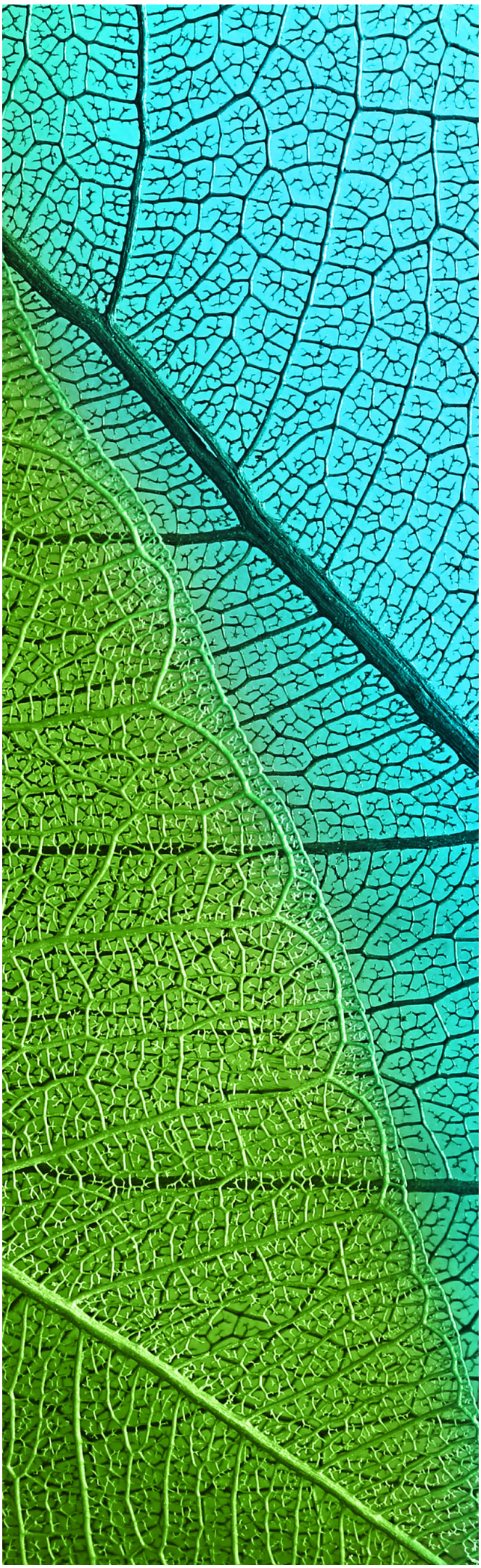

Cave Hill Quarry Lilydale

Flora and Fauna Assessment

Prepared for
Intrapac Projects Pty Ltd

April 2020
Report No. 7019 (7.4)

Nature Advisory
(Formerly Brett Lane & Associates Pty Ltd)
5/61-63 Camberwell Road
Hawthorn East, VIC 3123
PO Box 337, Camberwell VIC 3124
(03) 9815 2111
www.natureadvisory.com.au

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1 Executive summary

Nature Advisory Pty Ltd (formerly Brett Lane & Associates) was engaged by Intrapac Pty Ltd to update the existing Flora and Fauna assessment of the Cave Hill Quarry site at Melba Ave, Lilydale to comply with the Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017). The assessment will be used to support the preparation of a Development Plan and a Planning Scheme Amendment (PSA) submission for the rezoning of the site to a Comprehensive Development Zone.

The study area predominantly supported planted trees and shrubs. Dominant planted species included non-indigenous natives such as Spotted Gum, Southern Mahogany, Sugar Gum and Giant Honey-myrtle, which were planted in high numbers around the study area boundary.

No EPBC Act-listed flora species or ecological communities have been recorded during the assessments to date and none are considered likely to occur due to the highly modified and degraded nature of the study area.

The following native vegetation was recorded in the study area and is proposed to be removed by the proponent:

- 1.048 hectares of native vegetation, comprising:
  - Two patches of Herb-rich Foothill Forest (EVC 23), totalling 0.838 hectares; and
  - Three large scattered trees, totalling 0.210 hectares.

The following offsets will be required to compensate for the removal of this native vegetation from the study area:

- 0.178 general habitat units and must include the following offset attribute requirements:
  - Minimum strategic biodiversity value (SBV) of 0.256.
  - Occur within the Port Phillip and Westernport CMA boundary or the Yarra Ranges Shire Council.
  - Include protection of at least three large trees.

Under the Guidelines all offsets must be secured prior to the removal of native vegetation.

Given that the proposal would remove more than 0.5 hectares of native vegetation, it will be assessed under the **Detailed** assessment pathway and it **would** trigger a referral to DELWP.

The Native Vegetation Removal (NVR) report for this proposed removal is provided in the appendices. The table below summarises the compliance of the information in this report with the relevant application requirements of the Guidelines (DELWP 2017).

A planning permit will be required under Clause 52.17 of the Yarra Ranges Planning Scheme for the removal of native vegetation, in the form of patches, scattered trees and scattered indigenous flora from within the study area.

A permit will be required under Heritage Overlay Schedule 201 and Heritage Overlay Schedule 57 of the Yarra Ranges Planning Scheme to destroy, remove or lop any tree (including planted trees) within the parts of the study area covered by these overlays.

One listed threatened fauna species (Grey-headed Flying-fox) and one migratory bird species (Fork-tailed Swift) are considered to have the potential to occur within the study area. An assessment of the susceptibility of these species to the development found it is unlikely they would be significantly impacted upon.

The table below summarises the compliance of the information in this report with the application requirements of the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017a).

Application requirement		Response
1.	Information about the native vegetation to be removed	See Section 5 of this report.
2.	Topographic and land information relating to the native vegetation to be removed	See Section 5 of this report.
3.	Recent, dated photographs of the native vegetation to be removed	See Appendix 6 of this report.
4.	Details of any other native vegetation approved to be removed, or that was removed without the required approvals, on the same property or on contiguous land in the same ownership as the applicant, in the five-year period before the application for a permit is lodged	N/A
5.	An avoid and minimise statement	See Section 7.2.1 of this report.
6.	A copy of any Property Vegetation Plan contained within an agreement made pursuant to section 69 of the *Conservation, Forests and Lands Act 1987* that applies to the native vegetation to be removed	N/A
7.	Where the removal of native vegetation is to create defendable space, a written statement explaining why the removal of native vegetation is necessary. This statement is not required when the creation of defendable space is in conjunction with an application under the Bushfire Management Overlay.	N/A
8.	If the application is under Clause 52.16, a statement that explains how the proposal responds to the Native Vegetation Precinct Plan considerations (at decision guideline 8).	N/A

	Application requirement	Response
9.	An offset statement providing evidence that an offset that meets the offset requirements for the native vegetation to be removed has been identified and can be secured in accordance with the Guidelines	See Appendix 8 of this report.
	Additional requirements for applications in the *Detailed* assessment pathway	
10.	A site assessment report of the native vegetation to be removed, including: - A habitat hectare assessment of any patches of native vegetation, including the condition, extent (in hectares), Ecological Vegetation Class and bioregional conservation status. - The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any large trees within patches - The location, number, circumference (in centimetres measured at 1.3 metres above ground level) and species of any scattered trees, and whether each tree is small or large.	See Appendix 2 of this report for detailed habitat hectare assessment results. See Table 3 and Figures 1& 2 of this report for scattered tree information.
11.	Information about impacts on rare or threatened species habitat, including: The relevant section of the Habitat importance map for each rare or threatened species requiring a species offset. For each rare or threatened species that the native vegetation to be removed is habitat for, according to the Habitat importance maps: - the species' conservation status - the proportional impact of the removal of native vegetation on the total habitat for that species - whether their habitats are highly localised habitats, dispersed habitats, or important areas of habitat within a dispersed species habitat.	See Appendix 7 of this report.

2 Introduction

BL&A was engaged by Intrapac Pty Ltd to update the existing Flora and Fauna assessment of the Cave Hill Quarry site at Melba Ave, Lilydale to comply with the Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017). The site has operated as a limestone quarry for 135 years. The proposed Comprehensive Development Plan that has been prepared for the quarry site reflects a vision for the redevelopment of the land over the next 15-20 years.

Land within the study area on the eastern side of the railway line was affected by Work Authority (WA) 199. WA199 allowed Sibelco to carry out mining activities on the land. Under the WA199 approval, all trees (and vegetation) other than the landscape perimeter were permitted to be removed.

This investigation was commissioned to provide information on the extent and condition of native vegetation and fauna habitat in the study area, to provide supporting evidence for a Planning Scheme Amendment (PSA) for the Lilydale Quarry site. This report outlines the likely implications of development of the site under relevant national, state and local legislation and policy frameworks, including Victoria's Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017)., the state *Flora and Fauna Guarantee Act 1988* (FFG Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*.

This report has been commissioned to provide information to support a PSA request, and as such the precise requirements under the aforementioned acts would need to be addressed at the Planning Permit stage once the land has been rezoned and a development footprint has been determined.

The area covered by this investigation and report is shown in Figure 1, and is limited to the Lilydale Quarry site, excluding the Stage One area which was investigated in a previous report (BL&A Report No. 7019 (4.2)), and for which a Planning Permit has already been granted.

Specifically, the scope of the investigation included:

- Review of existing information on the flora, fauna and native vegetation of the area, including:
  - Victorian Biodiversity Atlas administered by the Department of Environment, Land, Water and Planning (DELWP); and
  - The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool.
- A site survey involving:
  - Characterisation and mapping of native vegetation on the site, as defined in Victoria's *Guidelines for the Removal, Destruction or lopping of Native Vegetation* (the 'Guidelines');

- Assessment of native vegetation in accordance with the Guidelines, including habitat hectare assessment and/or scattered tree assessment;
- Compilation of indicative flora species lists for the site;
- Assessment of the nature and quality of native fauna habitat; and
- An updated assessment of the likelihood of occurrence of EPBC Act and *Flora and Fauna Guarantee Act 1988* (FFG Act) listed flora, fauna and communities on the site.

This report is divided into the following sections:

Section 3 describes the sources of information, including the methods used for the field survey.

Section 4 provides the legislative background including details of all relevant Commonwealth, State and local legislation and policies.

Section 5 presents the assessment results, including details of the native vegetation, flora and fauna of the study area.

Section 6 discusses the proposed impacts of the project.

Section 7 details the implications of the findings under the relevant legislation and policy.

Section 8 provides recommendations to mitigate impacts to natural values during and post construction.

This investigation was undertaken by a team from Nature Advisory comprising Elinor Ebsworth (Botanist), Verity Fyfe (Botanist), Brett MacDonald (Senior Ecologist) and Inga Kulik (Senior Ecologist & Project Manager).

3 Sources of information

3.1 Existing information

Existing information used for this investigation is described below.

3.1.1 Existing reporting and documentation

The existing documentation below, relating to the study area was reviewed.

- Yarra Ranges Planning Scheme
- Flora and Fauna Assessment (Stage A), Cave Hill Limestone Quarry – BL&A 2010; ref. 7019 (2.5)
- Flora and Fauna Assessment, Cave Hill Limestone Quarry – BL&A 2011; ref. 7019 (3.0)
- Vegetation Assessment, Cave Hill Limestone Quarry – BL&A 2014; ref. 7019 (4.2)
- Flora and Fauna Assessment, Cave Hill Limestone Quarry – (BL&A 2015; ref. 7019 (7.2)

3.1.2 Native vegetation

Pre-1750 (pre-European settlement) vegetation mapping administered by DELWP was reviewed to determine the type of native vegetation likely to occur in the study area and surrounds. Information on Ecological Vegetation Classes (EVCs) was obtained from published EVC benchmarks. These sources included:

- Relevant EVC benchmarks for the Victorian Volcanic Plain bioregion[1] (DSE 2004a);
- *NatureKit* (DELWP 2020a).

3.1.3 Listed matters

Existing flora and fauna species records and information about the potential occurrence of listed matters was obtained from an area termed the 'search region', defined here as an area with a radius of ten kilometres from the approximate centre point of the study area (coordinates: latitude 37˚ 46' 05" S and longitude 145˚ 20' 20" E).

A list of the flora and fauna species recorded in the search region was obtained from the Victorian Biodiversity Atlas (VBA), a database administered by DELWP.

The online EPBC Act Protected Matters Search Tool (DAWE 2020) was consulted to determine whether nationally listed species or communities potentially occurred in the search region based on habitat modelling.

[1] A bioregion is defined as "a geographic region that captures the patterns of ecological characteristics in the landscape, providing a natural framework for recognising and responding to biodiversity values". In general bioregions reflect underlying environmental features of the landscape (DNRE 1997).

3.2 Field methodology

The field assessment was conducted on the 7th May 2015. During this assessment, the study area was inspected initially by vehicle and areas supporting remnant native vegetation and/or fauna habitat were surveyed in more detail on foot.

Sites in the study area found to support native vegetation and/or habitat for rare or threatened flora and/or fauna were mapped. Mapping was undertaken through a combination of aerial photograph interpretation and ground-truthing using a hand held GPS (accurate to approximately five metres).

3.2.1 Native vegetation

Native vegetation is currently defined in Clause 73.01 of all Victorian planning schemes as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'. The Guidelines (DELWP 2017a) further classify native vegetation as belonging to two categories:

- Patch; or
- Scattered tree.

The definitions of these categories are provided below, along with the prescribed DELWP methods to assess them. Further details on definitions of patches and scattered trees are provided in Appendix 1.

Patch

A patch of native vegetation is either:

- An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native; or
- Any area with three or more native canopy trees2 where the drip line3 of each tree touches the drip line of at least one other tree, forming a continuous canopy; or
- Any mapped wetland included in the Current wetlands map, available at MapShareVic (DELWP 2020b).

Patch condition is assessed using the habitat hectare method (Parkes *et al.* 2003; DSE 2004b) whereby components of the patch (e.g. tree canopy, understorey and ground cover) are assessed against an EVC benchmark. The score effectively measures the percentage resemblance of the vegetation to its original condition.

The *Native Vegetation Information Management* (NVIM) system (DELWP 2020c) provides modelled condition scores for native vegetation to be used in certain circumstances.

[2] A native canopy tree is a mature tree (i.e. it is able to flower) that is greater than 3 metres in height and is normally found in the upper layer of the relevant vegetation type.
[3] The drip line is the outermost boundary of a tree canopy (leaves and/or branches) where the water drips on to the ground.

Scattered tree

A scattered tree is:

- A native canopy tree2 that does not form part of a patch.

Scattered trees are counted and mapped, the species identified and their circumference at 1.3 m above the ground is recorded.

3.2.2 Flora species and habitats

Records of flora species were made in conjunction with sampling methods used to undertake habitat hectare assessments of native vegetation described above. Specimens requiring identification using laboratory techniques were collected.

Species protected under the FFG Act were determined by crosschecking against the FFG Act Protected Flora List (DELWP 2017b).

The potential for habitats to support listed flora species was assessed based on the criteria outlined below:

- The presence of suitable habitat for flora species such as soil type, floristic associations and landscape context; and
- The level of disturbance of suitable habitats by anthropogenic disturbances and invasions by pest plants and animals.

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence or flora listed under the EPBC Act and/or FFG Act. That is, where insufficient evidence was available on the potential occurrence of a listed species, it is assumed that it could be in an area of suitable habitat.

3.2.3 Fauna species and habitats

The techniques below were used to detect fauna species utilising the study area.

- Incidental searches for mammal scats, tracks and signs (e.g. diggings, signs of feeding and nests/burrows).
- Daytime bird observations.
- General searches for reptiles and frogs.

Fauna habitats are described using habitat components that include old-growth trees, fallen timber, leaf litter and surface rocks.

The study area's habitat connectivity (i.e. degree of isolation/fragmentation), including linkages to other habitats in the region, was determined using field observations, recent aerial photography and *NatureKit* (DELWP 2020a).

Wherever appropriate, a precautionary approach was adopted in determining the likelihood of occurrence or fauna listed under the EPBC Act and FFG Act. That is, where insufficient evidence was available on the potential occurrence of a listed species, it is assumed that it could be in an area of suitable habitat.

3.2.4 Threatened ecological communities

The study area was assessed against published descriptions of relevant listed ecological communities modelled to potentially occur in the study area.

Reviewed ecological community descriptions comprised identification criteria and condition thresholds from listing advice for EPBC Act communities as well as FFG Act listed community descriptions (SAC 2015).

3.3 Limitations of field assessment

Where feasible, all efforts are made to schedule flora and fauna field surveys in optimal weather conditions and times of year. Nevertheless, field surveys usually fail to record all species present for various reasons, including the seasonal absence of some species and short survey duration. Rare or cryptic species are often missed in short surveys.

The vegetation assessment was carried out in late autumn, when many annual and spring-emergent plant species may have been absent or in the senescent stage of their life-cycle and lacking essential identification characteristics. The timing of the survey and condition of vegetation was otherwise considered suitable to ascertain the extent and quality of native vegetation.

The fauna assessment was undertaken during fine and mild to cool and drizzly autumn weather conditions with light winds. These conditions were considered suitable for detecting most fauna groups likely to occur in the study area. Spring-breeding frogs would be difficult to detect at this time of year and a few species of migratory birds would have been absent.

As the primary purpose of the investigation was to assess the extent and quality of native vegetation and fauna habitats in the study area, the review of existing information, combined with the field survey were sufficient to complete this aspect of the assessment.

Wherever appropriate, a precautionary approach has been adopted in the discussion of implications. That is, where insufficient evidence is available on the occurrence or likelihood of occurrence of a species, it is assumed that it could be in an area of suitable habitat. The implications under legislation and policy are considered accordingly.

4 Planning and legislative considerations

This investigation and report address the application on the site of relevant legislation and planning policies that protect biodiversity. Local, state and Commonwealth controls are summarised below.

4.1 Local planning provisions

The study area is located within the Yarra Ranges local government area and is currently zoned Special Use Zone – Schedule 1 in the Yarra Ranges Planning Scheme.

The study area is located within a Bushfire-prone Area.

Local planning provisions apply under the *Victorian Planning and Environment Act 1987*.

4.2 Overlays

Four small areas within areas of planted trees at the northern end of the site are subject to Heritage Overlays. The purpose and implications of these overlays are provided below:

- **Heritage Overlay – Schedule 201 (HO201)** - Cave Hill: Limestone Works, Melba Avenue, Lilydale.
- **Heritage Overlay – Schedule 57 (HO57)** - Old Cave Hill Butter, Cheese & Bacon Curing Factory, David Mitchell Estate, Melba Ave, Lilydale.

The purpose of these overlays is to conserve and enhance heritage places of natural or cultural significance. Tree controls apply. As such a permit is required under these overlays to destroy, remove or lop any tree (even planted trees) within the areas applicable.

4.2.1 State planning provisions

State planning provisions are established under the *Victorian Planning and Environment Act 1987*.

Clause 52.17 of all Victorian Planning Schemes states that:

A permit is required to remove, destroy or lop native vegetation, including dead native vegetation.

A permit is not required if:

- If an exemption in Table 52.17-7 specifically states that that a permit is not required.
- If a native vegetation precinct plan corresponding to the land is incorporated into the planning scheme and listed in the schedule to Clause 52.16.
- If the native vegetation is specified in a schedule to Clause 52.17.

4.2.2 Exemptions

No exemptions to Clause 52.17 are relevant to this project.

4.2.3 Application requirements

Any application to remove, destroy or lop native vegetation must comply with the application requirements specified in the Guidelines (DELWP 2017a).

When assessing an application, Responsible Authorities are also obligated to refer to Clause 12.01-2 (Native vegetation management) in the Planning Scheme which in addition to the Guidelines, refers to the following:

- Assessor's handbook – applications to remove, destroy or lop native vegetation (Version 1.1) (DELWP 2018a).
- Statewide biodiversity information maintained by DELWP.

The application of the Guidelines (DELWP 2017a) are explained further in Appendix 1.

4.2.4 Referral to DELWP

Clause 66.02-2 of the planning scheme determines the role of DELWP in the assessment of native vegetation removal permit applications. If an application is referred, DELWP may make certain recommendations to the responsible authority in relation to the permit application.

Any application to remove, destroy or lop native vegetation must be referred to DELWP if:

- The impacts to native vegetation are in the Detailed Assessment Pathway;
- A property vegetation plan applies to the site; or
- The native vegetation is on Crown land which is occupied or managed by the responsible authority.

4.3 EPBC Act

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts on these species require the approval of the Australian Minister for the Environment.

If there is a possibility of a significant impact on nationally threatened species or communities or listed migratory species, a Referral under the EPBC Act should be considered. The Minister will decide after 20 business days whether the project will be a 'controlled action' under the EPBC Act, in which case it cannot be undertaken without the approval of the Minister. This approval depends on a further assessment and approval process (lasting between three and nine months, depending on the level of assessment).

Implications under the EPBC Act for the current proposal are discussed in Section 7.3.

4.4 FFG Act

The Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) lists threatened and protected species and ecological communities (DELWP 2018b, DELWP 2017b). Any removal of protected flora, which includes threatened flora species and the plants that make up threatened communities, listed under the FFG Act from public land requires a Protected Flora Licence or Permit under the Act, obtained from DELWP.

The FFG Act only applies to private land where a license is required to remove grass trees, tree ferns and sphagnum moss for sale, or where an Interim Conservation Order has been

made to protect critical habitat for a threatened species or community. As no such habitat has ever been declared, this mechanism under the FFG Act has never been implemented.

Implications under the FFG Act for the current proposal are discussed in Section 7.4.

4.5 EE Act

One or a combination of a number of criteria may trigger a requirement for a Referral to the Victorian Minister for Planning who will determine if an Environmental Effects Statement (EES) is required according to the *Ministerial Guidelines for Assessment of Environmental Effects under the* Environment Effects Act 1978 (DSE 2006).

The criteria related to flora, fauna and native vegetation which trigger a Referral are outlined below.

One or more of the following would trigger a Referral:

- Potential clearing of 10 hectares or more of native vegetation from an area that:
    - Is of an Ecological Vegetation Class identified as endangered by the Department of Sustainability and Environment (in accordance with Appendix 2 of Victoria's Native Vegetation Management Framework); or
    - Is, or is likely to be, of very high conservation significance (as defined in accordance with Appendix 3 of Victoria's Native Vegetation Management Framework); and
    - Is not authorised under an approved Forest Management Plan or Fire Protection Plan
- Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria
- Potential long-term change to the ecological character of a wetland listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'
- Potential extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems, over the long term

Two or more of the following would also trigger a Referral:

- Potential clearing of 10 hectares or more of native vegetation, unless authorised under an approved Forest Management Plan or Fire Protection Plan
- Matters listed under the Flora and Fauna Guarantee Act 1988:
    - Potential loss of a significant area of a listed ecological community; or
    - Potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or
    - Potential loss of critical habitat; or

Potential significant effects on habitat values of a wetland supporting migratory bird species.

Implications under the *Environment Effects Act 1978* (EE Act) for the current proposal are discussed in Section 7.5.

4.6 CaLP Act

The Catchment and Land Protection Act 1994 (CaLP Act) requires that landowners (or a third party to whom responsibilities have been legally transferred) must eradicate regionally prohibited weeds and prevent the growth and spread of regionally controlled weeds.

Weed species listed on the CaLP Act that have been recorded in the study area are discussed in Section 7.6.

5 Assessment results

5.1 Site description

The study area for this investigation (Figure 1) is the Cave Hill Quarry site in Lilydale, located approximately 35 kilometres east of Melbourne's CBD. It is bordered by Mooroolbark Road to the west, Melba Ave/Taylor Street to the north, and residential estates to the south and east. Lillydale Lake is located to the north east of the study area.

The topography of the study area has been extremely modified through the use of the site as a quarry. The quarry pit, which occurs in the centre of the site, is no longer mined for limestone and is approximately 120 metres deep. Excess clay and low-grade limestone previously excavated from the quarry now form steep mounds which occur around the perimeter of the quarry pit and eastern boundary of the site. The paddocks in the western part of the study area exhibit a steep topography. A large dam is present in the northern part of the site and a small farm dam lies in the paddock in the north-west corner. The site offices and additional buildings are placed to the north of the quarry pit.

As previously described (BL&A 2010; BL&A 2011; BL&A 2014; BL&A 2015), vegetation in the study area consists predominantly of planted trees and shrubs. Dominant species include Spotted Gum, Southern Mahogany, Sugar Gum and Giant Honey-myrtle, which have been planted in high numbers around the study area boundary. A mixture of planted indigenous and non-indigenous native trees occurred in dense numbers on excavated soil around the perimeter of the quarry. Commonly planted species in these areas include Manna Gum, Swamp Gum, Red Box, Sheoak, Hakea, Giant Honey-myrtle, Silver Wattle, Coast Wattle, Blue Gum and Blackwood. Further (previously unmapped) areas of planted vegetation were observed at the edge of the operational quarry site in the south-eastern corner. These areas are also dominated by Spotted Gum, Southern Mahogany, Sugar Gum and Giant Honey-myrtle.

Understorey vegetation throughout the site is dominated by introduced grasses and a variety of weed species. Cotoneaster was the most widespread weed at the site and was observed occurring prolifically within the western side of the quarry pit.

Large open paddocks occurred in the western part of the study area. The ground flora in this area is predominantly introduced and consists namely of introduced pasture grasses (i.e. Paspalum, Cocksfoot and Rye Grass) and common agricultural weeds (Clover and Ribwort). Scattered introduced shrubs (Hawthorn) occur throughout the paddocks.

Two patches of remnant native vegetation were observed in the western portion of the study area (Figure 1). The first was in the south-eastern corner of the grassy paddocks, and is dominated by native Weeping Grass (60% cover) but supported no other indigenous species. The second patch, occurring on the margins of the dam in the northern portion of the paddocks, is dominated by Green Rush and Marsh Club-sedge with the introduced Slender Rush.

Previously mapped remnant native vegetation within the study area included three scattered trees (large) within the western portion of the site (Figure 1).

The study area is bordered by the residential suburb of Lilydale to the north, west and south, and the park-like environment and artificial lake formed by Lilydale Lake to the east. There is a tenuous link of wooded habitats around Lilydale Lake and along Olinda Creek; otherwise the wooded and wetland habitats of the study area are rather isolated.

A number of biologically significant sites exist within a 5 km radius of the study area. The largest of these are: Olinda Creek pipeline (3.7 km south-east), Montrose Reserve (3.6 km south-east), Valley Road bushland, Croydon (4.1 km west), Lilydale Purification Plant (1.7 km north-east) and Leonard Road bushland (3.0 km east). These habitats are isolated from those of the study area.

The study area lies within the Highlands – Southern Fall bioregion and falls within the Port Phillip and Western Port catchment. It is currently zoned Special Use Zone – Schedule 1 (SUZ1) in the Yarra Ranges Planning Scheme. Two areas in the western part of the study area are subject to an Erosion Management Overlay (EMO). Four small areas in the northern part of the study area are subject to a Heritage Overlay (HO201 and HO57). The Lilydale Metropolitan rail line (Public Use Zone - Transport) runs through the centre of the study area to the west of the quarry pit. The proposed Lilydale Bypass footprint includes land to the north of study area and also some land at the northern end of the Lilydale Quarry site. The whole site is a designated Bushfire Prone Area.

5.2 Patches of native vegetation

Pre–European EVC mapping (DELWP 2020a) indicated that the study area and surrounds would have supported Herb-rich Foothill Forest (EVC 23), Valley Grassy Forest (EVC 47) and Plains Grassy Woodland (EVC 55) prior to European settlement based on modelling of factors including rainfall, aspect, soils and remaining vegetation.

Evidence on site, including floristic composition and soil characteristics, suggested that Herb-rich Foothill Forest (EVC 23) was present within the study area (Figure 1). A description of this EVC is provided in Appendix 5.

Two patches (referred to herein as habitat zones I & J) comprising the abovementioned EVC were identified in the study area (Table 1). This totalled an area of 0.837 hectares of native patch vegetation.

Table 1: Description of habitat zones in the study area

Habitat Zone	EVC	Description
I	Herb-rich Foothill Forest (EVC 23)	Highly modified and depauperate patch supporting two species of aquatic graminoids (Marsh Club-sedge and Green Rush). Introduced species include Slender Rush, Drain Flat Sedge and Dock.
J	Herb-rich Foothill Forest (EVC 23)	Highly modified and depauperate patch supporting only one native species (Weeping Grass). Introduced species include pasture grasses (Paspalum and Towoomba Canary-grass) and the high-threat weed Hawthorn (5% cover).

The habitat hectare assessment results for these habitat zones are provided in Table 2 More detailed habitat scoring results are presented in Appendix 2. Details of large trees in patches are provided in Appendix 3.

Table 2: Summary of habitat hectare assessment results

Habitat Zone	EVC	Area (ha)	Condition score (out of 100)	No. of Large Trees in habitat zone
I	Herb-rich Foothill Forest (EVC 23)	0.091	21	0
J	Herb-rich Foothill Forest (EVC 23)	0.746	16	0

Figure 1: Study area and native vegetation

Project: Cavehill Quarry, Lilydale **Client**: Intrapac Property Pty Ltd **Date**: 24/03/2020

- Study area
- Herb-rich Foothill Forest (EVC 23)
- Planted vegetation
- Large scattered tree

N

Metres 0 150

Nature Advisory
PO Box 337, Camberwell, VIC 3124, Australia
www.natureadvisory.com.au
03 9815 2111 - info@natureadvisory.com.au

5.3 Scattered trees

The three scattered were mapped as having once comprised the canopy of three different EVCs, but all met the benchmark large tree diameter at breast height (DBH) for their component EVCs. Scattered tree details are provided below in Table 3.

Table 3: Scattered trees recorded in the study area

Tree no.	Common name	Scientific name	Size Class	Representative EVC	DBH range (cm)
1	Narrow-leaf Peppermint	*Eucalyptus radiata*	Large	Plains Grassy Woodland (EVC 55)	>80
2	Narrow-leaf Peppermint	*Eucalyptus radiata*	Large	Valley Grassy Forest (EVC45)	>70
3	Manna Gum	*Eucalyptus viminalis*	Large	Herb-rich Foothill Forest (EVC 23)	>70

5.4 Flora species

5.4.1 Species recorded

During the field assessment 95 plant species were recorded, 27 of which had not previously been recorded on-site. Of the total number of plant species recorded on-site, 23 (24%) were indigenous and 72 (76%) were introduced, non-indigenous native or planted (Appendix 3).

5.4.2 Listed species

VBA records (DELWP 2020d) and the EPBC Protected Matters Search Tool (DEE 2020) indicated that within the search region there were records of, or there occurred potential suitable habitat for, 13 species listed under the Commonwealth EPBC Act and 12 listed under the state FFG Act, including 10 listed under both Acts. No flora species listed under the EPBC Act were recorded during the field survey.

The likelihood of occurrence in the study area of species listed under the EPBC Act and FFG Act is addressed in **Table 4.** Species considered 'likely to occur' are those that have a very high chance of being in the study area based on numerous records in the search region and suitable habitat in the study area. Species considered to have the 'potential to occur' are those for which suitable habitat exists, but recent records are scarce.

This analysis indicates that no listed flora species are likely to occur or have the potential to occur in the study area.

Flora species and communities protected under the FFG Act are now considered and protected under the Biodiversity Assessment Guidelines (DELWP 2017a), negating the requirement for assessment of likelihood of occurrence. Furthermore, controls under the FFG Act apply only to public land. As such, flora species listed only under the FFG Act have not been considered in the likelihood of occurrence assessment.

Table 4: Listed flora species and the likelihood EPBC Act-listed flora species in the study area

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Bacchus Marsh Wattle	*Acacia rostriformis*		L		1	20/12/2001	
River Swamp Wallaby-grass	*Amphibromus fluitans*	VU		River Swamp Wallaby-grass grows mostly in permanent swamps and also lagoons, billabongs, dams and roadside ditches. The species requires moderately fertile soils with some bare ground; conditions that are caused by seasonally-fluctuating water levels (DAWE 2020).	1	6/11/1996	No suitable habitat within study area. **Unlikely to occur**
Hairpin Banksia	*Banksia spinulosa var. cunninghamii*		Nominated		11	20/12/2014	
Eastern Spider-orchid	*Caladenia orientalis*	EN	L	Heathland and Heathy Woodland in coastal areas between the Mornington Peninsula and Wilsons Promontory (Jeanes & Backhouse 2006).	6	15/11/1992	No suitable habitat within study area. **Unlikely to occur**
Kilsyth South Spider-orchid	*Caladenia sp. aff. venusta (Kilsyth South)*	CR	L	Eucalyptus radiata - Eucalyptus cephalocarpa grassy open forest. The ground layer is species rich with patches of exposed ground and many orchids. Associated species include Joycea pallida, Patersonia fragilis (Swamp Iris), P. occidentalis, Thelionema caespitosum and Sphaerolobium minus (Coates et al. 2002).	1	28/10/1998	No suitable habitat within study area. **Unlikely to occur**
Matted Flax-lily	*Dianella amoena*	EN	L	Lowland grassland and grassy woodlands on well-drained to seasonally waterlogged fertile sandy loams to heavy cracking soils derived from sedimentary or volcanic Geology. It is widely distributed from eastern to south-western Victoria (DAWE 2020).	15	16/08/2019	No suitable habitat within study area. **Unlikely to occur**

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Buxton Gum	*Eucalyptus crenulata*	EN	L	Known from only two natural populations that are about 64 km apart, and separated by the Great Dividing Range. Yering: Low-lying, wet/swampy habitats that are seasonally cold with deep alluvial loams and a generally flat topography with scattered, periodically inundated depressions. Buxton: poorly drained hollow on the alluvial terraces adjacent to the Acheron River.	13	7/05/2014	Not recorded in study area. Beyond known range. **Unlikely to occur**
Strzelecki Gum	*Eucalyptus strzeleckii*	VU	L	Apparently endemic, confined to across the western section of the Strzelecki Range, from Neerim South in the north, south to Foster. Favours ridges, slopes and streambanks and deep fertile soils (Brooker & Slee 1996).	None	N/A	Not recorded in study area. Beyond known range. **Unlikely to occur**
Clover Glycine	*Glycine latrobeana*	VU	L	Found across south-eastern Australia in native grasslands, dry sclerophyll forests, woodlands and low open woodlands with a grassy ground layer. In Victoria, populations occur in lowland grasslands, grassy woodlands and sometimes in grassy heath (DAWE 2020).	None	N/A	No suitable habitat within study area. **Unlikely to occur**
Gully Grevillea	*Grevillea barklyana*		L		1	9/06/2017	
Round-leaf Pomaderris	*Pomaderris vacciniifolia*	CR	L	Occurs in damp forest and herb-rich foothill forest north-east of Melbourne in the upper catchments of the Yarra, Plenty and Yea rivers (DAWE 2020).	1	31/05/1996	No suitable habitat within study area. **Unlikely to occur**
Lilac Leek-orchid	*Prasophyllum colemaniae*	VU		known from one collection (1992) from Grassy Woodland near Bayswater, probably now extinct (Entwisle 1994).	None	N/A	No suitable habitat within study area. **Unlikely to occur**
Maroon Leek-orchid	*Prasophyllum frenchii*	EN	L	Grows mainly in open sedge swampland or in wet grassland and wet heathland generally bordering swampy regions. Sites are generally low altitude, flat and moist. Soils are generally moderately rich damp sandy or black clay loams. Climate is mild, with an annual rainfall of 600–1100 mm, occurring predominantly in winter and spring (DAWE 2020).	3	19/11/1990	No suitable habitat within study area. **Unlikely to occur**

Common Name	Scientific name	EPBC	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Green-striped Greenhood	*Pterostylis chlorogramma*	VU	L	Occurs in mixed Box-Stringybark forest with a shrubby understorey, often with Pteridium esculentum as a major component on sandy or clay loam soils (Duncan et al. 2009).	None	N/A	No suitable habitat within study area and beyond known range. **Unlikely to occur**
Swamp Fireweed	*Senecio psilocarpus*	VU		Herb-rich winter-wet swamps on volcanic clays or peaty soils (Walsh 1999). Known from approximately 10 sites between Wallan, about 45 km north of Melbourne, and Honans Scrub in south-eastern South Australia (TSSC 2008).	None	N/A	No suitable habitat within study area and beyond known range. **Unlikely to occur**
Swamp Everlasting	*Xerochrysum palustre*	VU	L	Grows in wetlands including sedge-swamps and shallow freshwater marshes, often on heavy black clay soils. Commonly associated genera include Amphibromus, Baumea, Carex, Chorizandra, Craspedia, Eleocharis, Isolepis, Lachnagrostis, Lepidosperma, Myriophyllum, Phragmites australis, Themea triandra and Villarsia (DAWE 2020).	4	5/10/2015	No suitable habitat within study area. **Unlikely to occur**

CR = Critically Endangered; **EN** = Endangered; **VU** = Vulnerable; **X =** Presumed Extinct; **L** = Listed as threatened under FFG Act

5.4.3 Planted Vegetation

A large amount of planted vegetation was observed within the study area, including that in previously mapped areas, and some additional areas within the operational area of the quarry. Planted trees included both indigenous and non-indigenous species. None of these trees constitute native vegetation and therefore no regulatory implications under the Biodiversity Assessment Guidelines apply.

5.5 Fauna

5.5.1 Habitat assessment

The study area supports the following habitat types:

- Native treed vegetation;
- Grazing paddocks;
- Aquatic habitat; and
- Quarry and built environment.

Native treed vegetation: This habitat consisted mostly of planted native trees and shrubs with a few introduced species in patches. Dominant overstorey species were Red Box, Swamp Gum, Manna Gum, Southern Mahogany, Sugar Gum and Spotted Gum. One stand of mature introduced Radiata Pines was also present. Common shrub layer plants included Giant Honey-myrtle and Hawthorn. Ground layer over the majority of the site comprised various introduced pasture grasses (e.g. Kikuyu and Couch) or leaf litter. One tree with hollows was observed (shown as Scattered Tree 3 on Figure 1). A small area of leaf litter had developed under some stands of trees, but very little fallen timber remained on the ground. Part of the ground layer had been regularly slashed. Land was used in this habitat for screening of the quarry site from local residential areas and filled soil stabilisation. The planted trees provided foraging for insectivorous and nectar eating birds and common mammals such as possums. It occupied only a small area (perhaps 5%) of the total study area had limited connectivity to remnant woodland blocks in the region. It was assessed as low quality fauna habitat based on the criteria.

Grazing paddocks: This habitat occupied a larger part of the study area, approximately 10%. Common elements were Couch, Weeping Grass, Cat's Ear, Bristled Ox-tongue, Subterranean Clover and Ribwort. This habitat lacks the majority of original elements and supported few fauna species, such as Rabbits, Foxes, Magpies and Ravens. It was assessed as low quality fauna habitat based on the criteria.

Aquatic habitat: This habitat comprised a few settling ponds and a farm dam, together with one minor drainage line. Most ponds were poorly vegetated although one was lined with sedges; generally they were highly turbid resulting from the quarrying and processing (washing) of rock. Aquatic habitats occupied a small proportion of the study area and were not well connected to other aquatic habitats in the surrounding region. They were considered likely to support only a few common water birds and frogs and were assessed as low quality fauna habitat based on the criteria.

Quarry and built environment: This habitat occupied the majority of the study area. It generally lacked vegetation except for some recolonising Cotoneaster. It would support few fauna species and was assessed as low quality fauna habitat based on the criteria.

5.5.2 Species recorded

During the field assessment 33 fauna species were recorded. This included 33 bird (six introduced), three mammal (two introduced) and three frog species (Appendix 5).

5.5.3 Listed species

The review of existing information (including VBA records (DELWP 2020d) and the results of the EPBC Protected Matters Search Tool (DAWE 2020)) indicated that within the search region there were records of, or there occurred potential suitable habitat for, 51 fauna species listed under the Commonwealth EPBC Act and the state FFG Act. The likelihood of occurrence of these species in the study area was assessed and the results are presented in Table 5.

This analysis of potential occurrence of listed fauna species excludes:

- Marine fauna given that the study area is inland
- Migratory oceanic bird species (such as albatrosses and petrels) and migratory shorebirds given that the study area is inland.

Species considered 'likely to occur' are those that have a very high chance of being in the study area given the existence of numerous records in the search region and suitable habitat in the study area. Using the precautionary approach, species considered to have the 'potential to occur' are those for which suitable habitat exists, but recent records are scarce. This analysis indicates that two listed fauna species are likely to occur or have the potential to occur. These species are:

- Fork-tailed Swift (EPBC Act: Migratory)
- Grey-headed Flying Fox (EPBC Act: Vulnerable)

The susceptibility of these species to impacts from development is discussed in Section 5.5.4.

Table 5: Listed fauna species and the likelihood of EPBC Act-listed fauna species in the study area

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Birds								
Australasian Bittern	*Botaurus poiciloptilus*	EN		L	Terrestrial wetlands, including a range of wetland types but prefers permanent water bodies with tall dense vegetation, particularly those dominated by sedges, rush, reeds or cutting grass (Marchant & Higgins 1990).	3	27/09/1988	No suitable habitat within study area. **Unlikely to occur.**
Australian Painted-snipe	*Rostratula australis*	EN		L	Generally inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum Muehlenbeckia or canegrass or sometimes tea-tree (Melaleuca). Sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber (DAWE 2020).	None	N/A	A lack of records in the search region for this species suggests that it is **unlikely to occur.**
Baillon's Crake	*Porzana pusilla*			L	Occurs in a range of ephemeral and permanent wetlands containing dense vegetation and abundant floating plants including swamps, creeks and lakes. Also occurs in open waters with clumped vegetation (Marchant & Higgins, 1993).	11	27/12/2018	No wetlands occur at the site – **unlikely to occur.**
Barking Owl	*Ninox connivens*			L	Eucalyptus dominated forests and woodlands, commonly near water-bodies, such as streams and rivers, and requires hollow trees for nesting and trees with dense foliage for roosting (Higgins 1999).	10	2/09/2004	No forests or woodlands occur at the site – **unlikely to occur.**

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Black Falcon	*Falco subniger*			L	Woodlands, open country and terrestrial wetlands; in arid and semi-arid zones; mainly over open plains and undulating land with large tracts of low vegetation. It is more commonly found in north-western Victoria and is only occasionally found in southern Victoria. It is a highly mobile species, moving in response to food availability and seasonal conditions (Marchant & Higgins 1993).	3	31/07/2018	May fly across the site occasionally, but **unlikely to occur** at the site.
Black-faced Monarch	*Monarcha melanopsis*		M (Bonn A2H)		Rainforests, eucalypt woodlands, coastal scrub and damp gullies (Higgins et al. 2006)	2	7/12/2006	A lack of records in the search region for this species suggests that it is **unlikely to occur.**
Blue-billed Duck	*Oxyura australis*			L	Terrestrial wetlands and prefers deep permanent, well vegetated water bodies. V (Marchant & Higgins 1990).	12	5/07/2019	No wetlands occur at the site – **unlikely to occur.**
Chestnut-rumped Heathwren	*Calamanthus pyrrhopygius*			L	Dense heathland and dense understorey or ground-layer in sclerophyll forests and woodlands; also in Box-ironbark forests. Widespread but sparsely distributed (Higgins & Peter 2002; Tzaros 2005).	5	28/05/2002	No suitable habitat within study area. **Unlikely to occur**
Diamond Firetail	*Stagonopleura guttata*			L	Commonly found in box-ironbark forests and woodlands and also occurs along watercourses and in farmland areas. Widespread but scattered. Forages on a wide range of seeds, which in some cases a large portion can be derived from weed species (Read 1994). Populations had declined in Victoria since the 1950s (Emison et al. 1987; Tzaros 2005).	2	7/07/1999	May fly across the site occasionally, but **unlikely to occur** at the site.

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Fork-tailed Swift	*Apus pacificus*		M (CAMBA, ROKAMBA, JAMBA)		The species can occur in wet sclerophyll forest but mainly prefers open forest or plains. It is almost exclusively aerial and feeds up to hundreds on metres above the ground, but can feed among open forest canopy. The species breeds internationally and seldom roosts in trees (Higgins 1999).	18	25/04/2000	This species has the potentially to occur above the study area while feeding on the wing. **Potential to occur.**
Freckled Duck	*Stictonetta naevosa*			L	Terrestrial wetlands; prefer fresh, densely vegetated waters, particularly floodwater swamps and creeks vegetated with lignum or cane grass. During dry seasons or droughts, move off ephemeral breeding swamps and occupy large permanent waters (Marchant & Higgins 1990).	9	8/06/2019	No wetlands occur at the site – **unlikely to occur.**
Grey Goshawk	*Accipiter novaehollandiae*			L	Inhabit rainforests, open forests, swamp forests, woodlands and plantations; most abundant where forest or woodland provide cover for hunting from perches. in Vic., most common in Otway ranges (Marchant & Higgins 1993).	26	2/01/2019	No suitable habitat within study area. **Unlikely to occur.**
Helmeted Honeyeater	*Lichenostomus melanops cassidix*	CR		L	Inhabits narrow patches of tall remnant eucalypt forest and woodlands along streams, or in surrounding swampland dominated by Mountain Swamp Gum with thickets of Scented Paperbark (Higgins et al. 2001). Currently only three populations exist in the wild, situated in riparian forest east of Melbourne (Zoos Victoria 2019).	1	24/05/1994	No suitable habitat within study area. **Unlikely to occur.**

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Hooded Robin	*Melanodryas cucullata*			L	Occur mostly in open Grey Box, White Box, Yellow Box, Yellow Gum and Ironbark woodlands with pockets of saplings or taller shrubs, an open shrubby understorey, sparse grasses and patches of bare ground and leaf-litter, with scattered fallen timber. The population has declined throughout range, especially since the early 1980s. This species typically occurs north of the great divide in shrubland or woodland dominated by acacias (Higgins & Peter 2002; Tzaros 2005).	3	1/03/1986	No suitable habitat within study area. **Unlikely to occur.**
Latham's Snipe	*Gallinago hardwickii*		M (Bonn A2H, ROKAMBA, JAMBA, CAMBA)		Occurs in wide variety of permanent and ephemeral wetlands; it prefers open freshwater wetlands with dense cover nearby, such as the edges of rivers and creeks, bogs, swamps, waterholes. The species is wide spread in southeast Australia and most of its population occurs in Victoria, except in the northwest of the state (Naarding 1983; Higgins & Davies 1996).	90	1/03/2019	No suitable habitat within study area. **Unlikely to occur**.
Lewin's Rail	*Lewinia pectoralis*			L	Occurs in a variety of densely vegetated wetland habitats, fresh or saline, and usually with areas of standing water. Requires shallow water areas for foraging (Marchant & Higgins, 1993).	25	26/11/2018	No wetlands occur at the site – **unlikely to occur.**
Little Egret	*Egretta garzetta*			L	It occurs in a range of coastal and terrestrial wetlands, including freshwater wetlands with vegetation such as bulrush and requires trees for roosting and nesting (Marchant & Higgins 1990).	8	21/07/2018	No wetlands occur at the site – **unlikely to occur.**
Yellow Wagtail	*Motacilla flava*		M (CAMBA, JAMBA, ROKAMBA)		Regular non-breeding visitor in northern Australia mainly spring-summer, vagrant to the south. Occupies a wide range of habitats, usually open areas with low vegetation such as crop, grassland and even parkland. Often recorded near water (Higgins, Peter & Cowling 1999)	None	N/A	A lack of records in the search region for this species suggests that it is **unlikely to occur.**

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Osprey	*Pandion cristatus*		M (Bonn A2S)		Rare vagrant to Victoria (Marchant & Higgins 1993). Littoral and coastal habitats and terrestrial wetlands. They are mostly found in coastal areas but occasionally travel inland along major rivers (Johnstone & Storr 1998; Marchant & Higgins 1993; Olsen 1995). They require extensive areas of open fresh, brackish or saline water for foraging (Marchant & Higgins 1993).	None	N/A	A lack of records in the search region for this species suggests that it is **unlikely to occur.**
Painted Honeyeater	*Grantiella picta*	VU		L	Inhabits box-ironbark forests and woodlands and mainly feeds on the fruits of mistletoe. Strongly associated with mistletoe around the margins of open forests and woodlands. Can also be found in farmland containing remnant treed vegetation. Occurs at few localities. Uncommon breeding migrant from further north, arriving in October and leaving in February (Higgins et al. 2001; Tzaros 2005).	None	N/A	A lack of records in the search region for this species suggests that it is **unlikely to occur.**
Plumed Egret	*Ardea plumifera*			L	It mainly inhabits terrestrial wetlands; only occasionally visit coastal wetlands and forages amongst aquatic vegetation in shallow water and requires trees for roosting and nesting. It often occurs in wetlands that contain vegetation, including bulrush (Marchant & Higgins 1990).	74	25/07/2019	No wetlands occur at the site – **unlikely to occur.**

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Powerful Owl	*Ninox strenua*			L	Found in open and tall wet sclerophyll forests with sheltered gullies and old growth forest with dense understorey. They are also found in dry forests with box and ironbark eucalypts and River Red Gum. Large old trees with hollows are required by this species for nesting. In Victoria, the Powerful Owl is widespread, having been recorded from most of the state. However, throughout its range it is uncommon and occurs in low densities (Higgins 1999). Also occurs in highly urbanised areas, such as metropolitan Melbourne, where they are heavily reliant upon various forms of movement corridors (riparian strips, roadside vegetation and recreational reserves) to both hunt within and navigate throughout the landscape (Carter et al. 2019).	253	15/05/2019	No suitable habitat within study area. **Unlikely to occur.**
Regent Honeyeater	*Anthochaera phrygia*	CR		L	Inhabits dry box-ironbark eucalypt forests near rivers and creeks on inland slopes of the Great Dividing Range. Can also occur in small remnant patches or in mature trees in farmland or partly cleared agricultural land (Higgins et al. 2001).	16	28/10/2009	Habitat sub-optimal (native treed vegetation). **Unlikely to occur regularly.**
Rufous Fantail	*Rhipidura rufifrons*		M (Bonn A2H)		In east and south-east Australia, mainly inhabits tall wet sclerophyll forests, often in gullies. When on passage in warmer months, they are sometimes recorded in drier sclerophyll forests and woodlands, as well as parks and gardens (Higgins et al. 2006). Virtually absent from south-eastern Australia during winter (Higgins et al. 2006).	105	4/03/2019	Habitat sub-optimal (native treed vegetation). **Unlikely to occur regularly.**

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Satin Flycatcher	*Myiagra cyanoleuca*		M (Bonn A2H)		Mostly found in eucalypt forest, particularly tall wet forests and woodland within gullies (Higgins et al. 2006). Also inhabits eucalypt woodland comprising an open understorey and a grassy ground layer (Higgins et al. 2006). Generally absent from rainforest (Higgins et al. 2006).	61	26/01/2019	Habitat sub-optimal (native treed vegetation). **Unlikely to occur regularly.**
Sooty Owl	*Tyto tenebricosa*			L	Inhabits old growth montane forests and wet or dry tall open sclerophyll forests (Higgins 1999).	83	17/10/2019	No suitable habitat within study area. **Unlikely to occur**
Speckled Warbler	*Pyrrholaemus sagittatus*			L	Inhabits dry eucalypt forests and woodlands, especially those with box-ironbark eucalypt associations. It is also found in River Red Gum woodlands. The species is uncommon; populations have declined since the 1980s (Higgins & Peter 2002; Tzaros 2005).	12	26/01/2000	No suitable habitat within study area. **Unlikely to occur.**
Square-tailed Kite	*Lophoictinia isura*			L	It occurs mainly in open forests and woodlands and in Victoria utilises habitats with box-ironbark, peppermint, Stringybark and River Red Gum eucalypt associations. The rarest and least seen bird in Victoria, mainly occur in the far east of the state, though occasionally recorded in central and western parts of the state (Marchant & Higgins 1993).	2	15/09/2018	May fly across the site occasionally, but **unlikely to occur** at the site.

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Superb Parrot	*Polytelis swainsonii*	VU		L	Occurs in eucalypt dominated forests and woodlands, namely comprised of River Red-gum, Yellow Box and Grey Box, with seasonal occurrences in box-pine and Boree woodland (Baker-Gabb 2011). The species range extends along major riverine systems and the inland slopes of the Great Divide, stretching from central Victoria to north of Tamworth in NSW. Breeds in hollow branch or trunk of tall eucalypts within 9 km of feeding areas. Mostly feeds in box woodlands and wooded farmlands; less often in riparian forests (Higgins 1999).	1	1/05/2005	Only one record within search region and no suitable habitat within study area. **Unlikely to occur.**
Swift Parrot	*Lathamus discolor*	CR		L	Prefers a select range of eucalypts in Victoria, including Yellow Gum, Grey Box, White Box, Red Ironbark and Yellow Box, as well as River Red-gum when this species supports abundant 'lerp' (Saunders & Tzaros 2011). The species is also known to forage within planted stands of Spotted Gum and Sugar Gum (Nature Advisory; unpublished data). Breeds in Tasmania and migrates to the mainland of Australia for the autumn, winter and early spring months. It lives mostly north of the Great Dividing Range, passing through two areas of Victoria on migration: the Port Phillip district and Gippsland (Emison et al. 1987; Higgins 1999; Kennedy & Tzaros 2005). Though it is also not uncommonly sighted in urban areas (Nature Advisory; unpublished data). Occurrence of this species on the mainland can substantially change from year to year depending on food availability, giving potential for this species to occur almost anywhere throughout its range (Emison et al. 1987).	24	5/04/2019	Habitat sub-optimal (native treed vegetation). **Unlikely to occur regularly.**

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
White-bellied Sea-Eagle	*Haliaeetus leucogaster*			L	Maritime habitats, terrestrial large wetlands and coastal lands of tropical and temperate Australia and offshore islands, ranging far inland only over large rivers and wetlands. The eagles usually breed on coast and offshore islands and inland beside large lakes or rivers, usually in tall trees in or near water, also in cliffs, rock pinnacles and escarpments (Marchant & Higgins 1993).	10	1/11/2018	No wetlands occur at the site – **unlikely to occur.**
White-throated Needletail	*Hirundapus caudacutus*	VU	M (CAMBA, ROKAMBA, JAMBA)		Aerial, over all habitats, but probably more over wooded areas, including open forest and rainforest. Often over heathland and less often above treeless areas such as grassland and swamps or farmland (Higgins 1999).	132	8/04/2019	Habitat sub-optimal (native treed vegetation). **Unlikely to occur regularly.**
Mammals								
Broad-toothed Rat	*Mastacomys fuscus mordicus*	VU		L	Specialist herbivore which occurs in high rainfall areas in eastern highlands, south gippsland highland and Otway ranges. Habitats include alpine herbfield, heath, woodland, sedgeland and coastal tussock grassland (Menkhorst 1995). This species has also been known to inhabit dense, heathy vegetation within disturbed areas such as powerline easements and alpine ski slopes (Clarke & White 2008; Whisson, Holland & Kelly 2015).	12	15/07/1989	Closest records are from Dandenong Ranges National Park, from which the study area is disconnected due to heavy urban development and main roads. **Unlikely to occur.**
Brush-tailed Phascogale	*Phascogale tapoatafa*			L	Dry forest and woodland in association with box, ironbark and stringybark eucalypts (Menkhorst 1995). Closely associated with remnant vegetation, this species occupies large home ranges of woodland habitat (M=100Ha; F=20-70Ha) (Menkhorst 1995).	114	21/12/2019	No suitable habitat within study area. **Unlikely to occur.**

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Common Bent-wing Bat	*Miniopterus schreibersii GROUP*			L	Roosts in caves during the day, dispersing over a range of habitats at night. Its feeding areas tend to be associated with major drainage systems (Menkhorst 1995).	4	10/03/1988	No suitable habitat within study area. **Unlikely to occur.**
Grey-headed Flying-fox	*Pteropus poliocephalus*	VU		L	Roosts in riverine habitat in Melbourne and forages widely in flowering eucalypts and fruit trees (Menkhorst 1995).	12	1/11/2008	Suitable habitat present. **Likely to occur.**
Long-nosed Potoroo	*Potorous tridactylus trisulcatus*	VU		L	In Victoria, the species occupies a wide variety of wet forest and wet scrub, usually occuring on sandy loam soils where rainfall exceeds 750mm annually (Menkhorst 1995); In Tasmania, moist forest with dense shrub layer; in the north edge of rainforest (Menkhorst 1995). Dense understorey vegetation is an essential component for the species persistence, which can consist of grass trees, sedges, ferns, heath, tea-tree or melaleucas (Menkhorst 1995).	None	N/A	A lack of records in the search region for this species suggests that it is **unlikely to occur.**
Smoky Mouse	*Pseudomys fumeus*	EN		L	Smoky Mouse occurs in a wide variety of habitats, from heath to dry sclerophyll forest, especially along ridgetops with a heath understorey, and occasionally adjacent wetter habitats such as fern gullies (Menkhorst 1995). A characteristic of many localities, except those in wet gullies, is a floristically diverse shrub layer with members of the plant families Epacridaceae, Fabaceae and Mimosaceae well represented (DEE 202X). Shrub seeds and berries are important food sources for the species, with fire frequency and intensity highly influential in the occurrence of such habitat, and ultimately the species (Menkhorst 1995).	None	N/A	No suitable habitat. No records within 10km. **Unlikely to occur.**

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Southern Greater Glider	*Petauroides volans*	VU		L	In Victoria, this species inhabits forest habitats dominated by peppermint, stringybark, ash and gum eucalypts (Menkhorst 1995). Restricted to the central highlands and eastern Victoria, and common in areas of high rainfall. Rare in dry stringybark-box and Snow Gum forest, and does not occur in the box-ironbark or River Red-gum dominated riverina regions (Menkhorst 1995).	24	27/02/2020	No suitable habitat within study area. **Unlikely to occur.**
Spot-tailed Quoll	*Dasyurus maculatus maculatus*	EN		L	Rainforest, wet and dry forest, coastal heath and scrub and River Red-gum woodlands along inland rivers (Menkhorst 1995).	2	20/07/1980	No suitable habitat within study area. **Unlikely to occur.**
Swamp Antechinus	*Antechinus minimus maritimus*	VU		L	Dense wet heath, tussock grassland, sedgeland heathy woodland and coastal heath and scrub (Menkhorst 1995). Requires mature, dense vegetation with thick ground cover (DAWE 2020). Shelters in short burrows or underneath dense leaf litter. Rarely occurs more than 200m above sea level. Though this species has also previously been detected at sites which had experienced some structural disturbance in the South Gippsland region (Nature Advisory; unpublished data).	None	N/A	A lack of records in the search region for this species suggests that it is **unlikely to occur.**

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Reptiles								
Striped Legless Lizard	*Delma impar*	VU		L	Grassland specialist. Known to occur in some areas dominated by introduced species such as Harding Grass Phalaris aquatica, Serated Tussock Nasella trichotoma and Flatweed Hypocharis radicata and at sites with a history of grazing and pasture improvement. shelter in grass tussocks, thick ground cover, soil cracks, under rocks, spider burrows, and under ground debris such as timber. The majority of sites in Victoria and NSW occur on cracking clay soils with some surface rock which provide shelter for the species (DAWE 2020).	None	N/A	A lack of records in the search region for this species suggests that it is **unlikely to occur.**
Swamp Skink	*Lissolepis coventryi*			L	Wetlands including swamp margins, lakes, rivers, creeks and even tidal salt marshes, often associated with tea-tree thickets (Wilson & Swan 2003).	6	17/12/2001	No wetlands occur at the site – **unlikely to occur.**
Frogs								
Brown Toadlet	*Pseudophryne bibronii*			L	Wet and dry forest, grassy areas besides small creeks, alpine grasslands and mossy bogs (Cogger 2000). In Victoria, the Brown Toadlet is distributed from the north-east through to central and western Victoria with scattered records in Gippsland (SWIFFT 2020).	2	7/07/1999	No wetlands occur at the site – **unlikely to occur.**
Growling Grass Frog	*Litoria raniformis*	VU		L	Permanent, still or slow flowing water with fringing and emergent vegetation in streams, swamps, lagoons and artificial wetlands such as farm dams and abandoned quarries (Clemann & Gillespie 2004).	15	30/12/2019	Habitat sub-optimal (aquatic - lacks basking sites and floating vegetation; poor connectivity). **Unlikely to occur.**

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Fish								
Australian Grayling	*Prototroctes maraena*	VU		L	Large and small coastal streams and rivers with cool, clear waters with a gravel substrate and altering pools and riffles (Cadwallader & Backhouse 1983).	3	9/04/2010	No suitable habitat within study area. **Unlikely to occur.**
Dwarf Galaxias	*Galaxiella pusilla*	VU		L	Ranges from the far west of the state through to the Mitchell River basin in central Gippsland. Vegetated margins of still water, ditches, swamps and backwaters of creeks, both ephemeral and permanent (Allen et al. 2002). Some wetlands where it occurs may partially or completely dry up during summer, with such wetlands reliant on seasonal flooding plus linkages to other sites where the species occurs, for habitat and population replenishment (Saddlier, Jackson & Hammer 2010). Dwarf Galaxias is also often found in association with burrowing freshwater crayfish (Engaeus spp.), with the crayfish burrows reportedly providing refuge from predators and dry conditions for the species (Saddlier, Jackson & Hammer 2010).	None	N/A	No suitable habitat within study area. **Unlikely to occur.**
Freshwater Catfish	*Tandanus tandanus*			L	Swims close to sand or ravel bottoms in slow-moving streams, lakes and ponds with fringing vegetation (Allen, GR, Midgley & Allen, M 2002).	1	1/06/1990	No suitable habitat within study area. **Unlikely to occur.**
Macquarie Perch	*Macquaria australasica*	EN		L	Cool, clear water of rivers and lakes. Favours slower moving water (Allen, Midgley & Allen, 2002).	39	12/03/2015	No suitable habitat within study area. **Unlikely to occur.**
Murray Cod	*Maccullochella peelii*	VU		L	Slow flowing turbid water of rivers and streams of low elevation; also fast flowing clear upland streams (Allen, Midgley & Allen, 2002).	4	7/04/2010	No suitable habitat within study area. **Unlikely to occur.**

Common Name	Scientific name	EPBC	EPBC-M	FFG	Habitat	Number of records	Date of last record	Likelihood of occurrence
Invertebrates								
Golden Sun Moth	*Synemon plana*	CR		L	Areas that are, or have been native grasslands or grassy woodlands. It is known to inhabit degraded grasslands with introduced grasses being dominant, with a preference for the native wallaby grass being present (DEWHA 2009). Also known to be closely associated with exotic grass species, with populations found in grassland almost entirely composed of Chilean needlegrass (Richter et al. 2013).	None	N/A	A lack of records in the search region for this species suggests that it is **unlikely to occur.**

CR = Critically Endangered; **EN** = Endangered; **VU** = Vulnerable; **NT** = Lower risk, near threatened; **DD** = data deficient; **L** = Listed as threatened under FFG Act; **M** = Listed migratory species; **(JAMBA)** = Japan-Australia Migratory Bird Agreement; **(CAMBA)** = China-Australia Migratory Bird Agreement; **(ROKAMBA)** = Republic of Korea-Australia Migratory Bird Agreement; **(Bonn)** = Bonn Convention

5.5.4 Susceptibility of listed fauna to impacts

The following analysis identifies the susceptibility to development of listed fauna species which may utilise the study area. This analysis includes consideration of the factors below.

- The mobility of the species
- The availability and extent of other suitable habitat in the region and the degree to which each species may rely on habitat in the study area

Targeted surveys will be required to determine the presence or absence of any listed fauna species considered to be susceptible to impacts from development.

Birds (non-migratory)

No listed non-migratory bird species are considered to have the potential to occur in the study area.

Migratory birds

One listed migratory bird species was considered likely to have the potential to occur in the study area based on records and the availability of suitable habitat. The vulnerability of this species to potential impacts from the proposed development is discussed below.

Fork-tailed Swift

(EPBC Act: migratory (JAMBA, CAMBA, ROKAMBA))

This species is more characteristic of the arid inland and western parts of Australia (Higgins 1999) but occurs infrequently in the Melbourne area in summer and early autumn. Given its mobile, aerial habits and huge extent of range occupied during the non-breeding season (Higgins 1999), its populations are unlikely to be impacted by the proposed development.

Mammals

One listed mammal species was considered likely to occur in the study area based on records and the availability of suitable habitat. The vulnerability of this species to potential impacts from the proposed development is discussed below.

- **Grey-headed Flying-fox**

  (EPBC Act: vulnerable)

  This species is likely to occur in the study area due to the presence of suitable habitat (flowering eucalypts). However, much alternative foraging habitat is available throughout the Melbourne suburban area, where the species is known to travel up to 50 km from its roosting colony at Kew during nocturnal foraging excursions. Given the small numbers of individuals of this mobile species that may be present and widespread availability of alternative foraging sites in the region, this species is unlikely to be impacted by development of the study area.

Reptiles, frogs, fish and invertebrates

No reptile, frog, fish or invertebrate species were considered likely to have the potential to occur in the study area.

5.5.5 Listed ecological communities

One ecological community listed under the EPBC Act was considered by the PMST to potentially occur in the study area:

- Natural Damp Grassland of the Victorian Coastal Plains (Critically Endangered under the EPBC Act).

Based on an assessment of native vegetation in the study area against published descriptions and condition thresholds for these communities, this community was found not to occur in the study area based on floristic composition and condition thresholds.

6 Impacts and regulatory implications

6.1 Proposed development

The current proposal will involve the removal of native vegetation within the Cave Hill Quarry site for the development of a residential estate, excluding Stage 1 of the development. This will occur providing the land is rezoned to a Comprehensive Development Zone.

To determine impacts to native vegetation, the proposed development plan was overlaid with the native vegetation mapped as part of this investigation. Native vegetation occurring in the following locations was considered to be removed based on the proposed development plan:

- Native vegetation within the construction footprint for the development (excluding Stage 1) as shown in Figures 1 & 2.

Impacts to trees

In accordance with the *Assessor's Handbook* (DELWP 2018a), a tree is deemed lost when earthworks encroach on more than 10% of its Tree Protection Zone (TPZ). A TPZ is defined as an area around the trunk of the tree which has a radius of 12 × the DBH (to a maximum of 15 metres but no less than 2 metres). Dead trees are treated in the same manner.

6.2 Impacts of proposed development

6.2.1 Native vegetation

The current proposal will result in the loss of a total extent of 1.048 hectares of native vegetation as represented in Figure 2 and documented in the Native Vegetation Removal (NVR) report provided by DELWP (Appendix 8).

This comprised of:

- 0.838 hectares of native vegetation in patches; and
- Three scattered trees (namely three large scattered trees), equating to an area loss of 0.21 hectares.

The native vegetation to be removed is not in an area mapped as an endangered Ecological Vegetation Class.

It is understood that 0.845 hectares native vegetation have been approved for removal on the property within the last five years.

Photographs of native vegetation proposed for removal are provided in Appendix 6.

6.2.2 Modelled species important habitat

The current proposal footprint will not have a significant impact on any habitat for any rare or threatened species as determined in Appendix 8.

6.2.3 Listed flora species

The analysis of the likelihood of occurrence of listed flora species presented in Section 5.3.2 identified that no listed species could be impacted by any development in the study area.

6.2.4 Fauna habitat

The current proposal would result in the loss of fauna habitat in the form of native treed vegetation, grazing paddocks, aquatic and quarry/built environs. These habitat types are considered to be of low quality value for fauna.

6.2.5 Listed fauna species

The analysis of susceptibility of listed fauna species to impacts presented in Section 5.5.4 identified that the following species could be impacted by any development in the study area:

- Fork-tailed Swift (EPBC Act: migratory (JAMBA, CAMBA, ROKAMBA))
- Grey-headed Flying-fox (EPBC Act: vulnerable)

It is considered that neither of these species would be residually impacted upon by the development.

6.2.6 Threatened ecological communities

The proposed development footprint will not result in the loss of any threatened ecological communities.

Figure 2: Native vegetation to be removed

Project: Cavehill Quarry, Lilydale **Client**: Intrapac Property Pty Ltd **Date**: 24/03/2020

- Study area
- Herb-rich Foothill Forest (EVC 23)
- Planted vegetation
- Large scattered tree
- Large scattered tree to be removed
- Native vegetation to be removed

N

Metres
0 150

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PO Box 337, Camberwell, VIC 3124, Australia
www.natureadvisory.com.au
03 9815 2111 - info@natureadvisory.com.au

7 Implications under legislation and policy

7.1 Summary of planning implications

Four small areas within areas of planted trees at the northern end of the site are subject to Heritage Overlays. The purpose and implications of these overlays are provided in this section:

- **Heritage Overlay – Schedule 201 (HO201)** - Cave Hill: Limestone Works, Melba Avenue, Lilydale.
- **Heritage Overlay – Schedule 57 (HO57)** - Old Cave Hill Butter, Cheese & Bacon Curing Factory, David Mitchell Estate, Melba Ave, Lilydale.

The purpose of both these overlays is to conserve and enhance heritage places of natural or cultural significance. Tree controls apply to both of these overlays. As such a permit is required under the Heritage Overlay to destroy, remove or lop any tree (even planted trees) within the area covered by either of these two overlays.

7.2 Implications under the Guidelines

7.2.1 Avoid and minimise statement

In accordance with the Guidelines, all applications to remove native vegetation must provide an avoid and minimise statement which details any efforts undertaken to avoid the removal of, and minimise the impacts on biodiversity and other values of native vegetation, and how these efforts focussed on areas of native vegetation that have the most value. Efforts to avoid and minimise impacts to native vegetation in the current application are presented as follows:

- Strategic level planning – the development has been sited within and around a very degraded mine site which is not considered to be of high value to biodiversity within the landscape.
- Site level planning – very little native vegetation was recorded within the study area and opportunities to retain native vegetation were very limited given the size of the development and the future use of the site requiring significant earthworks that will prevent the retention of remnant vegetation located on site.

7.2.2 Assessment pathway

The assessment pathway is determined by the location category and the extent of native vegetation as detailed for the study area as follows:

- Location Category: Location 3
- Extent of native vegetation: A total of 1.048 hectares of native vegetation (including three large trees).

Based on these details, the Guidelines stipulate that the proposal is to be assessed under the **Detailed** assessment pathway.

This proposal **would** trigger a referral to DELWP based on the criteria specified in Section 4.2.4.

7.2.3 Offset requirements

Offsets required to compensate for the proposed removal of native vegetation from the study area are provided below.

- 0.178 general habitat units and must include the following offset attribute requirements:
  - Minimum strategic biodiversity value (SBV) of 0.256.
  - Occur within the Port Phillip and Westernport CMA boundary or the Yarra Ranges municipal district.
  - Include protection of at least three large trees.

Under the Guidelines all offsets must be secured prior to the removal of native vegetation.

7.2.4 Offset statement

The offset target for the current proposal will be achieved via a third-party offset.

An online search of the Native Vegetation Credit Register (NVCR) has shown that the required offset is currently available for purchase from a native vegetation credit owner (DELWP 2020e).

Evidence that the required offset is available is provided in Appendix 9. The required offset would be secured following approval of the application to remove native vegetation.

7.3 EPBC Act

The EPBC Act protects a number of threatened species and ecological communities that are considered to be of national conservation significance. Any significant impacts on these species require the approval of the Australian Minister for the Environment.

Based on the relevant guidelines, the proposed development is unlikely to result in a significant impact on EPBC Act-listed values presented below.

- Fork-tailed Swift (EPBC Act: migratory (JAMBA, CAMBA, ROKAMBA))
- Grey-headed Flying-fox (EPBC Act: vulnerable)

Therefore, there are no implications under the EPBC Act.

7.4 FFG Act

The Victorian FFG Act lists threatened and protected species and ecological communities (DELWP 2018b, DELWP 2017b). Any removal of threatened flora species or communities (or protected flora) listed under the FFG Act from public land requires a Protected Flora Permit under the Act, obtained from DELWP.

The land addressed in this assessment is private land; therefore, a Protected Flora Licence or Permit under the FFG Act would not be required for the current proposal.

7.5 EE Act

The *Ministerial Guidelines for Assessment of Environmental Effects under the* Environment Effects Act 1978 (DSE 2006), identifies criteria which trigger a Referral to the State Minister for Planning.

Based on the relevant criteria, a Referral to the state Minister for Planning will not be required under the EE Act for the aspects covered by the current investigation.

7.6 CaLP Act

The *Catchment and Land Protection Act 1994* (CaLP Act) requires that landowners (or a third party to whom responsibilities have been legally transferred) must eradicate regionally prohibited weeds and prevent the growth and spread of regionally controlled weeds.

Property owners who do not eradicate Regionally prohibited weeds or prevent the growth and spread of Regionally controlled weeds for which they are responsible, may be issued with a Land Management Notice or Directions Notice that requires specific control work to be undertaken.

In accordance with the *Catchment and Land Protection Act 1994*, the noxious weed species listed below, which were recorded in the study area, must be controlled.

- Blackberry
- Sweet Pittosporum
- Hawthorn

Precision control methods that minimise off-target kills (e.g. spot spraying) should be used in environmentally sensitive areas (e.g. within or near native vegetation, waterways, etc.).

8 Recommendations

8.1 Construction mitigation recommendations

- Any tree pruning should be undertaken by an experienced arborist to prevent disease or unnecessary damage to the tree or disturbance to understorey vegetation during tree trimming.
- Any stockpiling will occur outside of environmentally sensitive areas.
- All machinery should enter and exit works sites along defined routes that do not impact on native vegetation or cause soil disturbance and weed spread.
- All machinery bought on site should be weed and pathogen free. This is important for environmental and agricultural protection. Soil borne pathogens such as Cinnamon Fungus and livestock diseases can be easily transported by machinery.
- All machinery wash down, lay down and personnel rest areas should be defined (fenced) and located in disturbed areas.
- Best practice erosion control should be installed where an erosion hazard is identified, erosion control activities should include:
    - The use of sediment fences down slope of exposed soil and stockpiles.
    - Bunding of stockpiles.
    - Minimisation of the area of disturbed soil at any one time.

8.2 Post construction mitigation recommendations

- The use of local indigenous plant species, of local genetic provenance, should be considered in the landscaping of any development on the site. Locally indigenous species generally have low water-use requirements, high survival rates and provide habitat to local fauna species.
- Species listed in the benchmarks of the EVCs that would have naturally occurred on the site (see Appendix 4) should be the preferred species for planting: Herb-rich Foothill Forest (EVC 23), Valley Grassy Forest (EVC 47) and Plains Grassy Woodland (EVC 55). These species include, for example:
    - Narrow-leaf Peppermint
    - Messmate Stringybark
    - Blackwood
    - Yellow Box
    - Candlebark
    - River Red-gum

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Appendix 1: Details of the assessment process in accordance with the Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017a)

Purpose and objective

Policies and strategies relating to the protection and management of native vegetation in Victoria are defined in the State Planning Policy Framework (SPPF). The objective identified in Clause 12.01 of all Victorian Planning Schemes is 'To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation'.

This is to be achieved through the following three-step approach, as detailed in the Guidelines:

1. Avoid the removal, destruction or lopping of native vegetation.
2. Minimise impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.
3. Provide an offset to compensate for the biodiversity impact from the removal, destruction or lopping of native vegetation.

Note: While a planning permit may still be required, if native vegetation does not meet the definition of either a patch or a scattered tree, an offset under the Guidelines is not required.

Assessment pathways

The first step in determining the type of assessment required for any site in Victoria is to determine the assessment pathway for the proposed native vegetation removal. The three possible assessment pathways for applications to remove native vegetation in Victoria are:

- Basic;
- Intermediate; or
- Detailed.

This assessment pathway is determined by two factors:

- **Location Category**, as determined using the states' Location Map. The location category indicates the potential risk to biodiversity from removing a small amount of native vegetation. The three location categories are defined as:
    - Location 1 – shown in light blue-green on the Location Map; occurring over most of Victoria.
    - Location 2 – shown in dark blue-green on the Location Map; includes areas mapped as endangered EVCs and/or sensitive wetlands and coastal areas.
    - Location 3 – shown in brown on the Location Map; includes areas where the removal of less than 0.5 hectares of native vegetation could have a significant impact on habitat for rare and threatened species.
- **Extent of native vegetation** – The extent of any patches and scattered trees proposed to be removed (as well as the extent of any past native vegetation removal), with consideration as to whether the proposed removal includes any large trees. Extent of native vegetation is determined as follows:

- **Patch** – the area of the patch in hectares.
- **Scattered Tree** – the extent of a scattered tree is dependent on whether the scattered tree is small or large. A tree is considered to be a large tree if it is greater or equal to the large tree benchmark diameter at breast height (DBH) for the relevant bioregional EVC. Any scattered tree that is not a large tree is a small scattered tree. The extent of large and small scattered trees is determined as follows:
  - **Large scattered tree** – the area of a circle with a 15-metre radius, with the trunk of the tree at the centre.
  - **Small scattered tree** – the area of a circle with a ten-metre radius, with the trunk of the tree at the centre.

The assessment pathway for assessing an application to remove native vegetation is then determined as detailed in the following matrix table:

Extent of native vegetation	Location Category		
	Location 1	Location 2	Location 3
< 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
< 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
≥ 0.5 hectares	Detailed	Detailed	Detailed

Note: If the native vegetation to be removed includes more than one location category, the higher location category is used to determine the assessment pathway.

Landscape scale information – strategic biodiversity value

The strategic biodiversity value (SBV) is a measure of a location's importance to Victoria's biodiversity, relative to other locations across the state. It is represented as a score between 0 and 1 and determined from the Strategic biodiversity value map, available from NVIM (DELWP 2020c).

Landscape scale information – habitat for rare or threatened species

Habitat importance for rare or threatened species is a measure of the importance of a location in the landscape as habitat for a particular rare or threatened species, in relation to other habitat available for that species. It is represented as a score between 0 and 1 and is determined from the Habitat importance maps, administered by DELWP.

This includes two groups of habitat:

- **Highly localised habitats** – Limited in area and considered to be equally important, therefore having the same habitat importance score.
- **Dispersed habitats** – Less limited in are and based on habitat distribution models.

Habitat for rare or threatened species is used to determine the type of offset required in the detailed assessment pathway.

Biodiversity value

A combination of site-based and landscape scale information is used to calculate the biodiversity value of native vegetation to be removed. Biodiversity value is represented by a general or species habitat score, detailed as follows.

Firstly, the extent and condition of native vegetation to be removed are combined to determine the habitat hectares as follows:

Habitat hectares = extent of native vegetation x condition score

Secondly, the habitat hectare score is combined with a landscape factor to obtain an overall measure of biodiversity value. Two landscape factors exist as follows:

- **General landscape factor** – determined using an adjusted strategic biodiversity score, and relevant when no habitat importance scores are applicable;
- **Species landscape factor** – determined using an adjusted habitat importance score for each rare or threatened species habitat mapped at a site in the Habitat importance map.

These factors are then used as follows to determine the biodiversity value of a site:

General habitat score = habitat hectares x general landscape factor

Species habitat score = habitat hectares x species landscape factor

Offset requirements

A native vegetation offset is required for the approved removal of native vegetation. Offsets conform to one of two types and each type incorporates a multiplier to address the risk of offset:

- A **general offset** is required when the removal of native vegetation does not have a significant impact on any habitat for rare or threatened species (i.e. the proportional impact is below the species offset threshold). In this case a multiplier of 1.5 applies to determine the general offset amount.

  General offset (amount of general habitat units) = general habitat score x 1.5

- A **species offset** is required when the removal of native vegetation has a significant impact on habitat for a rare or threatened species (i.e. the proportional impact is above the species offset threshold). In this case a multiplier of 2 applies to determine the species offset amount.

Species offset (amount of species habitat units) = Species habitat score x 2

Note: if native vegetation does not meet the definition of either a patch or scattered tree an offset is not required.

Offset attributes

Offsets must meet the following attribute requirements, as relevant:

- General offsets
    - **Offset amount** – general offset = general habitat score x 1.5
    - **Strategic biodiversity value (SBV)** – the offset has at least 80% of the SBV of the native vegetation removed
    - **Vicinity** – the offset is in the same CMA boundary or municipal district as the native vegetation removed
    - Habitat for rare and threatened species – N/A
    - **Large trees** – the offset include the protection of at least one large tree for every large tree to be removed
- Species offsets
    - **Offset amount** – species offset = species habitat score x 2
    - Strategic biodiversity value (SBV): N/A
    - Vicinity: N/A
    - **Habitat for rare and threatened species** – the offset comprises mapped habitat according to the Habitat importance map for the relevant species
    - **Large trees** – the offset include the protection of at least one large tree for every large tree to be removed

Appendix 2: Detailed habitat hectare assessment results

Habitat Zone			I	J
Bioregion			HSF	HSF
EVC Number			23	23
Total area of Habitat Zone (ha)			0.091	0.746
Site Condition	Large Old Trees	/10	0	0
	Tree Canopy Cover	/5	0	0
	Lack of Weeds	/15	11	6
	Understorey	/25	5	5
	Recruitment	/10	0	0
	Organic Matter	/5	5	5
	Logs	/5	0	0
	Site condition standardising multiplier*		1.00	1.00
	Site Condition subtotal		*21*	*16*
Landscape Context	Patch Size	/10	1	1
	Neighbourhood	/10	0	0
	Distance to Core	/5	1	1
Total Habitat Score		**/100**	**23**	**18**

* Modified approach to habitat scoring - refer to Table 14 of DELWP's Vegetation Quality Assessment Manual (DSE, 2004); # Habitat hectares = habitat score/100 X area [ha])

Appendix 3: Flora species recorded in the study area

Origin	Common Name	Scientific Name	EPBC	FFG
*	Cootamundra Wattle	*Acacia baileyana*		
	Silver Wattle	*Acacia dealbata*		
*	Cedar Wattle	*Acacia elata*		
#	Sticky Wattle	*Acacia howittii*		
	Lightwood	*Acacia implexa*		
#	Sallow Wattle	*Acacia longifolia*		
	Black Wattle	*Acacia mearnsii*		
	Blackwood	*Acacia melanoxylon*		
#	Wirilda	*Acacia retinodes s.l.*		
#	Sheoak	*Allocasuarina* sp.		
	Drooping Sheoak	*Allocasuarina verticillata*		
	Mistletoe	*Amyema* spp.		
	Marsh Club-sedge	*Bolboschoenus medianus*		
*	Large Quaking-grass	*Briza maxima*		
*	Prairie Grass	*Bromus catharticus*		
P	Bottlebrush	*Calistemon* spp.		
	Shiny Cassinia	*Cassinia longifolia*		
*	Centaury	*Centaurium* spp.		
*	Spear Thistle	*Cirsium vulgare*		
	Small-leaved Clematis	*Clematis microphylla s.l.*		
*	Fleabane	*Conyza* spp.		
	Common Correa	*Correa reflexa*		
*	Pampas Grass	*Cortaderia selloana*		
*	Lemon-scented Gum	*Corymbia citriodora* subsp. *citriodora*		
#	Red flowering-gum	*Corymbia ficifolia*		
#	Spotted Gum	*Corymbia maculata*		
*	Cotoneaster	*Cotoneaster* spp.		
*	Hawthorn	*Crataegus monogyna*		
*	Hawthorn	*Crataegus monogyna*		
*	Couch	*Cynodon dactylon* var. *dactylon*		
*	Rough Dog's-tail	*Cynosurus echinatus*		
*	Drain Flat-sedge	*Cyperus eragrostis*		
*	Cocksfoot	*Dactylis glomerata*		
*	Panic Veldt-grass	*Ehrharta erecta* var. *erecta*		
#	Southern Mahogany	*Eucalyptus botryoides*		
*	Sugar Gum	*Eucalyptus cladocalyx*		
P	Southern Blue-gum	*Eucalyptus globulus*		

Origin	Common Name	Scientific Name	EPBC	FFG
P	Bog Gum	*Eucalyptus kitsoniana*		
P	Swamp Gum	*Eucalyptus ovata*		
P	Red Box	*Eucalyptus polyanthemos*		
	Narrow-leaf Peppermint	*Eucalyptus radiata*		
P	Eucalypt	*Eucalyptus* spp.		
P	Red Ironbark	*Eucalyptus tricarpa*		
P	Manna Gum	*Eucalyptus viminalis*		
*	Caper Spurge	*Euphorbia lathyris*		
*	Petty Spurge	*Euphorbia peplus*		
	Cherry Ballart	*Exocarpos cupressiformis*		
*	Cleavers	*Galium aparine*		
*	Sweet Hakea	*Hakea drupacea*		
*	Hakea	*Hakea* sp.		
*	Ox-tongue	*Helminthotheca echioides*		
*	St John's Wort	*Hypericum perforatum* subsp. *veronense*		
*	Flatweed	*Hypochaeris radicata*		
*	Flatweed	*Hypochoeris radicata*		
	Green Rush	*Juncus gregiflorus*		
	Rush	*Juncus* spp.		
*	Slender Rush	*Juncus tenuis*		
*	Hairy Hawkbit	*Leontodon taraxacoides* subsp. *taraxacoides*		
#	Coast Tea-tree	*Leptospermum laevigatum*		
*	French Flax	*Linum trigynum*		
*	Perennial Rye-grass	*Lolium perenne*		
	Wattle Mat-rush	*Lomandra filiformis*		
	Mallow	*Malva* spp.		
#	Giant Honey-myrtle	*Melaleuca armillaris* subsp. *armillaris*		
P	Prickly Paperbark	*Melaleuca styphellioides*		
	Weeping Grass	*Microlaena stipoides* var. *stipoides*		
*	Cape Wattle	*Paraserianthes lophantha* subsp. *lophantha*		
*	Paspalum	*Paspalum dilatatum*		
*	Paspalum	*Paspalum dilatatum*		
*	Kikuyu	*Pennisetum clandestinum*		
*	Toowoomba Canary-grass	*Phalaris aquatica*		
*	Radiata Pine	*Pinus radiata*		

Origin	Common Name	Scientific Name	EPBC	FFG
#	Sweet Pittosporum	*Pittosporum undulatum*		
*	Ribwort	*Plantago lanceolata*		
*	Prostrate Knotweed	*Polygonum aviculare s.l.*		
	Austral Bracken	*Pteridium esculentum*		
*	Castor Oil Plant	*Ricinus communis*		
*	Sweet Briar	*Rosa rubiginosa*		
*	Sweet Briar	*Rosa rubiginosa*		
*	Blackberry	*Rubus fruticosus* spp. agg.		
	Small-leaf Bramble	*Rubus parvifolius*		
	Slender Dock	*Rumex brownii*		
*	Dock (naturalised)	*Rumex* spp. *(naturalised)*		
	Slender Wallaby-grass	*Rytidosperma racemosum* var. *racemosum*		
	Wallaby Grass	*Rytidosperma* spp.		
*	Willow	*Salix* spp.		
	Groundsel	*Senecio* spp.		
*	Variegated Thistle	*Silybum marianum*		
*	Rough Sow-thistle	*Sonchus asper s.l.*		
*	Common Sow-thistle	*Sonchus oleraceus*		
*	Dandelion	*Taraxacum* sp. 1		
*	White Clover	*Trifolium repens* var. *repens*		
*	Gorse	*Ulex europaeus*		
*	Blue Periwinkle	*Vinca major*		
*	Bathurst Burr	*Xanthium spinosum*		

***** = introduced species; **#** = native species occurring outside of natural range; **P =** planted.

Appendix 4: Fauna species recorded in the study area

Origin	Common name	Scientific name	EPBC	FFG
	Australian Magpie	*Gymnorhina tibicen*		
	Australian Wood Duck	*Chenonetta jubata*		
	Brown Thornbill	*Acanthiza pusilla*		
	Cattle Egret	*Ardea ibis*	M	
*	Common Blackbird	*Turdus merula*		
*	Common Myna	*Acridotheres tristis*		
*	Common Starling	*Sturnus vulgaris*		
	Crimson Rosella	*Platycercus elegans*		
	Eastern Rosella	*Platycercus eximius*		
	Eastern Spinebill	*Acanthorhynchus tenuirostris*		
*	European Goldfinch	*Carduelis carduelis*		
	Gang-gang Cockatoo	*Callocephalon fimbriatum*		
	Golden Whistler	*Pachycephala pectoralis*		
	Grey Butcherbird	*Cracticus torquatus*		
	Grey Fantail	*Rhipidura albiscarpa*		
	Grey Shrike-thrush	*Colluricincla harmonica*		
*	House Sparrow	*Passer domesticus*		
	Little Raven	*Corvus mellori*		
	Little Wattlebird	*Anthochaera chrysoptera*		
	Magpie-lark	*Grallina cyanoleuca*		
	Mistletoebird	*Dicaeum hirundinaceum*		
	New Holland Honeyeater	*Phylidonyris novaehollandiae*		
	Noisy Miner	*Manorina melanocephala*		
	Pacific Black Duck	*Anas superciliosa*		
	Peregrine Falcon	*Falco peregrinus*		
	Rainbow Lorikeet	*Trichoglossus haematodus*		
	Red Wattlebird	*Anthochaera carunculata*		
	Red-browed Finch	*Neochmia temporalis*		
	Silvereye	*Zosterops lateralis*		
	Spotted Pardalote	*Pardalotus punctatus*		
*	Spotted Turtle-Dove	*Streptopelia chinensis*		
	Sulphur-crested Cockatoo	*Cacatua galerita*		
	Superb Fairy-wren	*Malurus cyaneus*		
	Wedge-tailed Eagle	*Aquila audax*		
	Welcome Swallow	*Hirundo neoxena*		
	White-browed Scrubwren	*Sericornis frontalis*		
	White-plumed Honeyeater	*Lichenostomus penicillatus*		

Origin	Common name	Scientific name	EPBC	FFG
	Willie Wagtail	*Rhipidura leucophrys*		
	Yellow-faced Honeyeater	*Lichenostomus chrysops*		
	Eastern Grey Kangaroo	*Macropus giganteus*		
*	European Rabbit	*Oryctolagus cuniculus*		
*	Red Fox	*Vulpes vulpes*		
	Common Froglet	*Crinia signifera*		
	Southern Brown Tree Frog	*Litoria ewingii*		
	Spotted Marsh Frog	*Limnodynastes tasmaniensis*		

M = Listed as Migratory under the EPBC Act.

Appendix 5: EVC Benchmarks

- Highlands – Southern Fall bioregion:
  - Herb-rich Foothill Forest (EVC 23)

Department of Sustainability and Environment

EVC/Bioregion Benchmark for Vegetation Quality Assessment

Highlands – Southern Fall bioregion

EVC 23: Herb-rich Foothill Forest

Description:
Occurs on relatively fertile, moderately well-drained soils on an extremely wide range of geological types and in areas of moderate to high rainfall. Occupies easterly and southerly aspects mainly on lower slopes and in gullies. A medium to tall open forest to 25 m tall with a large shrub or understorey tree layer over a sparse to dense medium shrub layer. A high cover and diversity of herbs and grasses in the ground layer which characterises this EVC.

Large trees:

Species	DBH(cm)	#/ha
Eucalyptus spp.	70 cm	20 / ha

Tree Canopy Cover:

%cover	Character Species	Common Name
40%	*Eucalyptus radiata s.l.*	Narrow-leaf Peppermint
	Eucalyptus obliqua	Messmate Stringybark
	Eucalyptus cypellocarpa	Mountain Grey-gum

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	2	10%	T
Medium Shrub	7	20%	MS
Small Shrub	2	5%	SS
Prostrate Shrub	1	1%	PS
Large Herb	4	5%	LH
Medium Herb	11	20%	MH
Small or Prostrate Herb	3	5%	SH
Large Tufted Graminoid	2	5%	LTG
Large Non-tufted Graminoid	2	5%	LNG
Medium to Small Tufted Graminoid	5	20%	MTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG
Ground Fern	3	10%	GF
Scrambler or Climber	2	5%	SC
Bryophytes/Lichens	na	20%	BL

LF Code	Species typical of at least part of EVC range	Common Name
T	*Acacia melanoxylon*	Blackwood
MS	*Coprosma quadrifida*	Prickly Currant-bush
MS	*Cassinia aculeata*	Common Cassinia
MS	*Epacris impressa*	Common Heath
MS	*Olearia phlogopappa*	Dusty Daisy-bush
SS	*Olearia megalophylla*	Large-leaf Daisy-bush
MH	*Viola hederacea sensu Willis (1972)*	Ivy-leaf Violet
MH	*Gonocarpus tetragynus*	Common Raspwort
MH	*Veronica calycina*	Hairy Speedwell
SH	*Galium propinquum*	Maori Bedstraw
SH	*Dichondra repens*	Kidney-weed
LTG	*Lomandra longifolia*	Spiny-headed Mat-rush
LTG	*Gahnia sieberiana*	Red-fruit Saw-sedge
LNG	*Gahnia radula*	Thatch Saw-sedge
MTG	*Lomandra filiformis*	Wattle Mat-rush
MTG	*Dianella tasmanica*	Tasman Flax-lily
MTG	*Stylidium graminifolium s.l.*	Grass Trigger-plant
MNG	*Microlaena stipoides var. stipoides*	Weeping Grass
GF	*Pteridium esculentum*	Austral Bracken
SC	*Clematis aristata*	Mountain Clematis
SC	*Billardiera scandens*	Common Apple-berry

Victoria The Place To Be

EVC 23: Herb-rich Foothill Forest
Highlands – Southern Fall bioregion

Recruitment:
Continuous

Organic Litter:
40 % cover

Logs:
20 m/0.1 ha.

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
LH	*Sonchus oleraceus*	Common Sow-thistle	high	low
MH	*Hypochoeris radicata*	Cat's Ear	high	low
LNG	*Holcus lanatus*	Yorkshire Fog	high	high

Published by the Victorian Government Department of Sustainability and Environment April 2004

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Appendix 6: Photos of native vegetation to be removed

Habitat Zone I

Habitat Zone J

Appendix 7: Native Vegetation Removal (NVR) report

Native vegetation removal report

This report provides information to support an application to remove, destroy or lop native vegetation in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation*. The report **is not an assessment by DELWP** of the proposed native vegetation removal. Native vegetation information and offset requirements have been determined using spatial data provided by the applicant or their consultant.

Date of issue: **06/04/2020**
Time of issue: **7:59 pm**

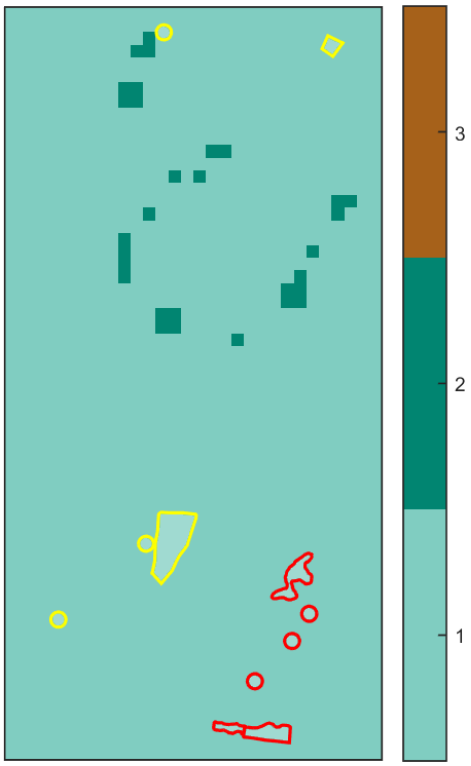
Report ID: NAA_2020_052

Project ID	7019_13_200403

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	1.893 ha
Extent of past removal	0.845 ha
Extent of proposed removal	1.048 ha
No. Large trees proposed to be removed	3
Location category of proposed removal	Location 1 The native vegetation is not in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map), sensitive wetland or coastal area. Removal of less than 0.5 hectares in this location will not have a significant impact on any habitat for a rare or threatened species

1. Location map



Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount[1]	0.178 general habitat units
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) or Yarra Ranges Shire Council
Minimum strategic biodiversity value score[2]	0.256
Large trees	3 large trees

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

1 The general offset amount required is the sum of all general habitat units in Appendix 1.

2 Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Detailed Assessment Pathway and it will be assessed under the Detailed Assessment Pathway.

If you wish to remove the mapped native vegetation you are required to apply for a permit from your local council. Council will refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

This *Native vegetation removal report* must be submitted with your application for a permit to remove, destroy or lop native vegetation.

Refer to the *Guidelines for the removal, destruction or lopping of native* vegetation (the Guidelines) for a full list of application requirements This report provides information that meets the following application requirements:

- The assessment pathway and reason for the assessment pathway
- A description of the native vegetation to be removed (partly met)
- Maps showing the native vegetation and property (partly met)
- Information about the impacts on rare or threatened species.
- The offset requirements determined in accordance with section 5 of the Guidelines that apply if approval is granted to remove native vegetation.

Additional application requirements must be met including:

- Topographical and land information
- Recent dated photographs
- Details of past native vegetation removal
- An avoid and minimise statement
- A copy of any Property Vegetation Plan that applies
- A defendable space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- A site assessment report including a habitat hectare assessment of any patches of native vegetation and details of trees
- An offset statement that explains that an offset has been identified and how it will be secured.

Authorised by the Victorian Government, 8 Nicholson Street, East Melbourne.

For more information contact the DELWP Customer Service Centre 136 186

www.delwp.vic.gov.au

Appendix 1: Description of native vegetation to be removed

The species-general offset test was applied to your proposal. This test determines if the proposed removal of native vegetation has a proportional impact on any rare or threatened species habitats above the species offset threshold. The threshold is set at 0.005 per cent of the mapped habitat value for a species. When the proportional impact is above the species offset threshold a species offset is required. This test is done for all species mapped at the site. Multiple species offsets will be required if the species offset threshold is exceeded for multiple species.

Where a zone requires species offset(s), the species habitat units for each species in that zone is calculated by the following equation in accordance with the Guidelines:

Species habitat units = extent x condition x species landscape factor x 2, where the species landscape factor = 0.5 + (habitat importance score/2)

The species offset amount(s) required is the sum of all species habitat units per zone

Where a zone does not require a species offset, the general habitat units in that zone is calculated by the following equation in accordance with the Guidelines:

General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
1-1	Scattered Tree	hsf_0023	Least Concern	1	no	0.200	0.070	0.070	0.180		0.012	General
1-2	Scattered Tree	hsf_0023	Least Concern	1	no	0.200	0.070	0.070	0.380		0.015	General
1-3	Scattered Tree	hsf_0023	Least Concern	1	no	0.200	0.070	0.070	0.110		0.012	General
1-I	Patch	hsf_0023	Least Concern	0	no	0.210	0.091	0.091	0.310		0.019	General
1-J	Patch	hsf_0023	Least Concern	0	no	0.160	0.746	0.746	0.348		0.121	General

Appendix 2: Information about impacts to rare or threatened species' habitats on site

This table lists all rare or threatened species' habitats mapped at the site.

Species common name	Species scientific name	Species number	Conservation status	Group	Habitat impacted	% habitat value affected
Wine-lipped Spider-orchid	*Caladenia oenochila*	503694	Vulnerable	Dispersed	Habitat importance map	0.0001
Dandenong Wattle	*Acacia stictophylla*	505140	Rare	Dispersed	Habitat importance map	0.0001
Grey-headed Flying-fox	*Pteropus poliocephalus*	11280	Vulnerable	Dispersed	Habitat importance map	0.0001
Swamp Bush-pea	*Pultenaea weindorferi*	502881	Rare	Dispersed	Habitat importance map	0.0000
Green Scentbark	*Eucalyptus fulgens*	505175	Rare	Dispersed	Habitat importance map	0.0000
Spurred Helmet-orchid	*Corybas aconitiflorus*	500835	Rare	Dispersed	Habitat importance map	0.0000
Slender Pink-fingers	*Caladenia vulgaris*	504449	Rare	Dispersed	Habitat importance map	0.0000
Matted Flax-lily	*Dianella amoena*	505084	Endangered	Dispersed	Habitat importance map	0.0000
Southern Toadlet	*Pseudophryne semimarmorata*	13125	Vulnerable	Dispersed	Habitat importance map	0.0000
Velvet Apple-berry	*Billardiera scandens s.s.*	504290	Rare	Dispersed	Habitat importance map	0.0000
Yarra Gum	*Eucalyptus yarraensis*	501326	Rare	Dispersed	Habitat importance map	0.0000
Grey Goshawk	*Accipiter novaehollandiae novaehollandiae*	10220	Vulnerable	Dispersed	Habitat importance map	0.0000
Forest Bitter-cress	*Cardamine papillata*	505034	Vulnerable	Dispersed	Habitat importance map	0.0000
Powerful Owl	*Ninox strenua*	10248	Vulnerable	Dispersed	Habitat importance map	0.0000
Floodplain Fireweed	*Senecio campylocarpus*	507136	Rare	Dispersed	Habitat importance map	0.0000
White-throated Needletail	*Hirundapus caudacutus*	10334	Vulnerable	Dispersed	Habitat importance map	0.0000

Habitat group

- Highly localised habitat means there is 2000 hectares or less mapped habitat for the species
- Dispersed habitat means there is more than 2000 hectares of mapped habitat for the species

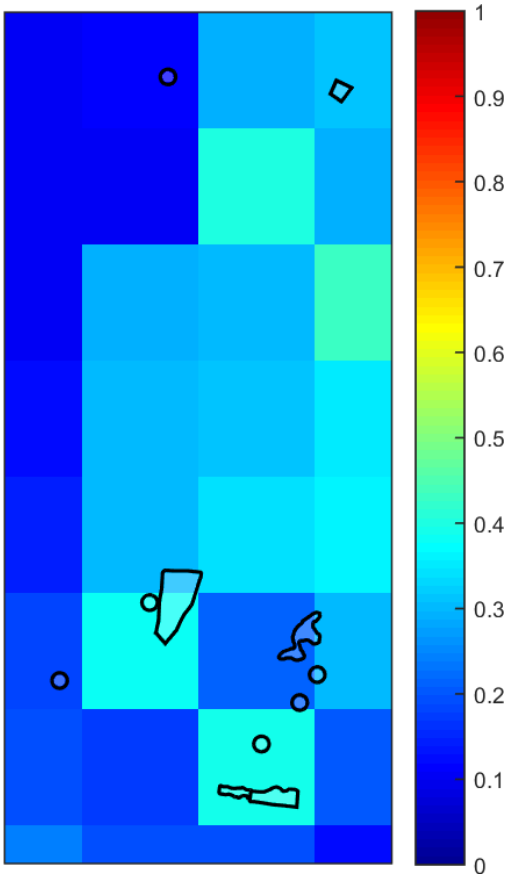
Habitat impacted

- Habitat importance maps are the maps defined in the Guidelines that include all the mapped habitat for a rare or threatened species

- Top ranking maps are the maps defined in the Guidelines that depict the important areas of a dispersed species habitat, developed from the highest habitat importance scores in dispersed species habitat maps and selected VBA records
- Selected VBA record is an area in Victoria that represents a large population, roosting or breeding site etc.

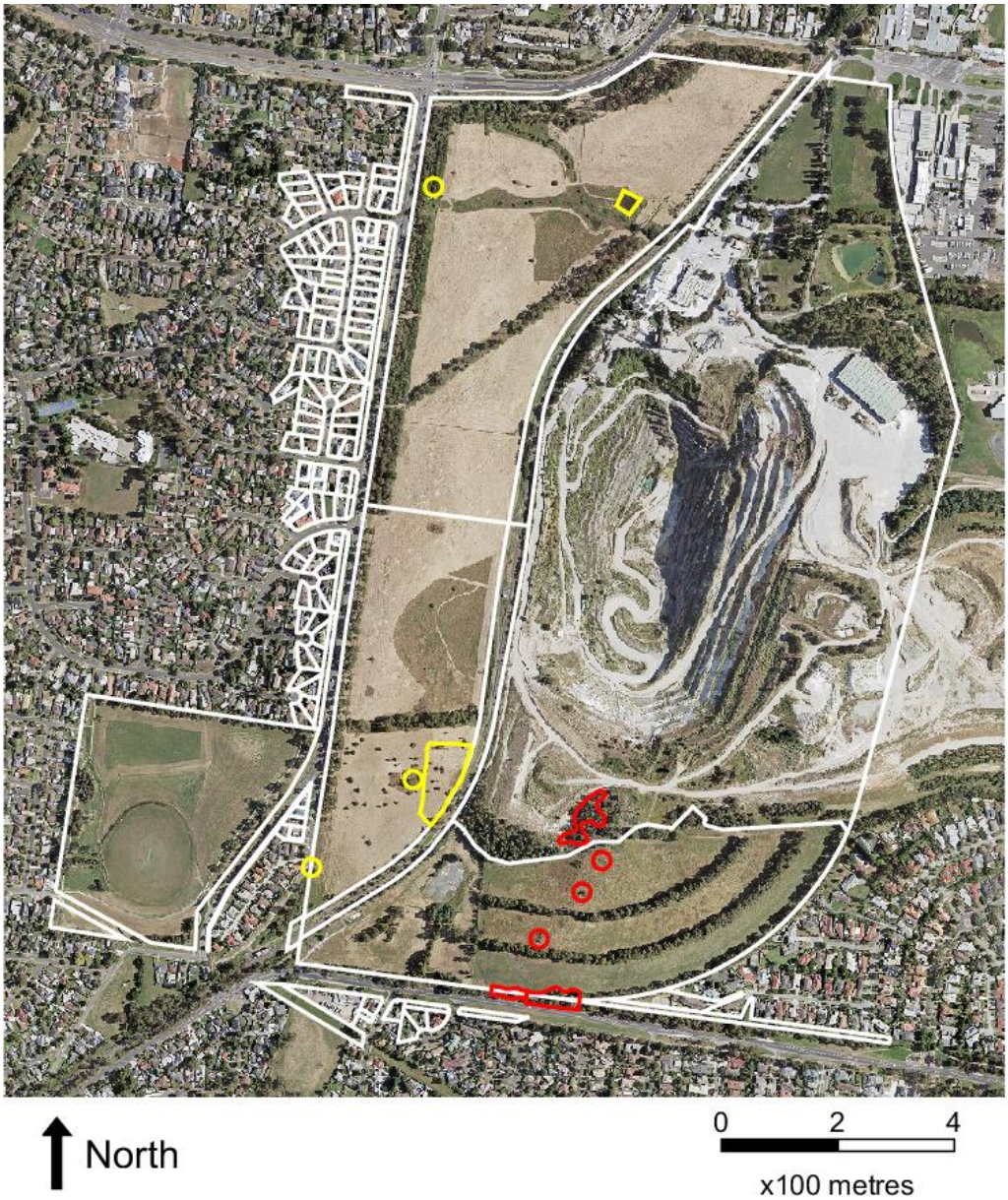
Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation

4. Map of the property in context



Yellow boundaries denote areas of proposed native vegetation removal.

Red boundaries denote areas of past removal.

Appendix 8: Evidence that native vegetation offset requirement is available

Report of available native vegetation credits

This report lists native vegetation credits available to purchase through the Native Vegetation Credit Register.

This report is **not evidence** that an offset has been secured. An offset is only secured when the units have been purchased and allocated to a permit or other approval and an allocated credit extract is provided by the Native Vegetation Credit Register.

Date and time: 24/03/2020 06:04 **Report ID: 3560**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
0.178	0.256	3	CMA	Port Phillip and Westernport
			or LGA	Yarra Ranges Shire

Details of available native vegetation credits on 24 March 2020 06:04

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0277	10.556	499	Port Phillip and Westernport	Mornington Peninsula Shire	Yes	Yes	No	Abezco, EHP, Ethos, VegLink
BBA-0670	23.583	362	Port Phillip and Westernport	Cardinia Shire	Yes	Yes	No	Abezco, EHP, VegLink
BBA-0677	21.554	1533	Port Phillip and Westernport	Whittlesea City	Yes	Yes	No	Abezco, EHP, VegLink
BBA-0678	50.092	2668	Port Phillip and Westernport	Nillumbik Shire	Yes	Yes	No	Contact NVOR
BBA-0678_2	0.388	59	Port Phillip and Westernport	Nillumbik Shire	Yes	Yes	No	Contact NVOR
BBA-1052	0.358	15	Port Phillip and Westernport	Cardinia Shire	Yes	Yes	No	Contact NVOR
BBA-2789	1.317	14	Port Phillip and Westernport	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2790	2.911	116	Port Phillip and Westernport	Baw Baw Shire	Yes	Yes	No	Contact NVOR
BBA-2832	2.192	7	Port Phillip and Westernport	Nillumbik Shire	Yes	Yes	Yes	Nillumbik SC
BBA-2870	2.885	444	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	EHP
BBA-2871	16.357	1668	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	No	EHP
BBA-3013	0.185	141	Port Phillip and Westernport	Moorabool Shire	Yes	Yes	No	VegLink
BBA-3045	1.413	8	Port Phillip and Westernport	Melton City	Yes	Yes	No	Bio Offsets

TFN-C1636	3.162	217	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	Yarra Ranges SC
TFN-C1650	2.680	92	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	Yarra Ranges SC
TFN-C1663	0.312	28	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	Yarra Ranges SC
TFN-C1664	3.635	96	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	Yarra Ranges SC
TFN-C1667	0.859	10	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	Yarra Ranges SC
TFN-C1750	3.186	11	Port Phillip and Westernport	Cardinia Shire	Yes	Yes	No	Bio Offsets
TFN-C1962	1.117	20	Goulburn Broken, Port Phillip and Westernport	Macedon Ranges Shire	No	Yes	No	Contact NVOR
VC_CFL-0838_01	8.272	897	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	Enviro Offset, VegLink
VC_CFL-0838_01	0.541	4	Port Phillip And Westernport	Yarra Ranges Shire	No	Yes	No	Contact NVOR
VC_CFL-3016_01	2.291	36	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	EHP
VC_CFL-3054_01	9.128	12	Port Phillip and Westernport	Moorabool Shire	Yes	Yes	No	Ethos
VC_CFL-3084_01	1.378	668	Port Phillip And Westernport	Cardinia Shire	Yes	Yes	No	VegLink

These sites meet your requirements using alternative arrangements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no sites listed in the Native Vegetation Credit Register that meet your offset requirements when applying the alternative arrangements as listed in section 11.2 of the Guidelines for the removal, destruction or lopping of native vegetation.

These potential sites are not yet available, land owners may finalise them once a buyer is confirmed.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)

There are no potential sites listed in the Native Vegetation Credit Register that meet your offset requirements.

LT - Large Trees *CMA - Catchment Management Authority* *LGA - Municipal District or Local Government Authority*

Next steps

If applying for approval to remove native vegetation
Attach this report to an application to remove native vegetation as evidence that your offset requirement is currently available.

If you have approval to remove native vegetation
Below are the contact details for all brokers. Contact the broker(s) listed for the credit site(s) that meet your offset requirements. These are shown in the above tables. If more than one broker or site is listed, you should get more than one quote before deciding which offset to secure.

Broker contact details

Broker Abbreviation	Broker Name	Phone	Email	Website
Abezco	Abzeco Pty. Ltd.	(03) 9431 5444	offsets@abzeco.com.au	www.abzeco.com.au
Bass Coast SC	Bass Coast Shire Council	(03) 5671 2125	d.whittington@basscoast.vic.gov.au	www.basscoast.vic.gov.au
Baw Baw SC	Baw Baw Shire Council	(03) 5624 2411	bawbaw@bawbawshire.vic.gov.au	www.bawbawshire.vic.gov.au
Bio Offsets	Biodiversity Offsets Victoria	0452 161 013	info@offsetsvictoria.com.au	www.offsetsvictoria.com.au
Contact NVOR	Native Vegetation Offset Register	136 186	nativevegetation.offsetregister@delwp.vic.gov.au	www.environment.vic.gov.au/native-vegetation
Ecocentric	Ecocentric Environmental Consulting	0410 564 139	ecocentric@me.com	Not avaliable
EHP	Ecology & Heritage Partners Pty Ltd	(03) 9377 0100	offsets@ehpartners.com.au	www.ehpartners.com.au
Enviro Offset	Enviro Offset Trading Pty Ltd	(03) 5444 0002	info@envirooffsettrading.com.au	www.envirooffsettrading.com.au
Ethos	Ethos NRM Pty Ltd	(03) 5153 0037	offsets@ethosnrm.com.au	www.ethosnrm.com.au
Nillumbik SC	Nillumbik Shire Council	(03) 9433 3316	offsets@nillumbik.vic.gov.au	www.nillumbik.vic.gov.au
TFN	Trust for Nature	8631 5888	offsets@tfn.org.au	www.trustfornature.org.au
VegLink	Vegetation Link Pty Ltd	(03) 5470 5232	offsets@vegetationlink.com.au	www.vegetationlink.com.au
Yarra Ranges SC	Yarra Ranges Shire Council	1300 368 333	biodiversityoffsets@yarraranges.vic.gov.au	www.yarraranges.vic.gov.au

For more information contact the DELWP Customer Service Centre 136 186 or the Native Vegetation Credit Register at nativevegetation.offsetregister@delwp.vic.gov.au