

Final Report

Biodiversity Assessment for a proposed Industrial Development at 140-204 Western Avenue, Westmeadows, Victoria

Prepared for

MAB Corporation Pty Ltd

December 2022



Ecology and Heritage Partners Pty Ltd

DOCUMENT CONTROL

Assessment type	Biodiversity Assessment
Address	140-204 Western Avenue, Westmeadows, Victoria
Project numbers	14520
Project manager	Aaron Organ (Director / Principal Ecologist)
Report reviewer	Aaron Organ (Director / Principal Ecologist)
Other EHP Staff	Nerissa Crabbe (Botanist); Alex Wilkinson (Consultant Zoologist); Claire Ranyard (Senior Consultant Botanist); Jamie Willey (Ecologist)
Mapping	Dr Monique Elsley (GIS Coordinator); Louisa Roy (GIS Consultant)
File name	14520_EHP_BA_WesternAvenueDevelopment_FINAL_v3_01122022
Client	MAB Corporation Pty Ltd
Bioregion	Victorian Volcanic Plain and Central Victorian Uplands
Catchment Management Authority	Port Phillip and Westernport
Council	Hume City Council

VERSION CONTROL

Report versions	Comments	Comments made by:	Date submitted
Draft 1	Report sent to the client for review	AO	30/07/2019
Draft 2	Updated in response to comments received	AO	01/08/2019
Draft 3	Updated in response to comments received	NC	11/12/2020
Draft 4	Final draft report updates	NC	23/09/2021
Draft 5	Updates in response to amended development plan	AW	12/08/2022
Final v2	Updated in response to comments received	AW	24/08/2022
Final v3	Updated in response to DELWP comments and updated field assessment	AW	01122022

Copyright © Ecology and Heritage Partners Pty Ltd

This document is subject to copyright and may only be used for the purposes for which it was commissioned. The use or copying of this document in whole or part without the permission of Ecology and Heritage Partners Pty Ltd is an infringement of copyright.

Disclaimer

Although Ecology and Heritage Partners Pty Ltd have taken all the necessary steps to ensure that an accurate document has been prepared, the company accepts no liability for any damages or loss incurred as a result of reliance placed upon the report and its contents.

CONTENTS

SUMMARY OF CLAUSE 52.17 APPLICATION REQUIREMENTS	6
1 INTRODUCTION	8
1.1 Background	8
1.2 Objectives	8
1.3 Study Area	8
2 METHODS	10
2.1 Desktop Assessment.....	10
2.2 Field Assessment	11
2.2.1 Flora Surveys	11
2.2.2 Fauna Surveys.....	11
2.3 Removal, Destruction or Lopping of Native Vegetation (the Guidelines)	14
2.3.1 Assessment Pathway.....	14
2.3.2 Vegetation Assessment.....	14
2.3.3 Impact Avoidance and Minimisation	15
2.3.4 Offsets	15
2.4 Assessment Qualifications and Limitations.....	15
3 RESULTS	17
3.1 Vegetation Condition	17
3.1.1 Patches of Native Vegetation.....	17
3.1.2 Large Trees in Patches and Scattered Tress	20
3.1.3 Introduced and Planted Vegetation.....	21
3.2 Fauna Habitat	22
3.3 Removal, Destruction or Lopping of Native Vegetation (the Guidelines)	23
3.3.1 Avoid and Minimise Statement.....	23
3.3.2 Vegetation proposed to be removed.....	23
3.3.3 Offset Targets	24
3.4 Significance Assessment.....	24
3.5 National Significance	25
3.5.1 Flora.....	25

3.5.2 Fauna25

3.5.3 Ecological Communities28

3.6 State Significance Assessment28

3.6.1 Flora28

3.6.2 Fauna29

3.6.3 Ecological Communities29

4 LEGISLATIVE AND POLICY IMPLICATIONS 30

4.1 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).....30

4.1.1 Implications30

4.2 *Environment Effects Act 1978* (Victoria)32

4.2.1 Implications32

4.3 *Flora and Fauna Guarantee Act 1988* (Victoria)32

4.3.1 Implications33

4.4 *Planning and Environment Act 1987* (Victoria).....33

4.4.1 Local Planning Scheme33

4.4.2 Implications35

4.4.3 The Guidelines.....36

4.4.4 Implications36

4.5 *Catchment and Land Protection Act 1994* (Victoria)37

4.5.1 Implications37

4.6 *Wildlife Act 1975* and *Wildlife Regulations 2013* (Victoria).....37

4.6.1 Implications37

5 POTENTIAL IMPACTS 38

6 MITIGATION MEASURES 39

6.1 Best Practice Mitigation Measures39

6.2 Offset Impacts and Strategy.....40

7 CONCLUSION AND FURTHER REQUIREMENTS..... 41

REFERENCES 43

FIGURES..... 46

APPENDIX 1 - FLORA 52

Appendix 1.1 - Flora Results	52
Appendix 1.2 - Habitat Hectare Assessment.....	54
Appendix 1.3 - Significant Flora Species.....	55
APPENDIX 2 - FAUNA	60
Appendix 2.1 - Fauna Recorded	60
Appendix 2.2 - Significant Fauna Species	63
APPENDIX 3 - PROPOSED DEVELOPMENT PLAN	68
APPENDIX 4 – NATIVE VEGETATION REMOVAL REPORT	70
APPENDIX 5 - AVAILABLE NATIVE VEGETATION CREDITS	77

SUMMARY OF CLAUSE 52.17 APPLICATION REQUIREMENTS

Table S1. Application requirements for a permit to remove native vegetation (Victoria Planning Provisions Clause 52.17; DELWP 2017a)

No.	Application Requirement	Response
1	<p>Information about the native vegetation to be removed, including:</p> <ul style="list-style-type: none"> • The assessment pathway and reason for the assessment pathway. This includes the location category of the native vegetation to be removed. • A description of the native vegetation to be removed that includes: <ul style="list-style-type: none"> - whether it is a patch or a scattered tree (or both) - the extent (in hectares) - the number and circumference (in centimetres measured at 1.3 metres above ground level) of any large trees within a patch - the number and circumference (in centimetres measured at 1.3 metres above ground level) of any scattered trees, and whether each tree is small or large - the strategic biodiversity value score - the condition score - if it includes endangered Ecological Vegetation Classes - if it includes sensitive wetland or coastal areas. • Maps showing the native vegetation and property in context and containing: <ul style="list-style-type: none"> - scale, north point and property boundaries - location of any patches of native vegetation and the number of large trees within the patch proposed to be removed - location of scattered trees proposed to be removed, including their size • The offset requirement, determined in accordance with Section 5 of the Guidelines, that will apply if the native vegetation is approved to be removed. 	<p>Assessment Pathway: Intermediate Site address: 140 – 204 Western Avenue, Westmeadows, Port Phillip and Western Port CMA.</p> <p>Further details provided Section 3, Figure 2 and Appendix 4.</p> <p>Offset analysis is based on Native Vegetation Removal report and attached in Appendix 4. Offset Requirement General: 0.033 General Habitat Units</p>
2	<p>Topographic and land information relating to the native vegetation to be removed, showing ridges, crests and hilltops, wetlands and waterways, slopes of more than 20 percent, drainage lines, low lying areas, saline discharge areas, and areas of existing erosion, as appropriate. This may be represented in a map or plan.</p>	<p>Refer to Section 1.3 and Figure 1</p>
3	<p>Recent, dated photographs of the native vegetation to be removed.</p>	<p>Refer to Section 3</p>
4	<p>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.</p>	<p>No removal of native vegetation has been removed by the proponent within the property within the past five years</p>
5	<p>An avoid and minimise statement. The statement describes any efforts to avoid the removal of and minimise the impacts on the biodiversity and other values of native vegetation, and how these efforts focussed on areas of native vegetation that have the most value. The statement should include a description of the following:</p> <ul style="list-style-type: none"> • Strategic level planning – any regional or landscape scale strategic planning process that the site has been subject to that avoided and minimised impacts on native vegetation across a region or landscape 	<p>Refer to Section 6.1.</p>

No.	Application Requirement	Response
	<ul style="list-style-type: none"> Site level planning – how the proposed use or development has been sited or designed to avoid and minimise impacts on native vegetation. That no feasible opportunities exist to further avoid and minimise impacts on native vegetation without undermining the key objectives of the proposal. 	
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.	Not applicable.
7	Where the removal of native vegetation is to create defensible space, a written statement explaining why the removal of native vegetation is necessary. This statement must have regard to other available bushfire risk mitigation measures. This statement is not required when the creation of defensible space is in conjunction with an application under the Bushfire Management Overlay.	Not applicable as the vegetation clearance is not for defensible space
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.	Not applicable as the application responds to Clause 52.17
9	<p>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.</p> <p>A suitable statement includes evidence that the required offset:</p> <ul style="list-style-type: none"> is available to purchase from a third party, or will be established as a new offset and has the agreement of the proposed offset provider, or can be met by a first party offset. 	<p>Offset analysis is based on development plans provided by MAB Pty Ltd</p> <p>Refer to Section 3.3.2</p>
10	<p>A site assessment report of the native vegetation to be removed, including:</p> <ul style="list-style-type: none"> 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. <p>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.</p>	Refer to Figure 2, Appendix 1.2 (habitat hectares assessment) and Appendix 1.3 (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.	Refer to Appendix 3 (EnSym Report)

1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by MAB Corporation Pty Ltd to undertake a biodiversity assessment for a proposed industrial development at 140-204 Western Avenue, Westmeadows, Victoria.

We understand that MAB Corporation Pty Ltd is proposing to submit a planning scheme amendment to rezone the land from Farming Zone to Industrial 3 Zone. Findings from this report will assist the planning application to facilitate future development works, as well as a program of landscaping and ecological work to enhance the areas of open space.

Ecology and Heritage Partners have undertaken several ecological assessments across the study area. This assessment collates previous ecological assessments undertaken as part of the Planning Scheme Amendment and proposed development for the study area.

1.2 Objectives

The objective of this assessment was to identify key ecological values within the study area and provide information in relation to any potential impacts and mitigation measures associated with the rezoning and future development of the study area. Specifically, this assessment aims to:

- Present the findings of the recent desktop analysis and field assessments;
- Identify ecological values within the study area;
- Provide advice with respect to implications under the *'Guidelines for the removal, destruction or lopping of native vegetation (the Guidelines) (DELWP 2017a)*, which replaced the *'Permitted clearing of native vegetation – Biodiversity Assessment Guidelines' (DEPI 2013a)* and the Native Vegetation Framework (NRE 2002) referred to in previous reports listed above;
- Document the implications of all other relevant environmental legislation and policy;
- Specify measures for impact avoidance and minimisation with respect to future development activities; and,
- Be used as part of the rezoning application through the provision of detailed and accurate information in accordance with the expectations of Hume City Council and the Victorian Department of Environment, Land, Water and Planning (DELWP).

1.3 Study Area

The study area includes several parcels of land and two adjacent informal roadside reserves as listed below:

- 140-204 Western Avenue
- Victoria Street roadside reserve
- Wright Street roadside reserve

Herein, they will be referred to collectively as Western Avenue (study area), except where specified. The study area is approximately 22 kilometres north-west of Melbourne's CBD (Figure 1). The study area covers a combined area of approximately 30 hectares and is bounded by Cleanaway depot facility on the western boundary, Moonee Ponds Creek along the northern boundary, parkland, paddocks, and Wright Street along the eastern boundary, and the Tullamarine Freeway along the southern boundary.

The study area is currently vacant and has historically been used for grazing purposes. The topography of the study area is relatively flat, with a gentle slope towards Moonee Ponds Creek. An ephemeral drainage line/tributary of Moonee Ponds Creek commences just outside the eastern boundary on the Wright Street study area.

According to the Department of Environment, Land, Water and Planning (DELWP) NatureKit Map (DELWP 2021a), the study area is located within the Victorian Volcanic Plain and Central Victorian Uplands bioregion, Port Phillip and Westernport Catchment Management Authority (CMA) and the Hume City Council municipality.

Under the Hume Planning Scheme, the majority of the study area is zoned as Farming – Schedule 3 (FZ3), with the area of the proposed bio-retention system and associated access tracks classified as Public Use Zone – Schedule 1 (PUZ1). The proposed bio-retention system is located in the north-east corner of the site, and is adjacent to the riparian corridor of Moonee Ponds Creek. Hume City Council has applied an Environmental Significance Overlay – Schedule 2 (ESO2) to this area (Figure 2), based on the following statement of environmental significance:

Moonee Ponds Creek is a major tributary, which extends from the inner suburbs of Melbourne to Gellibrand Hill. The Creek and its environs provide an important regional open space and habitat link and contain many Aboriginal cultural heritage sites of significance. Urban development has impacted upon the landscape character, catchment functions and water quality of parts of the Creek, however enormous potential exists for the recreational, aesthetic and ecological functions of these areas to be improved and restored.

Implications relating to the ESO overlay are described in Section 4.4. The significance of the Moonee Ponds Creek corridor is further demonstrated through the application of a BioSite of Regional Significance – Site 5185 – *Tullamarine Retarding Basin (Wright Street), Westmeadows* (Figure 2). BioSites comprises areas containing biological assets that contribute to the conservation of Victoria's indigenous flora and fauna. While there are no direct legislative implications associated with the classification, the identification of the BioSite allows for the prioritisation of conservation management and reservation, and incorporation of these assets into regional and local planning procedures.

2 METHODS

2.1 Desktop Assessment

Relevant literature, online-resources and databases were reviewed to provide an assessment of flora and fauna values associated with the study area. The following information sources were reviewed:

- The DELWP NatureKit Map (DELWP 2022a) and Native Vegetation Information Management (NVIM) Tool (DELWP 2022b) for:
 - Modelled data for location risk, native vegetation patches, scattered trees and habitat for rare or threatened species; and,
 - The extent of historic and current Ecological Vegetation Classes (EVCs).
- EVC benchmarks (DELWP 2022c) for descriptions of EVCs within the relevant bioregion;
- The Victorian Biodiversity Atlas (VBA) for previously documented flora and fauna records within the project locality (DELWP 2022d);
- The Illustrated Flora Information System of Victoria (IFIS) (Gullan 2017) and Atlas of Living Australia (ALA) (ALA 2021) for assistance with the distribution and identification of flora species;
- The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) for matters of National Environmental Significance (NES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (DCCEEW 2022);
- Relevant listings under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act), including the latest Threatened (DELWP 2022g) List;
- The online VicPlan Map (DELWP 2022e) to ascertain current zoning and environmental overlays in the study area;
- Aerial photography of the study area; and
- Previous ecological assessments relevant to the study area, including:
 - Ecology and Heritage Partners 2009. Flora and Fauna Assessment and Targeted Golden Sun Moth Surveys: Western Avenue, Tullamarine, Victoria. Unpublished report prepared for Transpacific Cleanaway Pty Ltd.
 - Ecology and Heritage Partners 2013. Flora and Fauna Assessment and Targeted Golden Sun Moth Surveys: 140-204 Western Avenue, Tullamarine, Victoria. Unpublished report prepared for Transpacific Cleanaway Pty Ltd.
 - Ecology and Heritage Partners Pty Ltd 2014. Flora and Fauna Assessment and Biodiversity Offset Analysis, 140-204 Western Avenue, Westmeadows. Report prepared for Transpacific Industries Group Limited.
 - Ecology and Heritage Partners Pty Ltd 2019. Biodiversity Assessment, 140-204 Western Avenue, 47-67/69-99 Wright Street, Westmeadows. Report prepared for MAB Corporation.

- o Ecology and Heritage Partners Pty Ltd 2019. Summary of Ecological Assessments Completed for the Proposed Rezoning and Development at 140-204 Western Avenue, Tullamarine, Victoria. Report prepared for MAB Corporation.
- o Ecology and Heritage Partners Pty Ltd 2020. Advice Regarding the Proposed Bio-retention Basin and Growling Grass Frog Habitat at Moonee Ponds Creek, Westmeadows, Victoria. Report prepared for MAB Corporation.

2.2 Field Assessment

This assessment, including the calculation of biodiversity offset requirements, is based on the results of flora and fauna surveys undertaken on 5 November 2008, 4 November 2013, 30 June 2014, 8 May 2019, and additional flora surveys on 16 October 2020 and the 9 March 2021. Three seasons of targeted Golden Sun Moth *Synemon plana* surveys have been undertaken in the 2008/09, 2012/13 and 2019/20 flight periods. One season of targeted Growling Grass Frog *Litoria raniformis* surveys were undertaken on 14, 18 and 25 November 2019.

2.2.1 Flora Surveys

Initial flora assessments were undertaken on 5 November 2008, 4 November 2013, 30 June 2014 and re-assessed on 8 May 2019, with additional surveys undertaken on 16 October 2020, 9 March 2021, and 20 October and 14 November 2022. Flora assessments were undertaken to obtain information on terrestrial flora values within the study area. The study area was walked, with all observed flora species recorded, any significant records mapped, and the overall condition of vegetation noted. Native vegetation in the local area was also investigated to assist in determining the pre-European vegetation within the study area. EVCs were determined with reference to DELWP pre-1750 and extant EVC mapping and their published descriptions (DELWP 2022c).

Vegetation within the study area was assessed according to the habitat hectare methodology, which is described in the *Vegetation Quality Assessment Manual* (DSE 2004a). Further detail regarding the habitat hectare assessment is provided in Section 3.

2.2.2 Fauna Surveys

Fauna surveys were undertaken concurrently with the detailed flora assessments on 5 November 2008 and 8 May 2019 to identify terrestrial fauna values within the study area. The site was visually assessed and active searching under and around ground debris for reptiles, frogs and small mammals was undertaken. Binoculars were also used to scan the area for birds, and observers listened for calls and searched for other signs of fauna such as nests, remains of dead animals, droppings and footprints. Potential habitat for fauna was assessed, with an emphasis on habitats that may provide shelter, food or other resources for significant species. In addition, as fauna species are mobile, a visual assessment of the adjoining areas outside of the study area was made to determine whether there was suitable habitat (principally for threatened species) in the immediate area, and to determine the likelihood that any of these species would either reside within the study area for extended periods of time, or whether the site contributes to a larger home range of a significant species.

2.2.2.1 Targeted Golden Sun Moth Surveys

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Vulnerable

Golden Sun Moth typically occurs in native grassland, grassy woodland, dominated by greater than 40% cover of Wallaby-grass (DSE 2004), but may also inhabit areas dominated by Kangaroo Grass (Endersby and Koehler 2006) and introduced grassland dominated by Chilean Needle-grass *Nassella neesiana* and other introduced species (A. Organ pers. obs.). Male flight is typically low, to about a metre above the ground, fast and can be prolonged, but they are generally not recorded flying more than 100 metres from suitable habitat (Clarke and O'Dwyer 1999).



Plate 1. Golden Sun Moth (Ecology and Heritage Partners Pty Ltd)

Prior to European settlement, Golden Sun Moth was widespread and relatively continuous throughout its range, inhabiting grassy open woodlands and grassland, although it now mainly inhabits small isolated sites (DSE 2004). The species is threatened by habitat loss, disturbance and fragmentation due to agricultural expansion and urbanisation. Many populations are isolated and fragmented, impeding the ability of the relatively immobile females to recolonise areas, thereby reducing the likelihood of genetic exchange (DSE 2004). Such populations are therefore vulnerable as there is little likelihood of recolonisation in the event of a local extinction.

Targeted surveys were undertaken for Golden Sun Moth within the study area on four separate events during the 2019/20 flight season – 20 November 2019, 27 November 2019, 9 December 2019, and 18 December 2019. Previous surveys for the species were conducted on 11 November 2008 and 13 January 2009, 11 November 2012. These surveys were undertaken in accordance with the significant impact guidelines for this species (DEWHA 2009a). Surveys were carried out between 11am and 3pm on warm, relatively calm, sunny days with a minimum temperature of 20°C, in weather conditions considered suitable for detecting the species. Surveys were undertaken by field personnel experienced in the identification and key habitat requirements of the species. Surveys comprised walking the entire site and surveying suitable grassland habitat searching for moths. The location of any moth sightings was recorded on a hand-held GPS unit (with +/- 5 metres accuracy) and later mapped on a site plan for reporting purposes.

In addition, several other sites in northern Melbourne known to support the species were surveyed on the same day as the surveys within the study area (i.e. reference sites), and this was undertaken to demonstrate that weather conditions were conducive to flying males and therefore detection of the species.

2.2.2.2 Targeted Growling Grass Frog Surveys

EPBC Act Conservation Status: Vulnerable

FFG Act Conservation Status: Vulnerable

Although formerly widely distributed across southern eastern Australia, including Tasmania (Littlejohn 1963, 1982; Hero *et al.* 1991), Growling Grass Frog has declined markedly over the past two decades and in many areas, particularly in south and central Victoria where some populations have experienced local extinction.

Growling Grass Frog (Plate 14) are largely associated with permanent or semi-permanent still or slow flowing waterbodies (i.e. streams, lagoons, farm dams and old quarry sites) (Hero *et al.* 1991; Barker *et al.* 1995; Ashworth 1998). The species can also use temporarily inundated waterbodies during breeding season, to facilitate reproduction (Organ 2005). The presence of key habitat attributes, primarily an extensive cover of emergent, submerged and floating vegetation



Plate 2. Growling Grass Frog (*Litoria raniformis*), Ecology and Heritage Partners Pty Ltd.

(Robertson *et al.* 2002, Organ 2005), and the spatial orientation of waterbodies (Robertson *et al.* 2002; Heard *et al.* 2004; Hamer and Organ 2008) are strong determinants of the species' presence. Terrestrial vegetation (grasses, sedges), rocks and other ground debris around wetland perimeters also provide important foraging, dispersal and over-wintering sites. Dispersal is thought to occur primarily along drainage lines or other low-lying areas between waterbodies, and unhindered movement between and within waterbodies is considered important for population viability

One season of targeted surveys for Growling Grass Frog was completed by Ecology and Heritage Partners. Nocturnal surveys were undertaken on two different occasions (14 and 25 November 2019) at numerous locations within areas of potential habitat on the Moonee Ponds creek line within the study area. Growling Grass Frog surveys were undertaken in accordance with the methods outlined in the Significant Impact Guidelines for the Vulnerable Growling Grass Frog (DEWHA 2009b) and Survey Guidelines for Australia's Threatened Frogs (DEWHA 2010). The targeted surveys were completed as follows:

- Survey sites within 30 meters of the primary water body were chosen based on the presence of supporting suitable habitat for Growling Grass Frog (i.e. moderate to good water quality, moderate to good percentage cover of fringing, emergent and floating vegetation, presence of other refuge).
- Two qualified zoologists, experienced in Growling Grass Frog detection, systematically walked along (or around) each watercourse (or waterbody).
- Zoologists searched fringing, emergent and floating vegetation within and adjacent to the watercourse/waterbody with 50W 12V hand-held spotlights and used call-playback to initiate a response from any males that may have been present.

- All frog species heard or seen were recorded and several site-specific habitat variables were documented including a visual assessment of water quality, flow and depth, and records of fringing, emergent, floating and submerged vegetation cover.
- Growling Grass Frog were confirmed to be calling at known reference sites prior to undertaking surveys.

2.3 Removal, Destruction or Lopping of Native Vegetation (the Guidelines)

Under the *Planning and Environment Act 1987*, Clause 52.17 of the Hume Planning Scheme requires a planning permit to remove, destroy or lop native vegetation. The assessment process for the clearing of vegetation follows the ‘*Guidelines for the removal, destruction or lopping of native vegetation*’ (the Guidelines) (DELWP 2017a). The ‘*Assessor’s handbook: Applications to remove, destroy or lop native vegetation*’ (Assessor’s handbook) (DELWP 2018) provides clarification regarding the application of the Guidelines (DELWP 2017a).

2.3.1 Assessment Pathway

The Guidelines manage the impacts on biodiversity from native vegetation removal using an assessment-based approach. Two factors – extent risk and location category – are used to determine the risk associated with an application for a permit to remove native vegetation. The location category (1, 2 or 3) has been determined for all areas in Victoria and is available on DELWP’s NVIM Tool (DELWP 2022b). Determination of assessment pathway is summarised in Table 1.

Table 1. Assessment pathways for applications to remove, destroy or lop native vegetation (DELWP 2017a).

Extent		Location		
		1	2	3
Native Vegetation	Less than 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
	Less than 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
	0.5 hectares or more	Detailed	Detailed	Detailed

Notes: For the purpose of determining the assessment pathway of an application to remove native vegetation the extent includes any other native vegetation that was permitted to be removed on the same contiguous parcel of land with the same ownership as the native vegetation to be removed, where the removal occurred in the five year period before an application to remove native vegetation is lodged.

2.3.2 Vegetation Assessment

Native vegetation (as defined in Table 2) is assessed using two key parameters: extent (in hectares) and condition. For the purposes of this assessment, both condition and extent were determined as part of the habitat hectare assessment.

Table 2. Determination of a patch of native vegetation (DELWP 2017a).

Category	Definition	Extent	Condition
Patch of native vegetation	<p>An area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native;</p> <p>OR</p> <p>An area with three or more native canopy trees where the drip line of each tree touches the drip line of at least one other tree, forming a continuous canopy;</p> <p>OR</p> <p>any mapped wetland included in the <i>Current Wetlands map</i>, available in DELWP systems and tools.</p>	<p>Measured in hectares.</p> <p>Based on hectare area of the native patch.</p>	<p>Vegetation Quality Assessment Manual (DSE 2004a).</p> <p>Modelled condition for <i>Current Wetlands</i>.</p>
Scattered tree	<p>A native canopy tree that does not form part of a native patch.</p>	<p>Measured in hectares.</p> <p>Each Large scattered tree is assigned an extent of 0.071 hectares (15 metre radius).</p> <p>Each Small scattered tree is assigned a default extent of 0.031 hectares (10 metre radius)</p>	<p>Scattered trees are assigned a default condition score of 0.2 (outside a patch).</p>

Notes: Native vegetation is defined in the Victoria Planning Provisions as 'plants that are indigenous to Victoria, including trees, shrubs, herbs and grasses'.

2.3.3 Impact Avoidance and Minimisation

All applications to remove native vegetation must demonstrate the three-step approach of avoid, minimise and offset. This is a precautionary approach that aims to ensure that the removal of native vegetation is restricted to what is reasonably necessary, and that biodiversity is appropriately compensated for any native vegetation removal that is approved.

2.3.4 Offsets

Biodiversity offsets are required to compensate for the permitted removal of native vegetation. Offset obligations and offset site criteria are determined in accordance with the Guidelines (DELWP 2017a) and are divided into two categories, being General Habitat Units and Species Habitat Units.

The offset requirements for native vegetation removal are calculated by DELWP and presented in a Native Vegetation Removal (NVR) Report, which are based on the vegetation condition scores determined during the biodiversity assessment.

2.4 Assessment Qualifications and Limitations

Data and information held within the ecological databases and mapping programs reviewed in the desktop assessment (e.g. VBA, PMST, NatureKit etc.) are unlikely to represent all flora and fauna observations within, and surrounding, the study area. It is therefore important to acknowledge that a lack of documented records does not necessarily indicate that a species or community is absent, but instead may reflect a lack of survey effort.

Notwithstanding the above, terrestrial flora and fauna data collected during the field assessments, and information obtained from relevant sources (e.g. biological databases and relevant literature) are considered adequate to provide an accurate assessment of the ecological values within the study area.

Ecological values identified within the study area were recorded using a hand-held GPS or tablet with an accuracy of +/-5 metres. This level of accuracy is considered to provide an accurate assessment of the ecological values present within the study area; however, this data should not be used for detailed surveying purposes.

3 RESULTS

3.1 Vegetation Condition

Fifty-five (55) flora species (16 indigenous and 39 non-indigenous) and 81 fauna species (10 mammals, 65 birds, three reptiles and three frogs) were recorded within the study area during the field assessments. A consolidated list of flora and fauna species recorded is provided in Appendices 2.1 and 3.1.

One dam was present in the east of the study area, and supported scattered Common Wallaby-grass *Rytidosperma caespitosa*, however it did not meet the threshold (>25% projective foliage cover) to constitute a patch of native vegetation.

3.1.1 Patches of Native Vegetation

The study area supports approximately 0.930 hectares of native vegetation including three small patches of Grassy Woodland (EVC 175), multiple spreading patches of treeless Plains Grassy Woodland (EVC 55_61), and Creekline Grassy Woodland (EVC 68) along Moonee Ponds Creek and tributary (Figure 2). Prior to European settlement, these EVCs would have covered the study area (DELWP 2022a), however due to vegetation clearing and degradation associated with agricultural activities, only fragmented and highly modified patches remain.

During a follow-up survey on 20 October 2022, ecological values in the study area were recorded to have degraded significantly. Previously recorded patches of native vegetation (Plains Grassy Woodland) no longer met the minimum cover threshold to be considered a patch. Areas previously dominated by native grass species were dominated by exotic grasses, with less than 25 per cent of the total perennial understorey plant cover now native. This may be attributed to significant rainfall events recorded during October 2022.

Plains Grassy Woodland (EVC 55_61)

The patches of treeless Plains Grassy Woodland were heavily modified and contained few species common to this EVC. The rush *Juncus* sp. was the dominant native understorey species identified with Spear grass *Austrostipa* sp. also occasionally present in very low abundance (Plate 1). These species just qualified as patches of native vegetation as they only met the required 25% native perennial cover to be considered a patch of native vegetation, never exceeding it. The mid-layer was devoid of native vegetation except for a single Black Wattle *Acacia mearnsii* identified along the eastern boundary of the study area's southern portion (Plate 2). The native vegetation was heavily interspersed with exotic grasses including environmental weeds and those listed under the *Catchment and Land Protection Act 1994* (CaLP Act) and Weeds of National Significance (WoNS) (predominantly Chilean Needle-Grass *Nassella neesiana*, Serrated Tussock *Nassella trichotoma*, Perennial Rye-grass *Lolium perenne*, Oat *Avena* sp. and Soft Brome *Bromus hordaceus*). Noxious weeds including Artichoke Thistle *Cynara cardunculus*, Spear Thistle *Cirsium vulgare*, African Box-thorn *Lycium ferocissimum*, Patterson's Curse *Echium plantagineum* and higher than expected annual weed cover (i.e. Annual Rye Grass *Lolium multiflorum*) were present in exceedingly high abundance, likely responsible for the diminished extent of previously present Plains Grassy Woodland native vegetation.



Plate 1. *Juncus* dominated patch of Plains Grassy Woodland within the study area (Ecology and Heritage Partners Pty Ltd 20/10/2022).



Plate 2. Black Wattle forming a PGW patch along the eastern boundary of the study area's southern portion (Ecology and Heritage Partners Pty Ltd 20/10/2022).

Creekline Grassy Woodland (EVC 68)

Creekline Grassy Woodland was recorded along the northern cadastral boundary along Moonee Ponds Creek and on a small tributary on the eastern boundary (Wright Street), which flows into Moonee Ponds Creek (Plates 3 and 4, respectively). This habitat type is characterised by a low cover of indigenous species, predominantly represented by recruiting and Large River Red-gum *Eucalyptus camaldulensis*, recruiting Golden Wattle *Acacia pycnantha*, Woolly Tea-tree *Leptospermum lanigerum*, Black Wattle *Acacia melanoxyton*, Hedge Wattle *Acacia paradoxa*, and Tree Violet *Melicytus dentatus*. The ground level was represented by a cover of Spear-grass *Austrostipa* sp. and Berry Saltbush *Atriplex semibaccata* and a high exotic cover with areas dominated by Kikuyu *Pennisetum clandestinum* and Toowoomba Canary-grass *Phalaris aquatica*, with WoNS listed Serrated Tussock, Prickly Pear *Opuntia* sp., Gorse *Ulex europaeus* and African Boxthorn *Lycium ferocissimum* (Plate 4).



Plate 3. Creekline Grassy woodland (Ecology and Heritage Partners Pty Ltd 08/05/2019).



Plate 4. Creekline Grassy Woodland vegetation on the tributary intersecting Wright Street (Ecology and Heritage Partners Pty Ltd 16/10/2020)

Aquatic Herbland (EVC 643)

Aquatic Herbland is often present within permanent to semi-permanent wetlands and regularly dominated by sedges and/or aquatic herbs. This EVC typically occurs on fertile paludal soils and heavy clays beneath organic accumulations.

Native vegetation characteristic of Aquatic Herbland was within and immediately surrounding a semi-permanent waterbody present with the study areas east. The rush *Juncus* sp. was the dominant species as it formed fringing and emergent vegetation alongside the common Common Spike-rush *Eleocharis acuta* and Common Swamp Wallaby-grass *Amphibromus nervosus*. The aquatic fern *Azolla* sp. was also present, floating in low abundance on the water's surface (Plate 6).



Plate 5. Semi-permanent waterbody supporting Aquatic Herbland vegetation with the study area's east. (Ecology and Heritage Partners Pty Ltd 20/10/2022).



Plate 6. Azolla floating on the semi-permanent waterbody's surface. (Ecology and Heritage Partners Pty Ltd 20/10/2022).

Grassy Woodland (EVC 175)

Highly modified Grassy Woodland (EVC 175) vegetation is present within the northern valley of the study area on approach to Moonee Ponds Creek (Plate 7). This habitat type was characteristic of shrub trees Black Wattle with exotic ground cover including Blanket Weed *Galenia pubescens* var. *pubescens* and the WoNS Listed Gorse.



Plate 7. Patch of poor-quality Grassy Woodland in north-east corner of the study area Ecology and Heritage Partners Pty Ltd 16/10/2020).

3.1.2 Large Trees in Patches and Scattered Tress

Two Large Trees (LTs) were recorded in the patch of Creeklane Grassy Woodland along Moonee Ponds Creek. Both specimens were River Red-gum (Tree ID 1 and 2) (Plate 8). One small scattered River Red-gum was present in the centre of the study area (Tree ID 3) (Plate 9). Scattered trees and large trees in patches have been detailed in Table 3 below.

Table 3. Scattered Trees and Large Trees in Patches.

Tree # (Figure 2)	Species Name	Common Name	DBH (cm)	Size Class	Scattered / Parch	Status
1	<i>Eucalyptus camaldulensis</i>	River Red-gum	133	Large	Patch	Retained
2	<i>Eucalyptus camaldulensis</i>	River Red-gum	140	Large	Patch	Retained
3	<i>Eucalyptus camaldulensis</i>	River Red-gum	40	Small	Scattered	Removed (Direct Impact)



Plate 8. Large River Red-gum in Creekline Grassy Woodland on Moonee Ponds Creek (Tree ID 1) within the study area (Ecology and Heritage Partners Pty Ltd 08/05/2019).



Plate 9. Small scattered River Red-gum (Tree ID3) in centre of study area (Ecology and Heritage Partners Pty Ltd 08/05/2019).

3.1.3 *Introduced and Planted Vegetation*

Large areas of exotic dominated grassland are common throughout the study area. The grasslands are composed of exotic plant species commonly associated with urban and rural environments (Plates 10 and 11).

Planted, exotic trees and shrubs were present throughout the study area. Dominant species African Boxthorn *Lycium ferocissimum*, Gorse *Ulex europaeuss* and Sweet Briar *Rosa rubiginosa* (Plates 12 and 13).



Plate 10. Exotic pasture looking south along Victoria Street study area (towards Tullamarine Freeway) (Ecology and Heritage Partners Pty Ltd 9/03/2021).



Plate 11. Exotic pasture and noxious weed cover looking north to Moonee Ponds Creek (Ecology and Heritage Partners Pty Ltd 16/10/2020).



Plate 12. Planted Shrubs within study area (African Boxthorn) (Ecology and Heritage Partners Pty Ltd 12/04/2019).



Plate 13. Planted African Boxthorn hedge in the north of the study area (Ecology and Heritage Partners Pty Ltd 16/10/2020).

3.2 Fauna Habitat

Planted trees and shrubs grow in several areas throughout the study area. This habitat provides foraging and breeding habitat for several common native bird species. Along the paddock boundaries in the eastern section of the study area, plantations of African Boxthorn, Gorse and Sweet Briar provide an important source of refuge for small bird species such as thornbills and wrens.

The condition of fauna habitat in exotic grassland areas were low. Generally, this vegetation provides little fauna habitat and is suitable for common urban-adapted native birds such as the Willie Wagtail *Rhipidura leucophrys*, Magpie-lark *Grallina cyanoleuca*, Australian Magpie *Gymnorhina tibicen*, and Noisy Miner *Manorina melanocephala* and introduced birds such as the Rock Dove *Columba livia*, Spotted Dove *Streptopelia chinensis* and Common Myna *Acridotheres tristis*.

Plains Grassy Woodland provides habitat for a diversity of native species including a range of grassland birds (Australasian Pipit *Anthus novaeseelandiae*) and ground-dwelling fauna. Targeted surveys for Golden Sun Moth did not detect a resident population of the species within the study area.

Areas of Creepline Grassy Woodland (EVC 68) provide suitable habitat for the nationally listed Growling Grass Frog, of which two occurrences were recorded in 2002 (Plate 2) at the northern border of the study area (Figure 4).

Growling Grass Frog is known to occur within the Moonee Ponds Creek adjacent to the study area (DELWP 2022d). The dams provide suitable habitat for several waterbirds such as Hardhead *Aythya australis* (state significant), Chestnut Teal *Anas castanea*, Eurasian Coot *Fulica atra* and Black Winged-stilt *Himantopus himantopus* (DELWP 2022d).

3.3 Removal, Destruction or Lopping of Native Vegetation (the Guidelines)

The below clearing scenario is based on the development design plans provided by MAB Corporation Pty Ltd by email dated 27 July 2022 (Appendix 3). All native vegetation within the development footprint will be impacted. Beyond the development footprint, Creekline Grassy Woodland will be retained along the Moonee Ponds Creek riparian area and a small patch on the eastern boundary of the study area will be retained.

3.3.1 *Avoid and Minimise Statement*

It is not possible to avoid impacts to native vegetation due to the engineering and road safety standards required to facilitate acceptable access and egress into the proposed industrial estate. The vegetation proposed to be impacted is due to the construction of a primary road within the estate, providing public access to the proposed 4.9 hectare reserve along Moonee Ponds Creek, which also supports the proposed bio-retention system and requires access for maintenance and operation activities. All patches of native vegetation proposed to be impacted are highly degraded and contain a high coverage of weeds that would require significant ongoing resources to maintain. The bio-retention system has been situated to minimise impacts to the Moonee Ponds Creek riparian area. While areas to the north-west corner and northern boundary of the site were considered for the bio-retention system, its proposed location in the north-east corner avoids any impacts to Creekline Grassy Woodland patches.

Land surrounding the bio-retention system will be subject to ongoing weed and rubbish management, ensuring a higher quality environment is maintained compared to its current state. A further benefit to Growling Grass Frog is proposed in the bio-retention system design. Where possible, aquatic vegetation and exposed rock will be provided within the sediment pond of the bio-retention system. The sediment pond will consider the Growling Grass Frog habitat design standards and provide additional suitable aquatic and basking habitat for the species (DELWP 2017b).

In the context of the development, the modified condition of low ecological values of vegetation proposed to be impacted, combined with the proposed retention of 0.007 hectares of Grassy Woodland, 0.715 hectares of Creekline Grassy Woodland, implementation of a CEMP and use of native species in landscaping, the environmental loss is anticipated to be minimal.

3.3.2 *Vegetation proposed to be removed*

The study area is within Location 2, with 0.255 hectares of native vegetation proposed to be removed. As such, the permit application falls under the Intermediate Assessment Pathway (Table 4).

Condition scores for vegetation proposed to be removed are provided in Appendix 1.2.

Table 4. Removal of Native Vegetation (the Guidelines) (DELWP 2017a).

Assessment pathway	Intermediate
Location Category	2
Total Extent (past and proposed) (ha)	0.255
Extent of past removal (ha)	0.00
Extent of proposed removal (ha)	0.255
Large Trees (scattered and in patches) to be removed (no.)	0
EVC Conservation Status of vegetation to be removed	Endangered (Grassy Woodland and Plains Grassy Woodland)

3.3.3 Offset Targets

The offset requirement for native vegetation removal is 0.033 General Habitat Units.

A summary of proposed vegetation losses and associated offset requirements is presented in Table 5 and the EnSym report is presented in Appendix 4.

Table 5. Offset Targets

General Offsets Required	0.033 General Habitat Units
Large Trees	0
Vicinity (catchment/council)	Port Phillip and Westernport CMA / Hume City Council
Minimum Strategic Biodiversity Value*	0.415

*The minimum Strategic Biodiversity Value is 80% of the weighted average score across habitat zones where a General offset is required.

3.4 Significance Assessment

This section outlines biodiversity matters of national significance. The significance criteria adopted for this assessment is outlined below (Table 6).

Table 6. Criteria for Defining Ecological Significance

National Significance
Flora and Fauna: National conservation status is based on the EPBC Act list of taxa considered threatened in Australia (i.e. Extinct, Critically Endangered, Endangered and Vulnerable).
State Significance
Flora: Species listed as threatened under the FFG Act.
Fauna: Species listed as threatened under the FFG Act.

3.5 National Significance

National significance for flora and fauna is defined in Table 6.

3.5.1 Flora

No nationally significant flora species were recorded within the study area during the field assessments. The VBA contain records of 13 EPBC Act listed flora species previously recorded within 10 kilometres of the study area (DELWP 2022d) (Appendix 1.3 and Figure 3). The PMST nominates five additional species which have not been recorded in the locality but have the potential to occur (DCCEEW 2022).

Based on habitat present within the study area, landscape context and the proximity of previous records, nationally significant flora species are considered unlikely to occur within the study area (Appendix 1.3).

3.5.2 Fauna

No nationally significant fauna species were recorded within the study area during the field assessments. The VBA contains records of 26 EPBC Act listed fauna species previously recorded within 10 kilometres of the study area (DELWP 2022d) (Appendix 2.2 and Figure 4). The PMST nominates an additional six nationally significant species which have not been recorded in the locality but have the potential to occur (DCCEEW 2022).

Based on the likelihood-of-occurrence assessment, one EPBC Act-listed fauna species have the potential to use habitats within the study area and be affected by future development activities - Growling Grass Frog. All other nominated species have been discounted from this assessment based on the lack of suitable habitat, the low likelihood of significant impacts (e.g. Grey-headed Flying-fox *Pteropus poliocephalus*), or where the species is known to be extinct in the locality (e.g. Eastern Barred Bandicoot *Perameles gunnii*). Golden Sun Moth and Growling Grass Frog are discussed below.

Targeted Golden Sun Moth Surveys

Golden Sun Moth generally occurs in native grassland dominated by greater than 40% cover of wallaby-grass, in particular Short Wallaby-grass *Rytidosperma carphoides* (DSE 2004b) but may also inhabit areas dominated by Kangaroo Grass *Themeda triandra* and introduced grassland (Endersby and Koehler 2006). Prior to European settlement, Golden Sun Moth was widespread and relatively continuous throughout its range, inhabiting grassy open woodlands and grassland, although it currently inhabits small isolated sites (DSE 2004b).

The VBA contains 145 records of Golden Sun Moth within 10 kilometres of the study area, with the closest to the site being recorded in 2006, approximately four kilometres to the north (Figure 4). Although suitable habitat is present on site and known populations exist in the locality, the presence of this species within the study area has been discounted through the absence of records during three separate survey seasons undertaken .

Parts of the study area were characterised by occurrences of one indigenous grass preferred by Golden Sun Moth (wallaby-grass.), as well as non-native Chilean Needle-grass – also a preferred grass for the species. Areas of potential habitat were moderate to low quality due to interspersed exotic grasses Perennial Rye-grass and Soft Brome and several weeds listed under the CaLP Act and WoNS, including Serrated Tussock and declared noxious weeds Artichoke Thistle and Spear Thistle.

For each survey season, targeted surveys were completed on four occasions during suitable weather conditions, and during periods when the species was known to be flying at other sites in the vicinity of the study area (Greenvale, Craigieburn and/or Wollert). Despite ideal weather conditions and confirmed activity at the reference sites, the species was not detected within the study area during surveys (Table 7). In addition, the species was not detected immediately adjacent to the study area during recent targeted surveys on Melbourne Airport land (Hatt *et al.* 2008). While the proposed area of the bio-retention system was not assessed in 2008/09, a detailed habitat assessment completed in 2014 identified that this area provides similar habitat to the remaining site and is unlikely to support this species. Therefore, a resident population of Golden Sun Moth is not present within the study area.

Table 7. Results of targeted Golden Sun Moth assessments

Survey/ Date	Weather conditions ¹						No. GSM
	Survey Temp C° (max/min)	Wind direction	Wind speed (km/hr)	Relative Humidity (%)	Cloud Cover (%)	Ground Conditions	
20/11/2019	26	NW	15	32	0	Dry	0
27/11/2019	23	WNW	20	20	0	Dry	0
9/12/2019	36	NNW	27	10	0	Dry	0
18/12/2019	37	WNW	17	17	20	Dry	0

Note: Bureau of Meteorology (BOM) weather for Melbourne Airport (Station 086282 – November 2019), Australian Government, ACT.

Targeted Growling Grass Frog Surveys

Growling Grass Frog is known to occur throughout the Moonee Ponds Creek system (DEPI 2014) and the VBA contains 111 records of the species within 10 kilometres of the study area, with the closest being recorded in 2009, approximately 80 metres to the north (Figure 4). The study area is bound by Moonee Ponds creek to the north, which contains potential habitat for Growling Grass Frog. The species was last detected along this creek line within the study area in 2009, and more recently (2014) approximately 500 metres north-west of the study area on the creek. A total of 254 Growling Grass Frog (GGF) observations have been recorded within 10 kilometres of the study area (DELWP 2022b). Favoured sites for the species include those with vegetation lining the banks and water bodies with a large proportion of emergent, submerged and floating vegetation.

The site of the proposed bio-retention system adjoins the riparian zone of Moonee Ponds Creek, which provides potential breeding and dispersal habitat for Growling Grass Frog (Figure 2). Based on preliminary siting information, bio-retention system development will largely be contained to areas of modified native/exotic grassland, which are maintained through slashing and do not contain frog refuge features such as logs and rocks. The reach of Moonee Ponds Creek within the vicinity of the bio-retention system site is congested with Bulrush *Typha* sp., however small pools containing more diverse assemblages of submergent, emergent and floating vegetation are distributed along the watercourse (Plates 12 and 13). These areas provide suitable habitat for Growling Grass Frog, which is also likely to use the revegetated riparian corridor for dispersal up/downstream of the creek and to other areas of high-quality habitat (i.e. dams).

One ephemeral dam was observed in the south-east of the study area during a further site assessment in October 2022, following a significant rainfall event. Based on the results of previous site assessments and the

depth profile of the dam, it is likely to only become inundated following significant rainfall events and remain dry for most of the year. In this context, the ephemeral dam is highly unlikely to provide suitable breeding habitat for Growling Grass Frog.

Given the lack of suitable habitat within the proposed development footprint and assuming the implementation of measures to avoid and mitigate indirect impacts (e.g. sedimentation), it is considered unlikely that construction of the bio-retention system would significantly impact on this species. Recommended mitigation measures and implications relating to Growling Grass Frog are further discussed in Sections 6.2.



Plate 12. Moonee Ponds Creek



Plate 13. Moonee Ponds Creek

One waterbody was surveyed in the study area: the Moonee Ponds creek. Sections of the creek in the study area provide moderate to high quality habitat for Growling Grass Frog given the presence of suitable aquatic habitats which are typical of suitable breeding and refuge habitat likely to be used by the species. This is primarily associated with the presence of species including Finger Rush *Juncus subsecundus*. Fringing and emergent vegetation predominantly comprised the introduced aquatic and terrestrial flora species. Some refuges in the form of rocks, logs or fallen litter were noted during the assessment.

No Growling Grass Frogs were detected during the targeted surveys despite weather conditions being suitable (Table 8). Common Froglet *Crinia signifera* and Spotted Marsh Frog *Limnodynastes dumerilii* were heard calling during the targeted surveys. Frog activity was relatively low during both survey events with approximately few individual frogs heard calling on each occasion.

Based on the findings of targeted surveys, there is a low likelihood that the creek section within the study area currently support a breeding population of Growling Grass Frog. However, the quality of habitat suggests the creek may be able to support the species in the future.

Table 8. Results of targeted Growing Grass Frog nocturnal assessments.

Survey/ Date	Weather conditions ¹						No. GGF
	Survey Temp C° (max/min)	Wind direction	Wind speed (km/hr)	Relative Humidity (%)	Cloud Cover (%)	Rain	
14/11/2019	14	W	10	85	15	0	0
25/11/2019	20	WNW	8	53	30	0	0

Note: Bureau of Meteorology (BOM) weather for Melbourne Airport (Station 086282 – November 2019), Australian Government, ACT.

3.5.3 Ecological Communities

Five nationally listed ecological communities are predicted to occur within 10 kilometres of the study area (DCCEEW 2022):

- Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEWVVP);
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Natural Damp Grassland of the Victorian Coastal Plains;
- Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP); and,
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

The treeless patches of Plains Grassy Woodland were assessed against the condition thresholds for the nationally significant Grassy Eucalypt Woodland of the Victorian Volcanic Plain (GEWVVP), as outlined below.

Step 1 – Is GEWVVP ecological community present within the study area?

- Does the patch occur within or near the Victorian Volcanic Plain bioregion? **Yes**
- Is the site dominated by native vegetation? **Yes**
- Are trees present such that projective foliage cover of native trees is more than 5%? **No** – however, the tree canopy cover for derived grasslands has a lower limit of 0% cover, which applies in this instance.

The current state of the habitat zone is a derived native grassland, which is still eligible for listing if further conditions thresholds are met.

Step 2 – Is the habitat zone of sufficient quality for national listing?

Is the habitat zone bigger than or equal to 0.5 hectares? **Yes**

Does 50% or more of perennial ground layer vegetation comprise native species? **No** – perennial exotic species make up more than 60% of the projective foliage cover.

The patches of PGW within the study area are not of sufficient quality for protection under the EPBC Act.

3.6 State Significance Assessment

State significance for flora and fauna is defined in Table 6.

3.6.1 Flora

No state significant flora species were recorded within the study area during the field assessments. The VBA contains records of 41 state significant flora species within 10 kilometres of the study area (DELWP 2022d) (Appendix 1.2 and Figure 3). Based on habitat present within the study area, landscape context and the

proximity of previous records, state significant flora species are considered unlikely to occur on site (Appendix 1.3).

3.6.2 *Fauna*

The state significant species Hardhead was recorded in a wetland located outside of the study area during field assessments completed in November 2008. The small dams within the broader study area are likely to provide occasional foraging habitat for this species. The VBA contains records of 38 State-significant fauna species within 10 kilometres of the study area (DELWP 2022d) (Appendix 2.2 and Figure 4).

3.6.3 *Ecological Communities*

One FFG Act Listed ecological community has the potential to be present in the study area, being the Western (Basalt) Plains Grasslands Community. This community would correspond to areas of treeless Plains Grassy Woodland mapped in the study area however does not meet relevant description and characteristics described for these communities (DELWP 2022g).

4 LEGISLATIVE AND POLICY IMPLICATIONS

4.1 *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions (i.e. project, development, undertaking, activity, or series of activities) that are likely to have a significant impact on matters of NES, or on Commonwealth land. An action, unless otherwise exempt, requires approval from the Commonwealth Environment Minister if it is considered likely to have an impact on any of the following matters of NES:

- World Heritage properties;
- National heritage places;
- Ramsar wetlands of international significance;
- Threatened species and ecological communities;
- Migratory and marine species;
- Commonwealth marine area;
- Nuclear actions (including uranium mining);
- Great Barrier Reef Marine Park; or,
- Water resources impacted by coal seam gas or mining development.

4.1.1 *Implications*

Based on concept information, activities associated with site development are unlikely to cause a significant impact on any matter of NES relating to biodiversity, including Ramsar wetlands and listed species/ ecological communities.

The DCCEEW Protected Matters Search Tool does not list any Ramsar wetlands as occurring within the same catchment as the study area and as such, future development activities are unlikely to impact upon any Ramsar values (DCCEEW 2022).

No EPBC Act-listed threatened species of flora or fauna were recorded during targeted surveys within the study area, including Growling Grass Frog (2019) and Golden Sun Moth, which was targeted during surveys completed across three survey periods 2008/09, 2012/13 and 2019/20. Of the EPBC Act-listed species recorded or predicted to occur in the locality, only Growling Grass Frog has the potential to use habitats within the study area. While the species is known to occur within the Moonee Ponds Creek system, the proposed bio-retention system site provides limited dispersal habitat, as it is frequently maintained by slashing and lacks suitable refuge features, such as rocks and logs.

In relation to the bio-retention system, it is considered that through appropriate design and construction of the bio-retention system it has the potential to contribute to habitat resources for this species (i.e. potential off-stream breeding habitat). The surrounding land will be subject to ongoing weed and rubbish management, ensuring a higher quality potential terrestrial habitat environment is maintained for Growling Grass Frog compared with its current state. A further benefit to Growling Grass Frog is proposed in the bio-retention system design. Where possible, suitable aquatic vegetation (i.e. submerged and floating vegetation) and

exposed rock will be provided within the sediment pond of the bio-retention system. The sediment pond will consider the Growling Grass Frog habitat design standards and provide additional suitable aquatic and basking habitat for the species (DELWP 2017b).

Table 5. Significant impact thresholds for Growling Grass Frog (DEWHA 2009)

Ecological element affected	Impact Threshold	Response
Habitat degradation in an area supporting an important population	Permanent removal or degradation of terrestrial habitat within 200 metre of a waterbody in temperate regions that results in the loss of dispersal or overwintering opportunities for an important population.	While the species is known to occur within the Moonee Ponds Creek system, the proposed bio-retention system site provides limited dispersal habitat, as it is frequently maintained by slashing and lacks suitable refuge features, such as rocks and logs. The surrounding land will be subject to ongoing weed and rubbish management, ensuring a higher quality potential terrestrial habitat environment is created for Growling Grass Frog compared to its current state. A further benefit to Growling Grass Frog is proposed in the bio-retention system design. Where possible, aquatic vegetation and exposed rock will be provided within the sediment pond of the bio-retention system. The sediment pond will consider the Growling Grass Frog habitat design standards and provide additional suitable aquatic and basking habitat for the species (DELWP 2017b).
	Alteration of aquatic vegetation, diversity or structure that leads to a decrease in habitat quality.	There will not be any alteration to aquatic vegetation.
	Alteration to wetland hydrology, diversity and structure.	The bio-retention system is intended to reduce the high flow impacts of stormwater into the Moonee Ponds Creek. The bio-retention system will improve water quality and moderate flow rates into the creek, which is likely to improve in-stream habitat for Growling Grass Frog.
	Introduction of predatory fish and/or disease agents.	The action will not cause the introduction of any additional populations of predatory fish or disease agents to wetland habitats.
Isolation and fragmentation of populations	Net reduction in the number and/or diversity of waterbodies available to a population.	Based on the site assessment and historical aerial photos, no areas proposed to be disturbed will be inundated for extended periods (i.e. support habitat suitable for breeding and recruitment) as a result of the proposed action. Although some areas within the study area are occasionally inundated after rainfall, these waterbodies do not support the preferred habitat characteristics for Growling Grass Frog (i.e. emergent and/or fringing vegetation), and do not provide limiting or breeding habitat.
	Removal or alteration of available terrestrial or aquatic habitat corridors.	While the species is known to occur within the Moonee Ponds Creek system, the proposed bio-retention system site provides limited dispersal habitat, as it is frequently maintained by slashing and lacks suitable refuge features, such as rocks and logs.
	Construction of physical barriers to movement between waterbodies, such as roads or buildings.	No physical barriers will be constructed that restrict movement between waterbodies.

Several migratory species have been previously recorded or are predicted to occur within the study area (Appendix 3.2). While Migratory species of bird are likely to use habitats within the study area on occasion, the study area is not classed as 'important habitat' as defined under the EPBC Act Matters of National Environmental Significance Significant Impact Guidelines 1.1 (DoE 2013).

The proposed development of the study area is not likely to significantly impact any matters of NES and therefore a referral to DCCEEW under the EPBC Act for the future development is not required.

4.2 Environment Effects Act 1978 (Victoria)

The Environment Effects Act 1978 provides for assessment of proposed actions that are capable of having a significant effect on the environment via the preparation of an Environment Effects Statement (EES). A project with potential adverse environmental effects that, individually or in combination, could be significant in a regional or state context should be referred.

4.2.1 Implications

As the removal of native vegetation classified as 'Endangered' is less than 10 hectares, and no referral criteria under the *Environment Effects Act* are met, the project will not need to be referred to the Minister administering the *Environment Effects Act* due to impacts on ecological values.

4.3 Flora and Fauna Guarantee Act 1988 (Victoria)

The FFG Act is the primary Victorian legislation providing for the conservation of threatened species and ecological communities, and for the management of processes that are threatening to Victoria's native flora and fauna. The FFG Act contains protection procedures such as the listing of threatened species and/or communities, and the preparation of action statements to protect the long-term viability of these values. Previously, Victoria had multiple lists of threatened species - those listed under the FFG Act, and non-statutory lists called the Victorian Threatened Species Advisory Lists. Recent amendments to the FFG Act have removed duplication by establishing a single comprehensive list of threatened flora and fauna species. This will continue to be known as the FFG Act Threatened List. With the new comprehensive list now in effect, the Advisory lists have been revoked.

Proponents are required to apply for an FFG Act permit to 'take' listed and/or protected flora species and listed vegetation communities. An FFG Act permit is generally not required for the removal of listed and/or protected flora species and communities on private land. There are currently no requirements for proponents to apply for a permit under the FFG Act where a proposed activity requires the removal of habitat for a listed terrestrial fauna species. The Act does however regulate the removal, salvage, temporary holding, relocation, taking, trading and keeping of FFG Act-listed fish species.

The *Flora and Fauna Guarantee Amendment Act 2019 (the Amendment Act)* came into effect on June 1, 2020. The Amendment Act requires consideration of biodiversity across government to ensure decisions and policies are made with proper consideration of the potential impacts on biodiversity and now applies the FFG Act to Crown land and private/freehold land that is managed by a public authority.

4.3.1 Implications

The local planning authority may consider flora, fauna and communities listed under the FFG Act when making decisions regarding the use and development of land. One 'listed' ecological community (Western (Basalt) Plains Grasslands Community) was present within the study area. One 'protected' species under the FFG Act (Jersey Cudweed) was recorded within the study area. The study area is privately owned, and as such the FFG Act permit to remove 'Protected Flora' is required.

4.4 Planning and Environment Act 1987 (Victoria)

The *Planning and Environment Act 1987* outlines the legislative framework for planning in Victoria and for the development and administration of planning schemes. All planning schemes contain native vegetation provisions at Clause 52.17 which require a planning permit from the relevant local Council to remove, destroy or lop native vegetation on a site of more than 0.4 hectares, unless an exemption under clause 52.17-7 of the Victorian Planning Schemes applies or a subdivision is proposed with lots less than 0.4 hectares¹.

Where the clearing of native vegetation is permitted, the quantity and type of vegetation to be offset is determined using methodology specified in The Guidelines (DELWP 2017a).

4.4.1 Local Planning Scheme

The study area is located within the Hume City Council. The following zoning and overlays apply (DELWP 2022e):

- Farming Zone – Schedule 3 (FZ3);
- Public Use Zone – Schedule 1 Service and Utility (PUZ1)
- Environmental Audit Overlay (EAO)
- Environmental Significance Overlay – Schedule 2 (ESO2).

The study area occurs in the West Growth Corridor Plan, is zoned as an 'Existing Urban' area, and is within a Designated Bushfire Prone Area.

Public Use Zone Service and Utility

An application for a permit by a person other than the relevant public land manager must be accompanied by the written consent of the public land manager, indicating that the public land manager consents generally or conditionally either:

- To the applicant for permit being made;
- To the application for permit being made and the proposed use for the development.

Before deciding on an application to use or subdivide land, construct a building or construct or carry out works, in addition to the decision guidelines in Clause 65, the responsible authority must consider, as appropriate:

¹ In accordance with the Victorian Civil and Administrative Tribunal's (VCAT) decision *Villawood v Greater Bendigo CC* (2005) VCAT 2703 (20 December 2005) all native vegetation is considered lost where proposed lots are less than 0.4 hectares in area and must be offset at the time of subdivision.

- The Municipal Planning Strategy and the Planning Policy Framework;
- The comments of any Minister or public land manager having responsibility for the care or management of the land or adjacent land;
- Whether the development is appropriately located and designed, including in accordance with any relevant use, design or siting guidelines.

Environmental Audit Overlay

The EAO classification allows council to apply stricter decision guidelines to ensure proper assessment of known and potential impacts on Moonee Ponds Creek. The assessment requires a certificate of environmental audit to be issued before a sensitive use (residential use, child care centre, pre-school centre or primary school) commences or before the construction or carrying out of building works, in accordance with Part IXD of the *Environment Protection Act 1970*. Alternatively, an environmental auditor appointed under the *Environment Protection Act 1970* must make a statement in accordance with Part IXD of that Act that the environmental conditions of the land are suitable for sensitive use.

A statement of environmental audit has been issued to permit the proposed development uses in the study area.

Environmental Significance Overlay Schedule 2 – Merri Creek and Moonee Ponds Creek

The Moonee Ponds Creek and its environs provide an important regional open space and habitat link and contain many Aboriginal cultural heritage sites of significance. The Merri Creek is protected under the ESO2 with the objective to achieve a series of environmental outcomes, including ecological function, waterway function, recreational use, landscape character and heritage. A permit will be required to remove, lop or destroy vegetation within an ESO2 area.

The following Decision Guidelines apply to an application for a permit under Clause 42.01:

- The Merri Creek Concept Plan or The Moonee Ponds Creek Concept Plan and any guidelines or local policies for the relevant creek;

Addressed in 4.4.2

- The need to assess the impact upon the creek environs and to ensure any impacts are adequately ameliorated;

Addressed in 4.4.2, 3.3, and Chapter 5 and 6

- The effect of the proposed removal of any native vegetation on the habitat value, wildlife corridor, and long-term viability of remnant and revegetated areas along the creek corridor;

Addressed in 4.4.2, Chapter 5 and 6

- The significance of the native vegetation area, including the significance of planted communities or significant planted and animal species supported;

Addressed in 3.4, 3.5 and 3.6

- The reason for removing the native vegetation and the practicality of alternative options which do not require the removal of the native vegetation;

Addressed in 3.3.1 and Chapter 6

- The effect of the height, bulk and general appearance of any proposed buildings and works on the environmental values and visual character of the creek;
Addressed in Chapter 6 and 7
- The need for landscaping or vegetation screening;
Addressed in Chapter 6
- The need to ensure that buildings or works do not disturb known sites of Aboriginal heritage or areas likely to contain Aboriginal heritage;
Not assessed
- The need to protect trees with Aboriginal trunk or branch scars;
Not assessed
- The need to retain native vegetation and natural features which contribute to the health and quality of the creek and the visual character of the creek corridor;
Addressed in Chapter 5 and 6
- The extent that buildings or works are designed to enhance or promote the environmental values of the creek and the visual character of the creek corridor.,
Addressed in Chapter 6
- The views of the Merri Creek Management Committee or the Moonee Ponds Creek Association and the Aboriginal Affairs Victoria Heritage Services Branch.
Not assessed

In granting a planning permit, Council may specify certain conditions of approval relating to protection of ecological values, such as the preparation of Weed and Pest Management Plan or Construction Environmental Management Plan (CEMP).

4.4.2 Implications

Three small patches of Grassy Woodland within the ESO2 are proposed for removal, however this patch is 0.01 hectares, isolated, low-quality, and is not contained within the Moonee Ponds Creek riparian area (Figure 2). Patches of Grassy Woodland proposed for removal do not form part of a wildlife corridor due to their small size and fragmented state. The completion of a Construction Environmental Management Plan (CEMP) prior to commencement of construction will ensure that impacts to the surround environment are proactively prevented. The CEMP is intended to enforce sediment retention methods to prevent sediment laden run-off getting to the ephemeral drainage line and the use of tree protection fencing to be implemented to prevent indirect damage to native vegetation to be retained. The small patch of endangered Grassy Woodland proposed to be removed exhibits minimal habitat value, and no flora or fauna species of significance. The removal of native vegetation is unavoidable, as it is to install a bio-retention system, that has a pre-determined footprint. The proposed area of disturbance is not a known site of aboriginal heritage and/or known to support significant aboriginal trees.

- The Moonee Ponds Creek Concept Plan (Melbourne Water 1992) was prepared for the Moonee Ponds Creek Association and comprised a review of the Moonee Ponds Creek environment, including the

reach adjacent to the study area. The following actions were proposed for the creek in relation to the study area: 9.01 - Purchase privately owned Melbourne Water zoned land between Wright and Victoria streets.

- 9.04 - Construct trail from Fawkner Street to Victoria Street.
- 9.05 - Plant trees in the vicinity of Wright Street, in association with the wetland development.
- 9.07 / 9.08 - Undertake further archaeological / aboriginal hearth recording upstream of Mickleham Road.

A stated issue in relation to the Moonee Ponds Creek in relation to the study area was the prevalence of weeds and rubbish dumping.

In relation to the proposed action, land surrounding the bio-retention system is proposed to be subject to ongoing weed and rubbish management, ensuring a higher quality environment is maintained compared to its current state.

4.4.3 *The Guidelines*

The study area contains approximately 9.978 hectares of native vegetation and one native scattered tree. Prior to the Guidelines (DELWP 2017a), replacing the Guidelines (DEPI 2013a) and The Framework (NRE 2002), the areas of modified native grassland were previously classified as Modified Treeless Vegetation (MTV) and excluded from offset considerations. The MTV classification no longer applies under the Guidelines (DELWP 2017a), with all vegetation patches containing >25% native understorey now considered a remnant patch (DELWP 2017 and DEPI 2013a)

The State Planning Policy Framework and the decision guidelines at Clause 12.01 Biodiversity and Clause 52.17 Native Vegetation require Planning and Responsible Authorities to have regard for the Guidelines (DELWP 2017a).

In this situation, the permit will need to be referred to DELWP as the vegetation proposed to be removed meets the top two thresholds listed below:

- It falls under the Detailed Assessment Pathway;
- It is on Crown land that is occupied or managed by the responsible authority;
- A property vegetation plan applied to the site.

4.4.4 *Implications*

As total loss of native vegetation within the development footprint is proposed, resulting in the loss of 0.255 hectares of native vegetation and the study area is within Location 2, the permit application falls under the Intermediate Assessment Pathway. The 0.255 hectares of native vegetation consists of 0.195 hectares of Plains Grassy Woodland, 0.011 hectares of Aquatic Herbland and 0.018 hectares of Grassy Woodland.

The offset requirement for native vegetation removal is 0.033 General Habitat Units.

A planning permit from the responsible authority is required to remove, destroy or lop any native vegetation under Clause 52.17 and Clause 42.01 (ESO2) of the Planning Scheme.

4.5 **Catchment and Land Protection Act 1994 (Victoria)**

The CaLP Act contains provisions relating to catchment planning, land management, noxious weeds and pest animals. The Act also provides a legislative framework for the management of private and public land and sets out the responsibilities of land managers, stating that they must take all reasonable steps to:

- Avoid causing or contributing to land degradation which causes or may cause damage to land of another land owner;
- Protect water resources;
- Conserve soil;
- Eradicate regionally prohibited weeds;
- Prevent the growth and spread of regionally controlled weeds; and,
- Prevent the spread of, and as far as possible eradicate, established pest animals.

4.5.1 *Implications*

Eight weeds listed as noxious under the *Catchment and Land Protection Act 1994* were recorded during the assessment (Artichoke Thistle *Cynara cardunculus*, Patterson's Curse *Echium plantagineum*, African Boxthorn *Lycium ferocissimum*, Chilean Needle Grass *Nassella neesiana*, Serrated Tussock *Nassella trichotoma*, Prickly Pear *Opuntia* sp., Blackberry *Rubus fruticosus* and Gorse *Ulex europaeus*). Included in the list are six WoNS African Boxthorn, Chilean Needle Grass, Serrated Tussock, Prickly Pear, Blackberry and Gorse. Similarly, there is evidence that the study area is currently occupied by several pest fauna species listed under the CaLP Act (Red Fox *Vulpes Vulpes* and European Rabbit *Oryctolagus cuniculus*). Landowners are responsible for the control of any infestation of noxious weeds and pest fauna species. To meet CaLP Act requirements listed noxious weeds should be appropriately controlled throughout the study area to minimise their spread and impact on ecological values, and a Weed/ Pest Management Plan may be required as part of any future development proposals.

4.6 **Wildlife Act 1975 and Wildlife Regulations 2013 (Victoria)**

The *Wildlife Act 1975* (and associated Wildlife Regulations 2013) is the primary legislation in Victoria providing for protection and management of wildlife. Authorisation for habitat removal may be obtained under the *Wildlife Act 1975* through a licence granted under the *Forests Act 1958*, or under any other Act such as the *Planning and Environment Act 1987*. Any persons engaged to remove, salvage, hold or relocate native fauna during construction must hold a current Management Authorisation under the *Wildlife Act 1975*, issued by DELWP.

4.6.1 *Implications*

Authorisation for habitat removal may be obtained under the *Wildlife Act 1975* through a licence granted under the *Forests Act 1958*, or under any other Act such as the *Planning and Environment Act 1987* (planning permit). In the event that conditions of approval or project activities involve the removal of native fauna (e.g. salvage and translocation of Growling Grass Frog), all works must be undertaken under a current Management Authorisation issued under the *Wildlife Act 1975*.

5 POTENTIAL IMPACTS

Any loss of ecological values should be viewed in the context of the overall ongoing loss, fragmentation, and deterioration in the quality of remnant vegetation throughout many areas on the suburban edge of Melbourne. In the absence of mitigation measures, development activities have the potential to impact upon ecological values within the study area and surrounding landscape. Potential impacts associated with development activities include:

- Modification of flow regimes and sedimentation levels into Moonee Ponds Creek (Growling Grass Frog habitat). However, flow rates are unlikely to increase as a result of the proposed development given the proposed construction of a bio-retention facility;
- Loss of potential habitat for State significant fauna species (Hardhead, Australasian Shoveler and Blue-billed Duck);
- Loss of habitat and potential mortality for locally common fauna species dependent on wetlands or inundated areas for foraging, shelter or nesting (e.g. aquatic or wading birds, frogs, microbats);
- Land-locking of local populations of Eastern Grey Kangaroo *Macropus giganteus* through development in and around the species' habitat. This can lead to a number of adverse impacts ranging from animal welfare issues to potential human safety concerns;
- Potential for further habitat fragmentation in a fragmented landscape and the associated creation of barriers to the movement and migration of indigenous fauna;
- Potential for an increase to levels of indigenous fauna roadkill along new road alignments;
- Potential for the spread of weeds and soil pathogens due to on-site activities;
- Disturbance to wildlife from increased human activity and noise during construction; and,
- Indirect impacts on adjacent areas if construction activities and drainage are not appropriately managed.

Given the modified nature of the study area and lack of suitable habitats, it is unlikely that future development activities will have a significant impact on matters of NES. Recommended mitigation measures for consideration during the planning and design phase are provided in Section 6.

6 MITIGATION MEASURES

6.1 Best Practice Mitigation Measures

Recommended measures to mitigate impacts upon terrestrial and aquatic values present within the study area may include:

- Appropriate consideration in planning processes and expert input into project design or management. Design of the bio-retention system should aim to provide habitat for the Growling Grass Frog, referencing best practice standards including the Melbourne Water Constructed Wetlands Guidelines (2010);
- Minimise impacts to native vegetation and habitats through construction and micro-siting techniques, including fencing retained areas of native vegetation. If indeed necessary, trees should be lopped or trimmed rather than removed. Similarly, soil disturbance and sedimentation within Moonee Ponds Creek should be avoided or kept to a minimum, to avoid, or minimise impacts to fauna habitats;
- All contractors should be aware of ecologically sensitive areas to minimise the likelihood of inadvertent disturbance to areas marked for retention. Native vegetation (areas of sensitivity) should be included as a mapping overlay on any construction plans;
- Removal of any habitat trees or shrubs (particularly hollow-bearing trees or trees/shrubs with nests) should be undertaken between February and September to avoid the breeding season for most fauna species. If any habitat trees or shrubs are proposed to be removed, this should be undertaken under the supervision of an appropriately qualified zoologist to salvage and relocation any displaced fauna. A Fauna Management Plan may be required to guide the salvage and relocation process;
- Where possible, construction stockpiles, machinery, roads, and other infrastructure should be placed away from areas supporting native vegetation, and/or waterways;
- Ensure that best practice sedimentation and pollution control measures are undertaken at all times, in accordance with Environment Protection Authority guidelines (EPA 1991; EPA 1996; Victorian Stormwater Committee 1999) to prevent offsite impacts to waterways and wetlands; and,
- As indigenous flora provides valuable habitat for indigenous fauna, it is recommended that any landscape plantings that are undertaken as part of the proposed works are conducted using indigenous species sourced from a local provenance, rather than exotic deciduous trees and shrubs.

In addition to these measures, preparation of the following documents may be incorporated into the conditions of approval:

- Construction Environmental Management Plan (CEMP). The CEMP should include specific species/vegetation conservation strategies, daily monitoring, sedimentation management, site specific rehabilitation plans, weed and pathogen management measures, etc.;
- Weed Management Plan. This plan should follow the guidelines set out in the CaLP Act, and clearly outline any obligations of the project team in relation to minimising the spread of weeds as a result of this project.

6.2 Offset Impacts and Strategy

When the removal of native vegetation has a significant impact on habitat for a rare or threatened species, the offset must compensate for the removal of that species' habitat. Offsets are divided into two categories: General and Specific. General offsets are based on the contribution a site makes to biodiversity overall, while Specific offsets consider the contribution a site makes to the persistence of rare or threatened species.

General offsets require an offset multiplier (Risk Factor) of 1.5 with restrictions on location (same Catchment Management Authority boundary or municipal district) and biodiversity value (strategic biodiversity score at least 80% that of the vegetation to be removed). A Specific offset requires an offset multiplier of two, with no location or biodiversity value restrictions, and must support habitat for each rare or threatened species for which an offset is required (currently designated by DELWP).

The offset requirements for native vegetation removal, as prescribed by The Guidelines (DELWP 2017a), have been calculated by DELWP, based on the habitat hectares scores as assessed during the recent flora survey. The resulting NVR produced by DELWP is presented in Appendix 4. A summary of offsets for proposed vegetation losses is presented in Table 4 and Appendix 5.

According to DELWPs Native Vegetation Offset Register (DELWP 2022f), there are eleven offset sites within the Port Phillip and Westernport CMA or Hume City Council region that can be used to satisfy the General Habitat Unit offset requirements. An offset register search statement identifying the relevant offsite sites is provided in Appendix 5.

7 CONCLUSION AND FURTHER REQUIREMENTS

The study area is representative of many areas within the region as it has been significantly modified, with vegetation generally limited to low quality grassland, planted trees and shrubs, and fragmented native vegetation. Native vegetation within the study area consists of approximately 0.930 hectares across six patches of Plains Grassy Woodland (0.195 hectares), one patch of Aquatic Herbland (0.011 hectares), three patches of Grassy Woodland (0.018 hectares) and two patches of Creekline Grassy Woodland (0.72 hectares) (Figure 2). One native Scattered Tree is also present in the middle section of the site.

Although the study area contained sufficient habitat characteristics to support a moderate diversity of flora and common urban-adapted fauna species, the general scarcity of structural diversity and density within most vegetated areas represented limited niche availability for supporting high species diversity. Whilst much of the study area has been modified through historic land use and edge effects, a number of ecological values persist. The following points summarise the findings of desk and field based assessments completed for this project:

- The study area contains approximately 0.930 hectares of native vegetation and one native scattered tree. Prior to the Guidelines (DELWP 2017a), replacing the Guidelines (DEPI 2013a) and The Framework (NRE 2002), the areas of modified native grassland were previously classified as MTV and excluded from offset considerations. The MTV classification no longer applies under the Guidelines (DELWP 2017a), with all vegetation patches containing >25% native understorey cover now considered a remnant patch (DELWP 2017a and DEPI 2013a).
- No species or ecological communities of national significance were recorded within the study area during targeted surveys (Section 3.4). Of the EPBC Act listed species recorded or predicted to occur in the locality, Growling Grass Frog have the potential to use habitats on site and be affected by future development activities. The presence of Golden Sun Moth within the (original) study area was discounted after no sightings were recorded after three survey periods. While Growling Grass Frog is known to occur within Moonee Ponds Creek, the area proposed to contain the bio-retention system currently provides low quality dispersal habitat characterised by high weed coverage. Based on the lack of direct impacts and assuming the mitigation of indirect impacts (e.g. sedimentation), construction works associated with the bio-retention system are unlikely to significantly impact upon this species. In fact, development of the bio-retention system is likely to improve habitat resources for the Growling Grass Frog in the long-term.
- The state significant species Hardhead was recorded outside of the study area during previous assessments and it is likely that the small dam on site provide occasional foraging habitat for this species, along with Australasian Shoveler and Blue-billed (FFG Act listed). It is noted that the removal of this waterbody would not constitute a significant impact on these species. A 'protected' flora species under the FFG Act (Jersey Cudweed) has been previously recorded on site, however the sections of the study area subject to the provisions of the Act (public land) are not considered to support this species (Section 4.3.1).
- The proposed bio-retention system site is subject to an ESO under the Hume City Council Planning Scheme (Section 4.2 and Figure 2). This area is also covered by a BioSite of regional significance (Section 4.4).

A summary of legislative implications associated with development of the study area, is provided below (Table 9).

Table 9. Further requirements associated with development of the study area.

Relevant Legislation	Implications	Further Action
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	The proposed action is unlikely to have a significant impact on any matter of NES relating to biodiversity. As such, a referral to the Commonwealth Environment Minister is unlikely to be required regarding these matters listed under the EPBC Act.	The proposed action is unlikely to significantly impact upon any matters of NES relating to biodiversity. No further action required.
<i>Environment Effects Act 1978</i>	The project is proposed to remove less than 10 hectares of 'Endangered' Ecological Vegetation Classes. No referral criteria relating to ecology are met under the <i>Environment Effects Act 1978</i> .	No further action required.
<i>Flora and Fauna Guarantee Act 1988</i>	The provisions of the FFG Act apply to the proposed bio-retention system site as it is located on Melbourne Water property (i.e. publicly owned land) and the road reserve on Western Avenue. No protected flora species (including Jersey Cudweed) are considered likely to occur within this area.	No further action required.
<i>Planning and Environment Act 1987</i>	<p>The study area is within Location 2, with 0.255 hectares of native vegetation proposed to be removed. As such, the permit application falls under the Intermediate Assessment Pathway.</p> <p>The offset requirement for native vegetation removal is 0.033 General Habitat Units.</p> <p>A planning permit from the responsible authority is required to remove, destroy or lop any native vegetation under Clause 52.17 and Clause 42.01 (ESO2) of the Planning Scheme</p> <p>In this instance, the application is not required to be referred to DELWP.</p>	<p>Prepare and submit a Planning Permit application. Planning Permit conditions are likely to include a requirement for:</p> <ul style="list-style-type: none"> • Demonstration of impact avoidance and minimisation. • Vegetation offsets, as detailed in Section 3.3. • A Construction Environment Management Plan (CEMP). • A Weed/ Pest Management Plan.
<i>Catchment and Land Protection Act 1994</i>	Eight weed species listed under the CaLP Act were recorded within the study area (Artichoke Thistle, Patterson's Curse, African Boxthorn, Chilean Needle Grass, Serrated Tussock, Prickly Pear, Blackberry and Gorse). To meet requirements under the CaLP Act, listed noxious weeds should be appropriately controlled throughout the study area.	Planning Permit conditions may include a requirement for a Weed and Pest Management Plan.
<i>Wildlife Act 1975</i>	Any persons engaged to conduct salvage and relocation, or general handling of terrestrial fauna species must hold a current Management Authorisation.	Ensure wildlife specialists hold a current Management Authorisation.

In summary, the key ecological constraint associated with site development activities relates to the costs associated with meeting offset obligations for the removal of modified native grassland. Following rezoning and during the project design phase, it is recommended that DELWP are contacted to clarify the status of this vegetation type within the study area.

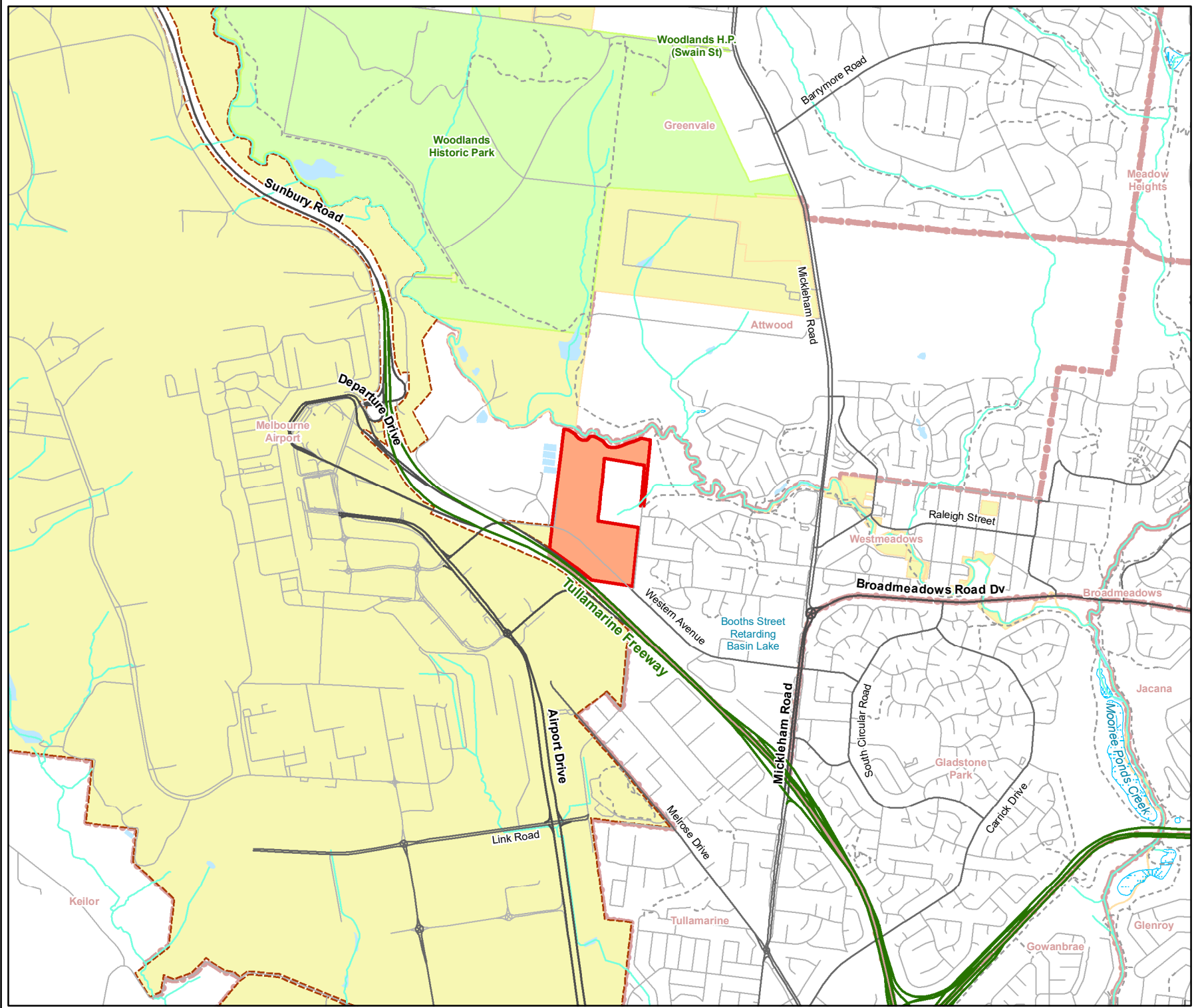
REFERENCES

- ALA 2021. Atlas of Living Australia. URL: <https://www.ala.org.au/>. Atlas of Living Australia, Canberra, ACT.
- Christidis, L. & Boles, W.E 2008. Systematics and Taxonomy of Australian Birds. CSIRO Publishing, Collingwood, Victoria.
- Clarke, G.M. & C. O'Dwyer 1999. Further survey in southeastern New South Wales for the endangered golden sun moth, *Synemon plana*. Pg 77. CSIRO Entomology, Canberra.
- Cogger, H.G., Cameron, E.E., Sadler, R.A. and Egger, P 1993. The Action Plan for Australian Reptiles. Australian Nature conservation Agency, Canberra, ACT.
- Cogger, H. G (Ed). 1996. Reptiles and Amphibians of Australia. 5th Edition. Reed Books Australia, Victoria.
- Cogger, H. G., Cameron, E. E. And Cogger, H. M. (1983). Volume 1 of Zoological Catalogue of Australia: Amphibia and Reptilia. Australian Government Publishing Service, Canberra.
- DWHA 2009a. Significant impact guidelines for the critically endangered golden sun moth (*Synemon plana*). Commonwealth Department of the Environment, Water, Heritage and the Arts, Canberra, ACT.
- DWHA 2009b. Significant impact guidelines for the vulnerable growling grass frog (*Litoria raniformis*). Commonwealth Department of the Environment, Water, Heritage and the Arts, Canberra, ACT.
- DCCEEW 2022. Protected Matters Search Tool. [www Document] URL: <http://www.environment.gov.au/epbc/pmst/index.html>. Commonwealth Department of Agriculture, Water and the Environment, Canberra, ACT.
- DELWP 2017a. Guidelines for the removal, destruction or lopping of native vegetation. December 2017. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
- DELWP 2017b. Growling Grass Frog Habitat Design Standards. Department of Environment, Land, Water and Planning. Melbourne, Victoria
- DELWP 2018 Assessor's handbook: Applications to remove, destroy or lop native vegetation. October 2018. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
- DELWP 2022a. NatureKit Map [www Document]. URL: <http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
- DELWP 2022b. Native Vegetation Information Management Tool [www Document]. URL: <https://nvim.delwp.vic.gov.au>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
- DELWP 2022c. Ecological Vegetation Class (EVC) Benchmarks for each Bioregion [www Document]. URL: <https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
- DELWP 2022d. Victorian Biodiversity Atlas. Sourced from GIS layers: "VBA_FLORA25", "VBA_FLORA100", "VBA_FAUNA25", "VBA_FAUNA100". March 2021. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.

- DELWP 2022e. VicPlan Map [www Document]. URL: <https://mapshare.maps.vic.gov.au/vicplan/>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
- DELWP 2022f. Search for Native Vegetation Credit Register [www Document]. URL: <https://nvcr.delwp.vic.gov.au/Home/Index>. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
- DELWP 2022g. *Flora and Fauna Guarantee Act 1988* Threatened List– June 2022 [www Document]. URL: https://www.environment.vic.gov.au/_data/assets/pdf_file/0024/115827/20191114-FFG-Threatened-List.pdf. Victorian Department of Environment, Land, Water and Planning, Melbourne, Victoria.
- DEPI 2013. Permitted Clearing of Native Vegetation – Biodiversity Assessment Guidelines. Victorian Department of Environment and Primary Industries, Melbourne, Victoria.
- DEPI 2014. Advisory List of Rare or Threatened Plants in Victoria. Victorian Department of Environment and Primary Industries, Melbourne, Victoria.
- DoE 2013. Matters of National Environmental Significance Significant Impact Guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999.
- DSE 2004a. Vegetation quality assessment manual: Guidelines for applying the habitat hectares scoring method. Version 1.3. Victorian Department of Sustainability and Environment, Melbourne Victoria.
- DSE 2004b. Flora and Fauna Guarantee Act Action Statement: Five threatened Victoria Sun Moths. Department of Sustainability and Environment, East Melbourne, Victoria.
- DSE 2009. Advisory list of Threatened Invertebrate Fauna in Victoria – 2009. Victorian Department of Sustainability and Environment, Melbourne, Victoria.
- DSE 2011. Native Vegetation Technical information sheet: Defining an acceptable distance for tree retention during construction works. Victorian Department of Sustainability and Environment, Melbourne, Victoria.
- DSE 2013. Advisory list of Threatened Vertebrate Fauna in Victoria – 2013. Victorian Department of Sustainability and Environment, Melbourne, Victoria.
- Duncan, A., Baker, G.B. and Montgomery, N. (Eds) 1999. The Action Plan for Australian Bats. Environment Australia, Canberra, ACT.
- Ecology and Heritage Partners 2019. Biodiversity Assessment: 140-204 Western Avenue, 47-67/69-99 Wright Street, Westmeadows. Unpublished report for MAB Corporation.
- Ecology and Heritage Partners 2014. Flora and Fauna Assessment and Biodiversity Offset Analysis, 140-204 Western Avenue, Westmeadows. Unpublished report for Transpacific Industries Group.
- Endersby, I and Koehler, S. 2006. Golden Sun Moth *Synemon plana*: discovery of new populations around Melbourne. The Victorian Naturalist 123, 362-365.
- EPA 1991. Construction Techniques for Sediment Pollution Control. Published document prepared by the Victorian Environment Protection Authority, Melbourne, Victoria.
- EPA 1996. Environmental Guidelines for Major Construction Sites. Published document prepared by the Victorian Environmental Protection Authority, Melbourne, Victoria.

- Garnett, S., Szabo, J. and Dutson, G 2011. The Action Plan for Australian Birds 2010. CSIRO Publishing, Melbourne, Victoria.
- Gullan, P. 2017. Illustrated Flora Information System of Victoria (IFISV). Viridans Pty Ltd, Victoria.
- Melbourne Water 1992. Incorporated Plan IPO5: Moonee Ponds Creek Concept Plan. Prepared by Melbourne Water for Moonee Ponds Creek Association
- Menkhorst, P. and Knight, F. 2004. A Field Guide to the Mammals of Australia . 2nd Edition. Oxford University Press, Victoria.
- NRE (2002). *Victoria's Native Vegetation Management: A Framework for Action*. Department of Natural Resources and Environment, East Melbourne.
- Nelson, J. S. 1994. Fishes of the World, 3rd Edition. John Wiley & Sons, New York.
- Sands, D.P.A. and New, T.R. 2002. The Action Plan for Australian Butterflies. Environment Australia, Canberra, ACT.
- Strahan, R. (Ed) 1995. The Mammals of Australia. Reed Books, Sydney.
- Tyler, M.J. 1997. The Action Plan for Australian Frogs. Wildlife Australia, Canberra, ACT.
- Victorian Urban Stormwater Committee 1999. Urban Stormwater: Best Practice Environmental Management Guidelines. CSIRO, Collingwood, Victoria.
- Woinarski, J., Burbidge, A. and Harrison, P. 2014. The Action Plan for Australian Mammals 2012. CSIRO Publishing, Melbourne, Victoria.

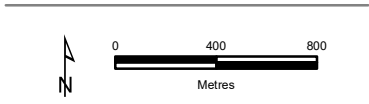
FIGURES



- Legend**
- Study Area
 - Freeway
 - Major Road
 - Collector Road
 - Minor Road
 - Proposed Road
 - Minor Watercourse
 - Permanent Waterbody
 - Wetland/Swamp
 - Parks and Reserves
 - Commonwealth Land
 - Crown Land
 - Localities



Figure 1
 Location of the study area
Ecological Assessment for
 140-204 Western Avenue,
 Westmeadows



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

12291 Fig01 StudyArea 23/08/2022 melsjv

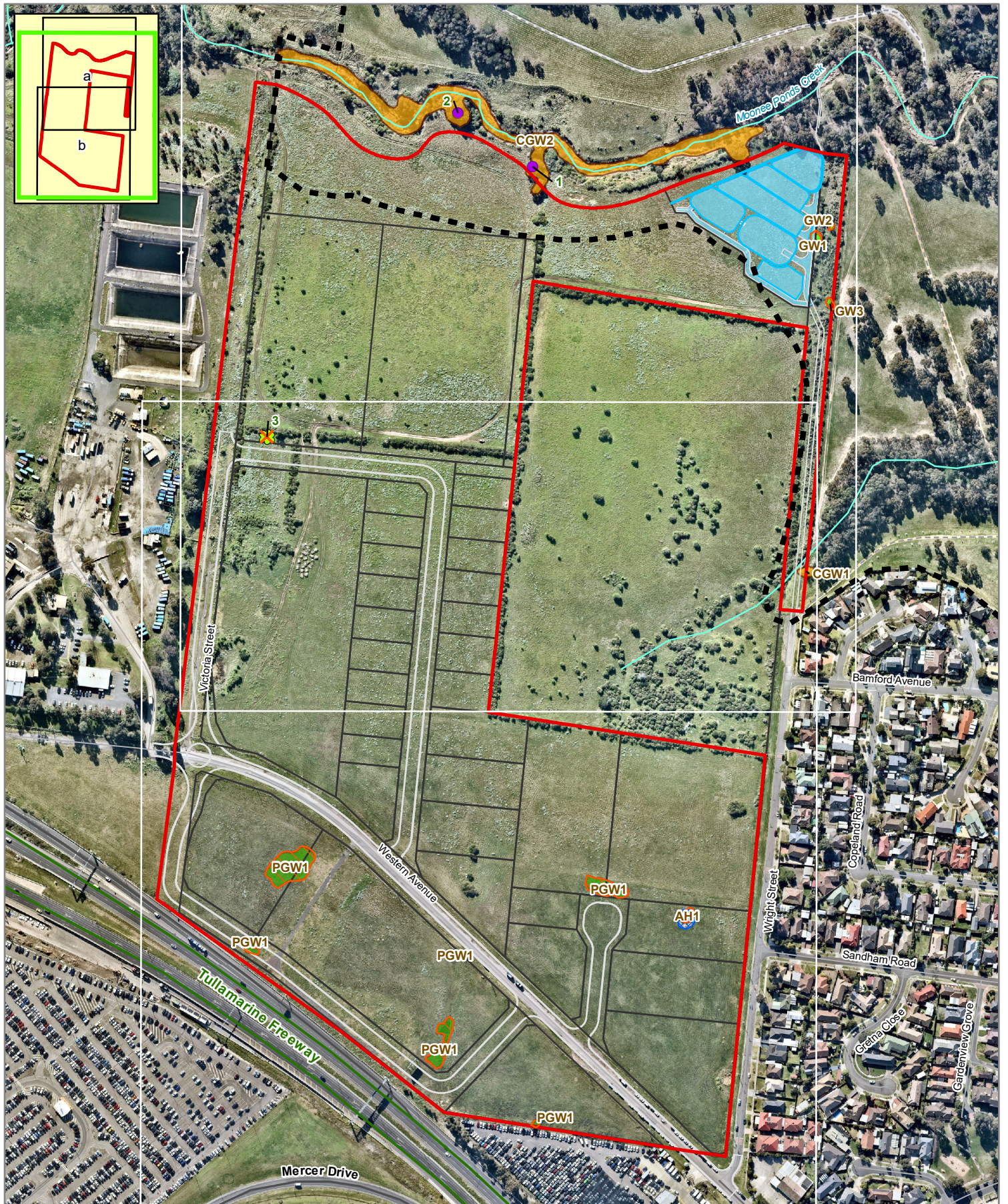


Figure 2 Overview
Ecological features
Ecological Assessment for 145/01 Western Avenue, Westmeadows

Legend

- Study Area
- Title and proposed lot boundaries
- Proposed Bio-retention System
- Environmental Significance Overlay (ESO2)
- Ephemeral dam
- Large Tree within a patch
- Scattered Small Tree
- ✕ Tree impacted

Ecological Vegetation Classes

- Aquatic Herbland (EVC 653)
- Creekline Grassy Woodland (EVC 68)
- Grassy Woodland (EVC 175_61)
- Plains Grassy Woodland (EVC 55)
- Vegetation proposed to be removed



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

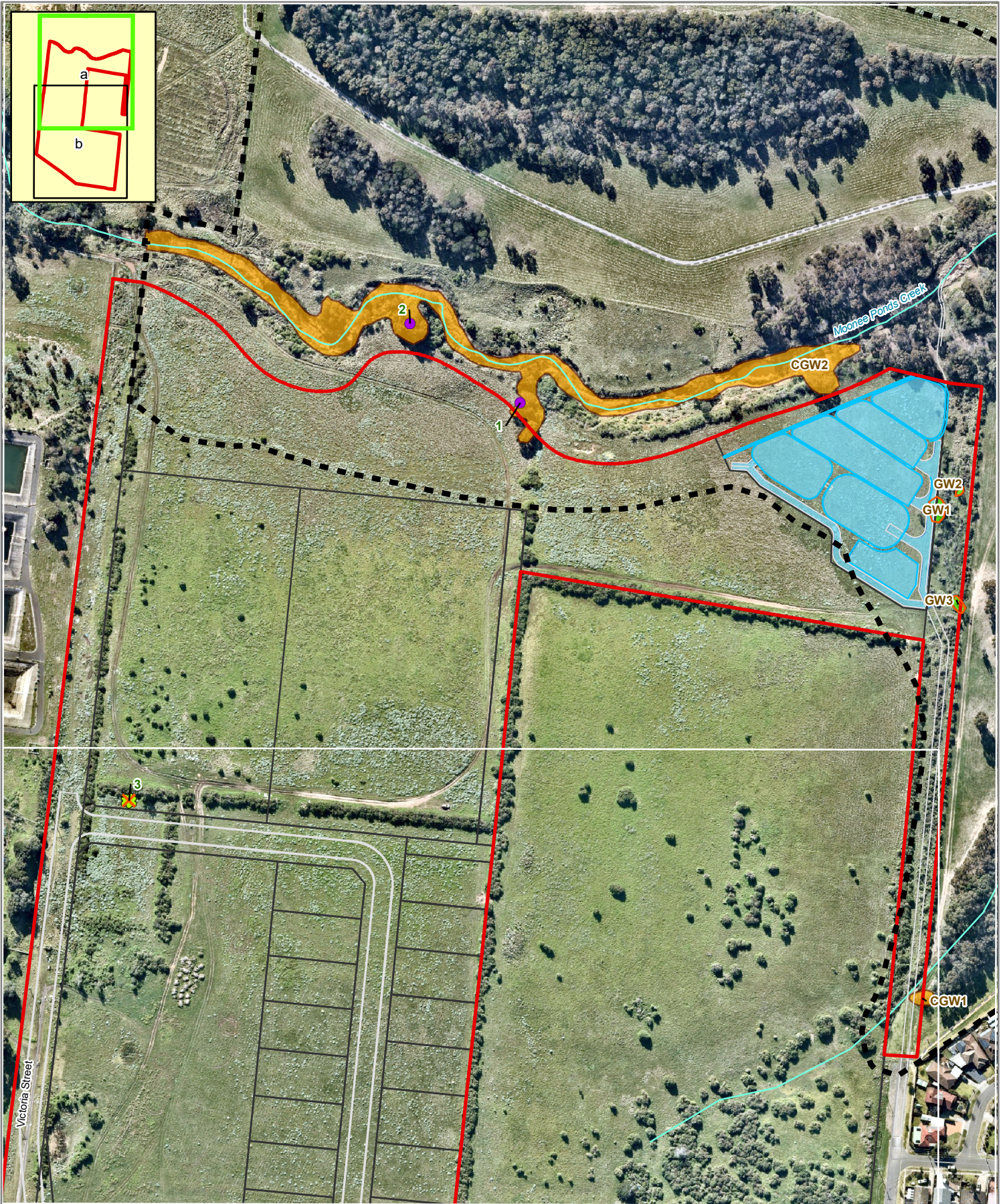


Figure 2a
Ecological features
Ecological Assessment for 145-01 Western Ave, Westmeadows

Legend

- Study Area
- Title and proposed lot boundaries
- Proposed Bio-retention System
- Environmental Significance Overlay (ESO2)
- Large Tree within a patch
- Scattered Small Tree
- ✕ Tree impacted

Ecological Vegetation Classes

- Creekline Grassy Woodland (EVC 68)
- Grassy Woodland (EVC 175_61)
- Vegetation proposed to be removed



VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

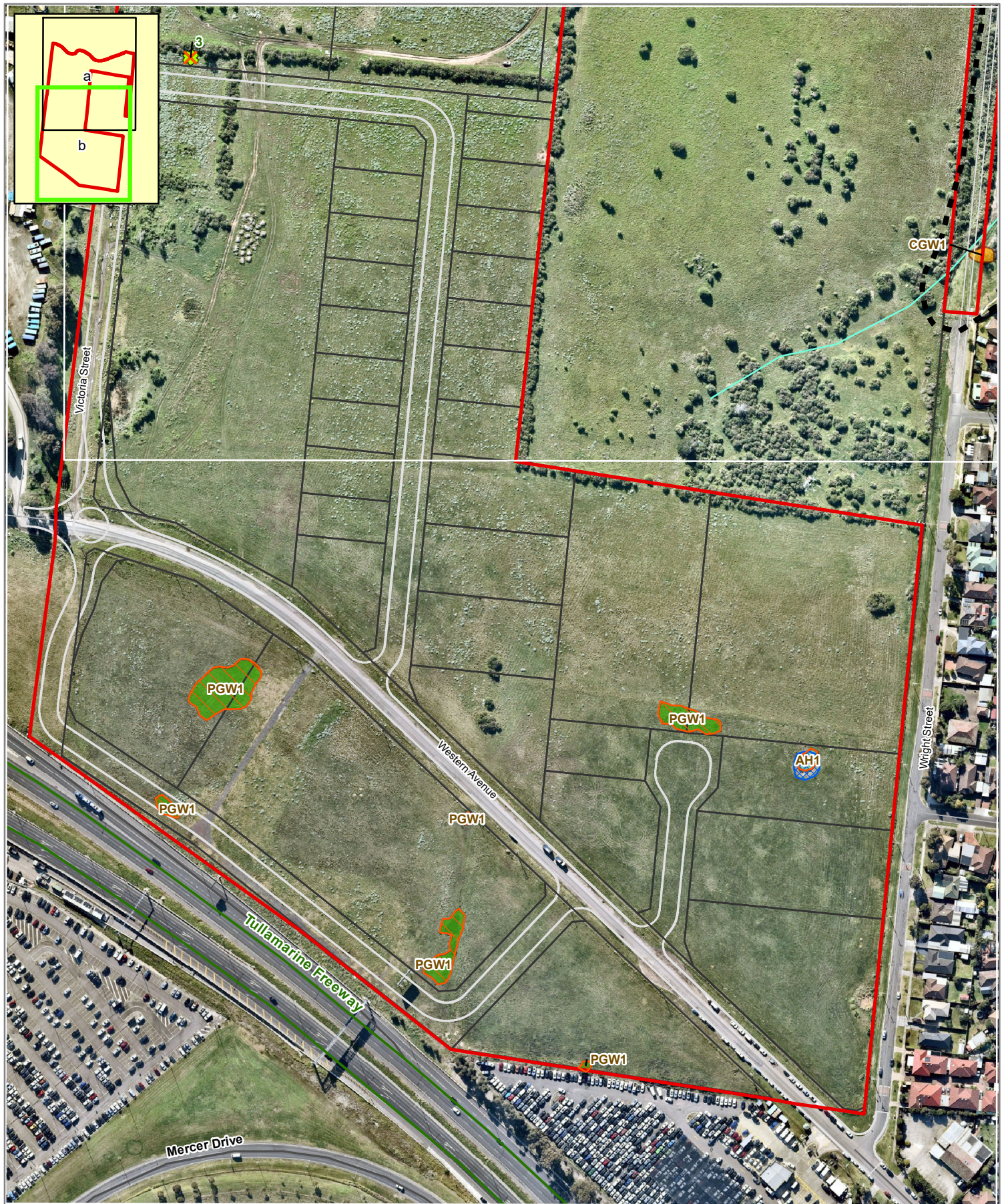


Figure 2b
Ecological features
Ecological Assessment for 14500 Western Avenue, Westmeadows

Legend

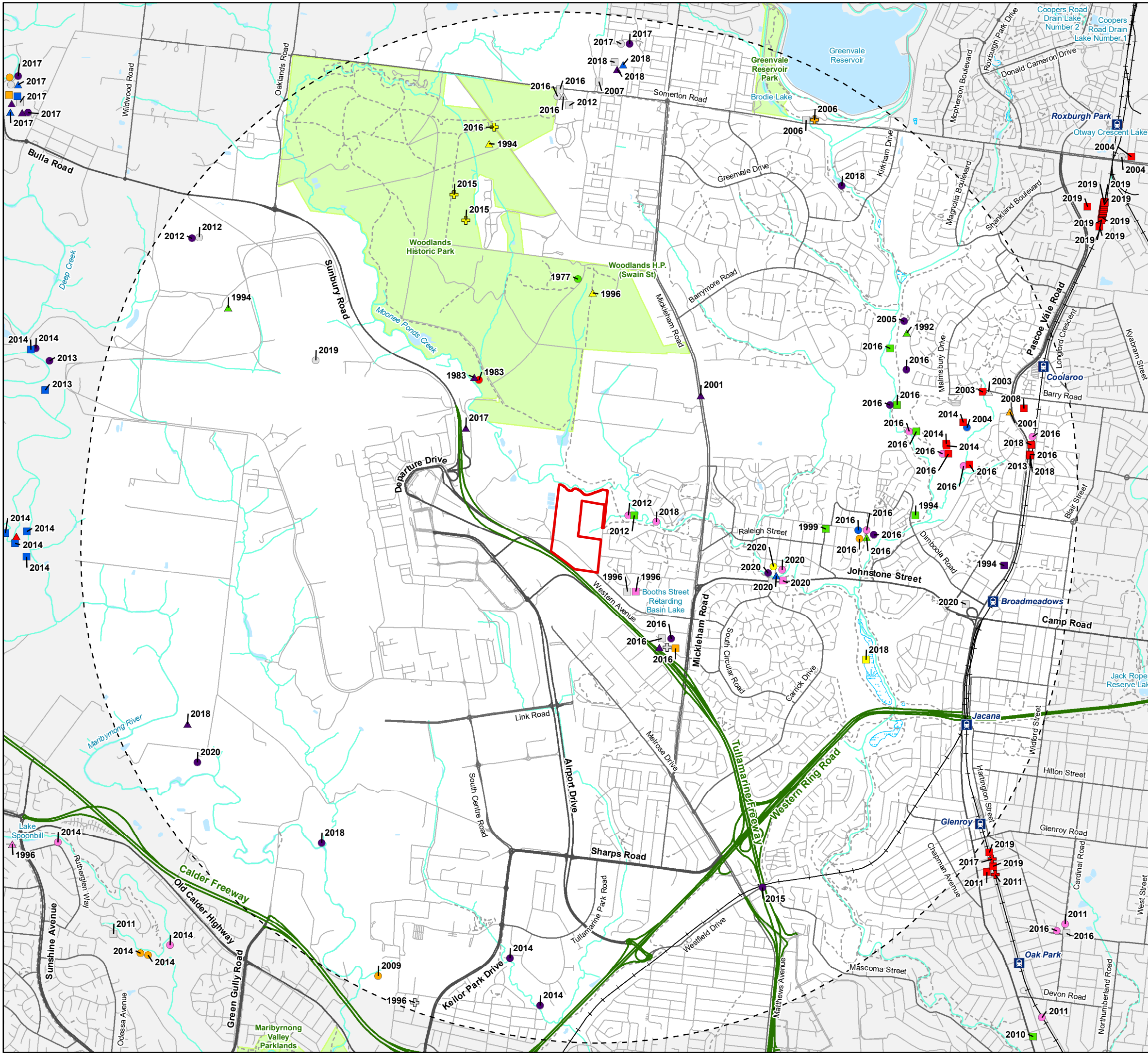
- Study Area
- Title and proposed lot boundaries
- Environmental Significance Overlay (ESO2)
- Ephemeral dam
- ✪ Scattered Small Tree
- ✕ Tree impacted

Ecological Vegetation Classes

- Aquatic Herbland (EVC 653)
- Creekline Grassy Woodland (EVC 68)
- Plains Grassy Woodland (EVC 55)
- Vegetation proposed to be removed



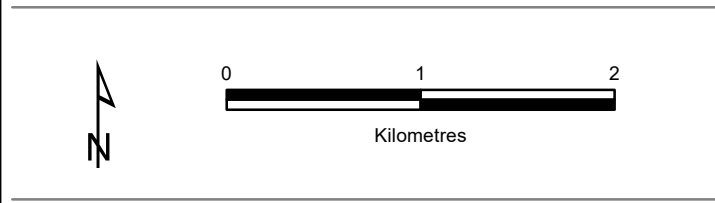
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.



- Legend**
- Study Area
- Significant flora**
- | | |
|-----------------------------|----------------------------|
| ○ Austral Crane's-bill | ■ Melbourne Yellow-gum |
| ● Austral Moonwort | ■ Mugga |
| ● Austral Tobacco | ■ Pale Swamp Everlasting |
| ● Bacchus Marsh Wattle | △ Pale-flower Crane's-bill |
| ● Basalt Peppercross | ▲ Plump Windmill Grass |
| ● Basalt Podolepis | ▲ Purple Blown-grass |
| ● Flax-lily | ▲ Rough-grain Love-grass |
| ● Fragrant Saltbush | ▲ Rye Beetle-grass |
| ■ Giant Honey-myrtle | ▲ Southern Blue-gum |
| ■ Large-flower Crane's-bill | ▲ Spiny Rice-flower |
| ■ Large-fruit Yellow-gum | ▲ Spotted Gum |
| ■ Leafy Twig-sedge | ⊕ Sticky Wattle |
| ■ Matted Flax-lily | ⊕ Tough Scurf-pea |
| | ⊕ Truncate Leonema |
| | ⊕ Western Golden-tip |



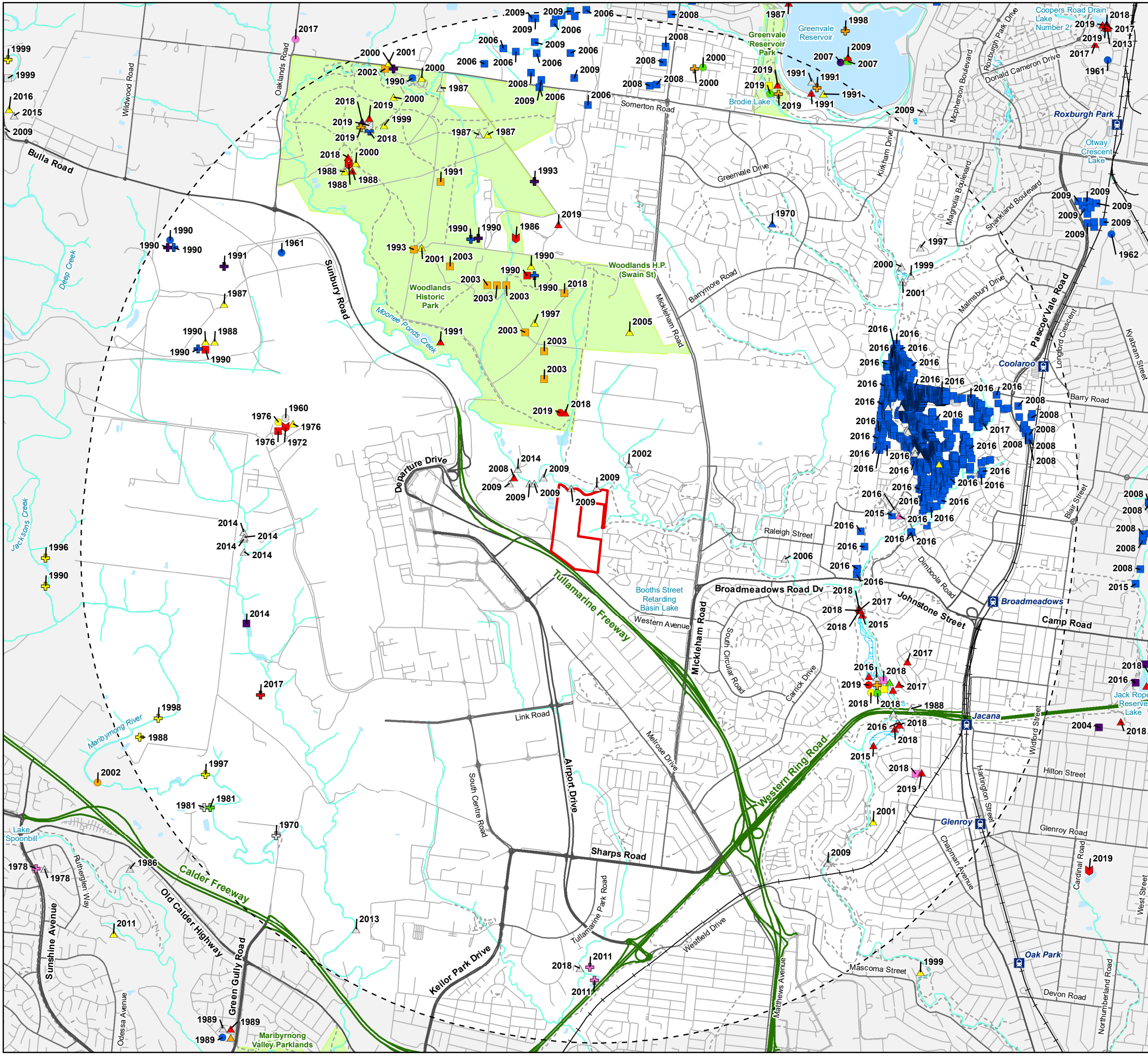
Figure 3
 Previously documented significant flora within 5km of the study area
Ecological Assessment for 140-204 Western Avenue, Westmeadows



Victorian Biodiversity Atlas (VBA) // Sourced from: 'VBA_FLORA25', 'VBA_FLORA100', 'VBA_FAUNA25' and 'VBA_FAUNA100'. Updated August 2021 © The State of Victoria, Department of Environment, Land, Water and Planning. Records prior to 1949 not shown.

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

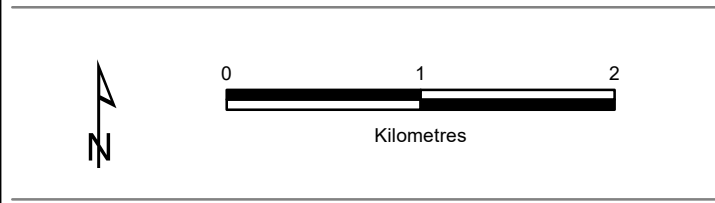
12291_Fig03_SigFlora_23/08/2022_msljey



- Legend**
- Study Area
- Significant fauna**
- Australasian Bittern
 - Australasian Shoveler
 - Australian Grayling
 - Black Falcon
 - Blue-billed Duck
 - Brown Toadlet
 - Brush-tailed Phascogale
 - Caspian Tern
 - Diamond Dove
 - Diamond Firetail
 - Eastern Barred Bandicoot
 - Eastern Great Egret
 - Freckled Duck
 - Golden Sun Moth
 - Grey Goshawk
 - Grey-headed Flying-fox
 - ▲ Growing Grass Frog
 - ▲ Hardhead
 - ▲ Lewin's Rail
 - ▲ Little Eagle
 - ▲ Little Egret
 - ▲ Macquarie Perch
 - ▲ Magpie Goose
 - ▲ Marsh Sandpiper
 - + Murray Cod
 - + Murray River Turtle
 - + Musk Duck
 - + Platypus
 - + Silver Perch
 - + Speckled Warbler
 - + Striped Legless Lizard
 - + Swift Parrot
 - ☾ White-bellied Sea-Eagle
 - ☾ White-throated Needletail



Figure 4
 Previously documented significant fauna within 5km of the study area
Ecological Assessment for 140-204 Western Avenue, Westmeadows



Victorian Biodiversity Atlas (VBA) // Sourced from: 'VBA_FLORA25', 'VBA_FLORA100', 'VBA_FAUNA25' and 'VBA_FAUNA100'. Updated August 2021 © The State of Victoria, Department of Environment, Land, Water and Planning. Records prior to 1949 not shown.

VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

12291 Fig04 SigFauna 23/08/2022 mslv

APPENDIX 1 - FLORA

Appendix 1.1 - Flora Results

Legend:

l Protected under the FFG Act (DELWP 2022g);

***** Listed as a noxious weed under the CaLP Act;

w Weed of National Significance;

Table A1.1. Flora within the study area.

Scientific Name	Common Name	Notes
Indigenous		
<i>Acacia implexa</i>	Lightwood	-
<i>Acacia melanoxylon</i>	Blackwood	-
<i>Acacia mearnsii</i>	Black Wattle	-
<i>Amphibromus nervosus</i>	Common Swamp Wallaby-grass	-
<i>Atriplex semibaccata</i>	Berry Saltbush	-
<i>Austrostipa</i> sp.	Spear-grass	-
<i>Azolla</i> sp.	Azolla	-
<i>Chloris truncata</i>	Windmill Grass	-
<i>Eleocharis acuta</i>	Common Spike-rush	-
<i>Einadia nutans</i> subsp. <i>nutans</i>	Nodding Saltbush	-
<i>Elymus scaberrimus</i>	Common Wheat Grass	-
<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>	Ruby Saltbush	-
<i>Eucalyptus camaldulensis</i>	River Red-gum	-
<i>Oxalis</i> sp.	Wood-sorrel	-
<i>Juncus</i> sp.	Rush	-
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass	-
Introduced		
<i>Arctotheca calendula</i>	Cape Weed	-
<i>Avena</i> sp.	Oat	-
<i>Brassica</i> sp.	Turnip	-
<i>Bromus hordaceus</i>	Soft Brome	-
<i>Cirsium vulgare</i>	Spear Thistle	*
<i>Cynara cardunculus</i>	Artichoke Thistle	*
<i>Cynodon dactylon</i> var. <i>dactylon</i>	Couch	-
<i>Dactylis glomerata</i>	Cocksfoot	-
<i>Echium plantagineum</i>	Paterson's Curse	*

Scientific Name	Common Name	Notes
<i>Ehrharta erecta</i> var. <i>erecta</i>	Panic Veldt-grass	-
<i>Ehrharta longiflora</i>	Annual Veldt-grass	-
<i>Foeniculum vulgare</i>	Fennel	-
<i>Galenia pubescens</i> var. <i>pubescens</i>	Galenia	-
<i>Helminthotheca echioides</i>	Ox-tongue	-
<i>Holcus lanatus</i>	Yorkshire Fog	-
<i>Hordeum</i> spp.	Barley Grass	-
<i>Hypochaeris radicata</i>	Flatweed	-
<i>Lepidium africanum</i>	Common Peppergrass	-
<i>Lolium perenne</i>	Perennial Rye-grass	-
<i>Lolium multiflorum</i>	Annual Rye Grass	-
<i>Lycium ferocissimum</i>	African Box-thorn	*W
<i>Pennisetum clandestinum</i>	Kikuyu	-
<i>Phalaris aquatica</i>	Toowoomba Canary-grass	-
<i>Malva</i> spp.	Mallow	-
<i>Medicago rugosa</i>	Medic	-
<i>Nassella neesiana</i>	Chilean Needle-grass	*W
<i>Nassella trichotoma</i>	Serrated Tussock	*W
<i>Opuntia</i> sp.	Prickly pear	*W
<i>Plantago coronopus</i>	Buck's-horn Plantain	-
<i>Plantago lanceolata</i>	Ribwort	-
<i>Romulea rosea</i>	Onion Grass	-
<i>Rosa rubiginosa</i>	Sweet Briar	*
<i>Rubus ulmifolius</i>	Blackberry	*W
<i>Schinus molle</i>	Pepper Tree	-
<i>Solanum linnaeanum</i>	Apple of Sodom	-
<i>Sonchus oleraceus</i>	Common Sow-thistle	-
<i>Sporobolus africanus</i>	Rat-tail Grass	-
<i>Taraxacum officinale</i> spp. agg.	Garden Dandelion	-
<i>Trifolium</i> sp.	Clover	-
<i>Ulex europaeus</i>	Gorse	*W
<i>Vicia</i> spp.	Vetch	-

Appendix 1.2 - Habitat Hectare Assessment

Table A1.2. Habitat Hectare Assessment Table.

Vegetation Zone	PGW ₁	GW ₁	GW ₂	GW ₃	CGW ₁	CGW ₂	AH ₁	
Bioregion	VVP	CVU	CVU	CVU	VVP	CVU	VVP	
EVC / Tree	PGW1	GW1	GW2	GW3	CGW1	CGW2	AH1	
EVC Number	55_63	68	68	68	68	68	653	
EVC Conservation Status	En	En	En	En	En	En	En	
Patch Condition	Large Old Trees /10	0	0	0	0	3	NA	
	Canopy Cover /5	0	0	0	0	0	NA	
	Under storey /25	5	5	5	5	10	5	
	Lack of Weeds /15	0	0	0	0	4	7	
	Recruitment /10	0	0	0	0	5	3	
	Organic Matter /5	2	0	0	0	4	0	
	Logs /5	0	0	0	0	0	NA	
	Treeless EVC Multiplier	1.00	1.00	1.00	1.00	1.00	1.00	1.36
	Subtotal =	7.00	5.00	5.00	5.00	11.00	24.00	20.4
Landscape Value /25	3	3	3	3	3	6	3	
Habitat Points /100	10	8	8	8	14	30	23	
Habitat Score	0.10	0.08	0.08	0.08	0.14	0.30	0.23	

Note: AH = Aquatic Herbland, PGW = Plains Grassy Woodland, GW = Grassy Woodland; CGW = Creekline Grassy Woodland; En = Endangered; CVU = Central Victorian Uplands, VVP = Victorian Volcanic Plain.

Appendix 1.3 - Significant Flora Species

Key:

EPBC *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

FFG *Flora and Fauna Guarantee Act 1988* (FFG Act)

EX	Extinct	X	Extinct
CR	Critically endangered	e	Endangered
EN	Endangered	v	Vulnerable
VU	Vulnerable	r	Rare
K	Poorly Known (Briggs and Leigh 1996)	k	Poorly Known
#	Records identified from EPBC Act Protected Matters Search Tool.	L	Listed
*	Records identified from the FIS		

1	Known occurrence	Recorded within the study area recently (i.e. within ten years)
2	High Likelihood	Previous records of the species in the local vicinity; and/or, The study area contains areas of high-quality habitat.
3	Moderate Likelihood	Limited previous records of the species in the local vicinity; and/or, The study area contains poor or limited habitat.
4	Low Likelihood	Poor or limited habitat for the species however other evidence (such as a lack of records or environmental factors) indicates there is a very low likelihood of presence.
5	Unlikely	No suitable habitat and/or outside the species range.

Table 2.1 Significant Flora Recorded within 10 Kilometres of the Study Area

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area
NATIONAL SIGNIFICANCE						
<i>Dodonaea procumbens</i> #	Trailing Hop-bush	-	-	VU	-	5
<i>Lachnagrostis adamsonii</i> #	Adamson's Blown-grass	-	-	EN	en	4
<i>Leucochrysum albicans</i> subsp. <i>tricolor</i> #	Hoary Sunray	-	-	EN	en	4
<i>Pterostylis cucullate</i> #	Leafy Greenhood	-	-	VU	-	4
<i>Senecio psilocarpus</i> #	Swamp Fireweed	-	-	VU	-	4
<i>Amphibromus fluitans</i>	River Swamp Wallaby-grass	2	2020	VU	-	4
<i>Dianella amoena</i>	Matted Flax-lily	280	2020	EN	cr	4
<i>Diuris basaltica</i>	Small Golden Moths	8	1962	EN	cr	4
<i>Diuris fragrantissima</i>	Sunshine Diuris	8	1962	EN	cr	4
<i>Eucalyptus crenulata</i>	Buxton Gum	1	2017	EN	en	4
<i>Glycine latrobeana</i>	Clover Glycine	1	1995	VU	vu	4
<i>Lepidium hyssopifolium</i> s.s.	Basalt Peppercross	4	2017	EN	en	4
<i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	447	2017	CR	cr	4
<i>Prasophyllum suaveolens</i>	Fragrant Leek-orchid	4	1962	EN	cr	4
<i>Rutidosis leptorhynchoides</i>	Button Wrinklewort	32	2015	EN	en	4
<i>Senecio macrocarpus</i>	Large-headed Fireweed	7	2015	VU	cr	4
<i>Thesium australe</i>	Austral Toad-flax	1	1904	VU	en	4
<i>Xerochrysum palustre</i>	Swamp Everlasting	1	2005	VU	cr	5
STATE SIGNIFICANCE						

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area
<i>Acacia howittii</i>	Sticky Wattle	3	2016	-	vu	4
<i>Acacia rostriformis</i>	Bacchus Marsh Wattle	1	2020	-	vu	5
<i>Allocasuarina luehmannii</i>	Buloke	2	1979	-	vu	4
<i>Amphibromus pithogastrus</i>	Plump Swamp Wallaby-grass	4	1989	-	cr	4
<i>Botrychium australe</i>	Austral Moonwort	1	1983	-	cr	4
<i>Callitriche umbonata</i>	Winged Water-starwort	2	2000	-	en	4
<i>Carex tasmanica</i>	Curly Sedge	7	2001	-	en	5
<i>Chloris ventricosa</i>	Plump Windmill Grass	4	2011	-	en	4
<i>Cladium procerum</i>	Leafy Twig-sedge	1	2018	-	en	4
<i>Comesperma polygaloides</i>	Small Milkwort	10	1986	-	cr	4
<i>Coronidium gunnianum</i>	Pale Swamp Everlasting	58	2017	-	cr	4
<i>Corymbia maculata</i>	Spotted Gum	19	2018	-	vu	5
<i>Cullen parvum</i>	Small Scurf-pea	2	1986	-	en	4
<i>Cullen tenax</i>	Tough Scurf-pea	17	2017	-	en	4
<i>Dianella longifolia</i> var. <i>grandis</i>	Flax-lily	60	2020	-	cr	4
<i>Diuris palustris</i>	Swamp Diuris	9	1979	-	en	4
<i>Diuris punctata</i> var. <i>punctata</i>	Purple Diuris	6	1982	-	en	4
<i>Diuris X palachila</i>	Broad-lip Diuris	1	1904	-	en	4
<i>Eleocharis plana</i>	Flat Spike-sedge	1	1986	-	cr	4
<i>Eragrostis trachycarpa</i>	Rough-grain Love-grass	2	1996	-	en	4
<i>Eucalyptus globulus</i> subsp. <i>globulus</i>	Southern Blue-gum	4	2020	-	en	5

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area
<i>Eucalyptus leucoxylon</i> subsp. <i>connata</i>	Melbourne Yellow-gum	12	2017	-	en	5
<i>Eucalyptus leucoxylon</i> subsp. <i>megalocarpa</i>	Large-fruit Yellow-gum	7	2018	-	cr	5
<i>Eucalyptus sideroxylon</i> subsp. <i>sideroxylon</i>	Mugga	7	2020	-	en	5
<i>Eucalyptus X studleyensis</i>	Studley Park Gum	1	2004	-	cr	4
<i>Geranium solanderi</i> var. <i>solanderi</i> s.s.	Austral Crane's-bill	15	2019	-	en	4
<i>Geranium</i> sp. 1	Large-flower Crane's-bill	72	2019	-	cr	4
<i>Geranium</i> sp. 3	Pale-flower Crane's-bill	8	2018	-	en	4
<i>Goodia medicaginea</i>	Western Golden-tip	10	2018	-	en	4
<i>Lachnagrostis semibarbata</i> var. <i>semibarbata</i>	Purple Blown-grass	13	2001	-	en	4
<i>Leiocarpa leptolepis</i>	Pale Plover-daisy	1	1912	-	en	4
<i>Leionema bilobum</i> subsp. <i>bilobum</i>	Truncate Leionema	1	2006	-	vu	4
<i>Melaleuca armillaris</i> subsp. <i>armillaris</i>	Giant Honey-myrtle	28	2020	-	en	5
<i>Microseris scapigera</i> s.s.	Plains Yam-daisy	10	2015	-	cr	4
<i>Nicotiana suaveolens</i>	Austral Tobacco	24	2019	-	en	4
<i>Podolepis linearifolia</i>	Basalt Podolepis	16	2016	-	en	4
<i>Pterostylis cucullata</i> subsp. <i>cucullata</i>	Leafy Greenhood	1	1770	-	en	5
<i>Rhagodia parabolica</i>	Fragrant Saltbush	49	2020	-	vu	4
<i>Senecio cunninghamii</i> var. <i>cunninghamii</i>	Branching Groundsel	3	1981	-	en	4
<i>Thelymitra gregaria</i>	Basalt Sun-orchid	8	1953	-	cr	4
<i>Tripogonella loliiformis</i>	Rye Beetle-grass	40	2016	-	en	4

Data source: Victorian Biodiversity Atlas (DELWP 2021); Protected Matters Search Tool (DCCEEW 2022).

Taxonomic order: Alphabetical.

APPENDIX 2 - FAUNA

Appendix 2.1 - Fauna Recorded

Common Name	Scientific Name	Present Survey ²
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	S
Common Brushtail Possum	<i>Trichosurus vulpecula</i>	I
Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>	I
Eastern Grey Kangaroo	<i>Macropus giganteus</i>	I
*Brown Rat	<i>Rattus norvegicus</i>	I
*House Mouse	<i>Mus musculus</i>	I
*European Rabbit	<i>Oryctolagus cuniculus</i>	S
*European Hare	<i>Lepus europeus</i>	S
*Red Fox	<i>Vulpes vulpes</i>	S
*Cat	<i>Felis catus</i>	S
Common Bronzewing	<i>Phaps chalcoptera</i>	S
Crested Pigeon	<i>Ocyphaps lophotes</i>	S
Dusky Moorhen	<i>Gallinula tenebrosa</i>	S
Purple Swamphen	<i>Porphyrio porphyrio</i>	S
Eurasian Coot	<i>Fulica atra</i>	S
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	S
Little Black Cormorant	<i>Phalacrocorax sulcirostris</i>	S
Little Pied Cormorant	<i>Microcarbo melanoleucos</i>	S
Australian Pelican	<i>Pelecanus conspicillatus</i>	S
Silver Gull	<i>Chroicocephalus novaehollandiae</i>	S
Masked Lapwing	<i>Vanellus miles</i>	S
Black-winged Stilt	<i>Himantopus himantopus</i>	S
Australian White Ibis	<i>Threskiornis molucca</i>	S
Straw-necked Ibis	<i>Threskiornis spinicollis</i>	S
White-faced Heron	<i>Egretta novaehollandiae</i>	S
Australian Wood Duck	<i>Chenonetta jubata</i>	S
Pacific Black Duck	<i>Anas superciliosa</i>	S
Chestnut Teal	<i>Anas castanea</i>	S
Hardhead	<i>Aythya australis</i>	S
Brown Goshawk	<i>Accipiter fasciatus</i>	S
Whistling Kite	<i>Haliastur sphenurus</i>	S
Brown Falcon	<i>Falco berigora</i>	S
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	S

Common Name	Scientific Name	Present Survey ²
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	S
Long-billed Corella	<i>Cacatua tenuirostris</i>	S
Galah	<i>Eolophus roseicapilla</i>	S
Eastern Rosella	<i>Platycercus eximius</i>	S
Red-rumped Parrot	<i>Psephotus haematonotus</i>	S
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	H
Pallid Cuckoo	<i>Cuculus pallidus</i>	H
Horsfield's Bronze-Cuckoo	<i>Chrysococcyx basalis</i>	S
Welcome Swallow	<i>Hirundo neoxena</i>	S
Tree Martin	<i>Hirundo nigricans</i>	S
Willie Wagtail	<i>Rhipidura leucophrys</i>	S
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	S
Magpie-lark	<i>Grallina cyanoleuca</i>	S
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	S
Yellow Thornbill	<i>Acanthiza nana</i>	S
Brown Thornbill	<i>Acanthiza pusilla</i>	S
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>	S
Brown Songlark	<i>Cincloramphus cruralis</i>	S
Clamorous Reed Warbler	<i>Acrocephalus stentoreus</i>	S
Superb Fairy-wren	<i>Malurus cyaneus</i>	S
Spotted Pardalote	<i>Pardalotus punctatus</i>	S
Striated Pardalote	<i>Pardalotus striatus</i>	S
Silvereye	<i>Zosterops lateralis</i>	S
White-plumed Honeyeater	<i>Lichenostomus penicillatus</i>	S
New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>	S
Noisy Miner	<i>Manorina melanocephala</i>	S
Little Wattlebird	<i>Anthochaera chrysoptera</i>	S
Red Wattlebird	<i>Anthochaera carunculata</i>	S
Australasian Pipit	<i>Anthus novaeseelandiae</i>	S
Red-browed Finch	<i>Neochmia temporalis</i>	S
Australian Magpie	<i>Gymnorhina tibicen</i>	S
Little Raven	<i>Corvus mellori</i>	S
*Rock Dove	<i>Columba livia</i>	S
*Spotted Turtle-Dove	<i>Streptopelia chinensis</i>	S
*Common Blackbird	<i>Turdus merula</i>	S
*Song Thrush	<i>Turdus philomelos</i>	S
*European Skylark	<i>Alauda arvensis</i>	S

Common Name	Scientific Name	Present Survey ²
*House Sparrow	<i>Passer domesticus</i>	S
*European Goldfinch	<i>Carduelis carduelis</i>	S
*European Greenfinch	<i>Carduelis chloris</i>	S
*Common Myna	<i>Acridotheres tristis</i>	S
*Common Starling	<i>Sturnus vulgaris</i>	S
Southern Bullfrog	<i>Limnodynastes dumerilii</i>	H
Spotted Marsh Frog	<i>Limnodynastes tasmaniensis</i>	H
Common Froglet	<i>Crinia signifera</i>	H
Eastern Striped Skink	<i>Ctenotus robustus</i>	S
Garden Skink	<i>Lampropholis guichenoti</i>	S
Common Blue-tongued Lizard	<i>Tiliqua scincoides</i>	S

Notes:

* Introduced species

1) Ma - Marine species, Mi - Migratory species

2) H- Heard, S - Seen, I - incidental (e.g. scats)

Appendix 2.2 - Significant Fauna Species

Table A2.2. Significant fauna within 10 kilometres of the study area.

Habitat characteristics of significant fauna species previously recorded within 10 kilometres of the study area, or that may potentially occur within the study area were assessed to determine their likelihood of occurrence. The likelihood of occurrence rankings for each of the threatened species are:

1	High Likelihood	<ul style="list-style-type: none"> • Known resident in the study area based on site observations, database records, or expert advice; and/or, • Recent records (i.e. within five years) of the species in the local area (VBA 2011); and/or, • The study area contains the species' preferred habitat.
2	Moderate Likelihood	<ul style="list-style-type: none"> • The species is likely to visit the study area regularly (i.e. at least seasonally); and/or, • Previous records of the species in the local area (DSE 2011b); and/or, • The study area contains some characteristics of the species' preferred habitat.
3	Low Likelihood	<ul style="list-style-type: none"> • The species is likely to visit the study area occasionally or opportunistically whilst en route to more suitable sites; and/or, • There are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or, • The study area contains few or no characteristics of the species' preferred habitat.
4	Unlikely	<ul style="list-style-type: none"> • No previous records of the species in the local area; and/or, • The species may fly over the study area when moving between areas of more suitable habitat; and/or, • Out of the species' range; and/or, • No suitable habitat present.

EPBC *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

FFG *Flora and Fauna Guarantee Act 1988* (FFG Act)

NAP National Action Plan (Cogger et al 1993; Duncan et al. 1999; Garnet and Crowley 2000; Lee 1995; Maxwell et al. 1996; Sands and New 2002; Tyler 1997)

EX	Extinct	DD	Data deficient (insufficiently or poorly known)
RX	Regionally extinct	L	Listed as threatened under FFG Act
CR	Critically endangered	I	Invalid or ineligible for listing under the FFG Act
EN	Endangered	#	Listed on the Protected Matters Search Tool
VU	Vulnerable	*	Additional information from the Victorian Fauna Database
RA	Rare		
NT	Near threatened		
CD	Conservation dependent		
LC	least concern		

Table A2.1.3 Significant fauna recorded within 10 kilometres of the study area.

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area
NATIONAL SIGNIFICANCE						
<i>Calidris canutus</i> #	Red Knot	-	-	EN	en	3
<i>Falco hypoleucos</i> #	Grey Falcon	-	-	VU	vu	3
<i>Galaxiella pusilla</i> #	Dwarf Galaxias	-	-	VU	en	4
<i>Grantiella picta</i> #	Painted Honeyeater	-	-	VU	vu	3
<i>Rostratula australis</i> #	Australian Painted-snipe	-	-	EN	cr	3
<i>Thinornis cucullatus</i> #	Hooded Plover	-	-	VU	vu	4
<i>Anthochaera phrygia</i>	Regent Honeyeater	2	1971	CR	cr	3
<i>Bidyanus bidyanus</i>	Silver Perch	1	1981	CR	en	4
<i>Botaurus poiciloptilus</i>	Australasian Bittern	3	1950	EN	cr	3
<i>Calidris ferruginea</i>	Curlew Sandpiper	1	1977	CR	cr	3
<i>Calyptorhynchus banksii graptogyne</i>	Red-tailed Black-Cockatoo (south-eastern)	1	1846	EN	en	3
<i>Charadrius mongolus</i>	Lesser Sand Plover	1	1978	EN	en	3
<i>Dasyurus maculatus maculatus</i>	Spot-tailed Quoll	1	1882	EN	en	4
<i>Dasyurus viverrinus</i>	Eastern Quoll	2	1902	EN	en-x	4
<i>Delma impar</i>	Striped Legless Lizard	28	2018	VU	en	3
<i>Hirundapus caudacutus</i>	White-throated Needletail	25	2019	VU	vu	3
<i>Lathamus discolor</i>	Swift Parrot	14	2000	CR	cr	3
<i>Limosa lapponica</i>	Bar-tailed Godwit	1	1977	VU	vu	3

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area
<i>Litoria raniformis</i>	Growling Grass Frog	254	2020	VU	vu	2
<i>Maccullochella macquariensis</i>	Trout Cod	1	1908	EN	en	4
<i>Maccullochella peelii</i>	Murray Cod	2	1981	VU	en	4
<i>Macquaria australasica</i>	Macquarie Perch	3	1970	EN	en	3
<i>Numenius madagascariensis</i>	Eastern Curlew	1	1977	CR	cr	3
<i>Paralucia pyrodiscus lucida</i>	Eltham Copper Butterfly	9	1922	EN	cr	4
<i>Pedionomus torquatus</i>	Plains-wanderer	9	1949	CR	cr	3
<i>Perameles gunnii</i>	Eastern Barred Bandicoot	13	2018	VU	en	3
<i>Polytelis swainsonii</i>	Superb Parrot	1	1846	VU	en	3
<i>Prototroctes maraena</i>	Australian Grayling	8	2015	VU	en	3
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	15	2020	VU	vu	3
<i>Sternula nereis</i>	Fairy Tern	1	1977	VU	cr	3
<i>Synemon plana</i>	Golden Sun Moth	2367	2018	CR	vu	3
<i>Tympanocryptis pinguicollis</i>	Grassland Earless Dragon	1	1884	EN	cr	4
STATE SIGNIFICANCE						
<i>Accipiter novaehollandiae</i>	Grey Goshawk	4	2018	-	en	2
<i>Actitis hypoleucos</i>	Common Sandpiper	4	1981	-	vu	3
<i>Anseranas semipalmata</i>	Magpie Goose	1	2016	-	vu	3
<i>Ardea alba modesta</i>	Eastern Great Egret	57	2019	-	vu	3
<i>Ardea intermedia plumifera</i>	Plumed Egret	5	1980	-	cr	3
<i>Ardeotis australis</i>	Australian Bustard	1	1846	-	cr	4

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area
<i>Aythya australis</i>	Hardhead	293	2020	-	vu	2
<i>Biziura lobata</i>	Musk Duck	15	2019	-	vu	3
<i>Burhinus grallarius</i>	Bush Stone-curlew	1	1846	-	cr	4
<i>Egretta garzetta</i>	Little Egret	4	2019	-	en	3
<i>Emydura macquarii</i>	Murray River Turtle	3	2017	-	cr	3
<i>Falco subniger</i>	Black Falcon	9	2018	-	cr	2
<i>Geopelia cuneata</i>	Diamond Dove	1	1999	-	vu	3
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	2	2019	-	en	4
<i>Hieraaetus morphnoides</i>	Little Eagle	54	2017	-	vu	2
<i>Hydroprogne caspia</i>	Caspian Tern	5	2007	-	vu	3
<i>Ixobrychus dubius</i>	Australian Little Bittern	2	2018	-	en	3
<i>Jalmenus icilius</i>	Amethyst Hairstreak Butterfly	2	2015	-	en	3
<i>Lewinia pectoralis</i>	Lewin's Rail	3	1991	-	vu	3
<i>Melanodryas cucullata</i>	Hooded Robin	1	1846	-	vu	3
<i>Miniopterus orianae oceanensis</i>	Eastern Bent-winged Bat	2	2013	-	cr	3
<i>Neochanna cleaveri</i>	Australian Mudfish	1	2008	-	en	3
<i>Neophema pulchella</i>	Turquoise Parrot	1	2000	-	vu	3
<i>Ornithorhynchus anatinus</i>	Platypus	18	1999	-	vu	3
<i>Oxyura australis</i>	Blue-billed Duck	12	2019	-	vu	3
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	1	2017	-	vu	3
<i>Pogona barbata</i>	Bearded Dragon	1	1988	-	vu	3

Scientific name	Common name	Total # of documented records	Last documented record	EPBC	FFG	Likely occurrence in study area
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	1	1846	-	vu	3
<i>Pseudemoia pagenstecheri</i>	Tussock Skink	86	2020	-	en	3
<i>Pseudophryne bibronii</i>	Brown Toadlet	29	1994	-	en	3
<i>Pseudophryne semimarmorata</i>	Southern Toadlet	3	1961	-	en	3
<i>Pyrrholaemus sagittatus</i>	Speckled Warbler	8	2018	-	en	3
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail Bat	1	1932	-	vu	3
<i>Spatula rhynchotis</i>	Australasian Shoveler	27	2019	-	vu	3
<i>Stagonopleura guttata</i>	Diamond Firetail	7	1990	-	vu	3
<i>Stictonetta naevosa</i>	Freckled Duck	3	2013	-	en	3
<i>Tringa stagnatilis</i>	Marsh Sandpiper	1	2018	-	en	3
<i>Turnix pyrrhothorax</i>	Red-chested Button-quail	1	1991	-	en	3

Data source: Victorian Biodiversity Atlas (DELWP 2022d); Victorian Fauna Database (Viridans 2011b); Protected Matters Search Tool (DCCEEW 2022).

Taxonomic order: Mammals (Strahan 1995 in Menkhorst and Knight 2004); Birds (Christidis and Boles, 2008); Reptiles and Amphibians (Cogger *et al.* 1983 in Cogger 1996); Fish (Nelson 1994).

APPENDIX 3 - PROPOSED DEVELOPMENT PLAN



LEGEND

- PROPOSED EASEMENT
- EXTERNAL LOT BOUNDARY
- INTERNAL LOT/RESERVE BOUNDARY
- PROPOSED 0.3m TREE RESERVE (EXAGGERATED)
- BUILDING ENVELOPE
- PROPOSED ROAD
- PROPOSED LOT
- PROPOSED RESERVE
- PROPOSED DRAINAGE RESERVE
- C22: COMMERCIAL 2 ZONE
- GRZ1: GENERAL RESIDENTIAL ZONE - SCHEDULE 1

DATE	UPDATES DETAILS	BY	REV
25/03/2022	INITIAL PLAN	CC	CC
11/04/2022		CC	B
27/04/2022		CC	C
05/05/2022		CC	D
19/07/2022	NEW LOT BOUNDARIES	EC	E
23/07/2022	BOUNDARY AMENDS	EC	F
27/07/2022	BOUNDARY, RESERVE & RDG ENVELOPES	EC	G
03/08/2022	NEW AREAS AND TREE RESERVE	EC	H
18/08/2022	NEW AREAS, SCHEDULE & BOUNDARY AMENDS	EC	I

DESKTOP DESIGN
 ADJACENT BOUNDARIES SOURCED FROM DATASHARE VICTORIA 26/09/2019
 NEARMAP IMAGE DATED 11/09/2019
 ROAD LINEWORK AND BUILDING ENVELOPES BASED ON DRAWING 17220.2CLP01 REV C DATED 09/06/2022 AS SUPPLIED
 BIO RETENTION AREA AS SHOWN ON 17220.2_J2222_Rev_RIP_BRS Fence added.dwg DATED 13/04/22.
 SEE SHEET 2 FOR SCHEDULE OF LOT, RESERVE AND ROAD AREAS.

MAB
CONCEPT PLAN
 WESTERN AVENUE
 TULLAMARINE

0	12.5	25	37.5	50	62.5
LENGTHS ARE IN METRES					
JOB NUMBER:	2190807	SCALE:	1:1250		
DATE OF SURVEY:	-				
FIELD PARTY:	-				
DRAWN BY:	EC	REVISION:	I		
PLAN DATE:	27/07/2022	SHEET:	1 OF 2	SIZE:	A1

1/87-91 Heatherdale Rd
 Ringwood 3134
 info@landair.com.au
 www.landair.com.au
 1300 130 158
 (03) 9872 5092

Landair
 SURVEYS

REP: S12192190807190807/SUBDIVISION PLANS/S190807-CONCEPT 1.DWG

SCHEDULE OF LOT, RESERVE AND ROAD AREAS

LOT	AREA
1	8662m ²
2	2.120ha
3	1.002ha
4	9105m ²
5	6165m ²
6	4928m ²
7	1.785ha
8	1.185ha
9	1858m ²
10	3904m ²
11	4352m ²
12	3798m ²
13	3474m ²
14	3528m ²
15	1628m ²
16	1635m ²
17	1407m ²
18	1412m ²

LOT	AREA
19	1417m ²
20	1422m ²
21	1427m ²
22	1500m ²
23	1422m ²
24	1422m ²
25	1500m ²
26	1500m ²
27	1430m ²
28	1500m ²
29	1500m ²
30	1321m ²
31	2650m ²
32	3.011ha
33	2.144ha
34	2.493ha
TOTAL	21.327ha

RESERVE	AREA
PUBLIC OPEN SPACE	3.388ha
TREE RESERVE	104m ²
DRAINAGE	1.365ha

ROADS TOTAL	2.503ha
-------------	---------

TOTAL AREA	28.593ha
------------	----------

MAB
CONCEPT PLAN
WESTERN AVENUE
TULLAMARINE

LENGTHS ARE IN METRES

SCALE

SEE SHEET 1 FOR PLAN DETAILS

SHEET: SHEET 2 OF 2 SIZE: A4



1/87-91 Heatherdale Rd
Ringwood 3134

info@landair.com.au
www.landair.com.au

1300 130 158
(03) 9872 5092

APPENDIX 4 – 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: 29/11/2022
Time of issue: 1:59 pm

Report ID: EHP_2022_203

Project ID EHP12291_Westmeadows_VG94_28112022

Assessment pathway

Assessment pathway	Intermediate Assessment Pathway
Extent including past and proposed	0.255 ha
Extent of past removal	0.000 ha
Extent of proposed removal	0.255 ha
No. Large trees proposed to be removed	0
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map). Removal of less than 0.5 hectares of native vegetation 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 amount¹	0.033 general habitat units
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) or Hume City Council
Minimum strategic biodiversity value score ²	0.415
Large trees	0 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 Intermediate Assessment Pathway and it will be assessed under the Intermediate 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 (met unless you wish to include a site assessment)
- Maps showing the native vegetation and property
- 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 defensible space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- An offset statement that explains that an offset has been identified and how it will be secured.

© The State of Victoria Department of Environment, Land, Water and Planning Melbourne 2022

This work is licensed under a Creative Commons Attribution 4.0 International licence. You are free to re-use the work under that licence, on the condition that you credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, the Victorian Government logo and the Department of Environment, Land, Water and Planning logo. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/34.0/au/deed.en>

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

Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Obtaining this publication does not guarantee that an application will meet the requirements of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes or that a permit to remove native vegetation will be granted.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes.

Appendix 1: Description of native vegetation to be removed

All zones require a general offset, the general habitat units each zone is calculated by the following equation in accordance with the Guidelines:

$$\text{General habitat units} = \text{extent} \times \text{condition} \times \text{general/landscape factor} \times 1.5, \text{ where the general/landscape factor} = 0.5 + (\text{strategic biodiversity value score}/2)$$

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

Native vegetation to be removed

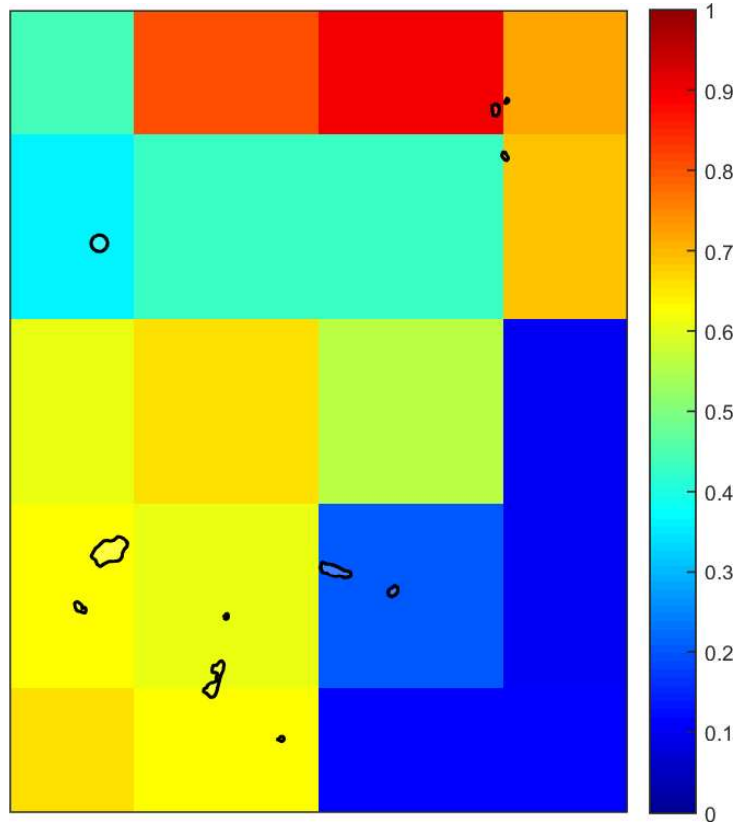
Information provided by or on behalf of the applicant in a GIS file						Information calculated by EnSym						
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
8-T	Scattered Tree	vvp_0055_63	Endangered	0	no	0.200	0.031	0.031	0.360		0.006	General
1-A	Patch	vvp_0055_63	Endangered	0	no	0.100	0.041	0.041	0.200		0.004	General
2-A	Patch	vvp_0055_63	Endangered	0	no	0.100	0.011	0.011	0.630		0.001	General
3-A	Patch	vvp_0055_63	Endangered	0	no	0.100	0.003	0.003	0.630		0.000	General
4-A	Patch	vvp_0055_63	Endangered	0	no	0.100	0.042	0.042	0.616		0.005	General
5-A	Patch	vvp_0055_63	Endangered	0	no	0.100	0.002	0.002	0.610		0.000	General
7-A	Patch	vvp_0055_63	Endangered	0	no	0.100	0.095	0.095	0.630		0.012	General
6-B	Patch	vvp_0653	Endangered	0	no	0.230	0.011	0.011	0.200		0.002	General
9-C	Patch	cvu_0175_61	Endangered	0	no	0.080	0.011	0.011	0.900		0.001	General
10-C	Patch	cvu_0175_61	Endangered	0	no	0.080	0.005	0.005	0.634		0.000	General
11-C	Patch	cvu_0175_61	Endangered	0	no	0.080	0.002	0.002	0.720		0.000	General

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

This is not applicable in the Intermediate Assessment Pathway.

Appendix 3 – Images of mapped native vegetation

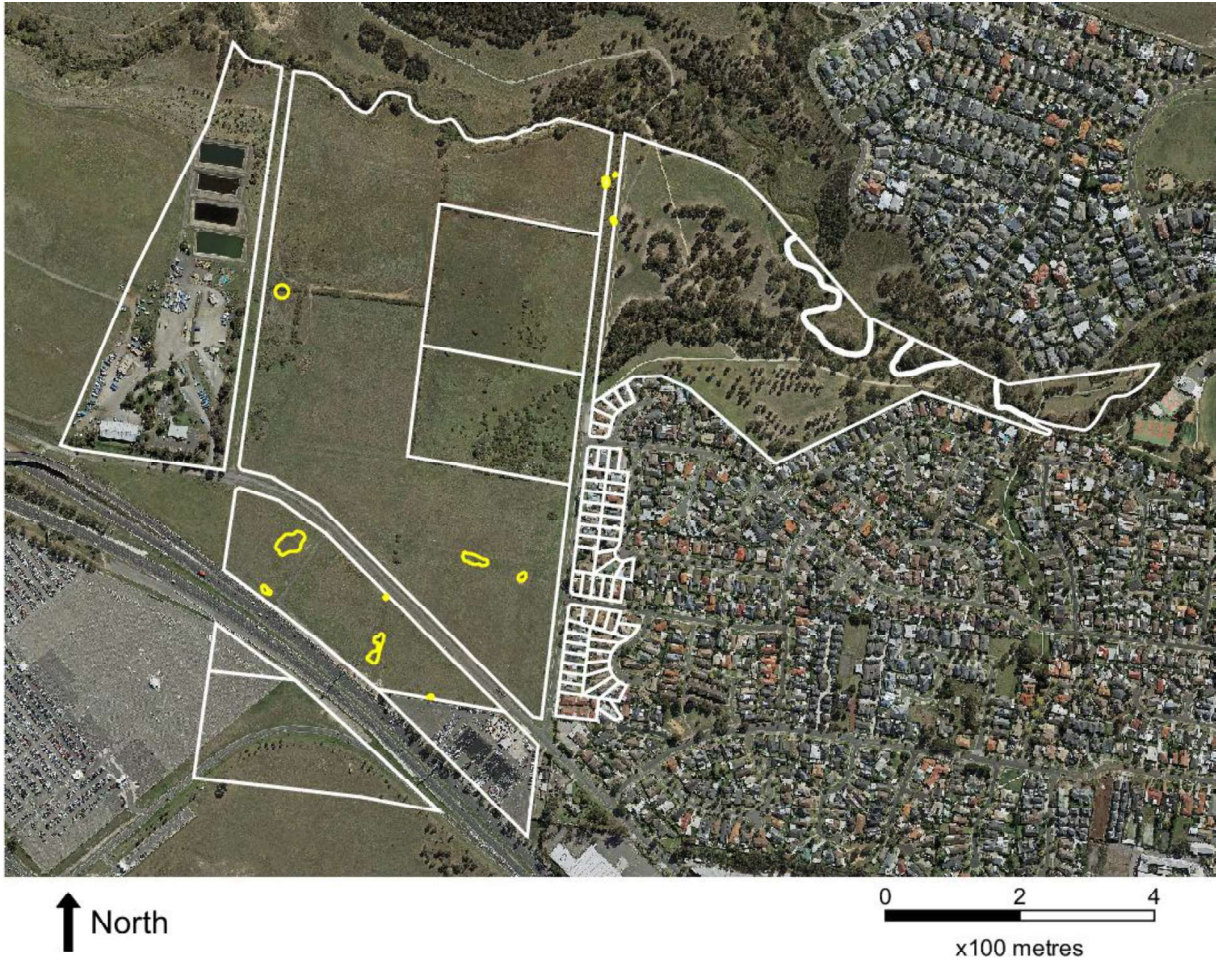
2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation



4. Map of the property in context



Yellow boundaries denote areas of proposed native vegetation removal.

APPENDIX 5 - AVAILABLE NATIVE VEGETATION CREDITS

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: 01/12/2022 05:43

Report ID: 16915

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
0.033	0.415	0	CMA	Port Phillip and Westernport
			or LGA	Hume City

Details of available native vegetation credits on 01 December 2022 05:43

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0277	6.426	454	Port Phillip and Westernport	Mornington Peninsula Shire	No	Yes	No	Abezco, Ethos, VegLink
BBA-0670	1.710	70	Port Phillip and Westernport	Cardinia Shire	No	Yes	No	Bio Offsets
BBA-0670	18.072	148	Port Phillip and Westernport	Cardinia Shire	No	Yes	No	Abezco, VegLink
BBA-0677	16.383	1491	Port Phillip and Westernport	Whittlesea City	No	Yes	No	Abezco, VegLink
BBA-0678	45.871	2623	Port Phillip and Westernport	Nillumbik Shire	No	Yes	No	VegLink
BBA-0678_2	0.388	59	Port Phillip and Westernport	Nillumbik Shire	No	Yes	No	VegLink
BBA-0931	0.034	0	Port Phillip and Westernport	Moorabool Shire	Yes	Yes	No	Bio Offsets
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	0.222	0	Port Phillip and Westernport	Nillumbik Shire	Yes	Yes	Yes	Nillumbik SC
BBA-2870	0.044	0	Port Phillip and Westernport	Yarra Ranges Shire	No	Yes	No	Contact NVOR
BBA-2870	2.544	431	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
BBA-2871	16.335	1668	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink

BBA-3030	1.489	0	Port Phillip and Westernport	Moorabool Shire	Yes	Yes	No	VegLink
BBA-3030	0.309	0	Port Phillip and Westernport	Moorabool Shire	Yes	Yes	Yes	VegLink
BBA-3030	0.257	0	Port Phillip and Westernport	Moorabool Shire	No	Yes	No	Contact NVOR
TFN-C0287	0.158	0	Port Phillip and Westernport	Cardinia Shire	Yes	Yes	No	TFN
TFN-C1636	0.941	130	Port Phillip and Westernport	Yarra Ranges Shire	No	Yes	No	Yarra Ranges SC
TFN-C1650	0.098	20	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	Yarra Ranges SC
TFN-C1663	0.102	27	Port Phillip and Westernport	Yarra Ranges Shire	Yes	Yes	Yes	Yarra Ranges SC
TFN-C1763_3	11.231	0	Port Phillip and Westernport	Mornington Peninsula Shire	Yes	Yes	No	Ecocentric
TFN-C1962	0.098	9	Goulburn Broken, Port Phillip and Westernport	Macedon Ranges Shire	No	Yes	No	Contact NVOR
VC_CFL-0838_01	0.209	697	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3016_01	0.035	22	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3084_01	0.297	122	Port Phillip And Westernport	Cardinia Shire	Yes	Yes	No	VegLink
VC_CFL-3084_02	0.038	38	Port Phillip And Westernport	Cardinia Shire	Yes	Yes	No	VegLink
VC_CFL-3682_01	1.834	0	Port Phillip And Westernport	Nillumbik Shire	Yes	Yes	No	Abezco
VC_CFL-3687_01	0.401	71	Port Phillip And Westernport	Baw Baw Shire	Yes	Yes	No	Baw Baw SC
VC_CFL-3708_01	0.198	507	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3709_01	0.139	395	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3740_01	1.383	96	Port Phillip And Westernport	Cardinia Shire, Yarra Ranges Shire	Yes	Yes	No	Bio Offsets
VC_CFL-3740_01	0.338	20	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	Bio Offsets
VC_CFL-3744_01	2.428	377	Port Phillip And Westernport	Macedon Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3762_01	0.325	103	Port Phillip And Westernport	Moorabool Shire	Yes	Yes	No	VegLink
VC_CFL-3762_01	0.116	0	Port Phillip And Westernport	Moorabool Shire	Yes	Yes	Yes	VegLink
VC_CFL-3764_01	8.011	51	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3769_01	2.617	77	Port Phillip And Westernport	Nillumbik 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)
VC_CFL_375 8_01	10.124	12	Port Phillip And Westernport	Melton City	Yes	Yes	No	VegLink
VC_CFL- 3710_01	7.606	322	Port Phillip And Westernport	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL- 3746_01	4.962	563	Port Phillip And Westernport	Macedon Ranges Shire	Yes	Yes	No	VegLink

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
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 available
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) 8578 4250 or 1300 834 546	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

© The State of Victoria Department of Environment, Land, Water and Planning 2022



This work is licensed under a Creative Commons Attribution 4.0 International licence. You are free to re-use the work under that licence, on the condition that you

credit the State of Victoria as author. The licence does not apply to any images, photographs or branding, including the Victorian Coat of Arms, the Victorian Government logo and the Department of Environment, Land, Water and Planning (DELWP) logo. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>

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

Disclaimer

This publication may be of assistance to you but the State of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence which may arise from you relying on any information in this publication.

Obtaining this publication does not guarantee that the credits shown will be available in the Native Vegetation Credit Register either now or at a later time when a purchase of native vegetation credits is planned.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes