmental effects

Preparation of the EES document and the necessary investigation of effects should be proportional to the project risk, as outlined in the Ministerial Guidelines (p. 14). A risk-based approach should be adopted during the EES studies, so that a greater level of effort is directed at investigating and managing those matters that pose relatively higher risk of adverse effects. The following structure sets out the specific requirements the EES should document in its assessment of effects for each draft evaluation objective.

1. **Identify key issues or risks** that the project poses to the achievement of the draft evaluation objective. In addition to addressing the highlighted issues, the proponent might undertake an environmental risk assessment.
2. **Characterise the existing environment** to underpin impact assessments having regard to the level of risk. Any risk assessment by the proponent could guide the necessary data acquisition.
3. **Assess the likely effects** of the project on the existing environment and evaluate their significance.
4. **Present design and mitigation measures** that could substantially reduce and/or mitigate the risk of significant effects. Note that an assessment of residual effects (post mitigation) and their significance will be required to illustrate the effectiveness of the proposed mitigation measure.
5. **Propose performance objectives and management** to evaluate whether the project's effects are maintained within permissible levels and propose contingency approaches if they are not.

The description and assessment of effects must not be confined to the immediate area of the project but must also consider the potential of the project to impact on nearby environmental values.

4.1 Resource development

Draft evaluation objective

To achieve the best use of available mineral sands resources, in an economic and environmentally sustainable way, including while maintaining viability of local industries.

Key issues

- Opportunity for development of a known mineral sands resource.
- Efficient and environmentally sustainable mining of available resources.
- Best use of land's resources considering environmental and agricultural values.
- Potential impacts on the existing local industries, businesses and landholders.
- Impact of commodity price fluctuation on project sustainability.

Existing environment

- Identify the extent, nature and development potential of the ore body, and composition of heavy mineral concentrate, including radiological content and activity levels.
- Identify the composition of tailings and waste material, and products from processing including radiological content and activity levels.
- Identify opportunities for local workers and suppliers of goods and services that could support the project.
- Describe local industries in the vicinity of the project which could be affected by the construction, operation, decommissioning and rehabilitation of the project.

Likely effects

- Assess the project's feasibility including the predicted economic costs and benefits from construction and operation, capital investment, operating expenditure, employment and business opportunities, taxes and royalties to the regional, state and national economies, and the temporary and permanent impacts on other industries.

Design and mitigation

- Describe alternative mine configurations to access mineral sands reserves (including location of the project's infrastructure) and strategies for management and disposal of tailings and waste material to avoid and minimise impacts and potential sterilisation of future reserves.
- Describe off-site activities including transportation and storage of heavy mineral concentrate.
- Describe methods and strategies to demonstrate the radioactivity of tailings and waste materials and products arising from processing of mined minerals stays within environmentally acceptable exposure levels.
- Describe alternative methods of site preparation which could optimise site rehabilitation, including potential for future productive land uses.
- Outline measures to enhance potential benefits to local and regional businesses and minimise potential adverse effects to local land-uses and businesses.

Performance objectives and management

- Describe key elements of the proposed work plan to enable monitoring of efficient resource recovery.

4.2 Biodiversity and habitat

Draft evaluation objective

To avoid or minimise potential adverse effects on biodiversity values within and near the site including native vegetation, listed threatened species and ecological communities, and habitat for these species, as well as address offset requirements for residual environmental effects consistent with state and commonwealth policies.

Key issues

- Direct loss or degradation of native vegetation and associated listed ecological communities, including those listed as threatened under the EPBC Act, the FFG Act and/or DELWP advisory lists.
- Direct loss or degradation of habitat for flora and fauna listed as threatened under the EPBC Act, the FFG Act and/or DELWP advisory lists.
- Disturbance and/or degradation of adjacent or nearby habitat that may support listed species or other protected flora, fauna or ecological communities.
- Indirect habitat loss or degradation resulting from other effects, such as edge effects, surface hydrological changes, groundwater drawdown, groundwater mounding, dust deposition, traffic, noise, vibration, light or the introduction of weeds/ pathogens.
- Disruption to the movement of fauna between areas of habitat across the broader landscape.
- The availability of suitable offsets for the loss of native vegetation and habitat for listed threatened species under the FFG Act and EPBC Act.

Existing environment

- Characterise the type, distribution and condition of native vegetation, terrestrial and aquatic habitat and habitat corridors or linkages that could be impacted by the project.
- Identify the existing or potential presence of any species listed under the EPBC Act, FFG Act and DELWP advisory lists that could be impacted by the project, as well as declared weeds, pathogens and pest animals.
- Identify the existing or likely presence of communities listed under the EPBC Act and FFG Act, including Buloke Woodland Threatened Ecological Community.
- Identify and characterise any areas of native vegetation and groundwater dependant ecosystems that may be affected by groundwater mounding, groundwater drawdown in particular by mine dewatering, or by water supply borefields.
- Describe the biodiversity values that could be affected by the project, including:
 - native vegetation and any ecological communities listed under the EPBC Act and FFG Act;
 - presence of, or suitable habitats for, native flora and fauna species, in particular species listed under the EPBC Act, FFG Act, and DELWP advisory lists; and
 - potential use of the site and its environs for movement by the EPBC Act, FFG Act, and DELWP advisory listed fauna species including: Plains-wanderer (*Pedionomus torquatus*), Corben's

Long-eared bat (*Nyctophilus corbeni*), Australasian Bittern (*Botaurus poiciloptilus*), Curlew Sandpiper (*Calidris ferruginea*) and Australian Painted-snipe (*Rostratula australis*).

- Describe the existing threats to biodiversity values, including:
 - direct removal of individuals or destruction of habitat;
 - historic or ongoing disturbance or alteration of habitat conditions (e.g. habitat fragmentation, severance of wildlife corridors or habitat linkages, changes to water quantity or quality, fire hazards, etc.);
 - background threats to mortality of listed threatened fauna; and
 - the presence of any declared weeds, pathogens and pest animals within and in the vicinity of the project area.
- Characterisation of the existing environment is to be informed by the literature (and published data) and appropriate seasonal or targeted surveys of the potential and actual presence of threatened species and communities, in line with commonwealth and state survey guidelines, conservation advices and threatened species recovery plans. Where surveys do not identify a listed species but past records and/or habitat analysis suggest that it may occur locally, justification will need to be provided if further investigations or further mitigation measures are not proposed.

Likely effects

- Assess the effects (including facilitated effects) of the project and feasible alternatives, on native vegetation, and EPBC Act and/or FFG Act listed ecological communities, listed threatened and other protected flora, including:
 - Buloke Woodlands Threatened Ecological Community;
 - Charriot Wheels (*Maireana cheelii*);
 - Candy Spider-orchid (*Caladenia versicolor*);
 - Greencomb Spider-orchid (*Caladenia tensa*);
 - Winged Peppergrass (*Lepidium monoplacoides*); and
 - Slender Darling-pea (*Swainsona murrayana*).
- Assess the effects (including facilitated effects) of the project and feasible alternatives, on protected fauna, and associated habitat and movement corridors, especially for listed threatened fauna species under the EPBC Act and/or FFG Act.
- Assess the effects (including facilitated effects) of the project, including transport route upgrades and use, on biodiversity values, including:
 - direct removal of individuals or destruction of habitat;
 - disturbance or alteration of habitat conditions (e.g. habitat fragmentation, severance of wildlife corridors or habitat linkages, changes to water quantity or quality, fire hazards, etc.);
 - threats to mortality of listed threatened fauna; and
 - the presence of any declared weeds, pathogens and pest animals within and in the vicinity of the project area.

Design and mitigation

- Identify potential alternatives and proposed design options and measures which could avoid or minimise significant biodiversity effects at all stages of the project. This includes potential effects on native vegetation, EPBC Act listed ecological communities and/ or threatened flora or fauna species or any other listed protected flora and fauna species and their habitat.
- Develop hygiene controls for vehicle and machinery movement to minimise the spread of pathogens and weeds.
- Justify and describe the assumptions and level of uncertainty associated with the proposed measures achieving their desired outcomes.
- Justify and describe the three-step approach to avoiding the removal of native vegetation, minimising impacts from removal of native vegetation that cannot be avoided and providing an offset to compensate for the biodiversity impact from the removal of native vegetation.

Performance objectives and management

- Describe proposed commitments to manage residual effects of the project on biodiversity values, including an outline of an offset strategy and offset management plan that sets out the ability to secure the appropriate offsets to satisfy both commonwealth and state offset policy requirements.
- Describe the approach to develop contingency measures to be implemented in the event of adverse residual effects on flora and fauna values requiring further management.
- Identify any further commitments proposed to monitor and manage risks and effects on biodiversity values and native vegetation, including as part of the EMF (see Section 3.8).

4.3 Water, catchment values and hydrology

Draft evaluation objective

To minimise effects on water resources and on beneficial and licensed uses of surface water, groundwater and related catchment values (including the Kerang Wetlands Ramsar site) over the short and long-term.

Key issues

- The potential for adverse effects on the functions, values and beneficial uses of groundwater due to the project's activities, including water extraction, interception or diversion of flows, discharges or seepage from mining areas and other operational areas or saline water intrusion.
- The potential for adverse effects on the functions, values, beneficial and licensed uses of surface water due to the project's activities, including water extraction, interception or diversion of flows, discharges or seepage from operational areas or saline water intrusion.
- The potential for adverse effects on nearby and downstream water environments (including the Murray and Avoca Rivers and Kerang Wetlands Ramsar site) due to changed water quality, flow regimes, groundwater mounding or waterway conditions during construction, operations, rehabilitation, decommissioning and post-closure.
- Ore, product, overburden, tailings and mining by-products management, in the context of potential water quality impacts including those arising from sedimentation, release of radionuclides, other contaminants and pollutants, acid sulphate soils, acid/metalliferous drainage formation, and salinity.

Existing environment

- Identify and characterise the relevant groundwater and surface water environments, including the Kerang Wetlands Ramsar site, in terms of their protected beneficial uses and values, existing drainage functions and behaviours and catchments.
- Identify existing groundwater and surface water users and allocations in the broader area, including downstream of the site.
- Characterise the interaction between surface water and groundwater within the project site and the broader area.
- Provide a hydrogeological characterisation (e.g. a model) of the current allocations, extractions and uses of groundwater or surface water (e.g. irrigation use, stock and domestic use and environmental flows) in the broader area, including downstream of the site.
- Characterise the physical and chemical properties of the project area soils/mine geological materials including the potential environmental risks (e.g. potential for erosion, salinity, nutrients and acidification).

Likely effects

- Develop a water balance model to quantify the project's demand (both quantity and quality) on groundwater and/or surface water resources, including volume to be extracted, stored and released during the construction, operations, decommissioning and post-closure phases of the project.
- Use appropriate methods, including modelling, to identify and evaluate effects of the project and feasible alternatives on groundwater and surface water environments, including:
 - the likely extent, magnitude and duration of groundwater level drawdown in the vicinity of the mine and water supply bores during construction and operation, and the expected timing and scale of recovery of groundwater levels post-closure (spatial and temporal groundwater modelling);

- the potential for mounding and migration of groundwater from the backfilled tailings material along the mine-path during operations, decommissioning and post-closure (including predicted volume, timing and water characteristics);
- changes to groundwater and surface water quality at all project phases, including effects from drawdown and rebound of groundwater levels in the vicinity of the mine-path and water supply bores, present contaminants (including radionuclides), as well as downstream and upstream effects on ecological values (e.g. groundwater dependent ecosystems and the Kerang Wetlands Ramsar site);
- changes to availability of surface water and groundwater for beneficial uses (e.g. licenced users and/or ecosystems) as a result of the project (e.g. as a result of predicted extraction groundwater and/or surface water for operational use), accounting for climate risks and the potential effects of climate change; and
- risks associated with potential acid forming materials (soil and rock) which may be disturbed or exposed by mining activities.

Design and mitigation

- Describe proposed design options and measures which could avoid or minimise significant effects on beneficial uses of surface water, groundwater and downstream water environments, accounting for climate risks and the potential effects of climate change, during the project construction, operations, decommissioning and post-closure phases.

Performance objectives and management

- Describe monitoring programs to be implemented to ensure prompt detection of surface water and groundwater effects associated with the project.
- Identify possible contingency actions to respond to foreseeable changes that may be identified through the monitoring program.

4.4 Amenity and environmental quality

Draft evaluation objective

To protect the health and wellbeing of residents and local communities, and minimise effects on air quality, noise and the social amenity of the area, having regard to relevant limits, targets or standards.

Key issues

- The potential for risks to public health and safety and diminished social wellbeing at all stages of the project due to a range of factors including but not limited to: exposure to dust, air pollution, noise, vibration, lighting, radiation, hazardous materials and transport hazards.

Existing environment

- Describe the physical and chemical characteristics of overburden, ore, product, tailings and mining by-products to be removed during mine development and operations including specific aspects relevant to air quality and radiation.
- Identify dwellings and any other potentially sensitive receptors (e.g. community centres, schools, recreation facilities and agricultural businesses) that could be affected by the project's potential effects on air quality, noise or vibration levels.
- Monitor and characterise background levels of air quality in accordance with PEM requirements, including air pollution indicators (dust, PM10, PM2.5, crystalline silica, metals, and greenhouse gas emissions from equipment), noise and vibration in the vicinity of the project, including adjacent sensitive receptors and along potential transport routes.
- Characterise background radiation levels within the project site and the broader project area.
- Evaluate the existing road/rail conditions and traffic (type, volume and timing) conditions on key proposed transport routes for the project.
- Evaluate the existing port facilities for storage of heavy mineral concentrate.

Likely effects

- Predict likely atmospheric concentrations of particulate matter and other relevant Class 1, 2 or 3 indicators in surrounding areas during mine construction, operation and rehabilitation, using an air quality impact assessment undertaken in accordance with the PEM. The air quality impact assessment is to also include an assessment using the SEPP (Ambient Air Quality) environmental objectives.
- Assess likely noise increases, vibration and lighting impacts at sensitive receptors in the vicinity of the project and along the proposed transport route.
- Assess likely radiation effects associated with the project during operations, decommissioning and post-closure.
- Assess likely traffic volume increase in the vicinity of the project and along proposed transport routes.
- Assess likely effects to the social cohesion, human health and well-being of the communities in the vicinity of the project.
- Assess potential safety hazards to the public arising from the project.

Design and mitigation

- Identify potential and proposed design responses and/or other mitigation measures in accordance with best management practice, to avoid, reduce and/or manage significant effects for sensitive receptors, during the project construction, operation, decommissioning and post-closure, arising from:
 - air pollution indicators; noise, vibration and lighting;
 - adverse changes to the background radiation levels in the vicinity of the project (including the radionuclide content of vegetation, surface water and groundwater);
 - dislocation due to severance causing reduced access to farm land and/or disruption to social networks and community facilities; and
 - public safety hazards.

Performance objectives and management

- Describe monitoring programs for potential effects on amenity, environmental quality, health and social wellbeing including a framework for identifying and responding to any emerging issues.

4.5 Social, land use and infrastructure

Draft evaluation objective

To minimise potential adverse social and land use effects, including on agriculture and transport infrastructure.

Key issues

- The potential for reduced access to farm land, businesses, social networks and community facilities.
- Potential for benefits and adverse effects on the existing and future land and beneficial uses, including agriculture and other local businesses.
- Potential for benefits and adverse effects on socio-economics at local and regional scales.
- The potential for changes to the existing infrastructure in the project area and in its vicinity, including water supply infrastructure, power transmission lines and local and regional roads or rail.
- Potential damage to local and regional road surfaces along transport routes and increased risk to road safety on transport routes.
- The potential to increase risk to environmental and landscape hazards such as bushfires.

Existing environment

- Characterise the existing and planned land use and the existing beneficial uses within and in the vicinity of the proposed project.
- Describe the existing infrastructure for water supply, irrigation, wastewater collection and power supply in the project area and in its vicinity.
- Characterise the current traffic conditions (including site access) and road infrastructure (including arterial and municipal roads) and road users in terms of capacity, condition and structural integrity, travel times, safety and accessibility.

- Describe proposed transport routes and infrastructure, its ability to accommodate traffic generated by the project, as well as other predicted future demands.
- Describe existing emergency response infrastructure and resources.
- Describe the characteristics of the existing community in the vicinity of the project site, having regard to demographic, socio-economic and societal connection factors and with reference to relevant municipal or sub-regional benchmarks.
- Describe community attitudes to the existing environment and the potential changes brought by mining and associated operations.
- Describe the bushfire hazard for the immediate site and broader landscape conditions and undertake appropriate risk assessment that considers the risk of bushfire to people, property and community infrastructure

Likely effects

- Assess potential social and land use impacts arising from the project.
- Assess the potential economic effects (beneficial and adverse) which could result from the project, including opportunities for business and for existing businesses.
- Assess the potential effects on workforce development opportunities in the local and wider region as a result of the project.
- Assess potential effects of the project on the structural condition of potentially affected public roads, having regard to relevant design standards in the context of historical and proposed future usage.
- Evaluate the consistency of the project with the policies and provisions of the Gannawarra and Swan Hill planning schemes and other relevant land use planning strategies.

Design and mitigation

- Outline and assess design and mitigation measures that address the potential for adverse land use effects during construction, operations (including progressive rehabilitation), decommissioning/ rehabilitation and post-closure, including the proposed principles for sustainable land use set for rehabilitation of soils and landforms post-mining.
- Identify the proposed transport routes' impacts on road safety and operational performance of the existing road infrastructure, considering all project vehicle types, traffic volumes and movements and need for installation of any proposed mine infrastructure along or across the public road network during the project construction and operation and decommissioning.
- Outline the required transport infrastructure upgrades and additional road maintenance regime to address adverse impacts of the project construction, operation and decommissioning (e.g. road, rail and port).
- Describe and evaluate the proposed traffic management and safety principles to address changed traffic conditions during construction, operation and decommissioning of the project, covering (where appropriate) road safety, temporary or permanent road diversions, different traffic routes, hours of use, vehicle operating speeds, types of vehicles and emergency services provisions.
- Outline measures to minimise potential adverse effects on local communities and infrastructure.
- Outline measures to minimise potential adverse effects to local businesses, including agriculture, and to enhance potential benefits to local and regional businesses.
- Outline appropriate bushfire protection measures to address the identified bushfire risk.

Performance objectives and management

- Describe monitoring programs to measure social, land use, economic and infrastructure outcomes for communities living within or in the vicinity of the project area including a framework for identifying and responding to any emerging issues.

4.6 Cultural heritage

Draft evaluation objective

To avoid or minimise adverse effects on Aboriginal and historic cultural heritage values.

Key issues

- Destruction or disturbance of sites or places of Aboriginal or historical cultural heritage significance.

Existing environment

- Provide contextual information on past and contemporary activities in the project area and its vicinity by Aboriginal people.
- Identify and document any Aboriginal cultural heritage sites or areas of sensitivity within the project area in accordance with the requirements for the cultural heritage management plan under the Aboriginal Heritage Act.
- Identify and document any known and previously unidentified places and sites of historical cultural heritage significance within the project area and its vicinity, including any necessary investigations to supplement past studies having regard for the "Guidelines for Conduct Historical Archaeological Surveys" (Heritage Council of Victoria, Heritage Victoria, 2008) or updates as relevant.

Likely effects

- Assess the potential effects of the project on identified sites or places of Aboriginal cultural heritage significance.
- Assess the potential effects of the project on sites and places of historical cultural heritage significance, having regard to the Heritage Victoria's Guidelines for Investigating Historical Archaeological Artefacts and Sites (2012) or updates.

Design and mitigation

- Describe and evaluate proposed design, operations methods or site protection measures which could avoid or minimise impacts on Aboriginal and historical cultural heritage values.

Performance objectives and management

- Outline any proposed commitments to mitigate and manage residual effects on sites and places of Aboriginal cultural heritage significance, within the framework of a draft cultural heritage management plan.
- Outline any proposed commitments to mitigate and manage residual effects on sites and places of historical heritage significance, including site investigation and recording procedures.

4.7 Landscape and Visual

Draft evaluation objective

To minimise adverse effects on landscape and visual amenity associated with the environs of the project site

Key issues

- The potential for effects on the landscape values, visual amenity and character of region from the project.

Existing environment

- Characterise the visual character and associated landscape values of the project site and surrounding area.
- Identify viewsheds in which the project site features, including from nearby residences (where permitted), public lookouts, roads and key vantage points in the vicinity.

Likely effects

- Assess the effects of the project and feasible alternatives on landscape and visual amenity values of the project site and surrounding area, including with respect to views from public vantage points and where possible representative local residences during construction, operation, decommissioning and post-closure.

Design and mitigation

- Outline and evaluate the proposed mine design options, staging of works and management measures that could mitigate project effects on landscape and visual amenity during mining.
- Describe and evaluate the potential and proposed measures to restore and rehabilitate the landscape and visual amenity values of the project site after mining.

Performance objectives and management

- Describe proposed environmental management commitments to mitigate or manage effects on landscape and visual amenity values including in relation to the configuration and staging of works and progressive rehabilitation, including appropriate provision for post-closure planning.
- Describe the approach to monitor effects and develop contingency measures to be implemented in the event of adverse residual effects on landscape and visual values requiring further management.

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Appendix A

Procedures and requirements under section 8B(5) of the *Environment Effects Act 1978*

The procedures and requirements applying to the EES process, in accordance with both section 8B(5) and the *Ministerial guidelines for assessment of environmental effects under the Environment Effects Act 1978* (Ministerial Guidelines), are as follows:

- (i) The EES is to document the investigation and avoidance of potential environmental effects of the proposed project, including for any relevant alternatives (such as for the mining extent, methods for mining and processing, water supply and transport of mining outputs), as well as associated environmental mitigation and management measures. In particular the EES should address:
 - a. Effects on biodiversity and ecological values within and near the site, and associated with adjacent road reserves, including: native vegetation; listed threatened ecological communities and species of flora and fauna; and other habitats values;
 - b. Effects on surface water environments, including local waterways and the broader catchment, as well as groundwater resources (hydrology, quality, uses and dependent ecosystems);
 - c. Effects on the land uses and landscape values of the site and surrounding areas, including the implications for agricultural productivity;
 - d. Effects on land stability, erosion and soil productivity associated with the construction and operation of the project, including progressive rehabilitation works;
 - e. Effects on Aboriginal and non-Aboriginal cultural heritage values;
 - f. Effects of project construction and operation on air quality and noise on nearby sensitive receptors (in particular residences);
 - g. Both positive and adverse socio-economic effects, at local and regional scales, potentially generated by the project, including increased traffic movement and indirect effects of the project construction workforce on the capacity of local community infrastructure; and
 - h. Solid and liquid waste that might be generated by the project during construction and operation.
- (ii) The matters to be investigated and documented in the EES will be set out in detail in scoping requirements prepared by the Department of Environment, Land, Water and Planning (the department). Draft scoping requirements will be exhibited for 15 business days for public comment, before being finalised and then issued by the Minister for Planning.
- (iii) The level of detail of investigation for the EES studies should be consistent with the scoping requirements issued for this project and be adequate to inform an assessment of the potential environmental effects (and their acceptability) of the project and any relevant alternatives, in the context of the Ministerial Guidelines.
- (iv) The proponent is to prepare and submit to the department a draft EES study program to inform the preparation of scoping requirements.
- (v) The department is to convene an inter-agency Technical Reference Group (TRG) to advise the proponent and the department, as appropriate, on scoping and adequacy of the EES studies during the preparation of the EES, as well as coordination with statutory approval processes.
- (vi) The proponent is to prepare and submit to the department its' proposed EES Consultation Plan for consulting the public and engaging with stakeholders during the preparation of the EES. Once completed to the satisfaction of the department, the EES Consultation Plan is to be implemented by the proponent, having regard to advice from the department and the TRG.
- (vii) The proponent is also to prepare and submit to the department its proposed schedule for the studies, preparation and exhibition of the EES, following confirmation of draft scoping requirements. This is to enable effective management of the EES process on the basis of an agreed alignment of the proponent's and department's schedules, including for TRG review of technical investigations and the EES documentation.

- (viii) The proponent is to apply appropriate peer review and quality management procedures to enable the completion of EES studies and documentation to an acceptable standard.
- (ix) The EES is to be exhibited for a period of 30 business days for public comment, unless the exhibition period spans the Christmas–New Year period, in which case 40 business days will apply.
- (x) An inquiry will be appointed under the *Environment Effects Act 1978* to consider and report on the environmental effects of the proposal.

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