MAJOR ROAD PROJECTS VICTORIA

ecology & heritage partners

Final Report

Technical Report F – Aboriginal and Historical Cultural Heritage Impact Assessment

Yan Yean Road Upgrade – Stage 2: Kurrak Road to Bridge Inn Road, Doreen, Victoria

Major Roads Projects Victoria and Arcadis Australia Pacific Pty Ltd

7 August 2020

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ACKNOWLEDGEMENTS

We thank the following people and/or organisations for their contribution to the Project:

- Major Road Projects Victoria for the Project information.
- WSP Australia Pty Ltd for the Project Information.
- Arcadis Australia Pacific Pty Ltd for the Project information.
- Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation for assistance in the field and cultural heritage information.
- Aboriginal Victoria.

Cover Photo: Stratigraphy on bank of road reserve, Yan Yean Road

(Photo by Ecology and Heritage Partners Pty Ltd)

Protocols for Handling Sensitive Information

Some of the information contained within this Aboriginal and Historical Cultural Heritage Impact Assessment (ACHHIA) is culturally sensitive. The contents of this ACHHIA has been moderated for the release of information to the public.

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ABBREVIATIONS

See Glossary (Appendix 3) for explanation of some of these terms.

Acronym	Description
Act, the	*Aboriginal Heritage Act 2006*
ACHRIS	Aboriginal Cultural Heritage Register and Information System
ACHHIA	Aboriginal Cultural and Historical Heritage Impact Assessment
AV	Aboriginal Victoria, formerly the Office of Aboriginal Affairs Victoria
CHMP	Cultural Heritage Management Plan
CMA	Catchment Management Authority
DEDJTR	Department of Economic, Development, Jobs, Transport and Resources. Superseded in 2019 by *Department of Jobs, Precincts and Regions (DJPR)*.
DELWP	Department of Environment Land Water and Planning (Victoria)
DJCS	Department of Justice, Community Safety
DJPR	Department of Jobs, Precincts and Regions (formally DEDJTR, see above)
DPC	Department of the Premier and Cabinet (Victoria)
DPCD	Department of Public and Community Development (Victoria)
EE Act	*Environment Effects Act 1978*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPR	Environmental Performance Requirements
EVC	Ecological Vegetation Class
ESS	Environment Effects Statement
GMU	Geomorphological units
GSV	Ground Surface Visibility
HA	Heritage Advisor
HO	Heritage Overlay
HV	Heritage Victoria
LDAD	Low Density Artefact Distribution
MRPV	Major Road Project Victoria
NLA	National Library of Victoria
NTA Act	*Native Title Act 1993*
NNTT	The Native Title Tribunal
NTR	National Trust Register
NPS	Nillumbik Planning Scheme
PCHA	Preliminary Cultural Heritage Appraisal
PIF	Place Inspection Form
PROV	Public Records Office Victoria
RAP	Registered Aboriginal Party

Acronym	Description
Regulations, the	*Aboriginal Heritage Regulations 2018*
RTP	Radial Test Pit
SGD	Significant Ground Disturbance
SLV	State Library of Victoria
STP	Shovel Test Pit
TP	Test Pit
VAHR	Victorian Aboriginal Heritage Register
VHI	Victorian Heritage Inventory
VHR	Victorian Heritage Register
WPS	Whittlesea Planning Scheme
Wurundjeri	Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation

EXECUTIVE SUMMARY

Introduction

Major Road Projects Victoria (MRPV) proposes to duplicate Yan Yean Road from Kurrak Road to Bridge Inn Road, Doreen, as part of the Yan Yean Road (Stage 2) Upgrade (the project).

On 14 October 2018, the Minister for Planning decided that an Environment Effects Statement (EES) is required under the *Environment Effects Act 1978* (EE Act) to assess the potential environmental effects of the project. The EES process provides for identification and analysis of the potential environment effects of the project and the means of avoiding, minimising and managing adverse effects. It includes public involvement and allows stakeholders to understand the likely environmental effects of the project and how they will be managed.

This Aboriginal and Historical Cultural Heritage Impact Assessment (AHCHIA) report has been prepared by Ecology and Heritage Partners Pty Ltd, for the EES in accordance with the Scoping Requirements released by the Minister for Planning in June 2019.

The Project Area and Project

Yan Yean Road is a primary north-south arterial road and connects the growth suburb of Doreen, with major east west arterials such as Bridge Inn Road, Kurrak Road and Diamond Creek Road. The road runs through the townships of Yarrambat and Plenty and connects with established areas of Diamond Creek and Greensborough. The project would duplicate a 5.5 km portion of Yan Yean Road between Kurrak Road and Bridge Inn Road, Doreen, increasing the existing two lanes to four lanes (comprising two lanes in each direction).

Assessment & Results

The assessment undertaken as part of this ACHHIA includes a Preliminary Cultural Heritage Appraisal (PCHA). Desktop assessment, standard assessment and complex assessments were required to inform a CHMP for the project. MRPV has commenced preparation of CHMP #15169 (Minos et al: In Prep). The CHMP will be completed and provided to the Registered Aboriginal Party (RAP) for evaluation following the completion of the EES. The CHMP resulted in the identification of two Aboriginal Places (registered on the Victorian Aboriginal Heritage Register (VAHR)) within the project area, and four Aboriginal Places within 50 m of the project area. During the standard assessment one previously unidentified and unregistered Aboriginal place was identified; however, due to changes in the project area this Place is now outside of the activity area of the CHMP. The complex assessment completed thus far did not identify any cultural heritage within the project area.

For Historical Heritage the assessments undertaken included a desktop review of statutory databases and previous heritage studies conducted in the project area. The heritage places identified during the desktop assessment were subject to a visual inspection to confirm the descriptions provided in previous heritage reports. The Historical Cultural Heritage Assessment resulted in the identification of two historical heritage places within the project area, recorded on the local government Heritage Overlay, during the desktop assessment. The site inspection did not identify any further heritage places.

All six Aboriginal places identified during the CHMP and the two historical heritage places identified during the PCHA are summarised below in Table ES 1.

Table ES 1 Aboriginal and Historical Places identified during the CHMP and PCHA

Place Name	Place Type	Place Identified During
VAHR Registered 1 (Yan Yean Archers 1)	Stone Artefact Scatter	Cultural Heritage Management Plan #15869 (Young and Barker 2018), desktop assessment
VAHR Registered 2 (Yan Yean Road LDAD 1)	Low Density Artefact Distribution	Cultural Heritage Management Plan #14387 (Watson et al. 2017), desktop assessment
VAHR Registered 3 (Yellow Brick Road LDAD 1)	Low Density Artefact Distribution	Cultural Heritage Management Plan #15169 (Minos et al :In Prep), standard assessment
VAHR Registered 4 (895 Yan Yean Road, Doreen LDAD1)	Low Density Artefact Distribution	Cultural Heritage Management Plan #16621 (Baker, M 2019), desktop assessment
VAHR Registered 5 (Garden Rd - Bridge Inn Rd IA).	Low Density Artefact Distribution	Cultural Heritage Management Plan #3438 (Weaver 2006), desktop assessment
VAHR Registered 6 (Yarrambat Park 5)	Low Density Artefact Distribution	Cultural Heritage Management Plan #230 (Ellender 1988), desktop assessment
Nillumbik HO191	(River Red Gums (2) 25 Doctors Gully Road)	Preliminary Cultural Heritage Appraisal (Harris 2018)
Nillumbik HO219	St. Michael Anglican Church	Cultural Heritage Management Plan #15169 (Minos et al: In Prep), desktop assessment

Statutory Requirements

A total of two Aboriginal cultural heritage places and two Historical heritage places are located within the proposed Project Boundary (Map 12). These places will be impacted by the project. Discussion of the proposed EPRs (Section 8) which address these impacts are contained within this ACHHIA. As required in accordance with Part 4 of the *Aboriginal Heritage Act 2006* and the *Aboriginal Heritage Regulations 2018* the preparation of a CHMP (#15169) is in progress to address the management of Aboriginal cultural heritage (Minos et al: In Prep).

The specific Regulations which trigger the requirement for the CHMP are:

- Under r.25(1) a registered cultural heritage place is an area of cultural heritage sensitivity: there are two Aboriginal Places located within the project area;
- Under r.25 (2) land within 50 metres of a registered cultural heritage place is an area of cultural heritage sensitivity: there are four Aboriginal Places located within 50 m of the project area; and
- Under r.47, the proposed project is a high impact activity, as it involves the construction of a road with a length exceeding 100 metres (r.47(1)(f)).

The specific Regulations which trigger the requirement for the ACHHIA are:

- Under Pathway 2 of the Environment Effects Statement (EES) and will be subject to approval by the RAP.

The management of Aboriginal cultural heritage within the project area must comply with the CHMP #15169 (Minos et al: In Prep) once approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation, under the *Aboriginal Heritage Act 2006.*

The River Red Gums (HO191, River Red Gums (2) 25 Doctors Gully Road) are on the Heritage Overlay under the Nillumbik Planning Scheme (Appendix 3). The current Environment Performance Requirements (EPRs) within this ACHHIA will require the project to avoid the trees. The proposed planning pathway for the use and development associated with the project is via a Planning Scheme Amendment to the Nillumbik Planning Scheme (NPS) and Whittlesea Planning Scheme (WSP). The Amendment would amend the NPS and the WSP to apply Clause 45.12 Specific Controls Overlay and Clause 45.01 Public Acquisition Overlay to affected land, and insert the Yan Yean Road (Kurrak Road to Bridge Inn Road) (Stage 2) Upgrade Project Incorporated Document into Schedules 45.12 and 72.04. This would exempt all use and development associated with the Project from the need for a planning permit, subject to conditions (Technical Report H – Planning and Land Use Impact Assessment). The design avoids the removal of these River Red Gums and Environment Performance Requirement (EPR AR1, AR2 and AR3) propose the specific performance measures for retention of these River Red Gums through construction and operational phases

St Michael Anglican Church (HO219) is on the Heritage Overlay under the *Nillumbik Planning Scheme* (Appendix 1) the current ERPs within this ACHHIA will require the project to avoid and minimise impacts on the church, if it cannot be avoided a permit is under Clause 43.01 of the Nillumbik Planning Scheme 2018, as well as a Heritage Impact Statement. The proposed planning pathway for the use and development associated with the Project is via a PSA to the NPS and WPS. The Amendment would amend the NPS and WPS to apply Clause 45.12 Specific Controls Overlay and Clause 45.01 Public Acquisition Overlay to affected land, and insert the Yan Yean Road (Kurrak Road to Bridge Inn Road) (Stage 2) Upgrade Project Incorporated Document into Schedules 45.12 and 72.04. This would exempt all use and development associated with the Project from the need for a planning permit, subject to conditions (Technical Report H – Planning and Land Use Impact Assessment).

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1 INTRODUCTION

Major Road Projects Victoria (MRPV) proposes to duplicate Yan Yean Road from Kurrak Road to Bridge Inn Road, Doreen, as part of the Yan Yean Road Upgrade – Stage 2 (the Project).

On 14 October 2018, the Minister for Planning decided that an Environment Effects Statement (EES) is required under the *Environment Effects Act 1978* (EE Act) to assess the potential environmental effects of the Project. The EES process provides for identification and analysis of the potential environment effects of the Project and the means of avoiding, minimising and managing adverse effects. It includes public involvement and allows stakeholders to understand the likely environmental effects of the Project and how they will be managed.

This Aboriginal and Historical Cultural Heritage Impact Assessment report has been prepared for the EES in accordance with the Scoping Requirements released by the Minister for Planning in June 2019.

1.1 Background

Yan Yean Road is a primary north-south arterial road and connects the growth suburb of Doreen with major east west arterials such as Bridge Inn Road, Kurrak Road and Diamond Creek Road. The road runs through the townships of Yarrambat and Plenty and connects with established areas of Diamond Creek and Greensborough. There is a high demand for north-south travel from Doreen and surrounding towns to established northern suburbs for employment and services.

Stage 1 of the Yan Yean Road upgrade (Diamond Creek Road to Kurrak Road) was completed in 2019, and construction on Stage 2 (this Project) is to be completed by 2025.

1.2 Project Description

The project would duplicate a 5.5km portion of Yan Yean Road between Kurrak Road and Bridge Inn Road increasing the existing two lanes to four lanes (comprising two lanes in each direction). The design speed along Yan Yean Road is 70km/h, with the exception of north of Bridge Inn Road which is 80km/h. The design for the Project has 3.5-metre-wide lanes with the majority of the Project using a 2.2 metre-wide central median. This cross section was adopted in design due to various constraints ranging from road safety issues, steep and rolling terrain, high cut and fill batters and subsequent retaining walls at certain locations, as well as seeking to limit impacts to existing properties, local accesses and trees along Yan Yean Road.

The Project will include:

- two new roundabouts (at Heard Avenue, and Youngs Road)
- five new signalised intersections (Bannons Lane, Jorgensen Avenue, North Oatlands, Orchard and Bridge Inn Roads)

- upgrades to one existing signalised intersection, including an additional right hand turning lane, slip lane, and traffic island (Ironbark Road)
- new street lighting at all intersections, road signage and landscaping
- The Project will also include a new 3 metre wide shared user path on the western side and 1.2 metre wide footpath on the eastern side of Yan Yean Road. The paths links Diamond Creek to Doreen and would improve safety and connectivity for pedestrians and cyclists.
- Continuous safety barriers would run along the Project's length and are proposed in the median and behind outer kerbs along the mid-block sections of the carriageways.

The project area and key project components are shown in Figure 1.

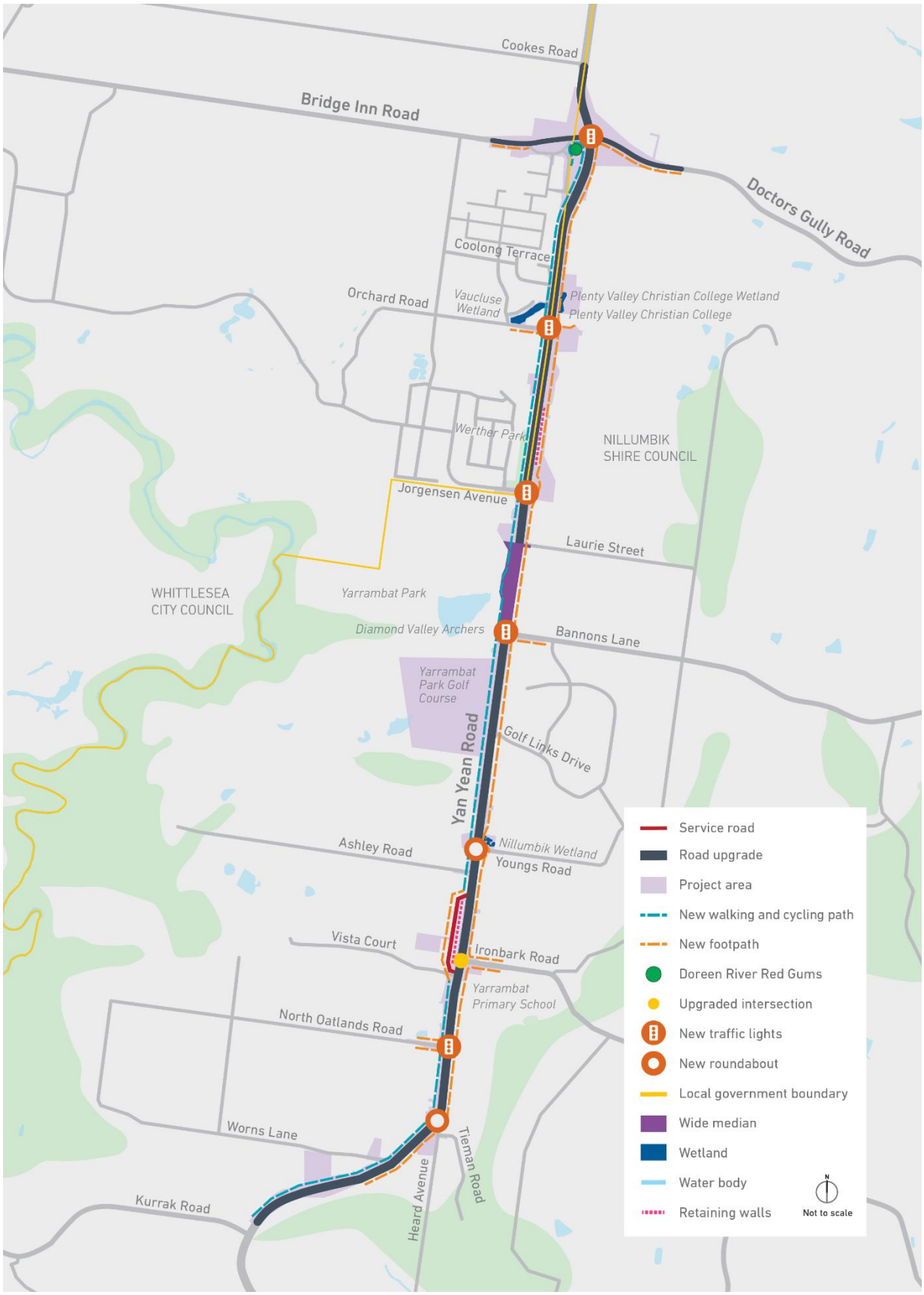


Figure 1.1: Project Area

1.2.1 Yan Yean / Bridge Inn / Doctors Gully Road intersection

The Yan Yean / Bridge Inn / Doctors Gully Road intersection has been designed to retain the two Doreen River Red Gums, General Store and Pet Supply/Stockfeed business situated adjacent to the current Doctors Gully and Yan Yean Road intersection by shifting the whole intersection to the north east (see Figure 2). This intersection design has been developed following community consultation and in response to arboricultural advice on the Doreen River Red Gums.

For illustrative purposes only and subject to change

Figure 2: Bridge Inn Road intersection design

1.2.2 Construction activities

Proposed construction activities would likely be standard road construction activities to be undertaken in accordance with the Environmental Performance Requirements for the Project. These construction activities would include:

- tree clearance and vegetation lopping and removal

- establishment of construction site compounds
- clearing and grubbing, temporary sediment and erosion control works
- establishment of environmental and traffic controls
- earthworks, including:
    - remediation of any existing contamination and removal of any hazardous material
    - protecting and relocating services
    - widening of existing rock cuttings (approximately 750m of existing cut along the Project would be widened by approximately 20 metres)
    - new cuttings (approximately 1300m of new rock cut would be required to a width of approximately 5 metres along the Project)
    - bulk earthworks and haulage.
- civil and structure works, including:
    - roundabouts and intersection upgrades
    - shared user path and pedestrian path construction and connections
    - retaining walls
    - drainage works
    - pavement works.
- 30 to 36-metre-high fence along the edge of the Yarrambat Park Golf Course to avoid golf ball collisions with pedestrians, cyclists or vehicles
- traffic management systems and landscaping.

1.3 Project objectives

The Project aims to improve travel times and reliability to and from growing residential areas in Doreen and Mernda, enhance north-south travel in the area, and improve safety along the corridor. The objectives of the Project are set out below:

- To improve road safety: The Project will achieve this by isolating road users from hazards and improving access control through signalised intersections. Congestion and the complex road environment (poor sight lines due to undulating linear / perpendicular grades and adjacent terrain) are presently contributing to the poor safety record on Yan Yean Road.
- To improve the customer experience: The Project will achieve this by improving access, improving network connectivity, opportunities for active transport, and providing more road capacity.
- To improve network efficiency: The Project will achieve improved traffic flow and a reduction in travel times by increasing road capacity and reducing congestion.

- To maintain environmental and amenity values: The Project will achieve this by managing environmental effects to acceptable levels and ensuring that impacts are avoided, minimised and mitigated to the extent practicable.

1.3.1 Reasons for Preparing this Aboriginal and Historical Cultural Heritage Impact Assessment

This ACHHIA has been prepared in accordance with 'Pathway 2' of the Aboriginal cultural heritage and the environment effects process, Environment Effects Advisory Note August 2007 (Department of Planning and Community Development (DPCD) 2007).

This option is utilised when a Project has a higher degree of uncertainty or complexity, or where a range of Project options are being considered and enables the details of a CHMP to be resolved as part of the Environment Effects Statement (EES) process (DPCD 2007: 4). Following this process, the CHMP can be finalised and evaluated as per the *Aboriginal Heritage Act 2006* and *Aboriginal Heritage Regulations 2018*. The preparation of an EES has commonly involved an assessment of the potential effects of a Project on Aboriginal cultural heritage (DPCD 2007).

This ACHHIA contains detailed information regarding Aboriginal and non-Aboriginal historical heritage issues relating to the project area.

2 EES SCOPING REQUIREMENTS

The Scoping Requirements for Yan Yean Road (Stage 2) Upgrade *Environment Effects Statement* (June 2019) have been prepared by DELWP on behalf of the Minister for Planning. The Scoping Requirements set out the specific environmental matters to be investigated and documented in the EES, which informs the scope of the EES technical studies.

The following matters of the Scoping Requirements are relevant to the cultural heritage impact assessment:

Draft evaluation objective

To avoid or minimise the adverse effects on social and cultural values, including landscape values, Aboriginal and historical cultural heritage values, and remnant, planted and regenerated vegetation, and to maximise the enhancement of these values where opportunities exist.

Key issues

- Potential for adverse impacts on social and cultural values of trees;
- Potential adverse effects on Aboriginal cultural heritage places and values; and
- Potential adverse effects on historical cultural heritage values, especially buildings, properties, trees, archaeological sites and precincts.

3 METHODOLOGY

This impact assessment was developed by drawing together the results of a desktop assessment of Historical Heritage, and a desktop and standard assessment of Aboriginal heritage and contrasting these results to the development plan for the project area. In this manner, potential impacts were identified, and mitigation measures were designed to minimise potential impacts. This assessment was limited by:

- The availability of complete datasets from government bodies. Every effort is made to keep datasets up to date, but gaps are inevitable; and
- The visibility and accessibility of heritage during field assessment.

These impacts were managed through multiple searches of datasets and close engagement with the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation in the area of Aboriginal Cultural Heritage.

Heritage significance is often influenced by social perceptions and values. Therefore, this report should be considered in context with other assessments regarding landscape and social values that have been undertaken for this project, assessments of each area should be considered together

3.1 Stakeholder Engagement

The Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation are the Registered Aboriginal Party for the project area. They have been engaged through the process of CHMP #15169 (Minos et al: In Prep). This engagement included several meetings to discuss the CHMP and its findings, Wurundjeri endorsement of all field work methodologies, the presence of Wurundjeri Field representatives at all stages during on site investigations for Aboriginal Heritage, Wurundjeri's views and statements of significance regarding any identified heritage places and final approval by Wurundjeri of the completed document.

The Wurundjeri and relevant stakeholder groups have also been engaged through the operation of a reference group which has met regularly and provided comments throughout the life of the project.

3.2 Study Area

Yan Yean Road is a primary north-south arterial road and connects the growth suburb of Doreen with major east-west arterials such as Bridge Inn Road, Kurrak Road and Diamond Creek Road. The road runs through the townships of Yarrambat and Plenty and connects with established areas of Diamond Creek and Greensborough (Map 1).

For the purposes of field recording and reporting during the standard assessment, the project area has been divided arbitrarily into seven sections (Sections 1-7) (Map 9 series), each approximately 1 km in length, as follows:

- Section 1 - Kurrak Road to Worns Lane – including an unnamed ephemeral waterway;
- Section 2 - Worns Lane to Ironbark Road – including North Oatlands Road, Vista Court and an ephemeral unnamed waterway; additional survey areas at Yan Yean Road, Yarrambat and North Oatlands Road, Yarrambat;
- Section 3 - Ironbark Road to Golf Links Drive – including Ashley Road, Youngs Road and an unnamed ephemeral waterway; additional survey areas at Yan Yean Road, Yarrambat;
- Section 4 - Golf Links Drive to Laurie Street – including Bannons Lane and an unnamed ephemeral waterway; additional survey areas at Yan Yean Road, Yarrambat;
- Section 5 - Laurie Street to Orchard Road – including Jorgensen Avenue and an unnamed ephemeral waterway; additional survey areas at Yan Yean Road, Yarrambat and Jorgensen Avenue;
- Section 6 - Orchard Road to Bridge Inn Road – including Tallis Grove and Coolong Terrace; additional survey area at Orchid Road, Yarrambat; Yan Yean Road, Yarrambat; Bridge Inn Road, Doreen and Yan Yean Road, Doreen;
- Section 7 - Bridge Inn Road to just north of Cookes Road – including Project Way and Doctors Gully Road; additional survey areas at Doctors Gully Road, Doreen and Yan Yean Road, Doreen.

3.3 Existing Conditions

The assessments undertaken for Aboriginal Heritage in this report included the desktop assessment and standard assessment required to inform a CHMP for the project. MRPV has commenced preparation of CHMP #15169 (Minos et al: In Prep). The CHMP will be completed and provided to the Registered Aboriginal Party following the completion of the EES. The desktop assessment identified two Aboriginal Places within the project area, and four Aboriginal Places within 50 m of the project area.

The standard assessment took the form of a formal survey, combined pedestrian and vehicle survey to determine the presence or absence of Aboriginal cultural heritage within the project area (Map 7). During the standard assessment one Aboriginal Place was identified; however, due to changes in the project area this Place is now outside of the project area. The complex assessment did not identify any cultural heritage within the project area.

For Historical Heritage the assessments undertaken included a desktop review of statutory databases and previous heritage studies conducted in the project area. The heritage places identified during the desktop assessment were subject to a visual inspection to confirm the descriptions provided in previous heritage reports.

3.4 Risk Assessment

An environmental risk assessment (ERA) has been completed to identify environmental impacts associated with construction and operation of the Project. The risk-based approach shown in Figure 3

is integral to the EES as required by Sections 3.1 and 4 of the Scoping Requirements and the *Ministerial guidelines for assessment of the environmental effects under the Environment Effects Act 1978*. The ACHHIA risk register is provided at Appendix 5 and the key impacts are presented in Section 7.

Primary environmental impact pathways were identified for Aboriginal and Historical Heritage and initial risk ratings were assessed by applying the risk significance matrix (Table 1) considering likelihood and consequence categories (Table 2 and Table 3). The initial risk ratings were assessed assuming the implementation of standard controls. Standard controls include compliance with legislative requirements and best practice requirements typically incorporated into the construction contracts for the delivery of road projects. The standard controls do not include any project-specific controls or requirements.

Environmental Performance Requirements (EPRs) have been informed by the ERA, to set the minimum outcomes necessary to avoid, mitigate or manage environmental impacts and reduce environmental risks during delivery of the Project. The development of the proposed EPRs was an iterative process with input from the technical specialists and MRPV. Section 8 provides further detail of the specific EPR's developed for Aboriginal and Historical Heritage.

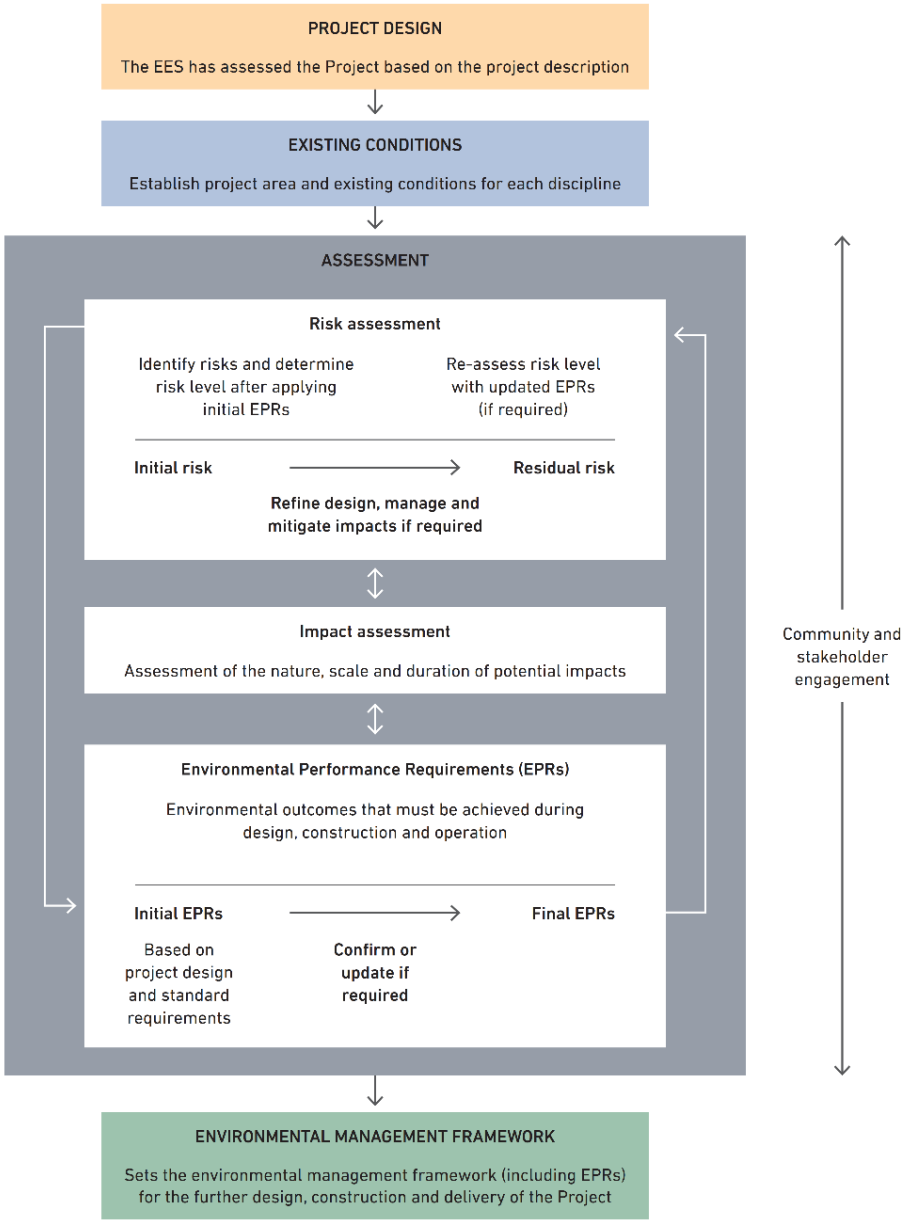


Figure 3: Environmental risk process

3.4.1 Risk Assessment Process

The ERA has guided the environmental studies for the Project. The objectives of the ERA are to:

- identify primary environmental risks that relate to the construction and operation of the Project;
- guide the level and extent of investigation and data gathering necessary for accurately characterising the existing environment and assessing the project's environmental effects;
- help identify performance requirements to avoid, minimise and mitigate environmental risks; and
- inform assessment of likely residual effects that are expected to be experienced after standard controls and proposed EPRs have been implemented.

The risk assessment process for the EES incorporates risk management requirements as detailed in MRPV's Environmental Risk Management Guideline. The process includes:

- an approach to environmental management which is aligned with *ISO 31000 Risk Management – Guidelines*;
- systems used to manage environmental risk and protect the environment, and how these are implemented at different stages of road construction, operation and maintenance; and
- tools and reporting requirements which provide guidance in managing environmental issues throughout the project.

The ERA identifies impact events for each relevant element of the environment, details the primary risks and has informed the level and range of technical reporting required to address predicted impacts. The ERA utilises a risk matrix approach where likelihood and consequence of an event occurring are considered (Table 1 to Table 3). Throughout the preparation of the EES, the likelihood and consequence criteria were updated to ensure currency, as required.

Table 1: Risk Significance Matrix

Likelihood	Consequence level				
	Insignificant	**Minor**	**Moderate**	**Major**	**Critical**
Almost Certain	Medium	Significant	High	High	High
Likely	Medium	Medium	Significant	High	High
Possible	Low	Medium	Medium	Significant	High

Likelihood	Consequence level				
	Insignificant	Minor	Moderate	Major	Critical
Unlikely	Low	Low	Medium	Medium	Significant
Rare	Low	Low	Low	Medium	Medium

Likelihood and generic consequence criteria, informed by the MRPV corporate risk matrix, are shown in Table 2, Table 3 and Table 4.

Risk ratings were then reassessed following risk evaluation and risk treatment to generate a 'residual' risk rating. Both initial and residual risk ratings are documented in the risk register attached in Appendix 5.

Table 2: Likelihood Categories

Likelihood	Description
Almost certain	76-99% Has occurred before and is expected to occur again Is expected to occur each year or more frequently All of the controls associated with the risk are extremely weak/non-existent. Without control improvement there is almost no doubt that the risk will eventuate
Likely	51-75% Has occurred before with a chance of it occurring again Has occurred several times at the Department, Group, Division, Program or Project before The majority of the controls associated with the risk are weak. Without control improvement it is more likely than not that the risk will eventuate
Possible	26-50% Has occurred before with a chance of occurring again Has occurred at the Department, Group, Division, Program or Project once before There are some controls that need improvement, however unless there is improvement the risk may eventuate
Unlikely	6-25% Has occurred elsewhere before, therefore a small chance of occurring The majority of controls are strong with no control gaps. The strength of this control environment means that is likely that the risk eventuating would be caused by external factors not known to the organisation
Rare	0-5% Has never occurred but may occur Is expected to occur 1/100 or more years All controls are strong with no control gaps. The strength of this control environment means that if this risk eventuated, it is most likely as a result of external circumstances outside of the control of the organisation

Table 3: Generic Consequence Criteria

Consequence	Description
Critical	A critical degree of impact on an environmental asset, value or use of moderate or higher significance
Major	A high degree of impact on an environmental asset, value or use of moderate or higher significance
Moderate	A moderate degree of impact on an environmental asset, value or use of moderate or higher significance
Minor	A low degree of impact on an environmental asset, value or use
Insignificant	A very low degree of impact on an environmental asset, value or use

Table 4: Aboriginal Cultural and Historical Heritage Consequence Categories

Risk Event	Insignificant	Minor	Moderate	Major	Critical
Aboriginal cultural heritage	No impact on cultural heritage places or values.	Destruction of a place (or places) and associated cultural values in a deteriorated condition with a high degree of disturbance evident and some cultural materials remaining.	Destruction of a common occurrence place(s)and/or associated cultural values. A place with a limited range of cultural materials and a place in a fair to good condition with some degree of disturbance evident	Destruction of rare occurrence place(s) and/or associated cultural values. A place with a large number and diverse range of cultural materials A place with stratified deposits and/or surface spatial patterning that reflects the way in which cultural materials were deposited.	Destruction of place(s) and/or associated cultural values with exceptional value. A place identified by Aboriginal Victoria and/or cultural values identified by Traditional Owners of exceptional value that the destruction would be catastrophic A burial.
Historical heritage	No detectable impact on the values of heritage places. No disturbance of archaeological sites.	Partial reduction in the heritage values of a locally significant place. Detectable impact on a state significant heritage place but overall heritage values retained intact.	Significant reduction or complete loss of the heritage values of one or more local significant places. Partial reduction in the heritage values of a State significant place.	Significant reduction or complete loss of the heritage values of a State significant heritage place.	Widespread loss of heritage values of locally or State significant places.

4 LEGISLATION AND POLICY

This section assesses the project against the Commonwealth and State legislation, policies and guidelines relevant to the Cultural Heritage Impact Assessment.

4.1 Commonwealth Government

4.1.1 *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a national framework for the protection of heritage, environment and the conservation of biodiversity. The EPBC Act is administered by the Australian Government Department of Agriculture, Water and the Environment (DAWE). The EPBC Act is responsible for the establishment of the National Heritage List, which includes natural, Indigenous and historic places that are of outstanding heritage value to the nation. The EPBC Act also establishes the Commonwealth Heritage List, which comprises natural, Indigenous and historic places on Commonwealth lands and waters or under Australian Government control and identified by the Minister for the Environment (the Minister) as having Commonwealth Heritage values (Department of Agriculture, Water and the Environment 2019).

At current there are no Aboriginal or historic places listed within the project area on the National Heritage List or the Commonwealth Heritage List.

4.2 State Government

4.2.1 *Environment Effects Act 1978*

In Victoria, environment assessment of the potential environmental impacts or effects of a proposed development may be required under the Environment Effects Act 1978 (DELWP 2019).

The process under this Act is not an approval process itself, rather it enables statutory decision-makers (Ministers, local government and statutory authorities) to make decisions about whether a project with potentially significant environmental effects should proceed. If the Minister for Planning decides that an Environment Effects Statement (EES) is required, the project proponent is responsible for preparing the EES and undertaking the necessary investigations (DELWP 2019).

Once the EES is completed and released for public comment, the Minister provides an Assessment to the relevant decision-makers. There are also opportunities for community involvement at certain stages of the process. The Department coordinates the process, implementing the Ministerial Guidelines that set out the processes and requirements under the Environment Effects Act. If an EES is required, the preparation of a Cultural Heritage Management Plan becomes mandatory under the provisions of the *Aboriginal Heritage Act 2006* (DELWP 2019).

Another possible decision following referral of a project under the Act is for conditions to be set in lieu of an EES. These conditions may provide a practical alternative to an EES or provide additional safeguards or management measures (DELWP 2019).

4.2.2 *Planning and Environment Act 1987*

All municipalities in Victoria are covered by land use planning controls which are prepared and administered by State and local government authorities. The legislation governing such controls is the *Planning and Environment Act 1987*. Places of significance to a locality can be listed on a local planning scheme and protected by a Heritage Overlay (or another overlay where appropriate). Places of Aboriginal cultural heritage significance can often not be included on local government planning schemes.

The purpose of the Heritage Overlay is:

- To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies;
- To conserve and enhance heritage places of natural or cultural significance;
- To conserve and enhance those elements which contribute to the significance of heritage places;
- To ensure that development does not adversely affect the significance of heritage places; and
- To conserve specifically identified heritage places by allowing a use that would otherwise be prohibited if this will demonstrably assist with the conservation of the significance of the heritage place.

The project area is located within and is governed by, the Nillumbik and Whittlesea Planning Schemes, and is part of the Nillumbik Shire Council and Whittlesea Council. There is one place HO191 (River Red Gums (2) 25 Doctors Gully Road) listed on the Nillumbik Planning Scheme Heritage Overlay (Appendix 1). There are no dry-stone walls within the project area and the Whittlesea Dry Stone Wall Policy does not apply to this project area.

There are no Aboriginal cultural heritage significance places listed on the Nillumbik and Whittlesea Planning Schemes within the project area.

4.2.3 *Aboriginal Heritage Act 2006 and Aboriginal Heritage Regulations 2018*

The *Aboriginal Heritage Act 2006* provides protection for Aboriginal cultural heritage in Victoria.

The objectives of this Act are:

a) to recognise, protect and conserve Aboriginal cultural heritage in Victoria in ways that are based on respect for Aboriginal knowledge and cultural and traditional practices;

b) to recognise Aboriginal people as the primary guardians, keepers and knowledge holders of Aboriginal cultural heritage;

c) to accord appropriate status to Aboriginal people with traditional or familial links with Aboriginal cultural heritage in protecting that heritage;

d) to promote the management of Aboriginal cultural heritage as an integral part of land and natural resource management;

e) to promote public awareness and understanding of Aboriginal cultural heritage in Victoria;

f) to establish an Aboriginal cultural heritage, register to record Aboriginal cultural heritage;

g) to establish processes for the timely and efficient assessment of activities that have the potential to harm Aboriginal cultural heritage;

h) to promote the use of agreements that provide for the management and protection of Aboriginal cultural heritage;

i) to establish mechanisms that enable the resolution of disputes relating to the protection of Aboriginal cultural heritage;

j) to provide appropriate sanctions and penalties to prevent harm to Aboriginal cultural heritage;

k) to recognise, protect and conserve Aboriginal intangible heritage by recording it on the Victorian Aboriginal Heritage Register.

The Aboriginal Heritage Regulations 2018 are made under section 194 of the *Aboriginal Heritage Act 2006.*

The objectives of these Regulations are:

a) to specify the circumstances in which a CHMP is required for a Project or class of Project;

b) to prescribe standards for the preparation of a CHMP including the carrying out of assessments;

c) to prescribe the form for the preparation of preliminary Aboriginal heritage tests including the carrying out of assessments;

d) to prescribe standards for the preparation of a map included in a cultural heritage agreement;

e) to prescribe fees for evaluating, approving and amending a CHMP;

f) to prescribe fees for an application for a cultural heritage permit;

g) to prescribe fees for an application to the Secretary for advice as to whether a record exists on the Register in relation to a nominated area of land;

h) to prescribe fees for an application for certification of a preliminary Aboriginal heritage test;

i) to prescribe fees for giving notice of intention to prepare a CHMP;

j) to prescribe fees for access to the Victorian Aboriginal Heritage Register (VAHR); and

k) to generally give effect to the *Aboriginal Heritage Act 2006*.

Within the project area three Aboriginal Heritage Places have been identified (recorded on the VAHR) (Map 7).

4.2.4 *Heritage Act 2017*

The *Heritage Act 2017* Is administered by the Minister for Planning, the Heritage Council and the Executive Director. The Act establishes the Victorian Heritage Register; however, the Act does not itself define the criteria against which heritage significance can be assessed. This Act protects all heritage places deemed to be of State significance by registration on the Victorian Heritage Register (VHR). Proposed impacts to any site registered on the VHR will require a Permit from Heritage Victoria (HV). This Act also protects all non-Aboriginal archaeological sites older than 75 years. If non-Aboriginal archaeological sites of State Significance are listed on the VHR a Permit is required to impact the site from Heritage Victoria. If a non-Aboriginal archaeological site is not of State significance and has archaeological value, it is usually listed on the Victorian Heritage Inventory (VHI) and a Consent from Heritage Victoria would be required to impact the site.

There are no historical sites registered on the VHR or included on the VHI within the project area.

5 EXISITING CONDITIONS

5.1 Desktop Assessment

5.1.1 Geology, Geomorphology and Vegetation

A geographic region has been determined for the purposes of this desktop assessment to review the physical environment and previously recorded archaeology located within the project area and surrounding geographic region. The geographic region is defined as a 3 km radius from the project area (Map 4). While arbitrary, the geographic region is defined to provide an understanding of the relationship between Aboriginal cultural heritage and the various geologies, geomorphologies and landforms on which the project area is situated. Importantly, it encompasses several kilometres of the Plenty River to the west, and the upper reaches of Diamond Creek to the east, along which many previously recorded archaeological places are located. Tributaries or drainage lines of both these major waterways intersect with the project area at several points (Map 4).

The geographic region further allows for an understanding of the specific vegetation history and resource availability around the project area and exhibits environmental characteristics that likely influenced Aboriginal occupation. The geographic region addresses the environmental context of Holocene resources available from the project area, as well as natural features that would have influenced the movement of groups across the landscape. The geographic region thus relates to the tangible and intangible values of the landscape and is highly relevant to any Aboriginal cultural heritage that may be present within the project area.

More generally, the region (and the project area itself) forms a part of the Highlands-Southern Fall Bioregion; however, a small portion of the northern extent of the project area is located within the Victorian Volcanic Plains (Department of Environment, land, Water and Planning (DELWP) 2018).

Geology

There are three main geological types present within the geographic region, these include Qa1 – Unnamed fluvial alluvium, Qno1 – Unnamed sheet flow basalt; and Sxg – Dargile Formation. The geology of the project area itself lies on Sxg – Dargile Formation, which comprises deep water sediment including mudstone, minor very fine-grained sandstone; laminated to thinly bedded, minor current ripples and shelly fossils (Department of Economic Development, Jobs, Transport and Resources (DEDJTR) 2017). Part of the northern portion of the project area, along Bridge Inn Road, lies on Qa1 – unnamed fluvial alluvium, which extends to the west. Qa1 is Quaternary (Holocene) in age and typically occurs in areas where flood plains of unnamed alluvium, gravel, sand and silt have formed. The sheet flow basalt of Qno1 is also located to the west of the project area, which is Pleistocene in age and features extrusive basalts, minor scoria and ash (Map 4).

Geomorphology

The project area is broadly situated in the Eastern Victorian Uplands (Eastern Uplands), a dissected plateau-like surface of hills known as the Nillumbik Terrain which extends from the eastern suburbs of

Melbourne (e.g. Camberwell and Templestowe) around Mount Dandenong and further eastwards to the NSW border. This surface was formed in the mid to late Tertiary and occurs at an elevation of between 20 and 200 metres. More locally, the project area lies on two geomorphological units (GMUs), including GMU 1.3.1 'Low relief landscapes at low elevation (Cann River south, Silvan, Templestowe)' and GMU 1.4.5 'Moderately dissected ridge and valley landscapes (Alexandra, Yea, Baranduda) in the south. These land systems are recognised by variation in relief, dissected by the creeks and rivers. The plateau consists of laminated marine sandstones, mudstones and shales of Silurian age (Kinglake land system) and Devonian granodiorite with a surrounding metamorphic aureole (Mount Disappointment batholith) (Map 5).

Soils

The soils developed on these rocks reflect the parent geology and are characterised by red or yellow gradational soils with fine structure on the less steep slopes; and red or brown gradational soils where there are alluvial/colluvial fans (DEDJTR 2017). Archaeological subsurface testing and geotechnical investigations along the alignment of Yan Yean Road to the south of the project area reveal a soil profile characterised by fine brown clayey silt overlying hard, pale brown or dark yellowish-brown silty clay at approx. 200 mm below surface; on the hilltops, there is little topsoil, and the silty clay and siltstone is reached at less than 150 mm below surface (Watson et al. 2017: 50, 60, 165-173).

Late Holocene Vegetation

The geographic region of the project area broadly falls within the Highlands – Southern Fall (HSF) and Victorian Volcanic Plain (VVP) bioregions (DELWP 2017a) (Map 6). Prior to European settlement, these bioregions historically supported grassy open forests and woodlands within the project area. According to the Department of Environment, Land, Water and Planning's (DELWP) mapping of vegetation prior to European colonisation (Pre-1750 EVCs), the majority of the project area would have contained vegetation classified as Grassy Dry Forest (EVC 22), with small areas of Swampy Riparian Complex (EVC 126), Plains Grassy Woodland (EVC 55) and Valley Grassy Forest (EVC 47) (DELWP 2017b) (Map 6).

Grassy Dry Forest regions are characterised by Eucalypts (including *Eucalyptus macrorhyncha* [Red Stringybark] and *Eucalyptus polyanthemos* [Red Box]), as well as sparse shrubs (including *Cassinia aculeate* [Common Cassina] and *Acacia genistifolia* [Spreading Wattle]) and drought-resistant ground cover (including *Pimelea humilis* [Common Rice-flower] and *Leucopogon virgatus* [Common Beard-heath]) (DSE 2004).

The Swampy Riparian Complex (EVC 126) is characterised by woodland to 15 m tall, typically Mountain Swamp-gum (*Eucalyptus camphora ssp. humeana*) located along ephemeral streams of the foothills and plains, with lower strata dominated by various large and medium shrub species on the levees and a ground layer of tussock grasses and sedges (DSE 2004).

Within the Plains Grassy Woodland ecosystem, larger trees were sparse comprising less than 10% cover. These were predominantly River Red Gums (*Eucalyptus camaldulensis).* The predominant vegetation in these areas comprised largely tufted graminoid (grass) and herb species, representing some 80% cover. Common species included kangaroo grass (*Themeda triandra*), bristly wallaby grass (*Austrodanthonia setacea*), Common Rice-flower (*Pimelea humilis*). The remainder comprised small to large shrubs including golden wattle (*Acacia pycnantha*) and hedge wattle (*A. paradoxa*) (DSE 2004).

The Valley Grassy Forest ecosystem (EVC 47) would have contained open forest of a variety of eucalypts, but especially species preferring wetter and more fertile conditions such as Yellow Box (*Eucalyptus melliodora*) and Candlebark (*Eucalyptus rubida*), over sparse scrub, and a ground layer of various herbs, lilies, grasses and sedges (DSE 2004).

Many of these types of vegetation would have been utilised by Aboriginal people in the area for food and the creation of cultural items such as weapons and vessels. They would also have supported a range of game that could be hunted for food. For example, the leaves of some eucalypt species were crushed and soaked in water for medicinal purposes, and bowls and dishes were made from the heavy bark. The Kulin people in southern Victoria made bowls called 'tarnuks' from the gnarls on gum trees to carry water. Hard eucalypt wood was also used to make spear-throwers, boomerangs and shields (Nash 2004).

Kangaroo Grass seeds ripen in summer and can be ground into a flour for the preparation of damper. Riceflower bark could be made into string and nets (Nash 2004). Blackwood (*Acacia melanoxylon*), common in the riparian zone is a very hard wood, used for spear-throwers and shields, and according to Gott and Conran (1991: 50) the bark was heated and infused in water to bathe rheumatic joints.

Other plants and fungi were also valuable food and medicine however, the ethnobotanical records of their use are limited. Eucalypt and tea tree leaves were crushed and soaked in water to prepare medicinal ointments. Bowls and dishes were made from the bark and gnarled growths, for food and water transportation. Canoes were also made from the bark of gum trees. The removal of bark characteristically results in visible modification of the trees that make them identifiable as scarred or culturally modified trees (Nash 2004).

5.1.2 Aboriginal Cultural Heritage

The Aboriginal Cultural Heritage Register and Information System (ACHRIS) was accessed to search the Victorian Aboriginal Heritage Register (VAHR). The search was conducted to provide information regarding previously registered Aboriginal places and previously published reports and works, within or associated with the project area. The results of this search are presented below.

5.1.2.1 *Victorian Aboriginal Heritage Register*

Searches of the Victorian Aboriginal Heritage Register (VAHR) were conducted 21 July 2017, 9 October 2018, 17 May 2019, 23 October 2019 and 18 March 2020 for places within a 3 km radius of the project area (Geographic Region), ensuring that a relevant and representative sample of information was obtained.

5.1.2.1.1 Aboriginal Heritage within the Geographic Region

The most recent search of the VAHR identified a total of 179 registered Aboriginal places within a 3 km radius of the project area (Map 7). These places are concentrated on the Plenty River or in close proximity to the branches of the river. This clustering of places may reflect the importance of this resource to the Aboriginal people occupying the region; or it may reflect a prevalence of previous archaeological studies being undertaken in this area. The occurrence of places can be seen to become significantly less frequent in the areas away from the river and major creek systems.

Places in the geographic region consist of a total of 295 place components comprising five place component types (object collections omitted) including artefact scatters (n=138), LDADs (n=125), scarred trees (n=27), earth features (soil deposits) (n=4) and an Aboriginal Cultural Place (n=1) (Table 5). The difference between the number of places and number of components is because a number of places contain two or more place component types. Stone artefacts, including isolated artefacts or LDADs and artefact scatters account for 89.1% of the place component types in the search area and are the most prevalent place type in the region. . It should also be noted that due to changing conventions for the recording of archaeological places over time, some of the places listed as 'artefact scatters' may in fact represent 'isolated artefacts', as early recording forms made no distinction between the two place types. Furthermore, isolated artefacts are today recorded as a form of LDAD.

Table 5: Aboriginal Place Component Types within the Geographic Region

Place Component Type	Number of Components	Percentage (%)
Artefact Scatter	138	46.7
Earth Feature (Soil Deposit)	4	1.3
Low Density Artefact Distribution	125	42.4
Scarred Trees	27	9.2
Aboriginal Cultural Place	1	0.4
Total	**295**	**100**

5.1.2.1.2 Aboriginal Heritage within the Project Area

Two registered Aboriginal places are located within the project area: VAHR Registered 1 (Yan Yean Archers 1) and VAHR Registered 2 (Yan Yean Road LDAD 1) (Map 7):

- VAHR Registered 1 (Yan Yean Archers 1) is a single artefact, described as a mottled grey silcrete microblade core identified during a survey by Claire Nicholls (TerraCulture) and Mark Wandin (Wurundjeri) in 2005. Its location is described as being in the road reserve alongside Yan Yean Road (between a small lake/pond to the north of the archery club, to the east of Yan Yean Road). This suggests that the registered coordinates of the place are inaccurate, and that it is positioned within the project area. An attempt was made, during Standard Assessment for CHMP #15169, to relocate this place using a DGPS and the description from the place registration. Neither the artefact previously associated with the registration of this place, nor any other archaeological material, was identified.
- VAHR Registered 2 (Yan Yean Road LDAD 1) was identified during a survey for a previous CHMP #14387 (Watson et al. 2017) and consists of an isolated lithic artefact – an angular fragment made from silcrete – located on a roadside cutting on the southern side of Worns Lane close to the intersection with Yan Yean Road. During the survey of Worns Lane, an attempt was made to relocate this place using a DGPS and the description from the place registration. The Aboriginal place was described by Watson (2016, CHMP #14387) as being a single silcrete stone artefact located on the surface of a shallow road reserve. During the survey this cutting was inspected thoroughly but the artefact, nor any other archaeological

material, could not be located, likely due to eroding of the road cutting which was also noted as a probable threat to the place in the original registration

Four additional registered places are within 50 m of the project area: VAHR Registered 3 (Yellow Brick Road LDAD 1), Registered 4 (895 Yan Yean Road, Doreen LDAD1), Registered 5 (Garden Rd – Bridge Inn Rd IA1) and Registered 6 (Yarrambat Park 5).

- VAHR Registered 3 (Yellow Brick Road LDAD 1). The primary grid coordinate is located 4 m west of the project area between Activity Way and Clark Avenue; however, the area of sensitivity of the place as per r.25 of the *Aboriginal Heritage Regulations 2018* (land within 50 m) is within the project area. This place is an LDAD comprising of a silcrete flake, recorded during the preparation of this CHMP (15169); however, due to project area updates in 2020 the primary grid coordinate of this place is now outside of the project area. In 2019 Barker completed a place inspection of a 20 m buffer of the primary grid coordinate during CHMP #16621; however, the artefact could not be reidentified. Subsurface testing of the place was completed, and a 1 x 1 m test pit was excavated, no subsurface material was identified.
- VAHR Registered 4 (895 Yan Yean Road, Doreen LDAD1). The primary grid coordinate is located 16 m west of the project area between Nancarrow Drive and Yan Yean Road; however, the area of sensitivity of the place as per r.25 of the *Aboriginal Heritage Regulations 2018* (land within 50 m) is within the project area. The Place identified by Barker 2019 (CHMP #16621), is an LDAD comprising of a quartzite complete blade, found during subsurface testing at a depth of 200 mm.
- VAHR Registered 5 (Garden Rd - Bridge Inn Rd IA). The primary grid coordinate is located 33 m north east of the project area along Bridge Road Inn, however, the area of sensitivity of the place as per r.25 of the *Aboriginal Heritage Regulations 2018* (land within 50 m) is within the project area. The Place identified by Weaver 2006 CHMP #3438, is an LDAD with a single honey coloured silcrete flaked fragment, with approximately 10% white coarse cortex. This artefact was located within churned up soil deposit on the southern side of a concrete water tank.
- VAHR Registered 6 (Yarrambat Park 5). The primary grid coordinate is located approximately 49 m west of the project area between Laurie Street and Bannons Lane, however, the area of sensitivity of the place as per r.25 of the *Aboriginal Heritage Regulations 2018* (land within 50 m) is within the project area. The Place identified by Ellender 1988 (AV report #230), is an LDAD with a single unretouched/waste flake made from chert, located in park land east of Yan Yean Road. The place is described on the place card as being badly eroded and of little research potential.

5.1.2.1.3 Aboriginal Heritage Listed on Local Council Planning Scheme Heritage Overlays

The project area is located within and is governed by, the Nillumbik and Whittlesea Planning Schemes. Planning schemes set out policies and provisions for the use, development and protection of land. The Heritage Overlays of these Planning Schemes were examined on 10 August 2017 and 18 March 2020. No Aboriginal heritage places listed on the Heritage Overlay are present within the project area.

5.1.2.2 *Reports and Published Works*

Localised and regional archaeological investigations have established the general character of Aboriginal places located within the same geographic region as the project area. This information, together with an environmental context, histories of land use and, historical and ethnohistorical sources, can be used to form the basis for a site prediction statement.

A search of the VAHR for previous archaeological investigations within the geographic region returned a total of 131 reports, including CHMPs, surveys, salvages, test excavations and desktop assessments.

A summary of the archaeological reports, including surveys and CHMPs from 2000 to 2019 intersecting the current project area are summarised below. The reports in Table 6 are considered less relevant as they are located further from the project area, within 1.5 km and are more relevant to the geographic region. Further summaries of archaeological reports relevant to the geographical region of the project area are present in Table 7.

5.1.2.2.1 Previous studies intersecting with current project area

Ten previous archaeological investigations have been undertaken of study areas that intersect sections of the current project area, and are summarised below:

Barker, M (2019) prepared a CHMP #16621 for the proposed residential subdivision of 895 Yan Yean Road, Doreen, which intersects the western section of the current project area. A standard assessment was completed as part of the CHMP, and no Aboriginal cultural heritage was identified due to poor (under 20%) ground surface visibility. A complex assessment was completed as part of the CHMP and Aboriginal cultural heritage was identified within one subsurface test pit, on a plain landform in disturbed context. VAHR Registered 4 (895 Yan Yean Road, Doreen LDAD1), comprises of a single quartzite artefact. Management conditions required for the two places included reburial of the artefacts and compliance inspections during the proposed works.

Carr and Tsiplakis (2018) conducted CHMP #14996 for the Doreen to Diamond Creek sewerage works upgrade, which interests the centre of the current project area. This work was undertaken for the Yarra Valley Water sewerage works. The works were linear and extended for a distance of approximately 11.8 km. The standard assessment only achieved 17.6% effective survey coverage due to dense vegetation coverage. Despite this, the previously registered place was successfully relocated and a new VAHR identified which was a scarred tree. The survey also identified two areas of potential archaeological sensitivity including, an elevated terrace landform within 200 m of Plenty River in the north eastern extent of the project area (PAS A). The second was an elevated terrace landform within 200 m of Diamond Creek in the southern extent of the project area (PAS B).

The complex assessment comprised 12 mechanical test pits, 24 test pits and 19 shovel test pits, with excavations ranging from 200 to 1000 mm in depth. The subsurface testing program identified two new VAHR places within PAS A and B. One place was recorded as an artefact scatter comprising a total of 364 stone artefacts. This place was merged with several other places due to the overlapping extents. Other components included two scarred trees, two isolated artefacts, another smaller artefact scatter and two LDADs. One LDAD was located on a terrace in association with named waterways. Subsurface testing was limited to the areas closest to Plenty River and Diamond Creek, as such the only subsurface

testing to take place within the current project area was located in the western road reserve north of Bannons Lane and the Diamond Valley Archery Club on and unsealed vehicle track. Any further subsurface testing on Yan Yean Road was considered unnecessary due to level of disturbance from the presence of underground and above ground services (electricity, gas, optic fibre, stormwater and sewerage) and previous roadway construction.

Watson et al. (2017) completed CHMP #14387 to the level of complex assessment, which intersects the southern section of the current project area. The standard assessment of that CHMP involved a ground survey of previously unsurveyed sections of land along the Yan Yean Road reserve and immediately adjacent land. The majority of the proposed development area was found to have been disturbed by past road construction. However, three Aboriginal artefacts were identified in three separate locations, recorded on the VAHR as three new Aboriginal places: VAHR Registered 2 (located within the project area of the present CHMP). Subsurface testing for the complex assessment involved the excavation of 88 test pits, in which low densities of Aboriginal flaked stone artefacts were found in 12. These cultural deposits were found to be localised to rises and registered as two new Aboriginal places.

Kaskadanis and Hamdorf (2017) completed a CHMP #15012 for a linear project area for a powerline, that intersects the northern section of the current project area. This work was undertaken for Austnet services. The powerline ran from Kalkallo Substation to the Doreen Substation and included the installation of approximately 24 km of new 66kV lines. The majority of works was to occur within the existing powerline easements and associated road reserves. The only area that this CHMP overlaps with the current CHMP was on Bridge Inn Road, Doreen where both extents overlap minimally at Bridge Inn Road. Following the standard assessment, despite the numerous disturbances observed, it was considered that the paddock at Bridge Inn Road (AusNet Services Station) may have archaeological potential for LDADs given the presence of VAHR Registered 5 (Garden Rd - Bridge Inn Rd IA) located in the abutting land to the west of the current project area. Subsurface testing comprised two test pits and five shovel test pits. The test pits were positioned on the proposed new pole locations and shovel test probes were targeted on the proposed cable route connecting the poles at Bridge Inn Road, Doreen. No Aboriginal cultural heritage was recorded during the preparation of the CHMP.

Noble et al. (2010) prepared a CHMP #11111 for the proposed road duplication and interests the current project area. The CHMP included a desktop and standard assessment, the results of which determined that the most likely Aboriginal place types to occur along the road alignment would be low density lithic scatters consisting of artefacts made from quartz, silcrete and chert. However, no Aboriginal cultural material was identified during the ground survey, though ground surface visibility was low, and the landscape was found to be extensively modified as a result of various development activities and construction of existing roadways (Noble et al. 2010: 47).

Murphy & Amorosi (2006) undertook a formal survey (report #3484) for the proposed residential development at 265 and 285 Cookes Road, Doreen, which intersects the northern section of the current project area. The project included a ground survey which investigated two historical homes; Cornell HS1 (VHI H7922-0344) and Cornell HS 2 (VHI H7922-0344), no Aboriginal cultural heritage was identified during the survey. The management recommendations included that excavation should be undertaken within the project area to test for the presence of subsurface cultural heritage.

Murphy et al. (2006) undertook subsurface testing for AV report number #3759, for the proposed residential development at 265 and 285 Cookes Road, Doreen, which intersects the northern section of the current project area. A survey for this project area was completed following the recommendations of report #3484 (Murphy & Amorosi 2006; see above) where no Aboriginal cultural heritage was identified, but excavation was recommended. During the subsurface testing, a total of two Aboriginal cultural heritage places were identified both artefact scatters recorded on ridgetops. One Place is comprised of nine quartz artefacts and nine silcrete artefacts, the other Place is comprised of three silcrete artefacts. Two historical houses were also investigated as part of this assessment; Cornell HS1 (VHI H7922-0344) and Cornell HS 2 (VHI H7922-0344). The management recommendations for these Places included preserving the places as public open spaces and monitoring of the historical homes.

Weaver (2006) undertook archaeological survey for AV report #3438, for a proposed residential development along Yan Yean Road, Doreen, which intersects the western section of the current project area. The ground surface visibility observed during the survey was poor, being less than 30%. The project area was observed to have been disturbed from agricultural use, residential buildings, dams and water tanks. One Aboriginal cultural heritage place was identified during the survey, a silcrete flake (VAHR Registered 5 (Garden Rd - Bridge Inn Rd IA)), in an area of exposure near a concrete water tank. Management recommendations included subsurface testing to test for the potential for subsurface cultural heritage.

Chamberlain and Nicholls (2003) undertook an archaeological survey (AV report #2634) for the proposed pressure main alignment, Cookes Road, which intersects the current project area to the north west. An archaeological survey was completed of the road reserves and due to poor GSV an opportunistic survey was completed. During the survey one artefact was located, a grey silcrete flake, on a low rise within the northern road reserve. The area was identified to be in a highly disturbed context, where a narrow trench possibly from the installation of telecommunications. The artefact was located outside of the proposed works and thought to not be *in situ*, therefore no management recommendations were made.

Debney and Amorosi (2000) undertook an archaeological survey (AV report #1878) for a local structure plan for Yarrambat North and intersects the northern section of the current project area. An archaeological survey was completed as part of this report and a total of two previously unrecorded Aboriginal Places were identified. The survey was completed in three survey units, and survey unit 1 located near Plenty River Gorge contained the highest density of artefacts. Poor GSV was recorded throughout majority of the project area which occasional patches of exposed ground. One LDAD comprising of a silcrete flake, located on lower spurs overlooking Plenty River. One scarred tree located on the edge of an ephemeral creek associated with Plenty River. The scarred tree has a large scar on the southern face and is a canoe in excellent condition with axe marks at the base of the scar. The management recommendations included notifying the local councils and property owners of known places within the project area, the places are to be incorporated into public open spaces and include no go zones.

A summary of previous archaeological reports relevant to the geographical region of the project area appears below (Table 6).

Table 6: Archaeological Reports Relevant to the Project Area within approximately 1.5 km

Author, Date, Report #	Description and Location	Results
Truscott, W. 2017 #4901	Cultural heritage survey to Standard Assessment for the Plenty Gorge Park, South Morang, to update existing preliminary report forms. The closest of six study areas (Option 1) for this report is located within 800 m west of the current project area.	The standard assessment undertaken investigated nine previously recorded Aboriginal Places, four of the place extents were expanded to include further identified artefacts. Management recommendations included restriction of casual vehicle use in the park, and minimising vehicle use along the escarpment landform.
Wackett, L. 2014 #13095	Cultural Heritage Management Plan for the proposed rain-garden and associated works, plenty river estate Doreen. The closest of four study areas (Option 1) for this report is located within 920 m west of the current project area.	The standard assessment undertaken identified two landforms, undulating plain and elevation in association with Plenty River. No unrecorded Aboriginal Cultural Heritage was identified as part of the standard. The complex assessment undertaken included two test pits, and 28 shovel pits which were radial testing for the test pits. One new artefact scatter was identified, with 10 silcrete flakes added to the extent of existing registration. Management recommendations included protective fencing of the scarred trees, and RAP compliance inspections of the proposed works.
Matic, A. 2010 #11287	Cultural Heritage Management Plan for the proposed residential development at Bridge Inn Road, Doreen. Located approximately 500 m west of the current project area.	The standard assessment did not identify any new Aboriginal cultural heritage material; however, it did identify two areas of potential, gentle rises in association with Plenty River. The complex assessment undertaken in two phases, phase one included 18 test pits in a grid across the project area. No Aboriginal cultural heritage was identified in phase one. Phase two included 4 test pits and 75 shovel test pits, two Aboriginal cultural Places were identified low density artefact scatters. Management recommendations included salvage of the places identified by using mechanical excavated test pits.
Veres, M. 2009 #10799	Mandatory complex cultural heritage management plan for a 3.25 ha parcel of land known as Browns Lane Plenty. Proposed project involved the subdivision of the land in low density residential allotments. Located approximately 800 m south of the current project area.	The desktop assessment identified three previously recorded Aboriginal places within the project area, all three places were LDAD's consisting of silcrete and quartz flakes. The standard survey was conducted across the entire subject area and involved transects that were five metres apart. Due to low grass cover, ground visibility was generally good, particularly along existing tracks and fences and around the base of trees. No new Aboriginal places were identified during the survey and only part of one of the three previously recorded LDAD's within the study area could be re-located. A complex assessment involving excavation and sub-surface testing was also carried out. One 50 x 50cm and four 1 x 1m test pits were excavated, as well as 2 x 10m and 6 x 20m shovel probe transects. Five artefacts, all comprised of silcrete, were located within the testing excavations. within the topsoil (3-5 cm) of a previously recorded place. No further management

Author, Date, Report #	Description and Location	Results
		recommendations were recommended for this previously recorded place.
Mitchell, J & Loizou, R. 2009 #10921	Cultural Heritage Management plan for proposed residential development for Bassetts Road, Doreen. Located approximately 1 km west of the current project area.	Complex assessment was completed as part of this CHMP, following the standard assessment completed by Ellender in 1994 where four scarred trees were identified, and Weaver in 2006 where a shell scatter was identified. The subsurface testing included four 1 x1 test pits, and eleven 400 mm x 400 mm shovel test pits in six transects. No Aboriginal cultural heritage was identified during the subsurface testing. As part of the CHMP two places, a Shell Scatter and scarred tree were delisted as places. Management recommendations included protective fencing of the scarred trees.
Weaver, F. 2006 #3506	Archaeological survey of proposed development plan at Bassetts Road, Doreen. Located approximately 1 km west of the current project area.	An archaeological survey was undertaken where ground surface visibility was poor, less than 10%. Disturbance of farming equipment, housing and infrastructure were noted. Four previously recorded scarred trees were reidentified during the survey, and one new shell scatter was identified within the River Red Gum woodland at the northern section of the project area. Management recommendations included changing proposed development plans, and subsurface testing.
Sivaraman, L. 2006 #3527	Archaeological investigation at Laurimar Estate, Mernda for proposed residential subdivision. Located approximately 1.2 km north of the current project area.	Further to previous archaeological investigations having been undertaken in the project area, subsurface testing was undertaken as part of this report. The testing was completed on three hill tops in the western section of the project area. During subsurface testing a total of eight new Aboriginal Places were identified, all isolated artefacts of silcrete, quartz and quartzite.
Feldman, R. 2005 #3119	Aboriginal cultural heritage assessment of RSPCA Doreen property, Cookes Road, Doreen for proposed residential subdivision. Located approximately 500 m north west of the current project area.	An archaeological survey was undertaken where poor ground surface visibility and previous land use resulted in no unrecorded Aboriginal cultural heritage material being identified. No previously recorded Aboriginal places were reidentified as part of the survey. Due to the absence of Aboriginal cultural heritage within the project area, management recommendations were not provided.
Luebbers, R. A. 2005 #3428	Standard cultural heritage assessment for a proposed retarding basin comprising 2.5 hectares at River Avenue, Plenty. Located approximately 1.3 km south of the current project area.	A survey was conducted across the entire subject area, with emphasis on areas of high visibility such as fence lines, erosional features and freshly washed surfaces. The landscape was identified as heavily modified with evidence of intensive grazing, grading and soil stock piling across much of the place. Two individual isolated artefacts were recorded.
Luebbers, R 2003 #3335	Archaeological survey of Laurimar Estate for prosed residential development. Located approximately 1.4 km north of the current project area.	An archaeological survey was undertaken, where ground surface visibility was poor (under 5%). Two previously unrecorded scarred trees were identified as part of the survey. These were identified in addition to three previously recorded scarred trees. Management recommendations included protecting the scarred trees in public open spaces, and temporary fencing with no go zones.

Author, Date, Report #	Description and Location	Results
Nicolson, O., and Thomson, M. 2003 #2595	Archaeological survey for three proposed sewer main options located at separate locations within Mernda South, Victoria. The closest of three study areas (Option 2) for this report is located within 800 m west of the current project area.	The desktop component of this report identified two previously recorded Aboriginal places within two of the three study areas. Both places consist of artefact scatters with both quartz and flint flakes. The ground survey identified three new Aboriginal places, two isolated artefacts within the study area of Option One and one artefact scatter within the study area for Option Three. There were no new Aboriginal places recorded within the study area for Option Two, however; all three study areas were deemed to be areas of high archaeological potential. Further archaeological investigation was recommended.
Muir, S 2002 #2360	Archaeological survey of proposed subdivision at Bond Land Yan Yean Road, Doreen. Located approximately 360 m north of the current project area.	An archaeological survey was undertaken, no previously unrecorded Aboriginal cultural heritage was identified due to poor ground surface visibility. Two previously recorded places were reinvestigated as part of the survey, isolated artefacts. Management recommendations included protecting the artefacts with public open spaces and monitoring of the proposed works.
Tulloch, J 2001 #2154	Archaeological survey of proposed residential development of a lot at Yan Yean Road, Doreen. Located approximately 300 m north of the current project area.	An archaeological survey was undertaken, no previously unrecorded Aboriginal cultural heritage was identified due to poor ground surface visibility. Three previously recorded scarred trees were reinvestigated as part of the survey. Management recommendations including preserving the scarred tress in an open public space and monitoring of the proposed works.
Bell, J. 2000 #3345	Archaeological survey of proposed residential development site, Yan Yean Road, Doreen. Located approximately 300 m north of the current project area.	An archaeological survey was undertaken, and ground surface visibility was considered poor due to thick vegetation. Two LDADs were recorded during the survey, and five historical features were identified. One comprises of a quartz flake, and one comprises of a ballast hammerstone. Management recommendations included further subsurface testing.

5.1.2.2.2 Previous relevant studies within the geographical region of the project area

A summary of archaeological reports relevant to the geographical region of the project area appears below (Table 7).

Table 7: Archaeological Reports of the Geographical Region Relevant to the Project Area

Author, Date, Report #	Description and Location	Results
Ellender, I. 1991 #230	Archaeological survey of Aboriginal places within the Plenty Valley corridor, a narrow rectangular area extending north from Greensborough to the slopes of Mt Disappointment, roughly bound by Yan Yean Road to the east, and Epping Road to the west.	Ground visibility throughout the survey varied, ranging from 2% (per square metre) to 20% and was generally limited to areas of erosion, animal and vehicle tracks and ground cultivation. A total of 70 places were identified and documented during the survey, in addition to the two scarred trees previously recorded. The places consisted of 16 artefact scatters, 20 scarred trees and one burial. 33 isolated artefacts were also recorded. Raw materials consisted of silcrete, quartz and chert.

Author, Date, Report #	Description and Location	Results
Ellender, I. 1994 #768	Report on the Aboriginal Heritage of the Mernda Development Area for potential urban development, including Quarry Hill, Granite Hill and the Middle Darebin Creek.	The report identified four landforms in the proposed growth area, Red Gum Woodland, Quarry and Granite Hills, Sedimentary Geology and the Riverine Strip of the Darebin Creek and Plenty River. A total number of 74 Aboriginal places were identified in the report, taken both from this and prior surveys, 35 of which were identified along the riverine strip of the study area. The study area for Ellender's report encompasses the project area for this CHMP.
Ellender, I. 1996 #1107	An archaeological survey of Aboriginal places in the South Morang Local Structure Plan area, comprising a total of 757 hectares.	The survey covered approximately half of the study area (45%) and involved transects that were up to 20 m apart. Ground surface visibility was generally poor across the site (approximately <10% per square metre) and limited to stock and vehicle tracks and the eroding banks of the Henderson watercourse. Seventeen new places were documented during this survey, making a total of 27 places with those recorded during previous surveys. These consist of 16 scarred trees, nine artefact scatters and a sub-surface concentration of stone artefacts, a quarry site and several isolated artefacts. Ellender's study area is located approximately 4.7 km north west of the current project area.
Ellender, I. 2003 #2231	An archaeological survey of the Mernda, Quarry Hills, Granite Hills and Middle Darebin Creek areas	The study area was divided up into landscape units including: red gum woodland, quarry and granite hills, sedimentary geology unit and the riverine strip unit. A total of 79 places were identified in this investigation, 27 places were identified within the red gum woodland unit, comprising one isolated artefact, one artefact scatter and 25 scarred trees. Ten places were identified within the quarry and granite hills unit, comprising three artefact scatters, two stone procurement sites, two scarred trees and three isolated artefacts. Seven places were identified in the sedimentary geology unit, comprising five isolated artefacts and two artefact scatters. A total of 35 places were identified within the riverine strip unit, comprising three artefact scatters and one isolated artefact on the Plenty River, nine artefact scatters, one scarred tree and 21 isolated artefacts on the Darebin Creek. Ellender identified Darebin creek, which traverses the current project area, to be of high archaeological sensitivity and significance. Approximately 5 km west of the project area for the current CHMP.

5.1.2.3 *Historical and Ethno-Historical Accounts*

The *Woi wurrung* shared a cultural and linguistic affinity with the *Bun wurrung, Ngurai-illam wurrung*, *Djadja wurrung*, *Wada wurrung* and *Duang wurrung* language groups. Collectively these groups were known as the Kulin Nation occupying the south-central Victorian region (Howitt 2001). This cultural grouping shared similarities in speech, burial practices, initiation, kinship marriage ties and religious beliefs. The language groups within the Kulin Nation adhered to a patrilineal descent system and the *Bunjil/Waa* moiety system. Each clan within the Kulin Nation language groups belonged to either one of two moieties; *Bunjil* (eaglehawk) and *Waa* (crow). Marriage partners were taken from the opposite

moiety and membership in the moiety had religious, economic and social implications and obligations that transcended local allegiances and clans (Barwick 1984).

According to Clark the *Woi wurrung, Bun wurrung, Ngurai-illam wurrung* and *Duang wurrung* languages were all dialects of the one language, as they share more than 75 percent common vocabulary with each other. Clark refers to these groups as dialectal-tribes and together as the East Kulin Nation (Clark 1990: 369).

Land tenure

At the time of European contact, the Doreen and Yarrambat areas, and surrounding region lay within the traditional lands of people from the *Woi wurrung* language group. This language group is believed to have occupied the Yarra and Maribyrnong watersheds, bounded on the north by the Dividing Range from Mount Bawbaw westward to Mount William and Mount Macedon and on the west by the Werribee River (Clark 1990: 379). The clan responsible for the Doreen area was the *Wurundjeri willam. Wurundjeri willam* in traditional East Kulin language means 'white gum tree dwellers'. The *Wurundjeri willam* was a patriline of the *Wurunjeri balug* clan (Clark 1990: 385). Historical sources suggest that the *Wurundjeri willam* occupied areas along the Yarra, Plenty and Maribyrnong Rivers (Clark 1990: 385). The *Wurundjeri willam* were custodians of sacred places around the area, including locations such as Aitken Hill, which were important to many neighbouring *Woi wurrung, Daung wurrung, Djadja wurrung* and *Wada wurrung* clans. Historical records suggest that the ranges east of Kilmore were used as a meeting place by these groups.

Resources

The *Woi wurrung* country was rich in resources as it is located in the temperate south zone of Australia, which covers the south part of the continent. Due to a present rainfall in excess of 300 mm a year, the temperate zone has many watercourses and lakes, which provided a reliable water supply to the Aboriginal population. This allowed a relative growth of the human populations in the region, and in favoured areas, hunter-gatherers invested much labour on maintaining resources such as fish traps and weirs (Presland 2010: 48).

The *Kurung-jang-balluk* occupied a large region west of Melbourne. It consisted of wetlands which would supply food sources such as eels, mussels, fish, snakes and plants (plains grassy woodland); as well as an abundance of wetland birds. Past Aboriginal occupation in the area is still evident today through the scars that were left on trees and the stone tool fragments that are still being discovered across the landscape.

However, the mainstays of the Aboriginal diet were plants and roots. One of the most important foods was called Myrnong (*Microseris lanceolata*), a tuber that resembled a dandelion, also known as Yam Daisy or Native Dandelion. In addition to this plant, there were more than 300 plants of which the roots or tubers were eaten, including the bulrush (*Typha* sp.), marsh club rush, early-nancy, milkmaid, various orchids (*i.e.* greenhood, onion and potato orchids) and many kinds of lilies (including bulbine lily (*Bulbine Bulbosa*), chocolate lily (*Anthropodium strictum)*, flax lily (*Dianella Tasmanica*), fringe lily (*Thysanotus tuberosus*), grass lily (*Caesia calliantha*), gymea lily (*Doryanthes excelsa*) (and pale vanilla lily (*Arthropodium milleflorum*) (Clarke 2011: 72). Roots of common reed (*Phragmites australis*) were also collected to manufacture items of personal adornment (Presland 2010: 71).

Similar to other hunter-gatherer societies, there was a division of labour based on gender. Men would engage in hunting and women gathered plants and roots; although it is not unusual that these subsistence activities overlap, especially with women and young children capturing small animals during their foraging excursions.

Before the European invasion disrupted their way of life, the Eastern Kulin clans were able to move freely around their land on an annual cycle, with some *Woi wurrung* bands spending the warmer months on the banks of the lower Yarra, and during the cooler months they would move to higher land into the Dandenong Ranges (Presland 2010). A significant place along the Yarra River was a wetland complex called *Bolin*, where mature eels were captured by hand or speared (Presland 2010: 67-68). Nets and traps were also used to capture eels and fish during the day and at night; spear fishing from a canoe was also practiced in freshwater bodies, attracting fish with a lighted brand near the water's surface. Two common freshwater fish that were captured include the Australian Grayling (*Prototroctes maraena*) and Tupong (*Pseudaphritis urvillii*) (Presland 2010: 68).

Possums, especially the Brush-tail Possum (*Trichosurus vulpecular*), were hunted for their meat and their skins that would later be used to make cloaks. Other animals included kangaroo, bandicoot, emu and other smaller quadrupeds; these were cooked and distributed among the participants of the hunting party, according to a set of very strict rules (Howitt 2001: 764-765).

European Contact

The *Woi wurrung* played a prominent role in early settlement history. In particular a clan leader, or Ngurungaeta, known as William Barak, as a boy witnessed the signing of the 'treaty' between *Woi wurrung* and *Bun wurrung* elders and John Batman, the founder of Melbourne. However, European arrival in the region had a devastating impact on Aboriginal people, and a steep decline in population was recorded soon after European arrival in of Australia. It is likely that Aboriginal communities had already suffered severe population decline prior to the official settlement in 1835 as a result of disease and conflict with whalers, sealers and squatters.

In 1839 the Aboriginal protectorate scheme was introduced in Victoria. Four Assistant Protectors were appointed under a Chief Protector, George Augustus Robinson. The role of the protectorates was to provide food, shelter and medical supplies, record cultural and population information and to indoctrinate Aboriginal peoples into the western European cultural and economic systems. Aboriginal reserves and stations were established across Victoria and Aboriginal peoples were encouraged to move to them. *Woi wurrung* clans moved to the reserves and stations set up at Narre Warren, Mordialloc, Warrandyte, and on the Acheron River. A school for Aboriginal children was also set up on Merri Creek (Presland 1994: 100). The Protectorate was largely unsuccessful and was disbanded in 1849.

The Central Board for the Protection of the Aborigines was founded in 1860 to provide an administrative structure to manage Aboriginal people in Victoria. Under their direction a series of missions and government stations were set up throughout Victoria where Aboriginal people could live (Department for Victorian Communities, AV Website 2018). In the 1860s the Coranderrk Mission Station was opened near Healesville. Aboriginal people from the *Woi wurrung* clan moved through, lived and worked on the station almost semi-autonomously up until the 1880s (Presland 1994: 100). Most Aboriginal people of

Woi wurrung descent can trace their ancestry to people who were associated with the Coranderrk Mission Station.

While many Aboriginal people lived on the missions and government stations, a significant number of people worked and lived on farms and pastoral stations. Some Aboriginal people farmed the land on smallholdings or worked in industries such as fishing on the Murray, the goldfields, and in the timber industries. People outside the reserves sometimes gathered together in camp sites on the outskirts of towns. They were also involved in sports such as cricket, football and athletics.

By the turn of the century only a small population of Aboriginal people lived on the missions and government stations, with most living and working in the same general area. The last missions and stations were phased out in the 1920s, though some of the land which was once part of the missions is now under the control of Aboriginal communities. Pressure from the government forced most of the remaining Aboriginal peoples to leave the Coranderrk Mission Station and it closed in 1924 (Presland 1994: 100).

Since the 1920s, Aboriginal people have continued to live in most areas of Victoria, often with strong ties to their original clan and tribal areas. This century, Aboriginal history has been marked by peoples' efforts to maintain their collective identity and culture. Today the descendants of the *Wurundjeri willam* clan of the *Woi wurrung* language group are represented by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation

Oral History

A request was made via email on the 18th October 2018. The Wurundjeri responded via email on the 2nd of November 2018 stating they had no oral histories relating to the project area for inclusion in this report.

5.1.2.4 *Desktop Assessment Conclusion - Place Prediction Model*

The following place prediction statement[1] has been formulated from the review of the desktop assessment and the previous archaeological reports recorded during this assessment. The statement presented is based on a place type approach (for further information on place types see AV 2017).

The review of the previously recorded Aboriginal archaeological places and previous archaeological investigations within the search area indicates that the place types most likely[2] to occur in the project area are stone artefact scatters and LDADs. Other likely place types to occur are scarred trees, and earth features (soil deposits). Place types considered unlikely to occur in the project area are shell middens, mounds, quarries, stone arrangements and Aboriginal burials.

Stone Artefact Scatters are considered likely to occur in the project area. The desktop assessment indicated that this place type is the most common place type in the geographic region, representing

[1] The term 'site prediction statement' is sometimes referred to as 'site prediction model'. Ecology and Heritage Partners Pty Ltd prefers the term 'statement' as it is more accurate; 'statistical modelling' is a rigorous and comprehensive process using empirical data.
[2] Likely is an assessment of site types with a 50% or more likelihood of occurring; Unlikely is an assessment of site types with less than 50% likelihood of occurring.

43% of place types within the region. There are no artefact scatters within the project area, however there are two artefact scatters located within 80 m of the project area, meaning it likely that the project area could contain artefact scatters.

Stone tools were made by hitting one piece of stone, called a core, with another called a 'hammerstone', often a pebble. This would remove a sharp fragment of stone called a flake. Both cores and flakes could be used as tools. New flakes were very sharp, but quickly became blunt during use and had to be sharpened again by further flaking, a process called 'retouch'. A tool that was retouched has a row of small flake scars along one or more edges. Retouch was also used to shape a tool.

Not all types of stone could be used for making tools. The best types of stone are rich in silica, hard and brittle. These include quartzite, chert, flint, silcrete and quartz. Aboriginal people quarried such stone from outcrops of bedrock or collected it as pebbles from stream beds and beaches. Many flaked stone artefacts found on Aboriginal places are made from stone types that do not occur naturally in the area. This means they must have been carried over long distances.

Stone tools are the most common evidence of past Aboriginal activities in Australia. They occur in many places and are often found with other remains from Aboriginal occupation, such as shell middens and cooking hearths. They are most common near rivers and creeks. It is easier to find them where there is limited vegetation or where the ground surface has been disturbed, for example by erosion.

Artefact scatters are the material remains of past Aboriginal people's activities. Scatter places usually contain stone artefacts, but other material such as charcoal, animal bone, shell and ochre may also be present. No two scatters are exactly the same.

Artefact scatters can be found wherever Aboriginal occupation has occurred in the past. Aboriginal campsites were most frequently located near a reliable source of fresh water, so surface scatters are often found near rivers or streams where erosion or disturbance has exposed an older land surface.

Low Density Artefact Distributions (LDAD) are considered likely to occur in the project area. LDADs are the second most common place type to occur within the geographic region.

Low density artefact distributions are stone artefact places that comprise less than 10 artefacts in a 10 x 10 m area and where artefact clusters are all contained within a single 1:100,000 scale mapsheet. LDADs can occur singly and may occur anywhere in the landscape. Surface artefacts may be indicative of further subsurface archaeological deposits. This place type can be found anywhere within the landscape; however, they are more likely to occur within contexts with the same favourable characteristics for stone artefact scatter places.

Scarred Trees are considered likely to occur in the project area if any portions of the project area contain remnant native vegetation. There are registered scarred trees within the geographic region, particularly associated with waterways of which there are several ephemeral waterways that pass through the project area.

Aboriginal people caused scars on trees by removing bark for various purposes. The scars, which vary in size, expose the sapwood on the trunk or branch of a tree. Scarred trees are found all over Victoria, wherever there are mature native trees, especially box and red gum. They often occur along major

rivers, around lakes and on flood plains. Scarred trees may occur where mature native vegetation is located in proximity to former swamps.

Shell Middens are considered unlikely to occur in the project area, as none have been recorded in the geographic region.

Shell middens may occur in both freshwater and coastal contexts. Shell middens are accumulations of shell produced by Aboriginal people collecting, cooking and eating shellfish. Shell middens often contain evidence of cooking such as charcoal, ash, fire-stones, burnt earth or burnt clay. Sometimes they also contain animal bones, fish bones, stone tools and Aboriginal burials.

Freshwater shell middens are found along river banks and flood plains, near swamps and lakes, and in sand dunes. They are sometimes found in dry areas, where fresh water was once present. Freshwater shell middens usually occur as fairly thin layers or small patches of shell. The shells usually come from both the freshwater mussel (*Velesunio ambiguus*) and river mussel (*Alathyria jacksoni*). The shells may be the remains of just one meal or hundreds of meals eaten over thousands of years.

Freshwater mussel shells may also be found in Aboriginal oven mounds, but usually only in small quantities. Middens may be visible as scatters of broken mussel shell, exposed along vehicle tracks. If you look closely, you may find mussel shells buried in the surrounding soil. Middens are also commonly visible as scatters of mussel shell eroding down the slopes of dunes. Again, the scatters can usually be traced up the dune to the buried shell layer. Shell fragments in the upcast from rabbit burrows in dunes may also indicate a midden.

Shell middens are also found in many areas along the Victorian coast. They can be located in sheltered positions in the dunes, coastal scrub and woodlands, within rock shelters, or on exposed cliff tops with good vantage points. They can occur near rocky or sandy shores and also close to coastal wetlands, inlets, estuaries, bays and river mouths. Coastal shell middens are found as layers of shell exposed in the sides of dunes, banks or cliff tops, or as scatters of shell exposed on eroded surfaces. They range in size from a few metres across to many hundreds of metres and can consist of a thin, single layer, or multiple layers forming a thick deposit.

Mounds are considered unlikely to occur in the project area, as none have been recorded in the geographic region.

Aboriginal mounds are places where Aboriginal people lived over long periods of time. Mounds often contain charcoal, burnt clay or stone heat retainers from cooking ovens, animal bones, shells, stone tools and, sometimes, Aboriginal burials.

Mounds usually occur near rivers, lakes or swamps but occasionally some distance from water. They are also found on dunes and sometimes among rock outcrops on higher ground.

Quarries are considered unlikely to occur in the project area, as none have been recorded in the geographic region.

Aboriginal quarries are the places where Aboriginal people took stone from rocky outcrops to make chipped or ground stone tools for many different purposes. Not all types of stone were suitable for making tools, so an outcrop of good stone that could be easily quarried was a valuable resource. Aboriginal people quarried different types of stone, each with its own special value and use. Stone tools

were made from greenstone, silcrete, quartz, quartzite, basalt and chert. Pigments were made from quarried ochre, and grinding tools were made from sandstone.

Some quarries are small, consisting of just a single protruding boulder. Other quarries incorporate many outcrops and areas of broken stone that can cover thousands of square metres.

Stone Arrangements are considered unlikely to occur in the project area, as none have been recorded in the geographic region.

Aboriginal stone arrangements are places where Aboriginal people have positioned stones deliberately to form shapes or patterns. The purpose of these arrangements is unknown because their traditional use ceased when European settlement disrupted Aboriginal society. They were probably related to ceremonial activities.

Stone arrangements occur where there are plenty of boulders, such as volcanic areas, and where the land could support large bands of people. Surviving stone arrangements are rare in Victoria, and most are in the western part of the State.

Stony Rises are considered unlikely to occur in the project area, as none have been recorded in the geographic region and the project area is not located in the stony rise geomorphological unit.

Stony Rises are a geological formation that emerges from the smooth lava fields of the western plains of Victoria, a fertile region that for tens of thousands of years supported the lives of its indigenous Aboriginal people. Stony Rises occur in a number of forms but generically comprise loosely consolidated rocks and boulders elevated above the surrounding plain. Ephemeral lakes occur at low points often adjacent to the Stony Rises, and are often interspersed with low-lying, poorly-drained plains (Joyce 2003). Stony rises provided vantage points to local Aboriginal tribes across the tribal territory.

Stony Rises are considered an area of Aboriginal archaeological sensitivity as they are likely to contain stone artefact places. Stony Rises are known to be the site of Aboriginal stone huts and stone circle arrangements and can also contain hearth sites. Previous studies have shown a tendency for stone artefacts located in surface and/or subsurface contexts on stony rises. Artefact distribution patterns commonly comprise isolated stone artefacts and diffuse low-density artefact scatters occurring across the volcanic plans, with moderate to higher densities of stone artefacts occurring on stony rises and that only occasional isolated stone artefacts may occur away from stony rises. The most significant places are located on the stony sites near watercourses.

Aboriginal Burials are considered unlikely to occur in the project area, as none have been recorded in the geographic region.

Aboriginal burials are normally found as clusters of human bones eroding from the ground or exposed during ground disturbance. Aboriginal customs for honouring and disposing of the dead varied greatly across Victoria, but burial was common. Aboriginal burial places normally contain the remains of one or two people, although cemeteries that contain the remains of hundreds of people buried over thousands of years have been found. Sometimes the dead person was buried with personal ornaments and artefacts. Charcoal and ochre are also often found in burial places.

Although Aboriginal burials are quite rare in Victoria, they have been found in almost every kind of landscape, from coastal dunes to mountain valleys. They tend to be near water courses or in dunes

surrounding old lake beds. Many burials have been found on high points, such as dune ridges, within surrounding flat plains. They are often near or within Aboriginal occupation places such as oven mounds, shell middens or artefact scatters.

5.1.2.5 *Summary*

Previous heritage studies demonstrate the region's rich Aboriginal archaeology and provides insight into the types of places that occur in the region, including their contexts and materials. The Plenty River and other waterways were clear focal points of past Aboriginal occupation. As noted during the desktop assessment the clustering of Aboriginal places could reflect the importance of this resource to the Aboriginal people occupying the region. This may be supported by the frequency of places becoming increasingly sparse the further the archaeological studies are from the river and major creeks systems. Alternatively, it may reflect a higher occurrence of previous archaeological studies being undertaken in this area.

There are two known Aboriginal places located within the project area: VAHR Registered 1 (Yan Yean Archers 1) and Registered 2 (Yan Yean Road LDAD 1). There are four known Aboriginal Places located within 50 m of the project area (Registered 3 to 6). Considering the number of previously recorded places in the region, there is potential for further Aboriginal places to be located within the project area. These are most likely to consist of low-density artefact scatters made from a variety of raw stone types such as silcrete, quartz and quartzite, on areas of raised ground close to natural water sources. Scarred trees might occur where there are remnant stands of mature box or red gum. There is a possibility that other place types occur, but these are comparatively rare in the region.

While there is potential for Aboriginal places to occur within the project area, the likelihood is considered low based on previous CHMPs conducted within the project area.

5.1.3 Historical Heritage

A search for registered Historical Places was undertaken of the project area, by searching the following databases and registers: Victorian Heritage Register, Victorian Heritage Inventory, National Trust Register, and Heritage Overlay (Map 11).

5.1.3.1 *Victorian Heritage Register*

The VHR established by the Victorian *Heritage Act 2017*, provides the highest level of statutory protection for historical places in Victoria. Only the State's most significant historical sites are listed on the VHR.

A search of the VHR initially conducted 21 July 2017, 9 October 2018, 17 May 2019, 23 October 2019 and 18 March 2020 and did not identify any registered historical heritage places on the VHR within the project area.

5.1.3.2 *Victorian Heritage Inventory*

The VHI, established by the Victorian *Heritage Act 2017*, provides the statutory protection for all historical archaeological sites older than 75 years, areas or relics, and private collections of relics, in

Victoria. Sites listed on the VHI are not of State significance but are usually of regional or local significance.

A search of the VHI initially conducted 21 July 2017, 9 October 2018, 17 May 2019, 23 October 2019 and 18 March 2020 and did not identify any historical archaeological places included on the VHI in the project area.

5.1.3.3 *National Trust Register*

The National Trust of Australia (Victoria) is an independent, not-for-profit organisation that classifies a number of heritage places. Listing on the National Trust Register (NTR) does not impose any statutory protection; however, often National Trust listings are supported by the local council Planning Scheme or the VHR.

A search of the NTR initially conducted 21 July 2017, 9 October 2018, 17 May 2019, 23 October 2019 and 18 March 2020 and did not identify any registered historical heritage places in the project area. However, a letter was sent from the National Trust to Major Projects Environmental and Planning Coordinator dated 6 December 2018 advising that HO191 (River Red Gums (2) 25 Doctors Gully Road) have been classified by the National Trust. The National Trust listing notes that the trees are in good condition, and that the large size of the trees makes them an important landscape feature that is a landmark for the area.

5.1.3.4 *Heritage Overlay*

The project area is located within the Nillumbik Shire Council and is governed by the Nillumbik Planning Scheme. Planning schemes set out policies and provisions for the use, development and protection of land.

The Heritage Overlay (HO) of the Nillumbik Planning Scheme (Appendix 1) was initially conducted 21 July 2017, 9 October 2018, 17 May 2019, 23 October 2019 and 18 March 2020 for the project area. The search identified two listed historical heritage places within the project area; HO191 (River Red Gums (2) 25 Doctors Gully Road) and HO219 (St Michael Anglican Church) (Map 11).

Place HO191 (River Red Gums (2) 25 Doctors Gully Road) within the City of Whittlesea Heritage Study (Appendix 2), is comprised of two River Red Gums (*Eucalyptus camaldulensis)* which are located on the northeast corner of the Yan Yean and Doctors Gully Road Intersection (Figure 4). The arboriculture report conducted by MPRV shows that Tree 1264 measures approximately 18 m high, Tree 1265 measures approximately 22 m high, and Tree 1266 measures approximately 6 m high. The trees are in a poor to fair health condition and are estimated to be in excess of 100 years old (Plate 1 and Plate 2).

Plate 1: Northernmost River Red Gum (Tree 1266) along Yan Yean Road, facing south.

Plate 2: Red Gums (Tree 1264 to 1266) on the north-east corner of Yan Yean and Doctors Gully Road, facing north

Figure 4: Map showing HO191, on the corner of Yan Yean Road and Doctors Gully Road, Doreen (Planning Maps Online 2019)

Place HO219 (St Michael Anglican Church) within the Yarrambat township (Appendix 3), comprises of a church and church grounds (Figure 5) located near the Yarrambat State School (Figure 6) and comprises of the public centre of the Yarrambat locality. The church was built in 1950's and is a simple gabled bullnose weatherboarded clad church with a faceted apse at the north end, and a similar but smaller, faceted hipped roof from as the entry porch, at the south end. The form adopted is more typical of

1920s rural churches, perhaps reflecting the conservative views of the parishioners. The church grounds include landscaping which is largely recent with a semi mature Monterey pine at rear agapanthus and gum specimens. There is also a recent memorial garden next to the church with memorials to the Hall and the Hern families.

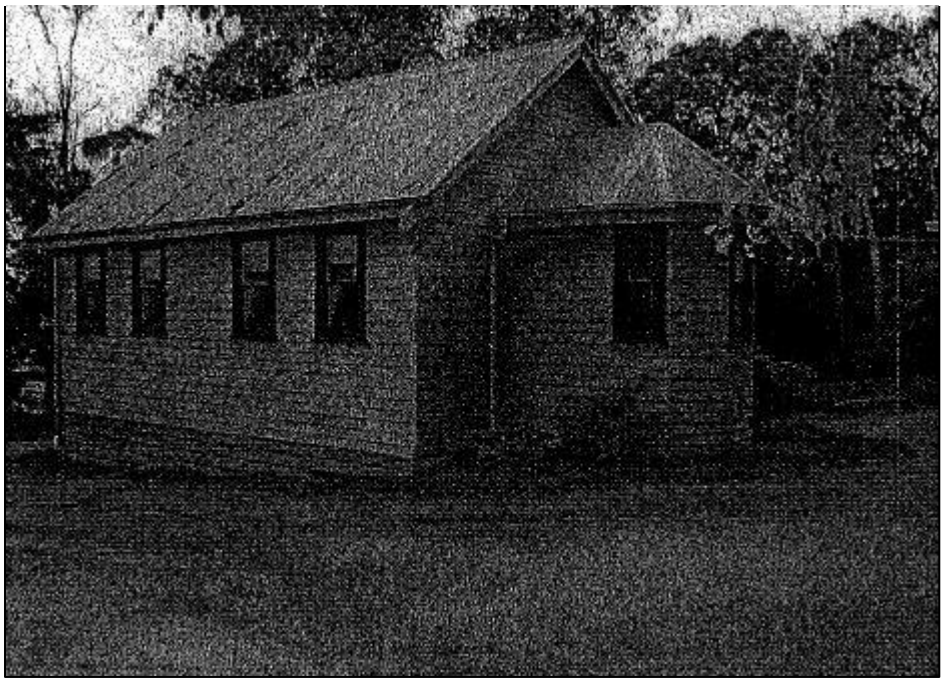


Figure 5: Photo of HO219 St Michaels Anglican Church, Yarrambat (Victorian Heritage Database 2020a)

Figure 6: Map showing HO219, along Ironbark Road, Yarrambat (Planning Maps Online 2019)

During the site inspection conducted as part of the PCHA 10741 (Harris 2018) a building which once comprised of the former Post Office and General Store was identified (Plates 3 and 4). This building is situated on the south eastern side of the Yan Yean Road/Bridge Inn Road Intersection. This building is not listed on the registers including the VHR, VHI and Heritage Overlay, however further investigation showed that in 1990 the City of Whittlesea Heritage Study (Appendix 2) recommended that the Post Office/General Store be given Planning Scheme Protection. The grading given to the property was D indicating *'sites are either reasonably intact representatives of particular periods or styles, or they have been substantially altered but stand in an area which retains much of its original character.'* (Meredith Gould Architects Pty Ltd 1990). Currently the building does not have any statuary protection and is not part of the impact assessment for this AHCHIA.

The former Post Office and General Store is located on the south east corner of Yan Yean Road and Doctors Gully Road, within Nillumbik Shire Council. It consists of a painted brick shop and storeroom constructed in 1932-3 with a weatherboard residence attached to the east side dating to c.1908. The post office was reconstructed based on an earlier version of the building that had previously burned down. The north and west facades of the building meet at a splayed corner entrance to the shop. All original door and window openings appear to be intact on both street frontages, although some have had unsympathetic window coverings introduced. The shop and storeroom have a hipped roof form and a modest parapet on the north and west elevations. The residence to the rear of the shop has a veranda at the façade oriented towards Doctors Gully Road but screened by a tall hedge. It has a gambrel roof form which runs perpendicular to the shop building. The buildings are in a dilapidated condition (Plate 3 and Plate 4).

Plate 3: Former Post Office and General Store on the south-east corner of Yan Yean and Doctors Gully Road, facing southwest

Plate 4: Rear of the Former Post Office and General Store, facing east.

5.1.3.5 *Land Use History*

The Plenty Valley was among the first of the Port Phillip districts to be settled. Hume and Hovell had been in the area as early as 1824, when they named Mt Disappointment in the Plenty Ranges (Hicks 1988: 6). Initial permanent European settlement commenced in 1837. This first group of settlers came

from highly diverse backgrounds, but tended to be literate, with financial resources available to them (Hicks 1988: 7). Though the land was suitable for pastoral development, the first settlers found themselves faced with problems such as the fact that the Plenty was prone to flooding and bushfire (Hicks 1988: 8).

The proximity of the Plenty area to Melbourne and demand for land by small-scale agriculturalists made land tenure of early squatters insecure. When the area later fell within Port Phillips 'settled districts', more and more squatters were forced out of their runs (Hicks 1988: 10). With this uncertainty, early pastoralists were reluctant to entrench themselves too deeply in their environment. By the mid-1840s all of the suitable land in the Plenty district to the west of the river was in private ownership. To the east, which was poorer, sedimentary country, the pastoral period lasted longer.

The Doreen area was first settled at this time, under the name of Hazel Glen, by McLaughlan and Campbell, later followed by Patrick Reid in 1844 who named the area Doreen. Reid's holding was later subdivided for farms in 1862, and soon after, in 1863, a Wesleyan/Methodist church opened at the corner of Yan Yean Road and Chapel Lane, followed by a school in c.1867 (Payne 1975). The junction of Yan Yean Road and Bridge Inn Road, at the northern end of the Project area, became the town's centre, which included a store, post office and recreation reserve. In the early 20th century, a public hall was opened.

The early pastoralists practised cultivation and dairying predominately; however, they were often reluctant to increase production too much due to the insecurity of their tenure (Hicks 1988: 14). Amenities during this time were limited to roadside inns, blacksmith shops, a few stores and the occasional school (Hicks 1988: 15). A second wave of settlement began in the early 1850s and large-scale speculators and small-scale farmers began to have a lasting impact on the land use and environment (Hicks 1988: 17). The area, which had previously been purely pastoral, was slowly being turned into agricultural land. By 1853 it was said that the Plenty district was one of the most important districts in the colony (Hicks 1988: 17).

The gold rush of the 1850s brought increased trade to the area, and as a result, numerous townships and settlements were established in the Plenty Valley. Diggings to the east of the project area appear on a map of Victoria's goldfields in 1866, and by 1868, the area had been mapped for the Geological Survey of Victoria, and gold workings are shown to be located near to the southern part of the project area, at the location of what is labelled as 'Gray's Reef'. Associated mine shafts and infrastructure are located within several properties adjoining the Yan Yean Road reserve to the south of the project area. Also shown on this map is a dotted line leading from the parish boundary northwards towards the reef. This is likely to have been a track servicing the mine, possibly the earliest iteration of Yan Yean Road. As noted by Watson et al. (2017: 21):

> *In 1869 the Greensborough Road District issued notice in the Victorian Government Gazette stating its intention to open a new road from Greensborough to Yan Yean (Victorian Government Gazette 1869: 1981). The notice stated that the road would pass through Lots 2 and 3 of Section 4, Section 5 and Lot 1 of Section 12 of the Parish of Morang — an alignment that would match the track shown on the 1868 map. The location of Gray's Reef could therefore be responsible for the sweeping curve in the [present alignment of Yan Yean Road, near Kurrak Road]. In the*

Government Gazette dated 7 February 1870, the Greensborough District Road Board ordered 'that the new road from Greensborough to Yan Yean … be now a public road under the provisions of The Local Government Act' (Victorian Government Gazette 1870: 545).

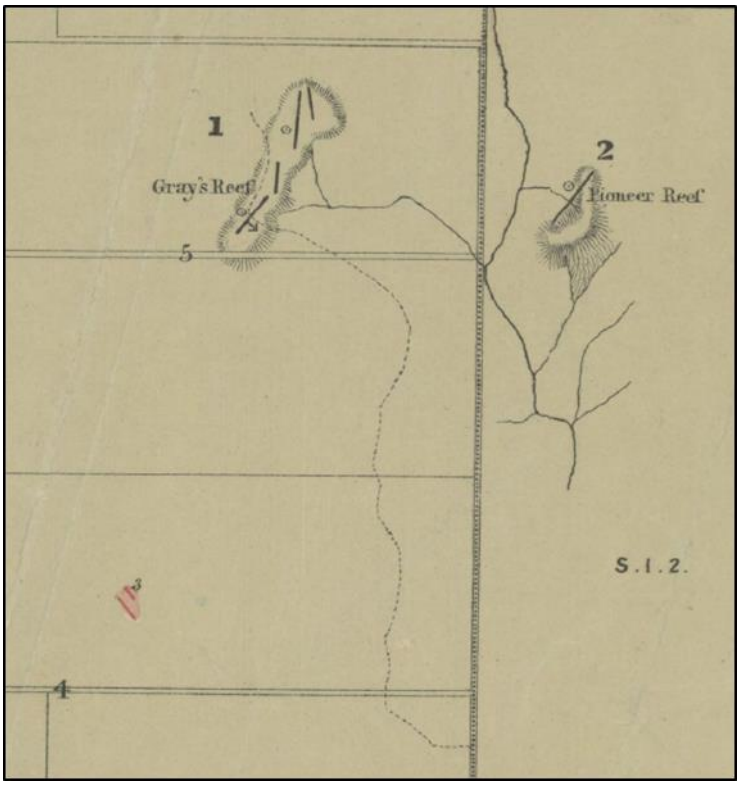


Figure 7: Detail of 'Victoria mining districts, mining division and goldfields', 1886, showing locations of alluvial workings indicated as blue dots, and reefs in red (NLA Digital Collections)

Another aspect that contributed to the growth of the area was the construction of the Yan Yean Reservoir between 1853 and 1857, which led to large numbers of workers and their families settling in the Plenty Valley. Yan Yean Road did not yet exist at this time, and the area was accessed via Plenty Road (known as 'Yan Yean Road' in 1912). By 1859, a railway line from Melbourne to Whittlesea had been established, which led to a growth in the dairying and fruit growing industries in the area due to efficiency of transport to the Melbourne markets.

The presence of European archaeological sites reflects the historic settlement of the region. The preparation of two CHMPs for the adjoining section of Yan Yean Road to the south (Noble et al. 2010; Watson et al. 2017) resulted in the recording of one of the earliest known post-contact sites in the region: VHI as site H7922-0215 Yan Yean 1, located at 50-72 Yan Yean Road. This site comprises the remains of a 19th century homestead and a domed well, including building foundations and an extensive scatter of glass, ceramics, brick and slate. Significantly, an Aboriginal artefact made from bottle glass was also identified amongst this scatter (VAHR Registered), indicating this is also a potential 'contact' or historic period Aboriginal place.

The cross-roads of Bridge Inn Road and Yan Yean Road in Doreen became the district's centre where a store (1890) and a recreation reserve were established (Victorian Places 2020). In 1908 a public hall was opened on the land set aside for the reserve; however, the Doreen Hall has since been removed.

Additionally, located at 25 Doctors Gully Road (at the north-eastern corner of the Bridge Inn, Doctors Gully and Yan Yean Roads) are the two large River Red Gum trees discussed above (HO191) estimated to be at least 100 years old (Butler & Associates 2006:54). The land the trees are located on was originally owned by Joseph Hutchinson of Morang in 1861 and despite the fact that pioneering local farmers and others would harvest red gums for firewood to supplement their income, Hutchinson did not remove these trees (Butler & Associates 2006:54).

The former Golden King battery plant was erected at the North Oatlands Road Golden King mine site in 1941, after being removed from an unknown mine at Spargo Creek in central Victoria, and removed to the Yarrambat Heritage Museum, Yan Yean Road Yarrambat, where the mine was closed down (VHD 2020). The battery is of local historical significance as a surviving remnant of mining in Yarrambat, and in particular of quartz mining which was undertaken in the district on a relatively small scale from the late nineteenth to the late twentieth century (VHD 2020).

The first Yarrambat Primary School was opened in 1878 and the original classroom has been relocated to the Yarrambat Heritage Museum. The modern school was opened in 1988. In 2015 the Yarrambat Primary School opened the Yarrambat Primary School's Avenue of Honour featuring the 100th anniversary of the Gallipoli Landing and paying tribute to 11 men from Yarrambat Primary School community who served in World War 1. Additionally, the School has a descendent of the original Lone Pine which serves as a memorial for the community of the sacrifices all service personnel made during war times and peace.

The Yarrambat Primary School's Avenue of Honour will also host future ANZAC Day services for the school and its community. In addition to the Avenue of Honour, Yarrambat also contains a War Memorial Park which is a hub for the local community and hosts a number of events including the local Junior Football Club, Plenty Valley Cricket Club and Yarrambat Netball Club.

Based on a review of aerial imagery from 1951 and 1963 (Appendix 5) it appears that many of the lots that face Yan Yean Road have established windbreaks (likely Pine based on previous regional studies [Honman et al. 2014]). As the beginnings of Yan Yean Road is dated to 1886 the windbreaks were likely planted between 1886 and 1920 (as they take approximately 35 years to mature). Additionally, based on aerial imagery from 1951 many of the lots facing Yan Yean Road have been cleared for agricultural purposes. A few exceptions appear to be lot 59 in the southern extent of the activity area which appears to have been cleared for an orchard and lot 58 which appears to contain dense vegetation.

For the great part of its history the Plenty Valley, including Yarrambat and Doreen areas, has therefore been predominantly rural, used for grazing and orchards. The area remains semi-rural, but further subdivision and residential development has continued with increasing population and as Melbourne's urban centre continues to expand. Construction of roadways and underground services associated with development has undoubtedly affected the land within the project area. Yan Yean Road has become the state arterial travel route for commuters from new housing estates and the city, which has resulted in increased pressure on the roadway.

5.1.3.6 *Desktop Assessment Conclusions – Historical Site Prediction Model*

The following site prediction statement has been formulated from the review of the desktop assessment. The review of the previously recorded historical archaeological sites and previous archaeological investigations indicates that the most likely[3] site types in the study area are domestic sites, tree plantings, farming sites, pastoral sites, and road and rail infrastructure sites.

Domestic Sites are unlikely to occur in the study area due to no such places being recorded on the VHR, VHI and HO within the project area, some domestic sites however may not be listed yet, such as the former post office. Evidence of domestic occupation may include structural remains or ruins of homesteads and/or outbuildings, domestic rubbish dumps or bottle dumps, wells or underground storage tanks.

Tree Plantings are likely to occur in the study area due to the recording of tree plantings on the HO. Historical tree plantings may be evidenced by large introduced trees planted along original driveways, paddock boundaries or close to homestead sites.

5.1.3.7 *Summary*

A search for registered and listed Historical Places was undertaken of the project area, by searching the following databases and registers: Victorian Heritage Register, Victorian Heritage Inventory, National Trust Register, and Heritage Overlay.

The Nillumbik Planning Scheme Heritage Overlay lists two Historical Heritage places within the project area, HO191 (Red Gum Trees (2) 25 Doctors Gully Road) and HO219 (St Michaels Anglican Church).

Research into the City of Whittlesea Heritage Study (Appendix 2) and a site inspection indicated that the former Post Office and General Store located within the project area may have heritage potential. A search of the databases showed that although this place was suggested to be given status during the Heritage Study, it currently does not have any statutory protection. Council should be engaged to further discuss the current condition of the place and any proposed listings or management requirements to ensure it is adequately considered in the project design

5.1.4 Standard Assessment

The standard assessment includes a ground survey of the project area to detect both the potential for and the presence of Aboriginal cultural heritage in or associated with the project area. This assessment was carried out as a part of the requirements for CHMP #15169 (Minos et al: In Prep).

The project area was initially surveyed on 18 December 2017 by Jenny Howes and Racheal Minos (Senior Archaeologists/Heritage Advisors), with Mark Gardiner and David Mullins representing the Wurundjeri. Subsequent to a revision of the project area in October 2019 which included additional areas, a survey was conducted of these new areas on 8 November 2019 by Albert Francis and Tim Russell (Archaeologists/Heritage Advisors), with Gary Galway representing the Wurundjeri. Further revision to the project area was approved in February 2020 which resulted in additional areas being added to the project area. A survey of the additional areas was conducted 8 to 9 April 2020 by Albert Francis and Tim

[3] Likely is an assessment of site types with a 50% or more likelihood of occurring; Unlikely is an assessment of site types with 50% or less chance of occurring).

Russell (Archaeologists/Heritage Advisors), with Gary Galway and Robbie Jones representing the Wurundjeri.

5.1.4.1 *Methodology of the Standard Assessment*

The standard assessment took the form of a combined pedestrian and vehicle survey to determine the presence or absence of Aboriginal cultural heritage within the project area, including evidence of stone tools, the presence of any mature native trees with potential to have cultural scarring, and for evidence of caves, cave entrances and or rock shelters.

Revisions to the maximum impact of the proposed works resulted in the project area being increased twice. The first change to the project area was in October 2019. Ecology and Heritage Partners were notified of the changed project area and conducted a survey of the additional areas included in December 2019. A second change to the project area occurred in February 2020 to cover the maximum extent of the proposed works for the Yan Yean Road upgrade. A survey of the additional areas was conducted in April 2020.

Large sections of the project area comprised of active roadways and road reserves, including major roads such as Yan Yean Road, Bridge Inn Road and Doctors Gully Road. Where physically possible and in accordance with Occupational Health and Safety requirements, all participants of the standard assessment walked 2 to 5 m apart targeting accessible areas of the project area.

Due to the size of the project area project area which covers approximately 5.5 km of Yan Yean Road, extending from the intersection with Bridge Inn Road to the intersection with Kurrak Road, for reporting and discussion purposes the project area has been divided into seven sections which are as follows:

- Section 1 - Kurrak Road to Heard Ave – including an unnamed ephemeral waterway;
- Section 2 - Worns Lane to Ironbark Road – including North Oatlands Road, Vista Court and an ephemeral unnamed waterway; additional survey areas at 503 Yan Yean Road Yarrambat and 526-538 Yan Yean Road Yarrambat and 10 North Oatlands Road Yarrambat;
- Section 3 - Ironbark Road to Golf Links Drive – including Ashley Road, Youngs Road and an unnamed ephemeral waterway; additional survey areas at 581 Yan Yean Road Yarrambat;
- Section 4 - Golf Links Drive to Laurie Street – including Bannons Lane and an unnamed ephemeral waterway; additional survey areas at 581 Yan Yean Road Yarrambat and 649-651 Yan Yean Road Yarrambat and 657 Yan Yean Road Yarrambat;
- Section 5 - Laurie Street to Orchard Road – including Jorgensen Avenue and an unnamed ephemeral waterway; additional survey areas at 807 Yan Yean Road Yarrambat and Jorgensen Avenue and 780 Yan Yean Road Yarrambat;
- Section 6 - Orchard Road to Bridge Inn Road – including Tallis Grove and Coolong Terrace; additional survey area at Orchid Road Yarrambat and 840 Yan Yean Road Yarrambat and 920 Bridge Inn Road Doreen and 900 Yan Yean Road Doreen;

- Section 7 - Bridge Inn Road to just north of Cookes Road – including Project Way and Doctors Gully Road. Additional survey areas at 25 Doctors Gully Road Doreen and 915 Yan Yean Road Doreen.

5.1.4.2 *Visibility, Exposure and Coverage*

For recording purposes during the standard assessment, the project area was divided into seven sections (Map 9 series). Within each section the ground surface visibility (GSV), landforms within the area and evidence of ground disturbance was recorded.

The GSV experienced during the standard assessment varied across the extent of the project area (Map 9 series). The differences in GSV can be attributed to the existing infrastructure within the project area, such as roads, road reserves, footpaths and carparks.

Landforms recorded during the standard assessment included ephemeral unnamed waterways, low relief landscapes and gently undulating terrain. It was found that much of the land within the project area had been subject to modification through the construction of roadways and the installation of subsurface utilities.

Each section of the project area was found to include a combination of road reserves and private property.

Survey Section 1 - Kurrak Road to Worns Lane (Map 9a)

Section 1 comprised of accessible or observable ground surface from Kurrak Road to Worns Lane Yarrambat, including the intersection and minor road of Heard Avenue.

The GSV within Section 1 was poor, approximately 0-5% across the majority of the survey area. Whilst overall, the GSV was noted to be poor several areas in Section 1 were identified to have a higher GSV. The overall poor GSV identified across Section 1 is largely attributed to the area being comprised of existing roadways, road reserves, pre-existing residential structures, thick vegetation and dense grass coverage.

The property located at 423 Yan Yean Road which will be impacted in its entirety was surveyed. GSV of the property was noted to be consistent with the GSV identified across the rest of Survey Section 1 ranging between 0-5%. The southern extent of the property was occupied by two large structures, the residential dwelling and garage (Plate 5 and 6). Concrete and brick paths were also identified in association with the two structures which limited the GSV to 0% in proximity to the residential dwelling. An overgrown garden comprising of shrub and bamboo vegetation was also located in proximity to the residential dwelling (Plate 7). Thick grass cover (Plate 7) was identified across most of the property and a small rise, likely artificial and possibly associated with a demolished structure was also identified in the south western extent of the property (Plate 9). Potentially remnant natural vegetation and a natural waterway was identified in the northern extent of the property (Plate 10 and 11). The mature eucalypts identified within the property were identified for evidence of cultural scarring. No tree was identified to show signs of this.

Several areas along the road reserve were identified to have a slightly higher GSV (10-20%) due to patchy grass allowing for minimal exposure of the ground surface. Leaf litter, native scrub and lichen covered

the ground surface at Worns Lane, but occasional areas of exposure and erosion provided slightly better visibility. Several properties were completely obscured by thick vegetation and could not be observed. Mature conifers such as those in Heard Avenue (Plate 12) preventing any observations of the property appear to be a common feature throughout the activity area.

The property located at 26 Worns Lane, also to be impacted by the activity was identified to have a slightly higher GSV, consistent with the findings of the road reserve. GSV for the property at 26 Worns Lane was noted to be 10-20% with areas of exposed gravel clearly visible (Plate 13).

Services mapping show both overhead and underground communication, optic fibres, electricity and water supply assets to be present within the road reserves on the north side of Kurrak Road and on both sides of Yan Yean Road within Section 1 of the activity area. Areas of natural ground surface are reduced within the activity area due to the installation and construction of subsurface utility installations.

An inspection was undertaken of VAHR Registered 2 (Yan Yean Road LDAD 1) in an attempt to reidentify the place (Plate 13) however, no component of this place could be observed likely due to erosion of the road cutting.

No Aboriginal cultural heritage was identified in Survey Section 1.

Plate 5: Project area showing at 423 Yan Yean Road, facing north showing the residential dwelling (Russell 2020).

Plate 6: Project Area at 423 Yan Yean Road, facing west showing the garage structure (Russell 2020).

Plate 7: Proejct Area at 423 Yan Yean Road, facing east showing overgrown bamboo garden (Russell 2020).

Plate 8: Project Area at 423 Yan Yean Road, facing west showing thick gross cover, limiting GSV (Russell 2020).

Plate 9: Project Area at 423 Yan Yean Road, facing north showing artificial rise likely associated with a former structure (Russell 2020).

Plate 10: Project Area at 423 Yan Yean Road, facing south showing remnant natural vegetation (Russell 2020).

Plate 11: Project Area at 423 Yan Yean Road, facing east showing unnamed natural waterway (Russell 2020).

Plate 12: Project Area, facing north showing overgrown mature conifers (Minos 2017).

Plate 13: General area shot of Project Area and previously recorded place near Worns Lane, facing south showing eroding road cutting (Minos 2017).

Survey Section 2 - Worns Lane to Ironbark Road (Map 9b)

Section 2 comprised all accessible or observable land from Worns Lane to Ironbark Road, Yarrambat. The following intersections and minor roads within this survey section were also surveyed:

- North Oatlands Road; and
- Vista Court.

As with Section 1, the GSV throughout Section 2 was generally poor, approximately 0-5%. This is attributed to existing roadways, road reserves, dense grass coverage, sealed surfaces such as pedestrian footpaths and carparks and the presence of residential dwellings within multiple properties across survey Section 2.

The GSV of private properties was predominantly poor (0-5%) due to dense grass coverage, pre-existing vegetation (Plate 15) and the presence of sealed roads and pathways which were identified (Plate 14).

On the road reserve at North Oatlands Road the GSV increased slightly, approximately 10-20% as the grass coverage was slightly less dense and very short, with some bare patches of exposure (Plate 14). Only a few properties were completely obscured by thick vegetation and could not be seen from the road reserve, in particular at the intersection of Vista Court and Yan Yean Road to the west. The property located at the north corner of Ironbark Road and Yan Yean Road was largely cleared of vegetation save for several trees located at the property boundary. Again, here GSV was poor (0-5%) due to dense grass.

Apart from the existing roadway there are two areas of sealed surfaces in this section, including a pedestrian footpath on the east road reserve of Yan Yean Road that extends from the north corner of North Oatlands Road and continues north to Ashley Road in Section 3. The sealed surface is located at Yarrambat Primary School which is located at the corner of Ironbark Road and Yan Yean Road. It includes a system of pedestrian paths, driveways, parking facilities and sports grounds that service the school (Plate 16 and 17).

Services mapping show both overhead and underground communication, optic fibres, electricity and water supply assets to be present within the road reserves on the north side of North Oatlands Road, on the north and south side of Vista Court; and on both sides of Yan Yean Road within Section 2 of the activity area. The natural ground surface across the survey section was diminished due subsurface utility installations. As such, despite some areas of exposure, areas of natural ground surface are reduced within the activity area.

No Aboriginal cultural heritage was identified in Survey Section 2.

Plate 14: General area shot of Project Area from North Oatlands Road, facing east towards Yan Yean Road, showing GSV (Minos 2017).

Plate 15: General area shot of private property located in the Project Area showing GSV (Russell 2020).

Plate 16: General area shot of road reserve in Project Area from, showing GSV (Minos 2017).

Plate 17: General area shot of Yarrambat Primary School located in Project Area, showing GSV (Russell 2020).

Survey Section 3 - Ironbark Road to Golf Links Drive (Map 9c)

Section 3 comprised all accessible or observable land from Ironbark Road to Golf Links Drive, Yarrambat. The following intersections and minor roads within this survey section were also surveyed:

- Ashley Road; and
- Youngs Road.

The GSV throughout Section 3 was largely poor (0-5%) across the survey area, due to the area comprising existing roadways, road reserves, dense grass coverage, sealed surfaces such as pedestrian footpaths and carparks. A few properties to the east side of Yan Yean Road were completely obscured by scrubby vegetation and a downward steep slope in the landscape meant that the properties at this point could not be seen from the road reserve. To the west was the continuation of the pedestrian footpath that started in Section 2 and continued to south corner of Ashley Road (Plate 18). Additionally, a number of other sealed surfaces occur within the activity area south of Ashley Road, including a driveway, car park and access road for the Welcome Boarding Kennels and Cattery accessed from Ashley Road. South of this property is an extended driveway accessed via Yan Yean Road to a private residence, and to the south of this is a restricted access road to a water reserve facility (Plate 19). Within the water reserve facility, GSV was identified to be 0-5% overall across the entire facility. Paved roads and maintained gardens were identified within the facility (Plate 16) which covered the majority of the property. Small patches of exposed gravel and what seems to be bedrock were identified on the hill slopes identified within the water reserve facility (Plate 17). It is likely that the water reserve facility has been cut into the bedrock, hence the areas of exposure.

Several residential properties which are to be impacted by the activity were also investigated during the survey. GSV was noted to be poor (0-5%). Thick grass cover was the major limiting factor in regard to GSV however, sealed driveways paths and other signs of disturbance were also noted to be present within the residential properties surveyed (Plate 18-21).

The GSV of the road reserve in Ashley Road was poor (5-10%) on the south side due to dense grass coverage (Plate 20). On the north side, GSV improved (20-50%) with areas of exposure present due to erosion, likely caused by vehicle traffic during carpark installation at St Macarius Coptic Orthodox Church. The portion of the activity area within the church grounds had very good GSV (75-100%) but this was the result of a cutting in the ground surface between the church and the eastern property boundary on Yan Yean Road.

To the north on the east side of Yan Yean Road is Youngs Road which was consistent overall with the GSV of Section 3 (0-5%). The road reserve was covered by thick grass cover restricting the ability to identify any areas of archaeological potential. Whilst the GSV was identified to be very poor, services were identified along the road reserve of Youngs Road.

No Aboriginal cultural heritage was identified in Survey Section 3.

Plate 18: Project area at corner of Yan Yean Road and Ashley Road, Yarrambat, facing south, showing the pedestrian path and underground services (Minos 2017)

Plate 19: Restricted access road heading west off Yan Yean Road, Yarrambat, facing west showing sealed road toward water facility (Minos 2017)

Plate 20: General area shot of water facility, facing east showing GSV (Russell 2020)

Plate 21: Artificial rise identified and GSV of water facility, facing south (Russell 2020)

Plate 22: Corner of Ashley Road and Yan Yean Road, Yarrambat, facing north showing GSV, road reserve and ground surface cutting on frontage of church (Minos 2017)

Plate 23: Project area at water crossing on Yan Yean Road, north of Youngs Road, facing west showing poor GSV and modification (Minos 2017)

Plate 24: Project area at water crossing on Yan Yean Road north of Youngs Road, facing south east showing poor GSV and modification (Minos 2017)

Plate 25: Project area in west road reserve on Yan Yean Road, with Yarrambat Park Golf Course to the west showing GSV and vehicle track (Minos 2017)

Plate 26: Road reserve on Ashley Road, Yarrambat, facing east towards Yan Yean Road, showing GSV (Minos 2017)

Survey Section 4 - Golf Links Drive to Laurie Street (Map 9d)

Section 4 comprised all accessible or observable land from Golf Links Drive to Laurie Street, Yarrambat. The Yarrambat Golf Course, Diamond Valley Archery Range and Bannons Lane was also surveyed

The GSV across Section 4 was slightly improved ranging between 0-30%. Section 4 is characterised by road ways, road reserves and dense grass coverage similar to the previous survey sections though differs somewhat with a wider road reserve on the west side of Yan Yean Road and the adjacent golf course. Further north on the western side of Yan Yean Road is the Diamond Valley Archery Club. On the east side the activity area narrows to include only road reserve.

The GSV within wide road reserve on the western extent of Section 4 varied between 5-15% (Plate 23). Areas of exposure were identified along an unsealed vehicle track just north of the Yarrambat Golf Course. The golf course itself was noted to have a poor GSV (0-5%) as grass cover associated with the golf course greatly limited the ground visibility (Plate 24). Further limitations to investigating the GSV of the golf course were encountered in the form of sealed and unsealed paths across the golf course (Plate 25), the presence of dumped sand (Plate 26), likely for the sand traps used by the golf course and other features including a large, sealed carpark (Plate 27) in the northern extent of the golf course all limited the GSV.

Within the Diamond Valley Archery Range, the GSV was identified as ranging from 0-30% (Plate **27**). Small patches of erosion inside the archery range provided areas of minimal exposure. A large proportion of fill was also noted. Further GSV was obstructed by a concrete block which was identified with the activity area associated with the archery range. The area is largely covered by both short and tall grass, with a sewerage pipeline extending through the survey area from the north and south. The activity area has a small number of young native trees which were not naturally occurring but had been planted in a row.

An attempt was made to relocate VAHR Registered 1 (Yan Yean Archers 1); however, no cultural heritage was identified, likely due to the installation of underground services in the immediate area indicated on the registration as an immediate threat. Additionally, vehicle traffic through the location is evidenced by the vehicle dirt track present through the location of the Aboriginal place.

The presence of services continues within road reserves on both sides of Yan Yean Road however in Section 4 they are primarily located on the eastern side of the activity area. Consequently, areas of exposure, areas of natural ground surface are reduced within the activity area.

No Aboriginal cultural heritage was identified in Survey Section 4.

Plate 27: GSV of road reserve, facing north (Russell 2019).

Plate 28: General area shot showing GSV of Project Area in Yarrambat Golf Course (Russell 2020).

Plate 29: Sealed pathway present across entirety of Yarrambat Golf Course, facing west (Russell 2020)

Plate 30: Dumped sand identified within the Project Area at Yarrambat Golf Course, facing south (Russell 2020)

Plate 31: Sealed carpark located ay Yarrambat Golf Course, facing west (Russell 2020)

Plate 32: General area shot of Yarrambat Archery Club showing GSV and disturbance, facing south (Russell 2019)

Survey Section 5 - Laurie Street to Orchard Road (Map 9e)

Section 5 includes Yarrambat Park, several private properties and a reserve north of the Jorgensen Avenue intersection. Section 5 extends from Laurie Street until reaching Orchard Road. The overall GSV of Section 5 ranged between 0-15%, being largely consistent with the previous survey sections.

The GSV of Yarrambat Park ranged between 0-15% with grass coverage limiting the standard assessment (Plate 29). GSV was further obstructed in the park by several services including toilet facilities, water installations, barbeques, carparks and an undercover picnic area. The survey area contains park fencing and mature native trees which are predominately located along the southern and eastern boundaries of the park with spontaneous trees located inside the park. The trees were checked for cultural scarring however displayed no evidence of this (Plate 30)

The activity area at the Jorgensen Avenue presents a built-up residential area to the north west of the intersection with Yan Yean Road (Plate 33). The area between Yan Yean Road and the residential area, known as Werther Park is mapped as a natural drainage area but has been heavily modified to include underground assets, pedestrian footpaths, landscaping and an extensive drainage channel (Plate 34). There has also been extensive modification of the landscape evidenced by the road embankments at Jorgensen Avenue and Yan Yean Road intersection.

Several properties on the east side of Yan Yean Road were investigated as part of the standard survey. The GSV of these properties was identified to be approximately 0-15% with thick grass cover and pre-existing vegetation covering most of the properties (Plate 35).

The presence of services continues within road reserves on both sides of Yan Yean Road within the activity area. Particularly underground water, sewerage and optic communications. As such, despite some areas of exposure, areas of natural ground surface are reduced within the activity area.

No Aboriginal cultural heritage was identified in Survey Section 5.

Plate 33: General area shot Yarrambat Park, showing GSV and evidence of subsurface disturbance, facing east (Russell 2019)

Plate 34: Native trees present in Yarrambat Park, facing west (Minos 2017)

Plate 35: Project area at the corner of Jorgensen Avenue and Yan Yean Road, Yarrambat, facing north east showing existing road way and GSV (Minos 2017)

Plate 36: Project area north of Jorgensen Avenue, showing evidence of subsurface services and landscaping, looking east towards Yan Yean Road embankment (Minos 2017)

Plate 37: General area shot of private property located in the Project Area, facing east showing the GSV (Russell 2020)

Survey Section 6 - Orchard Road to Bridge Inn Road (Map 9f)

Section 6 comprised all accessible or observable land from Orchard Road to Bridge Inn Road, Yarrambat. Areas surveyed within Section 6 include Tallis Grove and Coolong Terrace. Additionally, Plenty Valley Christian College and Orchard Park were also surveyed during the standard assessment as they are to be impacted by the activity.

The GSV across Section 6 was predominantly poor (0-5%) across the survey area, largely due to the area being comprised of existing road ways, road reserves, carparks, built-up residential areas and dense grass coverage. Section 6 still contained some large farmland private properties where GSV remained low (0-5%) in these areas due to dense grass coverage.

Section 6 is characterised by increased residential development and a series of sealed surfaces within the activity area. Other than the existing road way, a large carpark and several sealed roads at Plenty Valley Christian College was observed. (Plate 38). Associated with the College is an area that has been graded and modified to include a dam (Plate 39). A pedestrian footpath extends to the north to Tallis Grove from Orchard Road, additionally Coolong Terrace runs parallel to Yan Yean Road heading north to Tallis Grove. At the north west corner of this intersection is Butterflies Childcare and Early Learning Centre which also has a sealed carpark facility. As such the areas of natural ground surface are reduced within this part of the activity area. The presence of services continues within road reserves on both sides of Yan Yean Road of Section 6.

Orchard Park was survey and was identified to have a GSV of 0-5%, consistent with the rest of Section 6. Grass coverage and artificially planted natural vegetation covered much of the park. A water feature, likely artificial was also identified running through the park (Plate 40). The water feature feeds into water services on both the eastern and western extent further suggesting that it is artificial and not of natural origin.

Despite the poor GSV overall encountered in survey Section 6, the road reserve along Orchard road was identified to show a much higher GSV (approximately 50%) (Plate 41). A sandy gravel was identified which is likely an imported fill associated with the residential development of the area.

No Aboriginal cultural heritage was identified in Survey Section 6.

Plate 38: General area shot Plenty Valley Christian College, showing GSV, facing east (Russell 2019)

Plate 39: modified dam located at Plenty Valley Christian College, facing south (Russel 2020)

Plate 40: Project area at Orchard Park showing artificial waterway and vegetation, facing east (Russell 2020)

Plate 41: Project area Orchid Road facing south-west, GSV adjacent to Orchid Road and concrete pathway (Russell 2020)

Survey Section 7 - Bridge Inn Road to just north of Cookes Road (Map 9g)

Section 7 comprised all accessible or observable land from Bridge Inn Road to Cookes Road, Doreen. The following intersections and minor roads within this survey section were also surveyed:

- Doctors Gully Road; and
- Project Way.

The GSV in Section 7 was poor, approximately 0-5% across the majority of the survey area, largely due to dense grass coverage, but also combined with existing road ways, road reserves and carparks. Section 7 comprised predominately private pastoral properties largely cleared of trees except for some remaining on property boundaries (Plate 42). As with other similar properties in the activity area the GSV was low (0-5%) due to dense grass coverage.

To the east of Bridge Inn Road, the private properties that could be observed from the roadside had grass that was thick but with patches of exposure providing minimal GSV (10-20%) (Plate 43). Properties

on the north side of Bridge Inn Road comprised paddocks with poor GSV (0-5%). Similarly, on the properties to the north and south of Doctors Gully Road were densely covered with grass with a GSV of 0% (Plate 44). Mature native eucalypts were present on both properties and were closely inspected for evidence of cultural scarring. No cultural scarring was evident on any of the inspected trees.

The intersection at Bridge Inn Road, Doctors Gully Road and Yan Yean Road serves as a community hub in Doreen with a number of retail outlets and services, as well as community facilities. Included is a general store on the south east corner (Plate 45), a petrol station with surrounding shops and take-away outlets are located on the south west corner (Plate 46) . Aside from the vast majority of this area being developed, any available ground surface is highly modified and contains subsurface utilities. At the north west corner of the intersection is the Doreen Recreation Reserve (Plate 47) with an open field that has poor GSV (0-10%). Thick grass cover is present across the majority of the field however, along the southern boundary of the field, gravel and soil is clearly visible (Plate 48). A service was identified along the southern boundary and it is likely that the high GSV here is associated with this service (Plate 45). Significant erosion has also been identified along the south western most extent of the field, again, likely due to the presence of the service (Plate 49).

South of the intersection at the corner of Yan Yean Road and Project Way a vacant lot presented an area of good exposure (75-100%) (Plate 50). It was on this area of exposure that a new Aboriginal place was identified. Due to the apparent erosion, possibly partly due to the installation of optic cables and the presence of mounds of fill on the property (Plate 51) the context for this Aboriginal may not be secure.

Services mapping show both overhead and underground communication, optic fibres, electricity and water supply assets to be present within the road reserves throughout Section 7. The GSV across the survey section was diminished due subsurface utility installations. As such, despite some areas of exposure, areas of natural ground surface are reduced within the activity area.

Aboriginal cultural heritage was identified in Survey Section 7 and a new place VAHR Registered 3 (Yellow Brick Road LDAD 1) was identified in Survey Section 7.

Changes to the activity area in 2020 however has resulted in VAHR Registered 3 (Yellow Brick Road LDAD 1) no longer being within the activity area. VAHR Registered 3 (Yellow Brick Road LDAD 1) has still been registered due to the initial standard assessment but will not be impacted by proposed works due to the change in activity area.

Plate 42: Project area at Bridge Inn Road, Doreen, facing east showing GSV in private property (Minos 2017)

Plate 43: Project area at Bridge Inn Road, Doreen, facing north showing GSV (Minos 2017)

Plate 44: Project area at Doctors Gully Road, Doreen, facing south, showing GSV (Minos 2017)

Plate 45: Project area at intersection of Bridge Inn Road, Yan Yean Road and Doctors Gully Road, Doreen facing south east towards Doreen General Store (Minos 2017)

Plate 46: Project area on south side of Bridge Inn Road, Doreen facing south showing retail precinct (Minos 2017)

Plate 47: Project area at Doreen Recreation Reserve on the north corner of Yan Yean Road and Bridge Inn Road, Doreen facing west showing GSV (Russell 2020)

Plate 48: Project area at Doreen Recreation Reserve on the north corner of Yan Yean Road and Bridge Inn Road, Doreen facing west showing GSV (Russell 2020)

Plate 49: Project area at Doreen Recreation Reserve facing west showing services and erosion (Russell 2020)

Plate 50: Project area at Doreen Recreation Reserve facing west showing erosion (Russell 2020)

Plate 51: Project area at the corner of Yan Yean Road and Project Way, Doreen. West side of Yan Yean Road facing north east showing GSV of vacant lot (Minos 2017)

5.1.4.3 *Effective Survey Coverage*

Effective survey coverage calculations are based on the percentage of ground surface exposure and, provide a measure for the 'detectability' of artefacts and the level of survey sampling effort within each landform in the project area. The calculation assesses the level of average GSV across the project area in each landform, the extent of isolated exposures with higher or lower GSV than the average and, a calculation of the area within each landform surveyed.

An overview of the effective survey coverage in each landform within the project area is provided in Table 8.

Table 8: Effective Survey Cover Calculations within the Project Area

Landform	Total Area (Ha)	Average Section GSV (%)	Area of Project Area Surveyed (ha)	Percentage of Project Area Surveyed (%)	Effective Survey Coverage (%)
Section 1	7.23	2.5	7.23	100	2.5
Section 2	7.71	5	7.71	100	5.0
Section 3	7.04	8	7.04	100	8.0
Section 4	5.35	20	5.35	100	20.0
Section 5	11.47	13	11.47	100	13.0
Section 6	7.65	5	7.64	99.8	5.0
Section 7	6.04	5	2.25	37.25	1.9
Total	**52.49**	**8**	**48.69**	**91**	**7.7**

5.1.4.4 *Limitations and Obstacles Encountered During the Standard Assessment*

Access to private property was the major limitation encountered during the standard survey. Not all private properties which will be impacted by the activity were accessible during the standard assessment. Whilst a number of private properties could be viewed from the road reserve, several properties were not visible due to screening by dense vegetation or fencing.

Generally poor visibility across most of the survey area limited the effectiveness of the survey in much of the activity area. Poor visibility was caused by thick grass coverage and dense vegetation. Areas of poor GSV were due to sealed roads, driveways, carparks and pedestrian footpaths.

5.2 Results of the Standard Assessment

5.2.1.1 *Landforms*

The survey failed to identified the landforms predicted during the desktop assessment with a number of unnamed waterways landforms identified within the project area (Plate 52). Whilst several unnamed waterways were identified, many of these waterways show signs of disturbance and modification, likely to provide drainage into the Plenty River to the east of the project area and Sawpit Creek to the west. Within the project area, the following landforms were identified (Map 9):

- *Survey Section 1* – Unnamed minor waterway;
- *Survey Section 2* – Unnamed minor waterway;
- *Survey Section 3* – Low relief elevation and a modified unnamed minor waterway;
- *Survey Section 4* – Low relief elevation and two modified unnamed minor waterways;
- *Survey Section5* – Low relief elevation;
- *Survey Section 6* – Low relief elevation; and
- *Survey Section 7* – Low relief elevation.

The survey confirmed the presence of the unnamed waterway landforms predicted during the desktop assessment and confirmed that a high proportion of the project area has been subject to significant modification owing to substantial development which has occurred within the project area. Additionally, the survey confirmed that the installation of service assets has had a significant impact on the available natural ground surface.

The project area is dissected by a series of unnamed minor waterways which have been modified and channelized to variable degrees. Most of them are ephemeral and are likely to only hold water seasonally. These waterways are tributaries ultimately feeding the Plenty River catchment system, and eventually draining into the Yarra River. The modifications vary from having become associated with manmade dams, having been realigned to serve as drainage away from built up residential areas. Additionally, as all these waterways intersect with Yan Yean Road, a system of culverts, drainage ditches and pipes have been installed to for water management purposes.

Plate 52: Modified minor waterway crossing Yan Yean Road, facing south east (Minos 18.12.2017)

5.2.1.2 *Aboriginal Cultural Heritage Identified during the Standard Assessment*

A total of one Aboriginal place was identified during the standard assessment. This was identified as a previously unrecorded place (Map 9) and was subsequently registered as VAHR Registered 3 (Yellow Brick Road LDAD 1). Due to changes in the location of the project area as of February 2020, VAHR Registered 3 (Yellow Brick Road LDAD 1) is no longer present in the project area.

Previously Unrecorded Places

VAHR Registered 3 (Yellow Brick Road LDAD 1): this place consists of a single silcrete flake (Plate 53). The Aboriginal place was located on the surface of a vacant lot bound by Yellow Brick Road, Activity Way and Yan Yean Road, Doreen (Plate 54). The property lies immediately south of Doreen's commercial centre and was heavily disturbed having served as a site for stockpiling fill, as such the provenance of the single artefact is uncertain.

All accessible mature native trees were examined, and no cultural scarring was located. There are no caves, cave entrances or rock shelters present within the project area.

Plate 53: Silcrete flake recorded in Project Area (Howes 18.12.2017)

Plate 54: View of undulating plain landform and general location of VAHR Registered 3 (Yellow Brick Road LDAD 1), facing north west (Howes 18.12.2017)

Previously Recorded Places

As outlined in the desktop assessment, two previously registered Aboriginal places are shown on the VAHR to be located within the project area. Both, VAHR Registered 1 (Yan Yean Archers 1) and Registered 2 were reinspected during the standard assessment but neither were successfully relocated.

An inspection at the recorded location of VAHR Registered 1 (Yan Yean Archers 1) indicated that a small service road within the western road reserve has been graded and gravel laid and is likely associated with the Diamond Valley Archery Club. This service road continues north but becomes more of a dirt vehicle track. It is in this location that VAHR Registered 1 (Yan Yean Archers 1) was described in the place registration as having been located (Plate 55). An attempt was made to relocate the single silcrete multidirectional core, using a DGPS and the description from the place registration. Neither the artefact previously associated with the registration of VAHR Registered 1 (Yan Yean Archers 1), nor any other archaeological material, was identified at this location. This is likely due to the installation of

underground services in the immediate area indicated on the registration as an immediate threat. Additionally, vehicle traffic through the location is evident by the vehicle dirt track present through the location of the Aboriginal place.

Plate 55: Area recorded as being the location of VAHR Registered 1 Yan Yean Archers 1, facing south towards archery club (Minos 18.12.2017)

During the survey of Worns Lane, an attempt was made to relocate VAHR Registered 2 (Yan Yean Road LDAD 1) using a DGPS and the description from the place registration. The Aboriginal place was described by Watson (2016, CHMP #14387) as being a single silcrete stone artefact located on the surface of a shallow road reserve. During the survey this cutting was inspected thoroughly but the artefact, nor any other archaeological material, could not be located, likely due to eroding of the road cutting which was also noted as a probable threat to VAHR Registered 2 (Yan Yean Road LDAD 1) in the original registration (Plate 56).

Plate 56: View at Worns Lane southern road reserve cutting, probable location of VAHR Registered 2, facing south east (Howes 18.12.2018)

5.2.1.3 *Areas of Aboriginal Cultural Heritage Likelihood*

Several areas of Aboriginal cultural heritage likelihood were identified during the standard assessment. An area of *Aboriginal cultural heritage likelihood* differs from an areas of *Aboriginal cultural heritage sensitivity*. Areas of *Aboriginal cultural heritage likelihood* are areas assessed by archaeologists and Traditional Owner representatives as having potential to contain Aboriginal heritage, based on data collected during the desktop and standard assessments. Areas of *Aboriginal cultural heritage sensitivity* are defined in the *Aboriginal Heritage Regulations 2018*, and are triggers for determining the requirement for the preparation of a mandatory CHMP. While these two designations frequently overlap, they are not necessarily the same. Areas of *Aboriginal cultural heritage likelihood* identified in the project area include the following:

Heard Avenue (Survey Section 1)

This portion of the project area is not a mapped area of Aboriginal cultural sensitivity, but it does come to within 100 m of one. This area of cultural heritage likelihood is related to a tributary of Sawpit Creek to the east. Due to the proximity of the mapped area of sensitivity and the named waterway this area is considered to have a moderate likelihood for the occurrence of Aboriginal cultural heritage.

423 Yan Yean Road (Survey Section 1)

An area of Aboriginal cultural heritage likelihood was identified within this property. The northern most extent of the property was identified to be on a slight rise overlooking a natural, unnamed waterway. Whilst the majority of the project area has been shown to exhibit signs of post contact and modern ground disturbance, the northern extent of this property appears to be relatively undisturbed, something unique for the project area and wider geographic region as a whole. A significant amount of native vegetation was identified to be still present within this property. Based on the observations made during the standard assessment, that a seemingly natural, undisturbed rise in close proximity to a natural, unnamed waterway is present, there is considered to be a high likelihood for Aboriginal cultural material in this part of the project area.

Unnamed Minor Waterways (Survey Sections 1-4)

Based on the desktop assessment, there is a higher density of cultural heritage along waterways in the geographic region. This suggests that there is a higher likelihood of locating cultural heritage in association with all watercourses. The *Aboriginal Heritage Regulations 2018* define sensitive waterways as named waterways under the *Geographical Place Names Act 1998.* However, the unnamed waterways intersecting the current project area are minor; and many have been heavily modified within the project area. Therefore, there is considered to be a minor likelihood for the occurrence of Aboriginal cultural heritage along the unnamed waterways in the project area.

5.2.1.4 *Previous Ground Disturbance*

Previous ground disturbance was relatively similar across all survey sections, due to the presence of major and minor roads and road reserves such as Yan Yean Road, Bridge Inn Road, Doctors Gully Road and Kurrak Road across the project area. Commonly occurring ground disturbing works identified across the project area were observed as:

- Stripping, levelling, grading and filling of the area for road construction;

- Stripping, levelling, grading and filling of the area for the construction of road reserves and shared user paths;
- Underground and above ground utility installations;
- Removal of native vegetation; and
- Landscaping of road reserves with introduced plant species.

Utility mapping indicates the presence of sewer mains, water main and power lines within all road corridors in the project area.

Survey Section 1

Disturbance specific to Survey Section 1 outside of the above includes the following:

- Construction of Kurrak Road and Yan Yean Road intersection (Plate 58);
- Construction of Heard Avenue;
- Construction of Worns Lane; and
- Installation of culverts for waterway crossing on Worns Lane; and Various utility installations, including water, optic communication, electricity and gas (Plate 57 and 58).

Plate 57: Aerial view of Kurrak Road and Yan Yean Road intersection (Nearmap 2018)

Plate 58: Disturbance from installation of underground services, facing north (Minos 18.12.2017)

Survey Section 2

Disturbance specific to Survey Section 2 outside of the above includes the following:

- Construction of North Oatlands Road (Plate 59);

- Installation of culverts for waterway crossing on North Oatlands Road (Plate 60);
- Construction of pedestrian footpaths;
- Construction of carpark and sealed services for Yarrambat Primary School; and
- Various utility installations, including water, sewage, optic communication, electricity and gas.

Plate 59: North Oatlands Road, Yarrambat. Location of services, facing east (Minos 18.12.2017)

Plate 60: Bluestone culvert for waterway crossing on North Oatlands Road, Yarrambat. (Minos 18.12.2017)

Survey Section 3

Disturbance specific to Survey Section 3 outside of the above includes the following:

- Construction of Vista Court;
- Construction of Ironbark Road;
- Construction of pedestrian footpaths;
- Construction of carpark and sealed services for Yarrambat Primary School;
- Construction of Youngs Road;
- Construction of Ashley Road (Plate 61);
- Channelization of minor waterway crossing Yan Yean Road, north of Youngs Road, including culverts (Plate 62); and
- Various utility installations, including water, sewage, optic communication, electricity and gas

Plate 61: Pedestrian footpath and underground services, corner of Yan Yean Road and Ashley Road, facing south (Minos 18.12.2017)

Plate 62: Channelization of minor waterway crossing Yan Yean Road, north of Youngs Road, showing culvert and underground services (Minos 18.12.2017)

Survey Section 4

Disturbance specific to Survey Section 4 outside of the above includes the following:

- Construction of Golf Links Drive (Plate 63);
- Construction of Bannons Lane;
- Construction of Yarrambat Golf Club;
- Channelization of minor waterway crossing on Yan Yean Road, north of Gold Links Drive, including culverts (Plate 64); and
- Various utility installations, including water, sewage, optic communication, electricity and gas.

Plate 63: Golf Links Drive, Yarrambat and location of underground services (Minos 18.12.2017)

Plate 64: Culvert and services in eastern road reserve of Yan Yean Road, Yarrambat (Minos 18.12.2017)

The Yarrambat Park Golf Course was inspected for evidence of significant ground disturbance (SGD). Significant Ground Disturbance (SGD) is defined in r.5 of the Regulations as meaning:

disturbance of –

(a) the topsoil or surface rock layer of the ground; or

(b) a waterway –

by machinery in the course of grading, excavating, digging, dredging or deep ripping, but does not include ploughing other than deep ripping.

The Victorian Civil and Administrative Tribunal (VCAT) has determine that the words 'topsoil or surface rock layer" include the former topsoil or former surface rock layer if that topsoil or surface rock layer is naturally occurring surface level that is readily ascertainable and does not include the current topsoil or current surface rock later if established by the mere filling of the land (AV 2016: 2).

It is thought that the Yarrambat Park Golf Course may show signs of significant ground disturbance due to the implementation of the Yarrambat Park Master plan 2011 to 2019 which was adopted by the Nillumbik Council as of 2011. As part of the Masterplan was the Golf Master Plan drafted by Thomson Perret Master Planning and Golf Course Design (Perrett, T 2012.). The Golf Master Plan (GMP) outlined the Yarrambat Golf Course as being a newly constructed 18-hole layout when it was built approximately 25 years ago (at the time of writing in 2011). The GMP also advised that little alteration have been made to the Golf Course, except for the relocation of the 18th hole after the then clubhouse burnt down. The master plan advised various improvements to general landscape, tee, fairways, greens as well as water drainage and storage within the Golf Course (Figure 6).

Figure 8: The Golf Masterplan overlain on an aerial of the Yarrambat Golf Course (Source: Perrett 2011)

While the GMP was incorporated into the Yarrambat Park Master Plan and adopted by the Nillumbik Council, it only outlined recommendations to improve the Golf Course. It is unclear what recommendations the Nillumbik council acted upon if any. Recommendations including the realignment of tree lines, bunkers, mounds and greens would have involved the use of topsoil removal and laser levelling (Perrett 2011 pp: 38). These actions, if proven would possibly prove the occurrence of SGD per r.5 of the *Regulations.*

As part of the standard assessment it was identified that ground disturbance associated with the construction of the golf course has occurred. It is understood that prior to the construction of the golf course, the land was used for pastoral activity and was understood to be flat and predominately unmodified other than for the removal of natural vegetation. This is confirmed in the 1950s aerial photographs of the project area showing the future location of the Yarrambat Golf Course. During the standard assessment, the project area within Yarrambat Golf Course was identified to be heavily undulating and showed evidence of artificial modification. Artificial rises for the gold course and depressions such as sand traps were identified across the landscape (Plate 65 and 66). Many of these sand traps identified were also noted to show the subsurface bedrock within the profile of the sand trap depressions. This further supports the view that ground disturbance associated with the construction

of the Yarrambat Golf Course has gone to the point of reaching natural bedrock. It is possible that this has likely occurred across most of, if not all the golf course.

A large, artificial water feature that cuts across the Yarrambat Golf Course in an east to west direction was also identified within the project area (Plate 67). This water feature is understood to feed into artificial drainage channels on its most eastern and western extents and this was identified during the standard assessment (Plate 68). The presence of the drainage channels which the water feature runs into and the lack of any identifiable water feature on earlier aerial and satellite imagery supports the view that this is not a natural waterway, but one artificially created. Several other services likely associated with underground water and gas were also identified across the Yarrambat Golf Course suggesting further ground disturbance. Finally, ground disturbance has been identified to extensively cover the northern extent of the Yarrambat Golf Course. A sealed driveway, carparks and the club house and mini golf course were identified within the project area (Plates 69-70).

Based on the findings of the standard assessment within the Yarrambat Golf Course, located within the project area, it is understood that the entirety of the golf course located in the project area is believed to have seen large scale ground disturbance associated with the construction of the golf course. Despite this, further testing will need to be completed as part of the complex assessment to confirm the findings of the standard assessment to identify if the natural topsoil has been disturbed or removed from the use of machinery for excavating or digging.

Plate 65: Project area at Yarrambat Golf Course showing presumed artificial undulation across the landscape, facing north (Russell 2020)

Plate 66: Project area at Yarrambat Golf Course showing sand traps dug into bedrock, facing west (Russell 2020)

Plate 67: Project area at Yarrambat Golf Course showing water feature identified to cross entire project area, facing east (Russell 2020)

Plate 68: Project area at Yarrambat Golf Course showing underground water service, facing west (Russell 2020)

Plate 69: Project area at Yarrambat Golf Course showing clubhouse and mini golf course, facing north west (Russell 2020)

Plate 70: Project area at Yarrambat Golf Course showing sealed roads and carpark, facing west (Russell 2020)

Survey Section 5

Disturbance specific to Survey Section 5 outside of the above includes the following:

- Construction of Laurie Street;
- Construction of Jorgensen Avenue;
- Cutting through slope for construction of Yan Yean Road, Yarrambat (Plate 71);
- Channelization of minor waterway in Werther Park;
- Modification and landscaping of Werther Park (Plate 72);
- Construction of pedestrian footpaths; and
- Various utility installations, including water, sewage, optic communication, electricity and gas

Plate 71: Cutting for Yan Yean Road, showing eastern road reserve, north of Jorgensen Avenue (Minos 18.12.2017)

Plate 72: Werther Park Pedestrian footpath and services (Minos 18.12.2017)

Survey Section 6

Disturbance specific to Survey Section 6 outside of the above includes the following:

- Construction of Orchard Road intersection (Plate 73);
- Construction of Tallis Grove;
- Construction of Coolong Terrace;
- Construction of pedestrian footpaths, carpark and dam for Plenty Valley Christian College; and
- Various utility installations, including water, sewage, optic communication, electricity and gas

Plate 73: Orchard Grove intersection, facing south east toward Plenty Valley Christian College (Minos 18.12.2017)

Survey Section 7

Disturbance specific to Survey Section 7 outside of the above includes the following:

- Construction of Yan Yean Road, Bridge Inn Road/Doctors Gully Road intersection (Plate 74);
- Construction of Activity Way;
- Construction of Cookes Road;
- Construction of pedestrian footpaths; and
- Various utility installations, including water, sewage, optic communication, electricity and gas

Plate 74: Yan Yean Road and Bridge Inn/Doctors Gully Road intersection, facing south east (Minos 18.12.2017)

Plate 75: Easement for installation of services, facing north from Bridge Inn Road (Minos 18.12.2017)

5.2.1.5 *Standard Assessment – Summary of Results and Conclusions*

A targeted pedestrian and vehicular survey were conducted across the entire project area (Map 8a -8g). The vehicular method of site investigation was undertaken where appropriate due to large parts of the project area comprising active roadways and road reserves. Where physically possible and in accordance with Occupational Health and Safety requirements, all participants walked 2-5 m apart, targeting accessible areas and areas of high archaeological potential around Sawpit Creek. The standard assessment was divided into seven survey sections in order to assess and describe landforms, GSV and ground disturbance within the project area.

Consistent with the findings of the desktop assessment, two landforms were identified within the project area. The majority of the project area was characterised by gently undulating plain and low relief landforms. Also present within the project area was a series of minor waterways within the project area which intersected with Yan Yean Road at several points.

Ground surface visibility across the project area was relatively homogenous (0-5%), due to the majority of the project area comprising existing roadways, road reserves and pedestrian paths. These works were observed as having stripped, cut, levelled and filled large portions of the project area, thereby removing

or obscuring much of the natural ground surface. Areas of exposure were observed within the project area, increasing GSV (up to 50%) at the base of trees, in wider road reserves with vehicle tracks and in areas of erosion, largely owing to the installation of services.

Ground disturbance within the project area was similarly homogenous, again due to the majority of the project area comprising existing roadways, road reserves and pedestrian paths. Utility mapping also indicated a high level of subsurface disturbance, owing to the installation of optic communications, water, sewerage, gas and electricity utilities. Although the area had low GSV and was disturbed due to development and services a new unregistered place was identified during survey section 7.

Attempts were made to re-identify the previously registered VAHR Registered 1 (Yan Yean Archers 1) and Registered 2 (Yan Yean Road LDAD 1) places during the standard assessment (Map 7). One of the Aboriginal places was found to be incorrectly mapped on the VAHR Registered 1 (Yan Yean Archers 1) during the desktop assessment. On the VAHR it was shown as being outside of the project area; however, further investigation confirmed that the original recording of this single surface artefact in 1995 was within the current project area. An attempt to relocate this place during the standard assessment was unsuccessful, likely due to the disturbance caused by vehicle traffic on an unsealed track within the road reserve and by the installation of a sewerage pipeline in the area following the recording of the place in 2005. As a result, this place is believed to have previously been destroyed and no additional cultural material was recorded within this area.

An inspection was also carried out at another place VAHR Registered 2 (Yan Yean Road LDAD 1) identified during the preparation of CHMP 14387 (Watson et al 2017). The place was described as being located in the cutting of an eroding road reserve. No material component remained of this place within the project area, and no additional cultural material associated with this place was recorded.

One previously unidentified Aboriginal Place was as part of the standard assessment; VAHR Registered 3 (Yellow Brick Road LDAD). This place was initially within the project area however, due to changes of the project area by the sponsor, VAHR Registered 3 (Yellow Brick Road LDAD 1) is no longer present within the project area.

Some areas of archaeological likelihood were identified during the standard assessment and agreed upon by all field representatives. These areas include land around Heard Avenue west of Sawpit Creek, the property located at 423 Yan Yean Road and land around several minor waterways intersecting the project area.

As areas of Aboriginal cultural heritage likelihood and sensitivity were identified during the standard assessment and surface Aboriginal cultural material was also present, a complex assessment is required under the *Aboriginal Heritage Regulations 2018* (r.64(1)(b)), to establish the possible presence, nature and extent of any subsurface archaeological material which may be present within the project area.

6 RISK ASSESSMENT

The residual environmental risks identified for Aboriginal and Historical heritage are provided in Appendix 4. The residual risk ratings consider the standard controls and proposed EPRs. The proposed EPRs are set out in Table 10, Section 8. For further details on how these ratings were arrived at, and the specific nature of each category or consequence level, please see section 3.4.1 of this report.

Table 1: Summary of Aboriginal and Historical Heritage risk assessment

RISK No.	ASPECT	IMPACT PATHWAY (RISK)	MITIGATION MEASURES TO INFORM ENVIRONMENTAL PERFORMANCE REQUIREMENT	EPR		RESIDUAL RISK RATING
Site Establishment						
1	Aboriginal Cultural Heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage potentially impacting on heritage values	Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to."	EPR ACH1	Possible	Moderate Medium
10	Historical Heritage	Potential impact on the values of heritage places and/or archaeological sites	Designing permanent and temporary works to avoid where possible, and otherwise minimise, adverse effects on the two Doreen River Red Gums (HO191) and St. Michael Anglican Church (HO219). As part of the Construction Environmental Management Plan, there would be an archaeological discovery protocol that specifies measures to avoid and minimise impacts on any previously unidentified historical archaeological sites and values discovered during construction. The management protocol must be consistent with the requirements of the Heritage Act 2017 and include procedures for ceasing work if human remains or archaeological artefacts are discovered, notifying Heritage Victoria of the find, obtaining consent to deal with the find, and dealing with the find in accordance with the consent. All personnel on site must undertake a Cultural Heritage Awareness Induction prior to commencing work, which would include information on the Doreen River Red Gums.	EPR HH1 and HH2	Possible	Moderate Medium
Construction-Earthworks						
21	Aboriginal Cultural Heritage	Disturbance of known or previously unrecorded Aboriginal	Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage	EPR ACH1	Possible	Moderate Medium

RISK No.	ASPECT	IMPACT PATHWAY (RISK)	MITIGATION MEASURES TO INFORM ENVIRONMENTAL PERFORMANCE REQUIREMENT	EPR	RESIDUAL RISK RATING		
		cultural heritage potentially impacting on heritage values	Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to."				
32	Historical Heritage	Potential impact on the values of heritage places and/or archaeological sites	To avoid where possible, and otherwise minimise adverse effects on landscape values in accordance with the Project's Landscape Strategy, through mitigation measures such as: • Develop potential and proposed design options and measures that can avoid or minimise significant direct and indirect effects on trees or other landscape elements - with a focus on high value vegetation as identified within the Landscape Strategy's 'Cultural Value of Vegetation Assessment' • Prior to construction commencing, develop a Tree Management Plan based on the recommendations of Australian Standard 4970-2009 Protection of Trees on Development Sites. This should be in consultation with the City of Whittlesea and Nillumbik Shire Council and informed by a project arborist (with a minimum qualification of Diploma in Arboriculture (AQF level 5 or equivalent) • Develop strategies to address the loss of trees or other landscape elements • Retain and reinforce key existing views as identified within the Landscape Strategy. Design permanent and temporary works to minimise adverse visual impact, particularly in relation to: • Heritage values • Existing and proposed landmark elements across the Project • High value vegetation as identified within the Landscape Strategy's 'Cultural Value of Vegetation Assessment' • Community and recreational centres and open space, including existing Council masterplans for Doreen Recreational Reserve, Yarrambat Park & Golf Course and Yarrambat Township	EPR HH1 and HH2	Unlikely	Moderate	Medium

RISK No.	ASPECT	IMPACT PATHWAY (RISK)	MITIGATION MEASURES TO INFORM ENVIRONMENTAL PERFORMANCE REQUIREMENT	EPR	RESIDUAL RISK RATING		
Construction - Civils and Structures			• Residential interfaces • Business interfaces."				
41	Aboriginal Cultural Heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage potentially impacting on heritage values	Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to.	EPR ACH1	Possible	Moderate	Medium
50	Historical Heritage	Potential impact on the values of heritage places and/or archaeological sites	Designing permanent and temporary works to avoid where possible, and otherwise minimise, adverse effects on the two Doreen River Red Gums (HO191) and St. Michael Anglican Church (HO219). As part of the Construction Environmental Management Plan, there would be an archaeological discovery protocol that specifies measures to avoid and minimise impacts on any previously unidentified historical archaeological sites and values discovered during construction. The management protocol must be consistent with the requirements of the Heritage Act 2017 and include procedures for ceasing work if human remains or archaeological artefacts are discovered, notifying Heritage Victoria of the find, obtaining consent to deal with the find, and dealing with the find in accordance with the consent. All personnel on site must undertake a Cultural Heritage Awareness Induction prior to commencing work, which would include information on the Doreen River Red Gums.	EPR HH1, HH2 and HH3	Unlikely	Moderate	Medium
Construction - Reinstatement							
61	Aboriginal Cultural Heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage	Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006.	EPR ACH1	Unlikely	Minor	Low

RISK No.	ASPECT	IMPACT PATHWAY (RISK)	MITIGATION MEASURES TO INFORM ENVIRONMENTAL PERFORMANCE REQUIREMENT	EPR	RESIDUAL RISK RATING		
		potentially impacting on heritage values	All management conditions and contingencies would be adhered to."				
70	Historical Heritage	Potential impact on the values of heritage places and/or archaeological sites	Designing permanent and temporary works to avoid where possible, and otherwise minimise, adverse effects on the two Doreen River Red Gums (HO191) and St. Michael Anglican Church (HO219). As part of the Construction Environmental Management Plan, there would be an archaeological discovery protocol that specifies measures to avoid and minimise impacts on any previously unidentified historical archaeological sites and values discovered during construction. The management protocol must be consistent with the requirements of the Heritage Act 2017 and include procedures for ceasing work if human remains or archaeological artefacts are discovered, notifying Heritage Victoria of the find, obtaining consent to deal with the find, and dealing with the find in accordance with the consent. All personnel on site must undertake a Cultural Heritage Awareness Induction prior to commencing work, which would include information on the Doreen River Red Gums.	EPR HH1, HH2 and HH3	Unlikely	Minor	Low
Operations							
81	Aboriginal Cultural Heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage potentially impacting on heritage values	Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to."	EPR ACH1	Rare	Insignificant	Low
90	Historical Heritage	Potential impact on the values of heritage places and/or archaeological sites	Mitigation measures have been applied during the design and construction phases. As such, the risk of impact on historical heritage during operation of Yan Yean Road is considered to be low.	EPR EMF5	Rare	Insignificant	Low

RISK No.	ASPECT	IMPACT PATHWAY (RISK)	MITIGATION MEASURES TO INFORM ENVIRONMENTAL PERFORMANCE REQUIREMENT	EPR	RESIDUAL RISK RATING		
Maintenance			Any potential impacts during operation and maintenance will be managed in accordance with the Department of Transport's standards for managing declared roads in Victoria.				
101	Aboriginal Cultural Heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage potentially impacting on heritage values	Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to.	EPR ACH1	Rare	Insignificant	Low
110	Historical Heritage	Potential impact on the values of heritage places and/or archaeological sites	Mitigation measures have been applied during the design and construction phases. No-go zones should be implemented if maintenance works are to occur in proximity of the two Doreen River Red Gums at the Bridge Inn Road intersection. Any potential impacts during operation and maintenance will be managed in accordance with the Department of Transport's standards for managing declared roads in Victoria.	EPR EMF5	Rare	Insignificant	Low

7 IMPACT ASSESSMENT

Impacts to Aboriginal cultural heritage and Historical Heritage can be summarised into two categories:

- Impacts during construction; and
- Impacts during operations/maintenance.

The initial risk ratings (Table 1 to Table 3) for the Project consider standard inherent controls in accordance with the relevant standards and guidelines. The additional controls listed are those recommended to further mitigate and minimise the primary environmental risks which were risk rated as medium or above in Table 9. Primary environmental risks which were scored as low did not require additional controls to be applied.

With risks identified for Aboriginal cultural heritage and Historical Heritage, MRPV and industry best practice and standard mitigation controls intrinsic to the Project were identified, including relevant sections of the MRPV specifications developed for the project and relevant Standards and Policies, including:

- EPA Victoria's Environmental Guidelines for Major Construction Sites. Compliance must be met in accordance with the subordinate policy, standards and guidelines of the Environment Protection Act 1970 and/or the Environment Protection Amendment Act 2018, whichever is active during construction of the Project.

7.1 Construction Impacts

All construction activities conducted as part of the project will impact on known Aboriginal cultural heritage and Historical heritage within the project area. The impacts on the Aboriginal Places include:

- Duplication of Yan Yean Road two lanes in each direction;
- A new off-road shared use path on the western side of Yan Yean Road and a new footpath on the eastern side of Yan Yean Road; and
- Ancillary works as required.

7.1.1 Standard Controls

7.1.1.1 *Aboriginal Heritage*

Standard Controls for Aboriginal cultural heritage include:

- Standard Controls for this place will include compliance with the CHMP once approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation (the RAP) under the *Aboriginal Heritage Act 2006.*

- Standard conditions likely to be part of the CHMP include: all personnel on site must undertake a Cultural Heritage Awareness Induction prior to commencing work, and implementation of contingency plans for the discovery of Aboriginal cultural heritage.

7.1.1.2 *Historical Heritage*

Standard Controls for Historical heritage include:

The Historical Place HO191 (River Red Gum (2) 25 Doctors Gully Road) is a prominent remnant landscape feature which is now rare in this locale undergoing increasingly intensified development. The management recommendations contained within the City of Whittlesea Heritage Study (Meredith Gould Architects Pty Ltd 1990 (Appendix 2)) specified to "Ensure road widening does not threaten trees, and to restrict parking on roots." It is considered that, should removal of these trees be required, it would adversely impact on their aesthetic, historic and potential social cultural heritage significance. .

The Historical Place HO219 (St. Michael Anglican Church) within the Yarrambat township, comprises of a church and church grounds (Figure 5) located near the Yarrambat State School and comprises of the public centre of the Yarrambat locality. The Planning Scheme overlay recommendations for this place include external paint controls and internal alteration control. It is considered that encroachment on the lot containing the church may adversely impact on its aesthetic, historic and potential social cultural heritage significance.

The removal of HO191 and HO219 are in contravention with Clause 43.01 of the *Nillumbik Planning Scheme* (Appendix 1) and such a *Heritage Overlay* a permit is required to impact the listed heritage item and its associated land However, MRPV proposes to facilitate the Project via a planning scheme amendment rather than apply for a permit.

The standard controls for HO191 and HO219 are to avoid where possible, and otherwise minimise adverse effects on historical heritage values, including designing permanent and temporary works to avoid impact on the two River Red Gum (2) 25 Doctors Gully Road (HO191) and St. Michael Anglican Church (HO219).

The Construction Environmental Management Plan will include processes and measures to manage historical heritage, such as:

- If confirmed to be avoided, implementation of no-go zones for Doreen River Red Gums
- If confirmed to be avoided, implementation of no-go zones for St. Michael Anglican Church
- All personnel on site must undertake a Cultural Heritage Awareness Induction prior to commencing work, which will include information on the Doreen River Red Gums.

7.2 Operation Impacts

All Maintenance activities conducted as part of the project will impact on known and unknown Aboriginal Places and known Historical Places within the project area.

7.2.1 Standard Controls

7.2.1.1 *Aboriginal Heritage*

Standard Controls for Aboriginal cultural heritage including:

- Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. Standard conditions likely to be part of the Cultural Heritage Management Plan including: all personnel on site must undertake a Cultural Heritage Awareness Induction prior to commencing work and implementation of contingency plans for the discovery of Aboriginal cultural heritage.

7.2.1.2 *Historical Heritage*

Standard Controls for Historical heritage include:

- Mitigation measures have been applied during the design and construction phases. As such, the risk of impact on historical heritage during operation of Yan Yean Road is considered to be low. Any potential impacts during operation will be managed by Department of Transport in accordance with their Environmental Management System.

8 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

This section lists the EPRs for Aboriginal Cultural Heritage and Historical Heritage, these link to the Risk Numbers within the risk assessment and risk register.

Table 9: Proposed Environmental Performance Requirements (EPRs) relevant to Aboriginal and Historical heritage

EPR NUMBER	EPR	PROJECT PHASE	RISK NUMBER
EPR ACH1	Implement and comply with the Cultural Heritage Management Plan approved under the *Aboriginal Heritage Act 2006*.	Design and construction	1, 21, 41, 61, 81 and 101
EPR HH1	**Doreen River Red Gums** At the Bridge Inn Road intersection, retain the two Doreen River Red Gums that are identified in the Heritage Overlay HO191 (see also EPR AR3). For works within the Heritage Overlay that impact historic heritage, prepare a Heritage Impact Statement in consultation with Shire of Nillumbik and implement no-go zones in accordance with the CEMP (see also EPR AR3).	Design and Construction	10, 30, 50 and 70
EPR HH2	**St. Michael's Anglican Church** Design permanent and temporary works to avoid where possible, and otherwise minimise, potential impacts on the heritage values of the St. Michael's Anglican Church that are identified in the Heritage Overlay HO219. The CEMP must include processes and measures to manage historical heritage, such as implementation of no-go zones, within the Construction Environmental Management Plan.	Design and Construction	10, 30, 50 and 70
EPR HH3	**Archaeological discovery protocol** The CEMP must include an archaeological discovery protocol that specifies measures to avoid and minimise impacts on any previously unidentified historical archaeological sites and values discovered during construction. The management protocol must be consistent with the requirements of the *Heritage Act 2017* and include procedures for ceasing work if human remains or archaeological artefacts are discovered, notifying Heritage Victoria of the find, obtaining consent to deal with the find, and dealing with the find in accordance with the consent.	Design and Construction	10, 30, 50 and 70

9 CONCLUSION

A total of two Aboriginal places and two Historical places are located within the proposed project area. These places will be impacted by the project and discussion of the proposed EPRs (Section 8) have addressed these impacts. As required in accordance with Part 4 of the Victorian *Aboriginal Heritage Act 2006* and the Victorian *Aboriginal Heritage Regulations 2018* (s.47) preparation of CHMP #15169 is in progress to address these specific management Conditions relating to Aboriginal heritage (Minos et al: In Prep).

The specific Regulations which trigger the requirement for the CHMP are:

- Under r.25(1) a registered cultural heritage place is an area of cultural heritage sensitivity: There are two Aboriginal Places located within the project area;
- Under r.25 (2) land within 50 metres of a registered cultural heritage place is an area of cultural heritage sensitivity: There are Four Aboriginal Places located within 50 m of the project area; and
- Under r.47, the proposed project is a high impact activity, as it involves the construction of a road with a length exceeding 100 metres (r.47 [1][f]).

The specific Regulations which trigger the requirement for the ACHHIA are:

- Under Pathway 2 of the Environment Effects Statement (EES) and will be subject to approval by the RAP.

Management of Aboriginal cultural heritage within the project area must comply with the CHMP #15169 (Minos et al: In Prep) once approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation, as the Registered Aboriginal Party, under the *Aboriginal Heritage Act 2006.*

The River Red Gums (HO191) are on the Heritage Overlay under the *Nillumbik Planning Scheme* (Appendix 1) the current ERPs within this ACHHIA will require the project to retain the trees. The proposed planning pathway for the use and development associated with the Project is via a PSA to the NPS and WPS. The Amendment would amend the NPS and WPS to apply Clause 45.12 Specific Controls Overlay and Clause 45.01 Public Acquisition Overlay to affected land, and insert the Yan Yean Road (Kurrak Road to Bridge Inn Road) (Stage 2) Upgrade Project Incorporated Document into Schedules 45.12 and 72.04. This would exempt all use and development associated with the Project from the need for a planning permit, subject to conditions (Technical Report H – Planning and Land Use Impact Assessment).

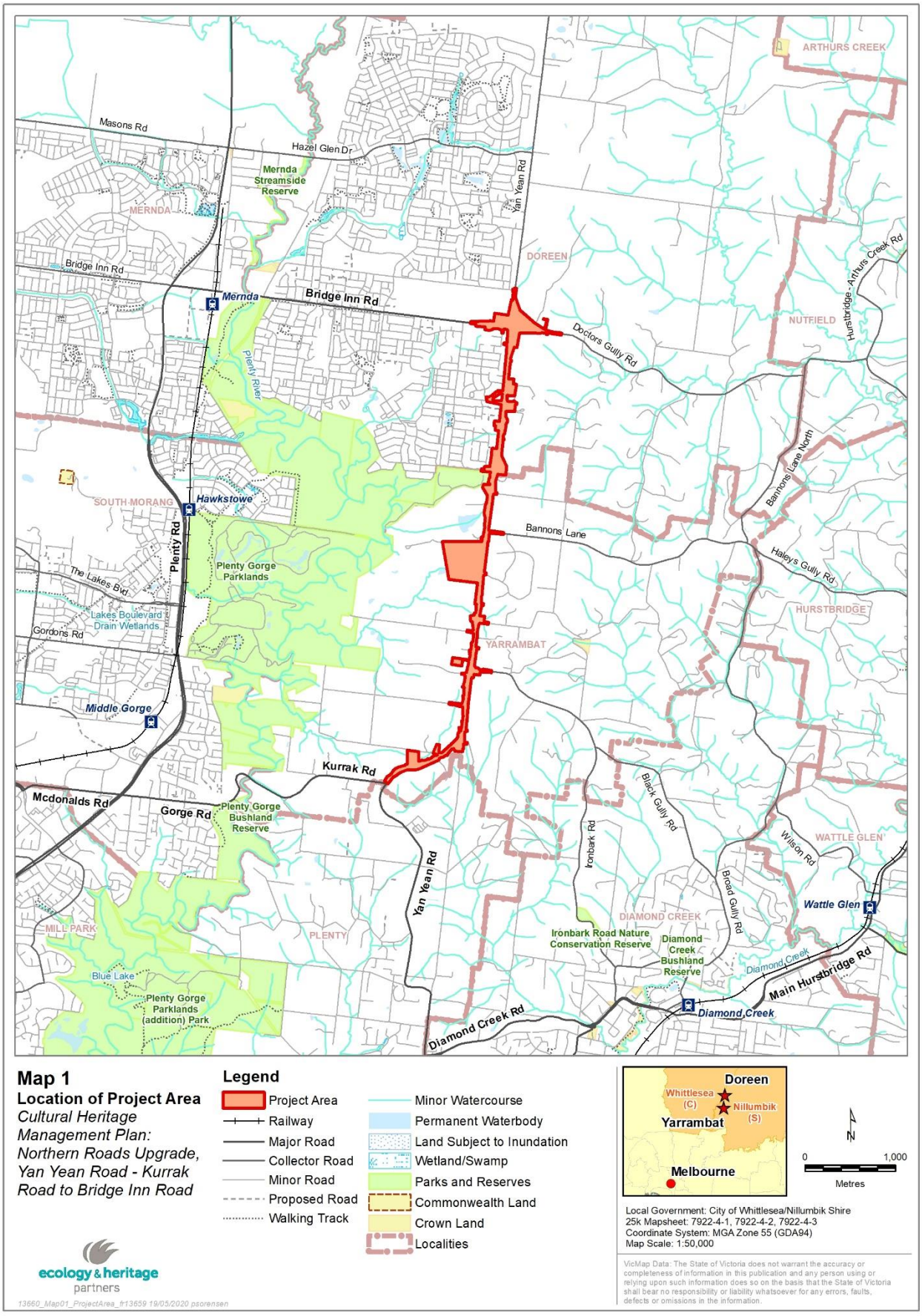
St Michael Anglican Church (HO219) is on the Heritage Overlay under the *Nillumbik Planning Scheme* (Appendix 1) the current ERPs within this ACHHIA will require the project to avoid and minimise impacts on the church, if it cannot be avoided a permit is required under Clause 43.01 of the Nillumbik Planning Scheme 2018, as well as a Heritage Impact Statement. The proposed planning pathway for the use and development associated with the Project is via a PSA to the NPS and WPS. The Amendment would amend the NPS and WPS to apply Clause 45.12 Specific Controls Overlay and Clause 45.01 Public Acquisition Overlay to affected land, and insert the Yan Yean Road (Kurrak Road to Bridge Inn Road)

(Stage 2) Upgrade Project Incorporated Document into Schedules 45.12 and 72.04. This would exempt all use and development associated with the Project from the need for a planning permit, subject to conditions (Technical Report H – Planning and Land Use Impact Assessment).

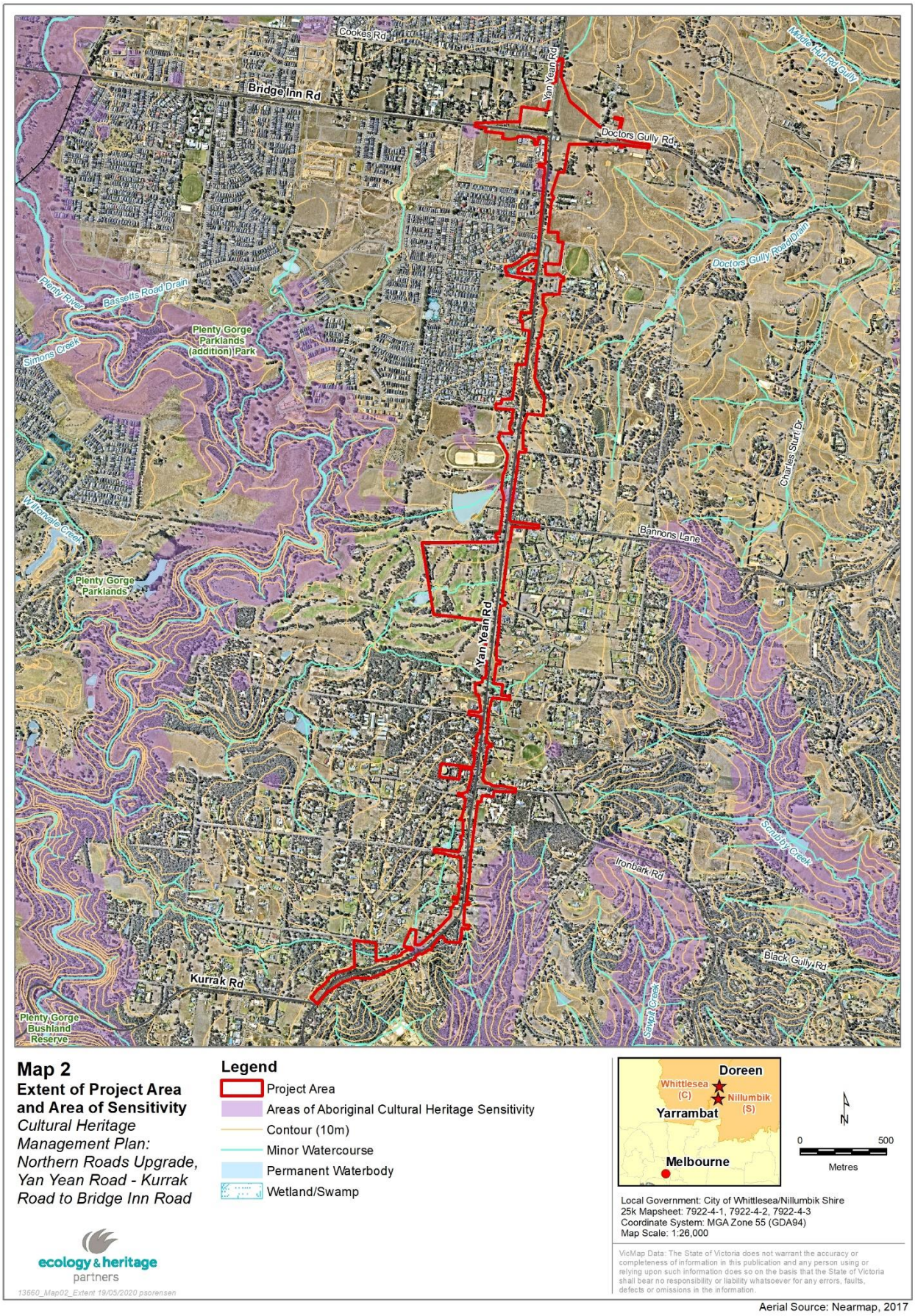
Risks of impacts to the Aboriginal and Historic heritage values detailed in the ACHHIA are considered to be moderate and low, following the implementation of project EPRs.

10 MAPS

Map 1: Location of project area

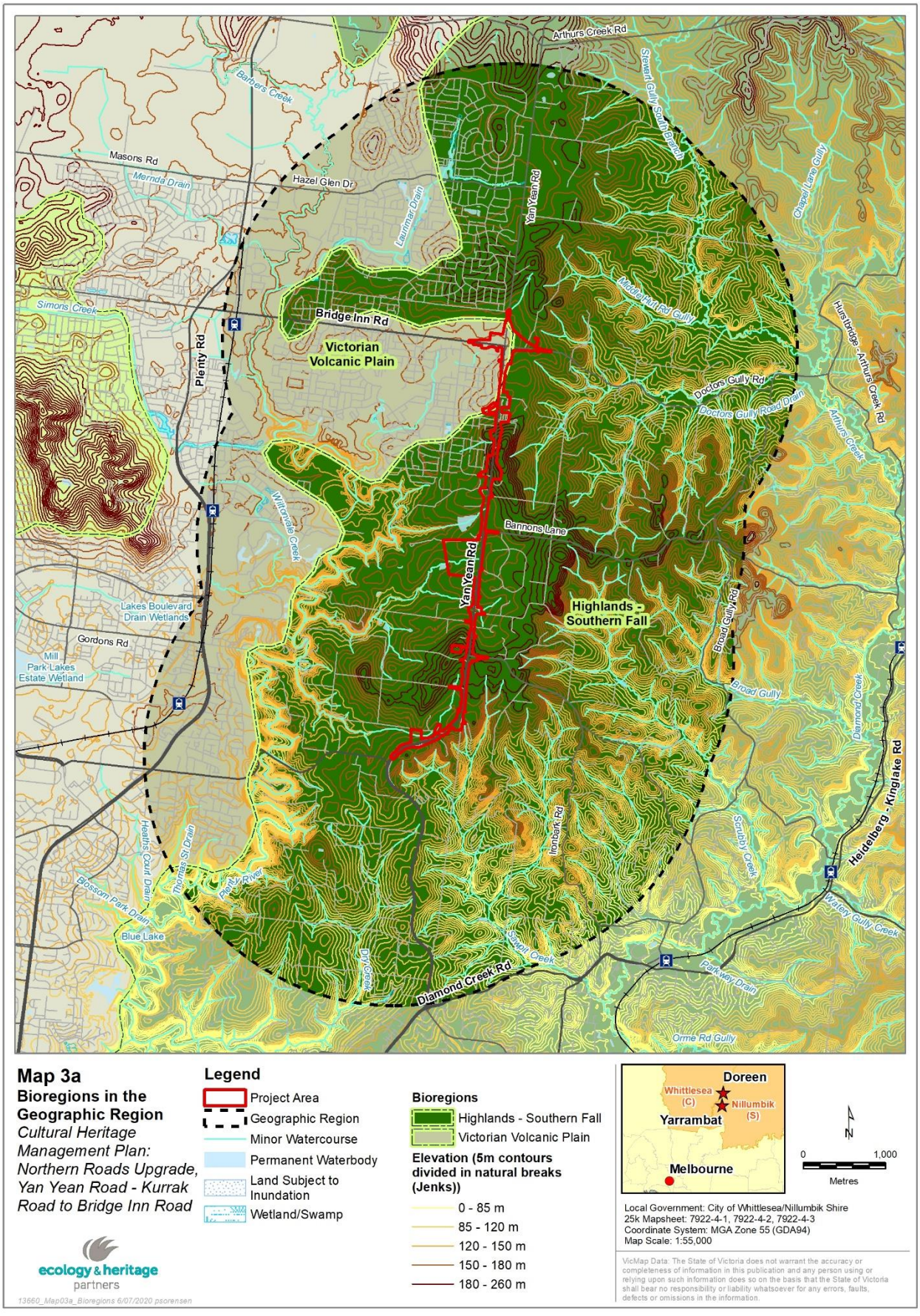


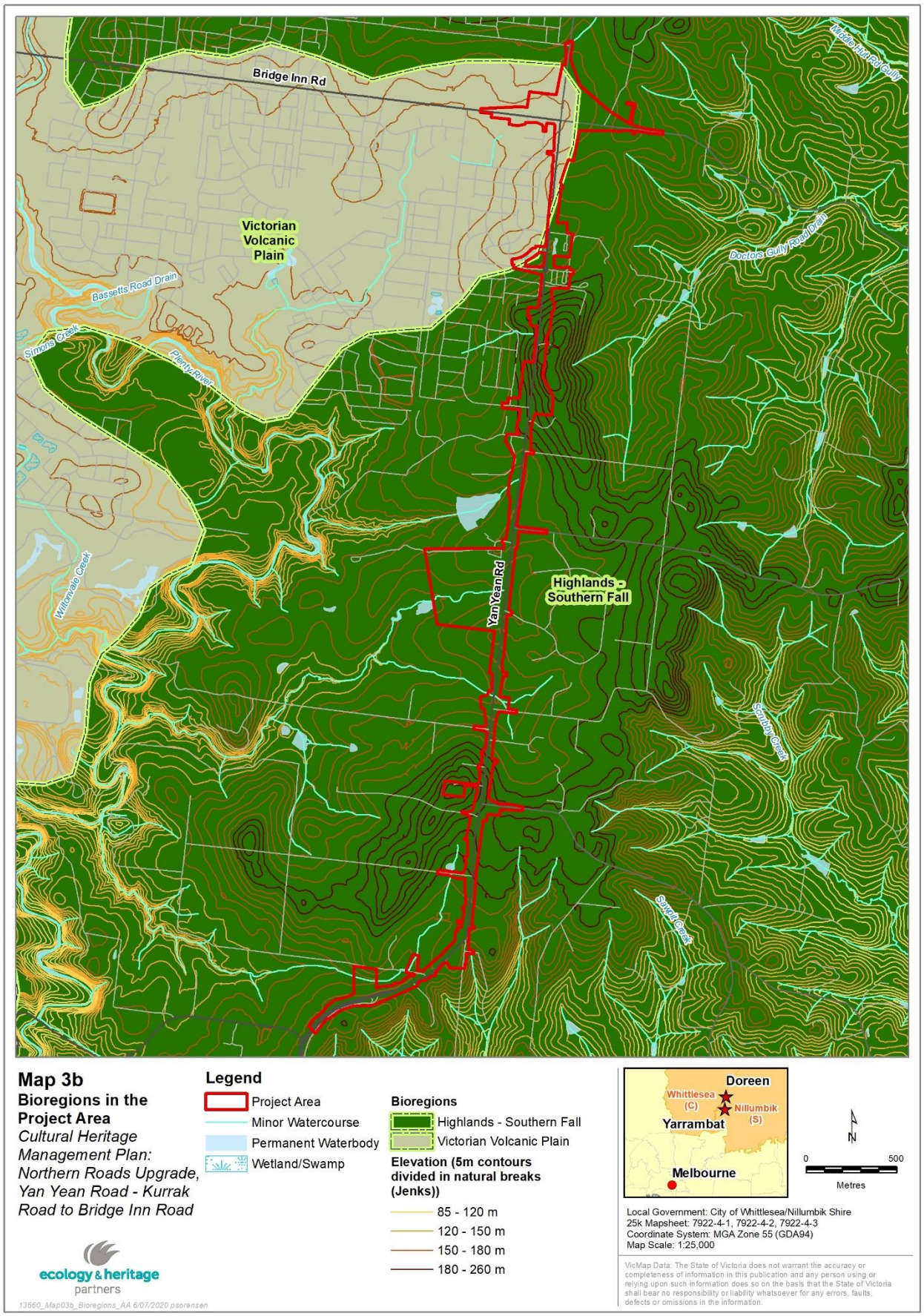
Map 2: Extent of project area and Area of Sensitivity



Aerial Source: Nearmap, 2017

Map 3: Bioregions in the Geographic Region




Bridge Inn Rd
Victorian Volcanic Plain
Bassetts Road Drain
Simons Creek
Plenty River
Willowvale Creek
Yan Yean Rd
Highlands - Southern Fall
Morris Hut Rd Gully
Doctors Gully Road Drain
Scrubby Creek
Sugarloaf Creek
Map 3b
Bioregions in the Project Area
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road
Legend
Project Area
Minor Watercourse
Permanent Waterbody
Wetland/Swamp
Bioregions
Highlands - Southern Fall
Victorian Volcanic Plain
Elevation (5m contours divided in natural breaks (Jenks))
85 - 120 m
120 - 150 m
150 - 180 m
180 - 260 m
Doreen
Whittlesea (C)
Nillumbik (S)
Yarrambat
Melbourne
N
0
500
Metres
Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:25,000
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.
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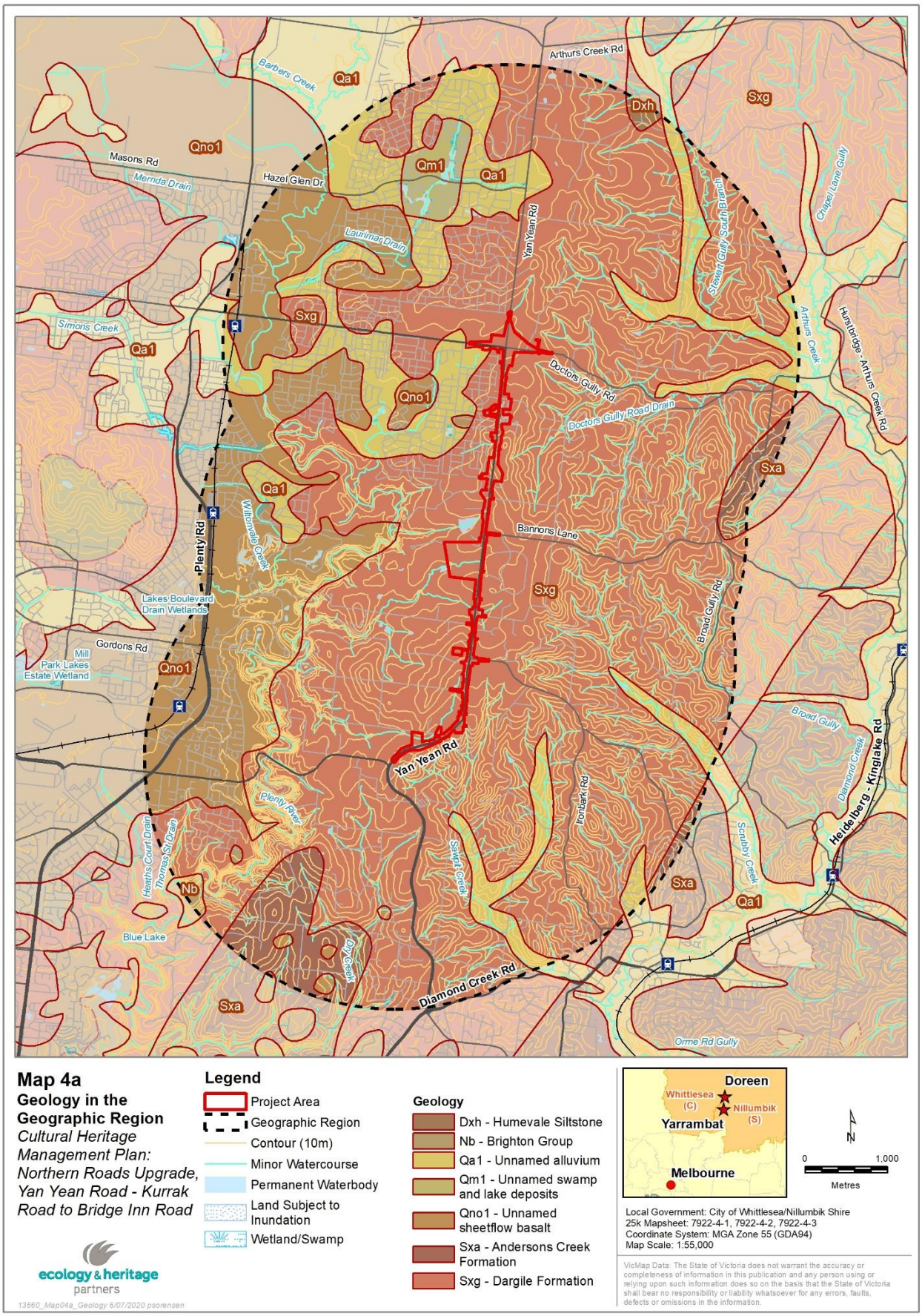
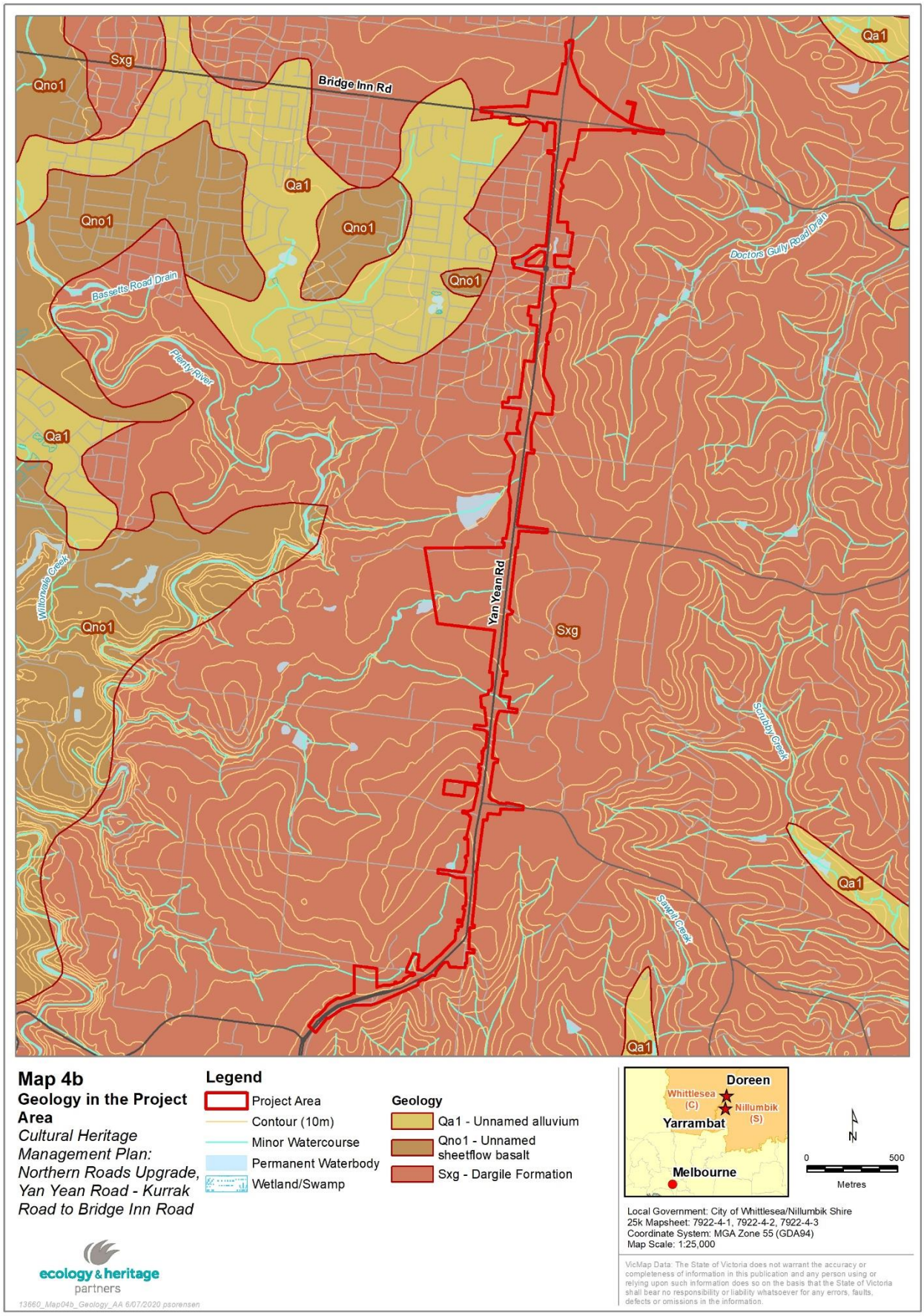
13660_Map03b_Bioregions_AA 6/07/2020 psorensen

Map 4: Geology in the Geographic Region




Sxg
Qno1
Bridge Inn Rd
Qa1
Qno1
Qno1
Qno1
Bassetts Road Drain
Plenty River
Qa1
Willowvale Creek
Qno1
Yan Yean Rd
Sxg
Doctors Gully Road Drain
Scrubby Creek
Qa1
Sawpit Creek
Qa1
Qa1
Map 4b
Geology in the Project Area
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road
Legend
Project Area
Contour (10m)
Minor Watercourse
Permanent Waterbody
Wetland/Swamp
Geology
Qa1 - Unnamed alluvium
Qno1 - Unnamed sheetflow basalt
Sxg - Dargile Formation
Doreen
Whittlesea (C)
Nillumbik (S)
Yarrambat
Melbourne
N
0
500
Metres
Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:25,000
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.
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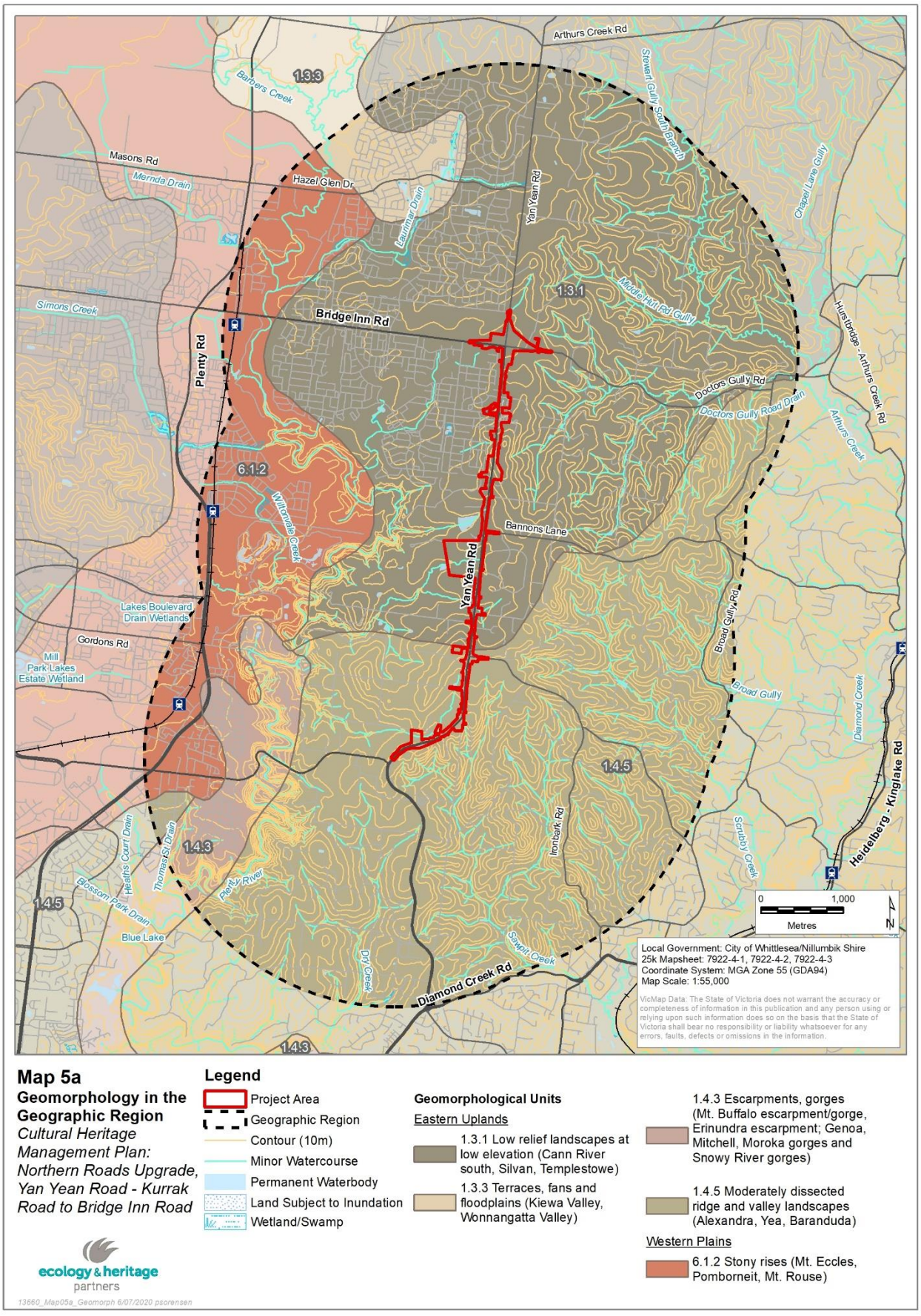
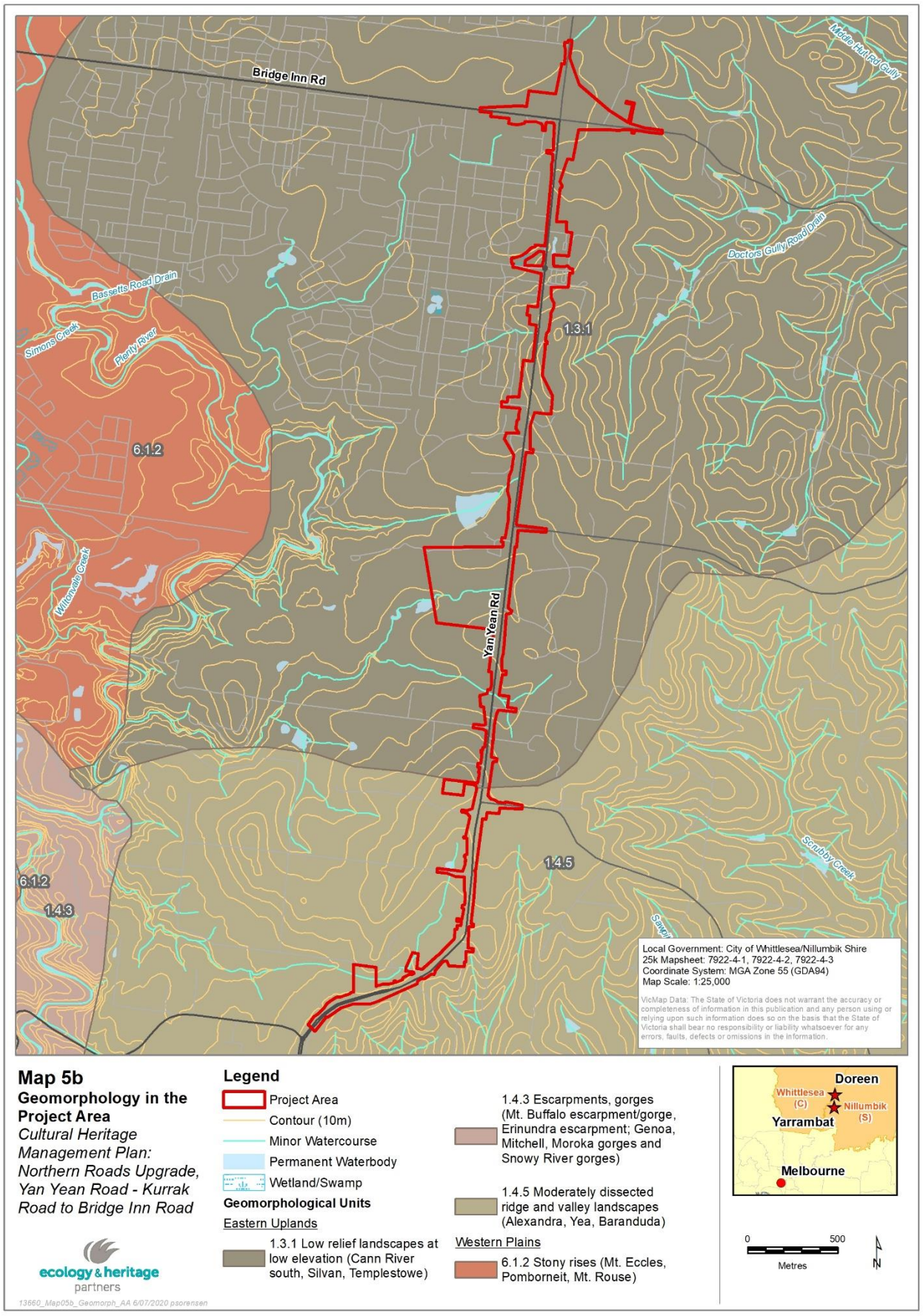
Map 5: Geomorphology in the Geographic Region




Bridge Inn Rd
Middle Hut Rd Gully
Doctors Gully Road Drain
Bassetts Road Drain
Simons Creek
Plenty River
1.3.1
6.1.2
Williamds Creek
Yan Yean Rd
1.4.5
Scrubby Creek
6.1.2
1.4.3
Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:25,000
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.
Map 5b
Geomorphology in the Project Area
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road
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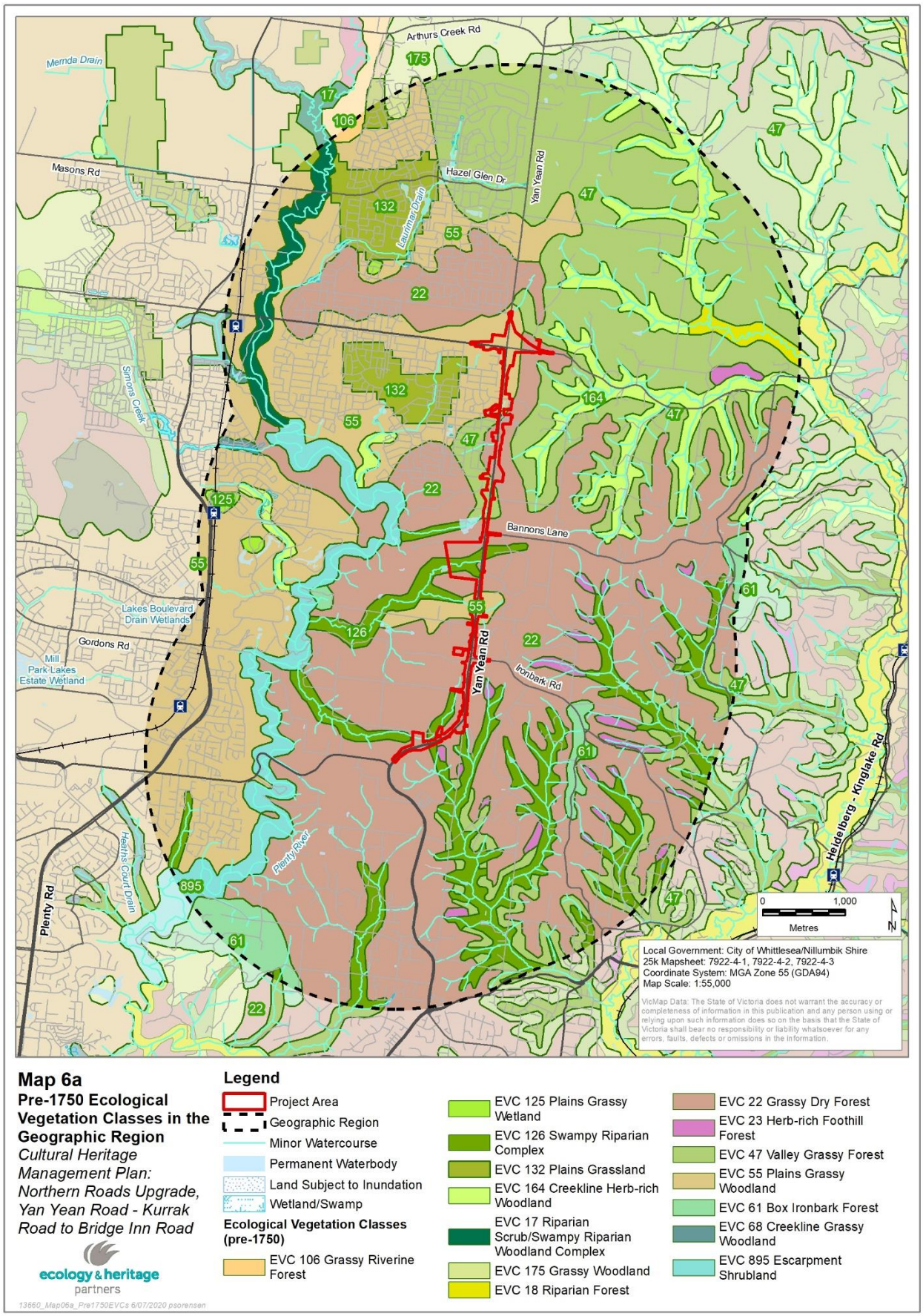
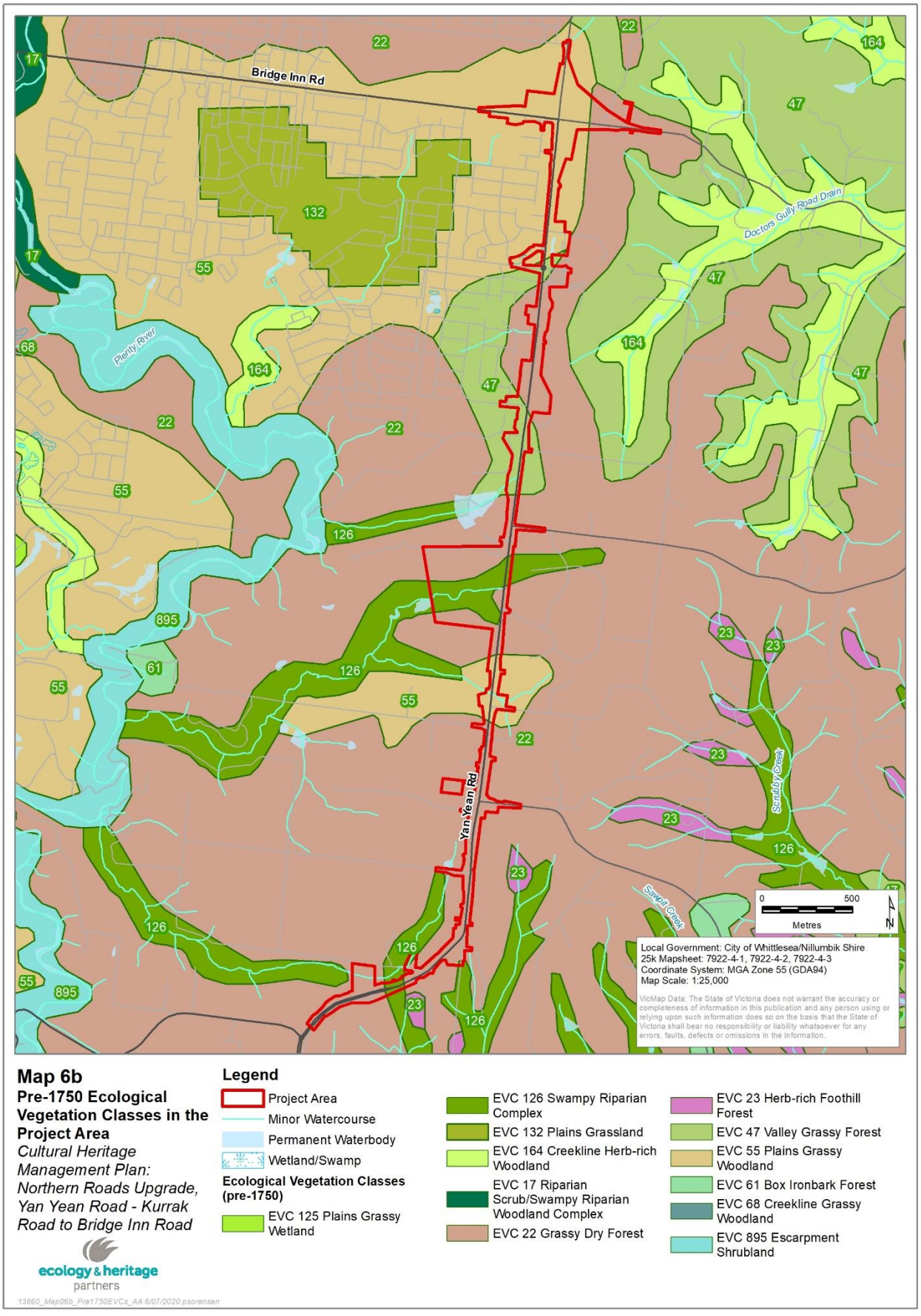
13660_Map05b_Geomorph_AA 6/07/2020 psorensen
Legend
Project Area
Contour (10m)
Minor Watercourse
Permanent Waterbody
Wetland/Swamp
Geomorphological Units
Eastern Uplands
1.3.1 Low relief landscapes at low elevation (Cann River south, Silvan, Templestowe)
1.4.3 Escarpments, gorges (Mt. Buffalo escarpment/gorge, Erinundra escarpment; Genoa, Mitchell, Moroka gorges and Snowy River gorges)
1.4.5 Moderately dissected ridge and valley landscapes (Alexandra, Yea, Baranduda)
Western Plains
6.1.2 Stony rises (Mt. Eccles, Pomborneit, Mt. Rouse)
Doreen
Whittlesea (C)
Nillumbik (S)
Yarrambat
Melbourne
0
500
Metres
N

Map 6 : Pre-1750 Ecological Vegetation Classes in the Geographic Region





Map 6b
Pre-1750 Ecological Vegetation Classes in the Project Area
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road

ecology & heritage partners

13660_Map06b_Pre1750EVCs_AA 6/07/2020 psorensen

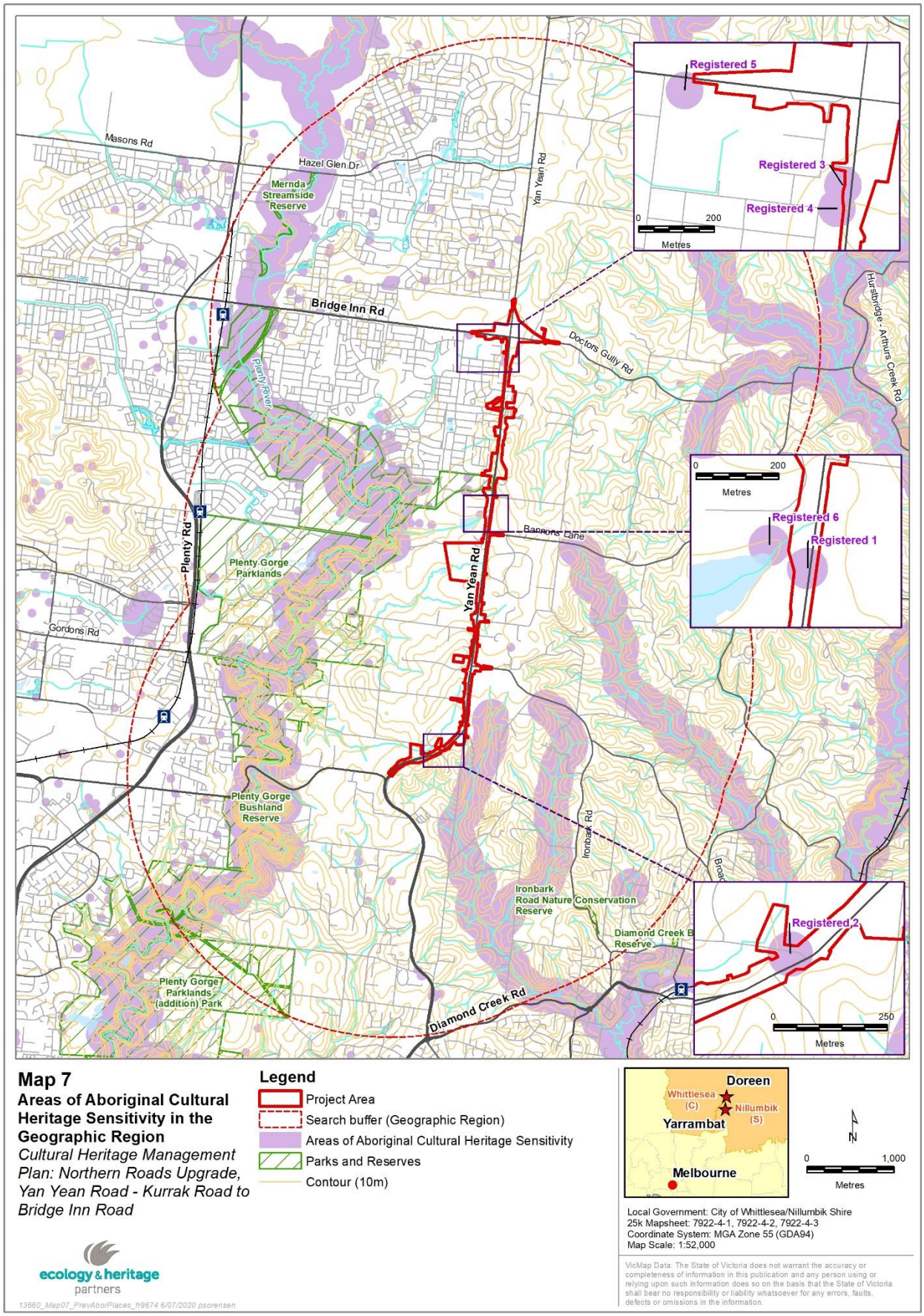
Legend

- Project Area
- Minor Watercourse
- Permanent Waterbody
- Wetland/Swamp

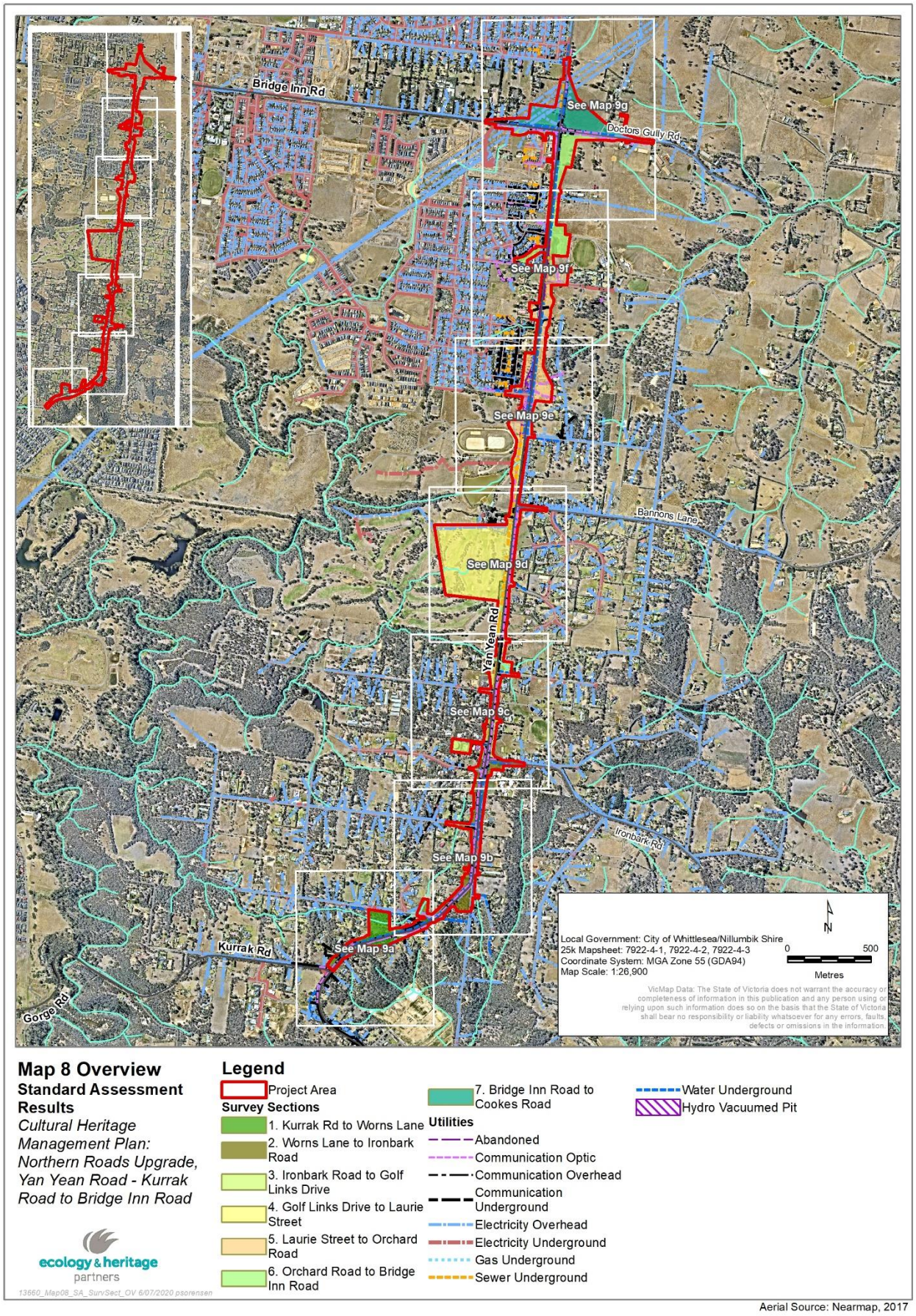
Ecological Vegetation Classes (pre-1750)

- EVC 125 Plains Grassy Wetland
- EVC 126 Swampy Riparian Complex
- EVC 132 Plains Grassland
- EVC 164 Creekline Herb-rich Woodland
- EVC 17 Riparian Scrub/Swampy Riparian Woodland Complex
- EVC 22 Grassy Dry Forest
- EVC 23 Herb-rich Foothill Forest
- EVC 47 Valley Grassy Forest
- EVC 55 Plains Grassy Woodland
- EVC 61 Box Ironbark Forest
- EVC 68 Creekline Grassy Woodland
- EVC 895 Escarpment Shrubland

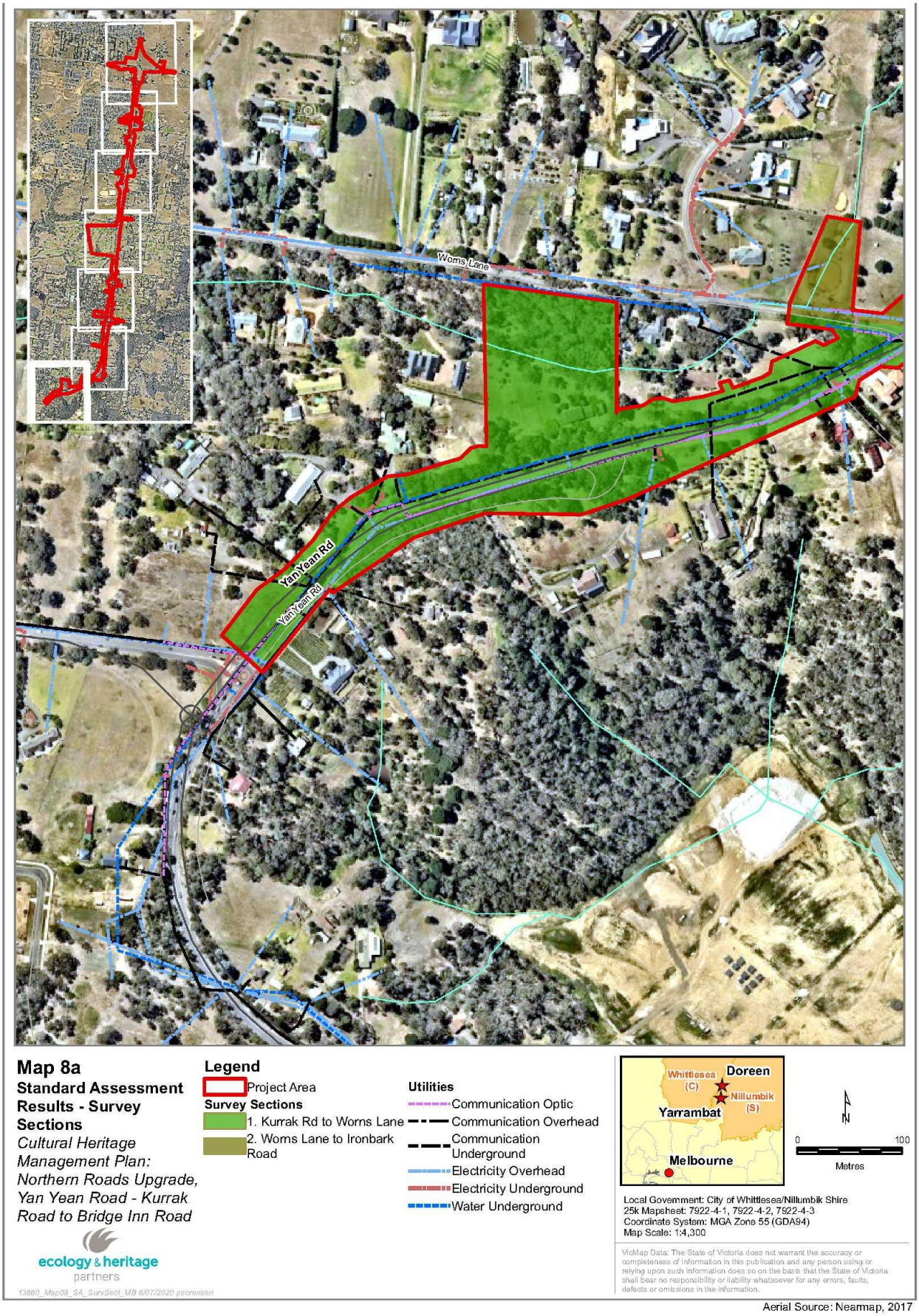
Map 7: Areas of Aboriginal Cultural Heritage Sensitivity in the Geographic Region



Map 8: Standard Assessment Survey Area and Areas of Archaeological Likelihood



Aerial Source: Nearmap, 2017



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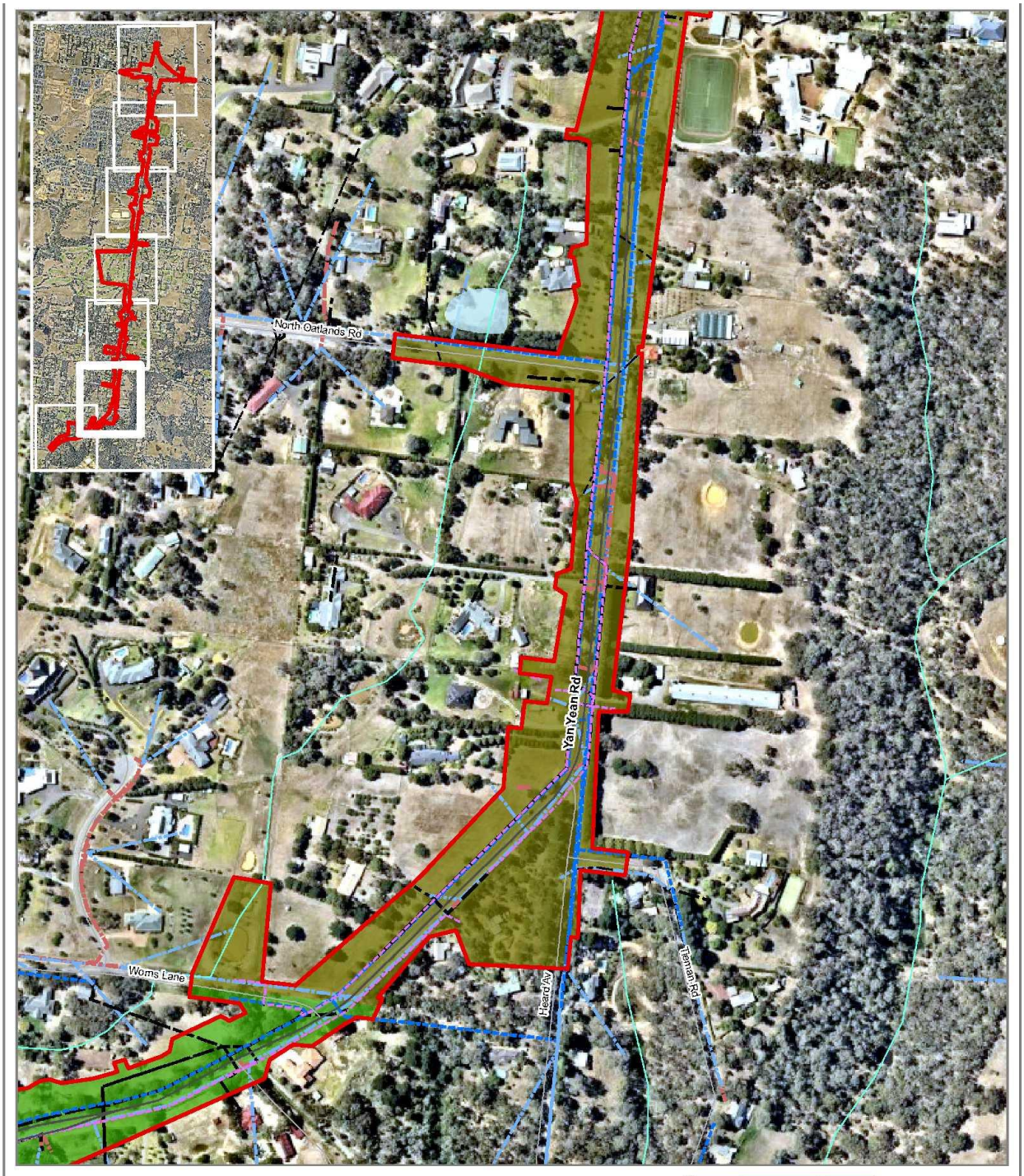


Map 8b
Standard Assessment Results - Survey Sections
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road

ecology & heritage partners

13660_Map08_SA_SurvSect_MB 6/07/2020 pscrensen

Legend

Project Area

Survey Sections
1. Kurrak Rd to Worms Lane
2. Worms Lane to Ironbark Road

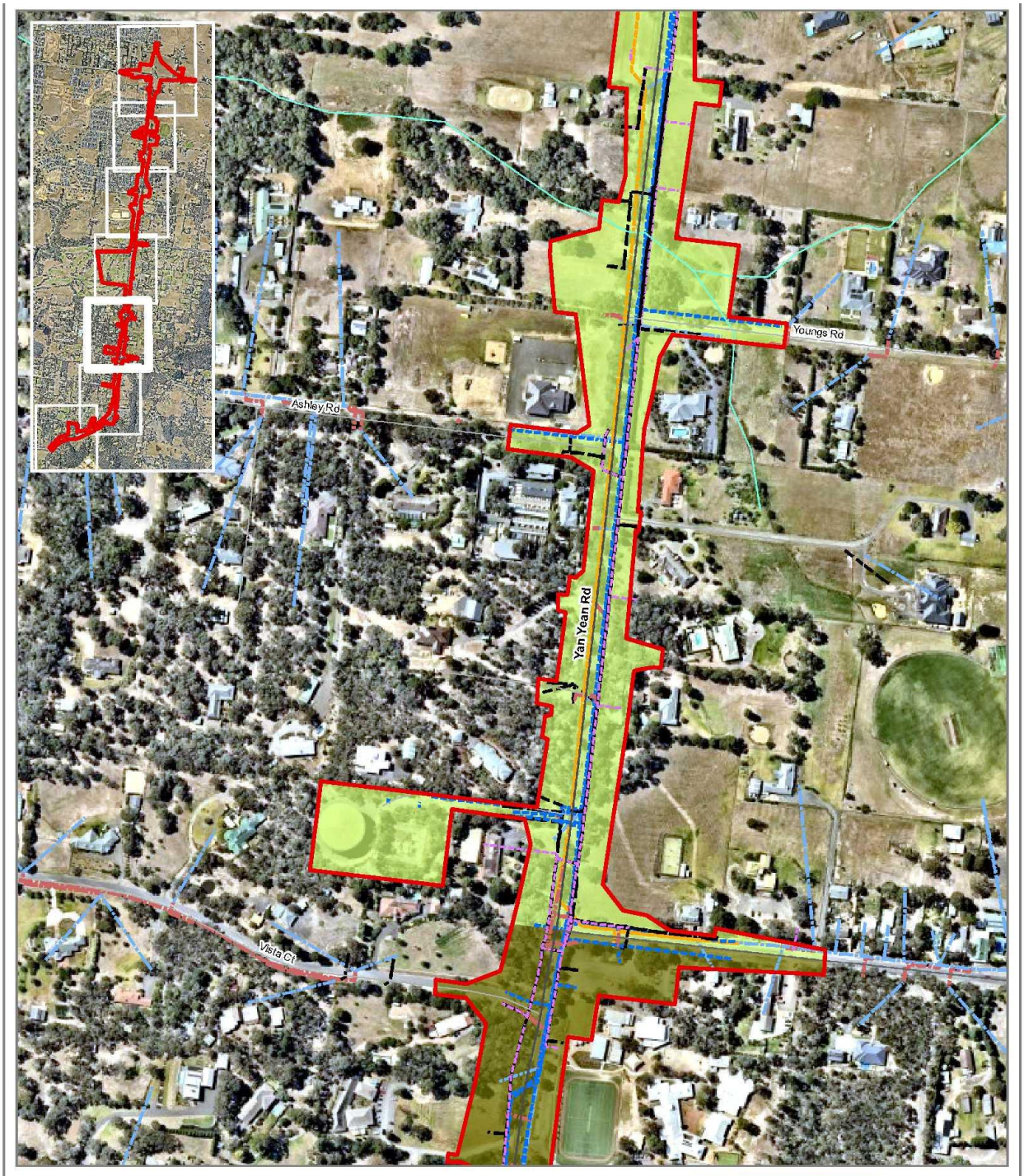
Utilities
Communication Optic
Communication Overhead
Communication Underground
Electricity Overhead
Electricity Underground
Water Underground

N

0 100
Metres

Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:4,300

Aerial Source: Nearmap, 2017



Map 8c
Standard Assessment Results - Survey Sections
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road

ecology & heritage partners

13660_Map08_SA_SurvSect_MB 6/07/2020 pscrensen

Legend

Project Area

Survey Sections

2. Worns Lane to Ironbark Road

3. Ironbark Road to Golf Links Drive

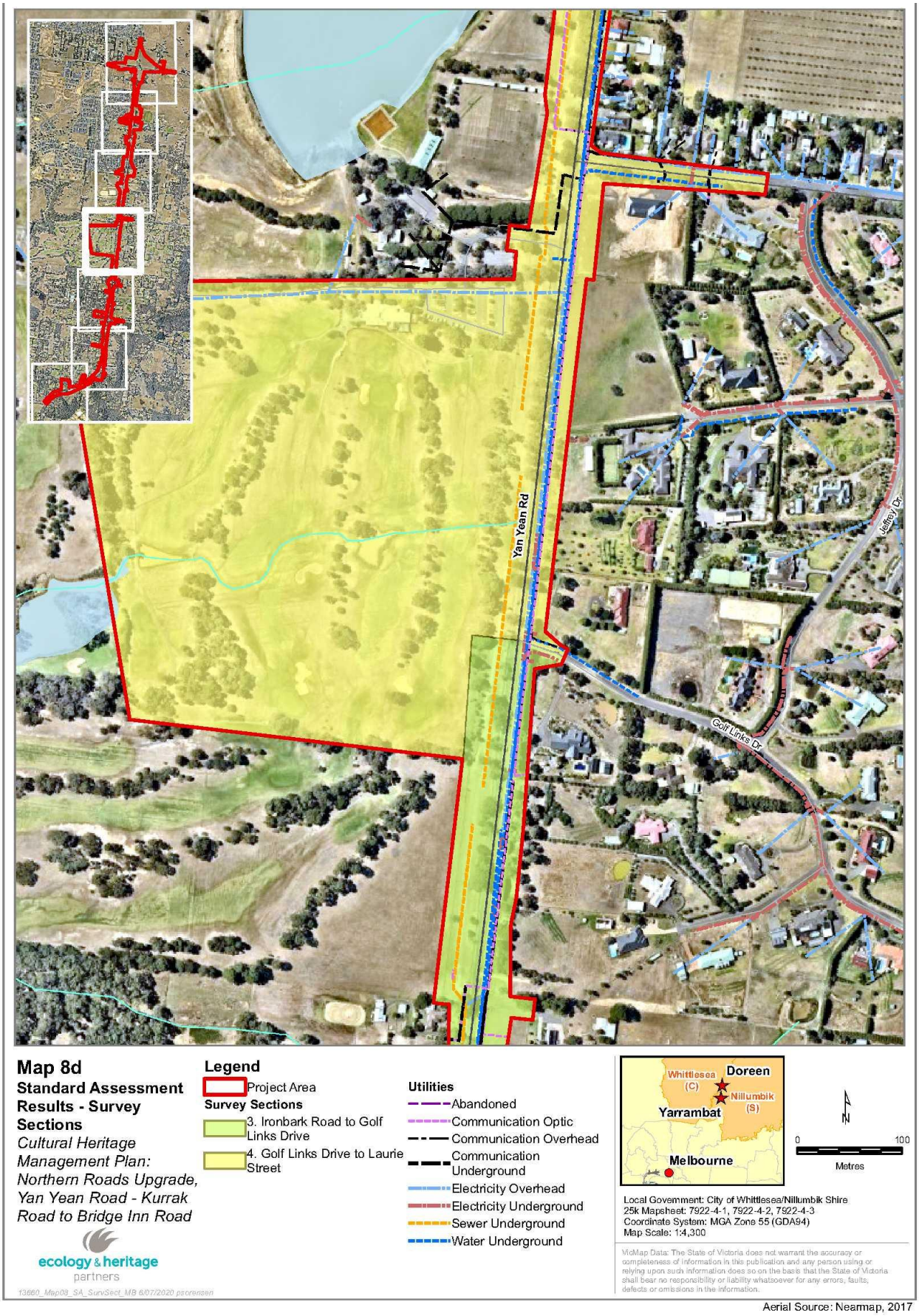
Utilities

Communication Optic
Communication Overhead
Communication Underground
Electricity Overhead
Electricity Underground
Sewer Underground
Water Underground

0 100
Metres

Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:4,300

Aerial Source: Nearmap, 2017



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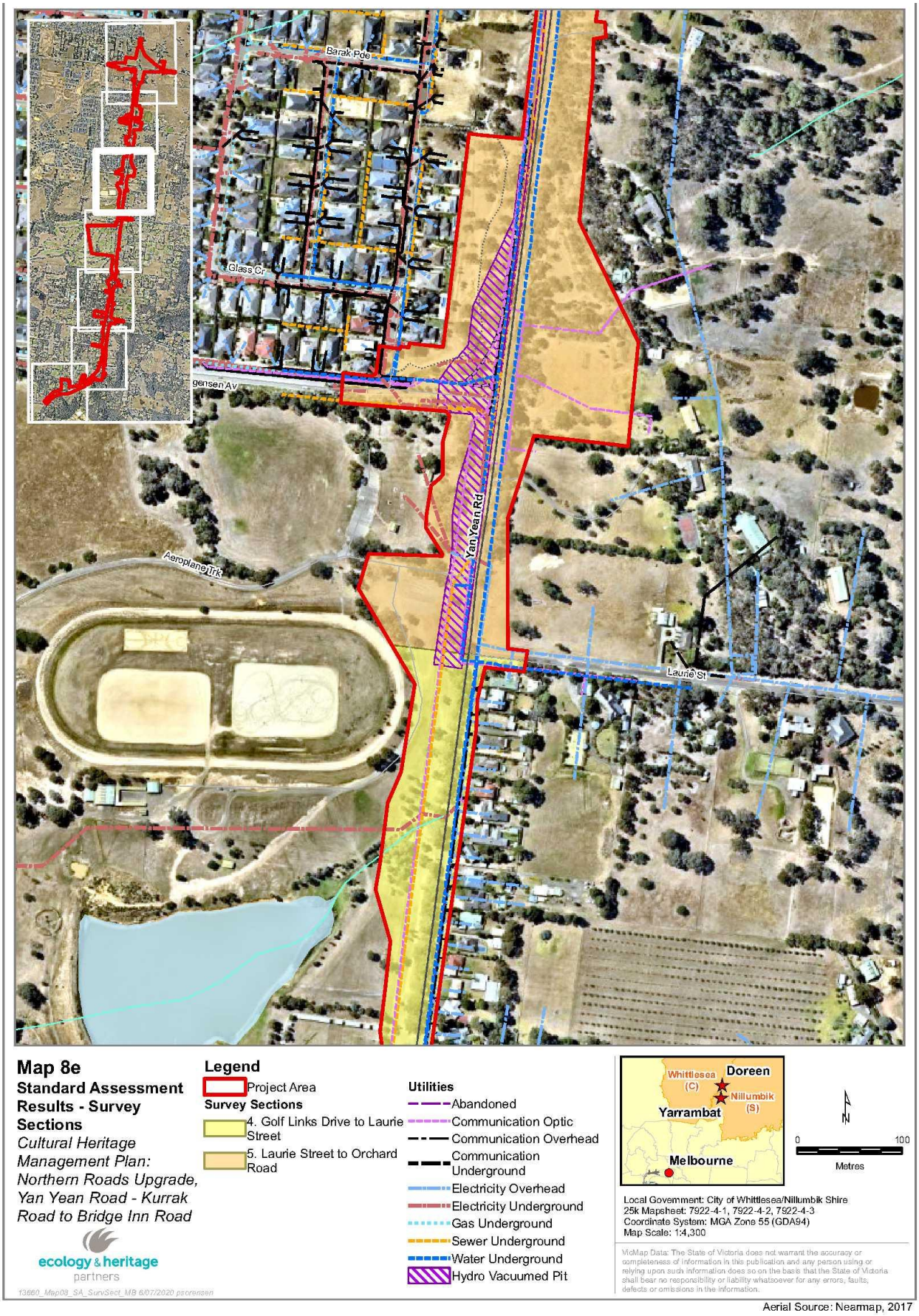
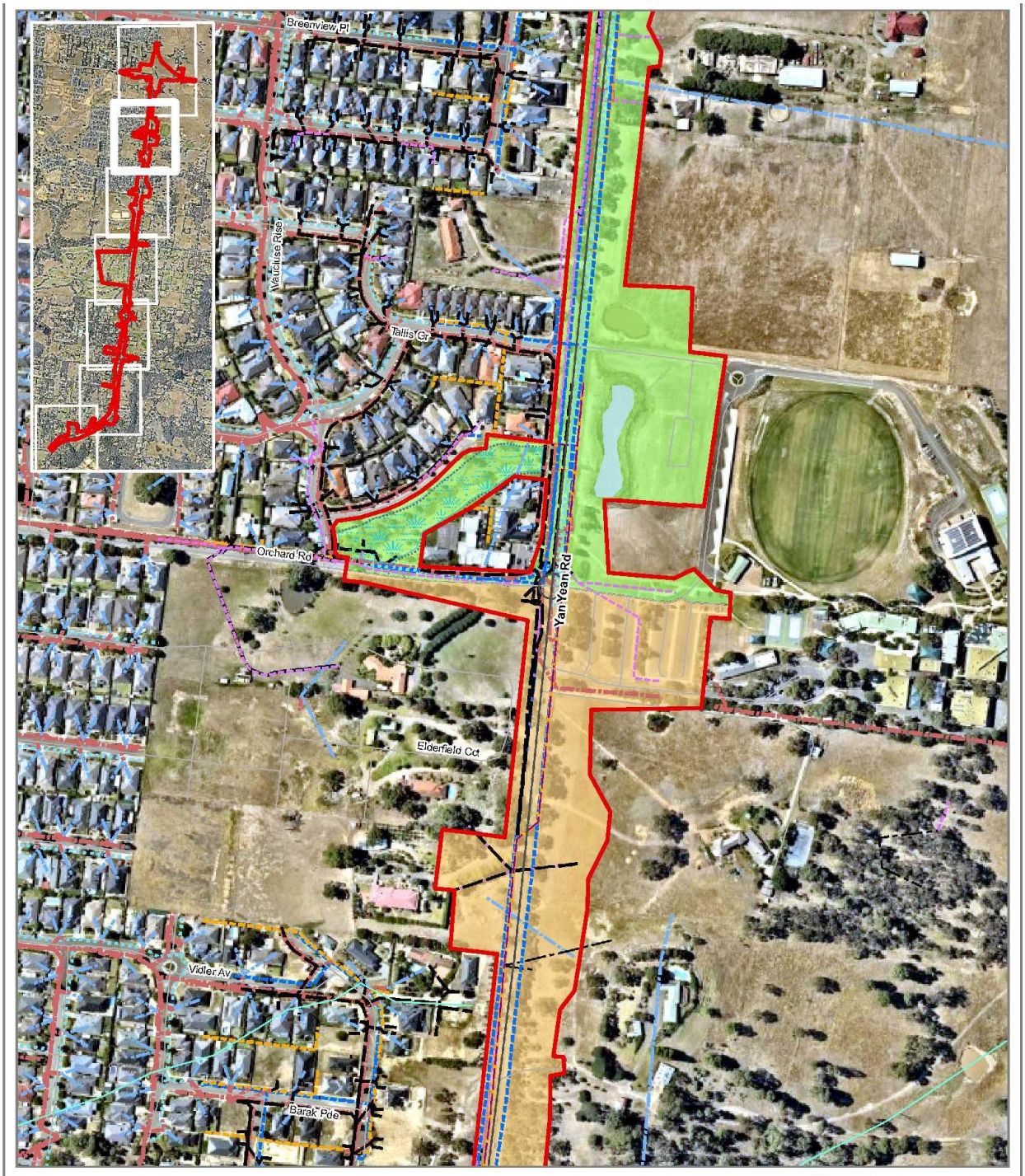

Barak Pde
Glass Cr
gensen Av
Aeroplane Trk
Yan Yean Rd
Laurie St
Map 8e
Standard Assessment Results - Survey Sections
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road
ecology & heritage partners
13660_Map08_SA_SurvSect_MB 6/07/2020 pscrensen
Legend
Project Area
Survey Sections
4. Golf Links Drive to Laurie Street
5. Laurie Street to Orchard Road
Utilities
Abandoned
Communication Optic
Communication Overhead
Communication Underground
Electricity Overhead
Electricity Underground
Gas Underground
Sewer Underground
Water Underground
Hydro Vacuumed Pit
Whittlesea (C)
Doreen
Nillumbik (S)
Yarrambat
Melbourne
N
0
100
Metres
Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:4,300
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.
Aerial Source: Nearmap, 2017



Map 8f
Standard Assessment Results - Survey Sections
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road

ecology & heritage partners

13660_Map08_SA_SurvSect_MB 6/07/2020 pscreesen

Legend

Project Area

Survey Sections

- 5. Laurie Street to Orchard Road
- 6. Orchard Road to Bridge Inn Road

Utilities

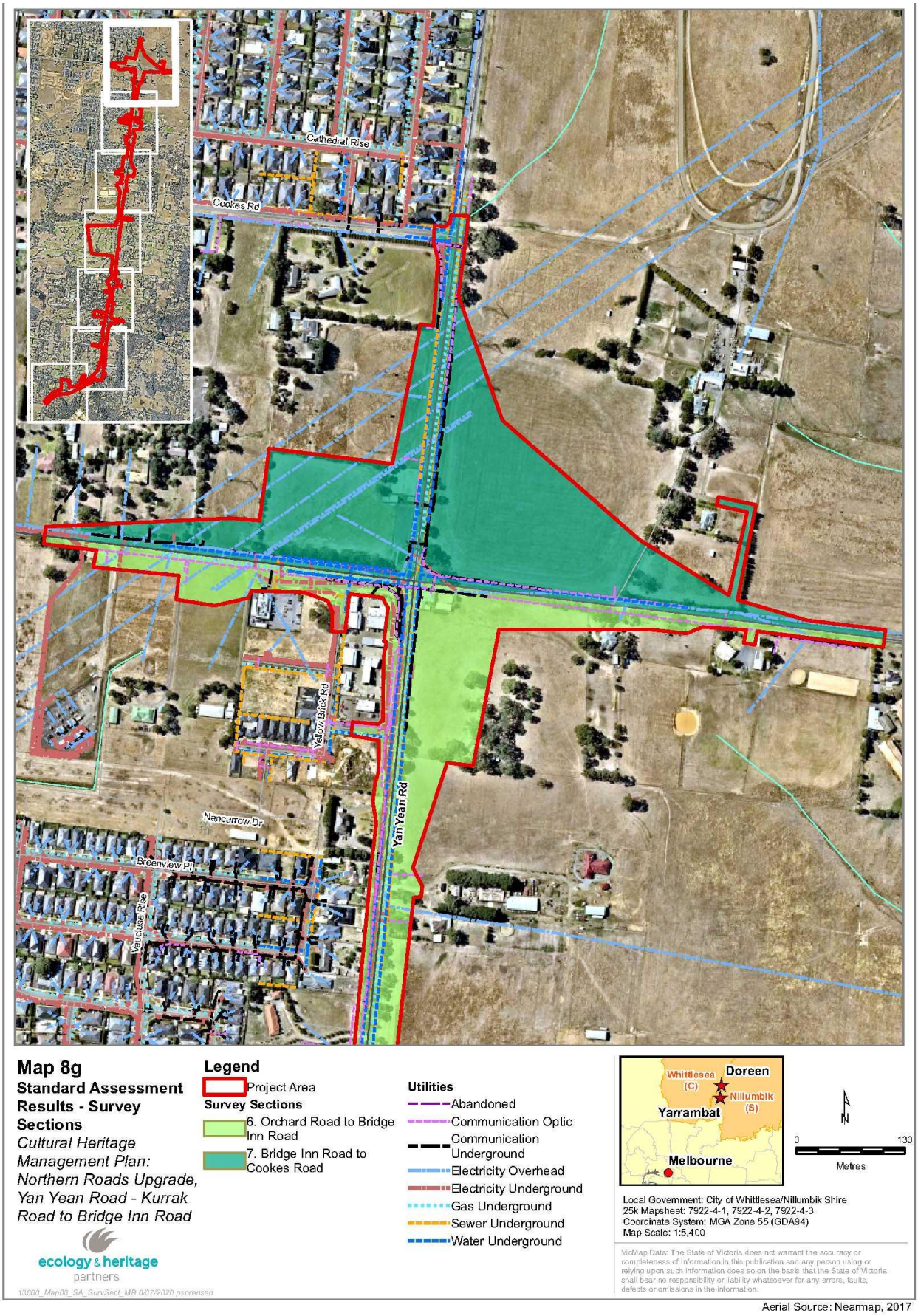
- Abandoned
- Communication Optic
- Communication Overhead
- Communication Underground
- Electricity Overhead
- Electricity Underground
- Gas Underground
- Sewer Underground
- Water Underground

0 100
Metres

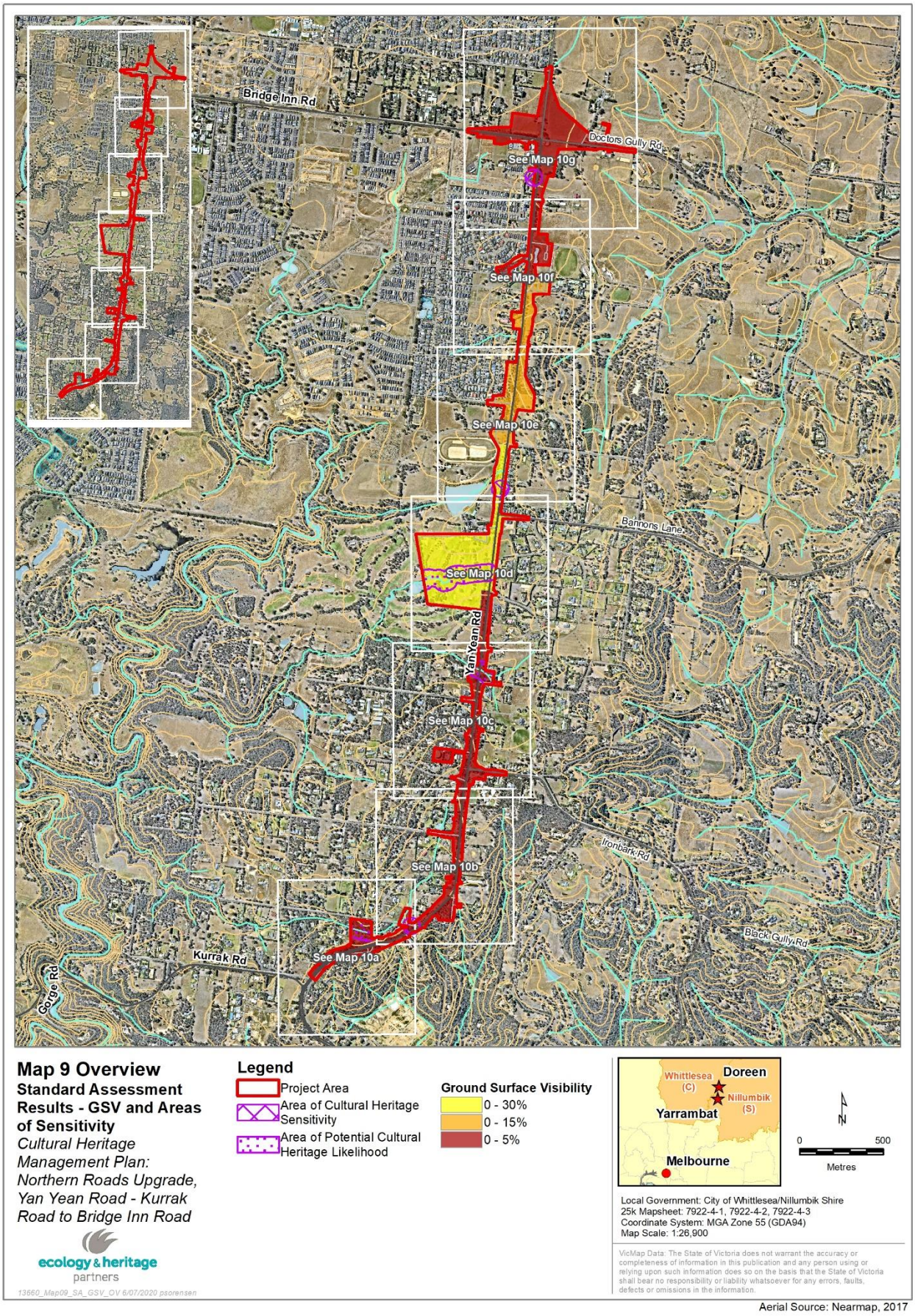
Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:4,300

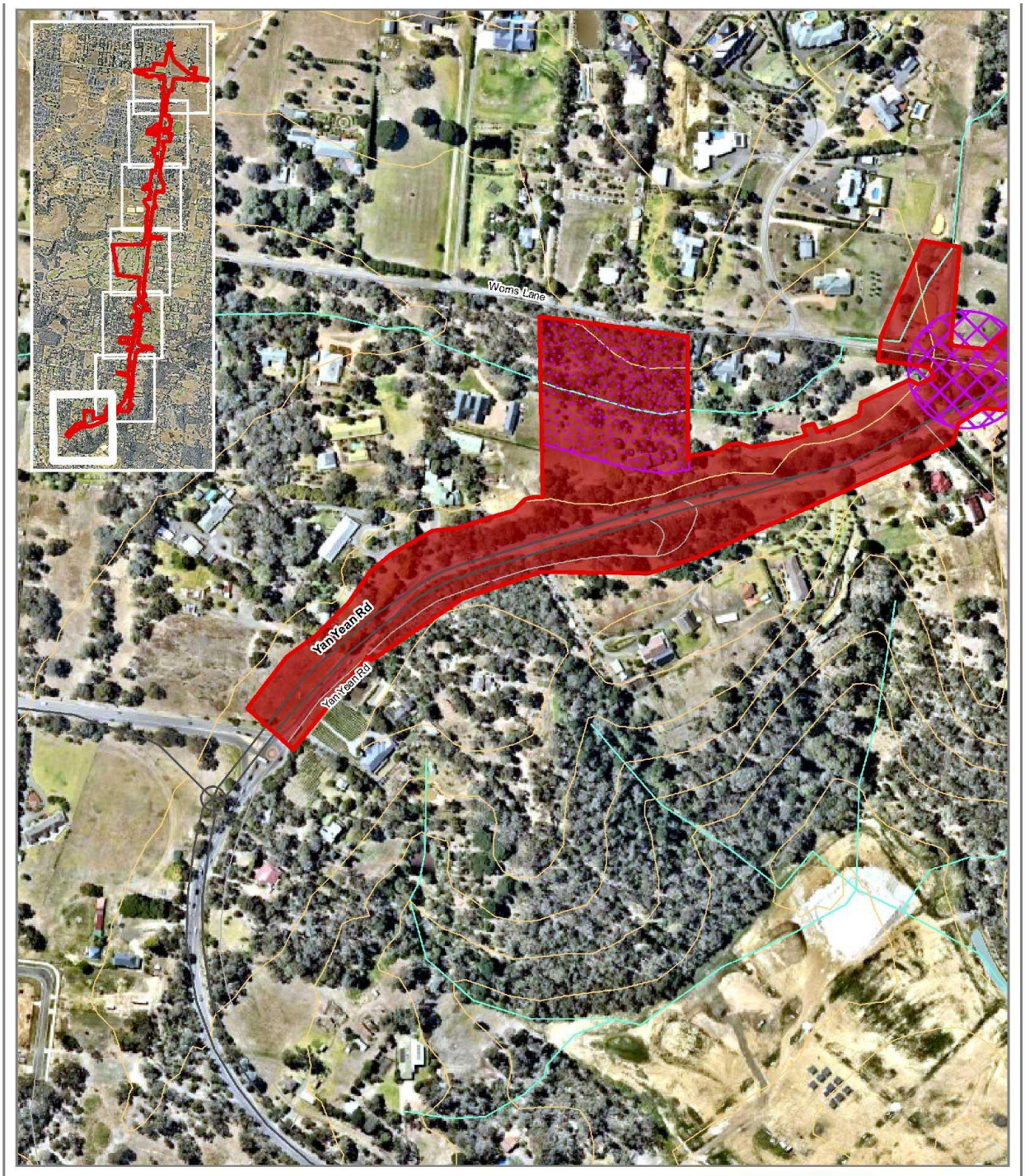
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects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

Aerial Source: Nearmap, 2017


Cathedral Rise
Cookes Rd
Yellow Brick Rd
Yan Yean Rd
Nancarrow Dr
Breenview Pl
Vaucluse Rise
Map 8g
Standard Assessment Results - Survey Sections
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road
ecology & heritage partners
13660_Map08_SA_SurvSect_MB 6/07/2020 psorensen
Legend
Project Area
Survey Sections
6. Orchard Road to Bridge Inn Road
7. Bridge Inn Road to Cookes Road
Utilities
Abandoned
Communication Optic
Communication Underground
Electricity Overhead
Electricity Underground
Gas Underground
Sewer Underground
Water Underground
Whittlesea (C)
Doreen
Nillumbik (S)
Yarrambat
Melbourne
0
130
Metres
Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:5,400
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.
Aerial Source: Nearmap, 2017

Map 9 : Standard Assessment Results – GSV and Areas of Sensitivity





Map 9a
Standard Assessment Results - GSV and Areas of Sensitivity
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road

ecology & heritage partners

13660_Map09_SA_GSV_MB 6/07/2020 psorensen

Legend
- Project Area
- Area of Cultural Heritage Sensitivity
- Area of Potential Cultural Heritage Likelihood

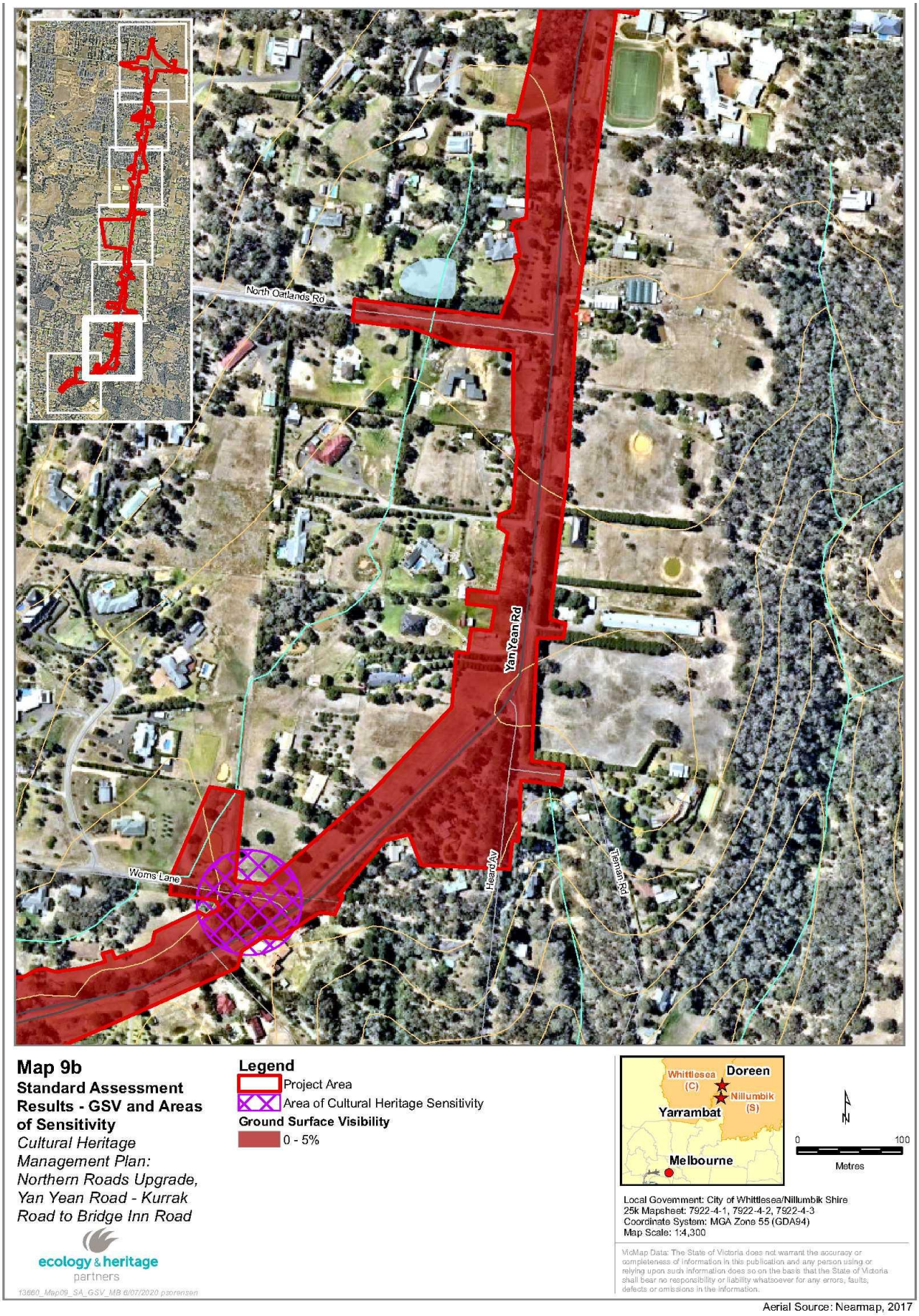
Ground Surface Visibility
- 0 - 5%

N

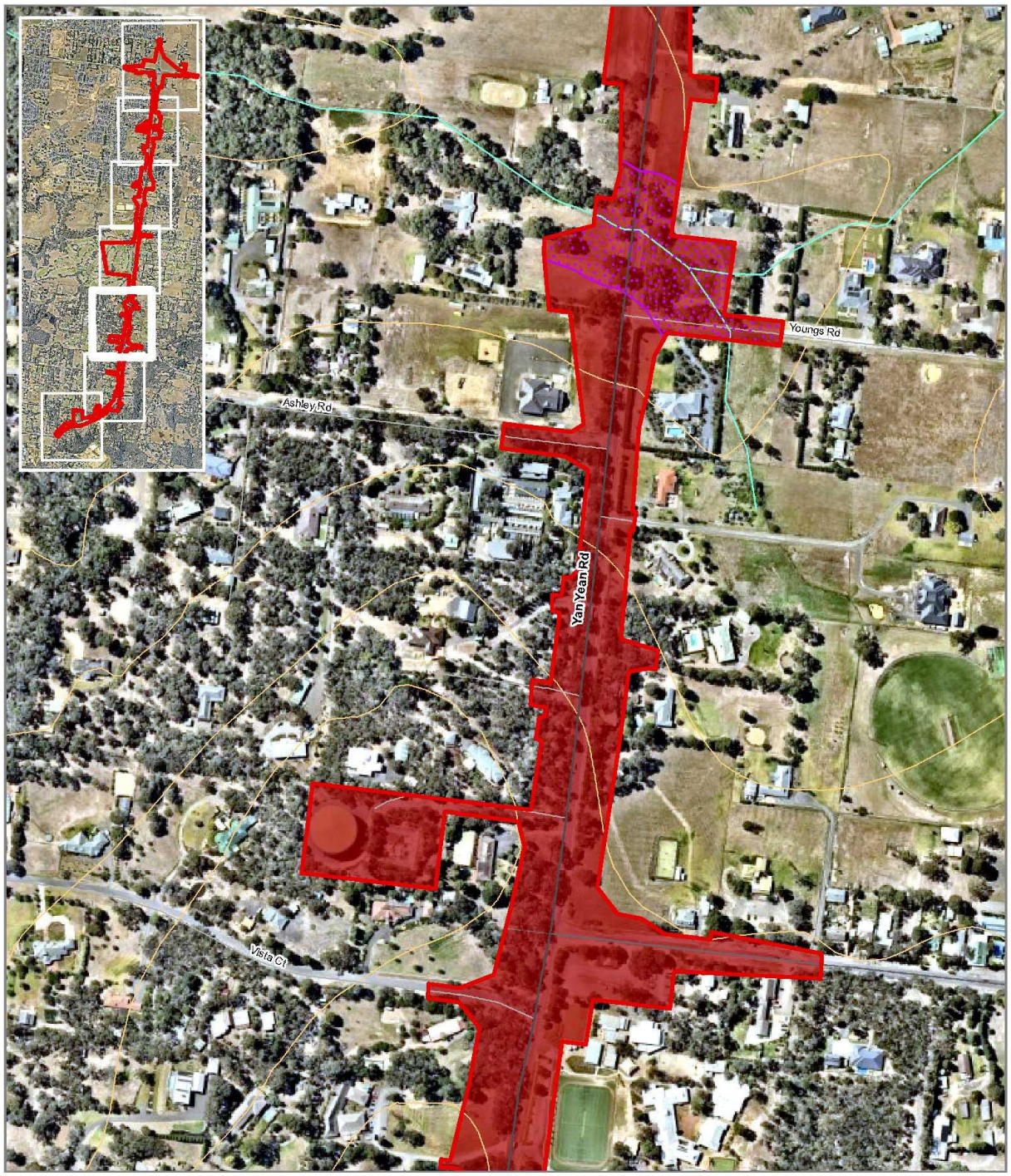
0 100
Metres

Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:4,300

Aerial Source: Nearmap, 2017



Aerial Source: Nearmap, 2017



Map 9c
Standard Assessment Results - GSV and Areas of Sensitivity
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road

ecology & heritage partners

13660_Map09_SA_GSV_MB 6/07/2020 psorensen

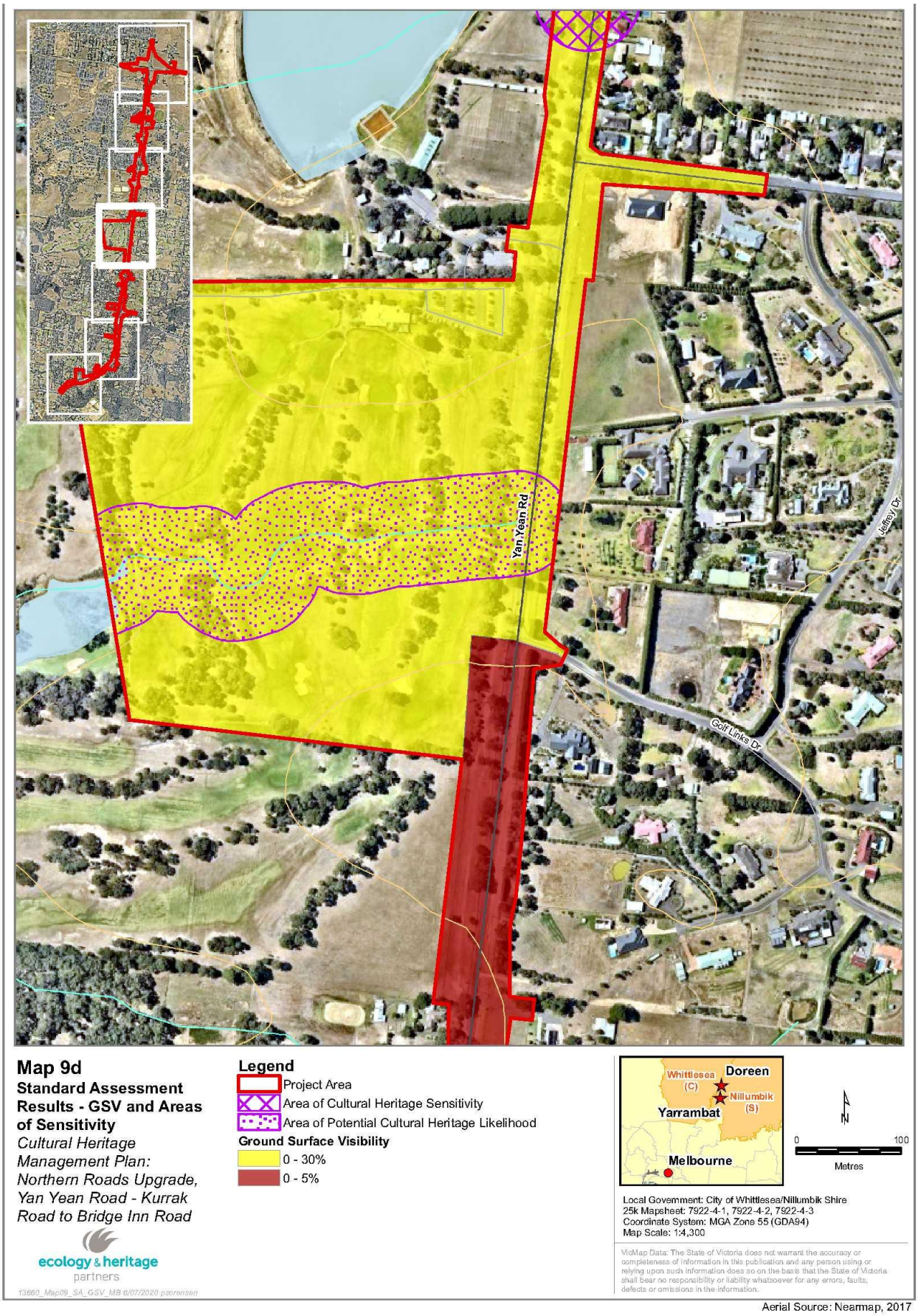
Legend
Project Area
Area of Potential Cultural Heritage Likelihood
Ground Surface Visibility
0 - 5%

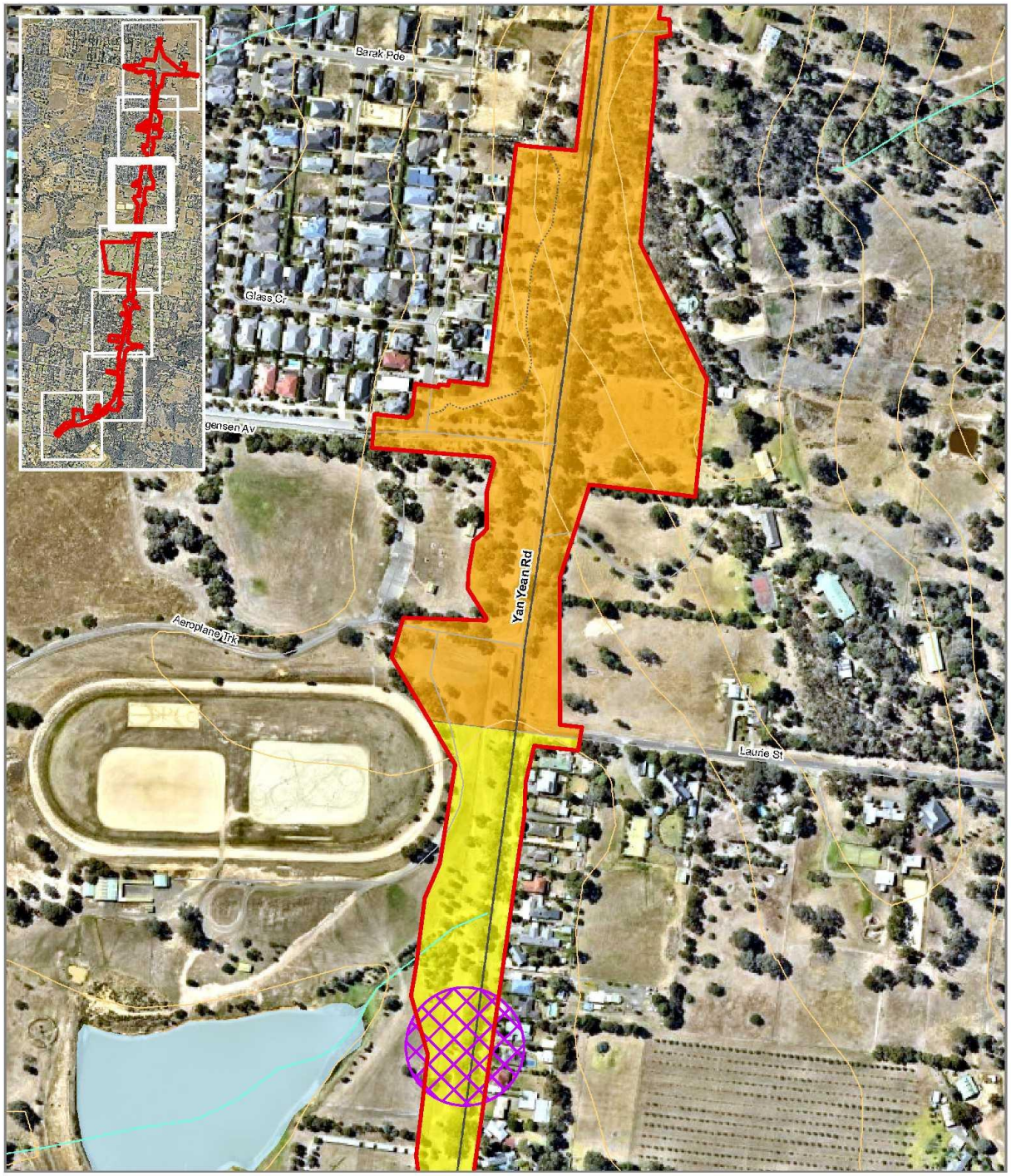
N

0 100
Metres

Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:4,300

Aerial Source: Nearmap, 2017


Yan Yean Rd
Jeffrey Dr
Golf Links Dr
Map 9d
Standard Assessment Results - GSV and Areas of Sensitivity
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road
ecology & heritage partners
13660_Map09_SA_GSV_MB 6/07/2020 psorensen
Legend
Project Area
Area of Cultural Heritage Sensitivity
Area of Potential Cultural Heritage Likelihood
Ground Surface Visibility
0 - 30%
0 - 5%
Whittlesea (C)
Doreen
Nillumbik (S)
Yarrambat
Melbourne
0
100
Metres
Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:4,300
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.
Aerial Source: Nearmap, 2017



Map 9e
Standard Assessment Results - GSV and Areas of Sensitivity
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road

ecology & heritage partners

13660_Map09_SA_GSV_MB 6/07/2020 psorensen

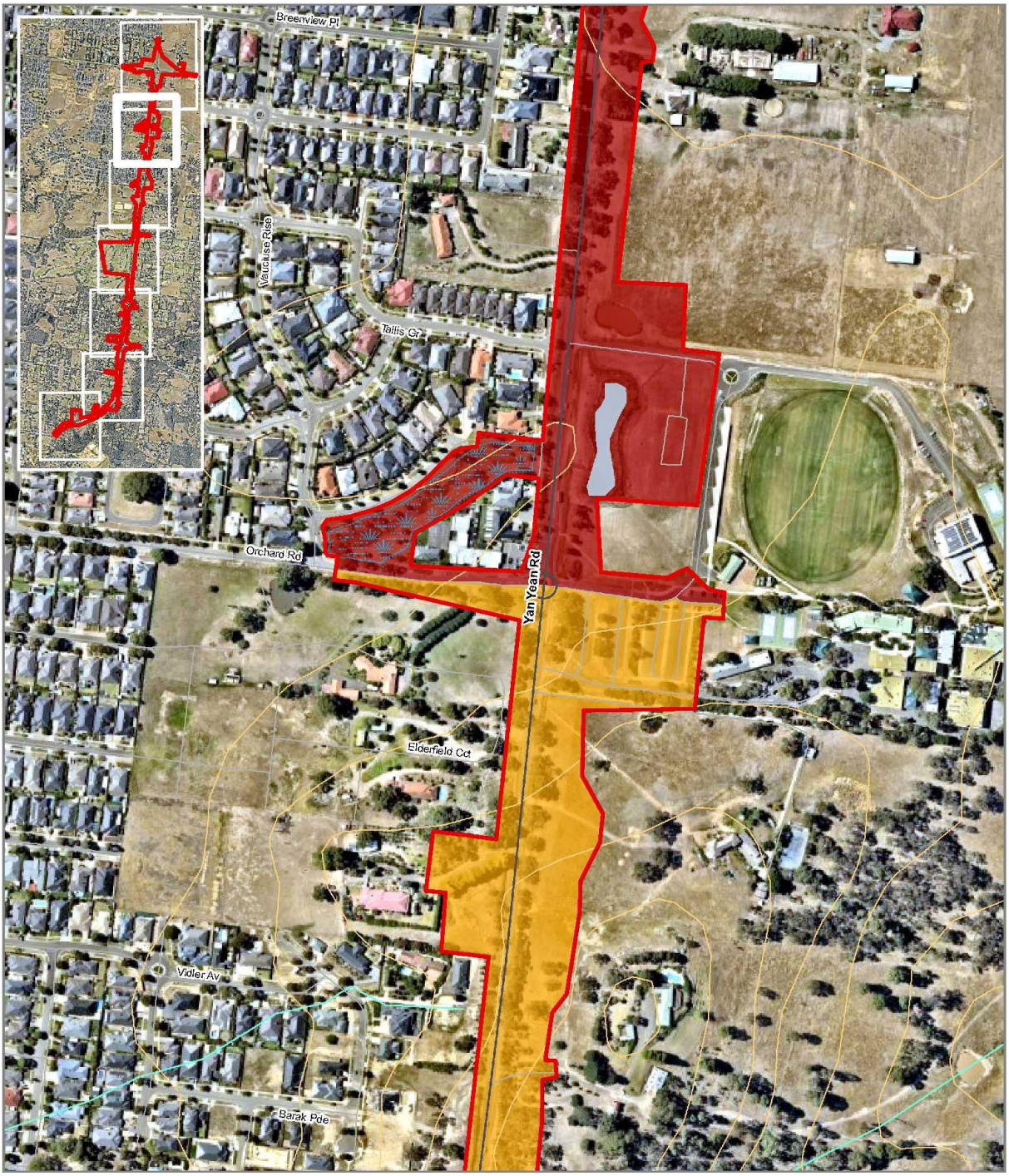
Legend
- Project Area
- Area of Cultural Heritage Sensitivity

Ground Surface Visibility
- 0 - 30%
- 0 - 15%

0 100
Metres

Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:4,300

Aerial Source: Nearmap, 2017

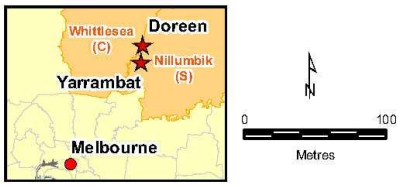


Map 9f
Standard Assessment Results - GSV and Areas of Sensitivity
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road

ecology & heritage partners

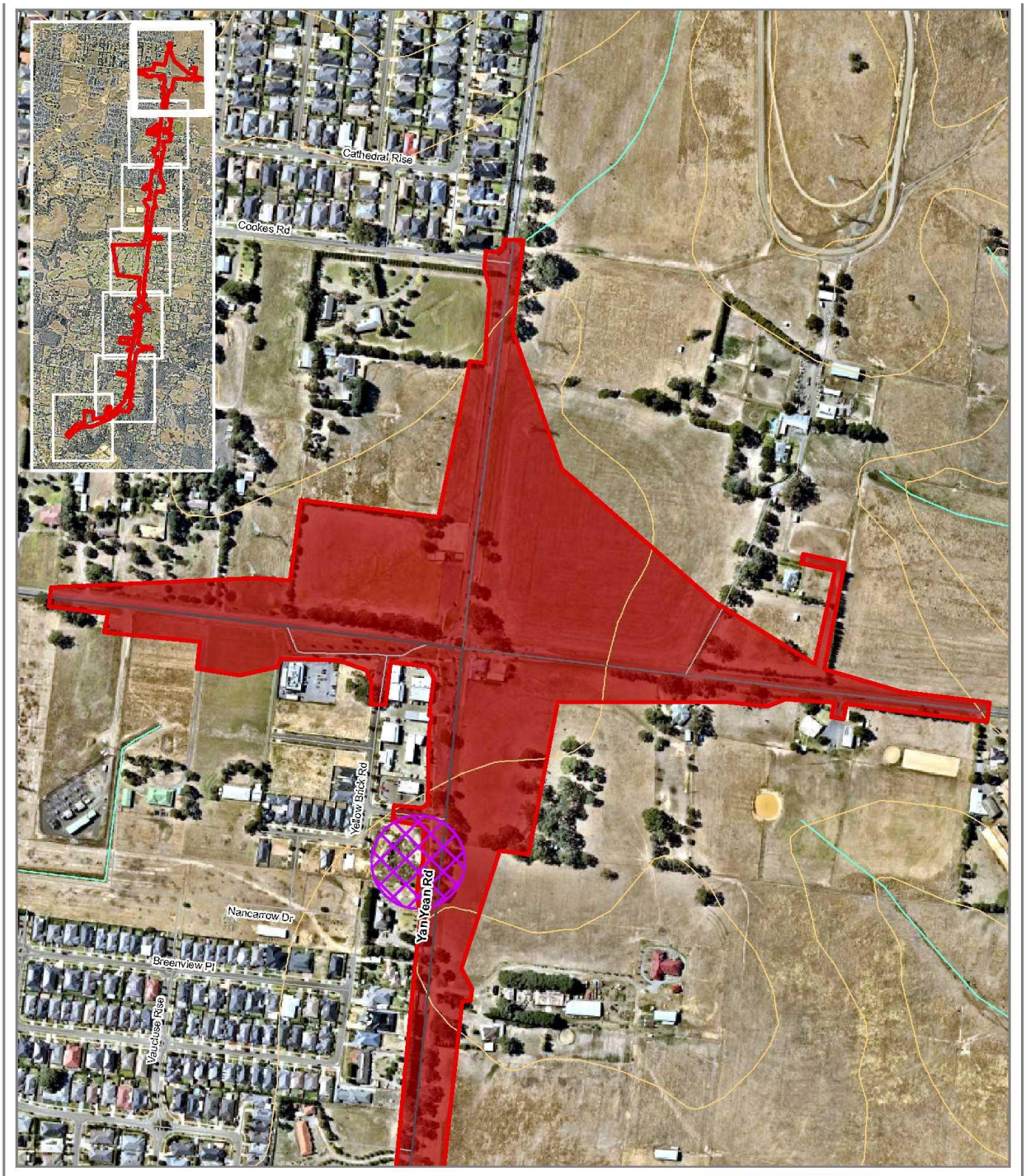
13660_Map09_SA_GSV_MB 6/07/2020 pcorensen

Legend
Project Area
Ground Surface Visibility
0 - 15%
0 - 5%



Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:4,300

Aerial Source: Nearmap, 2017



Map 9g
Standard Assessment Results - GSV and Areas of Sensitivity
Cultural Heritage Management Plan: Northern Roads Upgrade, Yan Yean Road - Kurrak Road to Bridge Inn Road

ecology & heritage partners

13660_Map09_SA_GSV_MB 6/07/2020 psorensen

Legend
Project Area
Area of Cultural Heritage Sensitivity
Ground Surface Visibility
0 - 5%

0 130
Metres

Local Government: City of Whittlesea/Nillumbik Shire
25k Mapsheet: 7922-4-1, 7922-4-2, 7922-4-3
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:5,400

Aerial Source: Nearmap, 2017

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GLOSSARY

Items highlighted in ***bold italics*** in the definition are defined elsewhere in the glossary.

Acronym	Description
Aboriginal Cultural Heritage Likelihood	An area assessed by a Heritage Advisor as having potential for containing either surface or subsurface Aboriginal archaeological deposits. This term is used in this report to differentiate between *legislated* ***areas of cultural heritage sensitivity*** and areas considered by an archaeologist to be sensitive.
Aboriginal Place	An area in Victoria or the coastal waters of Victoria that is of cultural heritage significance to the Aboriginal people of Victoria (the Act). For the purposes of this CHMP, an Aboriginal place is an ***Aboriginal place*** that has been registered on the ***VAHR***.
Aboriginal Place	A location containing Aboriginal cultural heritage, e.g. ***Artefact scatter***, ***isolated artefact***, ***scarred tree***, ***shell midden***, whether or not the place is registered in the ***VAHR***, cf. ***Aboriginal Place***.
AV	**Aboriginal Victoria**. Formerly the Office of Aboriginal Affairs Victoria, a division of ***DPC*** responsible for management of Aboriginal cultural heritage in Victoria.
Angular Fragment	An artefact which has technologically diagnostic features but has no discernible ventral or dorsal surface and hence is unidentifiable as either a flake or a core
Area of Cultural Heritage Sensitivity	An area specified as an area of cultural heritage sensitivity in Division 3 or Division 4 of Part 2 of the *Aboriginal Heritage Regulations 2018*.
Artefact Scatter	Stone artefact scatters consist of more than one stone artefact. Activities associated with this place type include stone tool production, hunting and gathering or domestic places associated with campsites. Stone artefacts may be flakes of stone, cores (flakes are removed from the stone cores) or tools. Some scatters may also contain other material such as charcoal, bone, shell and ochre.
Assemblage	The name given to encompass the entire collection of artefacts recovered by archaeologists, invariably classified into diagnostic items used to describe the material culture.
Backed	When one margin of a flake is retouched at a steep angle, and that margin is opposite a sharp edge. The steep margin is formed by bi-polar or hammer and anvil knapping. Also used to describe artefacts with backing, e.g. Backed artefact.
Backed Artefact	A class of artefact employed by archaeologists to describe artefacts which are backed. Sometimes divided into elouera, bondi point, microlith and geometric.
Before Present (BP)	In relation to radiocarbon dating refers to a specified amount of time or a specific point in time before 1950 AD.
Bipolar	A flaking technique where the object to be reduced is rested on an anvil and struck. This process is identified by flakes with platform angles close to 90 degrees as well as apparent initiation from both ends. Some crushing may also be visible.
Burials	Aboriginal communities strongly associate burial places with a connection to country and are opposed to disturbance of burials or their associated places. General considerations for the presence of burial places are the suitability of Subsurface deposits for digging purposes; with soft soil and sand being the most likely. They are more likely near water courses or in dunes near old lake beds or near the coast. Burials are often located near other places such as oven mounds, ***shell middens*** or ***artefact scatters***.
Chert	A cryptocrystalline siliceous sedimentary stone.
CHMP	**Cultural Heritage Management Plan**. A plan prepared under the *Aboriginal Heritage Act 2006*.

Acronym	Description
Core	An artefact which has technologically diagnostic features. Generally this class of artefact has only negative scars from flake removal, and thus no ventral surface, however, for the purposes of this research core has been employed to encompass those artefacts which were technically flakes but served the function of a core (ie. The provider of flakes).
Cortex	The weathered outer portion of a stone, often somewhat discoloured and coarser compared with the unweathered raw material.
Decortications	The process of removing cortex from a stone (generally by flaking).
Deep Ripping	The ploughing of soil using a ripper or subsoil cultivation tool to a depth of 60 cm or more (see ***significant ground disturbance***).
DELWP	**Department of Environment, Land, Water and Planning.** The Victorian State Government department responsible for management of natural and historical heritage in Victoria. **HV**, responsible for management of historical heritage in Victoria, is a part of DELWP.
DPC	**Department of the Premier and Cabinet**. The Victorian State Government department, of which **AV** is a part, responsible for management of Aboriginal cultural heritage in Victoria.
DAWE	**Department of Agriculture, Water and the Environment**. The Commonwealth Government department responsible for management of heritage sites on the World, National or Commonwealth Heritage lists.
Flake	An artefact which has technologically diagnostic features and a ventral surface.
Ground Surface Visibility (GSV)	Ground surface visibly (GSV) is the determination of how much of the surface is visible to you and what factors such as vegetation or introduced gravel might limit the visibility of artefacts on the surface. GSV can be categorised as for example, not visible (0%), poor (0-10%), fair (10-50%), good (50-90%) and excellent (90-100%). Meaning that this percentage of GSV was visible on the ground surface during the survey.
High Impact Project	A Project specified as a high impact Project in Division 5 of Part 2 of the *Aboriginal Heritage Regulations 2018*.
HV	**Heritage Victoria**. A division of ***DELWP*** responsible for management of historical heritage in Victoria.
Isolated Finds Or Artefacts	Isolated finds refer to a single artefact. These artefacts may have been dropped or discarded by its owner once it was of no use. This place type can also be indicative of further subsurface archaeological deposits. These place types can be found anywhere within the landscape; however, they are more likely to occur within contexts with the same favourable characteristics for stone artefact scatter places. Isolated finds are no longer registered on the ***VAHR*** as a place type; they now form part of an ***LDAD***.
LDAD	**Low Density Artefact Distribution**. A category of ***Aboriginal Place*** type in the ***VAHR*** comprising single stone artefacts and/or distributions of multiple stone artefacts at concentrations of less than 10 artefacts in a 10 x 10 m area.
Manuport	An object which has been carried by humans to the place.
Oriented Length	Dimension measured according to the following criteria: The length of the flake from the platform, at 90˚ to force indicators such as ring-crack, bulb of percussion, force ripples and striations, to the opposing end. Where there were an insufficient number of features present to take this measurement, such as when the flake was broken, this variable was not recorded (sometimes referred to as percussion length).
Oriented Thickness	Dimension measured at 90˚and bisecting the oriented width dimension. This was done from the ventral surface to the dorsal surface (sometimes referred to as percussion thickness).

Acronym	Description
Oriented Width	Dimension measured at 90˚and bisecting the oriented length dimension. This was done from one margin to the other. As this measurement and oriented thickness, both rely on oriented length, these were not recorded where the oriented length was not recorded (sometimes referred to as percussion width).
Place Inspection Form	A Place Inspection Form (PIF) is to provide a consistent record of all inspections of a registered Aboriginal place or object. The PIF is used to record changes in condition, and to identify current impacts and potential threats to an Aboriginal place or object.
Potential Archaeological Deposit	An area of land that was not formally assessed but is considered likely to contain surface or subsurface archaeological deposits.
Procurement	The process of obtaining raw material for reduction.
Quarries	Stone quarries were used to procure the raw material for making stone tools. Quarries are rocky outcrops that usually have evidence of scars from flaking, crushing and battering the rock. There may be identifiable artefacts near or within the place such as unfinished tools, hammer stones, anvils and grinding stones.
Quartz	A crystalline form of silica.
RAP	**Registered Aboriginal Party**. An Aboriginal organisation with responsibilities relating to the management of Aboriginal cultural heritage for a specified area of Victoria under the *Aboriginal Heritage Act 2006*.
Raw Material	The kind of stone the artefacts were manufactured from.
Reduction	The process of removing stone flakes from another pieces of stone. Generally, this is performed by striking (hard hammer percussion) one rock with another to remove a flake.
Retouch	Retouch is when a ***flake*** is removed after the manufacture of the original flake. This sequence can be observed when a flake scar is present and encroaches over the ventral surface and thus must have been made after the initial flake removal. Recorded whether retouch was absent or present on the artefact.
Rock Shelter	A concave area in a cliff where the cliff overhangs; or a concave area in a tor where the tor overhangs; or a shallow cave, where the height of the concave area is generally greater than its depth.
Scarred Trees	It is known that the wood and bark of trees have been used for a variety of purposes, such as carrying implements, shield or canoes. The removal of this raw material from a tree produces a 'scar'. The identification of a scar associated with aboriginal custom as opposed to natural scarring can be difficult. The scar should be of a certain size and shape to be identifiable with its product; the tree should also be mature in age, from a time that aboriginal people were still active in the area.
Significant Ground Disturbance	Disturbance of topsoil or surface rock layer of the ground or a waterway by machinery in the course of grading, excavating, digging, dredging or ***deep ripping***, but does not include ploughing other than ***deep ripping***.
Silcrete	A silicified sedimentary stone, often with fine inclusions or grains in a cryptocrystalline matrix. Because of the nature of the grains in silcrete (a hindrance in knapping/flaking predictability) the stone is sometimes heat treated. This exposure to heat can be identified by the presence of pot-lidding as well as a 'lustre' to the stone which is otherwise absent in the stones' natural state. Exposure to sufficient heat homogenises the stone matrix and improves the knapping (flake path) predictive potential (Crabtree and Butler 1964; Mandeville and Flenniken 1974; Purdy 1974; Domanski and Webb 1992; Hiscock 1993; Domanski et al. 1994). Similar to indurated mudstone, it has also been demonstrated that silcrete from the hunter valley often turns a red colour after being exposed to heat (Rowney 1992; Mercieca 2000).

Acronym	Description
Stone Arrangements	Stone arrangements are places where Aboriginal people have deliberately positioned stones to form shapes or patterns. They are often known to have ceremonial significance. They can be found where there are many boulders, such as volcanic areas and are often large in size, measuring over five metres in width.
Taphonomy	The study of the processes (both natural and cultural) which affect the deposition and preservation of both the artefacts and the place itself.
Technology	A form of artefact analysis which is based upon the knapping/ manufacturing process, commonly used to subsequently infer behaviour patterns, cultural-selection and responses to raw material or the environment.
Thumbnail scraper	A conceptual class of artefact employed to describe small rounded retouched flakes with steep margins (based on the classification by Mulvaney and Kamminga 1999).
VAHR	Victorian Aboriginal Heritage Register. A register of ***Aboriginal Places*** maintained by ***AV***.
VHI	Victorian Heritage Inventory. A register of places and objects in Victoria identified as historical archaeological sites, areas or relics, and all private collections of artefacts, maintained by ***HV***. Sites listed on the VHI are not of State significance but are usually of regional or local significance. Listing on the ***VHR*** provides statutory protection for that a site, except in the case where a site has been "D-listed".
VHR	Victorian Heritage Register. A register of the State's most significant heritage places and objects maintained by ***HV***. Listing on the VHR provides statutory protection for that a site.

APPENDICES

Appendix 1: City of Nillumbik Planning Scheme and Heritage Overlay

The below section relates to HO191 (River Red Gums (2) 25 Doctors Gully Road) and is the relevant pages of the heritage overlay and Clause 43 of the Nillumbik planning scheme. The complete heritage overlay can be found at http://planning-schemes.delwp.vic.gov.au/schemes/nillumbik

PS map ref	Heritage place	External paint controls apply?	Internal alteration controls apply?	Tree controls apply?	Outbuildings or fences not exempt under Clause 43.01-4	Included on the Victorian Heritage Register under the Heritage Act 2017?	Prohibited uses permitted?	Aboriginal heritage place?
HO185	Henzel Farm House 110 Cochrane's Lane, Panton Hill	No	No	Yes – Monterey pine and Bhutan Cypress rows	No	No	No	No
HO186	Kyah, Bourke house 1/15 Collins Street, Diamond Creek	No	No	Yes	No	No	No	No
HO187	Windermere, former Leach house 24 Collins Street, Diamond Creek	No	No	Yes	No	No	No	No
HO188	Collins house 25 Collins Street, Diamond Creek	No	No	Yes	No	No	No	No
HO189	Fruit Trees (7 plus 27) 864 Cottlesbridge-Strathewen Road, Arthurs Creek	No	No	Yes – 27 plus 7. 26 Williams pears 1880, and Packham pears 1930.	No	No	No	No
HO190	Orchard house 25 Cottlesbridge-Strathewen Road, Cottlesbridge	Yes	No	Yes	Yes	No	No	No
HO191	River Red Gums (2) 25 Doctors Gully Road, Doreen	No	No	Yes	No	No	No	No
HO192	Thornholm – farm complex 180 Doctors Gully Road, Doreen	No	No	Yes	No	No	No	No
HO193	Tregowan farm complex 310 Doctors Gully Road, Doreen	No	No	Yes	Yes	No	No	No
HO194	Richard House	Yes	No	No	No	No	No	No

PS map ref	Heritage place	External paint controls apply?	Internal alteration controls apply?	Tree controls apply?	Outbuildings or fences not exempt under Clause 43.01-4	Included on the Victorian Heritage Register under the Heritage Act 2017?	Prohibited uses permitted?	Aboriginal heritage place?
HO217	Edwin Peters, later Henry Ryan house 5 Hyde Street, Diamond Creek	No	No	No	No	No	No	No
HO218	Harless orchard house 35 Ingrams Road, Research	No	No	No	No	No	No	No
HO219	St Michael's Anglican Church 469 – 475 Ironbark Road, Yarrambat	Yes	Yes	No	No	No	No	No
HO220	Whippell Farm Complex 85 Kangaroo Ground St Andrews Road, Kangaroo Ground	No	No	Yes	Yes	No	No	No
HO221	Cracknell Orchard house 405 Kangaroo Ground St Andrews Road, Panton Hill	No	No	Yes	No	No	No	No
HO222	Hazeldell, Albert Smith house, later Lenkunya 925 Kangaroo Ground St Andrews Road, Smiths Gully	Yes	No	No	No	No	No	No
HO223	Jones Orchard Complex 205 Kangaroo Ground Wattle Glen Road, Wattle Glen	No	No	No	Yes	No	No	No
HO224	Arnold house 20 Kangaroo Ground Warrandyte Road, North Warrandyte	Yes	Yes – main living rooms	No	No	No	No	No
HO225	Pizzey house, later Rose Cottage 29 Main Street, Diamond Creek	No	No	No	No	No	No	No

VICTORIA PLANNING PROVISIONS

43.01 HERITAGE OVERLAY

31/07/2018
VC148

Shown on the planning scheme map as **HO** with a number (if shown).

Purpose

To implement the Municipal Planning Strategy and the Planning Policy Framework.

To conserve and enhance heritage places of natural or cultural significance.

To conserve and enhance those elements which contribute to the significance of heritage places.

To ensure that development does not adversely affect the significance of heritage places.

To conserve specified heritage places by allowing a use that would otherwise be prohibited if this will demonstrably assist with the conservation of the significance of the heritage place.

Scope

The requirements of this overlay apply to heritage places specified in the schedule to this overlay. A heritage place includes both the listed heritage item and its associated land. Heritage places may also be shown on the planning scheme map.

43.01-1 Permit requirement

24/01/2020
VC160

A permit is required to:

- Subdivide land.
- Demolish or remove a building.
- Construct a building or construct or carry out works, including:
  - Domestic services normal to a dwelling if the services are visible from a street (other than a lane) or public park.
  - A solar energy system attached to a building that primarily services the land on which it is situated if the services are visible from a street (other than a lane) or public park.
  - A rainwater tank if the rainwater tank is visible from a street (other than a lane) or public park.
  - A fence, if the fence is visible from a street (other than a lane) or public park.
  - Roadworks which change the appearance of a heritage place or which are not generally undertaken to the same details, specifications and materials.
  - Street furniture other than:
    - traffic signals, traffic signs, fire hydrants, parking meters, post boxes and seating.
    - speed humps, pedestrian refuges and splitter islands.
  - A domestic swimming pool or spa and associated mechanical and safety equipment, if the swimming pool or spa and associated equipment are visible from a street (other than a lane) or public park.
  - A pergola or verandah, including an open-sided pergola or verandah to a dwelling with a finished floor level not more than 800mm above ground level and a maximum building height of 3 metres above ground level.
  - A deck, including a deck to a dwelling with a finished floor level not more than 800mm above ground level, if the deck is visible from a street (other than a lane) or public park
  - Non-domestic disabled access, excluding a non-domestic disabled access ramp if the ramp is not visible from a street (other than a lane) or public park.

  - An electric vehicle charging station if the charging station is visible from a street (other than a lane) or public park.
  - Services normal to a building other than a dwelling, including chimneys, flues, skylights, heating and cooling systems, hot water systems, security systems and cameras, downpipes, window shading devices, or similar, if the works are visible from a street (other than a lane) or public park.
- Externally alter a building by structural work, rendering, sandblasting or in any other way.
- Construct or display a sign.
- Externally paint a building if the schedule to this overlay specifies the heritage place as one where external paint controls apply.
- Externally paint an unpainted surface.
- Externally paint a building if the painting constitutes an advertisement.
- Internally alter a building if the schedule to this overlay specifies the heritage place as one where internal alteration controls apply.
- Carry out works, repairs and routine maintenance which change the appearance of a heritage place or which are not undertaken to the same details, specifications and materials.
- Remove, destroy or lop a tree if the schedule to this overlay specifies the heritage place as one where tree controls apply. This does not apply:
  - To any action which is necessary to keep the whole or any part of a tree clear of an electric line provided the action is carried out in accordance with a code of practice prepared under Section 86 of the *Electricity Safety Act 1998*.
  - If the tree presents an immediate risk of personal injury or damage to property.

VicSmart applications

Subject to Clause 71.06, an application under this clause for a development specified in Column 1 is a class of VicSmart application and must be assessed against the provision specified in Column 2.

Class of application	Information requirements and decision guidelines
▪ Subdivide land to realign the common boundary between 2 lots where the area of either lot is reduced by less than 15 percent and the general direction of the common boundary does not change. ▪ Subdivide land into lots each containing an existing building or car parking space where: – The buildings or car parking spaces have been constructed in accordance with the provisions of this scheme or a permit issued under this scheme. – An occupancy permit or a certificate of final inspection has been issued under the Building Regulations in relation to the buildings within 5 years prior to the application for a permit for subdivision. ▪ Subdivide land into 2 lots if: – The construction of a building or the construction or carrying out of works on the land is approved under this scheme or by a permit issued under this scheme and the permit has not expired.	Clause 59.07

Class of application	Information requirements and decision guidelines
– The construction or carrying out of the approved building or works on the land has started lawfully. – The subdivision does not create a vacant lot. ▪ Demolish or remove an outbuilding (including a carport, garage, pergola, verandah, deck, shed or similar structure) unless the outbuilding is specified in the schedule to the Heritage Overlay. ▪ Demolish or remove a fence unless the fence is specified in the schedule to the Heritage Overlay. ▪ Externally alter a non-contributory building. ▪ External painting. ▪ Construct a fence. ▪ Construct a carport, garage, pergola, verandah, deck, shed or similar structure. ▪ Construct and install domestic services normal to a dwelling. ▪ Construct and install a non-domestic disabled access ramp. ▪ Construct a vehicle cross-over. ▪ Construct a domestic swimming pool or spa and associated mechanical equipment and safety fencing. ▪ Construct a rainwater tank. ▪ Construct or display a sign. ▪ Lop a tree. ▪ Construct or install a solar energy system attached to a dwelling. ▪ Construct and install an electric vehicle charging station. ▪ Construct and install services normal to a building other than a dwelling, including chimneys, flues, skylights, heating and cooling systems, hot water systems, security systems and cameras, downpipes, window shading devices, or similar.	

43.01-2
21/11/2017
VC141

Places in the Victorian Heritage Register

A heritage place which is included in the Victorian Heritage Register is subject to the requirements of the *Heritage Act 2017*.

Permit requirement

A permit is required under this overlay to subdivide a heritage place which is included in the Victorian Heritage Register. This includes the subdivision or consolidation of land including any building or airspace.

Referral of applications

An application to subdivide a heritage place which is included in the Victorian Heritage Register must be referred to the relevant referral authority under Section 55 of the Act in accordance with Clause 66 of this scheme.

43.01-3 No permit required

21/11/2017
VC141

No permit is required under this overlay:

- For anything done in accordance with an incorporated plan specified in a schedule to this overlay.
- To internally alter a church for liturgical purposes if the responsible authority is satisfied that the alterations are required for liturgical purposes.
- For interments, burials and erection of monuments, re-use of graves, burial of cremated remains and exhumation of remains in accordance with the *Cemeteries and Crematoria Act 2003*.
- To develop a heritage place which is included in the Victorian Heritage Register, other than an application to subdivide a heritage place of which all or part is included in the Victorian Heritage Register.

43.01-4 Exemption from notice and review

31/07/2018
VC148

An application under this overlay for any of the following classes of development is exempt from the notice requirements of section 52(1) (a), (b) and (d), the decision requirements of section 64(1), (2) and (3) and the review rights of section 82(1) of the Act:

- Demolition or removal of an outbuilding (including a carport, garage, pergola, verandah, deck, shed or similar structure) unless the outbuilding is specified in the schedule to this overlay.
- Demolition or removal of a fence unless the fence is specified in the schedule to this overlay.
- External alteration of a building.
- External painting.
- Construction of a fence.
- Construction of a carport, garage, pergola, verandah, deck, shed or similar structure.
- Domestic services normal to a dwelling.
- Carry out works, repairs and routine maintenance.
- Internally alter a building.
- Non-domestic disabled access ramp.
- Construction of a vehicle cross-over.
- Construction of a domestic swimming pool or spa and associated mechanical equipment and safety fencing.
- Construction of a tennis court.
- Construction of a rainwater tank.
- Construction or display of a sign.
- Lopping of a tree.
- Construction of seating, picnic tables, drinking taps, barbeques, rubbish bins, security lighting, irrigation, drainage or underground infrastructure, bollards, telephone boxes.
- Roadworks.
- An electric vehicle charging station.
- Services normal to a building other than a dwelling, including chimneys, flues, skylights, heating and cooling systems, hot water systems, security systems and cameras, downpipes, window shading devices, or similar.

43.01-5 Statements of significance

24/01/2020
VC160

The schedule to this overlay must specify a statement of significance for each heritage place included in the schedule after the commencement of Amendment VC148. This does not apply to:

- A heritage place included in the schedule to this overlay by an amendment prepared or authorised by the Minister under section 8(1)(b) or section 8A(4) of the Act before or within three months after the commencement of Amendment VC148.
- A registered heritage place included in the Victorian Heritage Register established under Part 3 of the *Heritage Act 2017*.
- A heritage place included in the schedule to this overlay on an interim basis.

43.01-6 Heritage design guidelines

31/07/2018
VC148

The schedule to this overlay may specify heritage design guidelines for any heritage place included in the schedule. A heritage design guideline must not contain any mandatory requirements.

43.01-7 Application requirements

31/07/2018
VC148

An application must be accompanied by any information specified in the schedule to this overlay.

43.01-8 Decision guidelines

24/01/2020
VC160

Before deciding on an application, in addition to the decision guidelines in Clause 65, the responsible authority must consider, as appropriate:

- The Municipal Planning Strategy and the Planning Policy Framework.
- The significance of the heritage place and whether the proposal will adversely affect the natural or cultural significance of the place.
- Any applicable statement of significance (whether or not specified in the schedule to this overlay), heritage study and any applicable conservation policy.
- Any applicable heritage design guideline specified in the schedule to this overlay.
- Whether the location, bulk, form or appearance of the proposed building will adversely affect the significance of the heritage place.
- Whether the location, bulk, form and appearance of the proposed building is in keeping with the character and appearance of adjacent buildings and the heritage place.
- Whether the demolition, removal or external alteration will adversely affect the significance of the heritage place.
- Whether the proposed works will adversely affect the significance, character or appearance of the heritage place.
- Whether the proposed subdivision will adversely affect the significance of the heritage place.
- Whether the proposed subdivision may result in development which will adversely affect the significance, character or appearance of the heritage place.
- Whether the proposed sign will adversely affect the significance, character or appearance of the heritage place.
- Whether the lopping or development will adversely affect the health, appearance or significance of the tree.
- Whether the location, style, size, colour and materials of the proposed solar energy system will adversely affect the significance, character or appearance of the heritage place.

43.01-9 Use of a heritage place

31/07/2018
VC148

A permit may be granted to use a heritage place (including a heritage place which is included in the Victorian Heritage Register) for a use which would otherwise be prohibited if all of the following apply:

- The schedule to this overlay specifies the heritage place as one where prohibited uses may be permitted.
- The use will not adversely affect the significance of the heritage place.
- The benefits obtained from the use can be demonstrably applied towards the conservation of the heritage place.

Decision guidelines

Before deciding on an application, in addition to the decision guidelines in Clause 65, the responsible authority must consider the effect of the use on the amenity of the area.

43.01-10 Aboriginal heritage places

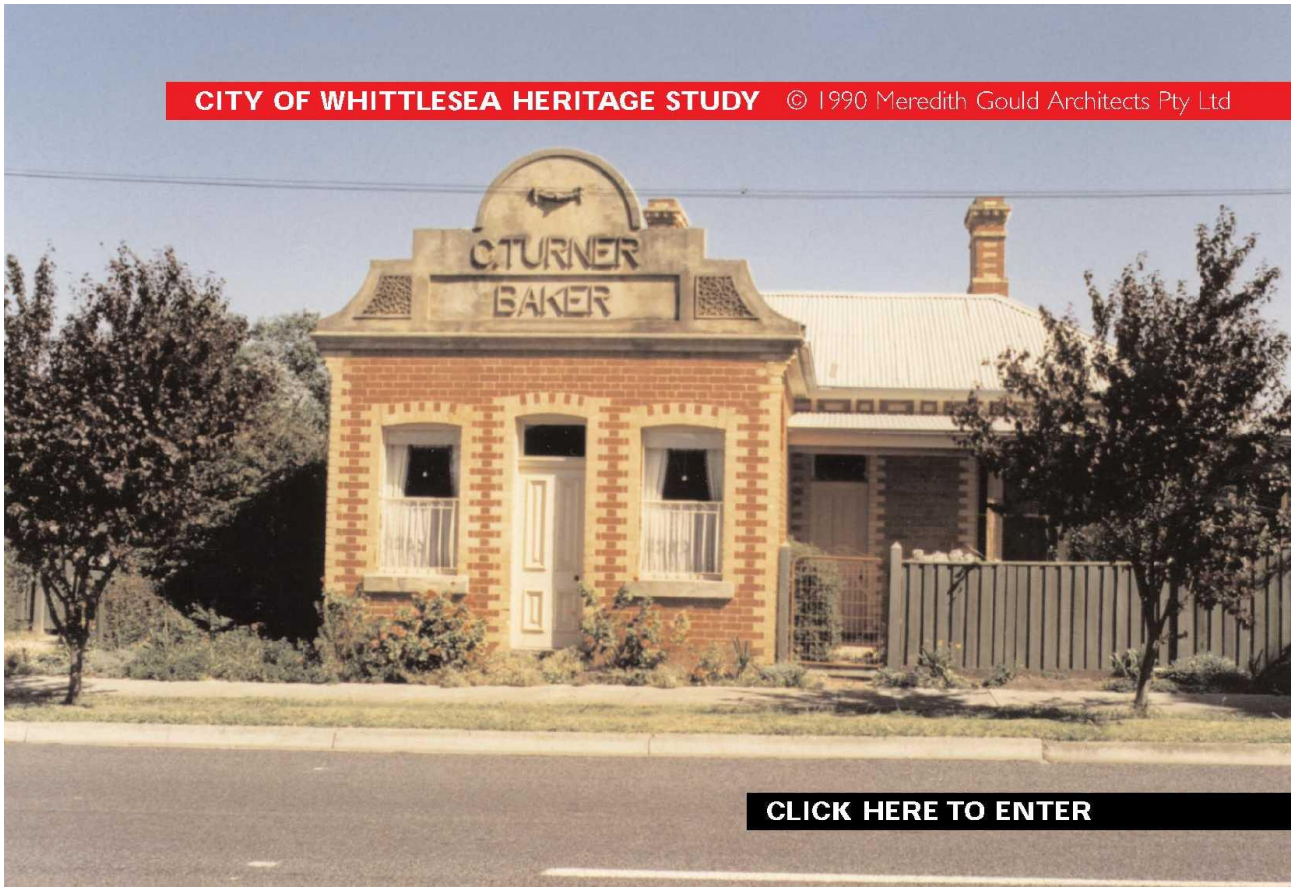
31/07/2018
VC148

A heritage place specified in the schedule to this overlay as an Aboriginal heritage place is also subject to the requirements of the *Aboriginal Heritage Act 2006*.

Appendix 2: City of Whittlesea Heritage Study

The below section (Section 12) that relates to the River Red Gums (HO191) and Former Post Office and General Store, the complete Heritage study is available at:

https://www.whittlesea.vic.gov.au/media/1762/city-of-whittlesea-heritage-study-1990.pdf



12 DOREEN — INDIVIDUAL BUILDINGS / STRUCTURES / SITES INVENTORY

EXISTING HERITAGE LISTING

HBC	Historic Buildings Register
AHC	Australian Heritage Commission Register (Register of the National Estate)
NT	Trust Register
GBR	Government Buildings Register
VAS	Victorian Archaeological Survey recording

RECOMMENDED FOR

VHR	Victorian Heritage Register
AHC	Australian Heritage Commission Register (Register of the National Estate)
HCA	Heritage Conservation Area
VAS	Victorian Archaeological Survey recording
PSP	Planning Scheme Protection
CL	Cultural Landscape

Item No.	Grading	Description	Existing Heritage Listing	Recommended for:
A.7	A	Yan Yean Water Supply Heritage Conservation Area	GBR some structures	HCA VHR PSP AHC CL VAS World Heritage Listing
12.01	C	Tree, Cookes Rd. south side.		PSP
*12.02		"Ashley Park", Bridge Inn Rd. south side (not possible to locate site).		VAS
12.03	C	Uniting Church, Chapel Lane, south side		PSP
*12.04	D	Cottage, Bridge Inn Rd.		
12.05	C	Cottage & outhouse, Cookes Rd. north side		PSP
12.06	D	Post Office/General Store cnr Yan Yean & Doctors Gully Rds.		
12.07	C	Hall, cnr. Yan Yean & Bridge Inn Rds.		PSP
*12.08	D	Cottage, outhouse & Garden, Yan Yean Rd. west side		
12.09	C	Cottage, Doctors Gully Rd.south side		PSP
12.10	C	House, ThornholmDoctors Gully Rd. south side		PSP
12.11	A	Tregowan, Doctors Gully Rd. south side		AHC VHR PSP
12.12	A provisional	"Linton Grange", Chapel Lane,		VHR AHC PSP all provisional
12.13	C	Trees, Doctors Gully Road and Yan Yean Roads.		PSP
*12.14	C	Parkside, Yan Yean Road.		PSP

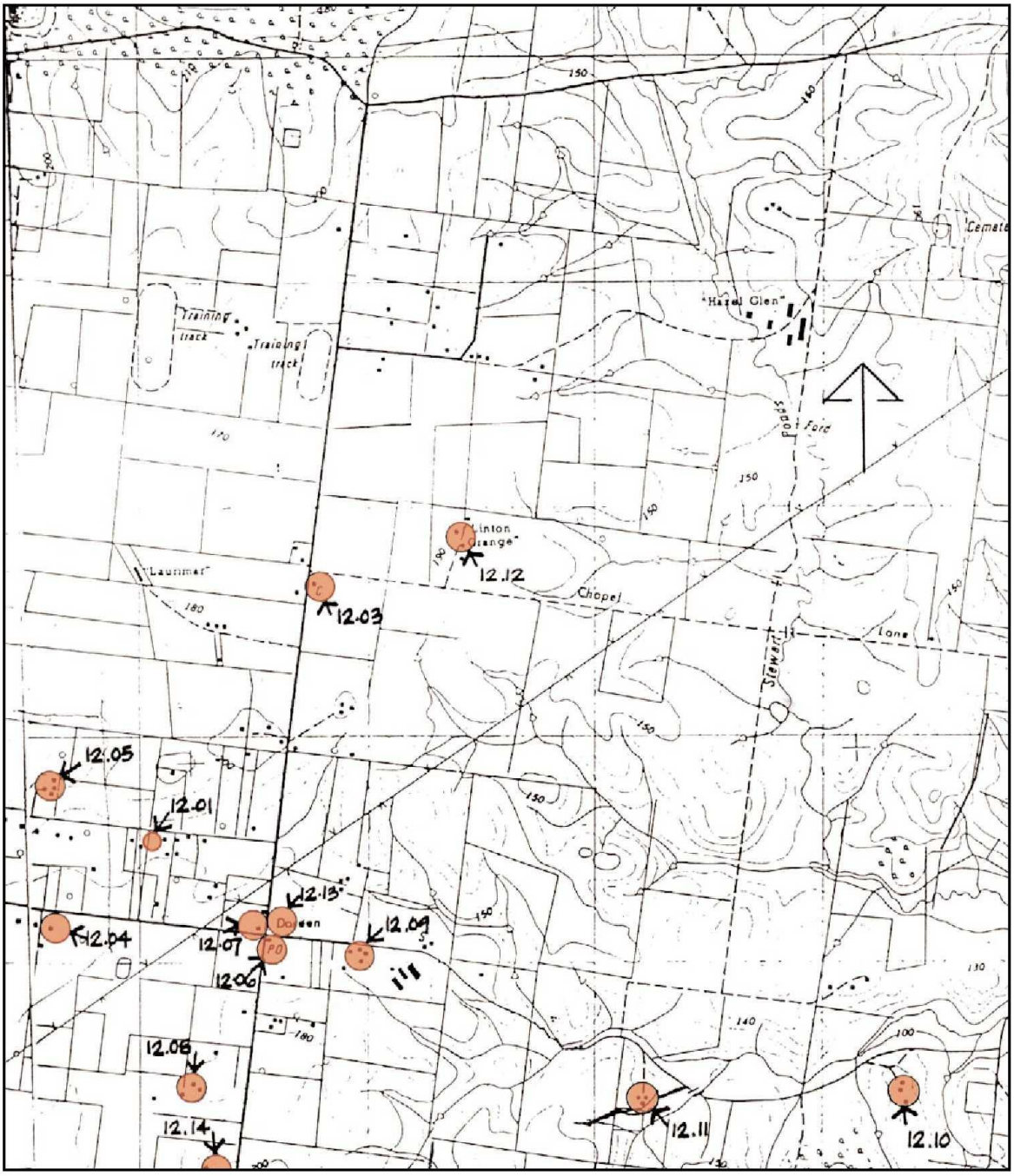
Items for further investigation by the V.A.S.

House, site, mature trees, ruins

Cookes Road. north side. VAS

> REGION MAP

REGION 12 DOREEN **CONTEXT MAP**



TWO RED GUMS 12.13

TYPE	Landscape feature
REGION	Mernda
ADDRESS	Doctors Gully Road and Yan Yean Road
GRADING	C
RECOMMENDED FOR	Planning Scheme Protection
THEME	Pre-European Settlement Landscape
CONSTRUCTION DETAILS:	
Elements:	Prominent mature red gums
INTEGRITY	N/A
CONDITION	Appears healthy
RECOMMENDATIONS	Restrict parking on roots. Ensure road widening does not threaten trees.

POST OFFICE/GENERAL STORE 12.06

TYPE	Shop
REGION	Doreen
ADDRESS	Yan Yean / Doctors Gully Rd intersection
GRADING	D
RECOMMENDED FOR	-
SURVEY DATE	8.8.90
THEME	Neighbourhoods and Townships
CONSTRUCTION DETAILS: Date:	c1865
INTEGRITY	Fair
CONDITION	Fair

DOREEN POST OFFICE/GENERAL STORE

The first store in Doreen was erected on the north east corner of the cross-roads by Patrick Hickey. The store, which soon proved successful, led to the crossroads becoming known as Hickey's corner.

In 1890 John Cornell opened a rival store on the south east corner and operated it until his death in 1901. Various storekeepers followed Cornell. In 1902 the post office was transferred from the nearby school and within a few years, Hickey's store over the road had closed.

In about 1908 the store and post office was destroyed by fire. It was rebuilt soon after and then in 1932, rebuilt again in brick.

Today the old store serves as milk bar, licensed newsagent and post office agency. Adjoining the store is a hay, grain and saddlery business, owned by the same interests.

HISTORICAL REFERENCES

J.W. Payne, "The Quiet Hills - History of Doreen", 1983.

Appendix 3: Yarrambat Structure Plan Project

Yarrambat Structure Plan Project

Heritage Assessment Report


October 2013

Prepared for

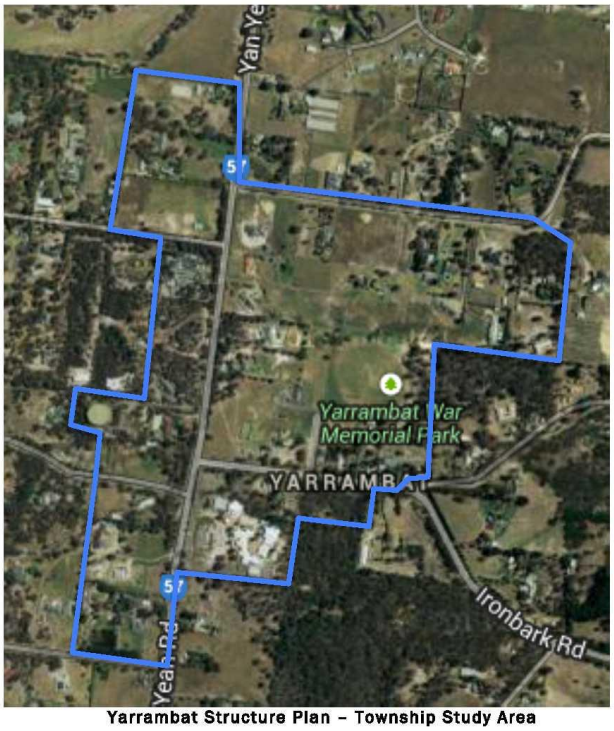
Nillumbik Shire Council

by

Samantha Westbrooke Pty Ltd
13 Richards Street
Coburg, Vic, 3058

1.0 INTRODUCTION

This report was commissioned by Nillumbik Shire Council. It provides one of the Technical Assessments for Stage 1 of the Yarrambat Structure Plan Project. The study area for this assessment comprises the Yarrambat Township and surrounding land as marked on the aerial image below:



Yarrambat Structure Plan – Township Study Area

Stage 1 of the project will undertake targeted consultation and a series of technical assessments to identify issues and opportunities relevant to the project. Stage 2 will then draw on the information obtained in Stage 1 to make recommendations regarding the future role of Yarrambat Township.

The purpose of this Heritage Assessment is to inform the Yarrambat Structure Plan Project of existing and potential heritage values (historic and Aboriginal) in the study area and to assist the project to make recommendations, which protect these values.

2.0 EXISTING & POTENTIAL HERITAGE SITES

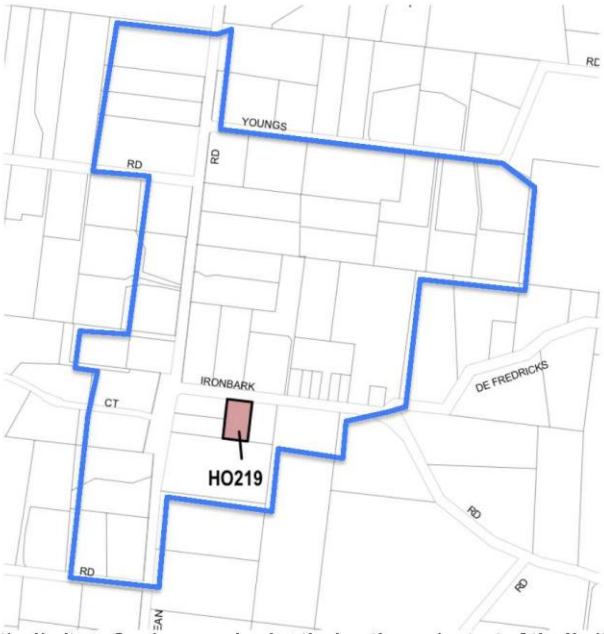
2.1 Existing Heritage Sites

Nillumbik Shire Heritage Overlay

There is only one site currently included in the Nillumbik Shire Heritage Overlay located within the Yarrambat Township Study Area as follows:

HO219 St Michaels Anglican Church, 469-475 Ironbark Road, Yarrambat

This weatherboard church was opened in 1954 after a long community effort to raise funds for a church in Yarrambat. The place is historically significant as the only church building in Yarrambat and the oldest public building in the township on its original site. The church is of social significance as the venue for a long period of worship (over 50 years) in the Yarrambat community.



Extract of the Heritage Overlay map showing the location and extent of the Heritage Overlay listed site within the Yarrambat Township Study Area (outlined in blue)

Appendix 4: Risk Register

Appendix 1: Risk Register

Major Road Projects Victoria

Yan Yean Road Stage 2 EES Environmental Risk Register - Draft Post Environmental Risk Workshop

Project name:

Version: 5

Date: 26/06/2020

Author: Sabrina Chapman

Review: Mat Peel

RISK No.	ASPECT	IMPACT PATHWAY (RISK)	MITIGATION MEASURES TO INFORM ENVIRONMENTAL PERFORMANCE REQUIREMENT	EPR	RESIDUAL RISK RATING		
		cultural heritage potentially impacting on heritage values	Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to."				
32	Historical Heritage	Potential impact on the values of heritage places and/or archaeological sites	To avoid where possible, and otherwise minimise adverse effects on landscape values in accordance with the Project's Landscape Strategy, through mitigation measures such as: • Develop potential and proposed design options and measures that can avoid or minimise significant direct and indirect effects on trees or other landscape elements - with a focus on high value vegetation as identified within the Landscape Strategy's 'Cultural Value of Vegetation Assessment' • Prior to construction commencing, develop a Tree Management Plan based on the recommendations of Australian Standard 4970-2009 Protection of Trees on Development Sites. This should be in consultation with the City of Whittlesea and Nillumbik Shire Council and informed by a project arborist (with a minimum qualification of Diploma in Arboriculture (AQF level 5 or equivalent) • Develop strategies to address the loss of trees or other landscape elements • Retain and reinforce key existing views as identified within the Landscape Strategy. Design permanent and temporary works to minimise adverse visual impact, particularly in relation to: • Heritage values • Existing and proposed landmark elements across the Project • High value vegetation as identified within the Landscape Strategy's 'Cultural Value of Vegetation Assessment' • Community and recreational centres and open space, including existing Council masterplans for Doreen Recreational Reserve, Yarrambat Park & Golf Course and Yarrambat Township	EPR HH1 and HH2	Unlikely	Moderate	Medium

1	Aborigina l cultural heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage potentially impacting on heritage values	Site establishment	Likely	Moderate	Significant	"Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to."	EPR ACH1	Possible	Moderate	Medium	The Aboriginal and Historical Cultural Heritage Impact Assessment (Ecology & Heritage Partners 2020) identified two Aboriginal places within the project area. A draft Cultural Heritage Management Plan (No.15169) has been prepared in consultation with the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation.

RISK No.	ASPECT	IMPACT PATHWAY (RISK)	MITIGATION MEASURES TO INFORM ENVIRONMENTAL PERFORMANCE REQUIREMENT	EPR	RESIDUAL RISK RATING		
		potentially impacting on heritage values	All management conditions and contingencies would be adhered to."				
70	Historical Heritage	Potential impact on the values of heritage places and/or archaeological sites	Designing permanent and temporary works to avoid where possible, and otherwise minimise, adverse effects on the two Doreen River Red Gums (HO191) and St. Michael Anglican Church (HO219). As part of the Construction Environmental Management Plan, there would be an archaeological discovery protocol that specifies measures to avoid and minimise impacts on any previously unidentified historical archaeological sites and values discovered during construction. The management protocol must be consistent with the requirements of the Heritage Act 2017 and include procedures for ceasing work if human remains or archaeological artefacts are discovered, notifying Heritage Victoria of the find, obtaining consent to deal with the find, and dealing with the find in accordance with the consent. All personnel on site must undertake a Cultural Heritage Awareness Induction prior to commencing work, which would include information on the Doreen River Red Gums.	EPR HH1, HH2 and HH3	Unlikely	Minor	Low
Operations							
81	Aboriginal Cultural Heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage potentially impacting on heritage values	Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to."	EPR ACH1	Rare	Insignificant	Low
90	Historical Heritage	Potential impact on the values of heritage places and/or archaeological sites	Mitigation measures have been applied during the design and construction phases. As such, the risk of impact on historical heritage during operation of Yan Yean Road is considered to be low.	EPR EMF5	Rare	Insignificant	Low

21	Aboriginal cultural heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage potentially impacting on heritage values	Earthworks	Likely	Moderate	Significant	"Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to."	EPR ACH1	Possible	Moderate	Medium	The Aboriginal and Historical Cultural Heritage Impact Assessment (Ecology & Heritage Partners 2020) identified two Aboriginal places within the project area. A draft Cultural Heritage Management Plan (No.15169) has been prepared in consultation with the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation.

30	Historical heritage	Potential impact on the values of heritage places and/or archaeological sites	Earthworks	Likely	Moderate	Significant	"Designing permanent and temporary works to avoid where possible, and otherwise minimise, adverse effects on the two Doreen River Red Gums (HO191) and St. Michael Anglican Church (HO219). As part of the Construction Environmental Management Plan, there would be an archaeological discovery protocol that specifies measures to avoid and minimise impacts on any previously unidentified historical archaeological sites and values discovered during construction. The management protocol must be consistent with the requirements of the Heritage Act 2017 and include procedures for ceasing work if human remains or archaeological artefacts are discovered, notifying Heritage Victoria of the find, obtaining consent to deal with the find, and dealing with the find in accordance with the consent. All personnel on site must undertake a Cultural Heritage Awareness Induction prior to commencing work, which would include information on the Doreen River Red Gums." "EPR HH1 EPR HH2 EPR HH3 "	Unlikely	Moderate	Medium	The Aboriginal and Historical Cultural Heritage Impact Assessment (Ecology & Heritage Partners 2019) identified one Heritage Overlay (HO191) for the two Doreen River Red Gums. These trees have cultural significance to the community, and therefore must be avoided.

41	Aboriginal cultural heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage potentially impacting on heritage values	Civils and structures	Likely	Moderate	Significant	"Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to."	EPR ACH1	Possible	Moderate	Medium	The Aboriginal and Historical Cultural Heritage Impact Assessment (Ecology & Heritage Partners 2020) identified two Aboriginal places within the project area. A draft Cultural Heritage Management Plan (No.15169) has been prepared in consultation with the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation.

450	Historical heritage	Potential impact on the values of heritage places and/or archaeological sites	Civils and structures	Likely	Moderate	Significant	"Designing permanent and temporary works to avoid where possible, and otherwise minimise, adverse effects on the two Doreen River Red Gums (HO191) and St. Michael Anglican Church (HO219). As part of the Construction Environmental Management Plan, there would be an archaeological discovery protocol that specifies measures to avoid and minimise impacts on any previously unidentified historical archaeological sites and values discovered during construction. The management protocol must be consistent with the requirements of the Heritage Act 2017 and include procedures for ceasing work if human remains or archaeological artefacts are discovered, notifying Heritage Victoria of the find, obtaining consent to deal with the find, and dealing with the find in accordance with the consent. All personnel on site must undertake a Cultural Heritage Awareness Induction prior to commencing work, which would include information on the Doreen River Red Gums."	"EPR HH1 EPR HH2 EPR HH3 "	Unlikely	Moderate	Medium	The Aboriginal and Historical Cultural Heritage Impact Assessment (Ecology & Heritage Partners 2019) identified one Heritage Overlay (HO191) for the two Doreen River Red Gums. These trees have cultural significance to the community, and therefore must be avoided.

61	Aboriginal cultural heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage potentially impacting on heritage values	Reinstatement	Possible	Moderate	Medium	"Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to."	EPR ACH1	Unlikely	Minor	Low	The Aboriginal and Historical Cultural Heritage Impact Assessment (Ecology & Heritage Partners 2020) identified two Aboriginal places within the project area. A draft Cultural Heritage Management Plan (No.15169) has been prepared in consultation with the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation.

70	Historical heritage	Potential impact on the values of heritage places and/or archaeological sites	Reinstatement	Likely	Minor	Low	"Designing permanent and temporary works to avoid where possible, and otherwise minimise, adverse effects on the two Doreen River Red Gums (HO191) and St. Michael Anglican Church (HO219). As part of the Construction Environmental Management Plan, there would be an archaeological discovery protocol that specifies measures to avoid and minimise impacts on any previously unidentified historical archaeological sites and values discovered during construction. The management protocol must be consistent with the requirements of the Heritage Act 2017 and include procedures for ceasing work if human remains or archaeological artefacts are discovered, notifying Heritage Victoria of the find, obtaining consent to deal with the find, and dealing with the find in accordance with the consent. All personnel on site must undertake a Cultural Heritage Awareness Induction prior to commencing work, which would include information on the Doreen River Red Gums."	"EPR HH1 EPR HH2 EPR HH3 "	Unlikely	Minor	Low	The Aboriginal and Historical Cultural Heritage Impact Assessment (Ecology & Heritage Partners 2019) identified one Heritage Overlay (HO191) for the two Doreen River Red Gums. These trees have cultural significance to the community, and therefore must be avoided.

81	Aboriginal cultural heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage by operation and maintenance activities potentially impacting on heritage values	Operations	Rare	Insignificant	Low	"Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to."	EPR ACH1	Rare	Insignificant	Low	The Aboriginal and Historical Cultural Heritage Impact Assessment (Ecology & Heritage Partners 2020) identified two Aboriginal places within the project area. A draft Cultural Heritage Management Plan (No.15169) has been prepared in consultation with the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation.

90	Historical heritage	Potential impact on the values of heritage places and/or archaeological sites	Operations	Rare	Insignificant	Low	"Mitigation measures have been applied during the design and construction phases. As such, the risk of impact on historical heritage during operation of Yan Yean Road is considered to be low. Any potential impacts during operation and maintenance will be managed in accordance with the Department of Transport's standards for managing declared roads in Victoria."	EPR EMF5	Rare	Insignificant	Low	The Aboriginal and Historical Cultural Heritage Impact Assessment (Ecology & Heritage Partners 2019) identified one Heritage Overlay (HO191) for the two Doreen River Red Gums. These trees have cultural significance to the community, and therefore must be avoided.

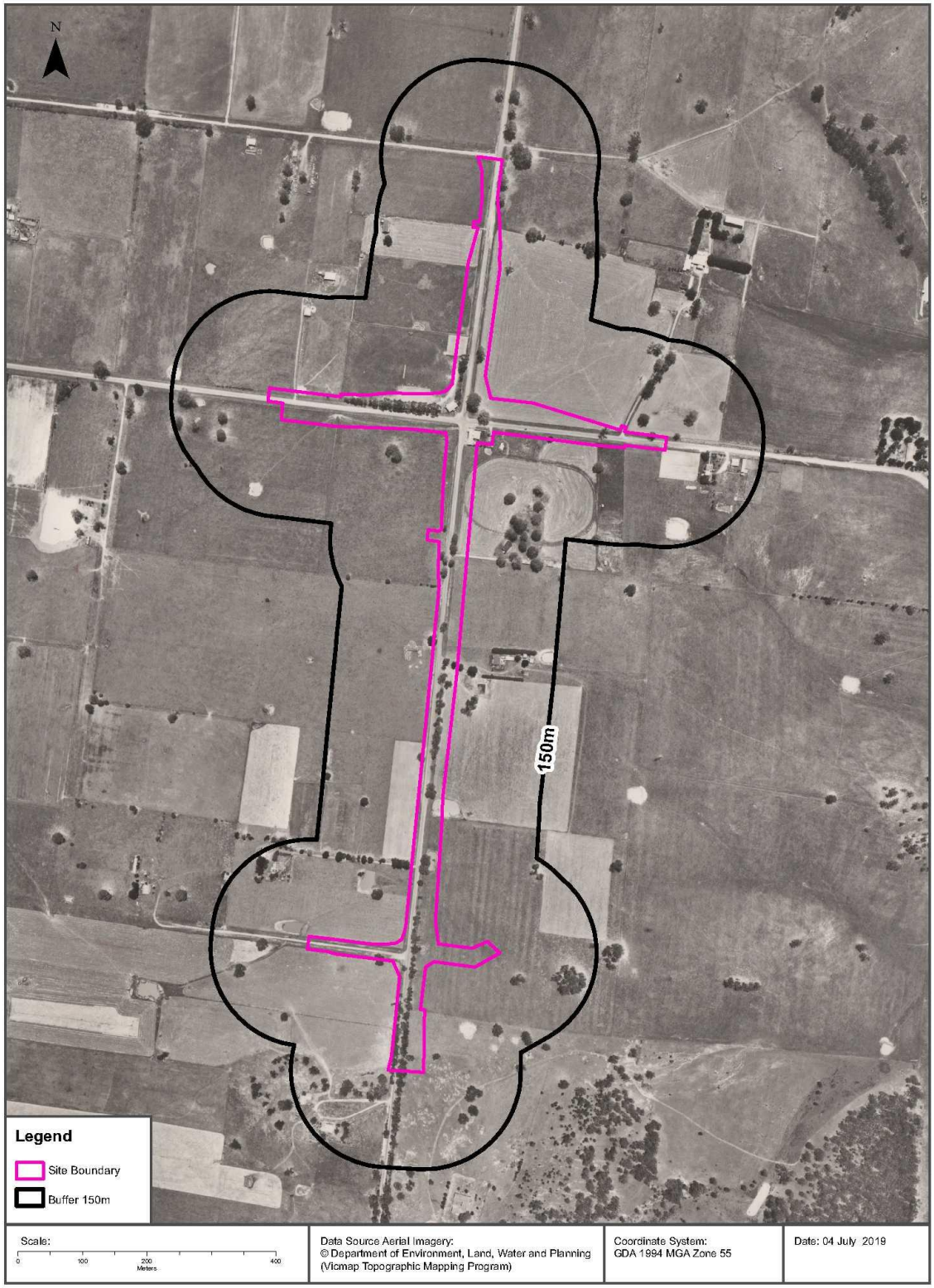
101	Aborigina l cultural heritage	Disturbance of known or previously unrecorded Aboriginal cultural heritage by maintenance activities potentially impacting on heritage values	Maintenance	Rare	Insignificant	Low	"Comply with the Cultural Heritage Management Plan (No.15169) when approved by Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation as the Registered Aboriginal Party under the Aboriginal Heritage Act 2006. All management conditions and contingencies would be adhered to."	EPR ACH1	Rare	Insignificant	Low	The Aboriginal and Historical Cultural Heritage Impact Assessment (Ecology & Heritage Partners 2020) identified two Aboriginal places within the project area. A draft Cultural Heritage Management Plan (No.15169) has been prepared in consultation with the Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation.

110	Historical heritage	Potential impact on the values of heritage places and/or archaeological sites	Maintenance	Rare	Insignificant	Low	"Mitigation measures have been applied during the design and construction phases. No-go zones should be implemented if maintenance works are to occur in proximity of the two Doreen River Red Gums at the Bridge Inn Road intersection. Any potential impacts during operation and maintenance will be managed in accordance with the Department of Transport's standards for managing declared roads in Victoria."	EPR EMF5	Rare	Insignificant	Low	The Aboriginal and Historical Cultural Heritage Impact Assessment (Ecology & Heritage Partners 2019) identified one Heritage Overlay (HO191) for the two Doreen River Red Gums. These trees have cultural significance to the community, and therefore must be avoided.

Appendix 5: Aerials of the Project area

Aerial Imagery 1963

OSAR Proposed Road Alignments, Yan Yean Road, VIC, 3091 - Site 32 (Section 1)

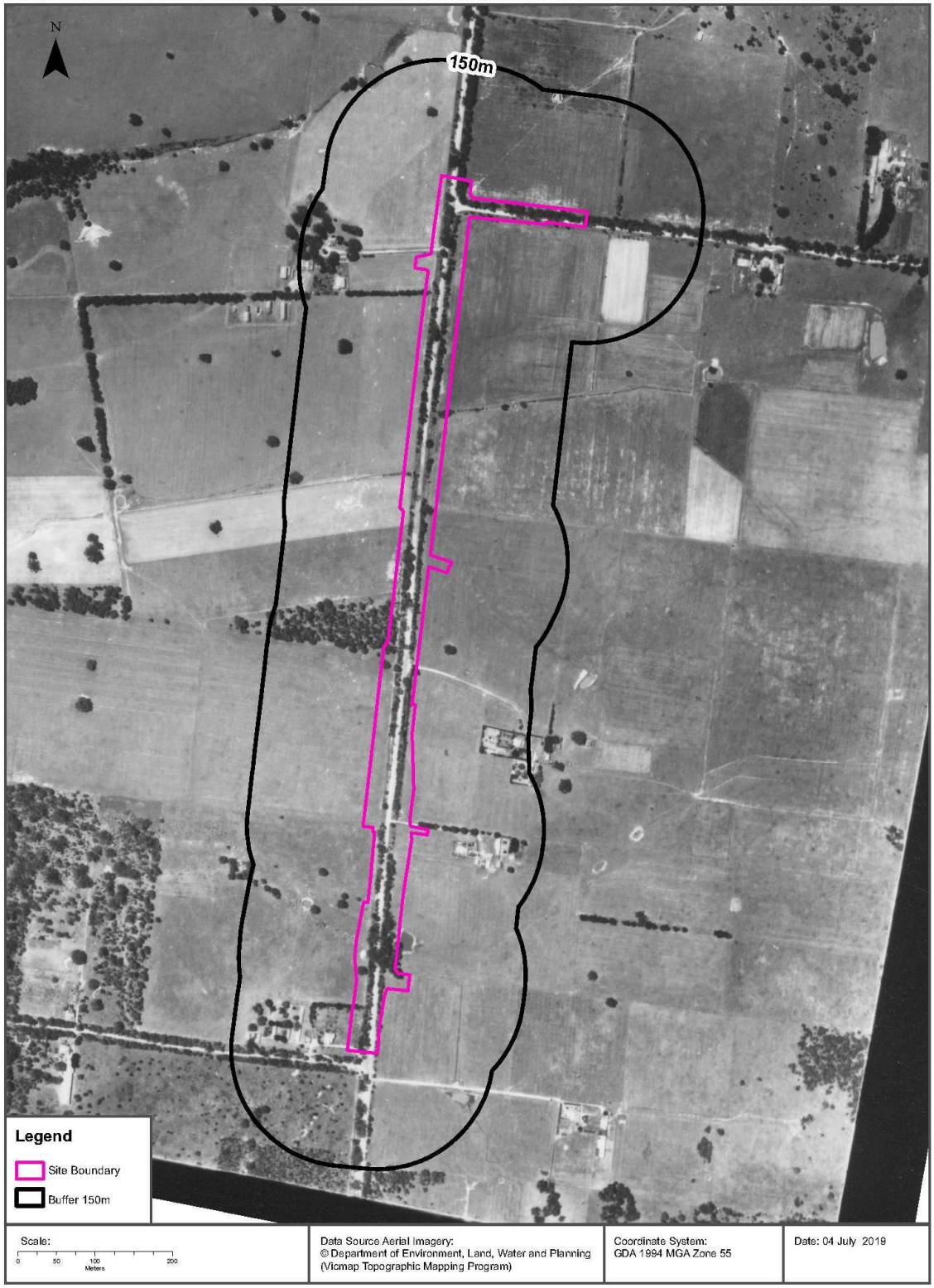


Aerial Imagery 1951

OSAR Proposed Road Alignments, Yan Yean Road, VIC, 3091 - (Section 2)

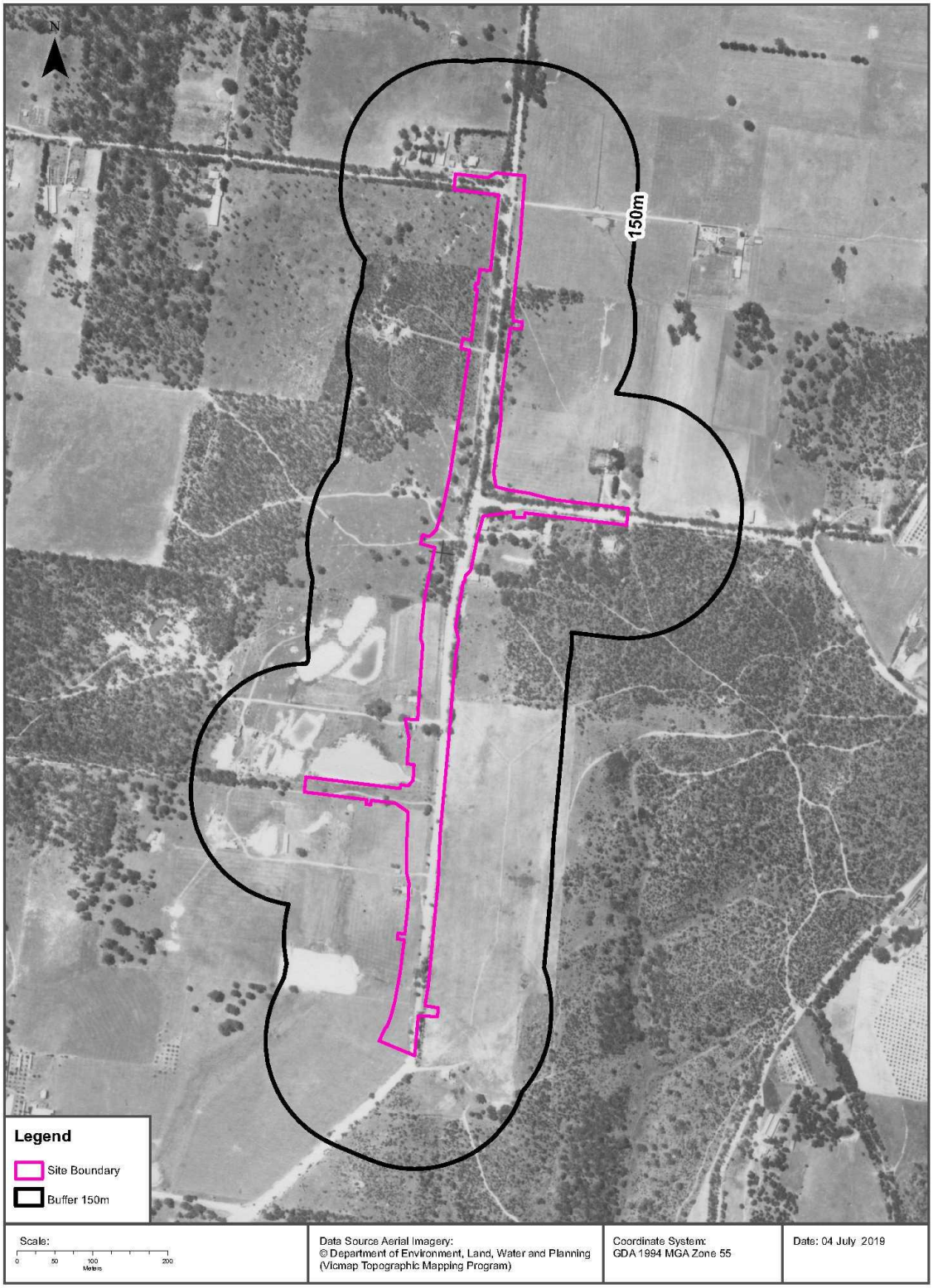
Aerial Imagery 1951

OSAR Proposed Road Alignments, Yan Yean Road, VIC, 3091 - Site 32 (Section 3)



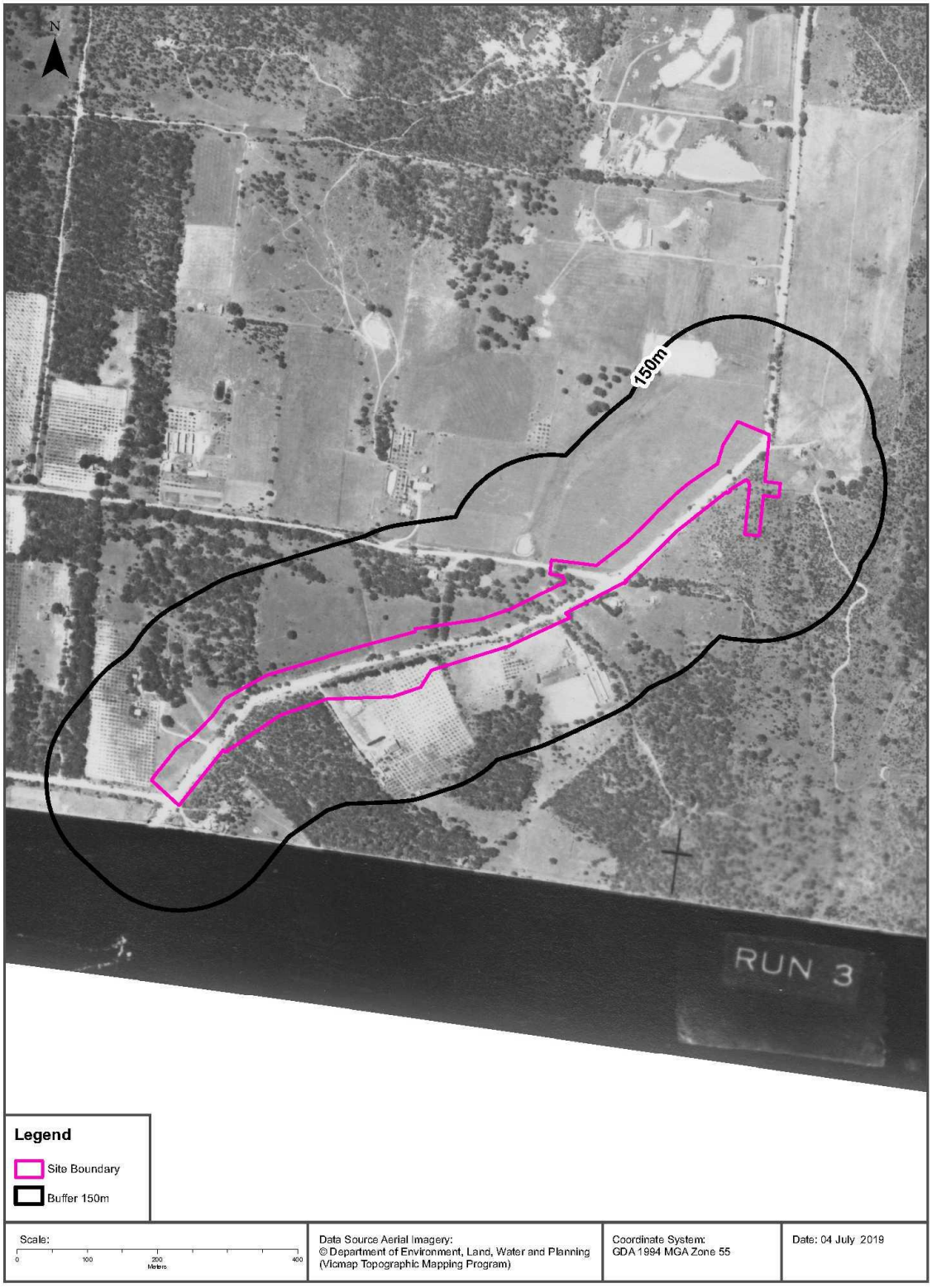
Aerial Imagery 1951

OSAR Proposed Road Alignments, Yan Yean Road, VIC, 3091 - Site 32 (Section 4)

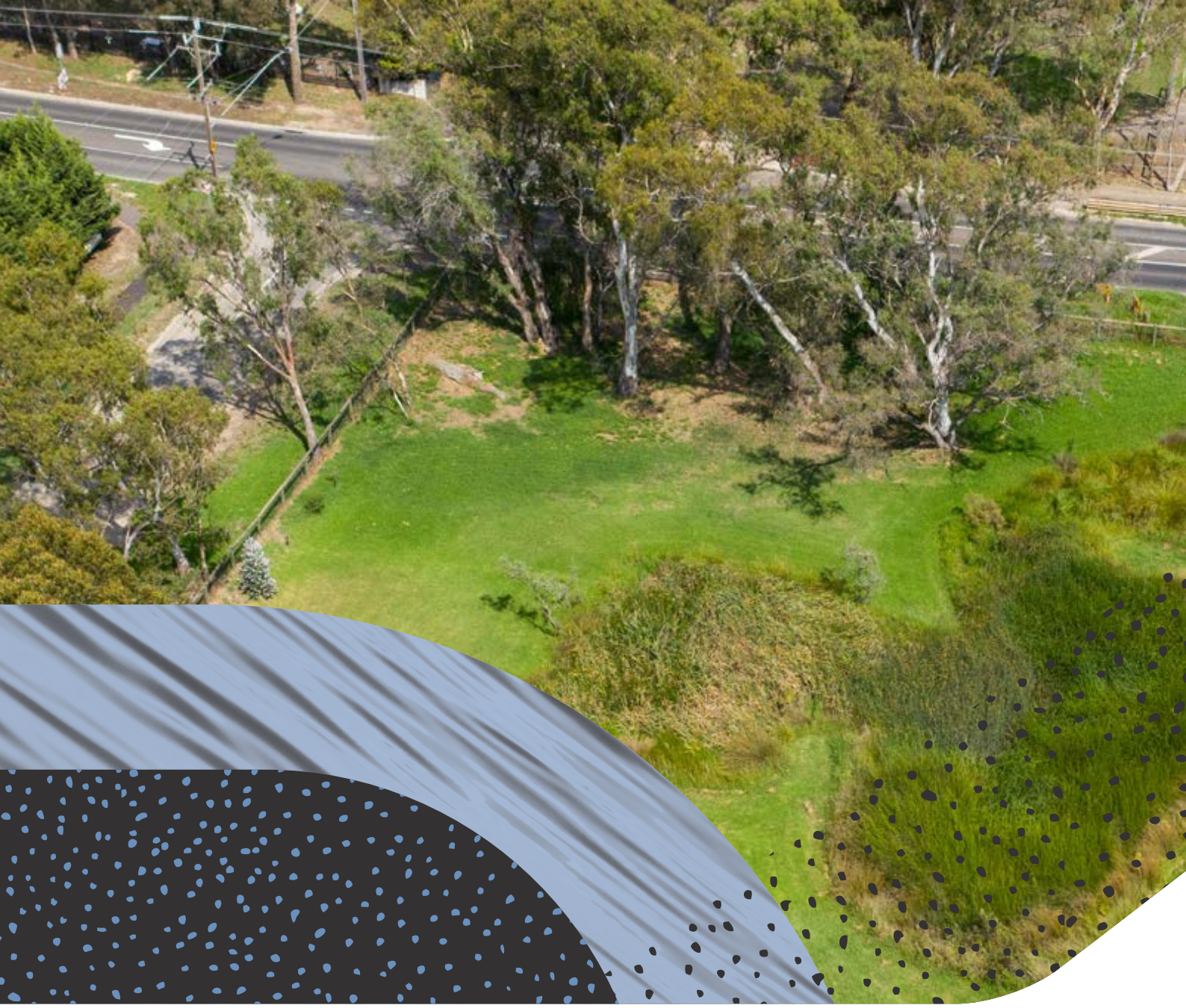


Aerial Imagery 1951

OSAR Proposed Road Alignments, Yan Yean Road, VIC, 3091 - Site 32 (Section 5)



Appendix 6: Final Project Description



PART 1 INTRODUCTORY CHAPTERS

5 Project Description

5.1 Introduction

This chapter describes the proposed design, construction and operation of the duplication of Yan Yean Road between Kurrak Road and Bridge Inn Road (the Project). The chapter should be read in conjunction with Attachment VI *Map Book*, which contains detailed plans and drawings of key elements of the Project.

This Project description has been developed to provide an understanding of all components, processes and development stages of the Project to enable assessment of the Project's potential environmental effects. The description includes specific design elements to address the potential for the Project to generate adverse environmental effects and impacts.

5.2 Project overview

Yan Yean Road is a significant north-south arterial road servicing the Shire of Nillumbik and the City of Whittlesea, providing connectivity for the City of Whittlesea's growing suburbs of Doreen and Mernda to the townships of Plenty and Yarrambat. Yan Yean Road connects with major east-west arterials such as Bridge Inn Road, Kurrak Road and Diamond Creek Road and also provides a connection to employment and services in established neighbouring suburbs such as Greensborough and Diamond Creek.

Stage 1 of the Yan Yean Road upgrade (Diamond Creek Road to Kurrak Road) was completed in 2019, and construction on Stage 2 (the subject of this EES) is scheduled for completion by 2025.

The Project seeks to upgrade an existing road in hilly terrain, largely within the existing road reserve. The surrounding environment is characterised by low density residential and rural living areas such as farmland and agricultural areas, with the suburb of Doreen experiencing rapid change from rural living to higher density residential developments. The Project alignment and immediate surrounds intersect a range of land uses including residential, open space, rural living, commercial and education.

Key land uses along the alignment include Yarrambat Park and the Yarrambat Park Golf Course, Plenty Valley Christian College, Yarrambat Primary School, St Macarius Coptic Orthodox Church and the Doreen business precinct.

Terms used in this project description

Carriageway: lanes where traffic would be travelling, plus shoulders and auxiliary lanes

Cross section: shows the width of the road with the position and number of traffic lanes, medians, walking and cycling paths and footpaths

Cutting: ground excavation that is required to create a smooth base for construction of a road

Land parcel: the smallest unit of land able to be transferred within Victoria's cadastral system

Median: the area between two opposing carriageways

Mid-block: a section of road between key intersections

Outer edge / shoulder: the area next to a roadway that provides clearance between the roadway and roadside

Road reserve: all the area of land that is within the boundaries of a road

Roadside: any land that is within the boundaries of a road (other than the shoulders of the road) which is not a roadway or pathway

Roadway: the area of the public road that is open to or used by members of the public and is developed by a road authority for the driving or riding of motor vehicles

Signalised intersections: intersections controlled by traffic lights

The Project would duplicate a 5.5 kilometre section of Yan Yean Road between Kurrak Road and Bridge Inn Road, increasing the existing two lanes to four lanes (comprising two lanes in each direction). The design speed along Yan Yean Road within the extent of the project area is 70 kilometres per hour, with the exception of north of Bridge Inn Road where the design speed is 80 kilometres per hour. This is consistent with existing speed limits. The design for the Project assessed in this EES has 3.5-metre-wide lanes, with the majority of the Project using a central 2.2 metre-wide median. This design was adopted due to various constraints: road safety issues, steep and rolling terrain, high cut and fill batters and subsequent retaining walls at certain locations.

The design also seeks to limit impacts to existing properties, local accesses and trees along Yan Yean Road. The existing road alignment has been retained due to constraints around the topography and land uses adjacent to the road corridor. The exception is at the Bridge Inn Road intersection, which would be shifted to the north east to retain two River Red Gums (referred to as the Doreen River Red Gums) and two businesses. The project area is shown in Figure 5.1 and key components of the Project are shown in Figure 5.2.

The Project includes:

- Two new roundabouts: one at Heard Avenue and one at Youngs Road
- Five new signalised intersections at Bannons Lane, Jorgensen Avenue, North Oatlands Road, Orchard Road and Bridge Inn Road
- Upgrades to one existing signalised intersection at Ironbark Road, including an additional right-hand turning lane, slip lane and traffic island
- New street lighting at all intersections, road signage and landscaping
- A new walking and cycling path on the western side and a footpath on the eastern side of Yan Yean Road, linking Diamond Creek to Doreen and improving safety and connectivity for pedestrians and cyclists
- Continuous safety barriers running along the Project's length, proposed in the median and behind outer kerbs along the mid-block sections of the carriageways
- A wide median between Bannons Lane and Jorgensen Avenue to provide for additional landscaping opportunities and potential avoidance of existing biodiversity values and large trees.

Figure 5.1 Project area

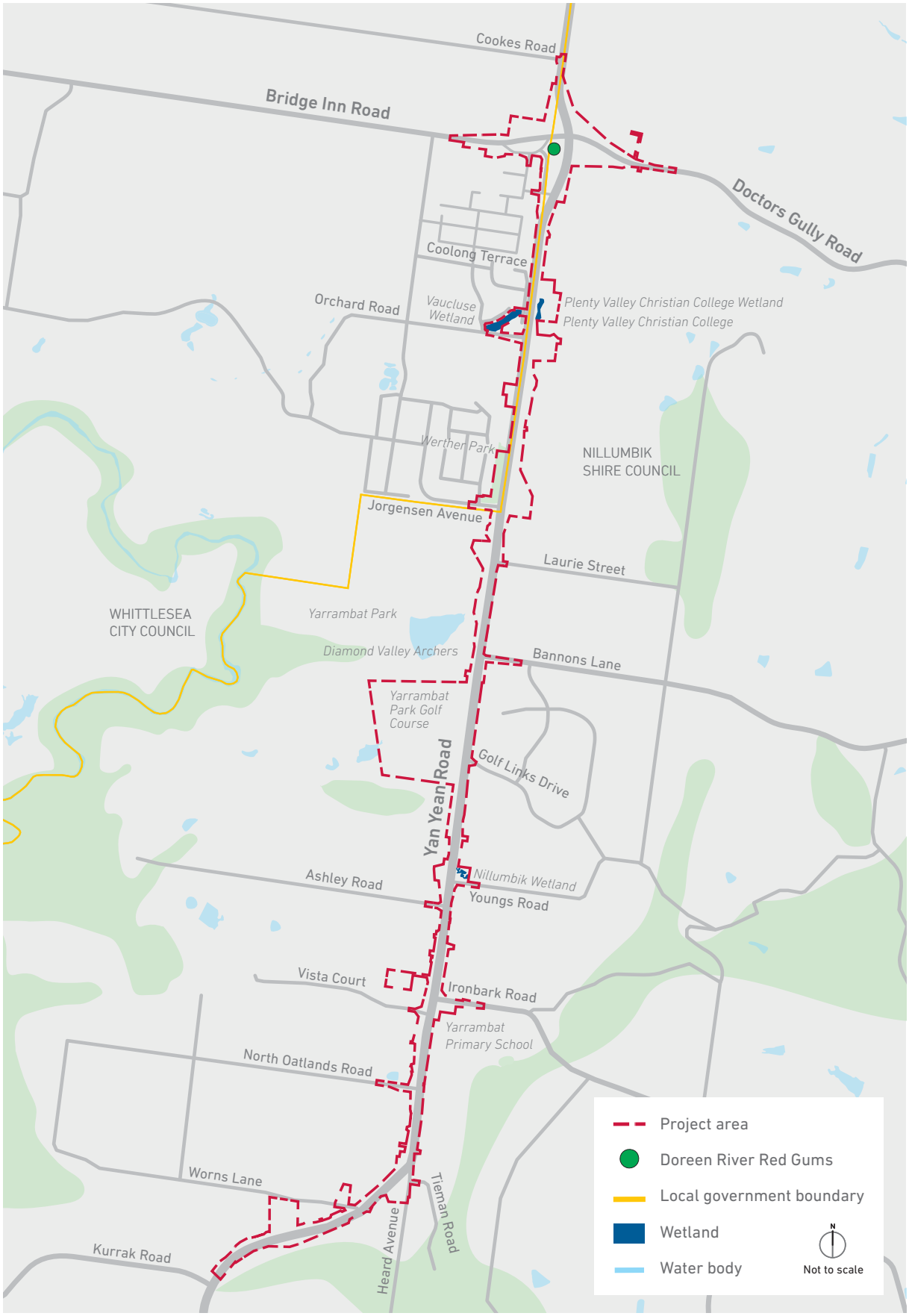
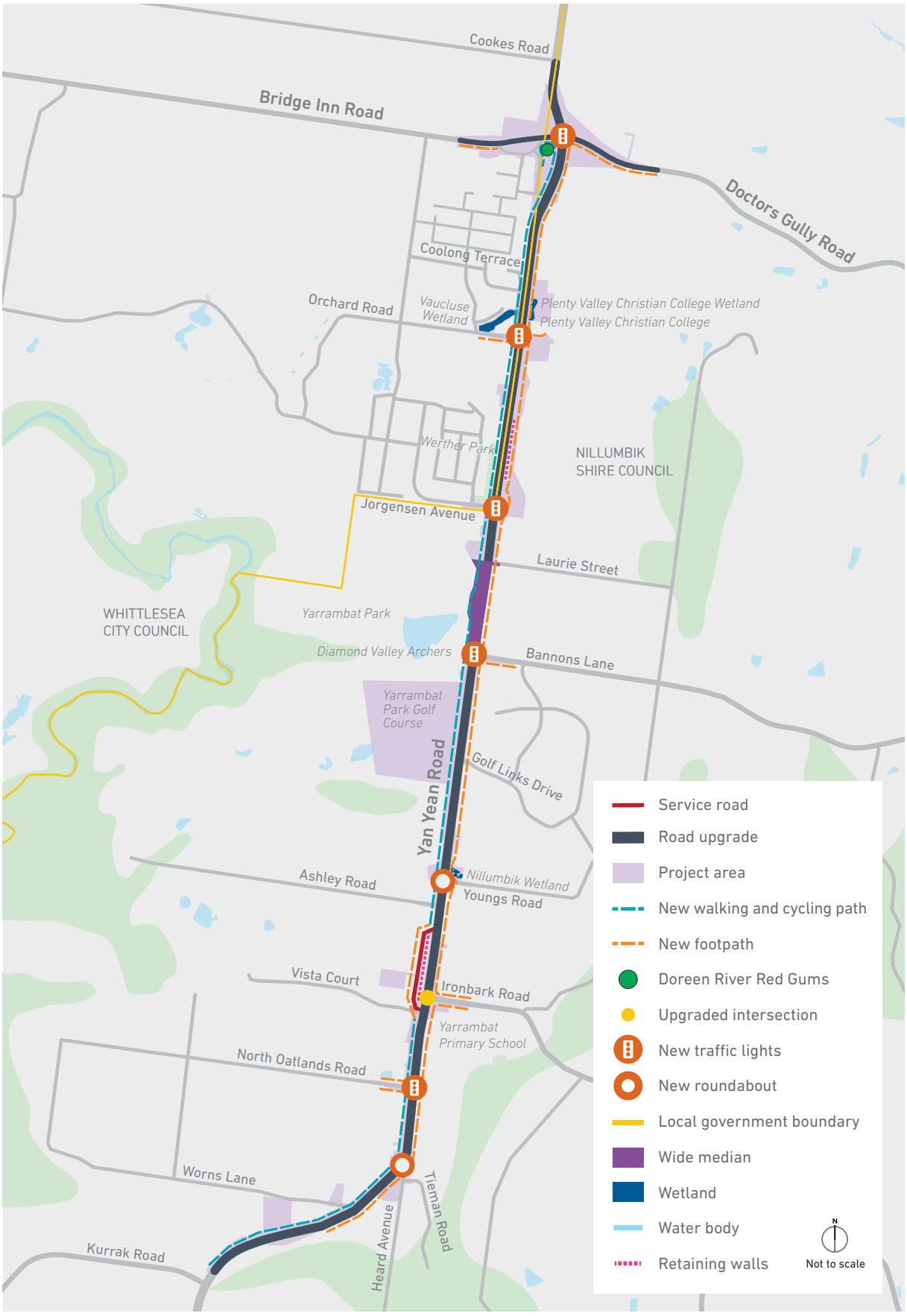


Figure 5.2 Key components of the Project



5.3 Project design

5.3.1 Road design

There are a number of elements to the road design of Yan Yean Road:

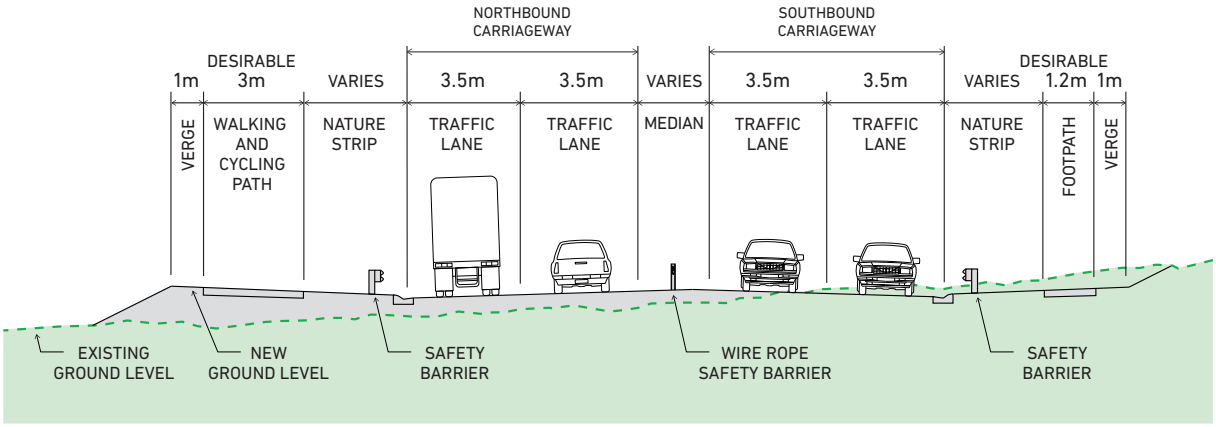
- Typical cross section
- Intersections
- Access
- Wide median
- Safety barriers
- Retaining walls
- Fencing
- Car parks
- Bus facilities.

Typical cross section

The following diagram indicates the typical cross section of the road design for the Project. At some locations along the alignment, such as intersections or roundabouts, this cross section would be slightly different and wider. Figure 5.3 shows the preferred mid-block cross section design, which allows for duplication with a 2.2 metre median with safety barriers.

The installation of safety barriers provides opportunities for tree planting in closer proximity to the road carriageway than would be otherwise permissible, in accordance with the Project's Landscape Strategy (Technical Report G). The total road reserve width along most of the proposed design is 24.2 metres increasing to 33 metres between Bannons Lane and Jorgensen Avenue to accommodate the widened median at this location. The current typical roadway width is eight metres.

Figure 5.3 Yan Yean Road preferred cross section design



For illustrative purposes only.

Intersection design

The scope of the Project includes modifications to a number of intersections. Signalised intersections are proposed to improve safety, provide U-turn opportunities and increase the capacity of existing intersections, and roundabouts are proposed to improve safety and provide larger U-turn opportunities. Intersection works include:

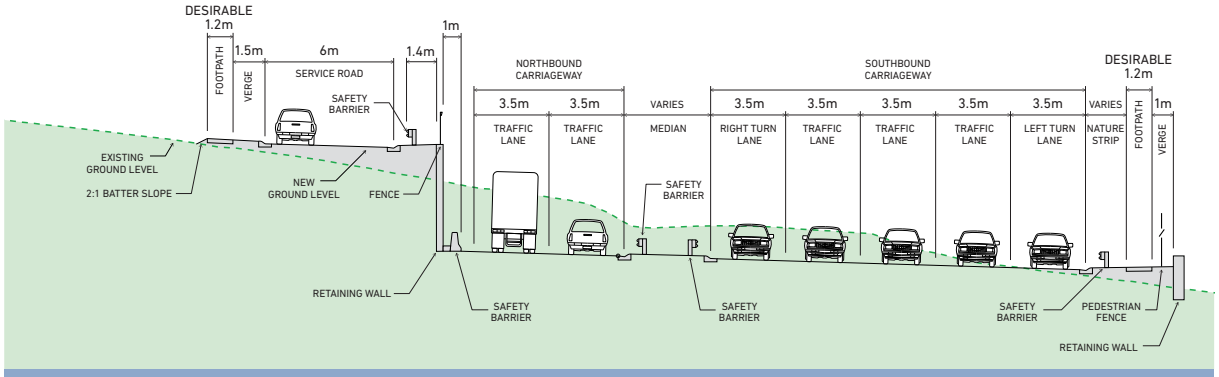
- Signalised intersections at North Oatlands Road, Ironbark Road (refer to Figure 5.4), Bannons Lane, Jorgensen Avenue, Orchard Road and Bridge Inn Road (refer to Figure 5.5)
- Roundabouts at Heard Avenue and Youngs Road
- Proposed left in / left out arrangements at all other intersections, including:
  - Yan Yean Road / Activity Way
  - Yan Yean Road / Laurie Street
  - Yan Yean Road / Golf Links Drive
  - Yan Yean Road / Ashley Road
  - Yan Yean Road / Service Road A exit (left out only)
  - Yan Yean Road / Vista Court
  - Yan Yean Road / Worns Lane
  - Yan Yean Road / 807 Yan Yean Road access
  - Yan Yean Road / Service Road B (between Kurrak Road and Worns Lane)
  - Residential properties and businesses along the alignment
- Auxiliary lanes provided for all left turns (and where applicable, right turns) from Yan Yean Road into key intersections to separate turning traffic from the main traffic flow to reduce collisions and improve the road capacity.

The project design at Bridge Inn Road would retain the two Doreen River Red Gums situated adjacent to the Bridge Inn Road and Yan Yean Road T-intersection and the General Store / former post office and Pet Supplies and Stockfeeds Store on the corner of Doctors Gully Road. It proposes shifting the whole intersection to the north-east corner of Yan Yean Road / Bridge Inn Road with two lanes in each direction.

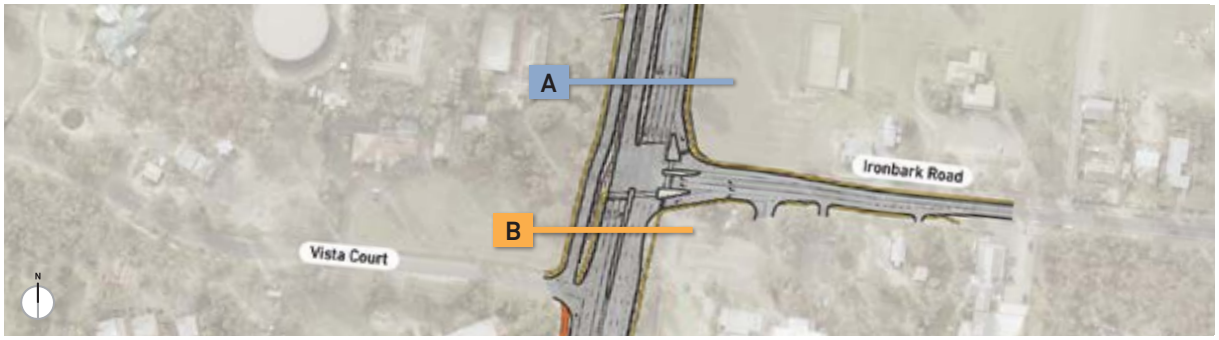
The design at Bridge Inn Road has been refined following community consultation and in response to additional arboriculture advice on the Doreen River Red Gums, which are situated south-west of the proposed intersection (refer to Figure 5.5).

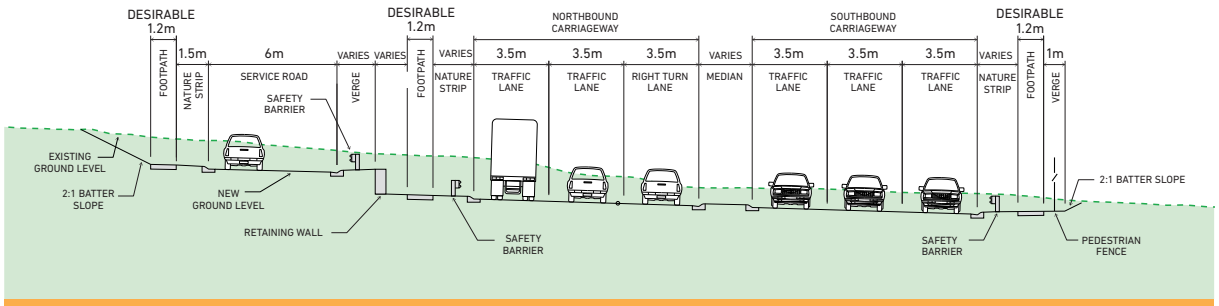
The project design at Bridge Inn Road would retain the two Doreen River Red Gums situated adjacent to the Bridge Inn Road – Yan Yean Road T-intersection and the General Store.

Figure 5.4 Typical signalised intersection cross section – Ironbark Road (northbound)



A: IRONBARK ROAD INTERSECTION DEPARTURE

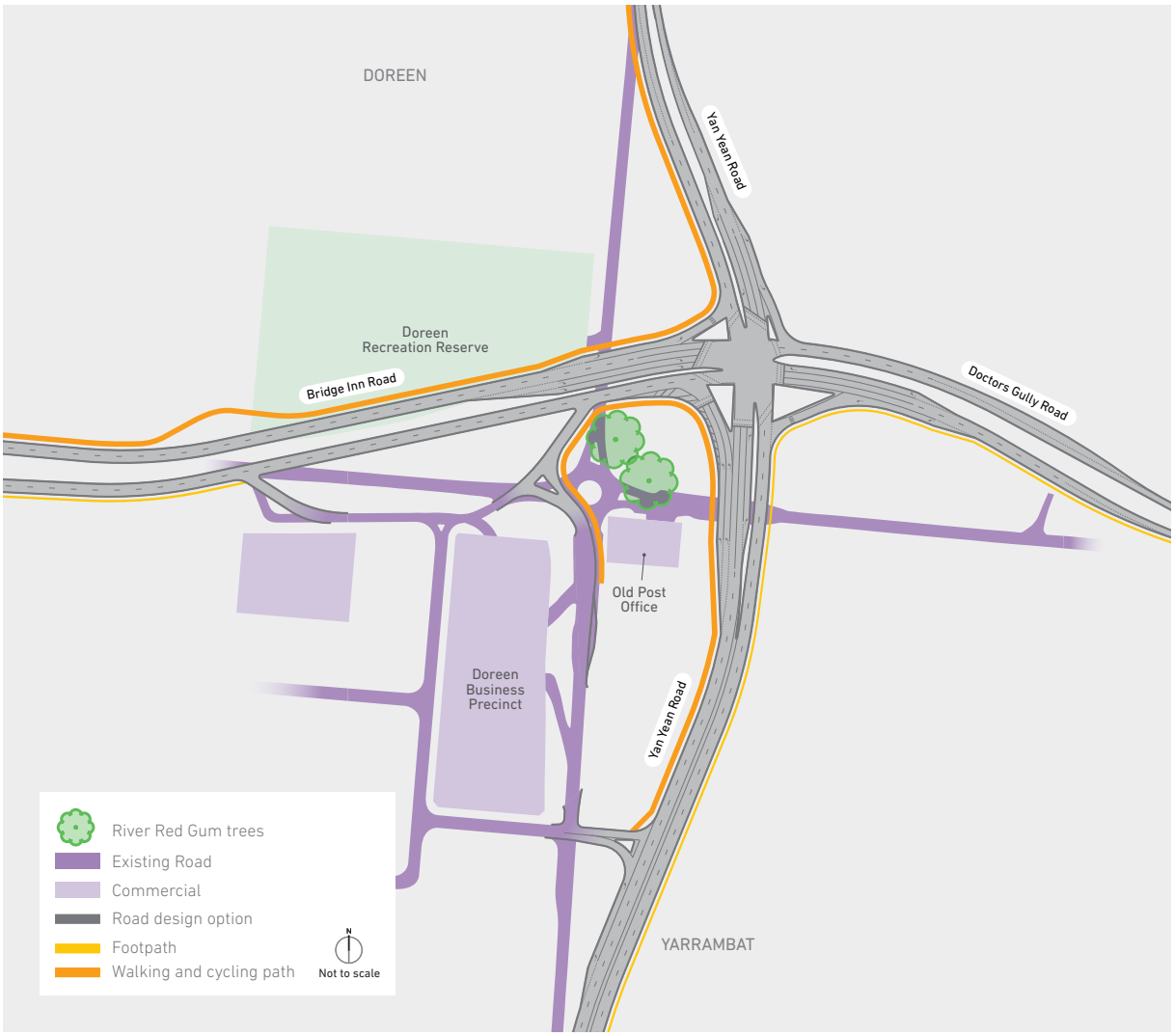




B: IRONBARK ROAD INTERSECTION APPROACH

For illustrative purposes only.

Figure 5.5 Bridge Inn Road intersection design



For illustrative purposes only.

Access design

All existing accesses would be changed to left in / left out arrangements to allow for the installation of a centre median and safety barriers. U-turn lanes would be provided at the following locations to allow for the safe turning of vehicles wishing to travel in the opposite direction:

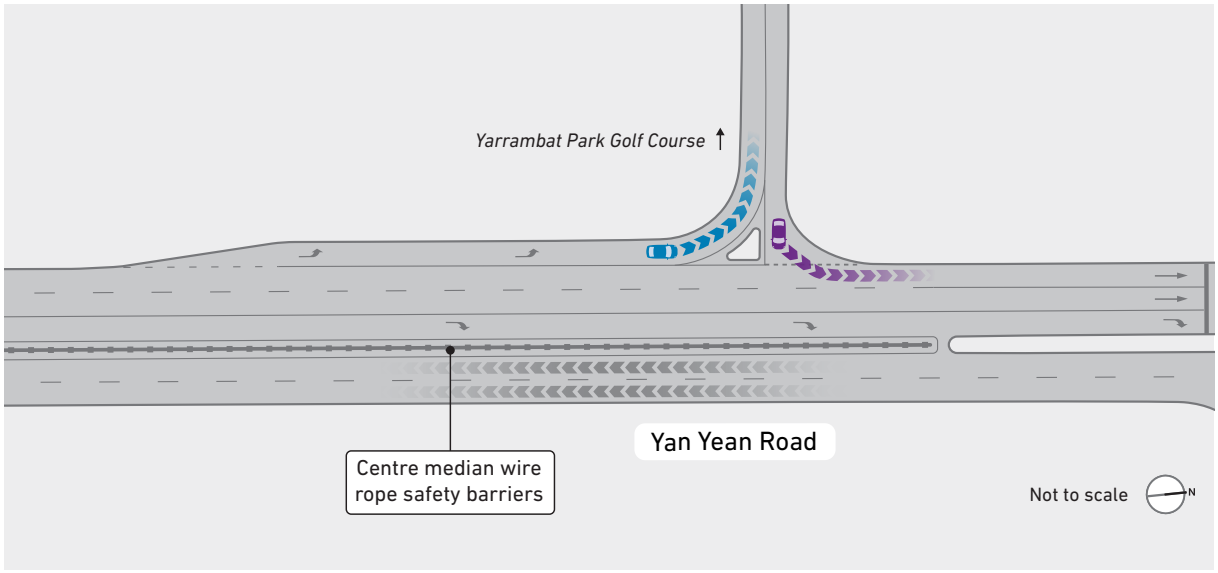
- Bridge Inn Road signalised intersection (cars only)
- Orchard Road signalised intersection (cars only)
- Jorgensen Avenue signalised intersection (cars only)
- Bannons Lane signalised intersection (cars only)
- Youngs Road roundabout (cars, cars with trailers / horse floats, semi-trailers and trucks)
- Ironbark Road signalised intersection (cars only)
- North Oatlands Road signalised intersection (cars only)
- Heard Avenue roundabout (cars, cars with trailers / horse floats, semi-trailers and trucks).

All existing Council approved property access and driveways are proposed to be maintained with minor tie-in works. Access for properties at the western side of Yan Yean Road from Vista Court to Ashley Road would be via a service road due to the steep grade and level differences between properties and Yan Yean Road (refer to Figure 5.4 and Attachment VI *Map Book*).

Access conditions at Yarrambat Primary School and Plenty Valley Christian College would be revised due to intersection upgrades impacting existing access and carpark arrangements.

The proposed design includes a left in / left out arrangement (refer to Figure 5.6) to the Yarrambat Park Golf Course.

Figure 5.6 Left in / left out arrangement – Access to Yarrambat Park Golf Course



For illustrative purposes only.

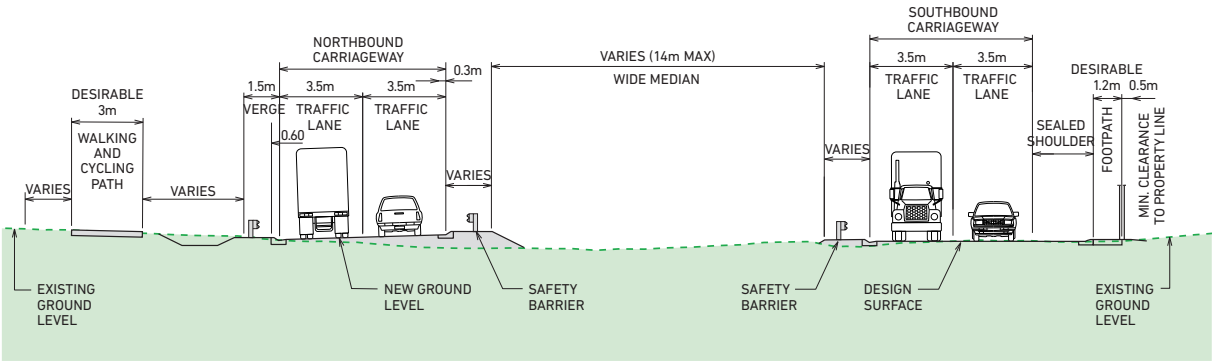
Wide median

A divided carriageway (boulevard design) increases the median width of Yan Yean Road from 2.2 metres to approximately 14 metres by realigning the northbound carriageway between Bannons Lane and Jorgensen Avenue (refer to Figure 5.7). The maximum road reserve width at this point would be approximately 33 metres, although the cross section would taper at either end to tie back into the standard cross section of 24.2 metres, as described above. A wider median at this location would provide for additional landscaping opportunities and potential avoidance of existing biodiversity values (including Matted Flax-lily) and large trees in accordance with the Project's Landscape Strategy (Technical Report G).

The southbound carriageway is aligned to follow the existing carriageway edge to retain the existing separation distance between driveways, residences and Yan Yean Road.

The wide median section of the road design tapers back to the standard cross section width at Bannons Lane. This allows the safe tapering of the road back to the standard road width while avoiding private land acquisition further south of the golf course.

Figure 5.7 Wide median cross section design



For illustrative purposes only.

Safety barrier design

Continuous safety barriers are proposed in the median and behind most outer kerbs (where there are not intersections). Safety barriers would be installed at various setbacks from the kerb ranging from 0.6 to 1 metre, depending on factors such as speed limit, topography and barrier type. Safety barriers require a cleared area behind them to maintain the integrity of their effectiveness. This includes clearance from walking and cycling paths, as well as footpaths. Proposed safety barriers include guardrail, wire rope and concrete barriers if deemed required.

Retaining walls design

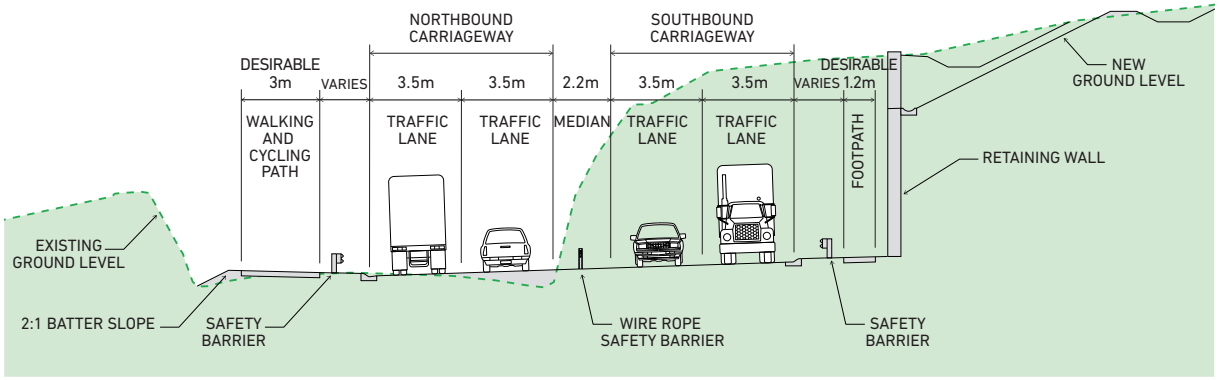
Retaining walls have been proposed at selected locations along Yan Yean Road to minimise the extent of land acquisition on adjacent properties, provide access to properties abutting Yan Yean Road, maximise the retention of existing trees and reduce the extent of cut earthworks. The design of retaining walls would be carried out in accordance with guidelines in the Project's Landscape Strategy (Technical Report G). Retaining walls are likely to be installed at the following locations (refer to Figure 5.8 and Figure 5.9):

- Between Service Road A and Yan Yean Road: a 270 metre long wall with an approximate maximum height of 3.6 metres. This retaining wall has been proposed to retain access to existing properties abutting Yan Yean Road and minimise impacts to existing trees
- At the north-east corner of Ironbark Road: a 230 metre long wall with an approximate maximum height of 2.4 metres. This retaining wall has been proposed to minimise the extent of land acquisition at the adjacent property
- North of North Oatlands Road along the western verge of Yan Yean Road: a 50 metre long wall with an approximate maximum height of 1.1 metres. This retaining wall has been proposed to minimise the extent of land acquisition at the adjacent property and minimise the impact to the existing driveway arrangement
- North of Jorgensen Avenue along the eastern verge of Yan Yean Road: a 220 metre long wall with an approximate maximum height of 8 metres. This retaining wall has been proposed to avoid impacting the existing telecommunication tower on the abutting property, maintain access to the adjacent property and telecommunication tower, maximise the retention of existing trees and reduce the extent of cut works.

Figure 5.8 Retaining wall locations

For illustrative purposes only.

Figure 5.9 Retaining wall cross section – north of Jorgensen Avenue intersection (northbound)



For illustrative purposes only.

Fencing design

The Project is required to ensure adequate safety measures are in place so that golf balls from Yarrambat Park Golf Course do not land on the walking and cycling path or road. This EES assumes that a 30-36 metre-high and 360 metre long fence along the edge of the golf course is included in the design to avoid golf ball collisions with pedestrians, cyclists or vehicles.

The proposed fence would incorporate elements to increase its visibility to Swift Parrot and other bird species. The alternative option to building a fence is to reconfigure golf course holes 1, 10 and 18 to increase their distance from the road and reduce the risk of golf balls landing on the new road and walking and cycling path to an acceptable level. This would not reduce the number of holes at the golf course.

A 1.8 metre timber paling fence has been designed to mitigate the risk of arrows from the Diamond Valley Archers facility affecting the road or walking and cycling path.

Plenty Valley Christian College and Yarrambat Primary School

Access to Plenty Valley Christian College and Yarrambat Primary School directly adjacent to the project area would be maintained during the Project's construction and operation. Some temporary arrangements may be required during construction to manage roadworks adjacent to the schools.

The Project would reconfigure and reinstate an existing car park at Plenty Valley Christian College. This includes a new access road to tie into the existing road. The dam at Plenty Valley Christian College would also require reconfiguration. This would be completed in collaboration with the school.

Land currently used by Yarrambat Primary School for informal car parking would require reconfiguration.

To facilitate these changes, partial land acquisition would be required along the frontage of both schools. This would be limited in extent and would not result in a long-term change to the existing land use; however, it would result in a permanent reduction in the land area on both school sites (refer to Attachment VI *Map Book*).

Bus facilities

Existing bus stops are proposed to be reinstated at the same location or within close proximity, in consultation with the Department of Transport and Public Transport Victoria. The project area allows for indentations around bus stops along the alignment if required.

5.3.2 Active transport design elements

Walking and cycling path and footpath

The design provides a walking and cycling path on the western side of Yan Yean Road in the following locations (refer to Figure 5.2):

- Adjacent to the northbound carriageway of Yan Yean Road from Kurrak Road to Bridge Inn Road, connecting to the existing walking and cycling path at both ends
- Adjacent to the eastbound carriageway of Bridge Inn Road, to be connected to existing walking and cycling paths.

Between Bannons Lane and Jorgensen Avenue, the walking and cycling path is realigned through Yarrambat Park and Shire of Nillumbik land to avoid the removal of more trees on the western side of Yan Yean Road. The walking and cycling path north of Jorgensen Avenue follows the existing footpath for the same purpose. The walking and cycling path would generally be three metres wide and would reduce slightly in width at various locations to allow the retention of trees.

In addition, a footpath, generally 1.2 metres wide, is proposed on the eastern side of Yan Yean Road in the following locations (refer to Figure 5.2):

- Adjacent to the southbound carriageway of Yan Yean Road from Bridge Inn Road to Kurrak Road to connect into the existing footpath
- Adjacent to the northbound carriageway of Yan Yean Road, along Service Road A from Vista Court to Ashley Road to connect to the proposed walking and cycling path extents
- Along Doctors Gully Road to Yan Yean Road to connect into the existing footpath.

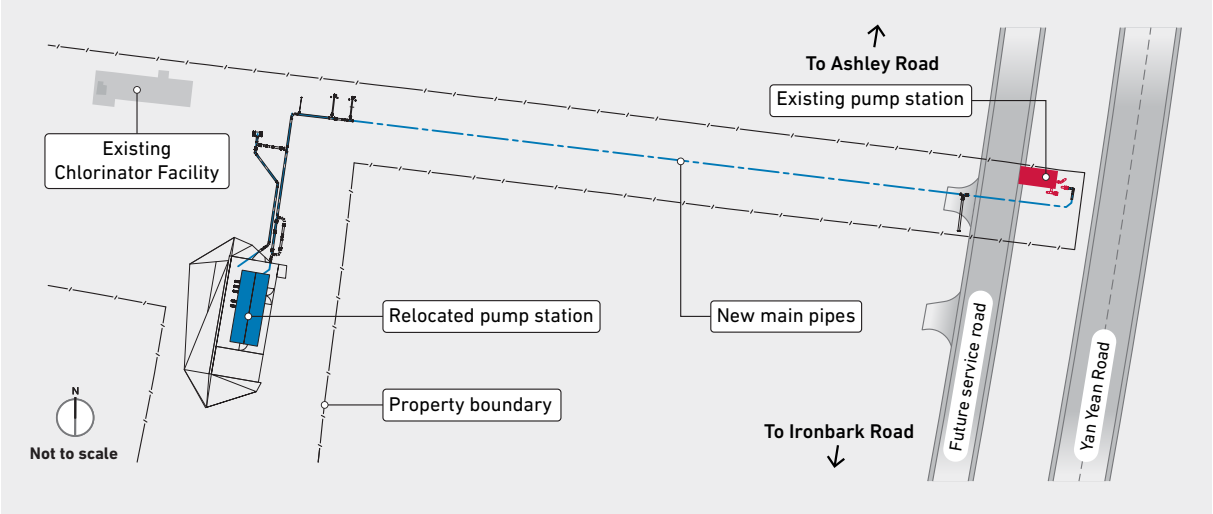
5.3.3 Utilities

New utility service upgrades, relocations and protection works may be required along the length of the Project. Where utility services cannot be avoided, protection / relocation / diversion works would occur adjacent to the proposed road pavement. Relocation of power lines along the alignment is anticipated to involve a combination of above ground and underground power. Works associated with existing water mains, sewer, gas and telecommunications assets may also require relocation and/or diversion adjacent to the road pavement. As such, a minimum allowance of five metres from the outermost construction extent (toe / top of batter, retaining wall, etc.) has been made to allow for potential utility upgrades and service relocations within the project area.

Relocation of Yarra Valley Water pump station

The project area includes a Yarra Valley Water pump station, near Ironbark Road on the western side of the existing Yan Yean Road, which the Project may be required to relocate. The tank may be re-located and new connecting infrastructure installed, all on existing Yarra Valley Water land. Refer to Figure 5.10 for the indicative relocation plan. MRPV continue to investigate design opportunities that could avoid the requirement to relocate the pump station.

Figure 5.10 Yarrambat pump station relocation indicative plan



For illustrative purposes only.

5.3.4 Drainage design

New drainage works, upgrades and relocations would occur along the length of the Project. Drainage along the alignment has been developed based on a flood model and expected outfall locations (which were determined by existing topography); however, the Project is also required to comply with water sensitive urban design (WSUD) requirements from Melbourne Water. This approach aims to make better use of stormwater in urban areas and reduce the harm it causes to the natural water cycle, rivers and creeks. Meeting Melbourne Water's requirements is likely to comprise grassed swale drains (where practicable), detention basins and water treatment basins.

The project area provides for a minimum 10 metres offset from the top of each drainage swale to allow for construction. In areas where drainage swales are not required, a minimum allowance of five metres from the outermost construction extent (toe / top of batter, retaining wall, etc.) has been provided in the project area to allow adequate construction space. The Project would coordinate closely with local schools to ensure the functionality of existing car parks and outdoor playing fields is maintained if these areas are impacted by drainage works.

Detention basin sites for surface water management have also been allowed for within the project area in proximity to Worns Lane, Heard Avenue, Youngs Road, Orchard Road (Melbourne Water wetland) and Bridge Inn Road.

5.3.5 Landscaping and urban design

A Landscape Strategy (Technical Report G) has been developed in consultation with Councils and other key stakeholders to ensure that the Project fits sensitively into the built, natural and cultural environment of Doreen and Yarrambat. The strategy would ensure that landscaping undertaken as part of the Project is well designed and contributes to the character and functioning of the Yan Yean Road corridor and the surrounding area, as well as to the accessibility and connectivity of people within the wider region and community. The Project would provide new and reinstated landscapes that are appropriate to the local conditions and consistent with the existing varied character of the area. Wherever possible, the Project would provide opportunities to increase canopy cover and improve amenity in the public realm.

The Landscape Strategy provides overarching principles to guide the Project landscape design, with a particular focus on minimising impacts on trees along the road corridor. Planting typologies have been considered to enhance the experience of drivers, pedestrians and cyclists, provide visual interest, screen infrastructure elements, improve habitat values and provide subtle wayfinding clues. Planting adjacent to the shared path would provide shelter and shade to improve user amenity. The activation of remnant open space would be explored to provide increased amenity to the local community where feasible.

5.3.6 Sustainability and climate change

MRPV is committed to delivering projects that optimise social, economic and environmental outcomes over the long term. To fulfil this commitment, MRPV would ensure:

- Sustainability risks and opportunities are identified and refined into project-appropriate performance objectives and requirements
- Delivery partners are monitored to ensure achievement of sustainability performance objectives and requirements
- Project sustainability performance is measured, verified and publicly reported on.

Key sustainability opportunities for the Project include:

- Ensuring the Project is resilient to the challenges of climate change by preparing and implementing a climate risk assessment and adaptation plan
- Optimising the use of recycled content in infrastructure materials
- Reducing greenhouse gas emissions, material lifecycle impacts and waste generation during the Project's construction and operation
- Protecting and enhancing the built, natural and cultural environment within and adjacent to the project area.

5.3.7 Land acquisition

The existing road corridor is not of sufficient width to accommodate the duplication and supporting infrastructure such as service roads, walking and cycling path and drainage. The Project would require the partial or full acquisition of 96 parcels of land. In most cases, partial acquisition of the land would be required along the frontages of landholdings.

This acquisition would be limited in extent and would not result in a long-term change in the existing land use, but it would result in a permanent reduction in the land area on those land parcels.

The land acquisition process would be undertaken in accordance with the *Land Acquisition and Compensation Act 1986* and would include consultation with affected landowners. Compensation would be provided for all land acquired for the Project. Refer to Attachment VI *Map Book* for the proposed Public Acquisition Overlay (PAO).

The landowner status of proposed land acquisition for the Project includes:

- Shire of Nillumbik: 24 land parcels
- City of Whittlesea: four land parcels
- Private: 60 land parcels
- Public Authorities / State: eight land parcels.

5.4 Project construction

5.4.1 Construction activities

Construction details would be subject to further refinement as the Project progresses; however, any changes to the activities and requirements outlined below would need to be in accordance with the Environmental Performance Requirements (EPRs) set out in Chapter 12 *Environmental Management Framework*.

Proposed construction activities would be standard road construction activities to be undertaken in accordance with the EPRs for the Project.

Site establishment would involve tree clearance and vegetation lopping and removal within the project area, establishment of construction site compounds, clearing and grubbing, temporary sediment and erosion control works, and establishment of environmental and traffic controls.

Earthworks would involve remediation of any existing contamination and removal of any hazardous material, as appropriate, protecting and relocating services, widening of existing rock cuttings (approximately 750 metres of existing cut along the Project would be widened by approximately 20 metres), new cuttings (approximately 1,300 metres of new rock cut would be required to a width of approximately five metres along the Project), and bulk earthworks and haulage. Some of the cutting locations would require retaining walls. Refer to Figure 5.8 for the location of proposed retaining walls in the Project and Figure 5.9 for a representative retaining wall cross section.

Civil and structure works would involve construction of infrastructure, including intersection upgrades, walking and cycling paths, retaining walls, drainage works and pavement works.

Reinstatement would involve implementing traffic management systems and landscaping in accordance with the Landscape Strategy (Technical Report G) for the Project.

5.4.2 Construction laydown areas

To minimise disruption at and around the Project site, one or more separate site compounds (or 'laydown areas') would be established for site offices, storage of materials and plant, amenities for workers, secure container storage, short-term storage for waste and potentially workforce parking. The laydown area(s) would be required to be in use for the full duration of Project construction.

Construction laydown areas have not yet been identified for the Project, other than those included in the project area. Following the engagement of a contractor, they would identify one or more sites that are suitable for this purpose on the basis of minimal environmental impact. Depending on the site(s) selected, a separate planning approval process may be required which would need to be informed by site investigation and consultation.

The project area has allowed for a site on the western side of Yan Yean Road in close proximity to the Yarrambat Horse and Pony Club, which is currently being used as laydown area by Yarra Valley Water. The Project may also utilise the existing Department of Transport owned land at 423-437 Yan Yean Road Yarrambat at the southern end of the project area. Vegetation removal would avoid the no-go zones identified in Attachment VI *Map Book*.

The laydown area(s) would be reinstated following works to their pre-Project condition, or as agreed with the landholder. The nature of reinstatement and any improvement works would be agreed with the landowner and any other relevant stakeholders, potentially Council and the Department of Transport.

5.4.3 Construction method

The construction methods adopted would seek to develop the Project in discrete stages to the extent practicable. This would assist with localising construction impacts for each stage of works. Maintaining traffic flow throughout the Project would be a key component of the construction methodology. Constructing new lanes 'offline' would be integral to maintaining traffic flow, including diverting traffic into new lanes as staged sections were completed. As traffic is diverted into newly constructed lanes, old lanes would be upgraded to assist in maintaining traffic flow.

Temporary road closures and diversions would be required for the construction of intersections. Road closures and diversions would be managed through community consultation and detailed traffic management plans.

Spoil is defined as waste soil or rock resulting from excavation activities. Spoil generated by construction activities would be managed in accordance with EPA requirements applicable at the time of construction.

The final spoil disposal strategy would be developed in accordance with EPA Victoria requirements, particularly in regard to managing any contamination entrained within the soil, and whether spoil would be stockpiled or taken immediately to landfill. Haulage routes would be constrained to arterial roads, including Yan Yean Road. Where roads other than Yan Yean Road or designated arterials are required to be used, this would be done in consultation with the Department of Transport and the relevant local authority, with appropriate notice given to any affected residents.

5.4.4 Working hours

Construction work for the Project would be undertaken in accordance with EPA requirements applicable at the time of construction. Standard construction work hours are:

- Monday to Friday, 7am to 6pm
- Saturday, 7am to 1pm.

Construction outside standard hours might occur at discrete stages to enable particular tasks to be undertaken more safely than could otherwise be achieved. Night works would also be required to minimise impacts on traffic or nearby stakeholders. Works proposed for outside standard hours would need to be approved in advance by MRPV, following consultation with all relevant stakeholders.

5.5 Project operation and maintenance

When complete, Yan Yean Road would be owned by the Department of Transport and operated in accordance with its environmental management approach. Ongoing monitoring and associated management and mitigation measures set out in the EPRs would be implemented during operation of the Project by the relevant organisation.

Maintenance of the infrastructure would be undertaken by Department of Transport, or local Councils for pathways and service roads, in accordance with the *Road Management Act 2004 – Code of Practice*.

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