

An aerial photograph of a dry, brown landscape. A line of trees runs horizontally across the upper portion of the image. A road or path runs vertically down the right side of the image. The ground is covered in light brown soil with some faint, curved tracks or patterns.

Environment
Effects
Statement

VHM Limited
Goschen Rare Earths and Mineral
Sands Project

Chapter 01 Introduction

November 2023

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1. Introduction

This chapter provides an overview of the proposed Goschen Rare Earths and Mineral Sands Project (the Project) and sets out the purpose and structure of the Environment Effects Statement (EES) for the Project.

VHM Limited (VHM) is proposing to develop the Goschen Rare Earths and Mineral Sands Project (the Project) in the Loddon Mallee Region of Victoria, approximately 35 kilometres (km) south of Swan Hill in the Gannawarra Shire. The Project would involve the mining and processing of heavy mineral sands and rare earth minerals.

The Project mining area contains ore which is proposed to produce a range of products including mixed heavy mineral concentrate (HMC), zircon concentrate, rutile product, leucoxene products, ilmenite product, and rare earth mineral products. The Project would involve mining within two defined mining areas within the Project mining area, and processing of heavy mineral sands at a throughput of approximately 5 million tonnes per annum (Mtpa) over an estimated 20-25 year mine life. Mine products are proposed to be transported via a combination of road and rail networks to port facilities for export overseas.

1.1 Goschen Rare Earths and Mineral Sands Project

1.1.1 Background

VHM initially held over 7,000 km² of near-contiguous tenements in Victoria, which provided the company with access to significant historical exploration data. This data formed the basis of VHM's exploration program to generate its own data for estimating mineral resources and ore reserves within its tenements. The exploration undertaken to date has discovered one of the world's largest, highest-grade zircon, rutile and rare earth mineral deposits, located near Lalbert in the Murray Basin, Victoria. The Project would involve the mining and processing of these deposits within VHM's retention licence 8606 (RL8606) (refer Figure 1-1 and Figure 1-2).

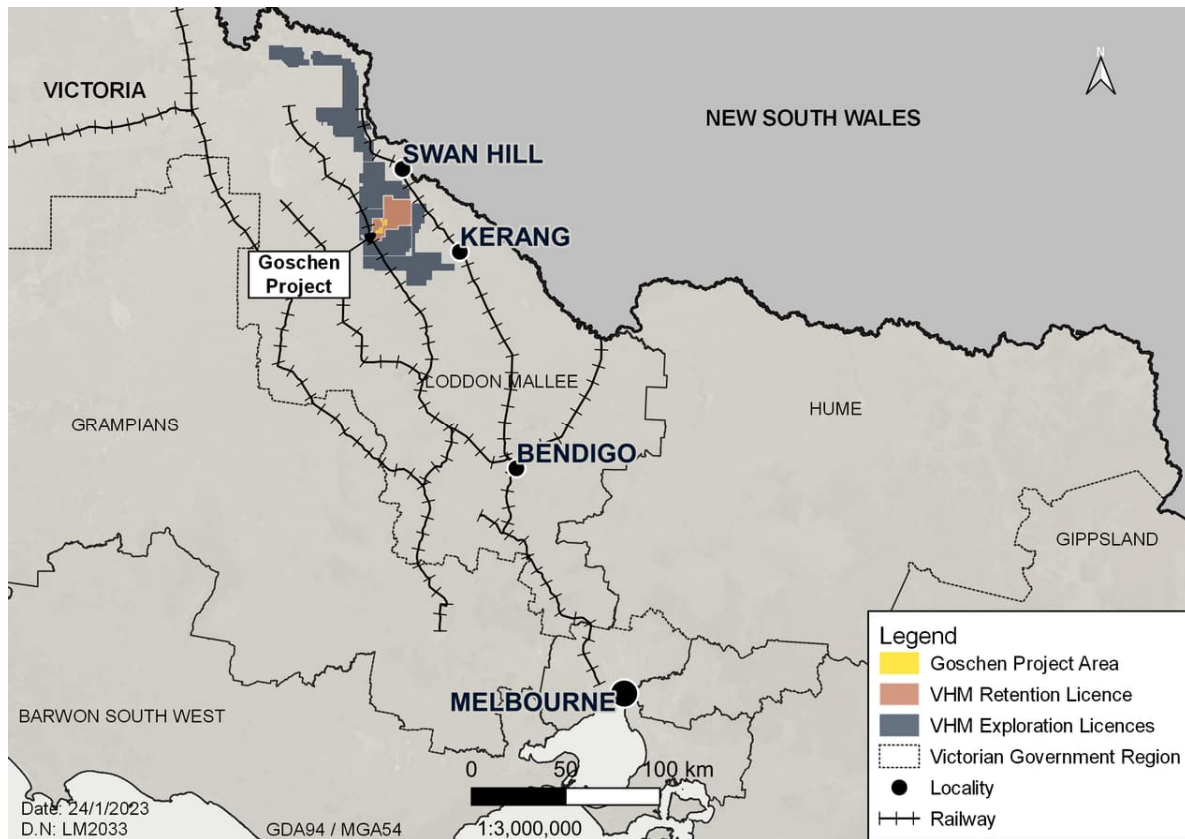


Figure 1-1 Project location

In addition to the resource and reserve estimates, VHM also completed a series of baseline surveys and financial evaluations to determine the proposed mining area (MIN) for the Project.

The Project would consist of a run of mine (ROM) ore feed throughput of nominally 5 Mtpa through the processing facility. The ore would be mined from Area 1 and Area 3 (refer to Figure 1-3) located within RL8606. All the ore mineral processing facilities would be located within the Project mining boundary and on land secured by the Company through land agreements.

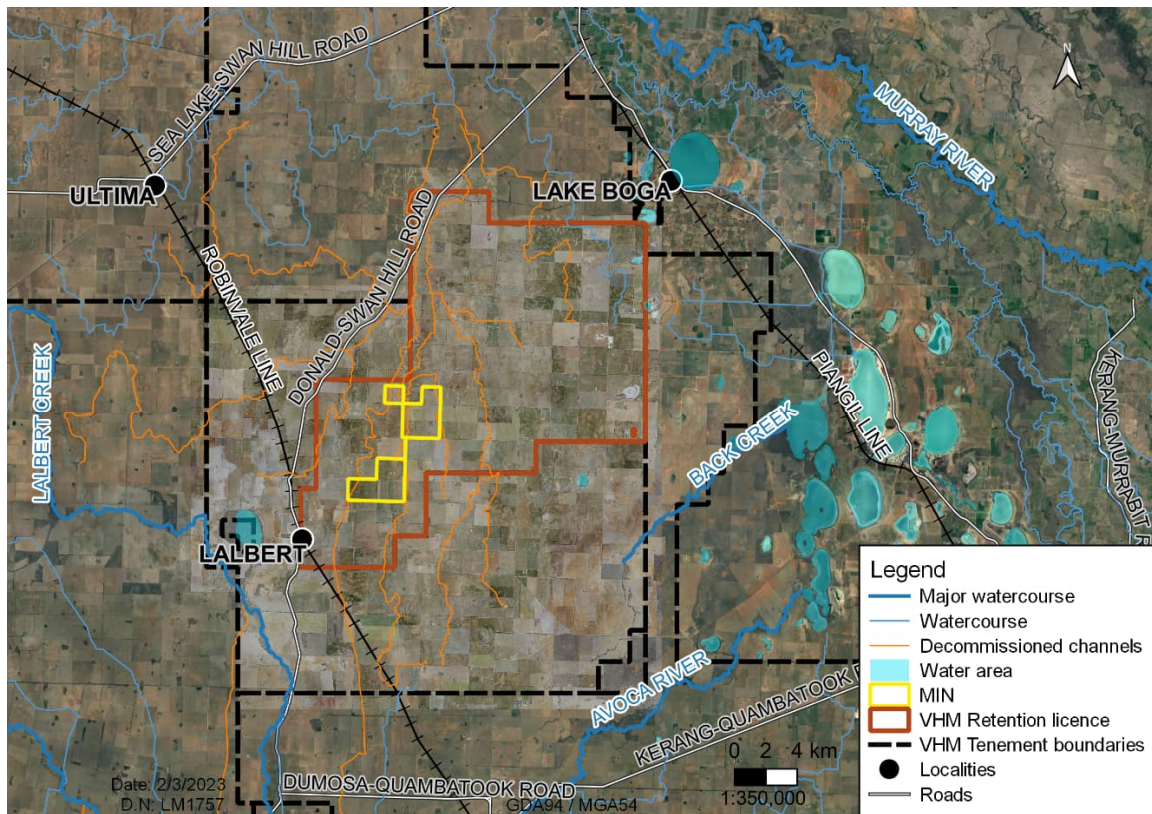


Figure 1-2 Retention licence area

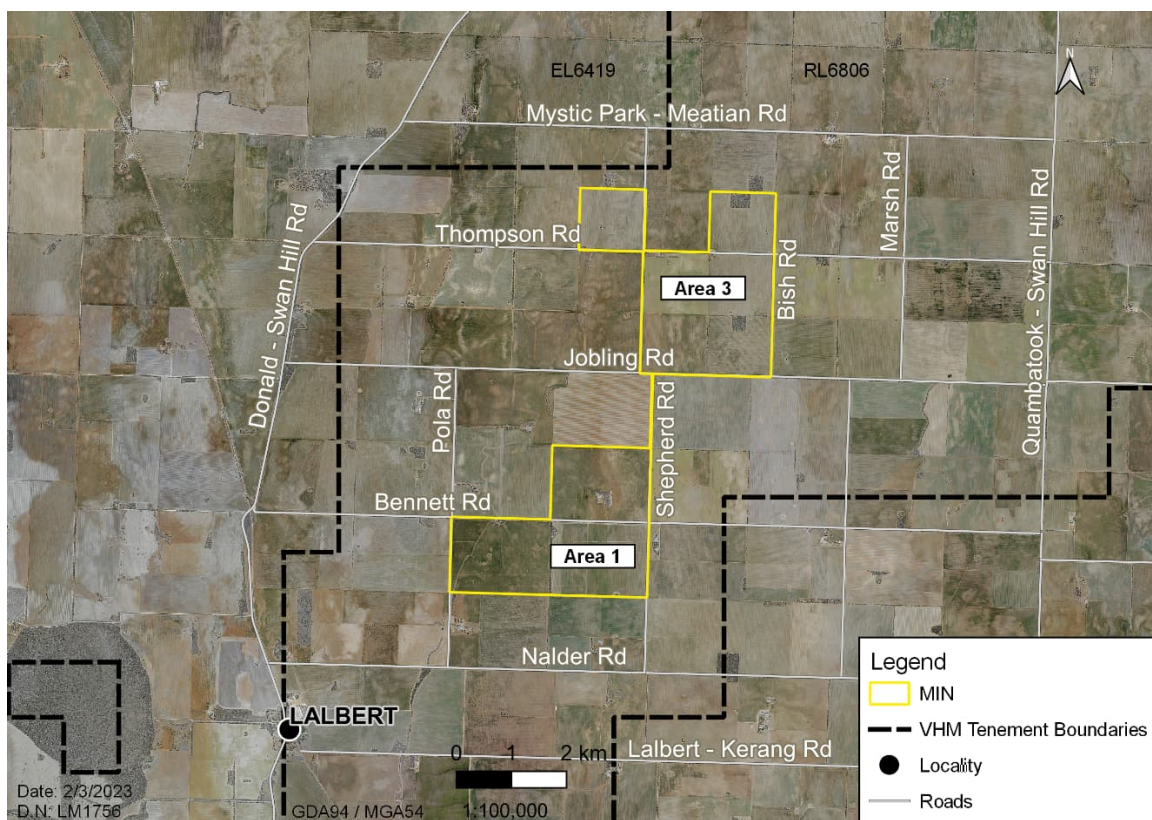


Figure 1-3 Area 1 and Area 3

1.1.2 Objectives

The purpose of the Project is to mine heavy mineral sands and rare earths in two stages:

- Goschen (Area 1) at 5 Mtpa Run of Mine (ROM) throughput capacity for an expected life of mine of approximately 9 years. The processing facility for ore extracted from Area 1 and Area 3 will remain in Area 1 for the entire life of mine and is proposed to be located north of Bennett Road; and
- Goschen (Area 3) at 5 Mtpa ROM throughput capacity for a further 11 years once mining of ore within Area 1 has ceased.

In accordance with accepted industry practice, VHM would ramp up construction, commissioning and operations within each of these stages to achieve the nameplate capacities as quickly as financially and technical practicable.

The Project would be designed and operated in accordance with regulatory requirements, and in so doing would deliver long-term benefits to the community, local, state and federal governments. VHM aims to effectively rehabilitate the Project site to enable the continuation of agricultural activities consistent with the previous use, or as agreed with the landholder, following mining; as well as rehabilitate areas of native vegetation, leaving a positive mining legacy for local landowners and the surrounding community.

1.1.3 Project alternatives

Across each of the development phases for the Project, the design was refined through an iterative process involving technical and environmental assessments, and community and stakeholder consultation. This process has ensured the objectives of the Project are met, that the relevant legislative and policy requirements are addressed, and the potential risks and adverse environmental impacts are minimised.

Refer to Chapter 4: Project alternatives for a discussion of the alternatives considered prior to deciding on the preferred development components, locations and construction techniques. Refer to Chapter 3: Project description for a description of the Project configuration assessed in this EES.

1.2 Project overview

1.2.1 Project description

VHM proposes to develop the Project, one the world's largest, highest-grade zircon, rutile and rare earth mineral deposits, located near Lalbert, in the Murray Basin, Victoria, approximately 35 km south of Swan Hill. The Project would involve the mining and processing of heavy mineral sands and rare earths extracted from two areas, one to the south (also referred to as Area 1) and the other 1.4 km to the north (referred to as Area 3) of Area 1, covering an area of approximately 1,479 hectares. Area 1 is to be developed as the first stage, followed by the development of Area 3. Figure 1-4 below presents the proposed layout of Area 1 and Area 3.

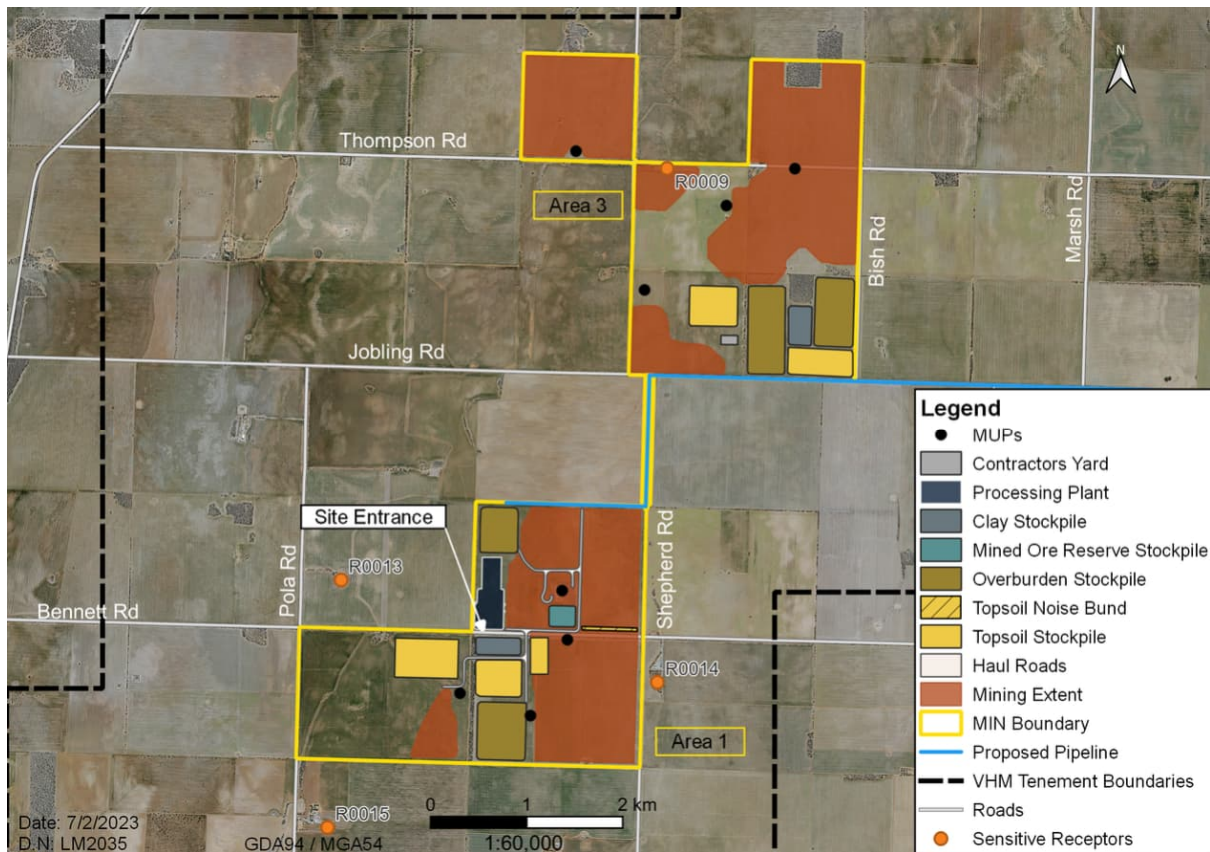


Figure 1-4 Area 1 and Area 3 proposed layout

Conventional open pit mining equipment would be used for a strip-mining operation above the water table. Cuts would be approximately 200 metres (m) along-strike and variable in width to suit prevailing ground conditions. Excavators would be used to move and stockpile overburden and to mine the ore, and trucks would transport the ore to the Mining Unit Plant (MUP), where the ore would be prepared for processing. The MUP will be moved as mining operations progress so indicative locations are shown. Primary mining operations would be supported by dozers and front-end loaders, which would be used for activities such as cross-ripping, pushing up bunds and contouring waste dumps.

Mining would occur in blocks, with excavation, tailings deposition and rehabilitation being undertaken in a progressive sequence. It is expected that each block would only be open for a maximum of eight to 12 months. The proposed mining sequence has been optimised to allow for the co-deposition of tailings into each block without the need for an aboveground tailings storage facility.

At the beginning of mining operations, overburden and ore extracted from the first mining block would be stored at the surface in stockpiles. Once the first block has been mined, overburden stockpiled at the surface would be used to make tailings bunds within the void of mined blocks. Ore processing would then begin and tailings would be deposited into the contained cells located within the mined block. The deposited tails would then be covered by more overburden as mining progresses to the next block, allowing for co deposition to occur.

The key infrastructure components and processors include:

Mining Unit Plants: The mined ore would be fed to the MUP which would have a processing capacity of 5 Mtpa. The MUP would be moved to different locations as mining operations progress, so that it is always proximate to the active mine face. The MUP prepares the ore for further processing by liberating minerals from clays, reducing the ore to a pumpable size. Ore would be pumped from the MUP to the feed preparation plant (FPP) situated within the processing plant for fine tailings removal.

Processors and plant: FPP, Wet Concentrator Plant (WCP), Rare Earth Mineral Concentrate (REMC) Plant, Hydrometallurgical Plant (HMP), Flotation and other Circuits including Wet High Intensity Magnetic Separation (WHIMS) Circuit, Non-magnetic Heavy Mineral Concentrate (HMC) Upgrade Circuit, Mineral Separation Plants (MSP) and hydromet facility. The processing would produce REMC, Zircon Concentrate and Titania concentrates. The processing plant is proposed to be located within Area 1.

Water pumpstation and pipeline: Up to 4.5 gigalitres a year (GL/y) of water would be needed for the start-up of the Project and supplied from Kangaroo Lake. This volume would be reduced to 3.1 GL/y during operation. A pumpstation would be constructed in accordance with Goulburn-Murray Water (GMW) approved works on the bank of Kangaroo Lake near the existing supply point for the GMW channel, with a 38 km buried pipeline following the most direct route possible utilising the local roads to minimise destruction or damage to flora when trenching during its construction. The pump station would be accessed via Mystic Park East Road.

Power: Electrical power for the mining and processing operations would be generated on site using dual fuel (natural gas and diesel) generators housed in a dedicated engine house. Fuel for the generators would be stored in dedicated storage and dispensing facilities on site, with fuel deliveries being made by road utilising the existing road network. Heat energy for the on-site gas fired appliances shall be provided from an extension of the distribution network from the main liquefied natural gas (LNG) storage and regasification system. A gradual evolution over the life of mine to renewables, hydrogen and/or battery as technologies and commercial viability increase would be explored.

Sewage treatment plant: A sewage treatment plant would be needed to treat up to 20,000 L/day to support on-site workers during operation of the mine. Sewage from toilets and showers would be treated to Class C standard and reused as part of mineral processing.

Service Corridor: once mining commences within Area 3, ore from the MUPs would be pumped to the FPP and other processing operations within Area 1 as a slurry within a pipeline on Shepherd Road between Area 3 and Area 1.

Other supporting non-process infrastructure within Area 1 and Area 3 (and outside of these mining areas), would include the following:

- Topsoil stockpiles;
- Water storage ponds;
- Personnel buildings (offices, administration, crib room, laboratories etc);
- Vehicle washdown and weighbridge;
- Chemical and reagent storage/preparation facilities;
- Diesel and LNG/ liquefied petroleum gas (LPG) fuel storage and distribution;
- Water pipelines;
- Power lines with electrical power generated onsite;
- Communications;
- Security (gatehouse and fencing); and
- Power Station.

Following processing, the product from the mine would be transported from Area 1 to the rail loading facility at the town of Ultima, approximately 40 km by road, north-west of the Project. From there, the mine products would be transported by rail to the destination port. Port of Melbourne is the preferred port for export and import, although Port of Geelong remains an option.

Transport routes to the Project mining area and between Area 1 and Area 3 would occur along existing public roads connecting to Donald Swan Hill Road, including Bennett Road which connects to Area 1, Mystic Park-Meatian Road to the north, and Jobling Road which runs along the southern boundary of Area 3. Shepherd Road connects Area 1 and Area 3 and will provide a service corridor between the two mining areas. Bish Road is also proposed as an access road when mining occurs in Area 3.

The land required for mining, including for water supply and associated road transport upgrades (where required), is shown in Figure 1-5 below.

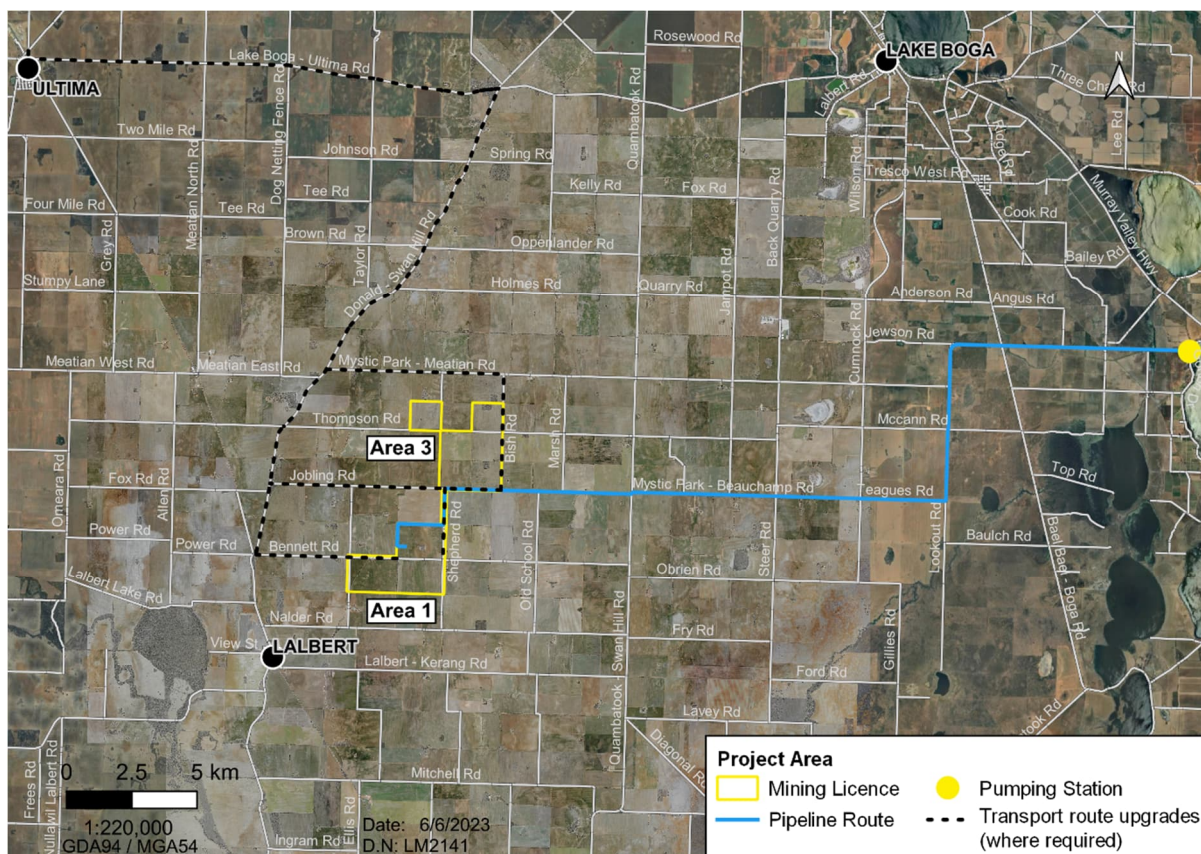


Figure 1-5 Project Area

Further details on the construction and operation of the Project are provided in Chapter 3: Project description.

1.3 Project delivery

1.3.1 Proponent

VHM is an Australian owned and operated mineral sands and rare earths mine development company that was established in 2014. VHM's flagship development is the Project. In addition to developing the Project, VHM has an ongoing systematic program designed to identify new mining opportunities to increase the company's value.

Environmental and sustainability policy

VHM's environment and sustainability policy reflects its commitment to integrate environmental considerations into Project planning, development, operations and rehabilitation. VHM commits to develop and implement environmental management measures that prevent or minimise the environmental effects of its operations. As a minimum, VHM would ensure compliance with applicable environmental legislation. However, it will continuously assess and improve its environmental performance and methods to ensure minimal impact wherever possible during and after operations (*Environment & Sustainability Policy*, VHM Limited, 2022).

1.3.2 Project timeline

The timeframes for planning, design, construction, operation and closure of the Project are shown in Figure 1-6.



Figure 1-6 Project Timeline

1.4 Environment Effects Statement

1.4.1 Requirement for an EES

The *Environment Effects Act 1978* (Vic) (EE Act) establishes a legislative framework to assess the environmental effects of proposed works that are capable of having a significant effect on the environment. The EE Act also enables the Minister for Planning (the Minister) to decide that a proponent of works should prepare an EES.

In light of the potential for significant environmental effects, on 10 October 2018 the Minister for Planning (the Minister) determined under the EE Act that an EES is required for the Project. The Minister's reasons for making this decision included 'the potential for a range of significant environmental effects'. In particular, the Project could potentially have significant effects on:

- Native vegetation and associated biodiversity values, including listed threatened species and communities;
- Surface water and groundwater and protected beneficial uses;
- Existing land uses, amenity and landscape values; and
- Aboriginal cultural heritage values.

The Minister subsequently prepared EES scoping requirements that set out the matters that must be addressed in this EES (discussed further below).

The Project was also referred to the Australian Government under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The delegate for the Minister for the Environment determined on 19 December 2018 that the Project is a 'controlled action' requiring assessment and approval under the EPBC Act. The controlling provisions for the Australian Government's controlled action decision under the EPBC Act were:

- Ramsar wetlands (sections 16 and 17B);
- Listed threatened species and communities (sections 18 and 18A); and
- Nuclear actions (sections 21 and 22A).

The EES process is accredited to assess impacts on matters of national environmental significance under the EPBC Act through the Bilateral (Assessment) Agreement between the Commonwealth and the State of Victoria. The EES for the Project would be undertaken in accordance with the bilateral agreement; there would be no separate assessment by the Commonwealth.

1.4.2 Role of the EES

The EES describes the Project and presents a systematic and integrated assessment of the Project's potential environmental effects and their conformity with the evaluation objectives set out in the Minister for Planning's scoping requirements for the EES. The EES would be exhibited for public comment and scrutinised by an inquiry appointed by the Minister before the Minister publishes an assessment of the project's environmental effects.

An EES is not an approval process, it is an assessment of whether the environmental effects of the Project are acceptable and meet statutory requirements. It provides decision-makers (including ministers and other statutory authorities) with the information they need to determine whether statutory approvals for the Project should be granted and, if so, what conditions should apply. The necessary statutory approvals and regulatory process required for the Project is shown in Figure 1-7 and outlined in more detail in Chapter 5: Legislative framework and approvals.

This EES:

- Describes the Project;
- Describes the existing environment that may be affected by the Project;
- Identifies the potential effects of the Project on the existing environment;
- Recommends ways to avoid, minimise or manage any adverse effects;
- Predicts the residual effects on the environment after mitigation measures have been applied; and
- Proposes an Environmental Management Framework (EMF) that contains the environmental management measures proposed to address specific issues, including commitments to mitigate adverse effects and enhance environmental outcomes.

The EES process is designed to be rigorous and transparent, with opportunities provided for input from stakeholders and the wider community. On the next page, Figure 1-7 provides an overview of the main steps in the EES process for the Project and sets out the statutory approval steps that would be carried out concurrently.

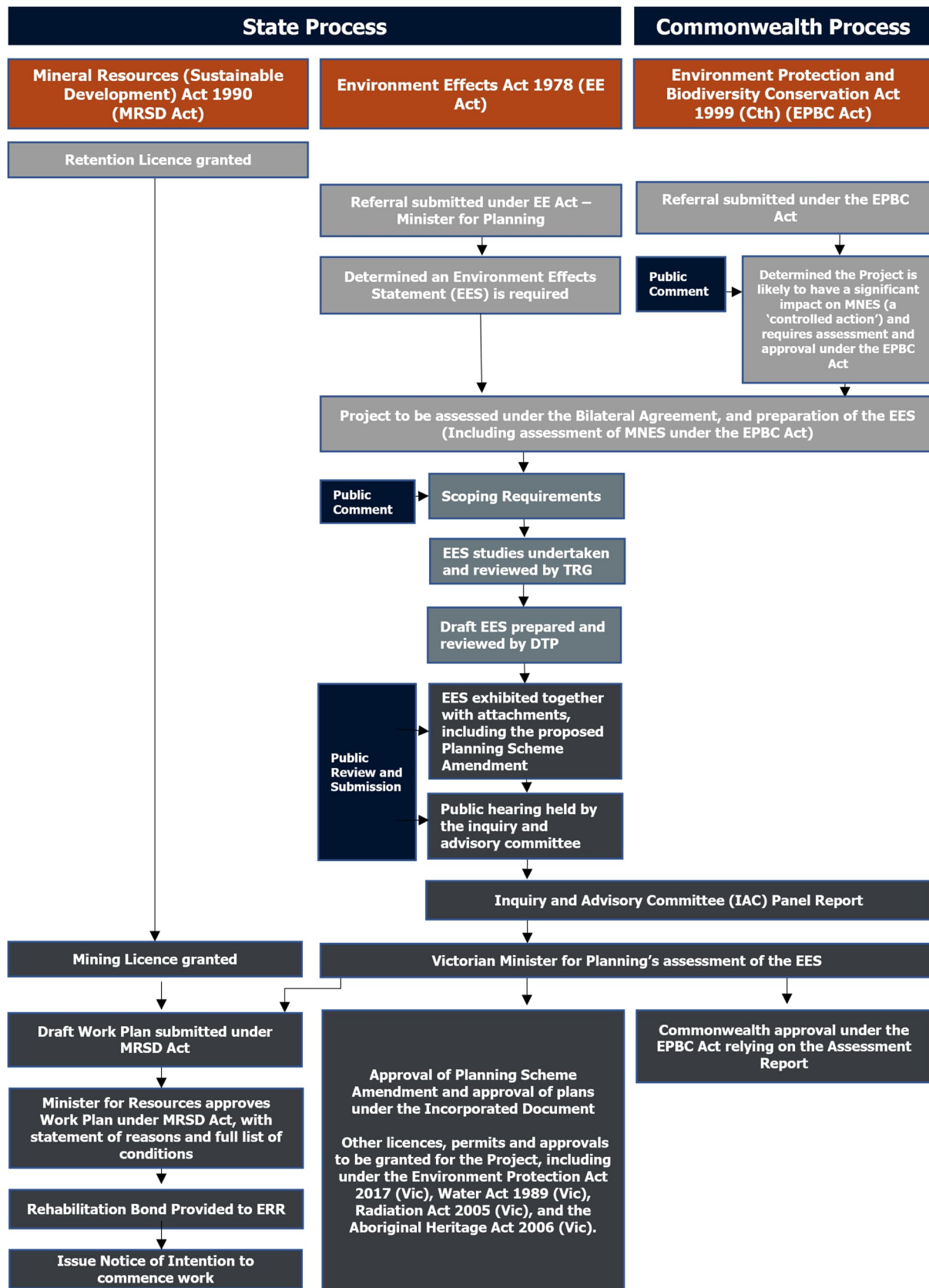


Figure 1-7 EES Process

1.4.3 Consultation

A consultation plan was developed to guide and inform VHM's engagement and consultation with the public and with individuals, the community and stakeholders during the EES process. The plan outlines opportunities for community input into the EES process, including raising specific issues of concern, identifying potential impacts, proposing possible mitigation measures and providing additional information to inform the Project's technical specialist investigations and design.

A program of community consultation, stakeholder engagement and communications would also be delivered during implementation of the Project. The consultation program is described in Chapter 22: Community and stakeholder engagement.

1.4.4 Scoping requirements and evaluation objectives

The matters to be investigated and documented in the EES are set out in the scoping requirements issued by the Minister for Planning. The purpose of the scoping requirements is to ensure the EES:

- Appropriately responded to the decision made by the Victorian Minister for Planning that an EES is required;
- Identifies potential significant environmental effects of the Project;
- Explains how the environmental effects of the works are proposed to be managed for the different stages and aspects of the Project; and
- Provides sufficient and appropriate information to allow the Minister to assess the environmental effects of the works under the EE Act.

Draft scoping requirements were exhibited by the Department of Transport and Planning (formerly the Department of Environment, Land, Water and Planning) for public comment between April and May 2019. After considering public submissions, the Minister published final scoping requirements in May 2019. This EES has been prepared in accordance with the final scoping requirements. The EES may also address other significant issues not identified in the scoping requirements that have emerged during the EES investigations and consultation process.

The scoping requirements establish evaluation objectives for the EES (listed in Table 1-1). These objectives reflect the decision of the Minister for Planning on the need for an EES, and each of the technical studies has had close regard to these objectives in their assessments.

Table 1-1: Evaluation objectives

Evaluation objectives
Resource development – To achieve the best use of available mineral sands resources, in an economic and environmentally sustainable way, including while maintaining viability of local industries.
Biodiversity and habitat - 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.
Water, catchment values and hydrology – 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.
Amenity and environmental quality - 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.
Social, land use and infrastructure - To minimise potential adverse social and land use effects, including on agriculture and transport infrastructure.
Cultural heritage – To avoid or minimise adverse effects on Aboriginal and historic cultural heritage values
Landscape and visual - To minimise adverse effects on landscape and visual amenity associated with the environs of the Project site.

1.5 Approach to the EES

This EES presents a holistic and integrated assessment of the Project. It considers design approach, construction methodology, operation, decommissioning, and the specific potential environmental impacts of each of the components of the Project.

1.5.1 Environmental impact assessment

To ensure all key issues identified in the EES scoping requirements were addressed, 17 specialist technical assessments evaluated the potential environmental effects of the Project during the construction, operation, decommissioning, and rehabilitation and closure phases. These assessments also assisted VHM to make informed decisions about the Project design.

The technical studies assessed how potential adverse environmental effects could be avoided, minimised and managed. The findings of the studies are provided in the technical reports attached to this EES.

The common assessment framework applied by the technical specialists is described in Chapter 6: Assessment framework.

1.5.2 Mitigation measures

The specialist technical assessments developed an initial set of mitigation measures, based on compliance with legislation and standard requirements as part of their impact assessments.

Through the risk assessment process, an initial set of mitigation measures were refined to a set of recommended mitigation measures that address the findings of the impact assessment, ongoing iterations to the Project design, and stakeholder inputs.

A complete list of the mitigation measures adopted for the Project is set out in Chapter 21: Environmental Management Framework.

1.5.3 Environmental Management Framework

The EMF is a framework for addressing the environmental requirements for the Project. The EMF is built from the requirements of each of the statutory approvals required for the Project and includes mitigation measures VHM would implement to manage any potential adverse effects.

The mitigation measures set out in the EMF are VHM's environmental commitments and would be given effect through the relevant statutory approvals including, but not limited to, a Mining Licence and approved Work Plan. These commitments would also be included in management plans such as the Cultural Heritage Management Plan, Construction Environmental Management Plan, Operational Environmental Management Plans and other subordinate management plans.

The mitigation measures would inform the conditions administered by relevant statutory authorities, and the proponent and their contractors would be responsible for their implementation. Contractual arrangements with contractors responsible for construction, operation and decommissioning of the Project would include requirements for contractors to adhere to specified mitigation measures.

The proposed EMF and mitigation measures are presented in Chapter 21: Environmental Management Framework.

1.6 EES structure

The structure of the EES is shown in Figure 1-8.

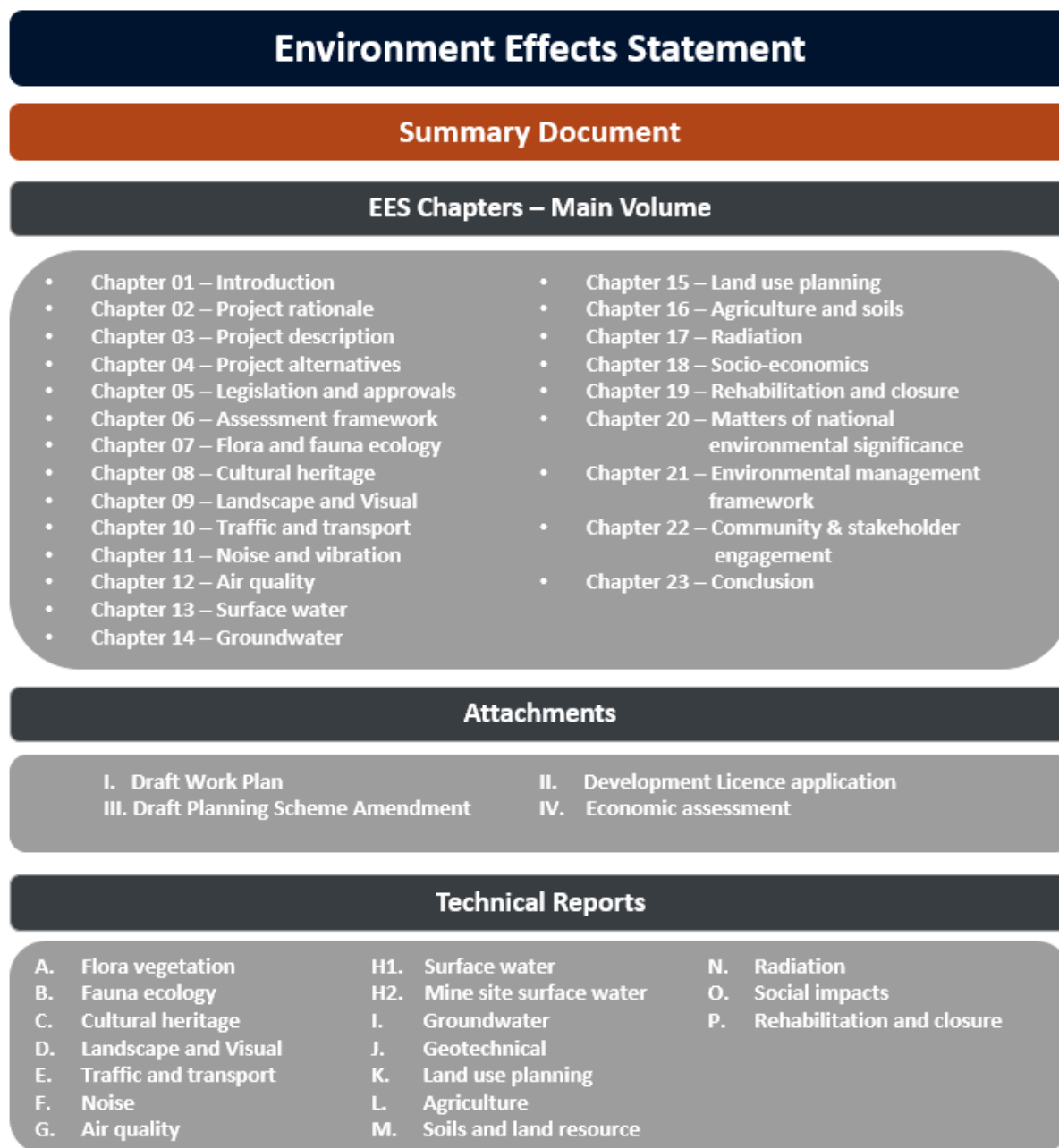


Figure 1-8: Structure of this EES

References:

VHM Limited (2022). *Environment & Sustainability Policy*. VHM Limited. Available at: <https://www.vhmltd.com.au/wp-content/uploads/2022/05/Environment-Sustainability-Policy.pdf>