MOUNTAIN VIEW QUARRY EXTENSION

ASSESSMENT

under

ENVIRONMENT EFFECTS ACT 1978

Minister for Planning

September 2009
### Glossary

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAV</td>
<td>Aboriginal Affairs Victoria</td>
</tr>
<tr>
<td>AHD</td>
<td>Australian Height Datum</td>
</tr>
<tr>
<td>AVW</td>
<td>Atlas of Victorian Wildlife</td>
</tr>
<tr>
<td>CHMP</td>
<td>Cultural Heritage Management Plan, prepared under Aboriginal Heritage Act 2006</td>
</tr>
<tr>
<td>C&amp;LP Act</td>
<td>Catchment and Land Protection Act 1994</td>
</tr>
<tr>
<td>dBL</td>
<td>Decibels</td>
</tr>
<tr>
<td>DEWHA</td>
<td>Commonwealth Department of the Environment, Water, Heritage and the Arts</td>
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<tr>
<td>DPCD</td>
<td>Victorian Department of Planning and Community Development</td>
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<tr>
<td>DPI</td>
<td>Victorian Department of Primary Industries</td>
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<td>DSE</td>
<td>Victorian Department of Sustainability and Environment</td>
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<tr>
<td>EES</td>
<td>Environment Effects Statement</td>
</tr>
<tr>
<td>EID Act</td>
<td>Extractive Industries Development Act 1995</td>
</tr>
<tr>
<td>EMP</td>
<td>Environmental Management Plan</td>
</tr>
<tr>
<td>EPA</td>
<td>Victorian Environment Protection Authority</td>
</tr>
<tr>
<td>EPBC Act</td>
<td>Environment Protection and Biodiversity Conservation Act 1999</td>
</tr>
<tr>
<td>ERC</td>
<td>Environmental Review Committee</td>
</tr>
<tr>
<td>ESD</td>
<td>ecologically sustainable development</td>
</tr>
<tr>
<td>EVC</td>
<td>Ecological Vegetation Class</td>
</tr>
<tr>
<td>FFG Act</td>
<td>Flora and Fauna Guarantee Act 1988 (Vic.)</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gases</td>
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<tr>
<td>GL</td>
<td>gigalitres</td>
</tr>
<tr>
<td>ha</td>
<td>hectares</td>
</tr>
<tr>
<td>hha</td>
<td>habitat hectares</td>
</tr>
<tr>
<td>IGAE</td>
<td>Inter-Governmental Agreement on the Environment</td>
</tr>
<tr>
<td>km</td>
<td>kilometres</td>
</tr>
<tr>
<td>LPPF</td>
<td>Local Planning Policy Framework</td>
</tr>
<tr>
<td>m, m³</td>
<td>metres, cubic metres</td>
</tr>
<tr>
<td>MEA</td>
<td>maximum extent achievable</td>
</tr>
<tr>
<td>Mt</td>
<td>Mega tonnes (million tonnes)</td>
</tr>
<tr>
<td>NVMF</td>
<td>Victoria's Native Vegetation Management Framework</td>
</tr>
<tr>
<td>P&amp;E Act</td>
<td>Planning and Environment Act 1987</td>
</tr>
<tr>
<td>PM₁₀</td>
<td>particles or “particulate matter” with equivalent aerodynamic diameter of 10 micrometers or less</td>
</tr>
<tr>
<td>SEPPs</td>
<td>State Environment Protection Policies</td>
</tr>
<tr>
<td>SPPF</td>
<td>State Planning Policy Framework</td>
</tr>
<tr>
<td>TDS</td>
<td>Total Dissolved Solids</td>
</tr>
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1 Introduction

1.1 Purpose of this Document

This document is the assessment of environmental effects (“Assessment”) under the Environment Effects Act 1978 (EE Act) of the proposed Mountain View Quarry Extension, at Point Wilson near Geelong. It represents the final step in the Environment Effects Statement (EES) process under the EE Act by providing findings to decision-makers on the likely environmental effects of the proposal and advice on their acceptability as well as how they should be addressed through statutory decisions.

This Assessment will inform the statutory decisions required under Victorian law for the Project to proceed, in particular a Work Plan and Work Authority under the Extractive Industries Development Act 1995, and a planning permit and Development Plan under the Greater Geelong Planning Scheme. It will also inform the Australian Government Minister for the Environment, Heritage and the Arts’ decision under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

1.2 Background

On 29 December 2003, the City of Greater Geelong wrote to the Minister for Planning requesting a decision on whether an EES was required for the Barro Group’s initial proposal to extend Mountain View Quarry across a large proportion of Point Wilson land. Subsequent to this and following consultation with governments, the proponent reconfigured their proposal into two stages: Stage 1 entailed a preliminary extension of the quarry, consisting of works that did not have the potential for significant environmental effects and therefore did not require an EES; and Stage 2, which entailed a major extension of the quarry in an area with the potential for significant environmental effects. On 5 July 2004, the then Minister for Planning decided that an EES was required for the Barro Group’s proposal to significantly extend the Mountain View Quarry (i.e. Stage 2).

1.3 Project Description

The Barro Group is proposing to extend the existing Mountain View Quarry at Point Wilson, which has been in operation since the early 1970’s. Approval currently exists (i.e. Work Authority 41) for an extraction area of 238 hectares (ha), referred to as Stage 1. The proposal that is being assessed is to significantly extend the quarry by approximately 324 ha, which is referred to as Stage 2. The proposed extraction areas are shown in Figure 1 below.

Included within the proposed extension is the quarrying of deeper pockets of basalt to a depth of approximately -12 m AHD\(^1\) to -13 m AHD. Some of these deeper pockets extend into the existing quarry area (see Figure 1). Approval of the preliminary extension (i.e. Stage 1) was limited to quarrying resources no deeper than 0.0 m AHD.

The proposed extension (Stage 2) of the quarry would enable existing operations to continue into the future (i.e. until approximately 2060). The current average output is not expected to change (i.e. 1 to 1.4 Million tonnes (Mt) of materials per year). In addition, the existing infrastructure, machinery, processing, hours of operation, staffing, and associated offsite traffic is not anticipated to change. Continuation of existing quarrying operations together with the proposed extension would involve the following:

- A fixed plant (i.e. site office, weighbridge, crushing and screening plant, integrated pugmill and blending plant, and a workshop), which would all remain in its existing locations, except the site office, amenities and weighbridge;
- Additional machinery would be brought on site as required (i.e. for overburden removal and rehabilitation). The current mobile plant (wheel loaders, haul trucks, a permanent water cart, excavators, rock breakers, dozers and hydraulic drill rigs) would continue to operate.

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\(^1\) mAH\(D\) = meters relative to the Australian Height Datum
- Blasting occurs between 10.00am and 4.00pm (approximately fortnightly), whereas the other quarrying operations occur 24 hours a day, 7 days a week.
- Extraction currently occurs in parallel at different quarry faces, given the different quality of rock sourced from each face, which is then used to produce the required material through blending.
- New buffers and bunds would need to be developed for quarrying operations in the proposed extraction areas.
- Rock that is processed is stored in stockpiles or overhead bins to the south of the processing plant.

The proposed extension involves the following staging of quarrying activities, whereby it radiates outwards from the current operations (refer to Table 1 and Figure 1). This is considered to be an efficient method for extracting the resource given the specifications of materials currently produced by the quarry. The creation of long working faces enables the selective quarrying of varied quality of rock ensuring a suitable blend of material can be provided to meet client specifications. Areas of high quality basalt present along discontinuous ridges through the proposed Stage 2 extension area. This basalt is required to mix with lower quality basalt in order to meet these particular product specifications, such as for major road projects. Quarrying activities may occur simultaneously across a number of faces within the quarry depending on market demand and the required combination of products for various clients.

It is anticipated that given current market demands the basalt resources within the existing quarry (including Stage 1) will last for another five to seven years.

In order to avoid clearing some significant native vegetation with internationally significance habitat values (i.e. both within and adjacent to the Barro Group site), the proponent proposes not to quarry the area in the north-east, east of 29 Mile Road (known as the Dry Saltmarsh). There are some reserves of high quality rock under this wetland area.

**Table 1.** Proposed sequence and periods of basalt extraction (source: EES, page 2-23)

<table>
<thead>
<tr>
<th>Upper Basalt</th>
<th>Period</th>
<th>Lower Basalt</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central area – East of Stage 1 extension area in east of WA41 area. Pocket to the southwest of WA41</td>
<td></td>
<td>Southern and western areas (2A1)</td>
<td></td>
</tr>
<tr>
<td><strong>2B</strong></td>
<td>2030 – 2045</td>
<td><strong>2B1</strong></td>
<td>2035 – 2045</td>
</tr>
<tr>
<td>North, west and southeastern areas</td>
<td></td>
<td>Northern area (2B1)</td>
<td></td>
</tr>
<tr>
<td><strong>2C</strong></td>
<td>2045 – 2050</td>
<td><strong>2B2</strong></td>
<td>2045 – 2055</td>
</tr>
<tr>
<td>Eastern area</td>
<td></td>
<td>Eastern area (2B2)</td>
<td></td>
</tr>
<tr>
<td><strong>2D</strong></td>
<td>2055 – 2060</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The proposed quarrying has the potential to adversely impact on some areas with significant environmental values and sensitivities, although most of these areas are not proposed to be quarried for some time. The EES sets out the following expected timeframes for quarrying in these areas:

- Deep extraction (area 2B1) with associated groundwater dewatering in the north (in proximity to saltmarsh and The Spit Nature Conservation Reserve): approximate commencement of 2035 to 2045.
- Shallow extraction (area 2D) in the northeast (closest to the saltmarsh and The Spit Nature Conservation Reserve): approximate commencement of 2055 to 2060.
- Shallow extraction in near native vegetation site no. 9: approximate commencement of 2015.
- Shallow extraction in native vegetation site no. 15: approximate commencement of 2045 to 2050.

Section 2 of the Mountain View Quarry EES provides a detailed description of the Barro Group’s proposal to significantly extend the Mountain View Quarry at Point Wilson (the Project).

1.4 Site and Environmental Setting

The site of the current quarry and proposed extension is at Point Wilson, approximately 50 km southwest of Melbourne and 20 km northeast of Geelong. Point Wilson abuts Corio Bay to the south and Port Phillip Bay to the east. Almost the entire site is surrounded by wetland areas included within the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site, such as the adjoining Corio Bay foreshore to the south, the Avalon Airport to the northwest, Western Treatment Plant lagoons to the north and The Spit Nature Conservation Reserve to the northeast (refer to Figure 2 below).
The site is generally flat with a slight ridge running from north to south. It is largely rural and covered by introduced species of plants, although there are some significant patches of native vegetation, most of which are endangered within the bioregion. Areas within and adjacent to the southern and eastern edges of the site include highly significant vegetation communities that provide habitat for protected fauna such as the Orange-bellied Parrot (OBP). Some areas are considered to be of high international significance, including The Spit Nature Conservation Reserve to the northeast. This includes an expansive area of saltmarsh habitat which continues into the Barro Group land in the north-eastern corner of the project site.

These saltmarsh habitats within and adjacent to the site contain two distinct areas: the Wet Saltmarsh east of 29 Mile Road and the Dry Saltmarsh wetland west of 29 Mile Road. The Dry Saltmarsh (both on Barro Group land and within the Reserve) is the most environmentally sensitive and it provides significant habitat for the OBP’s winter feeding.

There are no natural watercourses on the site. The northern section drains to the east into the saltmarsh wetlands and Port Phillip Bay, whereas the southern section drains to the southeast towards Corio Bay.
In terms of the site's geology, soil overlies the Newer Volcanics (basalt), then Moorabool Viaduct Formation (sandy clay, silty clays and sand) and lastly the Fyansford Formation (clay). The local watertable stems from the Coastal Quaternary Sediment Aquifer along the coast and the Newer Volcanics Aquifer under the saltmarsh wetlands and on the site (i.e. within the lower basalt layer). There is groundwater upflow from the basalts to the saltmarshes, although the local hydrological regime is a complex mix of tidal, surface and groundwater influences.

1.5 Structure of this Assessment

Section 2 of this Assessment outlines both the EES process and statutory approvals required for the proposed Project.

The core part of this Assessment is found in Section 3, which assesses the environmental effects of the proposed Project based on the applicable legislative and policy framework. This section also outlines the evaluation objectives for this Project, which are used to structure the integrated evaluation of the environmental effects within the Assessment. Further detail on applicable legislation and policy is provided within the Appendix.

Section 4 provides responses to the key recommendations of the Inquiry.

2 EES and Statutory Processes

2.1 The EES Process

On 29 December 2003, the City of Greater Geelong referred the entire proposed quarry extension to the then Minister for Planning requesting a decision on whether an EES was required. On 5 July 2004, the Minister for Planning determined that an EES was required to assess the potentially significant environmental effects of stage two of the proposed extension (i.e. the Project). Stage one of the extension entailed a preliminary expansion of the quarry, which were works considered not to have the potential for significant environmental effect and therefore were not subject to an EES.

On 17 June 2004, the proponent referred the Project (Stage 2) to the Commonwealth under the EPBC Act. The delegate of the Australian Minister for the Environment and Heritage decided on 1 July 2004 that the proposal (Stage 2) was a “controlled action” (EPBC 2004/1590) under the EPBC Act that required assessment and approval. Then on 21 January 2005, the Commonwealth accredited the Victorian EES process for this project under section 87 of the EPBC Act, in order to avoid duplication of assessment processes.

As the proponent, the Barro Group was responsible for preparing the EES, while the Department of Planning and Community Development (DPCD) administered the formal EES process. Draft Assessment Guidelines setting out the matters to be addressed in the EES were advertised for public comment in late December 2004, prior to the final Assessment Guidelines being issued to the proponent in March 2005.

An agency-based Technical Reference Group (TRG) was established and chaired by DPCD. The TRG included representatives of relevant government departments, agencies, and local government (e.g. Department of Sustainability and Environment (DSE)). The TRG’s role was to advise the Barro Group, as well as DPCD, in relation to the preparation of the EES, including with regard to technical, statutory and policy aspects.

In December 2007, DPCD provided advice to the proponent regarding finalisation of the EES documents. The Barro Group then completed the EES and sought permission to exhibit it in late December 2007. In early January 2008, the Minister for Planning authorised public exhibition of the Barro Group EES for public comment.

2 The Government’s planning and environmental assessment functions were part of the Department of Sustainability and Environment (DSE) at the time the EES process commenced. However, in August 2007 the Department of Planning and Community Development was created, which now includes these planning and environmental assessment functions.
2.2 Public Review Process

The EES was exhibited for six weeks, from 17 March to 30 April 2008. A total of 3 written submissions were received from: DSE, the Department of Primary Industries (DPI) and Birds Australia. The Panel subsequently invited the Environment Protection Authority (EPA) and Aboriginal Affairs Victoria (AAV) to provide advice on the proposal and attend the hearing. The EPA then lodged a written submission in June 2008.

An Inquiry was appointed by the Minister for Planning on 25 July 2008 under section 9(1) of the EE Act to consider the proposed Project, in relation to both the EES and public submissions. The Inquiry comprised Cathie McRobert (Chair), Stephen Hancock (Member) and Shane Dwyer (Member).

Following a Directions Hearing on 3 June 2008 at Planning Panels Victoria (PPV), the Main Hearing of the Inquiry was held for 3 days between 9 and 11 September 2008 at PPV. The Inquiry’s Report was provided to the Minister for Planning on 18 November 2008.

2.3 Required Statutory Approvals

The primary purpose of the Minister’s Assessment of environmental effects under the EE Act is to inform approval decisions under the relevant legislation. After receiving this Assessment, statutory decision-makers will decide whether or not to grant approvals for the project, potentially subject to specific conditions to prevent, minimise or mitigate adverse environmental effects.

In order to proceed, the Project requires the following key statutory approvals:

- A variation to the existing Work Plan and a Work Authority under the Extractive Industries Development Act 1995, consistent with the Extractive Industries Development Regulations 1996;
- Approval of a Cultural Heritage Management Plan (CHMP) prior to the approval and commencement of any works, as required under section 49 of the Aboriginal Heritage Act 2006;
- Approval under the Commonwealth’s Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act);
- Approval of a Development Plan (pursuant to DPO1) by the responsible authority, prior to the issuing of Planning Permits for use and development of land (under IN2Z, RCZ15, ESO1 and ESO2) and the removal of native vegetation under the Greater Geelong Planning Scheme.

In addition the Project is likely to require:

- An amendment to the existing licence (no. 4002210) to extract groundwater under the Water Act 1989, for the purposes of dewatering extraction areas;
- Consents to disturb European archaeological sites from Heritage Victoria under the Heritage Act 1995; and
- Written authority under section 21(2) of the Wildlife Act 1975 for any works that interfere with the hydrology (flow into, out of or within) of a State Wildlife Reserve, such as the surface and groundwater flows into The Spit Nature Conservation Reserve.

2.3.1 Extractive Industries Development Act 1995

The primary approvals required for this Project are under the Extractive Industries Development Act 1995 (EID Act) - i.e. an approved Work Plan and a Work Authority. Before a Work Authority can be granted by the Minister for Energy and Resources a Work Plan must be prepared and approved by the Department of Primary Industries (DPI). The Extractive Industries Development Regulations 2007 set out the information required in Work Plans, which includes:

- a rehabilitation plan; and
- an environment management program.
The Work Plan is a key regulatory instrument for giving effect to recommendations from the Minister for Planning’s Assessment. Recommendations can be addressed either in the body of the Work Plan or as project specific conditions within the Work Plan.

A Work Authority can only be granted once any other required consents and approvals have been issued, including an approved Work Plan and compliance with the relevant planning scheme. The granting of a Work Authority can also be subject to conditions imposed by the Minister, which could be about rehabilitation of the land, payment of a bond, and/or the protection and management of the environment.

A draft variation to the existing Work Plan (No 41) has been prepared by the proponent and submitted to DPI for review. The general content of this was provisionally endorsed by DPI during the EES process.

### 2.3.2 Planning and Environment Act 1987

The majority of the proposed site is zoned Industrial 2 (IN2Z) under the City of Greater Geelong Planning Scheme. Under the IN2Z the extraction of minerals, stone or soil is a permitted activity that requires a permit to be issued. An area along the eastern boundary of the site is zoned Rural Conservation Zone (RCZ15), due to the importance of The Spit and associated saltmarsh habitat of the OBP to the east of the current quarry, including the use of this ‘buffer zone’ for feeding and roosting during bad weather and very high tides.

The site is also covered by a Development Plan Overlay (DPO). This requires the submission of a Development Plan prior to the City of Greater Geelong considering a planning permit application for the land, with the purpose of the Plan being to ensure that the environmental values of the site and its surrounds are protected, particularly the habitat of significant fauna and flora.

There are two Environmental Significance Overlays (ESO) covering discrete portions of the site. ESO1 covers two parcels of land, one in the south of the site and one to the north of the existing quarry. The land covered by the ESO1 in the south has already been extracted by Barro Group. The Barro land to the north covered by the ESO1 is approximately 1.2 ha in area. It’s significance is not clear, both in the absence of documentation from the Council and in light of the EES studies.

The ESO2 corresponds with the land along the eastern boundary of the site zoned RCZ15. It is in place to protect high value wetlands and associated habitat of significant fauna, which in this case corresponds with The Spit and the areas of saltmarsh habitat.

The Planning and Environment Act 1987 (P&E Act) is also the primary legislation under which the policy ‘Victoria’s Native Vegetation Management Framework - A Framework for Action’ (NVMF) is implemented. However, in the circumstance that approval under this Act is not required, the NVMF may be applied under other applicable statutes, including the EID Act. The NVMF provides a policy framework for reversing the loss of native vegetation in Victoria and adopts a three step approach to achieving this: avoid, minimise, offset. Further, in the event that any remnant of an EVC of ‘very high conservation significance’ is proposed to be cleared, a specific exemption or approval is required from the Minister for Environment and Climate Change under the NVMF, as the NVMF does not permit its clearance unless extraordinary circumstances apply.

### 2.3.3 Water Act 1989

Groundwater needs to be pumped out of the local aquifer (i.e. dewatering), in order for dry extraction of the deeper basalt to occur below the current level of the watertable. A Groundwater Extraction Licence under the Water Act 1989 currently exists for the existing quarry operations. An amendment to this licence may be required.

### 2.3.4 Aboriginal Heritage Act 2006

Approval of a CHMP is required for this Project before statutory authorisation of the Project’s works can proceed. Under section 49 of the Aboriginal Heritage Act 2006, a CHMP must be prepared for any project for which an EES has been required. The Act requires relevant decision-makers to only grant a statutory authorisation for commencement of the activity if it is consistent with the approved CHMP.
2.3.5 **Wildlife Act 1975**

Written consent from the Secretary of DSE is required under section 21(2) of the *Wildlife Act 1975*, for any works (on-site or off-site) that may interfere with the flow of water into, out of or within a State Wildlife Reserve, such as The Spit Nature Conservation Reserve adjacent to the Barro site. The proposed quarry extension will change (reduce) the surface flows and groundwater flows into these saltmarsh wetlands.

2.3.6 **Commonwealth EPBC Act 1999**

Approval under the EPBC Act is required for this Project (EPBC 2004/1590), as a delegate of the Australian Government Minister considered there to be potential for significant impacts on matters of national environmental significance protected under that Act. A key matter in this case is the endangered Orange-bellied Parrot and wetlands (including Ramsar wetlands) that provide important habitat for this species. The controlling provisions under the EPBC Act that apply are:

- sections 16 and 17B (Wetlands of international importance);
- sections 18 and 18A (Listed threatened species and communities); and
- sections 20 and 20A (Listed migratory species).

As the Victorian EES process has been accredited under the EPBC Act, at the conclusion of the EES process the Victorian Minister for Planning’s Assessment will be provided to the Australian Government Minister to inform a decision on whether or not to approve the Project under the EPBC Act, and if so under what conditions.

3 **Environmental Assessment**

3.1 **Approach to this Assessment**

In assessing the environmental effects of this Project, this Assessment under the EE Act takes into account relevant legislation and policy – refer to the Appendix for further details of this context. In combination, applicable provisions, objectives and standards from this legislative and policy framework form the matters that need to be considered in evaluating environmental effects, in order to inform statutory approval decisions.

In line with applicable legislation, including the P&E Act, EPBC Act, *Environment Protection Act 1970* (EP Act) as well as the EE Act, the Assessment has regard to the consistency of the Project with ecologically sustainable development (ESD). The first three of these Acts incorporate objectives and/or principles of “ESD” or “sustainable development” - refer to the Appendix. Further, the Ministerial Guidelines made under section 10 of the EE Act specifically require the assessment of the proposal and its effects to be in the context of the principles and objectives of ESD.

To provide a coherent and integrated structure for this Assessment of environmental effects, relevant aspects of legislative and policy considerations have been synthesized into a set of evaluation objectives. A draft set of objectives were included within the Assessment Guidelines for this EES. These have now been refined in light of the further investigations of project issues in both the EES and the Inquiry’s report. Table 2 lists these evaluation objectives, together with the set of core legislation that underpins them. Specific aspects of applicable legislation and related policy will be highlighted in the discussion under individual evaluation objectives.

These evaluation objectives guide the assessment of likely environmental outcomes of the Project. In so far as particular objectives would only be partly or weakly satisfied, the specific statutory context needs to be further considered.
### Table 2. Evaluation Objectives

<table>
<thead>
<tr>
<th>Evaluation Objectives</th>
<th>Key Statutes</th>
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| - To contribute to regional and wider supply of quarry based products, as well as related social and economic benefits. | - EID Act  
- P&E Act                                           |
| - To avoid or minimise to the greatest extent practicable, adverse effects on native vegetation and biological diversity, including effects on native species and communities of flora and fauna protected under either the FFG Act or the EPBC Act. | - P&E Act  
- FFG Act  
- EPBC Act  
- Wildlife Act 1975 |
| - To avoid or minimise to the greatest extent practicable, adverse effects on surface water, groundwater and related aquatic environments, including on their environmental values and protected beneficial uses. | - EP Act & SEPPs  
- EPBC Act  
- Water Act  
- P&E Act  
- Wildlife Act 1975 |
| - To avoid or minimise to the greatest extent practicable adverse effects on both Aboriginal and non-Aboriginal cultural heritage values. | - Aboriginal Heritage Act 2006  
- Heritage Act 1995  
- P&E Act |
| - To avoid or minimise to the greatest extent practicable noise, landscape, visual, and traffic related impacts, in order to protect local amenity, neighbouring land-uses and activities during the development and operation of the quarry. | - EP Act  
- P&E Act  
- EID Act |
| - To ensure that the project can be implemented in accordance with a robust and transparent framework for environmental management, as well as an environmentally sustainable rehabilitation plan concept for the project area. | - EID Act  
- P&E Act  
- EP Act  
- EPBC Act |
| - To enable ecologically sustainable development over the short- and longer-term, having regard to the likely overall economic, social and environmental implications of the proposal. | - EE Act  
- P&E Act  
- EP Act  
- EPBC Act  
- Water Act 1989  
- C&LP Act  
- Aboriginal Heritage Act 2006 |
3.2 Economic and Social Outcomes

**Evaluation Objective** - To contribute to regional and wider supply of quarry based products, as well as related social and economic benefits.

**Statutory and Policy Context**

The primary purpose of the EID Act is to “provide a co-ordinated assessment and approvals process for extractive industries”, as well as to “ensure that extractive industry operations are carried out with safe operating standards and in a manner that ensures the rehabilitation of quarried land to a safe and stable landform”.

The State Planning Policy Framework (SPPF) includes policy that directly relates to the development of extractive industries such as this proposal:

- Clause 17.09: “Protect stone resources accessible to major markets and provide a consistent planning approval process for extraction in accordance with acceptable environmental standards”.

The Local Planning Policy Framework (LPPF) in the Greater Geelong Planning Scheme also includes Clause 21.25 Extractive Industry, which “aims to ensure that stone resources are available for long term extraction and references the Geelong Supply Area - Extractive Industry Interest Areas 1999”. Further to this, the Planning Scheme also includes a particular provision (Clause 52.09) for the development of extractive industries, which sets out the requirements and decision guidelines for the use and development of land for extractive industry, including:

- “To ensure that use and development of land for extractive industry does not adversely affect the environment or amenity of the area during or after extraction; and
- To ensure that excavated areas can be appropriately rehabilitated”.

**Key Issue**

The key issue to be considered in this statutory and policy context is whether:

- The Project will contribute to long-term regional economic well-being by supporting building and infrastructure development, as well as through employment, income and market supply.

**Economic Effects**

Annual production for the current operations at the quarry is 1 to 1.4 million tonnes (Mt) per year of crushed rock. This is approximately 60 percent of the market share for the Geelong region, 25 percent for the Werribee Region and 12 percent for the western and Port Melbourne region and 11 percent of the basalt aggregate for Victoria. These are significant contributions to market supply.

It is expected that the demand for basalt products in the wider region will continue to grow in the future, due to new large transport and infrastructure projects, as well as the general expansion of Werribee, Lara and Geelong. The proposed extension of the quarry is intended to enable it to continue to supply a significant proportion of basalt construction products to these local and regional markets, particularly given such material is usually sourced locally to minimise haulage costs. It would enable quarrying to continue for up to 50 years (based on present production rates). Given the quarry would continue to supply material to the broader regional and Melbourne markets, the absence of the extension would have a range of implications including altering the market responses and ultimately increasing the cost of building and road construction (for the region at least).

If the Stage 2 extension was not to proceed, between 1 to 1.4 Mt of market supply would required from other quarries further away. This would involve some expansion or possibly a new quarry to be developed. Economic implications of the proposal not proceeding could involve local and regional employment, through the loss of 36 jobs (onsite), and possibly downstream jobs (e.g. haulage). Annual expenditure at local suppliers would be lost as well (about $2 million). There is also potential for costs associated with basalt haulage and downstream construction increasing. As the Barro
Group quarry is highly accessible for transportation, the future haulage component of overall construction costs would remain comparatively low compared to quarries more distant from major development in this region.

The proponent's EES estimated the total cost of “rejecting the proposal” to be $52.8 million (at a discount rate of 5 percent)\(^3\), which is largely attributable to additional transport costs. At the Inquiry hearing both the proponent and DPI conceded that in the absence of the Stage 2 extension, the Melbourne and Geelong markets may need to rely on more distant resources in the future, although DPI suggested the exact cost implications are rather uncertain.

The economic impacts of implementing the proposed quarry extension are characterized in the EES as a significant contribution to the regional and state economy. EES Technical Appendix 16 included estimates of these economic contributions based on the year 2003/4: $5.93 million to the Victorian and regional gross product; $12.72 million of purchased inputs from 70 or more businesses; and $0.14 million in rates and government taxes.

Social Effects

The proposal is predicted to have low to moderate positive social impact for the local and wider region, associated with above mentioned employment and estimated annual expenditure of local suppliers\(^4\).

The proposed extension does not involve any other positive social impacts, as there would be no further employment or any extra demand on local community facilities or services relative to the current situation. Therefore the socio-economic impact of the extension on the local and regional community should be largely negligible.

There are large numbers of people visiting the general area (i.e. The Spit Nature Conservation Reserve and areas of the Western Treatment Plant). These are usually birdwatchers, environmental groups and education groups interested in Ramsar sites and the conservation values in the Point Wilson area. There may be some perceived social effect associated with the greater proximity of the quarry to the nature conservation area following its extension. The exact nature of such effects is very difficult to ascertain.

Conclusion

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

- The Project would involve the continued economic production of basalt resources, which is likely to provide a notable proportion of future market supply thus contributing positively to the regional and state economy.
- The Project is likely to have a positive social impact in the region through continuing existing employment and engagement of local suppliers, while other social impacts (positive and adverse) are likely to be negligible.

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\(^3\) EES Technical Appendix 16
\(^4\) EES Technical Appendix 15
3.3 Ecology, Flora and Fauna

**Evaluation Objective** - To avoid or minimise to the greatest extent practicable, adverse effects on native vegetation and biological diversity, including effects on native species and communities of flora and fauna protected under either the FFG Act or the EPBC Act.

**Statutory and Policy Context**

Key statutes, policies and strategies related to the protection of native vegetation and biodiversity in Victoria are the:

- *Planning and Environment Act 1987* (P&E Act), including the Victorian NVMF.

The purpose of the FFG Act is to enable and promote the conservation of Victoria's native flora and fauna. Its objectives include: “(c) to manage potentially threatening processes; and (e) to ensure that the genetic diversity of flora and fauna is maintained”. Further to this, Victoria's Biodiversity Strategy made under the FFG Act includes two related goals, i.e.:

- “the present diversity of species and ecological communities and their viability is maintained or improved across each bioregion”, and
- “there is no further preventable decline in the viability of any rare species or of any rare ecological community”.

One relevant objective of the EPBC Act is “to promote the conservation of biodiversity”, which closely aligns with objectives of sustainable development or ESD associated with protecting biological diversity and ecological integrity. These objectives also align with the purposes of the *Wildlife Act 1975*, which include the protection and conservation of wildlife and the prevention of taxa of wildlife from becoming extinct.

One of the objectives for planning in Victoria under Section 4(1) of the P&E Act is: “to provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity”. SPPF clause 15.09 “Conservation of native flora and fauna” complements this.

The Victorian NVMF is the principal document that sets out Victorian Government policy for the protection of native vegetation. Whilst a permit is not required to remove native vegetation for this Project under the Greater Geelong Planning Scheme, the principles and requirements of the NVMF are relevant and implemented through the EES and EID Act processes. The “net gain” approach set out in the NVMF adopts a hierarchy of avoidance, minimisation and offset principles. The first priority is the avoidance of clearing and therefore losses of existing native vegetation. The NVMF also includes specific guidance on when clearance should not be permitted for different classifications of Ecological Vegetation Classes (EVCs) - e.g. Very High Conservation Significance EVCs are not to be cleared unless exceptional circumstances exist and the Minister for Environment and Climate Change gives approval to do so.

In addition, the land’s zoning requires a Development Plan (DPO1) “to ensure that the area’s environmentally significant flora and fauna is protected and that all planning issues are fully addressed prior to the issue of a permit for the development of the land”.

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3 In May 2009 DPI released the *Native Vegetation Management Guidelines for the Earth Resources Industries*, which amongst other things clarifies the application of the NVMF through the EID Act and MRSD Act processes.
Key Issues
Given this statutory and policy context, the evaluation of potential effects on biodiversity and native vegetation needs to address the following issues:

- The potential loss of and effects on native vegetation communities and associated ecological impacts.
- The potential loss and impacts (direct and indirect) on protected (i.e. threatened and migratory) species and communities of flora and fauna (e.g. Orange-bellied Parrot).
- Legislative and policy requirements, including the avoidance, minimisation and off-setting of native vegetation clearance in accordance with the NVMF.

Native Vegetation
The Barro Group site comprises a combination of introduced vegetation (i.e. exotic grasses, particularly Toowomba Canary-grass and Wimmera Rye-grass and Soft Brome) and communities of four different EVCs: Coastal Saltmarsh, Plains Grassy Wetland, Plains Grassland, Aquatic Herbland. Some of these are native vegetation communities linked to Ramsar wetlands directly abutting the project site to the north-east. In addition, all four of these EVCs are endangered within the Victorian Volcanic Plain Bioregion.

As shown in Figure 3, 20 areas of native vegetation communities were detected across the study area (only some of which are proposed for clearing):

- Sites 1, 2, 6, 11, 12 and 13, which did not support a cover of native vegetation that satisfies the NVMF requirements to be defined as a ‘patch’ (i.e. 25% of the benchmark cover of understorey species);
- Sites 3 and 7, which have been confirmed by DSE as ‘degraded treeless vegetation’ (as was site 5);
- Sites 5, 8, 10 and 14, which are ‘patches’ outside of the proposed extraction area;
- Sites 4 and 16 to 20 which have been classified as of High Conservation Significance (HCS); and
- Sites 9 and 15 which have been classified as of Very High Conservation Significance (VHCS).
Figure 3. Areas of native vegetation (EVCs) within the project area. (Source: EES, page 8-9)

The proposed extension of the quarry includes the clearance of ten areas of native remnant vegetation communities: sites 3, 4, 7, 9, 15 and 16 to 20 (refer to Figure 3 and Table 3). This encompasses the removal of 1.87 habitat hectares\(^6\) (ha) of Plains Grassy Wetland classified as HCS, as well as some 3.84 ha of Plains Grassland that includes 3.42 ha classified as VHCS and 0.42 ha classified as HCS. The areas of Coastal Saltmarsh and Aquatic Herbland would be avoided.

\(^6\) Habitat hectares is “a site-based measure of quality and quantity of native vegetation that is assessed in the context of the relevant native vegetation type” (VNMF).
Table 3. Patches of EVCs within proposed expansion (i.e. to be cleared)  (source: EES pg 8-12)

<table>
<thead>
<tr>
<th>Site</th>
<th>EVC</th>
<th>Conservation Status</th>
<th>Conservation Significance</th>
<th>To be cleared (hectares)</th>
<th>To be cleared (hab. hectares)</th>
<th>Proposed EVC offsets (hab.hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Plains Grassland</td>
<td>Endangered</td>
<td>High</td>
<td>21.57</td>
<td>7.0</td>
<td>tbc</td>
</tr>
<tr>
<td>4</td>
<td>Plains Grassy Wetland</td>
<td>Endangered</td>
<td>High</td>
<td>6.8</td>
<td>1.87</td>
<td>2.81</td>
</tr>
<tr>
<td>7</td>
<td>Plains Grassland</td>
<td>Endangered</td>
<td>High</td>
<td>2.86</td>
<td>0.73</td>
<td>tbc</td>
</tr>
<tr>
<td>9</td>
<td>Plains Grassland</td>
<td>Endangered</td>
<td>Very High</td>
<td>1.26</td>
<td>0.53</td>
<td>1.06</td>
</tr>
<tr>
<td>15</td>
<td>Plains Grassland</td>
<td>Endangered</td>
<td>Very High</td>
<td>6.85</td>
<td>2.89</td>
<td>5.78</td>
</tr>
<tr>
<td>16</td>
<td>Plains Grassland</td>
<td>Endangered</td>
<td>High</td>
<td>0.385*</td>
<td>0.09*</td>
<td>0.14</td>
</tr>
<tr>
<td>17</td>
<td>Plains Grassland</td>
<td>Endangered</td>
<td>High</td>
<td>0.52</td>
<td>0.12</td>
<td>0.18</td>
</tr>
<tr>
<td>18</td>
<td>Plains Grassland</td>
<td>Endangered</td>
<td>High</td>
<td>0.2</td>
<td>0.05</td>
<td>0.08</td>
</tr>
<tr>
<td>19</td>
<td>Plains Grassland</td>
<td>Endangered</td>
<td>High</td>
<td>0.39</td>
<td>0.09</td>
<td>0.14</td>
</tr>
<tr>
<td>20</td>
<td>Plains Grassland</td>
<td>Endangered</td>
<td>High</td>
<td>0.29</td>
<td>0.07</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>16.695</strong></td>
<td><strong>5.71</strong></td>
<td><strong>10.28</strong></td>
</tr>
</tbody>
</table>

* 0.795 ha (0.19 hha) of site 16 could be retained, so only 0.385 hectares (0.09 hha) would need to be cleared.

* the totals do not include sites 3 and 7 – these EVC sites were subsequently assessed to be ‘degraded treeless vegetation’, so under the NVMF they are not considered to be patches that require off-sets.

The following is a summary of the proposed clearance of native vegetation communities within the proposed extraction area, based on the proponent’s EES and expert witness’ evidence to the Inquiry:

- Although sites 3 and 7 have been confirmed as “degraded treeless vegetation” and are therefore not formally included in the NVMF hha assessment, the proponent is still intending to offset the loss of these sites in consultation with DSE, but the proposed offsets were not specified during the EES or Inquiry process.
- Sites 4 and 16 to 20, which are classified as HCS, are within the proposed extraction area and would be difficult to avoid without a major reduction in the proposed extension, although some of these sites are closer to the edge of proposed clearing and could potentially be avoided (e.g. sites 15, 16 and 17). However, if any of these areas on the edge were to be retained they could become isolated remnants thus affecting their ability to survive in the long-term.
- Sites 9 and 15, which are classified as VHCS, require the approval of the Minister for Environment and Climate Change to be cleared, since clearing of VHCS areas is not permitted unless exceptional circumstances apply7 - i.e. impacts are an unavoidable part of a development project, with considerations based on environmental, social and economic values from a State-wide perspective.

The proposed extension of the quarry has incorporated some avoidance and minimisation of the native vegetation communities to be cleared within Barro Group land, primarily in relation to areas in close proximity to significant vegetation and habitat that exists adjacent to the site. This has included the designation of buffer zones adjacent to these areas off-site, given they are considered to be very significant and sensitive in ecological terms. For example, along the eastern and southern boundaries of the site significant areas of coastal saltmarsh exist, such as within The Spit Nature Conservation Reserve. Inclusion of a buffer within the proposal involves avoiding significant sites of native vegetation within the proponent’s land, in particular 37.34 ha of Coastal Saltmarsh EVC classified as VHCS (site 8) and a large remnant (18.77 ha) of Plains Grassland EVC classified as HCS but now deemed to be “degraded treeless vegetation” (site 5) by the proponent and DSE.

Based on the areas of EVCs proposed to be cleared for the quarry expansion (as outlined in Table 3), the EES identifies overall offset requirements under the NVMF to be 7.47 hha of Plains Grassland (including 6.84 hha of VHCS and 0.63 hha of HCS) and 2.81 hha of HCS Plains Grassy Wetland (see Table 3).

The EES proposes an offset of 6.84 hha for sites 9 and 15 by requesting an exemption from the normal offset requirements under the NVMF. This is based on offset requirements being via quarry rehabilitation works utilising a provision under the NVMF to grant an exemption for activities where there is a ‘temporary loss’ of native vegetation. In

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7 Table 6, Appendix 4 (page 54), Victoria’s Native Vegetation Management; A Framework for Action (DSE, 2002)
principle this temporary loss provision could allow revegetation (for quarry rehabilitation) to be regarded as an offset, including for VHCS native vegetation patches. However, as highlighted by the proponent’s expert evidence at the Inquiry, such revegetation of Plains Grassland is both unproven and a “high risk strategy” that may not deliver the required on-site off-sets. This view was supported by DSE and the Inquiry, which both concluded that the loss of vegetation due to extractive industry should not be treated as temporary “particularly where there is a high probability regeneration will not succeed, as is the case here”.

With the exemption for temporary loss being impractical and unacceptable for the proposed loss of VHCS Plains Grassland within Sites 9 and 15, the ‘like for like’ off-set requirement for these VHCS sites is unable to be satisfied within the proponent’s land. However, there was evidence from the proponent and DSE confirming the strong likelihood that off-site off-sets would be available for these EVCs if necessary. In addition, there is significant scope for off-sets through management gains on sites of remnant native vegetation around the perimeter of the project site.

The proponent proposed an alternative off-set of transferring site 8 (areas of VHCS dry Coastal Saltmarsh EVC) to Crown land that, which whilst not meeting the ‘like for like’ requirements would provide a substantial ecological and conservation gain. As an off-set it would equate to 11.8 hha of VHCS or 15.7 hha of HCS native vegetation. The Inquiry also recommended the inclusion of a buffer (100m along the edge of site 8) to provide for inland migration of the vegetation community, in light of predicted sea level rise, changes to groundwater levels and potential for edge effects. The Inquiry concluded that there is sufficiently strong justification in terms of significant conservation gains to justify a departure from the ‘like for like’ requirement for the proposal to transfer site 8 (with appropriate buffers) to the public estate as a suitable offset for the EVCs to be cleared.

DSE submitted that in general it would be feasible for the proponent to provide offsets consistent with the NVMF, although a specific offset plan with areas identified is yet to be prepared and would need to be incorporated in the approved works plan prior to removal of any vegetation. At the Inquiry DSE did not confirm whether the proposed use of site 8 as an off-set for the VHCS native vegetation to be cleared in sites 9 and 15 was likely to be acceptable.

The NVMF provides specific guidance on when clearance should not be permitted for different EVC classifications. HCS EVCs are generally not permitted to be cleared, although this can be considered under certain circumstances such as for economic developments of state or regional significance for which an EES has been undertaken. Clearance of VHCS EVCs is not permitted unless exceptional circumstances exist (i.e. they are unavoidable parts of a development) and the Minister for Environment and Climate Change gives approval based on environmental, social and economic factors from a State-wide perspective. DSE advised the Inquiry that the EES and proponent had not yet adequately demonstrated the exceptional circumstances that would justify the proposed clearance of the areas of VHCS native vegetation (sites 9 and 15), including why they could not be avoided. DSE noted that information on the consequences of losing access to these stone resources (associated with sites 9 and 15 respectively) for the overall viability of the project and regional market supplies would be needed, particularly given they are located on the perimeter of the proposed extension.

The proponent submitted to the Inquiry that the rock resource under these sites is of very high quality (for site 9) and high quality (for site 15), and would extend the quarry’s life by a year or more. In addition, it was highlighted that the rock’s more critical value “is in being able to be mixed with lower quality rock to provide product to required specifications” and therefore the proponent asserted that “access to the high quality rock on these sites is important to the economic viability of the quarry as a whole”.

As noted by the Inquiry, site 9 is on the periphery of the proposed extension and could be excluded from the extension without significant modifications to the overall extraction plan, although it would prevent $6 million worth (approximate current market value) of very high quality stone being extracted. The site is within area 2A of the upper basalt,

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8 Inquiry Report (page 39)
9 Table 6, Appendix 4 (page 54), Victoria’s Native Vegetation Management; A Framework for Action (DSE, 2002) and Native Vegetation Guide for assessment of referred planning permit applications (DSE, 2007).
10 Inquiry Report (page 32)
11 The proponent’s evidence to the Inquiry on the value of the rock under Sites 9 and 15 was: approximately 300,000 and 1.2 million tonnes respectively for sites 9 and 15, at current market rates of $20/tonne for site 9 (very high quality rock) and $15/tonne for site 15 (high quality rock). Therefore rock resources under sites 9 and 15 were estimated to be $6 million and $18 million respectively.
directly adjacent to the current quarry, and is scheduled for quarrying relatively soon, from 2015 to 2030 (see Figure 1 and Table 1 on page 2). The Inquiry considered the conservation benefits of retaining this small remnant to be rather limited, as it would be vulnerable to further deterioration given its location, size and current state. However, should an offset for this site be required to meet the NVMF requirements outlined above (i.e. based on Biosis' habitat assessment in 2003), it needs to be an overall net gain in conservation values having regard to the VHCS of this site. In light of the broader economic and environmental considerations and its location, the Inquiry recommended that the clearance of site 9 should be approved.

DSE advised the Inquiry that the proposed clearance of site 9 should probably be differentiated from the proposed clearance of site 15, due to the loss or removal of site 9's vegetation not being entirely attributable to the proposed extractive industry extension/activity. In light of this DSE also highlighted that this loss could not be proposed as a 'temporary loss', although this provision is very unlikely to apply anyway (as noted above).

Like site 9, site 15 is also Plains Grassland of VHCS on the periphery of the proposal quarry extension (area 2C) and would not be quarried for considerable time (i.e. until approximately 2045 to 2050) - refer to Figure 1 and Table 1. The Inquiry suggested that retention of this vegetation could occur without significant modifications to the overall extraction plan. However, it would see the loss of some high quality rock estimated by the proponent to be worth $18 million. The apparent importance of both sites 9 and 15 to the economic viability of the proposal was presented to the Inquiry, although whether site 15 is definitely an 'unavoidable' part of the development remains unclear. In particular, the significant delay in proposed extraction of basalt from this area on the very eastern edge of the extension raises uncertainties regarding both the actual value of this rock (in market terms) and its importance for mixing to meet certain product specifications. However, whether or not the estimated value of this basalt is largely speculative has only some bearing on its importance for the project, as the timeframe for its extraction strongly suggests this rock may not be a component of the resource vital to the project's overall viability in either the short or medium term.

The retention of site 15 could have conservation gains given it is adjacent to site 5 (also Plains Grassland EVC) which, although it is currently classified as 'detracted treeless vegetation', is not proposed for quarrying and could improve when surrounded by other native grassland. On the other hand, site 15 would also continue to be surrounded by grassland that has both native and introduced species, which could present ongoing weed management issues. The Inquiry's conclusion was that the retention of site 15 is definitely possible, but on balance it would reduce the rock resource and potentially provide only a "short term win for environmental protection". In order for site 15 to be cleared the Inquiry considered that off-sets should first be set in place, which is likely to require at least some off-site off-sets, which could make quarrying site 15 uneconomic.

Both the EES and Inquiry's analysis consider site 15 and the NVMF requirements in some detail, including in relation to the appropriate application of the NVMF. The Inquiry (consistent with DSE and DPI) noted that the NVMF is adopted Government policy that needs to be adhered to, especially in relation to any native vegetation of VHCS or HCS. Further to this, in May 2009 DPI released the Native Vegetation Management Guidelines for the Earth Resources Industries, which amongst other things confirms the relevance of the NVMF requirements, which is to be applied through the EID Act and MRSD Act approvals processes.

As this point, given the NVMF requirements, it is not evident that 'exceptional circumstances' apply with respect site 15 such as to justify clearing this VHCS native vegetation, particularly in view of its location and the proposed extraction timeframes.

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12 DSE's submission and EES Technical Appendix 5 (Biosis report) note the significant deterioration of site 9 between Biosis' first assessment in 2003 and their assessment in late 2006; quoting from the Biosis report (page 12): "The reassessment of Site 9 is also problematic. The site appears to have been subject to disturbance associated with both test drilling and weed control works. These activities, in association with current drought conditions appear to have had a significant negative impact on the native species present. In particular the use of herbicide associated with the weed control works appears to have been somewhat over-zealous with a considerable impact on non-target species. This has affected about half of Site 9."

13 Inquiry Report (page 39)

14 Inquiry Report (page 36)
Threatened Flora

The EES studies\textsuperscript{15} included field surveys over a number of seasons in 2002, 2004 and in late 2006, sufficient to assess the flora and ecological characteristics of the site. A total of 92 indigenous and 80 introduced vascular plant species (ferns, conifers, flowering plants) were recorded within the study area. Records from the Flora Information System (FIS) and Commonwealth’s EPBC Act Protected Matters Search Tool (i.e. database) were also used to identify species that may exist in the area.

Two species considered to be rare in Victoria (but not FFG-listed) were recorded, although not within the proposed extension area: Austral Cranesbill (\textit{Geranium solanderi var. solanderi}) and Marsh Saltbush (\textit{Atriplex paludosa}). One FFG-listed species (Brittle Greenhood (\textit{Pterostylis truncate})) may exist within the wider study area (i.e. within grasslands), but it was not recorded during any of the field surveys.

The EPBC Act database identifies the potential for five floral species protected under the Act to exist within grasslands in the wider region, though none of these have been recorded during the field surveys and are considered unlikely to exist within the proposed extraction area.

The proposed quarry extension is very unlikely to impact on flora species of state or national significance as none have been recorded or are likely to exist within the proposed area of extraction. In addition, most of the regionally significant species are also restricted to areas outside the proposed extension (e.g. Coastal Saltmarsh) and would therefore not be directly impacted by the project. Some species of regional significance will however be removed through the proposed extension - i.e. those within the grasslands and grassy wetland areas – such as the Ruby Saltbush, Small Spike-sedge, Fine-head Spear-grass and Drooping Cassinia.

Threatened Fauna

The EES field surveys conducted over a number of seasons were also sufficient to assess the fauna and habitats in the study area. This included surveys for terrestrial vertebrates mammals, birds, reptiles and amphibians. Specific species that were the subject of more targeted surveys were the Orange-bellied Parrot (\textit{Neophema Chrysogaster}), Striped Legless Lizard (\textit{Delma impar}) and the Growling Grass Frog (\textit{Litoria raniformis}). The surveys recorded a total of 104 terrestrial species, including 97 avifauna (9 introduced) five mammals (four introduced), one native reptile and one native frog. Records from the Atlas of Victorian Wildlife (AVW) and the EPBC Act database were also used to identify potentially relevant species.

The EES investigations\textsuperscript{15} identified six nationally threatened species (protected under the EPBC Act) that have been recorded within the site or a five kilometre radius of the proposed extension: Orange-bellied Parrot, Growling Grass Frog, Grey-headed Flying-fox (\textit{Pteropus poliocephalus}), Australian Painted Snipe (\textit{Rostratula australis}), Plains-wanderer (\textit{Pedionomus torquatus}) and Humpback Whale (\textit{Megaptera novaeangliae}). Of these, the Australian Painted Snipe and Plains-wanderer (and of course the Humpback Whale) are considered extremely unlikely to occur within the proposed extraction area, largely due to the lack of suitable habitat.

A further 19 threatened species of potential relevance were identified from the EPBC Act database, many of which were pelagic seabirds, freshwater fish and marine species that were not relevant to the assessment. The remaining species (Swift Parrot, Smoky Mouse, Regent Honeyeater, Spot-tailed Quoll, Southern Brown Bandicoot, Long-nosed Potoroo) were considered highly unlikely to exist on or near the site due to the absence of any significant habitat.

A Grey-headed Flying-fox was recorded entangled in a fence adjacent to the study area (Point Wilson Road), which suggests it may occasionally forage in the planted trees and shrubs (especially eucalypts) within the local area or perhaps on Barro Group land where there is some suitable habitat. However, as there no important habitat proposed to be cleared on the site there is not predicted to be an impact on this species due to the quarry extension.

Whilst the Striped Legless Lizard has not been recorded within five kilometres of site (based on the AVW) the EES included a targeted survey for the species (in February and March 2004), due to the potential for habitat to exist on the site. The survey did not detect the presence of the species and it was concluded that the grasslands on the site were not likely to be its optimal habitat.

\textsuperscript{15} EES Technical Appendix 6
The two nationally threatened (EPBC Act listed) species that were considered further through the EES’ investigations were the Orange-bellied Parrot and Growling Grass Frog - potential impacts on these species are addressed in further detail below.

The EES investigations identified thirty-seven relevant fauna species listed under the FFG Act, using the AVW and the EPBC Act database. In addition to those that are also EPBC Act listed species (noted above), six FFG listed species were recorded during the EES field investigations: White-bellied Sea-Eagle (Haliaeetus leucogaster), Great Egret (Ardea alba), Little Egret (Egretta garzetta), Brolga (Grus rubicunda), Fairy Tern (Sterna nereis), Caspian Tern (Sterna caspia).

Most of these six species were recorded within the adjacent coastal and saltmarsh habitats, where they are likely to forage in the shallows along the shoreline or within the coastal, estuarine or terrestrial wetlands, such as within The Spit Nature Conservation Reserve. The Fairy Tern has been recorded breeding within The Spit Nature Conservation Reserve. Most of these species have the potential to fly over the site on occasions, however the White-bellied Sea Eagle and Brolga are the only species likely to forage on or utilise Barro Group land, probably only occasionally, but there is no nesting or breeding habitat for these species within the proposed extraction area and therefore no direct impacts of any significance are predicted. The DSE submission highlighted that the recent return of the Brolga to breed in the Dry Saltmarsh is after an absence of approximately 40 years. Indirect effects are addressed within the discussion on Orange-bellied Parrot within the following pages.

**Growling Grass Frog**

The Growling Grass Frog is listed as vulnerable under the EPBC Act and known to occur in the general area. However, the proposed quarry extension does not provide suitable habitat for the Growling Grass Frog and the ecological surveys did not detect this species within the Stage 2 extraction area. A large population of Growling Grass Frogs occur in the Melbourne Water treatment lagoons, as close as 200 m from the northern boundary of the EES study area. In addition, Ecology Australia (1994) recorded the species in a dam near the boundary of the Barro Group property. However, the EES survey in March 2005 did not find any of the species at this location.

The EES concludes that there will be no direct impact on this species. Further to this, the proposed rehabilitation of the site includes wetlands that would potentially provide habitat for the species. Colonisation of newly created habitats by the Growling Grass Frog is quite likely, given the current conditions of the surrounding areas and the substantial population nearby.

**Orange-bellied Parrot**

The Orange-bellied Parrot (OBP) is listed as critically endangered under the EPBC Act, now surviving only as a small, single population that breeds in southwest Tasmania and migrates for winter across Bass Strait to coastal areas in Victoria and south-eastern South Australia. Following its winter migration around April each year, the OBP forages in coastal or near-coastal areas, with its preferred feeding habitat being natural saltmarshes dominated by Beaded Glasswort or Shrubby Glasswort (as well as nearby grassy or weedy pastures). Up to 70 percent of the entire known population of the OBP is believed to utilise three sites around Port Phillip Bay and the Bellarine Peninsula, including The Spit Nature Conservation Reserve which is directly adjacent to the proposed extraction area. In addition, monitoring since 1978 suggests that the OBP tends to use this Reserve more in recent years than other areas within Point Wilson.

Both the OBP Action Statement (no. 43) under the FFG Act and the OBP National Recovery Plan (2006) identify a key threat to the survival of the species to be the loss and alteration of the species' winter habitat - in particular impacts on saltmarsh feeding grounds by development (industrial, urban and agricultural). As highlighted in the EES, the OBP National Recovery Plan (2006) identifies the saltmarshes on the eastern fringe of the EES study area to be habitat critical to the survival of the species (i.e. The Spit Nature Conservation Reserve).

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16 EES Technical Appendix 6 (page 45)
17 EES Technical Appendix 6
18 National Recovery Plan for the Orange-bellied Parrot (Orange-bellied Parrot Recovery Team, 2006) (pg 3)
The proposed extension of the quarry does not entail clearing any OBP habitat (i.e. saltmarsh). However, the project has the potential to indirectly impact on this important saltmarsh habitat (both in The Spit Nature Conservation Reserve and the adjacent saltmarsh within Barro Group land), largely due to the proposed extraction of deeper rock that requires dewatering and therefore changes to the local hydrogeology. These saltmarsh areas are dependent on a relatively complex regime of surface water and groundwater hydrology and therefore the proposed extension has the potential to significantly affect this area's ecology.

The saltmarsh areas (and species dependent on them like the OBP), have quite narrow tolerances to changes in the soil's moisture content and chemistry, which is largely influenced by the local hydrology (surface water and groundwater). Minor changes to these physical and environmental parameters can significantly alter the growth form and composition of the wetland's key species like Beaded Glasswort and Shrubby Glasswort. Indeed any change to the local hydrology has the potential to significantly impact this habitat's flora and ecology, and therefore fauna like the OBP that rely upon it for feeding. The potential changes to groundwater and local hydrology as well as the associated environmental risks and impact predictions for the ecology of the saltmarsh wetland habitat are addressed in detail the following section (3.4 Hydrology and Aquatic Environments).

Other potential impacts on the OBP include indirect off-site disturbance due to activities associated with the quarry. The EES' assessment of these indirect impacts on fauna, in particular the OBP, was undertaken in the context of the existing levels of disturbance from the current quarry activities (and the other activities in the broader locality such as the armaments complex at Point Wilson and Avalon Airport). The proposed extension does not entail any changes to traffic volumes or routes, or the processing of quarried rock which will continue to occur near the south of the current quarry. Therefore the indirect impacts on the adjacent saltmarsh wetland habitats are likely to stem from noise, visual disturbances and dust, as well as vibration from quarry operations (i.e. blasting).

The current blasting regime is not expected to change as part of the proposed extension, although the distance between the blasting and the Dry Saltmarsh (and The Spit Nature Conservation Reserve) will be considerably less in the later stages of the project. For the first 30 years the blasting will not be within 500 m of the dry saltmarsh habitat. Blasting is also not expected to be within 100 m of the southern coastal area during the first 10 years of the Stage 2 extension. The EES (Technical Appendix 6) assessed the responses of avifauna to blasting to be varied. Most birds at a given monitoring site did not noticeably respond to quarry blasting, apart from on two days when all birds in the Wet Saltmarsh altered their behaviour. The conclusion of the EES investigation was that blasting (even as the quarry expands) would have little impact on the behaviour of birds in nearby habitats. This is essentially due to the infrequency and short duration of these vibrations and the existing activities in surroundings areas, which includes quarry blasting as well as aircrafts regularly using Avalon Airport just to the north west of the site.

The Inquiry’s conclusion was slightly more conservative, specifically in relation to blasting within 300 m of the extraction limit. This was based on the EES’ noise assessment (Technical Appendix 8), which predicted the vibration level at 280m from the extraction limit to be 2 mm/second - this complies with the ANZECC criterion and is barely perceptible to humans. The Inquiry proposed that monitoring should occur as the quarry approaches the sensitive saltmarsh (Ramsar) areas, in order for the responses of avifauna to blasting to be better assessed and consequently a controlled regime of blasting to be adopted within 300 m of the extraction limit.

The proponent's evidence and reports did consider the sensitivity of avifauna to any indirect disturbance to be very much related to the visibility of the source of disturbance. Therefore, screening the view of the quarry activities from the adjacent habitats will be important for minimising the indirect disturbance impacts on the OBP and other significant avifauna utilising these significant areas. The Inquiry endorsed the proposed bunding and screen planting at the proposed extraction limit, suggesting that bunds and screening vegetation should be established within approximately two years of approval and during a period when sensitive migratory birds do not frequent the area.

The EES predicts the impact from artificial lighting to be minimal for sensitive fauna (including the OBP), as the location of the processing plant will remain 1.5 km and 600 m respectively from The Spit Nature Conservation Reserve and the Ramsar wetland to the south. No additional artificial lighting is likely after sunset within the extended section of the quarry except for occasional vehicle headlights. The EES proposes that mitigation will include ensuring that stationary light sources "are not visible from important off-site habitats or coastal areas, to minimise impacts on the behaviour of significant bird populations". A further recommendation within EES Technical Appendix 6 that was not adopted in the

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19 EES Main Report (page 8-43)
EES was “that quarry activities that might involve vehicle or machinery lights should not be undertaken during the hours of darkness within 500 m of the Ramsar sites to the south and north-east of the proposed quarry expansion”, which was endorsed by the Inquiry.

The EES modelled the impacts from dust largely in the context of levels required to protect human health. However, the EES ecological assessment (Technical Appendix 6) considered the possible impacts of dust on ecologically sensitive areas, primarily the saltmarsh habitat of the OPB. The primary source of dust is the processing plant, which will remain some distance from these areas, whereas dust from within the proposed quarry extension will be generated much closer to these areas during the last 15 years of the proposed expansion. While there is some potential for the OPB habitat to experience dust deposition, the current dust management regime within the quarry is likely to be sufficient to control impacts to an acceptable level. Further, the establishment of the bunding, screening vegetation and a buffer zone between the quarry and the sensitive habitat will assist in the prevention of adverse impacts from dust on the sensitive ecological communities and avifauna. Notwithstanding this, given the significance of the saltmarsh habitat for the critically endangered OBP, the EES adopts the recommendation within Technical Appendix 6 (page 43) “to curtail operations that cause high levels of air-borne dust during periods when strong wind might blow dust toward those areas”. The Inquiry was satisfied that the proponent and EES had adequately addressed the potential for adverse impacts on the OPB habitat due to dust.

As alluded to above, the proponent has also proposed to mitigate the potential residual impacts from noise, dust and visual disturbance by including a buffer zone along the eastern edge of the quarry extension, which also contributes to the medium to long-term conservation of these habitats (including in the Spit Nature Conservation Reserve) by providing for the inland movement of these coastal ecosystems due to the predicted rise in sea levels induced by climate change. Therefore in light of the EES predictions and proposed mitigation these indirect effects on the OBP and other avifauna in the adjacent saltmarsh habitat are likely to be minor.

Migratory and Marine Species

The EES studies concluded that no habitat for shorebirds or listed migratory or marine species exists within the proposed extension area, and as such direct impacts on these species are considered unlikely. However, the project site is largely surrounded by significant wetlands, particularly to the south and the northeast, including The Spit Nature Conservation Reserve. All of these wetland areas are included within the Port Phillip Bay (Western Shoreline) and Bellarine Ramsar site and are therefore wetlands of International Importance protected under the Ramsar Convention (1971). These areas provide important foraging and roosting habitats for many shorebirds and waders, including international migratory species.

A significant array of migratory and marine bird species continue to utilise the wetland areas adjacent to and within the proposed quarry boundary, as well as in close proximity to a variety of other potential causes of disturbance such as the Avalon Airport. As discussed above, the proposed quarry expansion will not entail any significant additional disturbances. As already outlined, the various potential causes of additional disturbance are likely to be minimal and readily mitigated. Indeed the EES predicts that providing mitigation measures are implemented, the quarry extension would not result in any significant detrimental effects on shorebirds or any listed migratory or marine species. The Inquiry was also satisfied that the potential offsite effects on Ramsar wetlands and related avifauna were minimal, subject to recommended mitigation being employed.

While there is negligible potential for the migratory and marine species to be affected by indirect impacts such as from noise and visual disturbances, there is the potential for the proposed Stage 2 extension to compromise the integrity of adjacent wetlands directly to the north-east due to the proposed dewatering for the extraction of deeper rock. These potential changes to local hydrogeology and associated indirect environmental impacts for the adjacent wetland habitats are addressed in detail within section 3.4 (Hydrology and Aquatic Environments).

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20 EES Technical Appendix 6 (page 43)
Conclusions

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

- The proposed quarry extension has incorporated both some avoidance and minimisation of the native vegetation to be cleared, including incorporation of important buffer zones between the quarry and the significant habitats surrounding the site.

- However, the proposed extension does involve clearing almost 17 ha (5.71 hha) of both VHCS and HCS EVCs, specifically endangered Plains Grassland and Plains Grassy Wetland.

- The proposed extension is not likely to have any effect on any floral species or communities listed under either the FFG Act or EPBC Act, as none were recorded or are likely to exist within the proposed extraction limits.

- There is unlikely to be any direct impacts or any significant indirect impacts on any threatened faunal species or communities or migratory species listed under either the FFG Act or EPBC Act, apart from the likely alteration of the local hydrology associated with the saltmarsh wetlands (including OBP habitat) north-east of the proposed extension (these indirect effects are addressed in detail within section 3.4 of this Assessment).

Further, it is my assessment that:

- The clearing of native vegetation be further minimised where possible in accordance with the NVMF, in particular further consideration of sites 9 and 15 should occur in consultation with DSE before approval of the Work Plan.

- The Minister for Environment and Climate Change consider the appropriateness of allowing the permanent clearance of site 9 (under the NVMF7), in light of: (a) the need for action to address losses of VHCS native vegetation at site 9 from recent site activities12 (possibly including restoration and/or off-setting at either site 9 or at an alternative site); and (b) the economic justification for extracting the resource at this site in the overall project context.

- The Minister for Environment and Climate Change consider the appropriateness of currently allowing the permanent clearance of site 15 (under the NVMF7), in light of: (a) its location on the perimeter of the site; (b) the economic justification for this site in the overall project context; and (c) the significant delay (35 to 40 years) in the scheduled extraction of the resource at this site.

- The Minister for Environment and Climate Change consider the acceptability of the transfer of site 8 (VHCS Coastal Saltmarsh EVC) to a crown land reserve as an offset for the approved clearance of any conservation significant EVCs, given it requires a departure from the ‘like-for-like’ requirements for the loss of VHCS EVCs.

- The proposed loss of vegetation due to this extractive industry project should not be treated as ‘temporary’ given the high probability that the on-site regeneration of the Plains Grassland will not succeed.

- Protocols for monitoring avifauna responses to blasting within 500 metres of the extraction limit near the sensitive saltmarsh (Ramsar) areas to the north-east, are to be endorsed by DSE and implemented through the Work Plan, such that an appropriately controlled regime of blasting can be adopted in these areas.

- The Work Plan provides for the proposed bunding and screen planting at the proposed extraction limit be established as soon as practicable following approval, but during a period when sensitive migratory birds do not frequent the area.

- The Work Plan ensure that: (a) stationary light sources not be visible from important habitats and coastal areas off the site, such that impacts on the behaviour of significant bird populations are minimised; and (b) quarry activities involving vehicle or machinery lights not be undertaken during the hours of darkness within 500 m of the Ramsar sites.

- The Work Plan ensure that quarry activities that cause higher levels of air-borne dust be curtailed when strong winds that might blow dust towards sensitive Ramsar habitats are predicted.
3.4 Hydrology and Aquatic Environments

**Evaluation Objective** - To avoid or minimise to the greatest extent practicable, adverse effects on surface water, groundwater and related aquatic environments, including on their environmental values and protected beneficial uses.

**Statutory and Policy Context**

The primary statutory and policy context for the protection and management of water resources and associated aquatic environments is set out in the following:

- **Water Act 1989.**
- **EPBC Act** (in relation to Ramsar wetlands).
- **Crown Land (Reserves) Act 1978.**

EPBC Act approval is required for this project (action), partly due to the potential for significant impact on the ecological character of declared Ramsar wetlands. The *Matters of National Environmental Significance: Significant Impact Guidelines*\(^{21}\) define ‘ecological character’ to be “the combination of the ecosystem components, processes and benefits/services that characterise the wetland at a given point in time... the time of designation for the Ramsar List”. Further to this, The Spit Nature Conservation Reserve (within the Ramsar site) is protected under the **Crown Land (Reserves) Act 1978**; it was set aside to conserve the habitat of important indigenous species and communities of flora and fauna, which are in turn also protected under the **Wildlife Act 1975** and the **FFG Act**. Section 21(2) of the **Wildlife Act 1975** requires approval for any works (on-site or off-site) that have the potential to interfere with the flow of water into, out of or within a State Wildlife Reserve.

SEPPs made under the EP Act provide for the maintenance of environmental quality in water environments (surface and groundwater), sufficient to protect existing and anticipated beneficial uses. Both the SEPP (Groundwaters of Victoria) and the SEPP (Waters of Victoria) are relevant to the assessment of impacts for this project. The EES identified the local and regional groundwater to be within segments C and D of the SEPP (Groundwaters of Victoria), as the TDS ranges from 3,500 mg/L to 13,000 mg/L. Consequently, the protected beneficial uses of groundwater at the site are: maintenance of aquatic ecosystems and associated wildlife, primary contact recreation, stock watering, industrial water use; and buildings and structures. The relevant coastal surface water environments and beneficial uses protected under Schedule F6 (Waters of Port Phillip Bay) are those for the Inshore Segment.

The relevant factors under the **Water Act 1989** that guide the allocation and use of water resources (in this case groundwater) include: existing water availability, the requirements of existing and competing users, government policies, and the protection of the environment. Indeed the Act’s primary purposes include ensuring that water resources are conserved and sustainably used and that values of surface water environments are protected and enhanced.

**Key Issues**

The key issues for the Project that need to be considered in the context of this applicable policy and legislation are:

- The proposed dewatering (drawdown of the groundwater) to enable extraction of deeper rock, which could change the local hydrogeology and potentially compromise the integrity of adjacent environments.
- Surface water diversion, particularly from the saltmarsh areas due to the quarrying and lowering of the land surface. During and after quarrying all surface water and shallow groundwater from this project area is proposed to be diverted to a collection system and discharged via pumps to Corio Bay in the south.
- The potential impact (from changes to surface and groundwater) on the aquatic ecosystems of the saltmarsh wetlands adjacent to the proposed extension, especially the potential indirect impacts on the Dry Saltmarsh habitat directly adjacent to the Stage 2 extraction area that is of international conservation significance, largely

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\(^{21}\) Australian Government (Department of the Environment and Heritage), May 2006.
due to it providing vital habitat and feed stocks for protected bird species, including EPBC Act and Victorian endangered and threatened species, such as the critically endangered OBP.

- The potential impacts of groundwater extraction for mine dewatering on the quality and quantity of groundwater both near the site and regionally, including the potential impacts on beneficial uses of other receiving surface water environments or other current water users.

**Surface Water**

The proposed quarry extension will reduce the quantity of diffuse\(^{22}\) surface water that runs off the land into Corio Bay (by reducing the catchment), as well as possibly alter the quality (and to some extent the quantity) of the treated wastewater discharged to Corio Bay from the EPA licensed outfall. In its fully expanded state, the quarry is predicted to reduce the diffuse surface runoff from this project area into Corio Bay by up to 60 percent\(^{23}\), largely due to the quarry removing an entire sub-catchment.

Currently, treated water is pumped from a sump that collects surface and groundwater in the quarry via an EPA licensed discharge point into Corio Bay (Port Phillip Bay), located on the shore south of the existing quarry. The proposed extension of the quarry is not predicted to require any additional water discharges from the water diversion and collection system. Therefore the EES predicts that the current discharge will continue without the need to modify the existing EPA Licence specifications.

Both the predicted reduction in diffuse runoff discharging into Corio Bay and the licensed discharge of water from the Barro site are unlikely to have any adverse impact on the beneficial uses of the receiving marine and estuarine environments. The EES highlights that the water discharged under the EPA licence will continue to be the same or very similar, particularly in relation to water quality. The Inquiry concluded that by continuing to meet EPA Licence requirements that were set to prevent impacts on Corio’s Bay’s beneficial uses, no impacts are considered likely for the Ramsar Site along this shoreline of the Bay.

Of more significance is the potential change to the surface water flow (runoff) into the saltmarsh wetland directly to the north-east of the extended quarry, which would result from a 50 percent reduction in the catchment area due to quarrying and the diversion works around the perimeter. The EES predicts\(^{24}\) that the quarry will divert approximately 50 percent of the current surface water flow away from the Dry Saltmarsh\(^{25}\) - this runoff would be permanently diverted into the quarry’s drainage system that ultimately discharges into Corio Bay. The majority of the saltmarsh wetlands’ four sub-catchments are proposed to be quarried. However, the hydrology and inflows to the Dry Saltmarsh come from three sources: The Spit Lagoon tidal inundation, groundwater and surface water flow. Therefore, the consequences of reducing the catchment area and surface flows into the saltmarsh wetlands need to be considered in the context of the overall impacts and changes predicted for the local hydrology (including the hydrogeology), including the other two sources of water for these important aquatic environments - this is addressed below under ‘Aquatic Environments (Saltmarsh Wetlands)’.

**Groundwater**

Dewatering (extraction of groundwater by pumping) will be required for the extraction of lower (deeper) basalt pockets (refer to Figure 1 on page 3). Dry working conditions are required for this quarrying below the watertable. This would reduce the watertable levels in the area, including beneath the saltmarsh wetlands to the north-east. No dewatering is expected to be required for the quarrying of the upper basalt layer, except in the north-east corner of the site, although the watertable is typically 1 m or less from the upper layer of basalt during summer months. The watertable aquifer as well as the underlying aquifer discharge to the south-east, into Corio Bay.

Past and current licensed quarry dewatering has produced the current ‘cone of depression’ and reduced watertable levels under the quarry and the surrounding land. Since the 1970’s this dewatering has reduced groundwater flow in the southern half of the site and lowered groundwater levels by more than 3 m around the current extent of the quarry.

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\(^{22}\) Diffuse surface water is sheet flow or overland runoff that is not confined to channel and/or specific discharge point.

\(^{23}\) i.e. for a storm event with an Average Recurrence Interval (ARI) of 1 in 100 years (source: EES, Table 7.7, pg 7-20)

\(^{24}\) EES Technical Appendix 1 (page 79)

\(^{25}\) i.e. for a storm event with an ARI of 1 in 100 years the volume of water flowing into the Dry Saltmarsh would be reduced by approximately 118 ML (following the Stage 2 extension), which is 50% of the runoff predicted under a ‘no project’ scenario.
On the other hand, in the north-east section of the Barro land near The Spit Nature Conservation Reserve, the watertable has dropped much less and was close to pre-quarrying levels until recent dewatering reduced the watertable by approximately 1 m. Overall the historical groundwater data suggests that the watertable levels around the quarry have stabilised since 2002, despite recent dewatering.26

According to the EES the proposed extraction of deeper basalt (and dewatering) would occur sequentially on a ‘campaign’ basis (refer to Figure 1). Therefore no more than one deeper extraction area would be quarried at a particular time (refer to Table 1 on page 2) with each requiring dewatering over a 1 to 2 year period. The intention of this ‘campaign’ approach is to alternate between periods of dewatering (and deeper extraction) and no dewatering, to enable the watertable to recover between the extraction of each deeper area. Stock piles of deeper basalt rock would be established to enable the quarry to produce the required product range. The proponent expects current dewatering practices to continue as part of the Stage 2 extension, including a maximum daily extraction of 1.5 ML and an annual extraction of no more than 234 ML - these amounts are specified in the existing Groundwater Extraction Licence (No. 4002210).

The EES26 included numerical groundwater modelling to estimate the extent of watertable drawdown from dewatering deeper extraction areas, particularly for the northern (2B1) and eastern (2B2) areas. There was no modelling undertaken to assess the impacts on groundwater flow and watertable levels for the upper basalt extraction, as this is likely to require negligible dewatering. Modelling results for 12 months of continuous dewatering at each of the deeper areas show there will be a very local ‘cone of depression’ as well as a broader drawdown of the watertable in all directions extending beyond the proposed limits of the expanded quarry: i.e. probably as far as the eastern edge of the Dry Saltmarsh within The Spit Nature Conservation Reserve northeast of the quarry; and as far as the Corio Bay coast directly south of the quarry. The EES modelling predicts that watertable levels are likely to rebound generally within 12 months of the cessation of dewatering.

For the southern and western deep extraction areas (2A1south, 2A1west, 2A2 and 2A3) within or close to the existing quarry, the watertable is predicted to reduce to similar levels to that resulting from previous dewatering dating back to the 1970’s. This is unlikely to have any significant additional effects in terms of reducing groundwater flow across the southern half of the area or reducing discharges into Corio Bay, and is not expected to be significant for the groundwater and receiving environments in this area. However, the dewatering of 2A1 (i.e. west and south simultaneously) is predicted to reduce the watertable under the Dry Saltmarsh by between 1 and 2 m.

Dewatering of 2B1 and 2B2 is also predicted to significantly reduce the watertable under the Dry Saltmarsh, by approximately 1 - 3 m depending upon both the season and the proximity of the area being quarried. The EES also concludes that “some groundwater movement away from the Dry Saltmarsh is likely to occur during each dewatering period27”, with the worst occurring at the conclusion of the dewatering of 2B1.

Within the EES and at the Inquiry hearing the proponent highlighted their ‘campaign’ approach to minimising watertable drawdown as a key mitigation measure. It was suggested that this would minimise the reduction of groundwater flow to the Dry Saltmarsh. In addition, the EES suggested an ‘adaptive management’ approach could be adopted to address groundwater flows near the Dry Saltmarsh, either using tile drains or bores to inject water into the watertable near the perimeter of the wetland.

A peer review of the EES hydrology reports was undertaken for the proponent28. This generally endorsed the analysis within the EES, although it did highlight that the drawdown beneath the Dry Saltmarsh due to dewatering would not recover fully in the interim periods when deeper extraction and dewatering are to cease, referring in particular to the widespread watertable reduction stemming from the shallow quarrying conducted at the site since the 1970’s. It concluded that similar hydrogeological conditions (i.e. widespread and prolonged reduction in the watertable) would result from the proposed extension due to the inclusion of both shallow and deeper extraction in the project.

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26 EES Technical Appendices 1 and 3
27 EES Technical Appendix 3 (page 3)
28 Peer Review of Hydrogeological Aspects of the Environmental Effects Statement (Lane Piper, 2008)
In addition to this, the Inquiry made specific mention of the uncertainty regarding the groundwater model predictions, partly due to the simplifying nature of the model\textsuperscript{29}, which was due to a number of factors including it being unable to take into account the specific hydrogeology of the saltmarsh wetlands.

Under SEPP, one of the protected beneficial uses of the watertable aquifer proposed to be dewatered is “the maintenance of aquatic ecosystems and associated wildlife”. The Water Act 1989 also requires water resources to be conserved and sustainably used such that that values of surface water environments are protected. The consequences for the aquatic ecology of surface water environments (in particular for the saltmarsh wetlands) - likely to result from the predicted changes to the groundwater hydrology - are addressed below, including the suitability and reliability of ‘adaptive management’ approaches to addressing the consequences of water diversion from the Dry Saltmarsh habitat.

**Aquatic Environments - The Spit Nature Conservation Reserve, Saltmarsh Wetlands**

Located adjacent to the proposed extension is The Spit Nature Conservation Reserve. This protected reserve is an important site containing habitats for a number of significant state, national and internationally protected species, including migratory birds and the critically endangered OBP. The Reserve comprises a northern and southern spit, a large sea lagoon, and the saltmarsh wetlands. It forms part of the larger Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site. Within the Reserve is an extensive area of saltmarsh habitat which continues into the Barro Group freehold land (i.e. 27.5 ha of site 8 in the north-eastern corner - refer to Figure 3), all of which has been clearly identified as important winter habitat for the OBP. At times this general area has supported up to half of the known population of the OBP\textsuperscript{30}.

These saltmarsh habitats (both within and adjacent to the Reserve) are the key aquatic environments potentially affected by the proposed quarry extension. They contain two distinct areas: the Wet Saltmarsh wetland east of 29 Mile Road and the Dry Saltmarsh wetland west of 29 Mile Road. Tidal movement into the Dry Saltmarsh is restricted by the 29 Mile Road roadway and associated culverts (see below).

The Dry Saltmarsh (both on Barro Group land and within the Reserve) is the most environmentally sensitive of the two wetlands, particularly as it includes vegetation communities with quite narrow tolerances to change (in relation to soil moisture and chemistry). As noted in section 3.3, minor changes to physical and environmental parameters, especially the local hydrology, could significantly alter the growth form and relative dominance of key species like Beaded Glasswort and Shrubby Glasswort, which are important winter food sources for the OBP.

**Hydrology of the Saltmarsh Wetlands**

Groundwater discharges into the Dry Saltmarsh – indeed this wetland could be a groundwater sink\textsuperscript{31}. There is also surface flow or runoff into this wetland (see Surface Water section above) as well as direct rainfall. There are also tidal flows, through the culverts under the 29 Mile Road. Since the year 2000, Parks Victoria have been using drop boards placed across three of the five culverts to slow the recession of tidal inundation from the Dry Saltmarsh - this implements recommendations within management plans for these wetlands\textsuperscript{32}. As highlighted in the EES\textsuperscript{33}, the hydrology of this wetland is both variable and complex, including recent changes associated with drought conditions.

The Wet Saltmarsh wetland (east of 29 Mile Road) is quite different - by far the dominant water source is daily inundation by tides and therefore the wetland’s salinity is very similar to seawater. A 1982\textsuperscript{34} study concluded that there is groundwater flow into the wetland, largely at low tide. Notwithstanding this, both the EES and the Inquiry concluded that due to tides being the driving influence on water levels, salinity and hydrology within the wetland, the impacts of

\textsuperscript{29} Inquiry Report (pages 52-53)
\textsuperscript{30} Ecology of the Orange-bellied Parrots at their main remnant wintering site (Loyn, Lane, Chandler & Carr, *The Emu* 1986)
\textsuperscript{31} Groundwater sink is a depression in the local groundwater regime causing the local groundwater flow to be towards the depression.
\textsuperscript{32} Conservation Management Action Plan for The Spit Nature Conservation Reserve & Western Treatment Plant (NRE, MWC, 2000) and Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site Strategic Management Pan (DSE, 2003).
\textsuperscript{33} EES Main Report (page 9-4)
\textsuperscript{34} The hydrology of The Spit, Point Wilson (Kinhill, 1982)
dewatering and diverting surface water associated with the quarry extension are not likely to have any significant effect on this aquatic environment\textsuperscript{35}.

For the Dry Saltmarsh however, the significance of inflows and outflows can vary, with the tidal inflows generally being limited to below 0.4 m AHD. Apart from the tidal flows, there are lateral inflows around the western perimeter through the fine sandy loam soils, seasonal/infrequent surface runoff, as well as regular inflows from the watertable. The groundwater inflows generally become more significant during low tides and over the summer months (they increase with recharge of the aquifer), although quarry dewatering has influenced this in the past. Estimates of groundwater inflows have ranged from 110 ML per year (Kinhill, 1982\textsuperscript{34}) to 49 ML per year (EES modelling by Hyder\textsuperscript{26}). The EES estimates surface flows to be approximately 230 ML per year. There is also some past evidence of subsurface inflows of nutrient rich water from the Melbourne Water Corporation (MWC) treatment lagoons, directly to the north, although these are no longer active components of the wastewater treatment system.

**Soil Moisture and Salinity**

The EES noted the work of Lee and Burgman\textsuperscript{36} (1997), which found no clear correlation between the salinity of any subsurface water (groundwater and perched surface water) and that of the soil in the Dry Saltmarsh. Some sampling undertaken during the EES studies\textsuperscript{37} suggested that soil salinity and moisture levels in this wetland are likely to be controlled by capillary action (i.e. associated with evapotranspiration) when groundwater moves upward through the heavy clay soils. The EES also concluded that due to this significant capillary action, the watertable aquifer under this wetland seems to be relatively isolated from the surface soils. So for the area between 0.4 and 0.7 m AHD the soil moisture and salinity is likely to be driven by this capillary action, as well as the other hydrological influences such as surface water runoff and evaporation.

The EES makes it clear that for the area within the Dry Saltmarsh below 0.4 m AHD tidal inflows are governing the soil moisture and salinity levels, as the tidal flows are better retained in this area closer to the drop boards placed across three of the five culverts.

**Potential Impacts**

The EES predicts that during dewatering the watertable beneath the dry saltmarsh would be drawn away to the west and south (see ‘Groundwater’ section above)\textsuperscript{27}, to possibly be replaced by some subsurface flows from the MWC lagoons induced by the altered hydraulic gradient. Modelling of this drawdown predicts a 1 to 3 m reduction in the watertable levels beneath the Dry Saltmarsh (which can increase depending on the season). According to the proponent’s Peer Reviewer\textsuperscript{28} the watertable is not likely to recover fully in the interim periods when deeper extraction ceases. The EES predicts this will cause the capillary rise (upflow) of groundwater to the Dry Saltmarsh to be reduced or eliminated at times, but does not consider the likely impacts on the soils to be significant given the relative isolation from the watertable and the other factors that soil moisture is dependent upon\textsuperscript{38}.

The Inquiry took the view that the modelling uncertainties together with the significant delay to dewatering of the areas closer to the saltmarsh wetlands (2035 and 2045 for 2B1 and 2B2 respectively) prevent a reliable assessment of the likelihood of effects on the hydrogeology and this aquatic environment\textsuperscript{39}. However, at the same time they considered that while impacts on the saltmarsh vegetation are possible they are unlikely.

Conversely, both the EES and DSE’s submission noted the likelihood of changes to the local hydrology and hydrogeology, which has potential to induce stress and mortality in the Dry Saltmarsh vegetation, with DSE suggesting that these impacts would be compounded by the long-term reduction in runoff (due to the extension) as well as climate change\textsuperscript{40}. The predicted reduction of 50 percent of the current surface water catchment of the Dry Saltmarsh would permanently divert seasonal runoff into the quarry’s drainage system, which during the periods of dewatering could combine with the reduced capillary-based groundwater inflow to generate reduced soil moisture and changes to soil salinity.

\textsuperscript{35} Inquiry Report (page 45)
\textsuperscript{36} The ecology of winter food resources for the Orange-bellied Parrot in Victorian coastal saltmarshes (prepared for NRE, 1997)
\textsuperscript{37} EES Technical Appendix 4 (pages 11 to 17)
\textsuperscript{38} EES Main Report (page 9-6)
\textsuperscript{39} Inquiry Report (page 53)
\textsuperscript{40} DSE written submission (page 3 to 4)
It is apparent that there are complexities and uncertainties regarding both: i) the likely impacts on the Dry Saltmarsh’s hydrology (and their interaction); and ii) their consequences for the soil moisture and salinity levels, particularly for the areas between 0.4 and 0.7 m AHD. Therefore the significance of potentially altering the hydrological regime needs to be considered in terms of the possible effects on the saltmarsh ecology and vegetation that is dependent upon the soil salinity and moisture, which as acknowledged in the EES are in themselves complex\textsuperscript{41}.

**Dry Saltmarsh Ecology**

Most of this saltmarsh vegetation is unmodified with negligible weed invasion. It includes herbland dominated by Beaded Glasswort and Southern Sea-heath, shrubland dominated by Black-seeded Glasswort and sedgeland dominated by Chaffy Saw-sedge. These communities have quite narrow tolerances to variances in soil moisture and salinity – both species relative dominance and form is likely to vary in response to different soil moisture and salinity. If the available moisture for plants was to reduce there could also be drought stress, which in the short term could reduce the growth and seed production of these species, but in the longer term it could cause decline and death. The proponent’s Peer Reviewer\textsuperscript{28} agrees that the predicted reduction in capillary rise from the water table will decrease soil moisture in the Dry Saltmarsh causing stress in the vegetation.

The EES concluded that when there is normal or high rainfall (and groundwater inflows) it is unlikely that there would be a significant degree of change to the Dry Saltmarsh vegetation (in terms of composition, growth and decline)\textsuperscript{42}. However, when there is below average rainfall and/or high evaporation (such as during the drought of the last 7 or more years) the EES predicts the changes to this vegetation to be more significant. Regardless, it is apparent that by reducing the groundwater inflows (whether to a lesser or greater extent) the dewatering would pose a risk to this wetland vegetation and ecology.

It is more than likely that both the reduction in surface runoff and changes to groundwater inflow could produce periods with dryer conditions in the Dry Saltmarsh, which will affect the survival of some vegetation assemblages and their respective density in the wetland (particularly between 0.4 and 0.7 m AHD). As noted by the EES, Inquiry and DSE, such changes could reduce the seed stocks and the habitat values of this wetland and have implications for dependent species such as the OBP. So while there are different views on the likely duration of dryer soil conditions due to dewatering, there is general agreement on the significance of likely ecological consequences of reduced soil moisture.

**Proposed Mitigation and Management**

The EES proposes a management response to this risk of the quarry extension altering hydrology and impacting upon the saltmarsh ecology. The EES outlines an adaptive management concept that consists of an active hydrological system based on the monitoring of soil moisture. The proposed system would seek to offset the potential drought stress likely to result from reduced groundwater or surface flows. The concept is based on commercial irrigation systems in vineyards, orchards and sporting grounds that apply water from sprinklers (or soaker-lines) in response to soil moisture sensors. The objective of the proposed adaptive management is to maintain a soil moisture and salinity regime in the Dry Saltmarsh soil profile, particularly in area between 0.4 and 0.7 m AHD.

As outlined above, the EES also proposes a mitigation measure referred to as ‘campaign’ dewatering. The intention is to allow the watertable to recover between periods of dewatering, although the proponent’s Peer Reviewer concluded that the watertable was very unlikely to recover during these interim periods and therefore would be depressed under the Dry Saltmarsh for most of the proposed extension\textsuperscript{43} (i.e. from the commencement of deeper quarrying (see Table 1) until its completion in 2055).

The proposed adaptive management system would use low pressure sprinklers (fed by groundwater) with a computerised control system based on soil moisture meters in six different sectors, such that each is monitored and irrigated independently. This was preferred over the replenishment of the watertable by tile drains or injection wells. A program of ecological monitoring would be required to assess the success of the adaptive management, which could be overseen by a group of agencies and key stakeholders (e.g. Barro Group, Parks Victoria, DSE, OBP Recovery Team).

\textsuperscript{41} EES Main Report (page 9-7)
\textsuperscript{42} EES Technical Appendix 4 (page 35)
\textsuperscript{43} Lane Piper Peer Review (page 6)
During the Inquiry the proponent’s experts stated that specific quantitative triggers for management action are not preferred, as they are unlikely to generate consistently sound management or intervention. Instead, they suggested that monitoring should largely utilise expert judgement regarding overall ecological health within the six sectors, in order to inform decisions on the required adaptive management action. In addition, they considered continuity in the personnel conducting the ecological monitoring and advising on actions to be very desirable, including for the proposed five years of ecological monitoring prior to the commencement of deeper quarrying activities.

The core question to consider is whether the proposed adaptive management provides a sound and reliable approach to eliminating both the environmental risk associated with the predicted changes to the hydrology and therefore any adverse effects on this internationally significant saltmarsh habitat?

The proponent’s evidence to the Inquiry highlighted the rather narrow tolerances of soil moisture and salinity that the saltmarsh flora and fauna are dependent upon. Whether or not the proposed adaptive system can detect and respond to ecological changes is key to its reliability. DSE expressed concern about the adaptive approach, in particular that it “may oversimplify the complex hydrology” and that the proposed types of irrigation systems are not “intended to maintain a natural ecosystem in saline conditions”40. In view of this, DSE’s preference is to defer deeper extraction (particularly 2B1 and 2B2) until it is clearly demonstrated to a degree of very high confidence that such a system is reliable and adequate for this purpose. DSE’s submission was in part based on the Management of Victoria’s Ramsar Wetlands Strategic Directions Statement (DSE, 2002).

DPI’s submission also suggests that any proposed management of the hydrology and ecology of the saltmarsh not be established until further and thorough evaluation occurs (including field testing) in consultation with government44. DPI did not agree that ecological management of the Dry Saltmarsh was comparable to simple management of moisture levels such as at a golf course. During discussion at the Inquiry hearing questions were also raised regarding the degree of control over the volume and nature of irrigation, over the quality (salinity) of the water used, the reliability of the system (in relation to corrosion, etc.) with prolonged use of brackish water, and the suitability of surface application as opposed to subsurface application (e.g. via soaker-hoses).

The Inquiry concurred with the proponent about the inability to specify criteria for reliable management at this point, suggesting that an extended period of monitoring is required prior to the implementation of an adaptive management system. Initial periods of ecological and hydrological monitoring would be required to both inform and improve the reliability of a proposed adaptive management system. However, the required timing and extent of reliance upon the management system will influence how reliable and flexible it needs to be. As noted by the proponent’s Peer Reviewer28, the EES considers the adaptive system to only be necessary during short and intermittent periods of dewatering, largely for areas 2B1 and 2B2, whereas it is more likely that the adaptive system would be required for most of the proposed quarry extension. In this context the reliability and flexibility of the system is even more important and as such the preceding monitoring and development of the system are paramount. Indeed, until such monitoring has occurred it may be difficult to conclude that the system can be relied upon to prevent any adverse effect on the saltmarsh vegetation.

The Risk of Significant Impact on the Dry Saltmarsh

According to the EPBC Act significant impact criteria45, significant impact on the ecological character of a Ramsar wetland is likely if there is, amongst other things:

- "a substantial and measurable change in the hydrological regime of the wetland, for example, a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland; or
- the habitat or lifecycle of native species, including invertebrate fauna and fish species, dependant upon the wetland being seriously affected; or
- a substantial and measurable change in the water quality of the wetland – for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland, or water temperature which may adversely impact on biodiversity, ecological integrity, social amenity or human health”45.

44 DPI written submission (page 12)
The evidence assessed through this EES process does not eliminate the risk of one or more of the above criteria applying at some point before the proposed quarry extension concludes in approximately 2060. Certainly there is at least going to be a measurable change in the hydrological regime of the Dry Saltmarsh at some point, such as during the dewatering of deeper areas, in particular 2B1 and 2B2.

The delay in this proposed extraction of the deeper areas of basalt nearer the Dry Saltmarsh (2016 to 2035 or later - see Table 1) may provide a window for further monitoring and assessment of the environmental risks and uncertainties, including in relation to the proposed adaptive management. At the very least, a small scale trial of the system during the initial dewatering required for 2A1 would be warranted, assuming that approval for this area is obtained. This would need to occur after sufficient groundwater and ecological monitoring is undertaken to inform the final design of the adaptive system to be trialled. Whether or not such further assessment enables the elimination of any risk of significant impact on the Dry Saltmarsh habitat is unclear at this stage.

Conclusions

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

- The proposed quarry extension is unlikely to result in an adverse impact on the beneficial uses of Corio Bay, particularly as the existing EPA Licence specifications for water discharged into Corio Bay are expected to continue.

- There would be a significant reduction in the surface water catchment area of the Dry Saltmarsh, resulting in the permanent diversion of approximately 50 percent of its surface runoff into the quarry’s internal drainage system.

- The proposed extension is likely to cause drawdown of the water table in the local area, including under the adjacent saltmarsh wetlands, due to the dewatering required for quarrying of deeper basalt. This drawdown (including beneath the saltmarsh wetland) is not likely to recover fully during the proposed ‘campaign’ cessation of dewatering. This drawdown is likely to result in groundwater movement away from the Dry Saltmarsh.

- The proposed quarry extension will alter the hydrology of the Dry Saltmarsh area to the north-east of the project area, due to both dewatering groundwater and the reduction in surface flows.

- The predicted changes to the hydrological regime of the Dry Saltmarsh has potential to impact significantly on the saltmarsh vegetation that provides habitat for significant protected species. The impacts could include the reduction of the growth and seed production of vegetation, and its potential decline and death in the long-term.

- The proposed adaptive management approach to addressing the likely reduction in soil moisture has some potential to address the risk of environmental impact on the Dry Saltmarsh ecology, but at this stage it is largely unproven and hence would provide an uncertain basis for eliminating the potential for impact on this internationally significant wetland.

- The potential for impact in the Dry Saltmarsh vegetation has consequences for the long-term habitat values of this wetland for significant protected species, including the OBP.

- Given that the proposed deeper extraction of basalt has the potential to adversely affect the significant environmental values of the Dry Saltmarsh wetland in particular, limiting the deeper extraction of lower basalt in the short term would enable the potential environmental impacts and risks from dewatering to be effectively minimised.

Further, it is my assessment that:

- Deeper extraction of only area 2A1 be considered for approval at this stage.

- If approval is given for the extraction (and dewatering) of the lower basalt in the southern and western parts of 2A1, there may be an opportunity to undertake a trial of a proposed adaptive management system providing sufficient initial hydrological and ecological monitoring has occurred before and during associated dewatering. Further understanding of the Dry Saltmarsh’s ecology and local hydrological regime, as well as a trial of a suitable adaptive approach, should enable better understanding of the environmental risks and significance of potential impacts on the Dry Saltmarsh habitat in the longer term. This would in turn inform how (and if) any further deeper extraction of lower basalt pockets (i.e. 2A2, 2A3, 2B1, 2B2) could be considered for approval in the future.
3.5 Cultural Heritage

**Evaluation Objective** - To avoid or minimise to the greatest extent practicable adverse effects on both Aboriginal and non-Aboriginal cultural heritage values.

**Statutory Context and Key Issues**

The legislation that applies to the assessment of impacts on cultural heritage includes:

- **Heritage Act 1995**
- **Aboriginal Heritage Act 2006**

The objectives of the *Aboriginal Heritage Act 2006* include: “(a) to recognise, protect and conserve Aboriginal cultural heritage in Victoria… ; and (d) to promote the management of Aboriginal cultural heritage as an integral part of land and natural resource management”. Under this Act a proponent must prepare a CHMP where an EES is or has been required and works have not commenced. A CHMP is based on an assessment of a project’s impacts on Aboriginal cultural heritage values and outlines management measures, including contingency plans.

The main purpose of the *Heritage Act 1995* is “to provide for the protection and conservation of places and objects of cultural heritage significance…”. This Act provides the statutory context for the assessment of impacts on non-Aboriginal post settlement heritage.

The most pertinent objective of planning in Victoria, under Section 4(1) of the P&E Act, is: “to conserve and enhance those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest or otherwise of special cultural value”. Clause 15.11 ‘Heritage’ of the SPPF addresses both Aboriginal and non-Aboriginal cultural heritage, directing that planning authorities consult with local Aboriginal communities.

The issues to be considered in this statutory context are whether there is any significant loss of or impact on Aboriginal cultural heritage sites and values and/or non-Aboriginal cultural heritage sites and values?

**Aboriginal Cultural Heritage**

The Aboriginal significance of the wider Point Wilson area is considered to be high. The wider area is associated with fish traps, middens, burials and even historical records of John Batman’s meeting with Aboriginal people in the past. The development of the area since the mid-1800’s for agriculture, quarrying, shell grit extraction and more recently aircraft construction and Commonwealth explosive storage has impacted significantly on the Point Wilson landscape and archaeological Aboriginal records46.

The EES cultural heritage investigations included initial site surveys undertaken across both the Stage 1 and Stage 2 project areas in June and September 2003, as well as more detailed sub-surface testing in areas of potential sensitivity in September 2005 and January 2006. EES Technical Appendices 13 and 14 provide the details of the assessments.

The EES investigations identified a total of eight Aboriginal sites, seven of which are located within the proposed area of extraction (refer to Figure 4). Five of these are isolated artefacts of low scientific significance, one is an artefact scatter of moderate scientific significance (AAV7721/0779) and one is a burial and midden site along the southern coastline (AAV7721/0143) likely to have been destroyed in the late 19th century. All of the Aboriginal sites are considered to be of cultural significance to the local Aboriginal group, the Wathaurong Aboriginal Corporation (WAC), as they provide evidence of past use and occupation of the area.

All of the six existing sites within the proposed extraction area would need to be disturbed or removed in the event the project proceeded. The processes under the *Aboriginal Heritage Act 2006* (i.e. via an approved CHMP) will enable appropriate mitigation to be adopted, including consultation and advice with the local Aboriginal group during the life of

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46 EES Technical Appendix 13
the quarry. The CHMP would need to be approved by this group, the Wathaurung Aboriginal Corporation, as they are the Registered Aboriginal Party (RAP) 47 for this area.

The EES investigation also identified some areas of potential Aboriginal archaeological sensitivity where there could be undiscovered Aboriginal sites. Some of these areas of potential sensitivity are within the proposed extraction area (see Figure 4): two swamps and a ridge in Area 2, the south eastern boundary in Area 4 and the stony rise west of the existing quarry in Area 1.48 The proposal has the potential to impact on undiscovered Aboriginal heritage sites within these areas, as it is considered likely that some further (but isolated) artefacts and scatters may exist. However, given they are likely to be very isolated and few in number the management and mitigation proposed, including WAC monitoring of overburden removal, would readily be applied through an approved CHMP.

Non-Aboriginal Cultural Heritage

As noted above, EES investigations including field surveys occurred in 2003 and 2005. Nine historical non-Aboriginal cultural heritage sites have been recorded within the study area during past surveys, of which three have been destroyed in the past. No new unrecorded sites were detected during the EES investigations. The following three sites listed under the Heritage Act 1995 are within the proposed area of extraction (refer to Figure 4) and would need to be disturbed or removed as a result of the proposed quarrying: H7721-0004 (Western Homestead Complex), H7721-0020 (Dry Stone Wall), H7821-0027 (Dry Stone Wall). All three of these sites are of moderate scientific significance, although they are generally in poor condition49.

Given the sites are within the proposed area of extraction, applications for ‘consent to disturb’ would need to be obtained from Heritage Victoria prior to any disturbance or quarrying in these locations. Heritage Victoria would also need to be notified of any new non-Aboriginal cultural heritage sites encountered during the Project’s earthmoving.

Conclusions

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

- Project impacts on identified Aboriginal cultural heritage sites are generally minor and proposed mitigation is acceptable, particularly in the context of the requirement under the Aboriginal Heritage Act 2006 for an approved CHMP that would guide appropriate mitigation and management.

- The minor impact on non-Aboriginal cultural heritage is also acceptable.

Further, it is my assessment that:

- The CHMP prepared and approved under the Aboriginal Heritage Act 2006 includes processes that ensure the investigation of areas of potential Aboriginal archaeological sensitivity that may contain undiscovered Aboriginal sites, including appropriate monitoring and consultation during the removal of overburden in these areas.

47 At the time of the EES there was no RAP appointed for this area. On 21 May 2009 the Wathaurung Aboriginal Corporation (WPC) was registered as the RAP for this area by the Aboriginal Heritage Council under the Aboriginal Heritage Act 2006.

48 EES Main Report (page 14-20)

49 EES Main Report (page 14-18)
Figure 4. Aboriginal and non-Aboriginal sites and areas of potential Aboriginal significance (Source: EES, page 14-10)
3.6 Public Health, Amenity and Safety

**Evaluation Objective** - To avoid or minimise to the greatest extent practicable noise, landscape, visual, and traffic related impacts, in order to protect local amenity, neighbouring land-uses and activities during the development and operation of the quarry.

**Statutory Context**

Potential health, safety and amenity effects are inherent aspects of environmental effects to be considered as part of the assessment process under the *Environment Effects Act 1978*. One specific legislative basis for considering these type of effects of development is an objective of the *Planning and Environment Act 1987*: “to secure a pleasant, efficient and safe working, living and recreational environment for all Victorians and visitors to Victoria” 50.

The *Environment Protection Act 1970* provides a framework for the protection and maintenance of environmental quality sufficient to protect existing and anticipated beneficial uses of the environment, including ambient air. SEPP (Ambient Air Quality) and SEPP (Air Quality Management) provide for the protection of beneficial uses dependent on air quality, in particular public health. The applicable assessment processes for the extractive industry to demonstrate compliance with SEPP are set out in the Protocol for Environmental Management (PEM) for Mining and Extractive Industries (EPA Publication 1191, 2007), which is an incorporated document under the SEPP (Air Quality Management).

The EPA also prepares policy guidance to aid the implementation of the Act and minimise impacts from noise:


There is no subordinate legislation or SEPP for industrial noise in regional Victoria that specifies maximum allowable noise levels for new development, such as SEPP N-1 for metropolitan Melbourne. However, in 1989 the EPA published the Interim Guidelines for Control of Noise from Industry in Country Victoria N3/89 (N3/89), which provides the guidance on what noise levels are acceptable for industry at sensitive receptors in regional Victoria. Where background noise levels are comparable to those in metropolitan Melbourne, noise limits are to be determined using SEPP N-1.

**Key Issues**

The key issues to be considered in this statutory context are:

- Impacts on the local community could arise from a reduction in air quality as well as noise generated from the construction and operation of the quarry.
- There could be landscape and visual impacts in the short and long term.
- The transport of the basalt and use of local roads by the Barro Group could impact upon traffic and the levels of safety for local commuters.

**Air Quality**

Dust from the proposed extension to the quarry has some potential to affect air quality and its beneficial uses, including human health and well-being as well as the well-being of other animals and vegetation. This was assessed within EES Technical Appendix 7. There are significant flora and fauna habitats close to the site and the potential impacts of dust on these ecological values have been explored within section 3.3 of this Assessment.

The proposed quarry extension involves drilling, blasting and moving large volumes of overburden and rock materials, all using the current fleet of equipment and trucks at the quarry. These dust generating activities already occur at the Mountain View Quarry site.

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50 Under s.4(1)(c) of the P&E Act.
The EES investigations included dust dispersion modelling, undertaken in consultation with EPA, to predict the changes to PM$_{10}$ and Total Suspended Particulates (TSP). The nearest sensitive receptor is over 2.5km from the proposed extraction limit, which is well beyond the recommended buffer distance for quarrying of rock that involves blasting. The site is rather isolated and has not had previous issues associated with the management of dust. The modelling used the portion of the proposed extension that is closest to the sensitive receptor in order to represent a worst case scenario. EPA and the Inquiry have accepted that the modelling is largely adequate for this planning.

The results show that for this worst case scenario used in the modelling the predicted levels of PM$_{10}$, PM$_{2.5}$ and TSP at the nearest receptor (residence) are well below the PEM criteria (SEPP intervention levels) for these indicators. Therefore the likely impacts on local air quality and its beneficial uses are predicted to be minor and acceptable.

Crystalline silica, NO$_2$ and CO are not considered to be of concern, based on studies and monitoring of the current operations over the last number of years, which was confirmed by the EPA in its submission.

Some residual concerns of EPA and DPI were addressed during the Inquiry, largely through the proponent’s commitment to incorporate a reactive approach to the management of air quality via the EMP, including the use of real-time monitoring of PM$_{10}$ at two locations. In addition, a number of dust suppression measures are already employed at the quarry and these would continue to be applied in response to management requirements throughout the life of the quarry extension.

**Noise and Vibration**

Assessments of the potential impacts from noise and vibration were conducted for the EES (EES Technical Appendices 8 and 9), which included modelling of the noise levels from the existing quarry operations under neutral and worst case climatic scenarios.

The background noise levels monitored for the EES are not sufficiently low for the limits from N3/89 to apply, so noise limits were determined using SEPP N1. The current background noise is influenced by the close proximity of Avalon Airport, the current quarry operations, truck traffic, and the Defence armaments complex.

The noise modelling results show that the predicted levels on Dandos Road near the closest receptor (over 2.7km away) are well below both the limits derived from SEPP N1 and those from N3/89, even under worst case climatic conditions. The same is the case in Avalon Road near the other sensitive receptors further away from the quarry, where predicted levels are 18 to 30 dBA less than the SEPP N1 limits.

The predicted impacts from blasting are based on vibration measurements of existing quarry operations (blasting) in 2002 and 2003. Ground vibration contours were developed and used to assess peak ground vibration levels from blasting at the proposed extraction limits of the extended quarry, thus providing the highest ground vibration level that could be experienced anywhere outside the quarry. This assessment predicts that for the nearest sensitive receptor the ground vibration levels will be 0.16 mm/s – this is below the level that is perceptible to humans and well below the limit permitted by DPI.

The likely air vibration from the quarry extension was also assessed based on vibration measurements of existing quarry operations (blasting) in 1993, 2002 and 2003. A regression analysis of peak air-blasts at worst case locations was undertaken in order to model worst case contours of air vibration. This demonstrated that the current 120 decibels (dBL) limit enforced by DPI at the existing quarry would be met within 860m of blasting, which just extends outside the extended site. The highest air vibration likely to be experienced at the nearest sensitive receptor (a house)

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PM$_{10}$ - particles or “particulate matter” with equivalent aerodynamic diameter of 10 micrometers or less.

EPA Publication AQ 2/86 - *Recommended Buffer Distances for Industrial Residual Air Emissions* (July 1990)

EPA Submission (June 2008)

Inquiry Report (page 26)

EES Technical Appendix 9 (pages 3 - 4)

DPI is responsible for regulating blasting impacts associated with the extractive industry, including the specification of limits.

EES Technical Appendix 9 (pages 5 - 7)
is 103 dBL, which is well within the new limit of 115 dBL proposed by DPI\textsuperscript{58}, which is likely to be experienced around 1270m from the blast\textsuperscript{59}. In addition, most blasts will actually result in levels that are less than the worst case predictions mentioned here.

As noted by the Inquiry, there have been two isolated records of residents in Clifton Springs (on the other side of Corio Bay, approximately 10 km from the proposed extension) experiencing vibration from a previous blasting event at the quarry. However, there have been no complaints over the last five years of operation, during which blasting has occurred generally once a fortnight for approximately 4 seconds each time. DPI’s submission\textsuperscript{59} does suggest that on rare occasions the air vibration/blasts from the proposed quarry extension may be perceptible on the other side of Corio Bay (i.e. when there are worst case climatic conditions), although the blasting is expected to be below DPI limits and almost always imperceptible at this location.

The potential impacts from blasting on fauna associated with the nearby habitats have been addressed within section 3.3 (Ecology, Flora and Fauna).

**Visual and Landscape Character**

The EES included an assessment of the visual and landscape impacts of the proposed extension\textsuperscript{60}. The quarry extension would involve rock extraction faces below the surface of the surrounding area. In addition it exists within a largely flat plain with no elevated viewpoints and surrounding land-uses that include Avalon Airport, the Western Treatment Plant, and the Commonwealth’s restricted area. So there are very few potentially affected viewpoints.

Five viewpoints were selected however, based on the likely publicly accessible vantage points in the area (including Corio Bay) in order to assess the potential for visual impacts. For each of these viewpoints it was concluded that there would be insignificant visual impacts at these locations\textsuperscript{60}. The inclusion of buffer planting, vegetated embankments and groundcover planting would further minimise the small visual impacts during and post the quarry extension. The Inquiry also concluded that the Project would result in very insignificant visual impacts\textsuperscript{61}.

**Roads, Traffic and Transport**

The proposed quarry extension largely maintains the existing traffic conditions in the area, including the existing access routes and timeframes (i.e. largely during the day). Currently any night or evening truck traffic uses a specific alternate route to minimise any impacts on the local residential amenity. The EES predicts that there will be no adverse impact from the proposed extension on the current road network and local traffic\textsuperscript{62}.

The Inquiry also concluded that the likely impact on roads and traffic will be negligible, providing that the existing arrangements for mitigating potential effects on local amenity are maintained.

**Conclusions**

Having regard to the Inquiry’s analysis and in light of the above considerations, it is my assessment that:

- The Project’s likely impacts on air quality and its beneficial uses from dust are acceptable in the context of relevant SEPP criteria, particularly with the adoption of mitigation measures to the satisfaction relevant agencies.
- The noise generated by the proposed extension is likely to have very minor impacts on local amenity and is not expected to exceed the limits adopted from SEPP N-1 (or even N3/89 limits) at the closest residences within the vicinity of the quarry.
- The impacts from blasting vibrations are likely to be minor and have very little effect on people in the wider area.

\textsuperscript{58} DPI’s new limits for air vibrations from blasting are set out in the draft conditions for the Work Plan – i.e. in the vicinity of any sensitive location 115 dBL is not to be exceeded for more than 5% of blasts over 12 months and 120 dBL is not to be exceeded at any time.

\textsuperscript{59} DPI Submission (page 8)

\textsuperscript{60} EES Technical Appendix 11

\textsuperscript{61} Inquiry Report (page 79)

\textsuperscript{62} EES Main Report (page 13-11)
• The Project would result in negligible visual impacts at the likely public viewpoints in the area.

• Additional impacts from the proposed extension on local roads, traffic conditions and users are likely to be very low and easily managed through the current measures adopted by the quarry.

Further, in light of the Inquiry’s recommendations it is my assessment that:

• An adaptive management system for air quality be established to the satisfaction of the EPA and DPI, enabling the implementation of management responses informed by: i) real time monitoring at two locations on the perimeter of the extraction area (i.e. one in the south and one near the Dry Saltmarsh); and ii) dust gauge monitoring close to sensitive locations.

• The new DPI vibration limits for blasting be incorporated into the Work Plan and preparation of the EMP.

3.7 Environmental Management Framework and Rehabilitation

**Evaluation Objective** - To ensure that the project can be implemented in accordance with a robust and transparent framework for environmental management, as well as an environmentally sustainable rehabilitation plan concept for the project area.

**Statutory Context**

This section focuses on the approach for managing the potential effects of the proposed quarry extension, as well as the future use and rehabilitation of the project area.

The VPPs (Clause 52.09) include provisions that require the use and development of land for extractive industry to not adversely affect the environment or amenity of the area, as well as the appropriate rehabilitation of the land. Additionally, the land’s zoning requires a Development Plan that must include a number of measures to address potential adverse effects and enable the protection of the adjacent native habitats, bird flight paths and the management of appropriate buffer areas.

Under Part 1 of Schedule 1 of the *Extractive Industries Development Regulations 2007* the Work Plan for this proposal will require an Environmental Management Program that sets out the following:

* (a) proposals for the disposal of any effluents, protection of groundwater, and drainage and erosion control;
(b) proposals for the suppression of noise, dust from any source and vibrations from blasting operations;
(c) proposals for the effective monitoring of the operation.”

Further, the EID Act specifically requires a rehabilitation plan be prepared and approved, such that all land affected by the industry is ultimately rehabilitated in accordance with the approved plan as well as any conditions of both the Work Authority and any planning requirements. The *Extractive Industries Development Regulations 2007* require the rehabilitation plan to include:

* (a) the concepts for the possible end use of the site;
(b) the proposals for the progressive rehabilitation to a safe and stable landform of extraction areas including slope batters, road cuttings, and dumps;
(c) the proposals for landscaping to minimise the visual impact of the site;
(d) any proposals to protect and conserve native vegetation during the production phase of the operation;
(e) any proposals for the final rehabilitation and vegetation of the site including final security of the site, securing of water dams and slimes.”
Key Issues

The key issues to be considered in this context are:

- Whether there is a robust and transparent framework for managing the environmental impacts and risks of the project, which accords with legislative requirements.
- The inclusion of sound and effective management measures for potentially significant environmental risks.
- Environmental issues associated with the proposed rehabilitation of the land, including its general suitability given potential for adverse impacts on the environmental conditions and values of adjacent land given its ecological sensitivity and conservation significance.

Environmental Management

The EES proposes an Environmental Management Framework (EMF) for the extended quarry (Chapter 18). This would include an environmental policy and an Environmental Management Plan (EMP), which would in turn address requirements for both the Work Plan (under the EID Act) and the planning permit approval (including the Development Plan). The EMP would be developed based on the existing EMP for the Barro Group quarry and would consist of specific plans and systems. This is likely to include, amongst other things:

- Ecological Management Plans;
- Rehabilitation Plans;
- Contingency Plans; and
- Monitoring Programs.

A summary of the specific environmental management and mitigation measures that have stemmed from the EES investigations is also included within the EES63.

At this stage the content of the draft EMP is not fully developed and would need to be refined to address various matters already raised through the EES, the Inquiry Report and this Assessment. The current EMP in use at the quarry was not provided within the EES, so the adequacy of its structure and content was not able to be considered by the Inquiry. Ultimately an EMP for the extended quarry would need to cover any matters required under both the Extractive Industries Development Regulations 2007 and Planning Scheme (outlined above). The Work Plan conditions proposed by DPI70 require the EMP to be based on the EES assessment process and be prepared in consultation with DPI, DSE and the Council, and then be approved prior to work commencing. The EMP also needs to incorporate an environmental monitoring program.

The general content of the EMF outlined in the EES includes: a reporting structure and environmental responsibilities; a range of plans (see above); environmental targets; site management systems; operational controls; as well as monitoring and reporting programs to measure performance. The content within the EES seems to be sound in terms of both its structure and the process for its future development.

However, one matter that requires particular attention in the development of the EMP is the management and monitoring of potential hazards and impacts for adjacent wetlands and habitats associated with any protected species (e.g. OBP, migratory birds) and the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site. This would need to be developed in consultation with DSE, DEWHA, Parks Victoria, EPA, MWC and DPI, in light of the conclusions of this Assessment.

Environment Review Committee

The EES proposes an Environmental Review Panel be established when quarrying commences “to review monitoring data to ensure compliance with various requirements and ensure the EMP is being appropriately implemented and reviewed”64, with members coming from DSE, Parks Victoria, DPI, the Council and Southern Rural Water. The EES suggests the group meets annually for the initial three years of stage two and then only on an as needs basis.

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63 Table 18.1, EES Main Report (page 18-8)
64 EES Main Report (page 18-6)
DPI recommends that this group be established as a condition of the Work Plan\textsuperscript{65}, that it starts meeting two years before the proposed quarrying commences and that the EPA should be included in the group. In addition, DPI suggests it meets a minimum of three times a year, in February, June and October. The Inquiry also strongly supports the establishment of an Environmental Review Panel or Environmental Review Committee (ERC) for the Project and considered it to be a vital element of the EMF. Recommended composition of the ERC includes the aforementioned organisations (including EPA) as well as Melbourne Water, the Department of Defence, Avalon Airport Management, the local Aboriginal group, Birds Australia and The Spit Nature Conservation Reserve Advisory Group. The wider composition is intended to help facilitate complimentary management of the land within the wider Point Wilson area given its ecological sensitivity and significant conservation values.

The importance of appropriate resourcing and operation of the ERC is emphasised by the Inquiry\textsuperscript{66}, including the provision of expert advice and access to specialists when required. DPI’s recent review of ERCs\textsuperscript{67} provides some guidance on how ERCs should be established and operated, including their resourcing by the proponent.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{image1.png}
\caption{Site Rehabilitation Concept Plan (Source: EES page 2-37)}
\end{figure}

\textsuperscript{65} DPI Submission (page 13)
\textsuperscript{66} Inquiry Report (pages 94-5)
\textsuperscript{67} Review of Environmental Review Committees, Final Report (DPI, 2008)
Rehabilitation

The EES outlined a proposal to progressively rehabilitate the quarried land, such that it can be prepared for future industrial uses, as requested by the City of Greater Geelong following their Industrial Land Study in 200168. A draft Rehabilitation Plan has been developed. A number of objectives, procedures, design elements and general guidelines for the site’s rehabilitation are set out within the EES (section 2.6), including for revegetation species and locations, quarry face profiles, finished surface levels, as well as the drainage and wetland system. Figure 5 shows a number of these elements of the rehabilitation concept plan.

The Inquiry identified some key matters that need resolution or sound responses in the ongoing development and implementation of the Rehabilitation Plan, including: watertable management and likely soil salinisation; impact on all adjoining land and conservation areas (including the Dry Saltmarsh); opportunities to enhance ecological benefits and values of the area; and accounting for climate change and its impacts. The Inquiry’s recommendations incorporated some specific items to be addressed in the Plan in relation to these issues. It also concluded that the Plan would need to be adapted and developed in phases given the duration of the proposed quarrying and the uncertain nature of most of these issues without further monitoring and understanding69.

DPI’s proposed Work Plan conditions requires an approved “detailed final end use proposal70” (prepared in consultation with DPI and the Council), before the proposed quarry extension can commence. The conditions also note that the proponent's proposed end-use of an ‘industrial precinct’ is just conceptual at this stage. As noted by the Inquiry, DPI is requiring further information regarding a number of matters before the Rehabilitation Plan can be considered ready for the purposes of the Work Plan process. The future approval process for the Work Plan under the EID Act in combination with the permit and Development Plan under the Planning Scheme should effectively guide the development and refinement of the rehabilitation plan and end-use concept. In addition, the Inquiry was comfortable that the draft plan is a good starting point and that these approvals will enable an appropriate process for determining the content and final approach to the rehabilitation and end-use of the site.

It is clear from the Inquiry Report that there are a number of key issues and uncertainties regarding the suitability and sustainability of the proposed end-use rehabilitation concept, which are quite difficult to address at this stage of the project. The long timeframe for the quarry and the complexity of issues such as climate change, long-term environmental trends, the local hydrology, and the ecology of the Dry Saltmarsh and other wetlands, make it impracticable to determine whether the proposed end-use concept is ultimately going to be acceptable for the broader Point Wilson environs. The phased approach to rehabilitation that is proposed in the Inquiry Report71 provides an avenue for moving forward with the development of the current Rehabilitation Plan, as well as enabling the future resolution of both key rehabilitation issues and the final use of the site such that it is ecologically sustainable in the long-term.

Conclusions

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

- In general the proposed EMF and EMP provide a robust and transparent approach to managing environmental hazards and impacts during the implementation of the project, having regard to the specific aspects addressed previously in this Assessment as well as the following matters.
- Establishment and operation of a suitable ERC for this project will be an important component of the EMF, including to guide the formulation and implementation of the EMP over the life of the quarry.
- The proposed Rehabilitation Plan provides a sound basis for the short to medium term rehabilitation of the site.
- The long-term rehabilitation and end-use concept of an ‘industrial precinct’ at this site still needs further consideration and assessment before its suitability and environmental sustainability can be determined.

68 EES Main Report (page 2-39)  
69 Inquiry Report (pages 84-92)  
70 DPI Submission, Attachment 1 - Endorsed Work Plan Conditions Plus Revised Rehabilitation and Site Specific Conditions  
71 Inquiry Report (pages 91-92)
Further, it is my assessment that:

- The EMP be fully developed to address specific matters identified in this Assessment (and by reference the Inquiry Report and EES), as well as to address any requirements of the EID Act approval and the planning approval. This would involve consultation on relevant matters with DPI, DSE, Parks Victoria, EPA and the City of Greater Geelong respectively.

- The EMP be a condition of the approval of both the Work Plan and the planning permit (and Development Plan).

- DPI establish and convene an ERC in accordance with proposed Work Plan conditions and the recommendations of the Inquiry, including with respect to its membership and timing of meetings.

- The Rehabilitation Plan be developed in two phases, enabling an adaptive approach to site rehabilitation that can respond to the environmental risks and changes in local conditions over the life of the quarry. The initial Plan should be developed to cover short- to medium-term aspects of rehabilitation, including designated surface levels, drainage, revegetation, and so forth. In the second phase the Plan should be subject to revision at intervals of five or so years, based on monitoring and further assessment, in order for it to address other changing issues and complexities, such as those identified within the Inquiry Report.

- In the first instance, the draft Rehabilitation Plan be refined to further address some other key matters identified by the Inquiry: groundwater capillary rise management to prevent soil salinisation across the site, and sea level and watertable variations in relation to climate change.

- During the second phase, the final end-use of the site should be progressively developed and confirmed through consultation with DPI, City of Greater Geelong, DSE, DEWHA, Parks Victoria and EPA.

### 3.8 Ecologically Sustainable Development

_Evaluation Objective_ - To enable ecologically sustainable development over the short- and longer-term, having regard to the likely overall economic, social and environmental implications of the proposal.

**Statutory Context**

This section focuses on the acceptability of the environmental effects of the Project in the context of relevant legislation, policy and ESD. The Ministerial Guidelines made under section 10 of the EE Act specifically require the assessment of a proposal and its effects to be in the context of the principles and objectives of ESD.

In addition to the objectives of the P&E Act incorporating core aspects of ESD, the Planning Scheme also includes a Clause (52.09) with requirements and decision guidelines for the use and development of land for extractive industry within the City of Greater Geelong, including: “To ensure that use and development of land for extractive industry does not adversely affect the environment or amenity of the area during or after extraction” and “that excavated areas can be appropriately rehabilitated”.

**Overview of Environmental Effects**

In summary, this Assessment accepts that the Project’s direct and indirect economic benefits for the local region and State are likely to be significant, given that it would be likely to provide a substantial proportion of the future market supply.

The preceding sections of this Assessment also recognise that the proposed extension is likely to give rise to both some potentially significant adverse environmental effects and risks, as well as some more moderate and less significant environmental effects, which are briefly summarised below:

- The removal of floral species of regional significance (e.g. Ruby Saltbush, Small Spike-sedge, Fine-head Spear-grass and Drooping Cassinia) when the proposed remnants of Plains Grassland and Plains Grassy Wetland are cleared.

- Clearance of almost 17 ha (5.71 hha) of both VHCS and HCS EVCs. This includes endangered Plains Grassland and Plains Grassy Wetland EVCs.
A significant reduction (approximately 50 percent) in the surface water catchment area of the Dry Saltmarsh, resulting in the permanent diversion of approximately 50 percent of its surface runoff.

The drawdown of the watertable across the Point Wilson area, including under the adjacent saltmarsh wetlands, due to the dewatering required for quarrying of deeper basalt, which is not likely to recover fully during the proposed 'campaign' cessation of dewatering. This is in addition to groundwater movement away from the saltmarsh wetlands due to this watertable drawdown over the project life.

Alteration of the hydrological regime of the Dry Saltmarsh area to the north-east of the project area (in relation to both watertable drawdown and reduced surface flows), as well as associated potential impacts on the Dry Saltmarsh wetland vegetation and ecology. At this point the significance of changes to the hydrological regime of the saltmarsh wetlands are unable to be confidently established, including its consequences for the soil moisture, salinity and vegetation in the wetland.

Potential impacts on the habitat values of the Dry Saltmarsh could affect threatened and migratory species such as the OBP. In the absence of further monitoring and assessment of changes to and consequences of the altered hydrology (resulting from dewatering and changes to the catchment), including an adaptive management trial, deeper extraction of basalt must be assumed to have the potential to adversely affect the habitats of significant protected species.

Disturbance or removal of six existing Aboriginal sites within the proposed extraction area, as well as disturbance of some areas of potential Aboriginal archaeological sensitivity that could contain undiscovered Aboriginal sites, which should be able to be mitigated and managed through a CHMP.

Disturbance of three sites of non-Aboriginal cultural heritage significance within the proposed area of extraction, which are of moderate scientific significance but generally in poor condition.

Minor and largely negligible impacts on air quality and noise and therefore local amenity, assuming effective adoption of appropriate mitigation measures, as well as some minor impacts from blasting vibrations, which should have little effect on potential human receptors in the wider area.

Consistency with ESD

The Project's overall consistency with ESD needs to be considered in the context of the following pertinent ESD objective and guiding principles:

Objective (c): To protect biological diversity and maintain essential ecological processes and life-support systems. The proposed quarry extension would be compatible with the protection of biological diversity and maintenance of ecological processes if:
- quarrying of lower basalt areas that require dewatering is limited to area 2A1, at least in the short term, in order to limit the extent of groundwater drawdown and associated effects for saltmarsh ecosystems;
- further monitoring and assessment of ecological effects associated with quarrying, especially of deeper basalt areas, occurs; and
- VHCS native vegetation sites 15 and 9 are retained and potentially provide off-sets for other native vegetation proposed to be cleared.

Principle (a): That Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equity considerations. This Assessment has considered and integrated relevant short- and longer-term implications of the proposal. It will guide statutory decisions for the proposed quarry extension. However, some aspects of uncertainty may require further information on economic and environmental implications to inform decision-making, in particular:
- the justification of clearing of some areas of VHCS native vegetation (sites 9 and 15) under the NVMF; and
- the potential future authorisation of quarrying lower basalt pockets, beyond the initial quarrying of area 2A1.

Principle (b): If 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 potential for serious and irreversible ecological damage associated with medium- to long-term dewatering for the extraction of lower basalt has been identified through the environmental assessment process. Having regard to the large degree of uncertainty involved, it will be appropriate to adopt a precautionary approach by limiting the
extent of deeper extraction until the combined hydrological and ecological implications, as well as the efficacy of mitigation strategies, can be established with an acceptable degree of certainty.

Principle (c): The need to consider the global dimension of environmental impacts of actions and policies.

This Assessment of the proposed extension has considered the global dimension of environmental impacts, including in relation to species, communities and wetlands protected under international agreements, as well as climate change implications associated with this area and the proposal.

Principle (d): The need to develop a strong, growing and diversified economy which can enhance the capacity for environment protection.

The proposed extension will contribute to the strength and growth of the local, regional and state economy, especially by continued long-term production of basalt resources for future market supply.

Principle (g): The need to facilitate community involvement in decisions and actions on issues that affect the community.

This process under the EE Act of the proposed extension has facilitated community involvement in the assessment at various stages.

With appropriate modification of the proposal consistent with the findings of this Assessment, together with future monitoring and management of environmental risks, the proposed extension can be implemented in a manner that is environmentally acceptable and consistent with ESD.

My Assessment finds that only limited short-term extraction of deeper basalt should be considered for approval at this stage (i.e. only Area 2A1). This approach would enable effective monitoring and assessment of key environmental uncertainties associated with dewatering, such that the potential medium- to long-term effects of any possible future deeper extraction (and dewatering) could be considered by the relevant authorities at a more appropriate time.

**Overall Conclusion**

It is my assessment that:

- Having considered the likely beneficial and adverse social, economic and environmental effects of the Project, most aspects of the project are likely to be consistent with ESD, apart from the environmental risks associated with the Dry Saltmarsh wetland habitat and the associated protected areas and species such as the OBP.

- Modifications to the Project discussed in this Assessment (particularly limiting the deeper extraction of lower basalt in the short term), will ensure the potential environmental effects of the Project are essentially minor and acceptable.

- Only a limited extent of deeper extraction (i.e. only area 2A1) should be considered for approval, which would facilitate the monitoring and assessment of key environmental uncertainties and potential medium to long-term effects on the Dry Saltmarsh.

- Further assessment - and if appropriate the future approval - of the extraction of lower basalt from any of the following areas would need to occur at an appropriate subsequent stage: 2A2, 2A3, 2B1, 2B2.

In conclusion, it is my overall assessment that:

- A modified version of the project, consistent with the specific findings of this Assessment, should be approved, which would see the Project being implemented in a manner that has minor and acceptable environmental effects.

JUSTIN MADDEN MLC
Minister for Planning
### 4 Response to Inquiry Recommendations

The Inquiry’s recommendations are reproduced in the left column of Table 3 below. The Minister for Planning’s general response to the recommendations are included in the table together with references to the relevant section(s) in this document that includes the detailed analysis and response(s) on the matter(s).

Table 4. Summary of Responses to Inquiry Recommendations

<table>
<thead>
<tr>
<th>Inquiry Recommendation</th>
<th>Response</th>
<th>Relevant Section &amp; Subsection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Recommendation</strong></td>
<td>It is my assessment that this recommendation be supported subject to variations, as set out below and within the body of this Assessment.</td>
<td>Section 3.8 (Overall Conclusion) Section 3.3 (Native Vegetation) Section 3.4 (Aquatic Environments)</td>
</tr>
<tr>
<td>The Panel recommends that the Stage 2 extension to the Mountain View quarry proceed on the basis of the documentation and commitments in the EES documentation, subject to the following recommended changes.</td>
<td></td>
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<tr>
<td><strong>Ecology, Flora and Fauna</strong></td>
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<tr>
<td><strong>Clearing of Native Vegetation</strong></td>
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<tr>
<td>1. Approve removal of native vegetation as outlined in the Stage 2 quarry extension proposal, including removal of two areas of Very High Conservation value, subject to offsetting losses to achieve the net gain objectives of the Native Vegetation Management Framework and the conditions outlined below</td>
<td>It is my assessment that this recommendation be supported subject to variations (associated with the proposed removal of Very High Conservation Significance vegetation), as set out within the body of this Assessment.</td>
<td>Section 3.3 (Conclusions; Native Vegetation)</td>
</tr>
<tr>
<td>2. The Work Authority or Work Plan under the EID Act should include a condition requiring the preparation of an offset plan, to the satisfaction of DSE, prior to the removal of native vegetation. The offset plan should be prepared on the following basis:</td>
<td>It is my assessment that this recommendation generally be supported, as set out within the body of this Assessment.</td>
<td>Section 3.3 (Native Vegetation)</td>
</tr>
<tr>
<td>(a) Revegetation of areas post quarrying as grasslands is a high risk strategy and should not be accepted as offsets (unless in the future it is demonstrated to DSE’s satisfaction that there is a high level of confidence of revegetation success).</td>
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<td>(b) Given all the circumstances, while the objectives and principles of the Native Vegetation Framework offset provisions should generally apply, a flexible approach should be adopted, particularly in assessing the high</td>
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value of adding Site 8 to the Public Land estate and also in applying the “like for like” provisions for Very High Conservation vegetation.

(c) Offsets should comprise:
- the transfer of Site 8 plus a buffer of not less than 100 metres to the Spit Nature Conservation Reserve; and
- management gains (due to enhanced management including protection measures) of areas of native vegetation on the site but outside the extraction perimeter.

(d) When these options are exhausted, then offsite offsets can be utilised, if required.

<table>
<thead>
<tr>
<th>Protection of Orange-bellied Parrot Dry Saltmarsh Habitat</th>
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<tbody>
<tr>
<td>3. Refine the groundwater monitoring and testing program coupled with vegetation surveys and soil moisture monitoring on the basis of advice from the Environmental Review Committee and specialist experts.</td>
</tr>
<tr>
<td>4. Schedule a groundwater monitoring and testing program coupled with vegetation surveys and soil moisture monitoring to take advantage of the time periods between the commencement of Stage 2 Quarrying and the need for the implementation of the adaptive management plan.</td>
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<tr>
<td>5. Monitor the health and levels of stress of flora in the eight quadrats of the dry saltmarsh. This monitoring should:</td>
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<tr>
<td>- be undertaken by a suitable expert; and</td>
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<tr>
<td>- supported by regular comparable photogrammetric records of vegetation health/stress in each quadrat.</td>
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<tr>
<td>6. Continue monitoring of existing functional groundwater monitoring bores for water level and salinity variations at intervals determined by the ERC.</td>
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<tr>
<td>7. Implement facilities for:</td>
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<tr>
<td>- soil moisture monitoring of the surficial sediment sequence adjacent to the eight quadrats around the perimeter of the dry saltmarsh;</td>
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<tr>
<td>- water level measurement within the Newer Volcanic aquifers beneath the surficial sediment sequence adjacent to the eight quadrats around the perimeter of the dry saltmarsh; and</td>
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<tr>
<td>- tidal fluctuations and sea level in the Spit Reserve inlet.</td>
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<tr>
<td>8. Initiate the testing of the hydrological relationships between the dry saltmarsh</td>
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</table>

Section 3.4 (Aquatic Environments) and Section 3.3 (Ecology, Flora and Fauna)
environment and the Newer Volcanic aquifer when subject to drawdown as soon as practicable, having regard to the quarry development schedule and the expected increasing impacts of Climate Change.

9. Undertake Environment Resource Efficiency Plan studies considering the extent of beneficial groundwater diversions which can be implemented away from the licensed discharge point to produce the optimum outcomes for the dry saltmarsh and the environment of the Spit Reserve.

10. Review the adequacy of the buffer between the dry saltmarsh and the extraction area when extraction approaches this interface, and specifically at least one year before extraction in Stages 2C (northern portion) and 2D. This review should have regard to the planning policy relating to climate change that applies at that time.

11. Incorporate the following measures in the ecological element of the Environmental Management Plan to minimise disturbance to birds in sensitive habitat areas:
   - maintain the buffer of at least 150 metres between the dry saltmarsh and the extraction limit (as shown in the EES documents);
   - construct bunds and plant vegetation at the edge of the approved extraction area to screen views from sensitive habitat areas to the quarry and attenuate potential noise impacts;
   - establish the perimeter bunds and screening vegetation within two years of approval of the works authority;
   - the bunds should be constructed and vegetation should be planted in the season when migratory birds are not present;
   - the screening vegetation should be maintained to achieve effective screening throughout the life of the quarry;
   - vehicles/machinery should not operate during hours of darkness within 500 m of Ramsar wetlands to the south and north-east of the site during the times migratory birds use this habitat;
   - design new stationary lighting to avoid light spill into sensitive avifauna habitat areas;
   - monitor bird reactions to blasting when the quarry face reaches 500 metres from sensitive avifauna habitat areas;
   - require controlled blasting during the season when migratory birds use the area when blasting occurs within 300 m or an alternative distance determined as a result of monitoring of avifauna responses to blasting in areas to the north-east, east and south of the site;
- unless monitoring satisfies DSE that alternative criteria should apply, blasting operations must not exceed:
  - airblast - 115 decibels on more than 5% of blasts in a 12 month period and 120 decibels at any time in sensitive avifauna habitat;
  - ground vibration - 5mm/s on more than 5% of blasts in a 12 month period, and 10mm/s at any time in sensitive avifauna habitat.

**Environment Review Committee**

| 12. Establish an Environmental Review Committee to advise on the formulation and implementation of the Environmental Management Plan and particularly to oversee appropriate adaptive management over the life of the quarry. The ERC membership should include DSE, DPI, Parks Victoria, EPA and City of Greater Geelong. It would also be desirable to invite Aboriginal representation, adjoining landholders (especially Melbourne Water, Avalon Airport, Department of Defence) and members of the Spit Nature Conservation Reserve Advisory Group to facilitate complementary management of land in the area. | Supported | Section 3.7 (Environmental Management) |
| 13. Forward monitoring information via the Committee to adjoining land managers. | Supported | |

**Environmental Management Plan**

| 14.i) Require an Environmental Management Plan (EMP) as a condition of the planning permit for the proposal and the works authority/plan. ii) Develop the Environmental Management Plan to provide more specific guidance, particularly in relation to the protection of the dry saltmarsh, and to reflect this Panel's recommendations. | Supported | Section 3.7 (Environmental Management) |
| 15. The EMP should be generally as proposed in the EES and should: - adopt an adaptive management approach to ensure that actions are appropriate to any changes in the environment; and - be developed and implemented with advice from the Environmental Review Committee and specialist experts. | Supported | Section 3.7 (Environmental Management) |

**Air Quality**

| 16. Require the EMP to address air emissions to the satisfaction of the EPA and DPI through: - Implementation of reactive management responses that: | Supported | Section 3.6 (Air Quality) |
- are informed by real time monitoring of PM10 at two locations (one in the south of the quarry site and one adjacent to dry saltmarsh) plus dust gauge monitoring close to sensitive locations.
- are activated when hourly emission levels specified by the EPA occur.
- Quarterly submission of air emission monitoring results to the Environmental Review Committee.
- Annual assessment of the need for ongoing air emission monitoring.

<table>
<thead>
<tr>
<th>Traffic</th>
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<tbody>
<tr>
<td>17. Require evening and night time traffic to use the Pousties-Beach Road route to minimise impacts on residential properties in the locality.</td>
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<tr>
<td>18. Formalise arrangements for a contribution to maintenance of roads used for access to the site through conditions of subsequent approvals.</td>
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<thead>
<tr>
<th>Rehabilitation</th>
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<tr>
<td>19. Develop a full rehabilitation plan that incorporates an adaptive approach to accommodate any changes in the environment over the life of the quarry. The initial plan should essentially be a concept plan, generally as proposed, with designated levels, ponds, etc but the plan should be subject to revision as required and as works progress.</td>
</tr>
<tr>
<td>20. Revise the existing rehabilitation plan concept to acknowledge the relevance of and foreshadow the need to respond to:</td>
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<td>- data collected on capillary rise characteristics of the backfill sequence as currently proposed; and</td>
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<tr>
<td>- sea and water table level variations consequent upon climate change.</td>
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<tr>
<td>21. Require regular review (at not more than 5 year intervals) of the rehabilitation plan provisions against the data from the recommended monitoring and testing.</td>
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<tr>
<td>22. Incorporate at the outset a requirement in the rehabilitation plan for the collection and diversion of surface runoff from the quarry drainage system to the dry saltmarsh. This requirement should only include those areas originally within catchment areas contributory to the dry saltmarsh where ever there is adequate elevation for gravity flow to the perimeter of the dry saltmarsh. This requirement shall not be required to be implemented if monitoring shows the impacts of lower salinity water on the perimeter has an adverse impact on the dry saltmarsh.</td>
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</tbody>
</table>

Section 3.6 (Roads, Traffic and Transport)
ecosystems.

23. Obtain Environment Review Committee advice on the refinement and implementation of the rehabilitation plan.

24. Manage revisions to the rehabilitation plan through amendments to the Development Plan and the Work Plan approvals (corrected to read “Plan”).

25. Develop the rehabilitation plan on the basis of 0.8 metre sea level rise over the life of the quarry but periodically review the plan to reflect current knowledge and government policy. In particular the plan will need to reflect the fact that any increase in this figure may require modification of groundwater management measures and that saltmarsh and coastal vegetation may “migrate” to higher ground in response to a rise in sea level.

26. Utilise, as far as practicable, locally indigenous species in rehabilitation works.

27. Set the rehabilitation bond at an adequate level to permit full rehabilitation. The bond can operate on a rolling basis as areas are progressively rehabilitated and the level should be reviewed from time to time as appropriate.

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### Cultural Heritage

28. Prepare a Cultural Heritage Management Plan for the Stage 2 extension in accordance with the *Aboriginal Heritage Act 2006*.

29. Develop a Memorandum of Understanding with the Wathaurong community to formalise a protocol for a representative from the community to be present during overburden removal in possibly sensitive areas.

30. Invite a representative of the Aboriginal community to participate in the proposed Environmental Review Committee.

31. Amend the relevant applications for approvals if the Cultural Heritage Management Plan does not allow disturbance of an area or for any reason permits are not granted to disturb known sites.

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### Zones and Overlays

32. Rezone privately owned land in the Public Conservation and Recreation Zone after review by the Planning Authority regarding the appropriate alternative zoning.

33. Review the appropriateness of the SUZ1 and the proposed Work Authority boundaries having regard to both environmental constraints and the desirability of alignment of zone and ownership boundaries. Rezoning the land owned by the Proponent to Industrial 2 Zone should be considered if it is not subject to

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The Minister’s Assessment under the EE Act 1978 does not include conclusions on statutory planning matters that are unrelated to the assessment of environmental effects associated with the proposal.
environmental constraints.

34. Rezone land the currently in the Rural Conservation Zone that is within the exhibited extraction area to Industrial 2 Zone.

35. Provide for two phases of development planning by specifically requiring a ‘Post-rehabilitation Phase’ development plan in Development Plan Overlay 1 (DPO1). The City of Greater Geelong should formulate the associated revision of the schedule to DPO1 which would need to specify a requirement for a second phase development plan, the timing of the preparation of such a plan and development plan requirements for the development of an industrial precinct.

<table>
<thead>
<tr>
<th>n/a</th>
<th>Supported</th>
<th>Section 3.7 (Rehabilitation)</th>
</tr>
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</table>

**Commonwealth Matters under EPBC Act**

36. The Victorian Minister for Planning advise the Commonwealth Minister for Environment, Water, Heritage and the Arts that the Mountain View Quarry Point Wilson Extension project will not have a significant impact on any listed threatened species or communities under the EPBC Act provided the relevant mitigation and adaptive management measures identified in the EES and this report are implemented.

| It is my assessment that this recommendation be supported subject to variations, as set out within the body of this Assessment. | Section 3.3 (Ecology, Flora & Fauna), and Section 3.4 (Hydrology & Aquatic Environments) |
Appendix - Further Legislative and Policy Context

**Extractive Industries Development Act 1995**

The *Extractive Industries Development Act 1995* (EID Act) regulates extractive industry activities throughout Victoria. Schedule 1 of the *Extractive Industries Development Regulations 2007* requires approved Work Plans to address a number of environmental matters, including through the development of an Environmental Management Program. DPI Guidelines\(^7^2\) have been developed to assist proponents in the preparation of the Work Plan in order to address the requirements of the Regulations EID Act.

The EID Act requires all land affected by the industry to be rehabilitated (Section 31), in accordance with an approved rehabilitation plan.

**Planning and Environment Act 1987**

The objectives for planning in Victoria are set under Section 4(1) of the P&E Act. Some relevant objectives include:

- (a) to provide for the fair, orderly, economic and sustainable use and development of land;
- (b) to provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity;
- (c) to conserve and enhance those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest or otherwise of special cultural value;
- (d) to facilitate development in accordance with the objectives set out in paragraphs (a), (b), (c), (d) and (e);
- (e) to balance the present and future interests of all Victorians.

The Act’s objectives establish a broad framework for considering the implications of land use and development, and from a more contemporary perspective may be seen to encompass environmental, economic and social aspects of sustainable development.

Clause 52.09 of the *Victorian Planning Provisions* (VPP) specifically cover extractive industry. The provisions ensure that use and development of land for extractive industry does not adversely affect the environment or amenity of the area, that excavation areas can be appropriately rehabilitated and that sand and stone resources are protected from inappropriate development.

The *State Planning Policy Framework* (SPPF), which is part of the Yarriambiack and Northern Grampians Planning Schemes, sets State-level policy for land-use planning and for considering development proposals. The SPPF highlights the need for planning and development to balance key principles relating to settlement, environment, resource management, infrastructure, economic well-being and social needs. Moreover, clause 11.02 of the SPPF sets a goal of ‘integrating environmental, social and economic factors in the interests of net community benefit and sustainable development’.

Specific clauses in the SPPF that are relevant to the assessment of the environmental and related effects of the proposal include:

- Protection of catchments, waterways and groundwater (clause 15.01)
- Air quality (clause 15.04)
- Noise abatement (clause 15.05)
- Soil Contamination (clause 15.06)
- Conservation of native flora and fauna (clause 15.09)
- Heritage (clause 15.11)
- Industry (clause 17.03)
- Agriculture (clause 17.05)

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\(^7^2\) Work Plan Guidelines (G3) for Areas of 5 Hectares or More or Greater Than 2 Metres in Depth (DPI)
The **Local Planning Policy Framework (LPPF)** identifies the long terms directions for land-use and development within a municipality and provides the framework and basis for zones, overlays and specific provisions of a Planning Scheme. Relevant aspects of the LPPF for the Yarriambiack and Northern Grampians Planning Schemes (including the SPPF) need to be considered in the context of broader land-use development decisions.

Victoria’s **Native Vegetation Management Framework – A Framework for Action (NVMF)** implements the principles of the Victorian Biodiversity Strategy (1997). The NVMF is implemented largely through the P&E Act, in the Victorian Planning Provisions that apply to all Planning Schemes, in particular through clauses 15.09 and 52.17. The goal of the NVMF is to achieve a ‘net gain’ in the area and quality of native vegetation, in part by applying a three step approach when development proposals are considered:

- **Avoid** adverse impacts, particularly through vegetation clearance;
- **Minimise** impacts if they cannot be avoided;
- **Offset** impacts that cannot be avoided or minimised.

When there is an exemption for a planning permit the principles and requirements of the framework are still relevant and are implemented through the EES and Work Plan processes.

**Flora and Fauna Guarantee Act 1988 and Biodiversity Policy**

Under section 4(1) of the FFG Act, the objectives of flora and fauna conservation and management in Victoria include:

- **a)** to guarantee that all taxa of Victoria’s flora and fauna other than the taxa listed in the Excluded List can survive, flourish and retain their potential for evolutionary development in the wild; and
- **b)** to conserve Victoria's communities of flora and fauna; and
- **c)** to manage potentially threatening processes; and
- **d)** to ensure that the genetic diversity of flora and fauna is maintained.

Part 3 of the FFG Act establishes a process of listing threatened species and ecological communities which are in a demonstrable state of decline which is likely to result in extinction, as well as potentially threatening processes which could pose a significant threat to the survival or evolutionary development of a range of flora or fauna. Action statements provide background information about the listed threatened species, reasons for its decline and the threats which affect it.

**Victoria’s Biodiversity Strategy (1997)** was prepared under section 17 of the Act, following the Victorian Government’s signing of the National Strategy for the Conservation of Australia’s Biodiversity in 1996.

Victoria’s Biodiversity Strategy identifies goals for biodiversity management in Victoria, including ensuring that:

- There is a reversal across the entire landscape, of the long term decline in the extent and quality of native vegetation, leading to a net gain with the first target being no net loss by the year 2001;
- The ecological processes and the biodiversity dependent upon terrestrial, freshwater and marine environments are maintained and, where necessary, restored;
- The present diversity of species and ecological communities and their viability is maintained or improved across each bioregion;
- There is no further preventable decline in the viability of any rare species or of any rare ecological community;
- There is an increase in the viability of threatened species and in the extent and quality of threatened ecological communities.

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73 In May 2009 DPI released the [Native Vegetation Management Guidelines for the Earth Resources Industries](https://www.dpi.vic.gov.au)
**Water Act 1989**

The purpose of the Water Act 1989 is to conserve, allocate and manage terrestrial surface and ground waters, including the following specific purposes set out in the Act:

- (c) To promote the orderly, equitable and efficient use of water resources.
- (d) To make sure that water resources are conserved and properly managed for sustainable use for the benefit of present and future Victorians.
- (j) To provide a formal means for the protection and enhancement of the environmental qualities of waterways and their in-stream uses.

The Minister for Environment and Water may allocate water resources through bulk water entitlements and issue licences to take and use water from waterways and groundwater. Sections 53 and 40 of the Water Act 1989 specify the range of matters that must be taken into account in considering an application for a license to take and use water. These matters include existing and project water availability, water quality, the requirements of existing and competing users, any adverse effects that the allocation may have on waterways, aquifers, the drainage regime and government conservation policies and legislation.

The SEPP (Groundwaters of Victoria) provides the framework for protection of groundwater resources in the state and has the aims of maintaining and, where possible, improving groundwater quality and the protection of beneficial uses, including receiving surface water environments.

**Environment Protection Act 1970**

The principles of environment protection are set out in sections 1B to 1L of this Act. Those potentially relevant to this proposal and Assessment are:

1B. Principle of integration of economic, social and environmental considerations
1C. Precautionary principle
1D. Principle of intergenerational equity
1E. Principle of conservation of biological diversity and ecological integrity

In addition, the Environment Protection Act 1970 provides for the making of subordinate legislation including Regulations, Waste Management Policies and SEPPs. SEPPs provide the policy basis for maintaining environmental quality sufficient to protect existing and anticipated beneficial uses of the environment. The following are particularly relevant to the present proposal:

- **SEPP (Groundwaters of Victoria)** provides for the protection of beneficial uses of groundwater, including the maintenance of ecosystems, water supply and industrial water use.
- **SEPP (Air Quality Management)** provides for the protection of beneficial uses dependent on clean air quality.
- **SEPP (Prevention and Management of Contamination of Land)** provides for the protection of beneficial uses of land and the preventing the contamination of land.
- **Environment Protection (Environment and Resource Efficiency Plans) Regulations 2007.**

The EPA also prepares policy guidance to aid the implementation of the Act and subordinate legislation. The following are relevant to this Assessment:


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**Footnote:**

74 These principles are derived in part from the Principles of Environmental Decision-Making adopted by all jurisdictions in Australia as part of the 1992 Inter-Governmental Agreement on the Environment (i.e. IGAE).
Commonwealth EPBC Act 1999

The DMS Project has been declared to be a ‘controlled action’ requiring assessment and approval under the EPBC Act. The EES process was accredited as the required assessment process for this project, and as such this Assessment needs to assess the potential for significant impacts on the controlling provisions (see section 2.3.7). In this context, it will be appropriate to have regard to the guidance provided in Matters of National Environmental Significance: Significant Impact Guidelines 1.1.

International Agreements (Ramsar Convention, JAMBA and CAMBA)

Several international conventions and treaties are relevant, in particular:

- The Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site is listed under the Convention on Wetlands of International Importance (Ramsar Convention) (1971), which promotes the conservation, wise use and repair of wetlands and obliges member countries to list Wetlands of International Importance and protect their ecological character;
- Several of the migratory waterbird species that frequent the Ramsar site and the Bay are listed under the Japan – Australia Migratory Birds Agreement (JAMBA); the China – Australia Migratory Birds Agreement (CAMBA); and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

The SPPF obliges planning and responsible authorities under the P&E Act to consider the implications of proposals with respect to these treaty obligations.

National Strategy for Ecologically Sustainable Development

In 1992 all jurisdictions in Australia agreed to the National Strategy for Ecologically Sustainable Development, which defined and articulated objectives and guiding principles of ecologically sustainable development (ESD). This framework has informed subsequent government reforms and programs. In Victoria, the definition and objectives of ESD have recently been incorporated in the MRSD Act (through amendments in 2006). They were previously given formal recognition in Section 4 of the Commissioner for Environmental Sustainability Act 2003, viz.:

1. Ecologically sustainable development is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

2. The objectives of ecologically sustainable development are:
   (a) to enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
   (b) to provide for equity within and between generations;
   (c) to protect biological diversity and maintain essential ecological processes and life-support systems.

3. The following are to be considered as guiding principles of ecologically sustainable development:
   (a) that decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equity considerations;
   (b) if 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;
   (c) the need to consider the global dimension of environmental impacts of actions and policies;
   (d) the need to develop a strong, growing and diversified economy which can enhance the capacity for environment protection;
   (e) the need to maintain and enhance international competitiveness in an environmentally sound manner;
   (f) the need to adopt cost effective and flexible policy instruments such as improved valuation, pricing and incentive mechanisms;
   (g) the need to facilitate community involvement in decisions and actions on issues that affect the community.

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75 Australian Government (Department of the Environment and Heritage), May 2006.
This framework for ESD has been adopted in the EES Ministerial Guidelines (June 2006) as a framework of reference, in combination with the principles of environment protection under the *Environment Protection Act 1970* and other applicable legislation and policy to inform the assessment of environmental effects.