

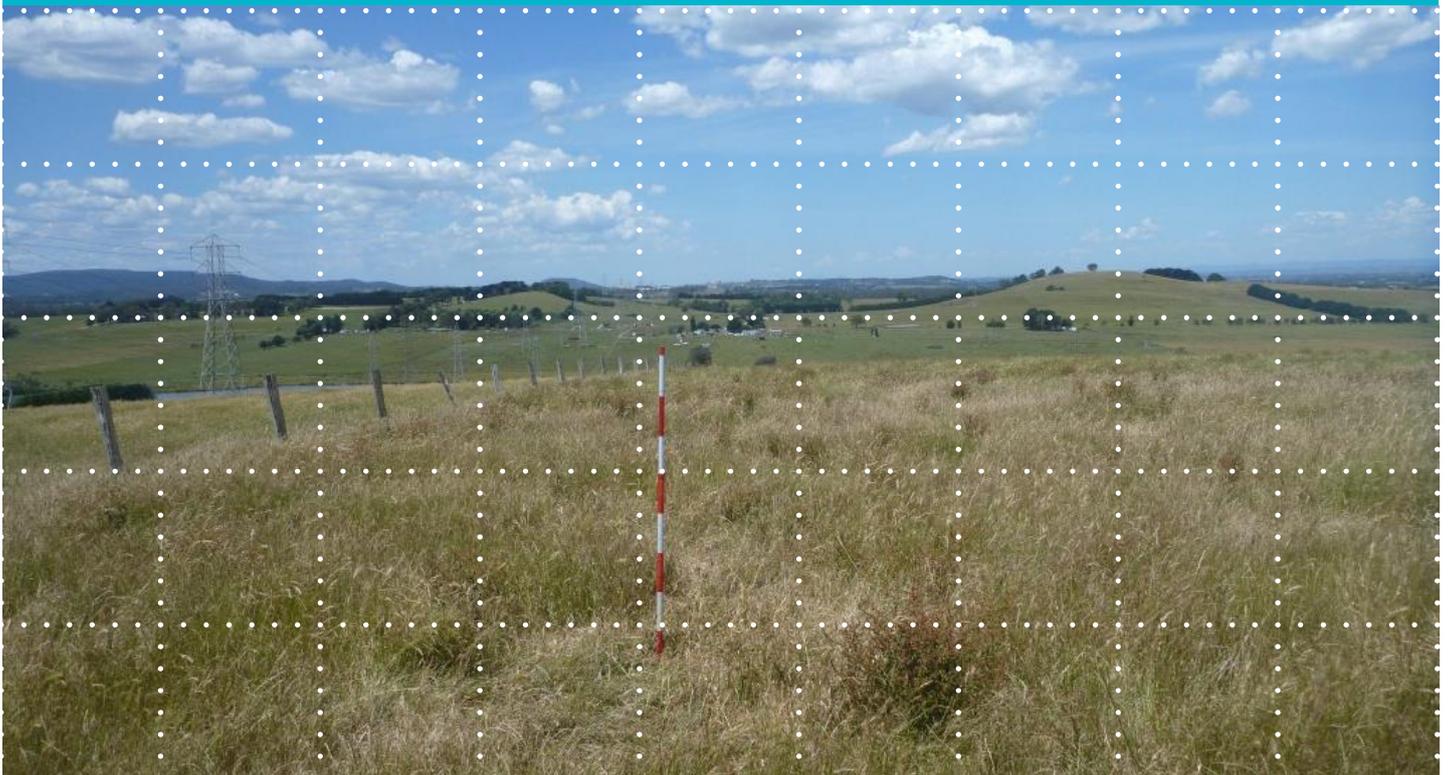
Final Report

Pakenham East Precinct Structure Plan, Pakenham, Victoria: Aboriginal and Historical Heritage Assessment

Client

Cardinia Shire Council

December 2017



Ecology and Heritage Partners Pty Ltd

Author

Bradley Ward

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- Cardinia Shire Council for project and site information.
- Aboriginal Victoria (formally the Office of Aboriginal Affairs Victoria) for information regarding Aboriginal Places.
- Heritage Victoria for information regarding historical heritage places.

Cover Photo: View east over the study area
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ABBREVIATIONS

Acronym	Description
Act, the	<i>Aboriginal Heritage Act 2006</i>
AHHA	Aboriginal and Historical Heritage Assessment
AV	Aboriginal Victoria (formally Office of Aboriginal Affairs Victoria)
BLCAC / Bunurong	Bunurong Land Council Aboriginal Corporation
BWF / Boon Wurrung	Boon Wurrung Foundation Ltd
CHL	Commonwealth Heritage List
CHMP	Cultural Heritage Management Plan
CHP	Cultural Heritage Permit
CMA	Catchment Management Authority
DELWP	Department of Environment Land Water and Planning (Victoria)
DoE	Department of the Environment (Commonwealth)
DPC	Department of the Premier and Cabinet (Victoria)
EES	Environment Effects Statement
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EVC	Ecological Vegetation Class
HA	Heritage Advisor
HHA	Historical Heritage Assessment
HO	Heritage Overlay
HV	Heritage Victoria
LDAD	Low Density Artefact Distribution
NES	National Environmental Significance
NHL	National Heritage List
NNTT	National Native Title Tribunal
PMST	Protected Matters Search Tool
PSP	Precinct Structure Plan
RAP	Registered Aboriginal Party
RNE	Register of the National Estate
Regulations, the	<i>Aboriginal Heritage Regulations 2007</i>
SGD	Significant Ground Disturbance
SLV	State Library of Victoria
STH	Shovel Test Hole
STP	Stratigraphic Test Pit
T/O	Traditional Owner/s
VAHC	Victorian Aboriginal Heritage Council

Acronym	Description
VAHR	Victorian Aboriginal Heritage Register
VGf	Victorian Geomorphological Framework
VHI	Victorian Heritage Inventory
VHR	Victorian Heritage Register
VWHI	Victorian War Heritage Inventory
WHL	World Heritage List
WTLCHCI / Wurundjeri	Wurundjeri Tribe Land and Compensation Cultural Heritage Council Inc

EXECUTIVE SUMMARY

Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by Cardinia Shire Council to prepare an Aboriginal and Historical Heritage Assessment (AHHA) for the proposed Pakenham East PSP in Pakenham, Victoria (Cardinia Shire Council) (Map 1).

The Activity

Cardinia Shire Council is proposing to rezone the study area to allow for future residential development as part of the Pakenham East PSP.

The Study Area

The study area is 633.2127 ha in size and is bounded to the north by agricultural land, to the east by Mount Ararat Road, to the west by Deep Creek Road and Ryan Road, and to the south by the Princes Freeway (Map 2).

Methods

The assessments undertaken as part of this AHHA were a desktop assessment, initial field survey (undertaken by Szydzik and Alberto [2013]), geoarchaeological augering program and additional field inspection. The desktop assessment consisted of reviews of relevant heritage registers and databases, previous archaeological publications and unpublished reports, and a review of the environmental context of the study area, culminating in a predictive statement regarding the likelihood of Aboriginal cultural heritage occurring in the study area.

The initial field survey consisted of a ground surface survey of the study area by qualified archaeologists, in conjunction with representatives of the Traditional Owner communities to discover any Aboriginal and/or historical cultural heritage visible on the ground surface and to identify any areas of Aboriginal and/or historical cultural heritage likelihood (areas that have landforms that are considered likely to contain subsurface Aboriginal or historical archaeological deposits).

The geoarchaeological augering program and field inspection of the study area was conducted by Ecology and Heritage Partners Pty Ltd Archaeologist and Heritage Advisor, Bradley Ward to confirm the results of the initial survey and desktop assessment and to further refine areas of archaeological likelihood for Aboriginal cultural heritage.

Subsurface testing did not form part of the scope of works for this assessment.

Results

Desktop Assessment

The updated desktop assessment indicated that there have been 28 Aboriginal Places previously recorded within a 2 km radius of the study area (Map 8). Seven Aboriginal sites were located in the study area. The

desktop assessment concluded that artefact scatters and LDADs are the types of Aboriginal Places most likely to occur within the study area.

Field Survey

The initial field survey was undertaken on 11th and 12th December 2012 by Ecology and Heritage Partners Pty Ltd Archaeologists/Heritage Advisors, Sylvana Szydzik and Wendy Alberto, with Bobby Mullins and Eddy Ockwell representing the Wurundjeri Tribe Land and Cultural Heritage Compensation Council, Ngarra Williams representing the Boon Wurrung Foundation, and Darren Symington representing Bunurong Land Aboriginal Council.

Aboriginal Cultural Heritage

One Aboriginal Place was located during the initial survey:

- VAHR 8021-0380 (Nar Nar Goon IA 1) / LDAD (one artefact).

The subsequent field inspection identified the following areas of Aboriginal likelihood:

- Low-lying areas, comprising seasonally inundated flood plains and former marshlands (low likelihood);
- Heavily sloping areas, comprising moderate to steep slopes (>10%) on ridges/hills (low likelihood);
- Elevated areas, comprising relatively flat to gentle slopes (<10%) on ridges/hills (moderate likelihood);
- Areas of cultural heritage sensitivity (high likelihood).
- A draft copy of this report was provided to AV and the relevant Aboriginal Traditional Owner groups. Comments on the draft report were received by AV and the Bunurong Land Aboriginal Council, and highlighted that the ridgeline landform, extending from the north through to the south of the study area, should be considered as having cultural heritage sensitivity. This landform is considered sensitive as ridgelines within the greater PSP region were often utilised as transit routes from the Dandenong Ranges to the adjacent swamplands (Koo Wee Rup). The 'Areas of Archaeological Likelihood' provided in Map 11 has been updated to reflect this landform as having cultural heritage sensitivity (attributed as moderate likelihood).

Historical Heritage

No historical heritage places or areas of historical likelihood were located.

Summary of Management Recommendations

Recommendation 1: Mandatory Cultural Heritage Management Plans

In properties where areas of CHS (as identified by *Aboriginal Heritage Regulations 2007*) are present (Map 11), and a high impact activity will take place, a mandatory CHMP must be undertaken. The CHMP will include an archaeological survey and subsurface testing program to establish the nature, extent and significance of all Aboriginal cultural heritage in the study area (in accordance with r.60 and r.61 of the *Aboriginal Heritage Regulations 2007*). This must include consultation with the relevant Traditional Owner

communities, Sponsor and HA to agree on an appropriate sampling methodology suitable to the subsurface testing of Aboriginal cultural heritage within the study area.

The complex assessment will focus within the areas of cultural heritage sensitivity and Aboriginal archaeological likelihood (Map 11) and the primary aims will be to:

- Establish the presence of any subsurface Aboriginal archaeological deposits;
- Define the nature, extent and significance of any subsurface Aboriginal archaeological deposits;
- Determine the extent of the pre-existing surface site identified as part of this assessment; and
- Determine the nature and condition of the stratigraphy.

The methodology to be used to sample the area of sensitivity will be to excavate a series of representative test pits (e.g. 1 m x 1 m test pits and 50 cm x 50 cm shovel test holes), removing sediments with horizontal control in excavation units (spits) of either 50 mm or 100 mm (or following the natural stratigraphy where present) by using accepted stratigraphic methods and standard hand-held tools.

It should also be noted that the Traditional Owner communities may request controlled excavation using mechanical equipment (e.g. mechanical excavator and mechanical sieve). If machinery is used for the purposes of uncovering Aboriginal cultural heritage, the disturbance or excavation shall be conducted on a detailed stratigraphic basis. In addition, if the use of machinery results in the finding of occupation deposits or features, the deposits or features shall be uncovered and assessed by controlled non-mechanical excavation.

Any future Aboriginal archaeological subsurface testing involving both hand and mechanical excavation methods will require consultation between the Traditional Owner communities, proponent and a HA in order to determine an appropriate sampling methodology.

Pursuant to the *Aboriginal Heritage Act 2006* and *Aboriginal Heritage Regulations 2007*, the HA will discuss the results of the complex assessment with the relevant Aboriginal stakeholders, AV and Sponsor and determine recommendations for additional Aboriginal cultural heritage investigations that may be undertaken for the purpose of preparing a CHMP.

██████████ has been subject to a previous archaeological assessment, conducted in 2005 by Paynter and Rhodes. The recommendations set out by Paynter and Rhodes (2005) included salvage requirements for Deep Creek 1 and Deep Creek 2 (VAHR 8021-0110-0111). As mentioned in Section 3.3.4, Deep Creek 2 (VAHR 8021-0111) falls within the set aside open space reserve (within 100 m of Deep Creek) (Map 3) and is unlikely to be impacted as a result of the PSP. Deep Creek 1 (VAHR 8021-0110) does not fall within this open space reserve and therefore salvage of this Aboriginal Place will be required if impacts occur in this area. The recommendations set out by Paynter and Rhodes (2005) are as follows:

- Application for a Consent to Disturb sites Deep Creek 1 and Deep Creek 2 (VAHR 8021-0110 and 8021-0111) from the Minister of Aboriginal Victoria, and the support of the Traditional Owner communities for the proposed residential development and further archaeological works;

- In the event that a Consent to Disturb is issued, controlled salvage of the place Deep Creek 1 (VAHR 8021-0110) is to be conducted, comprising the excavation of a 2 m x 2 m trench in close proximity to the noted deposits associated with either a former course or former tributary of Deep Creek;
- Controlled excavator scrapes across the activity area associated with either the stripping of soil within the property, or fill to be placed over the study area; and
- If *in situ* features, such as a hearth, are identified during the excavation of the 2 m x 2 m or the excavator scrapes, there should be provision for dating of radiocarbon dating.

It is recommended that the previous assessment (Paynter and Rhodes 2005) be included in the mandatory CHMP for this property. During this process, it must be determined if a Consent to Disturb has been issued for the place Deep Creek 1 (VAHR 8021-0110), and, in consultation with the Traditional Owner communities, the salvage recommendations outlined by Paynter and Rhodes (2005) be included in the Complex CHMP.

Recommendation 2: Voluntary Cultural Heritage Management Plans

In properties where there is no area of cultural heritage sensitivity present, as identified by *Aboriginal Heritage Regulations 2007*, the proponent is not legally required by the *Aboriginal Heritage Act 2006* and the *Aboriginal Heritage Regulations 2007* to prepare a mandatory CHMP.

However, it is recommended that the proponent consider preparing a voluntary CHMP given that areas of moderate archaeological likelihood are present (see Map 11 and Map 12); therefore, there is a risk that any future development of the study area may impact potential Aboriginal archaeological sites. There are a number of advantages to preparing a CHMP, and reasons why the proponent may wish to consider the preparation of a voluntary CHMP:

- **No requirement for Cultural Heritage Permits at a later stage:** There are no cultural heritage permit requirements in relation to a CHMP as long as you are acting in accordance with the CHMP. There is no requirement for an excavation permit or a permit to harm, or any of the other permit requirements. In effect, the approved CHMP is a permit. If something turns up unexpectedly during construction, there is no permit requirement. These are dealt with through contingency plans in the CHMP, already signed off and agreed to by the Registered Aboriginal Party, or by Aboriginal Victoria (in the absence of a RAP) in the CHMP process;
- **Increased certainty for your project:** As there are no Cultural Heritage Permit requirements at a later stage, there is a great deal more certainty for the project. If a CHMP has been prepared, there is certainty that the project can proceed without work stoppages. This certainty is provided during the planning phase, allowing the construction phase of projects to be unimpeded. Preparing a CHMP provides the proponent with peace of mind. A CHMP removes the development activity from the harm provisions of the *Aboriginal Heritage Act 2006*, as long as the proponent acts in accordance with the CHMP; and
- **Good Risk Management:** Lastly, preparing a CHMP is good risk management for a project, just as preparing a cultural heritage assessment has been in the past.

Recommendation 3: Inspection and Risk Assessment

For areas of low likelihood outside of the voluntary and mandatory CHMP areas, it is recommended that a detailed inspection and risk assessment be undertaken, this may be undertaken in the form of a voluntary CHMP. While these areas do not contain legislative obligations to complete an Aboriginal archaeological investigation, effective risk management should be implemented to avoid any damage to Aboriginal places that may exist in these areas.

Recommendation 4: Open Spaces and Parkland

Additional allowance for open spaces and parklands in areas of high likelihood is also recommended. These areas include areas where mandatory and voluntary CHMPs have been recommended. These areas are likely to contain further Aboriginal cultural heritage and therefore all attempts should be made to avoid impacts to these areas.

Recommendation 5: Contingency for Aboriginal Heritage

There are no other known Aboriginal cultural heritage issues in regard to the proposed development. If any Aboriginal cultural heritage issues are encountered during the course of construction then works should cease within 10 m of the area and a qualified Heritage Advisor as well as the relevant Aboriginal stakeholders (or AV) should be contacted to investigate the nature of the cultural heritage. **Recommendation 6:**

Contingency for Historical Heritage

There are no other known historical heritage issues in regard to the proposed development. If any historical heritage issues are encountered during the course of construction then works should cease within 10 m of the area of concern and a qualified Heritage Advisor (or Heritage Victoria) should be contacted to investigate the nature of the historical heritage.

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1 INTRODUCTION

1.1 Background and Scope of Works

Ecology and Heritage Partners Pty Ltd was commissioned by Cardinia Shire Council to prepare an Aboriginal and Historical Heritage Assessment (AHHA) for the proposed Pakenham East Precinct Structure Plan (PSP) in Pakenham, Victoria (Cardinia Shire Council) (Map 1).

The project brief agreed upon by Ecology and Heritage Partners Pty Ltd and Cardinia Shire Council is as follows:

- Review the relevant heritage databases (e.g. Victorian Aboriginal Heritage Register [VAHR] at Aboriginal Victoria [AV], Local Government Heritage Overlays, the Victorian Heritage Register and Inventory at Heritage Victoria (HV), the National Trust Register and Commonwealth heritage databases);
- Review relevant available literature (e.g. previous archaeological reports and Local Government heritage studies);
- Provide a brief review of land use for the study area;
- Conduct a site inspection by a qualified Heritage Advisor to identify any Aboriginal and/or historical heritage within the study area;
- Identify and provide a series of maps showing any Aboriginal and historical archaeological heritage or areas likely to contain Aboriginal or historical heritage;
- Provide information in relation to any implications of Commonwealth and State environmental legislation and Government policy associated with the proposed development;
- Discuss any opportunities and constraints associated with the study area;
- Liaise with the key stakeholders, local government, AV and HV; and
- Production of an AHHA report.

1.2 Location of Study Area

The study area is located in Pakenham, Victoria (Cardinia Shire Council). 



1.3 Name of Client

This report was commissioned by Cardinia Shire Council (ABN: 32 210 906 807).

1.4 Name of Heritage Advisors

This report was prepared by Ecology and Heritage Partners Pty Ltd Archaeologist/Cultural Heritage Advisor Bradley Ward. The quality assurance review was undertaken by Ecology and Heritage Partners Pty Ltd Director/Principal Heritage Advisor Oona Nicolson. The field inspection was undertaken by Ecology and Heritage Partners Pty Ltd Archaeologists/Heritage Advisors Bradley Ward. Mapping was provided by Ecology and Heritage Partners Pty Ltd GIS Coordinator Dr Monique Elsley.

Bradley Ward

Bradley is an archaeologist at Ecology and Heritage Partners Pty Ltd with over eight years of experience in Australian archaeology. Bradley has worked in a variety of roles over numerous cultural heritage and academic projects in Victoria, Western Australia, New South Wales and the Northern Territory. Bradley has also participated in international prehistoric excavations in Central Cyprus.

Bradley has experience in a variety of tasks including the identification of Aboriginal Cultural Heritage through survey and subsurface testing, conducting background research, artefact cataloguing, analysis and interpretation, geoarchaeological interpretation and assisting in the preparation of standard and complex heritage assessments of high specifications. His formal qualifications include:

- Bachelor of Archaeology, La Trobe University, Vic (2010); and
- Masters of Archaeological Science, Australian National University (ANU) (2013).

Sylvana Szydzik

Sylvana is a Heritage Advisor at Ecology and Heritage Partners Pty Ltd. She has worked in a variety of roles over several different projects, including developments such as housing estates, site surveys and large infrastructure projects.

Sylvana has experience in a variety of tasks including the identification of Aboriginal and Historic Cultural Heritage through survey and subsurface testing, conducting background research, artefact cataloguing, analysis and interpretation and assisting in the preparation of standard and complex heritage assessments. Her formal qualifications include:

- Bachelor of Arts (Honours), La Trobe University, Vic (2009); and
- Bachelor of Arts (Archaeology), La Trobe University, Vic (2008).

Oona Nicolson

Oona Nicolson is a Director and the Principal Heritage Advisor at Ecology and Heritage Partners Pty Ltd. She is a heritage specialist with over 18 years of experience in the archaeological consulting sector, working in Victoria, South Australia, New South Wales and Tasmania. Oona regularly appears before VCAT and independent panels as an Expert Witness in the areas of Aboriginal and historical heritage. Oona has extensive experience in over 800 projects with a wide variety of Agents.

Oona's skills include project management, peer reviews, background research and due diligence assessments, archaeological survey, subsurface testing and salvage excavation, Aboriginal and non-Aboriginal site identification, recording and photography, site significance assessment, development of recommendations to mitigate the impact of development upon Aboriginal and non-Aboriginal historical heritage, flaked stone artefact and historical artefact recording and interpretation, communication and

consultation with regulatory bodies (AV and HV), Agents, landowners, RAPs and community representatives, preparation of conservation management plans, expert witness statements, Permits and Consents to Disturb for Heritage Victoria, Historical Heritage Assessments and, desktop, standard and complex Aboriginal CHMPs. Her formal qualifications and memberships include:

- Bachelor of Arts (Honours in Archaeology; First Class), Flinders University (1996);
- Bachelor of Arts (Australian Archaeology and Australian Studies), Flinders University (1995);
- Current Archaeology (Alternate) Member of the Victorian Heritage Council;
- Maritime Archaeology Certificate: Part 1 (Part 2 pending), AIMA and NAS (U.K.);
- Australian Association of Consulting Archaeologists Inc. AACAI (Full Member and current Treasurer of Victorian Chapter; Current National Secretary and Current Membership Committee);
- Member, Australian Archaeological Association (AAA);
- Victorian Planning and Environmental Law Association;
- Accredited UDIA EnviroDevelopment Professional (Accredited August 2012)
- UDIA Sustainability Committee; and
- Heritage member of the South Australian Chamber of Mines and Energy (SACOME) Sustainability and Development Committee.

1.5 Consultation with Aboriginal Parties

Registered Aboriginal Parties or Traditional Owner Groups

The scope of works for this project did not include consultation with Registered Aboriginal Parties (RAP) or other Aboriginal stakeholders. Consultation with the Traditional Owners was undertaken during the initial site assessment as part of the original Cultural Heritage Assessment (HA) (Szydzik and Alberto 2013) for the Pakenham East PSP. The following representatives of the Aboriginal communities participated in the initial consultation as part of the field assessment:

- Bobby Mullins representing Wurundjeri Tribe Land and Cultural Heritage Compensation Council (11 December 2012);
- Eddy Ockwell representing Wurundjeri Tribe Land and Cultural Heritage Compensation Council (12 December 2012);
- Ngarra Williams representing the Boon Wurrung Foundation (11 and 12 December 2012); and
- Darren Symington representing Bunurong Land Council Aboriginal Corporation (11 December 2012).

1.6 Native Title

There are currently no Native Title claims extending over the study area and as the study area comprises privately owned land Native Title has been extinguished (see Appendix 2 for a summary of the Commonwealth *Native Title Act 1993*).

1.7 Notice of Intention to Survey to Heritage Victoria

The brief site assessment undertaken as part of this updated AHHA did not constitute a formal archaeological survey; therefore a Notice of Intention to Conduct an Archaeological Survey (NOI) was not required to be submitted to Heritage Victoria for this assessment.

1.8 Report Review and Distribution

Copies of this AHHA will be lodged with the following organisations:

- Cardinia Shire Council;
- Aboriginal Victoria; and
- Heritage Victoria.

1.9 Heritage Legislation

An overview of the *Aboriginal Heritage Act 2006*, the *Commonwealth Native Title Act 1993*, the *Victorian Planning and Environment Act 1987*, the *Heritage Act 1995* and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* is included in Appendix 1. This legislation is subordinate to the *Victorian Coroners Act 2008* in relation to the discovery of human remains.

2 DESKTOP ASSESSMENT

The desktop assessment includes research into information relating to Aboriginal and historical cultural heritage in or associated with the study area.

2.1 Geographic Region

The geographic region defined for this AHHA is the catchment of Deep Creek and its associated tributaries (Map 4). This geographic region addresses the specific environmental context of Holocene resources available within the alluvial and incised ridge landforms that characterises much of the study area. Thus, the geographic region relates specifically to the tangible and intangible values of the landscape and is highly relevant to any Aboriginal cultural heritage that may be present within the activity area.

More broadly, the majority of the study area is located within Gippsland Plain bioregion; however, the northern section of the study area falls within the Highlands Southern Fall bioregion. For the purposes of this assessment, the Gippsland Plain bioregion will be discussed. The Gippsland Plains bioregion extends from Port Phillip Bay in the west to Bairnsdale in the east, and consists of low lying plains south extends from the southern slopes of the Great Dividing Range to Wilsons Promontory, excluding the Strzelecki Ranges. The geographic region selected for the study area comprises the Deep Creek and Bessie Creek catchment areas to the east and west of the study area, highland to the north and lowland to the south. This area is relevant to any Aboriginal cultural heritage that may be present within the study area.

More generally, the region (and the activity area itself) forms a part of the Gippsland Plain bioregion and a small section of the Highlands Southern Falls bioregion (HSF). The Gippsland Plain bioregion extends from the southern slopes of the Great Dividing Range to Wilsons Promontory and consists of flat, low lying coastal and alluvial plains with a gently undulating terrain dominated by barrier dunes and swampy flats (DEPI 2015a).

This geographic region is relevant to any Aboriginal cultural heritage that may be present within the activity area.

2.2 Environmental Context

Environmental factors influence how land may have been used in the past. This section reviews the environmental context of the study area to gain an understanding of environmental factors relevant to Aboriginal cultural heritage.

2.2.1 Geology, Geomorphology and Soils

The geology of the study area comprises intrusive Tynong Granite (G239) and Lysterfield Granodiorite (G241) of Palaeozoic age (Devonian to Silurian) (Map 5). These deposits are heavily weathered and are exposed on elevated ridges and hills within the study area and the broader Pakenham region. More recent geological deposits within the study area comprise the Older Volcanic Group (Po) associated with volcanic eruptions of Mount Ararat during the Palaeogene. These eruptions resulting in extrusive basalt flows which cap may of

the hill crests of the region. The most recent geological deposits in the study area comprise unnamed alluvium (Qa1) of Quaternary age. This deposit occurs in low-lying areas and is associated with generally low energy fluvial deposition during the last 10,000 years.

Other significant geological deposits which occur more broadly in the region comprise an unnamed belt of Devonian metamorphic hornfels (H) which are separated by the Murrindindi Supergroup by a minor fault line running through the region. The hornfels deposit in particular would have provided Aboriginal people with an important raw material for stone tool manufacture.

The geomorphology of the study area is characterised by low-lying areas bounded by uplifted fault blocks including the Mornington Peninsula region to the south and the Tynong Province to the north and east. This geomorphological framework is part of the central sunklands of the Eastern Plains (EP) (Map 6). The major faults separating these two sunklands are the Selwyn Fault on the west side of the Mornington Peninsula and the Tyabb Fault on the east. Bounding the Western Port Sunklands are the Tyabb Fault on the west and the Heath Hill Fault on the east. The surface materials within these sunklands are quite varied and include sandy loams, siliceous and calcareous sands, lacustrine (swamp) deposits and alluvial deposits. Sandy coastal dunes and beach ridges cover the Nepean Peninsula, which is a Quaternary sand barrier that has largely retained its form through to the present time. Sand sheets also mantle much of the southeast margins of the Western Port Sunkland. Around Brighton and Cranbourne, Neogene sediments underlie the predominantly sandy coastal plains, and the discontinuous northwest trending sandy ridges are believed to represent stranded Neogene coastlines. Within the sunklands are extensive alluvial deposits and deposition into former Carrum, Koo-Wee-Rup and Tobin Yallock Swamps only ceased following drainage after European settlement. The EP comprises four discrete types of land; coastal plains with ridges and dunes, alluvial plains, former swamps and wetlands and coastal dune fields (DEPI 2015b).

The soils that have developed in the study area comprise poorly drained, unconsolidated contrast soils (mostly Kurosols). There are also areas of Vertosols in swampy low-lying areas, as well as Chromosols and Kandosols on the more deeply weathered ridge slopes comprising the Silurian siltstone. These ridge slopes in particular are subject to colluvial erosion.

2.2.2 Hydrology

The activity area is located within the Alluvial Plains (Nar Nar Goon, Caldermeade, Bass River Plain) geomorphological sub unit (DEPI 2015b). The Alluvial Plains developed in the lower reaches of the Dandenong, Cardinia, Deep and Tynong Creeks and the Bunyip, Lang Lang and Bass Rivers. The drainage of these low energy creeks and rivers flowed into swamps and lagoons such as the Carrum, Koo Wee Rup and Dalmore swamps. Since the drainage of the swamps, drains now confine the flows of all these rivers and streams.

2.2.3 Vegetation

According to the Department of Sustainability and Environment's (DSE) Ecological Vegetation Classes (EVCs), the soils of the study area could have historically supported several different vegetation classes (DSE 2015 Map 7). Swampy riparian woodland would have lined the Deep Creek corridor and the north/south drainage channel that intersects the east of the study area. This woodland occurs along streams of the foothills and

plains, and would have comprised woodland to 15 m tall and medium to large shrubs with large tussock grasses and sedges in the ground layer.

Swamp scrub and swampy woodland would have occurred on the lowland plains and on the lower slopes of the rise in the study area. This vegetation occurs on poorly drained seasonally waterlogged soils and at low elevations of alluvial deposits along streams, and would have comprised a mix of open eucalypt woodland to 15 m tall, with a ground layer dominated by tussock grasses and sedges and closed scrub to 8 m. Grassy forest and damp heathy woodland would have covered the rise in the centre of the study area. This vegetation occurs on sandy soils of low to moderate fertility, and would have comprised low growing forest to 20 m tall with an understory of small and medium shrubs, and woodland to 10 m tall with a dense heathy understory and a ground layer of grasses, herbs and small shrubs.

These types of vegetation would have been utilised by Aboriginal people in the area for the creation of weapons and vessels, and would have supported a range of game that could be hunted for food.

2.2.4 Climate

The present climate is humid to sub-humid with rainfall generally well distributed throughout the year. According to the Bureau of Meteorology (BOM) the climate of Pakenham is characterised by warm summers and cool winters; temperatures range between an average maximum of 25.6°C and minimum of 14°C in February to an average maximum of 13.3°C and minimum of 6.1°C in July. Rainfall varies between a maximum of 86.5 mm in September and 41.2 mm in March, with annual average rainfall of 67.4 mm (BOM 2015).

2.3 Aboriginal Context

The following section reviews the Aboriginal context of the study area and includes; an examination of historical and ethnohistorical sources, previously recorded Aboriginal archaeological site types and locations in the geographic region of the study area and, archaeological studies undertaken in the area. Together, these sources of information can be used to formulate a predictive site model concerning what types of sites are most likely to occur in the study area, and where these are most likely to occur.

2.3.1.1 Archaeological Research

Archaeological evidence suggests that Aboriginal peoples had occupied all of Australia's environmental zones by 40,000 years BP. Pleistocene archaeology of the Port Phillip Bay and Hinterland area documents human occupation dating back at least 40,000 years. The oldest dated archaeological site in Victoria occurs at Keilor in Melbourne. Charcoal from a hearth excavated in 1973 has been dated to 31,000 years BP (Flood 1995: 286). More recently research at the Bend Road site in Melbourne's southeast has dates extending back to 30–35,000 BP (Hewitt and Allen 2010). However, the majority of the site is associated with the late Holocene backed artefact period – the site has now yielded hundreds of asymmetric points and geometric microlith forms. The site points to more common resource orientation patterns relevant to many greater Melbourne Aboriginal Places. Notably, the site is located on an undulating sand promontory jutting out into the northern end of Carrum Swamp. Such land was likely subject to irregular inundation and periodic drying, as such, "Aboriginal use of this resource was also likely to have been seasonal. Ethnographic accounts suggest that

birds, eggs, fish, yabbies, shellfish, eels and edible swamp plants, together with the focus the swamp provided for foraging terrestrial marsupials, would have made the area an important resource for Aborigines, especially in spring” (Hewitt and Allen 2010: 3).

The archaeological record of the Greater Melbourne area includes a rich record of artefact scatters, scarred trees and stone arrangements that documents Aboriginal life dating from the Pleistocene through to the immediate pre-European past. Most of these sites point to important relationships between sites and landscapes and resources within the immediate area.

2.3.2 History and Ethnohistory

The following is a summary of historical and ethnographic accounts of Woi wurrung and Bun wurrung culture and practices. It is largely derived from non-Indigenous historical sources and does not incorporate the oral history of the contemporary Woi wurrung and Bun wurrung communities. Such a record would require an exhaustive treatment beyond the scope of the current report. The current summary is thus a limited account of social and economic life that may facilitate a more detailed interpretation of the archaeological record by way of ethnographic analogy. Such analogy is not without its limitations. This summary is not intended to be a detailed study of the Woi wurrung and Bun Wurrung people prior and subsequent to European settlement and does not necessarily reflect any opinions or knowledge held by the contemporary Woi wurrung and Bun Wurrung communities. The current desktop review of the ethnohistoric literature details many of the prosaic and ritual behaviours of the Woi wurrung and Bun Wurrung cultures, with a particular emphasis on those that may manifest in the archaeological record.

At the time of European contact, the Pakenham area and surrounding region was bordered by the traditional lands of two language groups, the Woi wurrung to the north and the Bun wurrung to the south. The Woi wurrung are believed to have occupied the Yarra and Maribyrnong watersheds, bounded on the north by the Dividing Range from Mount Baw Baw westward to Mount William and Mount Macedon and on the west by the Werribee River (Clark 1990: 379). The Bun wurrung are sometimes referred to as the “Westernport tribe” or “coast tribe” (Presland 2010:20). Their country was located to the east of Port Phillip and Western Port Bays, extending from the south of the Yarra River to the creeks and inlets from the sea into the Werribee River. Along the coast, it extends from the Werribee River to Anderson’s inlet, then north to the Dandenong Ranges, Mirboo, Warragul, and upper Latrobe River (Clark 1990:363). Howitt (2001:71) likewise mentions that a strip of country stretching from the mouth of the Werribee River to Williamstown and the southern suburbs of Melbourne on the coast around the whole Mornington Peninsula also belonged to the Bun wurrung. There are seven main Woi wurrung clans and six main Bun wurrung clans, all separated by location, as with the rest of the Eastern Kulin clans (Howitt 2001:127). The most likely clans to have utilised the Pakenham area and current study area are the Bun wurrung clan Mayune balug, who occupied the area around Carrum Swamp and ‘Mayune’ station, and the Wurundjeri willam.

Early descriptions about the Woi wurrung and Bun wurrung are available through the works of George Augustus Robinson, who was Chief Protector of Aborigines in the Port Phillip District, and the works of one of his Assistant Protector, William Thomas. These two made extensive notes about their way of life (Presland 2010:31). There is obviously more detailed research required into both European sources and indigenous oral history, to try and clarify the clans within the region of the study area and their relationships to particular areas of country.

The Woi wurrung and Bun wurrung shared a cultural and linguistic affinity with the Ngurai-Wilam-wurrung, Daung wurrung, Djadja wurrung, and Wada Wurrung language groups. Collectively these groups were known as the Kulin Nation occupying the south central Victorian region. 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: 105).

As many of the other Australian clans, the Woi wurrung and Bun wurrung were hunters and gatherers, hunting kangaroo and possum. Native animals that still abound include Long-nosed Potoroo, Swamp Antechinus, White-footed Dunnart, Broad-toothed Rat, Feather-tailed Glider and Eastern Pygmy-possum, as well as the more familiar kangaroos, koalas and wombats (Parks Victoria 2012). The Woi wurrung and Bun wurrung likely exploited these and other terrestrial species. In addition, the Bun wurrung were also known as the “salt water people”, and heavily exploited the coastline and marine resources. In particular, the Wilsons Promontory area was a valuable food source, particularly in summer.

Although women sometimes hunted, their primary role was as gatherers. They provided the bulk of the food (supplying as much as 80% of food requirements). As well as a collecting bag, the women carried long digging sticks. These were vital in the gathering of tuberous plants which made up a third of the 940 plant species recorded as a food source. In the Melbourne area daisies, Lilies and orchids flourished. Murnong or yam daisies were eaten raw in spring but cooked at other times. In the Woi wurrung and Bun wurrung area the women also were in charge of collecting shell fish (Presland 2010). For vegetables they would collect a variety of bulbs, shoots and foliage like the Warrigal Spinach, after eating their meal they would wash it all down with a lovely drink made from the nectar of the Coastal Banksia flowers.

The primary food source for the Bun wurrung was undoubtedly the coastal landscape that formed much of their traditional territory. This maritime adaptation is evidenced by the numerous shell middens on cliffs and sand dunes of Port Phillip, Bass Strait and Western Port (Massola 1959:180). Other middens can be found at one of their many coastal camps at Mordialloc, Frankston or Warneet on Westernport Bay, and these in particular are attributed to the Mayone bulluk. Here they would have accessed many of their favourite resources such as bird eggs, fish, shellfish, eels, freshwater mussels and crayfish.

In present times, the descendants of the Woi wurrung are represented by the RAP Wurundjeri Tribe Land and Cultural Heritage Compensation Council. The descendants of the Bun wurrung are represented by the Bunurong Land Council Aboriginal Corporation (BLCAC) and the Boon Wurrung Foundation (BWFL).

2.3.3 Oral History

The Bunurong, Boon Wurrung and Wurundjeri did not have any further oral histories relating to the study area for inclusion in this report.

2.3.4 Database Searches

The following database searches were conducted:

2.3.4.1 Victorian Aboriginal Heritage Register

A search of the Victorian Aboriginal Heritage Register (VAHR) was conducted on 29 September 2015 for sites within a 2 km radius of the study area. Searching an area with this radius ensured that a relevant and representative sample of information was obtained.

The search identified a total of 28 registered Aboriginal sites within a 2 km radius of the study area. These sites consist of a total of 78 site component types (Table 1). The difference between the number of sites and number of site components is because four sites contain numerous component types (LDADs). There were no Aboriginal Historical References identified within the search area.

Seven of these sites are located within the study area (Map 9):

- VAHR 8021-0027 (P-G IAO 1) comprising one isolated silcrete flake located on the surface [REDACTED] [REDACTED], and a quartz flake;
- VAHR 8021-0110 (Deep Creek 1) comprising 30 subsurface artefacts [REDACTED] [REDACTED]. The artefacts were recovered from 5 – 9 cm in depth and comprised flaked pieces, cores and retouched flakes manufactured predominantly from silcrete, but also from chert and crystal quartz;
- VAHR 8021-0111 (Deep Creek 2) comprising six subsurface artefacts, [REDACTED] [REDACTED]. The artefacts were recovered from 5 – 9 cm in depth and comprised flaked pieces, cores and retouched flakes manufactured predominantly from silcrete, but also from chert and crystal quartz;
- VAHR 8021-0112 (Deep Creek 3) comprising two retouched silcrete flakes identified on the surface of stockpiled soil adjacent to Deep Creek;
- VAHR 8021-0147 (PB3 M4) comprising 94 subsurface artefacts [REDACTED] [REDACTED]. Artefacts were located between depths of 15 to 20 cm, and comprised flaked pieces, cores, angular fragments and retouched flakes manufactured from silcrete, quartz and quartzite.;
- VAHR 8021-0148 (PB3 N8) comprising one isolated subsurface quartz flake located on a low rise within the Deep Creek floodplain, [REDACTED] and
- VAHR 8021-0380 (Nar Nar Goon IA 1) comprising one isolated complete quartzite flake identified during the initial survey (Szydzik and Alberto 2013) [REDACTED] [REDACTED]

Table 1 shows that stone artefact sites, either artefact scatters or LDADs, account for all of the site component types in the study area and within the wider search area.

A summary of the Aboriginal archaeological site component types appears in Table 1 and a list of all sites in the search area is shown in Table 2.

Table 1: Summary of Previously Identified Aboriginal Site Component Types within 2 km of the Study Area

Site Type	Quantity	Percentage (%)
Artefact Scatters	24	86
LDADs	4	14
Total	28	100

Table 2: List of Previously Identified Sites within 2 km of the Study Area

VAHR Site Number	Site Name	Site Type	Artefact Qty	Within Study Area?
7921-0531	RC RD 1A	Artefact Scatter	1	No
7921-0608	Army Rd 1	Artefact Scatter	12	No
7921-0609	Army Rd 2	Artefact Scatter	32	No
8021-0027	P-G IAO 1	Artefact Scatter	1	Yes
8021-0040	Pakenham Bypass 1	Artefact Scatter	1	No
8021-0104	Cardinia Lakes SAS 2	Artefact Scatter	19	No
8021-0105	Cardinia Lakes SAS 3	Artefact Scatter	4	No
8021-0106	Cardinia Lakes SAS 1	Artefact Scatter	1	No
8021-0110	Deep Creek 1	Artefact Scatter	30	Yes
8021-0111	Deep Creek 2	Artefact Scatter	6	Yes
8021-0112	Deep Creek 3	Artefact Scatter	2	Yes
8021-0144	PB3 M1	Artefact Scatter	10	No
8021-0145	PB3 M2	Artefact Scatter	1	No
8021-0146	PB3 M3	Artefact Scatter	15	No
8021-0147	PB3 M4	Artefact Scatter	94	Yes
8021-0148	PB3 N8	Artefact Scatter	1	Yes
8021-0149	PB3 P11	Artefact Scatter	26	No
8021-0150	PB3 P13	Artefact Scatter	1	No

8021-0161	Bald Hill 1	Artefact Scatter	2	No
8021-0162	Bald Hill 2	Artefact Scatter	4	No
8021-0163	Bald Hill 3	Artefact Scatter	1	No
8021-0186	Bald Hill Estate 1	Artefact Scatter	1	No
8021-0240	PB3 M5	Artefact Scatter	1	No
8021-0250	Bald Hill 4	Artefact Scatter	1	No
8021-0379	Deep Creek 13	LDAD	7	No
8021-0380	Nar Nar Goon IA 1	LDAD	1	Yes
8021-0385	Deep Creek 14	LDAD	28	No
8021-0387	185 Oakview Lane, East Pakenham	LDAD	11	No

2.3.4.2 Local Council

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

The Heritage Overlay of the Cardinia Planning Scheme was examined (DELWP 2015). No Aboriginal heritage places listed on the Heritage Overlay are present within the study area.

2.3.5 Previous Aboriginal Archaeological Investigations

Localised and regional archaeological investigations have established the general character of Aboriginal sites located within the same geographic region as the study 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.

In 1999, Lane completed a heritage study for the proposed intergas expansion project. This study aimed to assess any possible impacts the duplication of the existing gas line may have on cultural heritage sites. Two sections of the pipeline route were north of Melbourne, between Tallarook and Euroa, and between Baddaginnie and Barnawartha, and two were east of Melbourne, between Tyers and Drouin West, and between Pakenham and Gembrook. The latter section, between Pakenham and Gembrook, was located within the current study area. Archaeological survey identified three isolated artefact scatters along the pipeline corridor between Pakenham and Gembrook, one of which, P-G IAO 1 [VAHR 8021-0027], was located within the current Study Area. The remaining two sites are located approximately 6 km north of the study area.

The place P-G IAO 1 [VAHR 8021-0027] comprised a quartzite flake and a silcrete flake located along the eastern edge of a small dam, situated on low lying, flat ground. Due to its location and the limited number of

artefacts identified, this place was interpreted as the result of transient use of the area. Lane (1999) identified areas of potential archaeological sensitivity, which included the location of P-G IAO 1 [VAHR 8021-0027] within the current study area, the banks and floodplain of Ararat Creek and a flat hill top and slope down to Gembrook Creek. Lane (1999) recommended works during the installation of the pipeline be monitored for possible discovery Aboriginal archaeological sites in potentially sensitive areas, and that disturbance to place P-G IAO 1 [VAHR 8021-0027] be avoided.

Rhodes and Bell (2004) conducted an Aboriginal Heritage Study of the Shire of Cardinia Urban Growth Corridor, the eastern extent of which forms the western boundary of the current study area. This investigation aimed to develop a predictive model for the location of Aboriginal archaeological sites that would assist in planning the growth corridor. Rhodes and Bell (2004) identified that the majority of past investigations have focused on major watercourses, and though evidence indicates these were used as corridors of movement, previous investigations have not taken into consideration changes in the geomorphological context of the floodplain over time, and the possible changes in patterns of land and resource use.

Due to a limited time frame, archaeological survey targeted specific areas within the study corridor, rather than attempting full coverage. Areas were selected based on environmental, archaeological and historical information about previous land use and potential to contain archaeological sites. Fifteen Aboriginal archaeological places were identified during the survey, 12 of which were located on the floodplain landform, two in the hills formed on Silurian bedrock and one on a hill formed of granite. None of these were located within 2 km of the current study area. Poor ground surface visibility contributed to the low number of sites identified during the survey, though the results did conform to the predictive model developed in the desktop assessment. Results of the survey also suggested that subsurface scatters are likely to occur in alluvial sands and sandy loam deposits located on the floodplain, not necessarily in close proximity to existing creek channels.

Paynter and Rhodes (2005) completed a subsurface testing program for proposed subdivision at [REDACTED]. This program involved excavation of 90 cm wide transects by backhoe. Two subsurface artefact scatters were identified, Deep Creek 1 [VAHR 8021-0110] and Deep Creek 2 [VAHR 8021-0111], located on flat, well drained sand and silt deposits, [REDACTED]. Deep Creek 1 [VAHR 8021-0110] was a subsurface scatter of 30 artefacts, located between 15-25 cm in depth and comprising complete, broken and retouched flakes, cores and tools manufactured from silcrete and chert. Deep Creek 2 [VAHR 8021-0111] was a subsurface scatter of 6 artefacts, located between 20-30 cm in depth and comprising flaked pieces and a core, manufactured from crystal quartz and silcrete.

Paynter and Rhodes (2005) suggested the places Deep Creek 1 and Deep Creek 2 may represent former campsites located along previous courses of Deep Creek and its associated floodplain. As the proposed subdivision would impact Deep Creek 1 [VAHR 8021-0110] and Deep Creek 2 [VAHR 8021-0111], Paynter and Rhodes recommended a Consent to Disturb be sought for both places prior to development, and Deep Creek 1 [VAHR 8021-0110] be archaeologically salvaged. It is understood that the proposed development at Canty Lane has yet to occur and as such the condition of Deep Creek 1 and Deep Creek 2 is unlikely to have changed. For this reason, the salvage recommendations set out by Paynter and Rhodes should be adopted in

any future archaeological work within this allotment (including for a CHMP) (see Paynter and Rhodes 2005 and Recommendation 1, p. 56, for further information).

Howell-Meurs and Long (2006) conducted an archaeological subsurface testing program for sections 1 and 3 of the Pakenham Bypass Reservation. Section 3 was located between Ryan Road and Main Street, within the southern extent of the current study area. This program built on previous subsurface investigation, and aimed to assess previously recorded sites PB3 M4 [VAHR 8021-0147], located within the current Study Area, and PB3 P11 [VAHR 8021-0149], to the east of the current study area. This program also aimed to expand on previous excavation that did not locate archaeology and to test previously unexcavated areas of Section 1.

Howell-Meurs and Long (2006) identified four Aboriginal archaeological sites in Section 3, comprising two artefact scatters, PB3 P4 [VAHR 7921-0147] and PB3 P11 [VAHR 8021-0149], and two isolated artefacts, PB3 N8 [VAHR 8021-0148] and PB3 P13 [VAHR 8021-0150]. This investigation identified two zones of archaeological sensitivity, the Cardinia Creek corridor and high ground and ridges within the floodplain. All sites identified during this assessment within the bypass reservation would be impacted by construction of the bypass, therefore, it was recommended a consent to disturb be obtained for each site to be disturbed.

A summary of archaeological reports relevant to the geographical region of the study area appears below (Table 3).

Table 3: Archaeological Reports Relevant to the Study Area

Author, Date, Report #	Description and Location	Results
Smith, 1991 # 439	Smith (1991) conducted an investigation of the Pakenham Corridor, between Dandenong and Bunyip. This investigation aimed to identify areas of high Aboriginal archaeological potential and significance, to identify threats potential development might have on archaeological sensitive areas and to consult with Aboriginal communities and identify their views on cultural heritage of the area	This investigation identified 62 previously unrecorded Aboriginal archaeological sites, comprising 32 artefact scatters, 13 isolated artefacts, 15 scarred trees and 2 private collections. A predictive model was developed that indicated the availability of water most influenced site location within the study area. Several areas of archaeological potential were identified; these included the Cranbourne Sands geological unit, all areas associated with permanent water courses and swamps, and remnant river red gum forests between Cranbourne and Dandenong.
Tulloch, 2001 # 1930	In 2001, Tulloch completed an archaeological survey of the then proposed Pakenham Bypass, from Beaconsfield to Nar Nar Goon, a portion of which borders the southern extent of the current Study Area.	Tulloch (2001) identified six Aboriginal archaeological sites, and two historical archaeological sites. The Aboriginal archaeological sites comprised two isolated artefacts (PB1 [VAHR 8021-0040] and PB3 [VAHR 7921-0401]), three artefact scatters (PB4 [VAHR 7921-0402], PB5 [VAHR 7921-0245] and PB7 [VAHR 7921-0189]) and one scarred tree (PB6 [7921-0403]). Only one site, PB1 [VAHR 8021-0040], was identified within 2 km of the current Study Area. All sites located during this investigation were within 100m of Cardinia Creek, approximately 10 km west of the current Study Area.

Author, Date, Report #	Description and Location	Results
Leubbers, 2001 # 1939	Leubbers (2001) completed an archaeological survey of the proposed Henry Road branch sewer, located approximately 2 km west of the current Study Area	Desktop assessment identified 8 previously recorded sites within the area, all along Toomuc Creek, and identified the creek as having high potential to contain Aboriginal heritage. The survey focused on the banks of Toomuc Creek, and identified two sites, Toomuc Creek 8 [VAHR 7921-0398] and Toomuc Creek 9 [VAHR 7921-0404]. The identification of these sites during the survey prompted subsurface testing along the alignment of the sewer. This testing, however, did not identify any further Aboriginal heritage.
Murphy, 2003 # 2440	In 2003 Murphy completed a cultural heritage assessment for the proposed Cardinia Country Club, located approximately 800 m west of the current Study Area.	Desktop assessment during this investigation did not identify any previously recorded Aboriginal heritage. Survey located one isolated artefact, RC RD 1A [VAHR 7921-0531], which was assessed as being of low scientific significance.
Murphy, 2004a # 2965	In 2004, Murphy (2004a) completed a cultural heritage assessment of 'Cardinia Lakes' on Abrehart Road, Pakenham, located approximately 400 m west of the current Study Area.	This assessment involved background research and an archaeological survey. The desktop assessment indicated that no Aboriginal archaeological sites had been previously identified within the study area, and that land within 50 to 100 m of creeks, wetlands and swamps are assessed as containing potential for Aboriginal archaeological sites. The study area did not include any landforms assessed as containing the potential for Aboriginal archaeological sites. Due to low ground surface visibility, no Aboriginal archaeological sites were identified during this assessment.
Murphy, 2004b # 2967	Murphy (2004b) conducted a cultural heritage assessment of the existing Pakenham Golf Course, located approximately 200 m west of the current study area.	Background research and site distribution models indicated that the study area contains potential for buried and surface Aboriginal archaeological material. Due to poor ground surface visibility, however, no archaeological sites were identified during the survey.
Walker, 2013 # 12448	Walker (2013) conducted a Cultural Heritage Management Plan (# 12448) for the Ryan Road Branch Sewer, located immediately west of the study area.	The CHMP comprised a desktop and complex assessment of the approximately 4 km long sewer alignment. The desktop assessment identified undulating plains, lowland plains, floodplains and the Cranbourne Sands as having potential for the presence of cultural material, particularly artefact scatters and isolated artefacts. A standard assessment was not undertaken for this CHMP as parts the activity area had previously been surveyed by the author (Walker 2012). The initial survey by Walker (2012) identified one artefact scatter site [VAHR 8021-0379] despite very poor (<3%) GSV. The complex assessment involved the excavation of 38 400 x 400 mm shovel test pits and 2 1 x 1 m stratigraphic test pits. The results of the investigation identified an additional 7 artefacts which were later collected as part of the surface salvage program.
O'Connor, 2014 # 13065	O'Connor (2014) conducted a Cultural Heritage Management Plan (# 13065) for the Train Maintenance Depot, Pakenham East, located immediately south of the study area.	The CHMP comprised a desktop, standard and complex assessment of the Pakenham East rail corridor. The desktop assessment identified undulating plains, lowland plains, floodplains and the Cranbourne Sands as having potential for the presence of cultural material, particularly artefact scatters and isolated artefacts. The standard did not identify any additional cultural material. One previously recorded site [VAHR 8021-0163] was located within the activity area. The complex assessment involved the excavation of 400 x 400 mm shovel test pits and 1 1 x 1 m stratigraphic test pit. Twelve subsurface artefacts were recovered from 12 shovel test pits s. these artefact comprises one LDAD site [VAHR 8021-0387].

2.3.6 Aboriginal Archaeological Site Prediction Statement

The following site prediction statement¹ has been formulated from the review of previous assessments. The statement presented is based on a site type approach. (For further information on site types see OAAV 2015).

The review of the previously recorded Aboriginal archaeological sites and previous archaeological investigations indicates that the most likely² site types in the study area are stone artefacts scatters and LDADs. Other likely site types to occur are scarred trees. Site types considered unlikely to occur in the study area are shell middens, mounds, quarries, stone arrangements and Aboriginal burials.

Stone Artefact Scatters are considered likely to occur in the activity area. Stone artefact scatters have been previously recorded in the study area as well as throughout the broader Pakenham region.

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 sites 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 sites 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 are considered likely to occur in the activity area. LDADs have been previously recorded in the study area as well as throughout the broader Pakenham region.

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.

Low density artefact distributions are stone artefact sites 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 site 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 sites.

Scarred Trees are considered likely to occur in the study area. Although no scarred trees were identified during the initial assessment undertaken by Szydzik and Alberto 2013, scarred trees are known to occur throughout the broader Pakenham region.

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.

Shell Middens are considered unlikely to occur in the study area. No shell midden sites have been previously recorded in the broader Pakenham region and it is more likely that these sites will occur in close proximity to coastal areas.

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 rockshelters, 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 study area. No Aboriginal mounds have been previously recorded in the broader Pakenham 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 study area. No Aboriginal quarry sites have been previously recording in the broader Pakenham region and the geology of the study area is not conducive to raw material types commonly used for resource collection.

Aboriginal quarries are the sites 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 study area. No Aboriginal stone arrangements have been previously recording in the broader Pakenham region and the geology of the study area does not comprise raw material types commonly used in the creation of stone arrangements.

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 study area as no stony rises have been recorded in the broader Pakenham region (these sites occur in the western basalt plain).

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 sites. 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 sites are located on the stony sites near watercourses. Scarred trees may occur where mature native vegetation is located in proximity to former swamps.

Aboriginal Burials are considered unlikely to occur in the study area. No aboriginal burials have been recorded in the broader Pakenham 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 sites 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 sites.

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 sites such as oven mounds, shell middens or artefact scatters.

Aboriginal mortuary trees are considered unlikely to occur in the study area as no Aboriginal mortuary trees have been recorded in the broader Pakenham region and these sites are a phenomenon usually associated with southwestern Victoria.

Accounts of Aboriginal mortuary trees are contained in newspaper reports (Mount Ararat Advertiser 1858), ethnohistorical accounts (Bride 1983[1898]: 322), oral history (Ron Howlett, personal communication 2003), and unpublished diaries (Johns 1877). These accounts describe the following treatment of Aboriginal human remains: the corpse was allowed to decompose. Later, the remains were recovered and sometimes the bones of limbs were distributed among relatives to be kept as relics. Then, postcranial remains were bundled and placed in a hollow tree, sometimes with the skull. On other occasions, the skull was deposited in a hollow tree while postcranial remains were given to a relative for placement at a later date, possibly also in a hollow tree (article: 70).

The Chief Protector of Aborigines, George Augustus Robinson, recorded several different forms of treatment of the dead by the northern Djab Wurrung clans in his 1841 journal (Clark 1987: 15, 1998: 335, 368), including placement in trees. The ethnographic record for southwestern Victoria also indicates that while low-ranking individuals were usually placed in simple burials, higher-ranking individuals were subject to more complex rituals that included placement in trees (Dawson 1881: 62–66; Howitt 1996 [1904]: 455–457; article: 63).

The study of the Moyston Mortuary Tree and references to additional mortuary trees within the region demonstrate a local pattern of mortuary practices in southwestern Victoria. While burials in lunettes, earth mounds, and sand dunes are more common in the region, more complex practices also existed in southwestern Victoria in the late pre-contact to early post-contact periods (Sprague 2005: 70; article: 69-71).

2.3.7 Aboriginal Heritage Desktop Assessment – Summary of the Results and Conclusions

Based on a review of geology, soils and vegetation, the study area could have historically supported several different vegetation classes, including swampy riparian woodland along Deep Creek, swamp scrub and swampy woodland on the lowland plains, swamp scrub and swampy woodland would have occurred on the lowland plains and on the lower slopes of the rise in the study area, and grassy forest and damp heathy woodland would have covered the rise in the centre of the study area.

These types of vegetation would have been utilised by Aboriginal people in the area for the creation of weapons and vessels, and would have supported a range of game that could be hunted for food.

Based on previous archaeological investigations and the predictive statement developed in section 2.3.6 above, artefact scatters and LDADs are the most likely site types to be identified within the study area. Larger artefact scatters are likely to occur on the gentle slopes, rises, terraces and plateaus within the study area, and isolated artefacts (LDADs) are most likely to occur on the lower plains and floodplains within the study area.

Furthermore, Aboriginal sites will generally occur in elevated areas within close proximity to watercourses. Conversely, Aboriginal sites are unlikely to occur on steep slopes away from water courses.

2.4 Historical Context

The section reviews the historical context of the study area and includes an examination of primary historical sources, relevant heritage databases, previously recorded historical built-heritage or archaeological site types and locations in the geographic region of the study area, and previous heritage and archaeological studies undertaken in the area. Together, these sources of information can be used to formulate a predictive site model concerning what types of sites are most likely to occur in the study area, and where these are most likely to occur.

2.4.1 History

2.4.1.1 *Regional History*

By 1836, European settlers began expanding east from Melbourne to take up pastoral runs. From this period until 1841 grazing licenses covering many grassland areas within the Port Phillip district were acquired. Land within what is now called the Cardinia Shire was then located within the Western Port District, one of the two squatting districts within Port Phillip (Cabena et al. 1989: 2). The conversion of large pastoral estates into smaller farms changed Cardinia Shire to a district in which farming and agriculture became the major local industries (Graeme Butler and Associates 1998: 32).

Dairying became an important industry in the Pakenham Shire in the 1880s. As the townships in the region became important farming and dairying centres, road linkages were established. This was particularly the case after the 1860s, with improvements having been made to the Gippsland Road (Graeme Butler and Associates 1998: 44-47, 75).

2.4.1.2 *Land Use History*

The study area itself lies east of Deep Creek and north of the Princes Freeway, an area currently and historically used for grazing sheep and cattle. A high pressure gas pipeline intersects the eastern study area north/south, and transmission lines cross the northern portion of the study area. Both activities have contributed to significant ground disturbance in parts of the study area. Similarly, the southern boundary of the activity area has been subject to significant ground disturbance in the form of Freeway construction activity for the Pakenham Bypass.

2.4.2 Database Searches

2.4.2.1 *Victorian Heritage Register*

The Victorian Heritage Register (VHR), established by the Victorian *Heritage Act 1995*, provides the highest level of statutory protection for historical sites in Victoria. Only the State's most significant historical sites are listed on the VHR.

The VHR also lists historic shipwrecks in Victorian State waters. Under the Victorian *Heritage Act 1995*, all shipwrecks in Victorian State waters that wrecked 75 years³ or more ago (including any parts that were originally from that shipwreck) are protected. Certain shipwrecks that are less than 75 years old may also be declared historic shipwrecks.

A search of the VHR was conducted for a 2 km radius area centred on the study area. The search did not identify any registered historical heritage places in the search area (Map 8).

2.4.2.2 Victorian Heritage Inventory

The Victorian Heritage Inventory (VHI), established by the Victorian *Heritage Act 1995*, provides the statutory protection for all historical archaeological sites, 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 was conducted for a 2 km radius area centred on the study area. The search identified a total of four registered historical heritage places in the search area (Map 8). Two of these sites have been delisted. These sites include:

- H8021-0024 (Allwinkle House Site Cardinia Lakes Feature 1);
- H8021-0025 (Wright House Site Cardinia Lakes Feature 2);
- D7921-0072 (Pakenham No. 1 Reservoir); and
- D8021-0008 (Pakenham Farm Machinery Dump).

None of these sites are located within the study area.

2.4.2.3 Victorian War Heritage Inventory

The Victorian War Heritage Inventory (VWHI) was established in 2011 as a means to catalogue Victoria's war history such as war memorials, avenues of honour, memorial buildings, former defence sites and places of commemoration. Places listed on the VWHI do not currently have discrete statutory protection, however many are concurrently listed on the VHR, VHI, or local planning schemes.

A search of the VWHI was conducted for a 2 km radius area centred on the study area. The search did not identify any historical heritage places in the search area (Map 8).

2.4.2.4 Local Council

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

The Heritage Overlay (HO) of the Cardinia Planning Scheme was examined for a 2 km radius area centred on the study area. The search identified a total of three registered historical heritage places in the search area (Map 8). These sites include:

³ Note that that this is a blanket, 75-year, rolling provision. This means that more shipwrecks become protected each year as the 75th anniversary of their loss is reached

- HO10 (Salvation Army Commandant's & Nurses Barracks);
- HO81 (Mt. Ararat Pre-emptive Right); and
- HO108 (Bourke House & Stables).

None of these sites are located within the study area.

2.4.2.5 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.

A search of the NTR was conducted for a 2 km radius area centred on the study area. The search did not identify any historical heritage places in the search area (Map 8).

2.4.2.6 Commonwealth and International Heritage Lists

The Commonwealth Department of the Environment (DoE) maintains the National Heritage List (NHL), a register of exceptional natural, Aboriginal and historical heritage places which contribute to Australia's national identity. DoE also maintains the Commonwealth Heritage List (CHL), a register of natural, Aboriginal or historical heritage places located on Commonwealth land which have Commonwealth heritage values.

A place can be listed on one or both lists, and placement on either list gives the place statutory protection under the EPBC Act.

The World Heritage List (WHL) lists cultural and natural heritage places which are considered by the World Heritage Council to have outstanding universal value.

DSEWPC also maintains the Register of the National Estate (RNE) which is a list of natural, Indigenous and historic heritage places throughout Australia. Following amendments to the *Australian Heritage Council Act 2003*, the RNE was frozen on 19 February 2007, and no new places have been added or removed since then. The RNE ceased as a statutory register in February 2012, although items listed on the RNE may continue to be considered during approvals processes. Many items on the RNE have been listed on the NHL or CHL. They may also be registered on State or local heritage registers. In these cases, those items are protected under the relevant Commonwealth or State heritage legislation. However, items that are only listed on the RNE no longer have statutory heritage protection.

Listings on the NHL, CHL, WHL and RNE are accessed via the Australian Heritage Database (AHD), managed by DoE.

DoE also maintains the Commonwealth Historic Shipwreck Database (HSD). Under the *Commonwealth Historic Shipwrecks Act 1976*, all shipwrecks in Commonwealth waters that were lost 75 years or more ago are protected. For Victoria, the majority of these are also reflected as listings on the VHR.

A search of the AHD and HSD was conducted for a 2 km radius area centred on the study area. The search did not identify any historical heritage places in the search area (Map 8).

2.4.2.7 Summary

A summary of the relevant historical heritage sites appears in Table 4 below.

Table 4: Summary of Previously Identified Historical Heritage Sites within 2 km of the Study Area

Register & Site Number	Site Name	Site Type	Within Study Area?
VHI H8021-0024	Allwinkle House Site Cardinia Lakes Feature 1	Building Feature	No
VHI H8021-0025	Wright House Site Cardinia Lakes Feature 2	Building Feature	No
VHI D7921-0072	Pakenham No. 1 Reservoir	Former Reservoir	No
VHI D8021-0008	Pakenham Farm Machinery Dump	Old Farm Site	No
HO10	Salvation Army Commandant's & Nurses Barracks	Building	No
HO81	Mt. Ararat Pre-emptive Right	Building	No
HO108	Bourke House & Stables	Building	No

2.4.3 Previous Historical Archaeological Investigations

Regional and localised archaeological investigations have established the general character of historical sites located within close proximity to the study area. This information, together with histories of land use and historical information can be used to form the basis for a site prediction statement.

The most relevant historical archaeological investigation in relation to the study area is:

Tulloch (2001) conducted a survey for Aboriginal and non-Aboriginal sites along the proposed route for the Pakenham Bypass between Beaconsfield and Nar Nar Goon. The survey identified one previously unknown historical archaeological sites along the 17 km survey route. The site – D8021-0008 (Pakenham Farm Machinery Dump) consists of car parts that appear to date from the 1920s and probably form part of a farm dump.

2.4.4 Historical Archaeological Site Prediction Statement

The following site prediction statement has been formulated from the review of previous assessments. The statement presented is based on a site type approach. The review of the previously recorded historical archaeological sites and previous archaeological investigations indicates that the most likely⁴ site types to occur in the study area are domestic sites, farming sites and pastoral sites.

Domestic Sites are likely to occur in the study area. 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.

⁴ **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).

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

Farming Sites are likely to occur in the study area. Evidence of farming may include fence lines, dams, water channels, plantings or terracing.

Pastoral Sites are likely to occur in the study area. Breeding of livestock and dairying may be evidenced by the remains of stockyards, stables, barns and holding pens.

2.4.5 Historical Heritage Desktop Assessment – Summary of the Results and Conclusions

Although no previously recorded Historical heritage sites have been recorded within the study area, given the regional history of Pakenham area and the number of domestic, pastoral and farming sites located within the search radius, there remains the possibility that these site types in particular may occur within the study area. A formal historic heritage assessment (HHA) and archaeological survey would be required to determine if any historical heritage sites are located within the study area.

3 FIELD ASSESSMENT AND RESULTS

The initial ground survey of the study area was conducted on the 11th and 12th of December 2012 by Ecology and Heritage Partners Pty Ltd Archaeologists and Heritage Advisors, Sylvana Szydzik and Wendy Alberto. Bobby Mullins and Eddy Ockwell (representing Wurundjeri Tribe Land and Cultural Heritage Compensation Council), Ngarra Williams (representing the Boon Wurrung Foundation), and Darren Symington (representing Bunurong Land Aboriginal Council) assisted with the field assessment, and were consulted throughout the initial assessment.

A geoarchaeological auger program and field inspection of the study area was also conducted on 29th of September 2015 by Ecology and Heritage Partners Pty Ltd Archaeologist and Heritage Advisor, Bradley Ward to confirm the results of the initial assessment desktop assessment and to further refine areas of archaeological likelihood for Aboriginal cultural heritage.

3.1 Aims and Objectives

The aims of the initial survey conducted by were:

- To identify and record any surface indications of Aboriginal and historical heritage sites and/or areas of Aboriginal and historical archaeological likelihood in areas that will be impacted by the proposed development; and/or
- To verify the results of the background review and site predictive statement; and/or
- To assess the cultural heritage significance of any historical sites identified in the survey.

3.2 Methodology of the Survey

The initial field assessment involved a field inspection of the landforms within the study area to identify any areas of Aboriginal archaeological likelihood. Due to the nature of the assessment and the size and extent of the study area, an appropriate methodology for the rapid field assessment had to be developed. An archaeological survey methodology was developed in line with the requirements of this assessment and in consultation with the representatives of the Aboriginal communities who participated in the field assessment.

The proposed methodology for the initial field assessment of the study area was as follows:

- Inspect and assess previously recorded Aboriginal archaeological places;
- Inspect and assess any mature gum trees and remnant native vegetation areas;
- Inspect and assess the waterways (e.g. named waterways and minor drainage channels);
 - Deep Creek; and
 - Drainage channels; and
- Other significant landforms (e.g. high rises, terraces and ridgelines).

The initial field assessment took the form of a combined vehicular and pedestrian survey in which the five participants inspected and identified landforms and areas of Aboriginal archaeological likelihood.

3.3 Results of the Survey

The study area comprises a large rise and ridgeline in the north, which slopes down to lowland plain and Deep Creek to the east, and lowland plain and a drainage channel to the west. A gently sloping spur continues from the ridgeline south through the study area, ending just north of the Princes Freeway, overlooking lowland plain to the east, south and west. The eastern boundary of the study area rises again, up to Mount Ararat immediately adjacent to the study area.

The majority of the study area was covered in pasture grass, reducing ground visibility. Isolated ground surface exposures were inspected more closely.

Each previously recorded Aboriginal archaeological place was inspected during the initial field assessment conducted by Szydzik and Alberto (2013), however, due to limited ground surface visibility, no Aboriginal archaeological material was identified at these places. One Aboriginal archaeological place, an isolated artefact, was identified during the initial assessment (VAHR 8021-0380 [Nar Nar Goon IA 1]). No scarred trees, caves, or rockshelters were identified during the assessment.

The field assessment confirmed the findings of the desktop assessment, that the activity area comprises a highly sensitive archaeological and natural landscape characterised by alluvial deposits on lowland and flood plains, high ridges and rise, and gently undulating slopes, plateaus and terraces. The lowland plains and drainage systems within the activity area may have provided seasonal foods such as fish and eels, favourable hunting grounds, and thoroughfares would have been significant locales for large gatherings of people and other groups as part of their cultural and social obligations. Rises and ridgelines would have provided travelling routes and transient occupation sites.

Table 5 describes the results of the initial field assessment within each property, identifying previously recorded Aboriginal archaeological places, and landforms and areas of Aboriginal archaeological likelihood. Property ID numbers were supplied by the Cardinia Shire Council, and are used to differentiate properties (Map 2).

Table 5: Results of the Archaeological Survey

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#1	[REDACTED]	12 Dec 2012	Ground surface visibility varied from 0-10% throughout the whole property	<p>Terraces, floodplain and gentle slopes.</p> <p>The property (which comprises an alpaca farm) is located on a hill which gently slopes down from east to west towards Deep Creek.</p> <p>The property is currently used for hay crops and grazing.</p>	<p>Areas of likelihood:</p> <p>Terraces located above the floodplain and the upper slope to the east of the property.</p>	 <p>Plate 1: [REDACTED], facing south east</p>  <p>Plate 2: [REDACTED], facing south west</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#2	[REDACTED]	12 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Crest and upper slope of a large hill vegetated with pastoral grasses.</p> <p>The property is located on the top of a large hill (crest) with a gentle slope in the mid-section of the property.</p> <p>The property is currently used for grazing.</p>	<p>Areas of likelihood:</p> <p>Crest and upper slope.</p>	 <p>Plate 3: [REDACTED], facing north</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#3	[REDACTED]	12 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Upper slope and low lying plain vegetated with pastoral grasses.</p> <p>The property is located on the upper slope of a large hill which slopes gently west to east, towards a modified drainage line. The property is intersected by this drainage line which runs north to south. A large dam has been constructed along the drainage line in the north of the property.</p> <p>The property is currently used for grazing.</p>	<p>Areas of likelihood: Upper slope.</p>	 <p>Plate 4: [REDACTED], facing north east</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#4	[REDACTED]	13 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Terrace and gentle slope vegetated with pastoral grasses.</p> <p>The property is located on a hill which slopes gently east to west.</p> <p>The property is currently used for hay crops and grazing.</p>	<p>Areas of likelihood:</p> <p>Terraces and upper slope.</p>	 <p>Plate 5: [REDACTED], facing west</p>
#5	[REDACTED]	13 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Terraces and slope vegetated with pastoral grasses;</p> <p>The property is located on a hill which slopes gently east to west.</p> <p>The property is currently used for hay crops and grazing.</p>	<p>Areas of likelihood:</p> <p>Terraces and upper slope.</p>	 <p>Plate 6: [REDACTED], facing east</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#6	[REDACTED]	13 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Low lying plain and slight rise vegetated with pastoral grasses;</p> <p>The property is located on a slight rise which gently slopes down from north east to south west towards until becoming low lying plain at the south of the property;</p> <p>The property is currently used for grazing.</p>	<p>Areas of likelihood:</p> <p>Upper slope of slight rise at the northern end of property.</p>	 <p>Plate 7: 15 [REDACTED], facing east towards the property in the background</p>  <p>Plate 8: [REDACTED], facing south</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#7	[REDACTED]	12 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Low lying plain, terraces and lower slope of large rise to the north west vegetated with pastoral grasses.</p> <p>The property is located predominantly on low lying plain with the north western section of the property located on the lower slope of the a large rise in the north west of the study area (properties #2, #8 and #9). A modified drainage line intersects the property north to south.</p> <p>The property is currently used for grazing.</p>	<p>Areas of likelihood:</p> <p>Terraces and lower slope of large rise.</p>	 <p>Plate 9: [REDACTED], facing south east</p>  <p>Plate 10: [REDACTED], facing east (from the lower slope of large rise)</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#8	[REDACTED]	12 Dec 2012	Ground surface visibility varied from 0-3% throughout the whole property.	<p>Terraces, large hill and slopes vegetated with pastoral grasses.</p> <p>The property is located on a large hill which slopes down from north west to south east in direction. Several terraces were noted.</p> <p>The property is currently used for grazing.</p>	<p>Areas of likelihood:</p> <p>Hills crest, terraces and upper slopes.</p>	 <p>Plate 11: [REDACTED], facing north (from terrace)</p>  <p>Plate 12: [REDACTED], facing south</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#9	[REDACTED]	12 Dec 2012	Ground surface visibility varied from 0-3% throughout the whole property.	<p>Terraces, large hill and slopes vegetated with pastoral grasses.</p> <p>The property is located on a large hill. Several terraces were noted.</p> <p>The property is currently used for grazing.</p>	<p>Areas of likelihood:</p> <p>Hills crest, terraces and upper slopes.</p>	 <p>Plate 13: [REDACTED], facing north (top of the hill)</p>  <p>Plate 14: [REDACTED], facing south (mid-slope)</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#10	[REDACTED]	Not inspected	-	Property is a small residential block comprising house and landscaped gardens.	-	-
#11	[REDACTED]	Not inspected	-	Property is a small residential block comprising house and landscaped gardens.	-	-
#12 #13	[REDACTED]	Not inspected	-	Property is a small block, asphalted and fenced.	-	-

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#14	[REDACTED]	12 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Rise, terraces, low lying plain, and slope vegetated with pastoral grasses and remnant native vegetation;</p> <p>The property is located on the upper slope of the large rise to the east (properties #2, #8, #9). The land gently slopes down from east to west towards the drainage line (traversing the mid-section of the property) until it meets low lying plain and floodplain landforms. Deep Creek runs along the western boundary of the entire property;</p> <p>The property is currently used for hay crops and grazing. Transmission lines cross the property east to west.</p>	<p>Previously recorded place:</p> <ul style="list-style-type: none"> P-G IAO 1 (VAHR 8021-0027) <p>Areas of likelihood: Upper slopes, terraces, Deep Creek (200m CHS buffer); CHS buffer zone from previously recorded place P-G IAO 1 (VAHR 8021-0027).</p>	 <p>Plate 15: [REDACTED], facing east</p>  <p>Plate 16: [REDACTED], facing south (from VAHR 8021-0027)</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#15	[REDACTED]	13 Dec 2012	No ground surface visibility; high grass and weeds	<p>Low lying plain with Deep Creek traversing the western section of the property from north to south.</p> <p>The property is vegetated with pastoral grasses and remnant native vegetation.</p> <p>The property is currently used for hay crops and grazing.</p>	<p>Previously recorded places:</p> <ul style="list-style-type: none"> • Deep Creek 1 (VAHR 8021-0110) • Deep Creek 2 (VAHR 8021-0111) • Deep Creek 3 (VAHR 8021-0112) <p>Areas of likelihood: Deep Creek (200m CHS buffer); CHS buffer zone from previously recorded places Deep Creek 1 (VAHR 8021-0110), Deep Creek 2 (VAHR 8021-0111) and Deep Creek 3 (VAHR 8021-0112)</p>	 <p>Plate 17: [REDACTED], facing west towards Deep Creek (from VAHR 8021-0110)</p>  <p>Plate 18: [REDACTED], facing north</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#16	[REDACTED]	Not Inspected	-	Properties are a small residential blocks comprising house, gardens and sheds.	Properties are located within the Deep Creek CHS buffer.	-
#17	[REDACTED]					
#18	[REDACTED]					
#19	[REDACTED]					
#20	[REDACTED]					
#22	[REDACTED]					
#23	[REDACTED]					
#24	[REDACTED]					
#25	[REDACTED]					
#26	[REDACTED]					
#27	[REDACTED]					
#28	[REDACTED]					
#29	[REDACTED]					

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#30	[REDACTED]	12 Dec 2012	Ground surface visibility varied from 0-10% throughout the whole property.	Large hill, low lying plain, terraces, floodplain, slopes vegetated with pastoral grasses. Several farm houses, a dairy and associated sheds are located at the top of a large hill to the north, which is intersected by Princes Hwy. The paddocks surrounding the property are gently sloping down from the hill, until becoming low lying plains and floodplains along the outskirts of the property boundaries. The property is currently used for grazing.	<p>Previously recorded place:</p> <ul style="list-style-type: none"> • PB3 N8 (VAHR 8021-0148) <p>Areas of likelihood: Crest, upper slopes and terraces; CHS buffer zone from previously recorded place PB3 N8 (VAHR 8021-0148)</p>	 <p>Plate 19: [REDACTED], facing east towards #40 Deep Creek (from VAHR 8021-0148)</p>
#31						 <p>Plate 20: [REDACTED], facing north west towards #31 from main track in #34</p>
#32						
#33						
#34						
#40						
#41						
#42						

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#35 #36	[REDACTED]	12 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Low lying plain vegetated with pastoral grasses.</p> <p>The property is located on low lying plain with a gentle rise towards the western boundary of the property (becoming the large rise in #34). A modified drainage line runs through the eastern section of the property.</p> <p>The property is currently used for grazing.</p>	<p>Newly recorded place:</p> <ul style="list-style-type: none"> Nar Nar Goon IA 1 (VAHR 8021-0380) <p>Areas of likelihood: Lower slope (part of large rise in #34); CHS buffer zone from newly recorded place Nar Nar Goon IA 1 (VAHR 8021-0380)</p>	 <p>Plate 21: [REDACTED], facing north east.</p>  <p>Plate 22: [REDACTED], facing north (drainage line)</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#37 #38	[REDACTED]	12 Dec 2012	No ground surface visibility; high grass and weeds	<p>Low lying plain, terraces, gently sloping up towards the eastern boundary vegetated with pastoral grasses.</p> <p>The property is located on low lying plain with a gentle rise towards the eastern boundary of the property (associated with Mt Ararat 320 m north east).</p> <p>The property is currently used for hay crop and grazing.</p>	<p>Areas of likelihood: Terraces and lower slopes associated with Mt Ararat.</p>	 <p>Plate 23: 3 [REDACTED], facing north east (from VAHR 8021-0380)</p>  <p>Plate 24: 3 [REDACTED], facing north (from eastern boundary)</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#39	[REDACTED]	12 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Low lying plain, floodplain, gently sloping up on the eastern and western boundaries vegetated with pastoral grasses.</p> <p>The property is located on low lying plain and floodplain; a modified drainage line runs through the mid-section of the property.</p> <p>The property is currently used for hay crops and grazing.</p>	<p>Areas of likelihood:</p> <p>Lower slopes to the east and west.</p>	 <p>Plate 25: [REDACTED], facing east</p>  <p>Plate 26: [REDACTED], facing south east</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#43	[REDACTED]	13 Dec 2012	Ground surface visibility varied from 0-10% throughout the whole property.	<p>Low lying plain with subtle gentle rises vegetated with pastoral grasses.</p> <p>The property is located predominantly on low lying plain with gently undulating rises throughout. Gravel has been introduced into the paddock tracks and there is a large mound of soil deposited in the north of the paddock.</p> <p>There is a modified drainage line traversing the south western section of the property.</p> <p>The property is currently used for hay crop and grazing.</p>	<p>Areas of likelihood:</p> <p>Deep Creek runs 100m north west of the property and is therefore within the 200 m CHS buffer zone</p>	 <p>Plate 27: [REDACTED], facing north</p>  <p>Plate 28: [REDACTED], facing south</p>
#44	[REDACTED]	Not inspected	-	Property comprises truck storage area.	-	-

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#45	[REDACTED]	Not inspected	-	Property is a small residential block comprising house and garden, sheds and a large dam.	-	-
#46	[REDACTED]	Not inspected	-	Property is a small residential block comprising house and garden.	-	-
#47	[REDACTED]	Not inspected	-	Property is a small residential block comprising house and garden.	-	-

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#48	[REDACTED]	13 Dec 2012	No ground surface visibility; high grass and weeds	<p>Rise over-looking low lying plain and floodplain vegetated with pastoral grasses.</p> <p>The property consists of a large rise gently sloping down towards the east, over-looking low lying plain and floodplain, with a modified drainage line traversing the eastern most point of the property. A farm house is located on the rise along the western boundary of the property.</p> <p>The property is currently used for grazing.</p>	<p>Previously recorded place:</p> <ul style="list-style-type: none"> PB3 M4 (VAHR 8021-0147) <p>Areas of likelihood: Crest and upper slopes; CHS buffer zone from previously recorded place.</p>	 <p>Plate 29: [REDACTED], facing east</p>
#49	[REDACTED]	Not inspected	-	Property is a small residential block comprising farm house, garden and associated sheds.	-	-

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#50	[REDACTED]	13 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Rise over-looking low lying plain and floodplain vegetated with pastoral grasses.</p> <p>The property consists of a large rise sloping down towards the south east, over-looking low lying plain in the north east.</p> <p>The property is currently used for grazing.</p>	<p>Areas of likelihood: Crest and upper slopes; CHS buffer zone from previously recorded place located in property #50.</p>	 <p>Plate 30: [REDACTED], facing west (from VAHR 8021-0147)</p>

PSP Property ID	Property Address	Date Inspected	Visibility / Exposure	Landform and Property Description	Aboriginal Sites / Areas of Likelihood	Representative Photographs
#51	[REDACTED]	13 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Rise with a gentle slope vegetated with pastoral grasses.</p> <p>The property is located on a large rise which slopes down towards the south.</p> <p>The property is currently used for grazing.</p>	<p>Areas of likelihood: Crest and upper slopes.</p>	 <p>Plate 31: [REDACTED], facing east</p>
#53	Land to the east of Mount Ararat Road North	13 Dec 2012	Ground surface visibility varied from 0-5% throughout the whole property.	<p>Crest, gentle slope and lowland plain, vegetated with pastoral grasses.</p> <p>The property is located [REDACTED] west of Mount Ararat, and includes a crest which slopes down east to west. A small basalt quarry is located on the western slope of the rise.</p> <p>The property is currently used for grazing.</p>	<p>Areas of likelihood: Crest, upper slopes and base of slopes.</p>	 <p>Plate 32: Land [REDACTED]</p>

3.3.1 Field Inspection and Ge archaeological Augering

The purpose of the field inspection and augering probe program was to redefine areas of archaeological likelihood and determine the nature of the subsurface deposits within the study area. Three auger probes in total were positioned within the study area (Map 10) to assess the soil types and depth of deposits encountered within each of the different landform settings (i.e. creek terraces/floodplains, elevated ridges/hills and low-lying depressions) (Plate 33 – Plate 36). A conventional 60 mm diameter AMS core auger was employed for this purpose and excavated to a total depth of between 450 mm and 1200 mm. No evidence of Aboriginal cultural heritage material was identified during the auger probe program.

The results of the auger probe program are shown in Table 6 below.

Table 6: Auger Probe Stratigraphic Descriptions and Depth.

Auger Probe 1 – Creek Terrace / Floodplain		
Context 1	Context 2	Context 3
<p>A1 Horizon: 0-600 mm:</p> <p>10YR 4/2 Dark greyish brown, dry, firm, fine silt with frequent fine to medium grass roots and occasional poorly sorted sub rounded gravels. Abrupt boundary. Medium blocky structure. pH 6.5.</p>	<p>A2 Horizon: 600-1200 mm:</p> <p>10YR 6/2 light brownish grey, dry, firm, fine silt with occasional fine roots and poorly sorted sub rounded gravels. Clear boundary. Fine to medium rounded structure. pH 6.5.</p>	<p>B Horizon: 1200 mm (base) continuing:</p> <p>10YR 6/3 - 10YR 5/8 Pale brown with yellowish brown mottles, dry, very firm, clayey silt with occasional poorly sorted sub rounded gravels. Fine to medium platy structure. pH 6.5.</p> <p>Auger reached maximum depth at 1200 mm.</p>
<p>Interpretation:</p> <p>The stratigraphy in this landform showed a duplex character with a generally abrupt texture contrast between the A and B horizons. Soils in this landform are expected to be variable, comprising Chromosols or Kurosols (depending on acidity) in slightly elevated dry areas, grading to weaker texture contrast soils, comprising Dermosols in low-lying areas. It is also expected that Hydrosols (regularly inundated soils) will occur in most regularly waterlogged areas. All of these soils have developed on the more recent Holocene alluvial deposits within the study area. Soils in this landform will generally be deep and may contain buried soils (palaeosols). Further soil testing would be required to assess the overall extent of soil types present in this landform. Aboriginal site types that are likely to occur in these landforms are intact subsurface artefact scatters and LDADs.</p>		

Auger Probe 2 – Ridges / Hills		
Context 1	Context 2	Context 3
<p>A1 Horizon: 0-250 mm:</p> <p>10YR 4/2 Dark greyish brown, dry, firm, fine silt with frequent fine grass roots and occasional fine sub rounded gravels. Clear boundary. Fine granular structure. pH 6.5.</p>	<p>A2 Horizon: 250-600 mm:</p> <p>10YR 5/3 Brown, dry, firm, sandy silt with occasional fine roots and fine sub rounded gravel continuing Gradual boundary. Fine to medium rounded structure. pH 6.5</p>	<p>B Horizon: 600 mm (base) continuing:</p> <p>10YR 5/3 - 10YR 4/6 Brown with dark yellowish brown mottles, dry, very firm, silty clay with occasional poorly sorted sub rounded gravels. Medium to coarse blocky structure. pH 6-6.5.</p> <p>Auger refusal at 600 mm</p>
<p>Interpretation:</p> <p>The stratigraphy in this landform also showed a duplex character with a generally abrupt texture contrast between the A and B horizons. Soils in this landform are expected to be variable, comprising Chromosols or Kurosols (depending on acidity) in slightly elevated dry areas, grading to weaker texture contrast soils, comprising kandosols (a strongly weathered earth with minor changes in texture) in the most elevated areas. Rudosols, comprising a minimally developed stony soil may also occur in this landform, particularly in heavily eroded areas. The variation in soil types is primarily associated with the ridge slope setting. In general, however, the soil catena of the ridge (running downslope) comprises heavily deflated (eroded) silts on upper slopes, with a relatively thin A and B horizon (which may be clast supported), containing residual poorly sorted weathered parent material (C horizon). This then grades to a thicker A and B horizon on lower slopes and floodplain verges. These soils have developed on the underlying weathered granite and residual basalt geology and given the generally steep nature of this landform, soils are colluvial in origin. Aboriginal site types which are likely occur in this landform are surface artefact scatters, and subsurface artefact scatter and isolated artefacts in secondary contexts.</p>		
Auger Probe 3 – Low-lying Depressions		
Context 1	Context 2	
<p>A Horizon: 0-400 mm:</p> <p>10YR 3/3 Dark brown, moist, firm silty clay with frequent fine grass roots. Clear boundary. Coarse blocky structure. pH 5.5</p>	<p>B Horizon: 400-450 mm (base) continuing:</p> <p>10YR 3/2 Greyish brown, moist, very firm heavy clay occasional fine roots continuing. Coarse blocky structure. pH 5.5</p> <p>Auger refusal at 450 mm</p>	
<p>Interpretation:</p> <p>Soils encountered in this landform can be classified as Vertosols (Plate 36). These soils are defined heavy clay soils which have developed on the residual basalt geology associated with Mount Ararat. Vertosols are described as shrink-swell (cracking) clays with self-mulching properties (McKenzie et al. 2004). These soils are poorly drained and therefore often occur in seasonally waterlogged areas. Soils in these landforms comprise generally shallow topsoils (A horizon) and deep subsoil (B horizon). Sites which are likely to occur in this landform are isolated surface artefacts and subsurface isolated artefact often in shallow secondary contexts.</p>		



Plate 33: Deep kurosolic soil encountered within the creek terraces and floodplains (AP 1).



Plate 34: Moderately developed kurosolic soil encountered near the lower ridge/hill slopes (AP 2).



Plate 35: Skeletal rudosolic soil encountered on the upper slopes of ridges/hills.



Plate 36: Clayey vertosolic soil encountered in low-lying areas around the base of Mount Ararat (AP 3).

3.3.2 Previous (Significant) Ground Disturbance

The term Significant Ground Disturbance (SGD) is defined under r.4 of the *Aboriginal Heritage Regulations 2007* (see Glossary). SGD is used to determine whether a CHMP is triggered for an activity. Under the *Aboriginal Heritage Act 2006*, a CHMP is required where a study area (or parts thereof) is located within an identified area of cultural heritage sensitivity and the activity is a high impact activity. The portions of an area of cultural heritage sensitivity that have been subject to SGD are no longer considered to be areas of cultural heritage sensitivity. This may have a direct bearing on whether a mandatory CHMP is required or not.

Several areas of previous (significant) ground disturbance were identified during the initial survey and subsequent field inspection, comprising, but not limited to (Map 10):

- Areas with modified drainage channels, passing north south through properties 36, 37, 39 and 40, and 43 and 48;
- Areas affected by the excavation of dams;

- Areas of dumped soil noted on the top of the rise in property 32, and in property 43;
- Areas affected by the installation of the high pressure gas pipeline, running east west through the study area;
- Areas affected by the construction of the Princes Highway, which has cut through the southern spur of the rise between properties 8 and 34.
- Areas affected by the construction of the Princes Freeway noted along the southern boundary of the study area;
- Areas affected by the construction of secondary sealed roads and gravel tracks;
- Areas affected by the construction of the overhead transmission lines and towers, running east west through the northern section of the study area;
- Areas affected by the installation of underground services (water, gas, sewerage, electricity and telecommunications); and
- Areas affected by the construction of buildings and structures.

3.3.3 Aboriginal Cultural Heritage and Areas of Aboriginal Cultural Heritage Likelihood

A total of four areas of Aboriginal likelihood were identified during the initial survey and subsequent field inspection (Map 11):

- Areas subject to significant ground disturbance (unlikely) (see above);
- Low-lying areas, comprising seasonally inundated flood plains and marshland (low likelihood);
- Heavily sloping areas, comprising moderate to steep slopes (>10%) on ridges/hills (low likelihood);
- Elevated areas, comprising relatively flat to gentle slopes (<10%) on ridges/hills (moderate likelihood);
- Areas of cultural heritage sensitivity (high likelihood).
- A draft copy of this report was provided to AV and the relevant Aboriginal Traditional Owner groups. Comments on the draft report were received by AV and the Bunurong Land Aboriginal Council, and highlighted that the ridgeline landform, extending from the north through to the south of the study area, should be considered as having cultural heritage sensitivity. This landform is considered sensitive as ridgelines within the greater PSP region were often utilised as transit routes from the Dandenong Ranges to the adjacent swamplands (Koo Wee Rup). The 'Areas of Archaeological Likelihood' provided in Map 11 has been updated to reflect this landform as having cultural heritage sensitivity (attributed as moderate likelihood).

3.3.4 Allowance for Open Spaces and Parkland within Areas of Archaeological Likelihood

The current Future Urban Structure (FUS) Plan for the Pakenham East PSP already has allowance for open spaces and parkland within areas defined as having a high to moderate likelihood for the presence of Aboriginal cultural heritage (see Map 3 for the current FUS and Map 11 for areas of archaeological likelihood). These open space areas include drainage easements and wetlands, as well as passive open space,

active open space and vegetation reserves. These areas occur within the [REDACTED] buffer adjacent to Deep Creek (an area of CHS and high likelihood), also along the existing drainage lines and the low lying areas in the southern section of the study area. Additional areas of passive open space have been set aside on the elevated hilltops including northern hilltop park (Map 3) which occurs within an area of moderate likelihood (Map 11). These open space areas provide an opportunity for the preservation of both previously recorded and unrecorded Aboriginal Places that exist in these sensitive landforms. The previous recorded Aboriginal Places that occur within the set aside open spaces include:

- VAHR 8021-0111 (Deep Creek 2) which fall within the [REDACTED] buffer of the Deep Creek reserve;
- VAHR 8021-0112 (Deep Creek 3) which fall within the [REDACTED] buffer of the Deep Creek reserve;
- VAHR 8021-0147 (PB3 M4) which falls within the southern wetland opens space reserve; and
- VAHR 8021-0380 (Nar Nar Goon IA 1) which falls within the drainage easement reserve.

One remaining previously recorded Aboriginal Place also falls within undevelopable land (although not an open space) associated with the existing electricity transmission easement:

- VAHR 8021-0027 (P-G IAO 1) comprising one isolated silcrete flake located on the surface of a slight hollow on flat land 300 m from Deep Creek, and a quartz flake;

3.3.5 Historical Heritage Sites and Areas of Historical Archaeological Likelihood

No historical heritage sites or areas of historical archaeological likelihood were identified during the initial survey.

3.3.6 Survey and Field Inspection– Summary of Results and Conclusions

The initial survey, subsequent field inspection, updated database searches and the Aboriginal archaeological site prediction statement (Section 2.3.6) has clearly shown that Aboriginal sites may occur anywhere within the study area except areas previously impacted by development. These areas have been mapped as unlikely to contain Aboriginal cultural heritage and therefore do not require further archaeological assessment. Areas of low likelihood may contain sporadic episodes of Aboriginal occupation or archaeological deposits affected by post depositional processes (primarily colluvial processes), comprising mainly LDADs and isolated artefact occurrences in largely secondary contexts. These areas comprise low-lying floodplains (away from natural water courses) and heavily sloping (>10%) ridges and hills (see Map 11 and Appendix 4). It is recommended in areas of low likelihood that further assessments, by way of detailed inspection and risk assessment, be undertaken to confirm the presence or absence of cultural heritage. Areas of moderate likelihood incorporate relatively flat (<10%) elevated landforms that may contain Aboriginal cultural heritage comprising artefact scatters and LDADs of greater frequency. Voluntary CHMPs are recommended for these areas of moderate likelihood. Areas of high likelihood comprise areas of previously mapped CHS (including the 200 m Deep Creek buffer and 50 m buffers around previously recorded Aboriginal places). These areas are sensitive and likely to contain further Aboriginal cultural heritage associated either with a continuation of the previously mapped Aboriginal site extents or areas in close proximity to natural water courses. Site types most likely to occur in these areas are intact artefact scatters associated with long-term occupation. Mandatory CHMPs will be required for all areas of high likelihood that will be impacted as part of the Pakenham East PSP (i.e. not with the set aside open spaces). It is also recommended that all attempts are made for the allowance of additional open spaces and parkland in these areas to avoid impacts Aboriginal cultural heritage.

4 DETAILS OF CULTURAL HERITAGE IN THE STUDY AREA

4.1 Aboriginal Cultural Heritage in the Study Area

Seven previously recorded Aboriginal Places are located within the study area (Map 9):

- VAHR 8021-0027 (P-G IAO 1);
- VAHR 8021-0110 (Deep Creek 1);
- VAHR 8021-0111 (Deep Creek 2);
- VAHR 8021-0112 (Deep Creek 3);
- VAHR 8021-0147 (PB3 M4);
- VAHR 8021-0148 (PB3 N8); and
- VAHR 8021-0380 (Nar Nar Goon IA 1).

5 MANAGEMENT RECOMMENDATIONS

This section provides a summary of the recommendations made in relation to the Aboriginal and historical heritage values of the study area. For Aboriginal cultural heritage the following recommendations explain whether a Cultural Heritage Management Plan (CHMP) under the *Aboriginal Heritage Act 2006* will or will not be required (mandatory). Additional recommendations are based on whether a voluntary CHMP should be prepared or at least a site inspection be undertaken by a qualified HA as a risk management measure. Voluntary CHMPs have been recommended for areas of moderate to high likelihood outside areas of CHS. Site inspections have been recommended for areas of low likelihood outside areas of CHS. Finally, in areas considered to have no Aboriginal cultural heritage likelihood and areas that have been subject to previous significant ground disturbance, no further archaeological investigation (by way of CHMP or site inspection) is recommended (Map 12).

The results of the initial survey and subsequent field inspection clearly show that there is potential for additional Aboriginal cultural heritage to be present within the study area. The recommendations below are relevant for the current condition of the study area and may be subject to change with future additions to areas of cultural heritage sensitivity.

A summary of the Recommendations is provided at the end of this section.

5.1 Aboriginal Cultural Heritage

Recommendation 1: Mandatory Cultural Heritage Management Plans

In properties where areas of CHS (as identified by *Aboriginal Heritage Regulations 2007*) are present (Map 11), and a high impact activity will take place, a mandatory CHMP must be undertaken. The CHMP will include an archaeological survey and subsurface testing program to establish the nature, extent and significance of all Aboriginal cultural heritage in the study area (in accordance with r.60 and r.61 of the *Aboriginal Heritage Regulations 2007*). This must include consultation with the relevant Traditional Owner communities, Sponsor and HA to agree on an appropriate sampling methodology suitable to the subsurface testing of Aboriginal cultural heritage within the study area.

The complex assessment will focus within the areas of cultural heritage sensitivity and Aboriginal archaeological likelihood (Map 11) and the primary aims will be to:

- Establish the presence of any subsurface Aboriginal archaeological deposits;
- Define the nature, extent and significance of any subsurface Aboriginal archaeological deposits;
- Determine the extent of the pre-existing surface site identified as part of this assessment; and
- Determine the nature and condition of the stratigraphy.

The methodology to be used to sample the area of sensitivity will be to excavate a series of representative test pits (e.g. 1 m x 1 m test pits and 50 cm x 50 cm shovel test holes) removing sediments with horizontal

control in excavation units (spits) of either 50 mm or 100 mm (or following the natural stratigraphy where present) by using accepted stratigraphic methods and standard hand-held tools.

It should also be noted that the Traditional Owner communities may request controlled excavation using mechanical equipment (e.g. mechanical excavator and mechanical sieve). If machinery is used for the purposes of uncovering Aboriginal cultural heritage, the disturbance or excavation shall be conducted on a detailed stratigraphic basis. In addition, if the use of machinery results in the finding of occupation deposits or features, the deposits or features shall be uncovered and assessed by controlled non-mechanical excavation.

Any future Aboriginal archaeological subsurface testing involving both hand and mechanical excavation methods will require consultation between the Traditional Owner communities, proponent and a HA in order to determine an appropriate sampling methodology.

Pursuant to the *Aboriginal Heritage Act 2006* and *Aboriginal Heritage Regulations 2007*, the HA will discuss the results of the complex assessment with the relevant Aboriginal stakeholders, AV and Sponsor and determine recommendations for additional Aboriginal cultural heritage investigations that may be undertaken for the purpose of preparing a CHMP.

██████████, Pakenham has been subject to a previous archaeological assessment, conducted in 2005 by Paynter and Rhodes. The recommendations set out by Paynter and Rhodes (2005) included salvage requirements for Deep Creek 1 and Deep Creek 2 (VAHR 8021-0110-0111). As mentioned in Section 3.3.4, Deep Creek 2 (VAHR 8021-0111) falls within the set aside open space reserve (within 100 m of Deep Creek) (Map 3) and is unlikely to be impacted as a result of the PSP. Deep Creek 1 (VAHR 8021-0110) does not fall within this open space reserve and therefore salvage of this Aboriginal Place will be required if impacts occur in this area. The recommendations set out by Paynter and Rhodes (2005) are as follows:

- Application for a Consent to Disturb sites Deep Creek 1 and Deep Creek 2 (VAHR 8021-0110-0111) from the Minister of Aboriginal Affairs, and the support of the Traditional Owner communities for the proposed residential development and further archaeological works;
- In the event that a Consent to Disturb is issued, controlled salvage of the place Deep Creek 1 (VAHR 8021-0110) is to be conducted, comprising the excavation of a 2 m x 2 m trench in close proximity to the noted deposits associated with either a former course or former tributary of Deep Creek;
- Controlled excavator scrapes across the activity area associated with either the stripping of soil within the property, or fill to be placed over the study area; and
- If *in situ* features, such as a hearth, are identified during the excavation of the 2 m x 2 m or the excavator scrapes, there should be provision for dating of radiocarbon dating.

It is recommended that the previous assessment (Paynter and Rhodes 2005) be included in the mandatory CHMP for this property. During this process, it must be determined if a Consent to Disturb has been issued for the place Deep Creek 1 (VAHR 8021-0110), and, in consultation with the Traditional Owner communities, the salvage recommendations outlined by Paynter and Rhodes (2005) be included in the Complex CHMP.

Recommendation 2: Voluntary Cultural Heritage Management Plans

In properties where there is no area of cultural heritage sensitivity present, as identified by *Aboriginal Heritage Regulations 2007*, the proponent is not legally required by the *Aboriginal Heritage Act 2006* and the *Aboriginal Heritage Regulations 2007* to prepare a mandatory CHMP.

However, it is recommended that the proponent consider preparing a voluntary CHMP given that areas of moderate archaeological likelihood are present (see Map 11 and Map 12); therefore, there is a risk that any future development of the study area may impact potential Aboriginal archaeological sites. There are a number of advantages to preparing a CHMP, and reasons why the proponent may wish to consider the preparation of a voluntary CHMP:

- **No requirement for Cultural Heritage Permits at a later stage:** There are no cultural heritage permit requirements in relation to a CHMP as long as you are acting in accordance with the CHMP. There is no requirement for an excavation permit or a permit to harm, or any of the other permit requirements. In effect, the approved CHMP is a permit. If something turns up unexpectedly during construction, there is no permit requirement. These are dealt with through contingency plans in the CHMP, already signed off and agreed to by the Registered Aboriginal Party, or by the Aboriginal Victoria (in the absence of a RAP) in the CHMP process;
- **Increased certainty for your project:** As there are no Cultural Heritage Permit requirements at a later stage, there is a great deal more certainty for the project. If a CHMP has been prepared, there is certainty that the project can proceed without work stoppages. This certainty is provided during the planning phase, allowing the construction phase of projects to be unimpeded. Preparing a CHMP provides the proponent with peace of mind. A CHMP removes the development activity from the harm provisions of the *Aboriginal Heritage Act 2006*, as long as the proponent acts in accordance with the CHMP; and
- **Good Risk Management:** Lastly, preparing a CHMP is good risk management for a project, just as preparing a cultural heritage assessment has been in the past.

Recommendation 3: Inspection and Risk Assessment

For areas of low likelihood outside of the voluntary and mandatory CHMP areas, it is recommended that a detailed inspection and risk assessment be undertaken, this may take the form of a voluntary CHMP. While these areas do not contain legislative obligations to complete an Aboriginal archaeological investigation, effective risk management should be implemented to avoid any damage to Aboriginal places that may exist in these areas.

Recommendation 4: Open Spaces and Parkland

Although noted in Section 3.3.4 that large areas have already been set aside for open space and parkland as part of the current FUS for the Pakenham East PSP, additional allowance for open spaces and parklands in areas of high likelihood is also recommended. These areas include areas where mandatory and voluntary CHMPs have been recommended. These areas are likely to contain further Aboriginal cultural heritage and therefore all attempts should be made to avoid impacts to these areas.

Recommendation 5: Contingency for Aboriginal Heritage

There are no other known Aboriginal cultural heritage issues in regard to the proposed development. If any Aboriginal cultural heritage issues are encountered during the course of construction then works should cease within 10 m of the area and a qualified Heritage Advisor (or AV) should be contacted to investigate the nature of the cultural heritage.

Table 7: Summary of Management Recommendations (see Map 12)

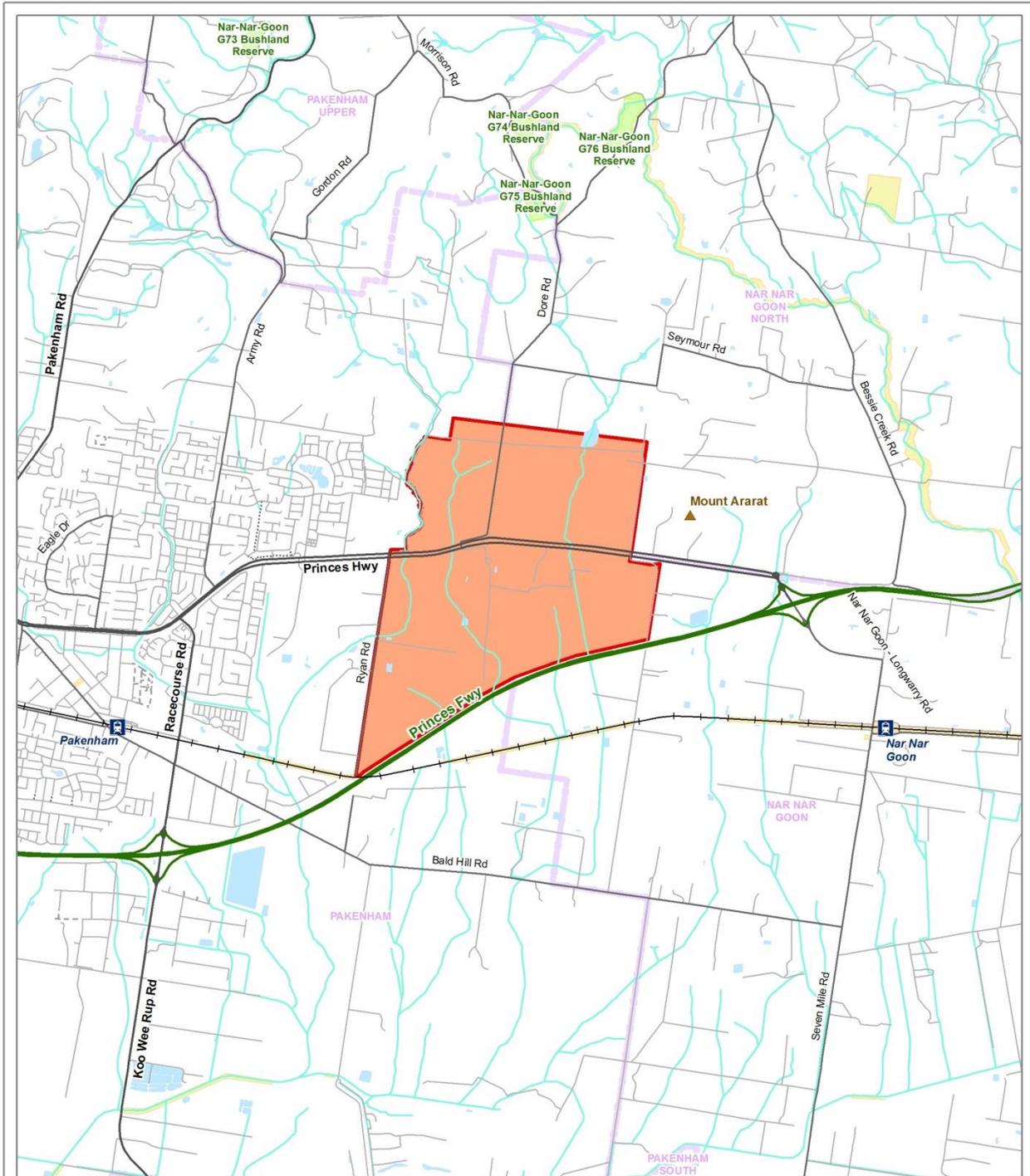
Property ID	Aboriginal Heritage			
	Mandatory CHMP Required	Voluntary CHMP Recommended	Site Inspection and Risk Assessment Recommended	No Further Investigation
1, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 36, 37, 40, 43, 44, 48, 49, 50	✓			
2, 3, 4, 5, 6, 7, 8, 9, 10, 31, 32, 33, 34, 35, 39, 45, 46, 47		✓		
11, 41, 51, 52			✓	
12, 13, 38, 42				✓

5.2 Historical Heritage

Recommendation 6: Contingency for Historical Heritage

There are no other known historical heritage issues in regard to the proposed development. If any historical heritage issues are encountered during the course of construction then works should cease within 10 m of the area of concern and a qualified Heritage Advisor (or Heritage Victoria) should be contacted to investigate the nature of the historical heritage.

MAPS



Map 1
Location of Study Area
Aboriginal and Historical
Heritage Assessment
report for the Pakenham
East PSP, Pakenham
East

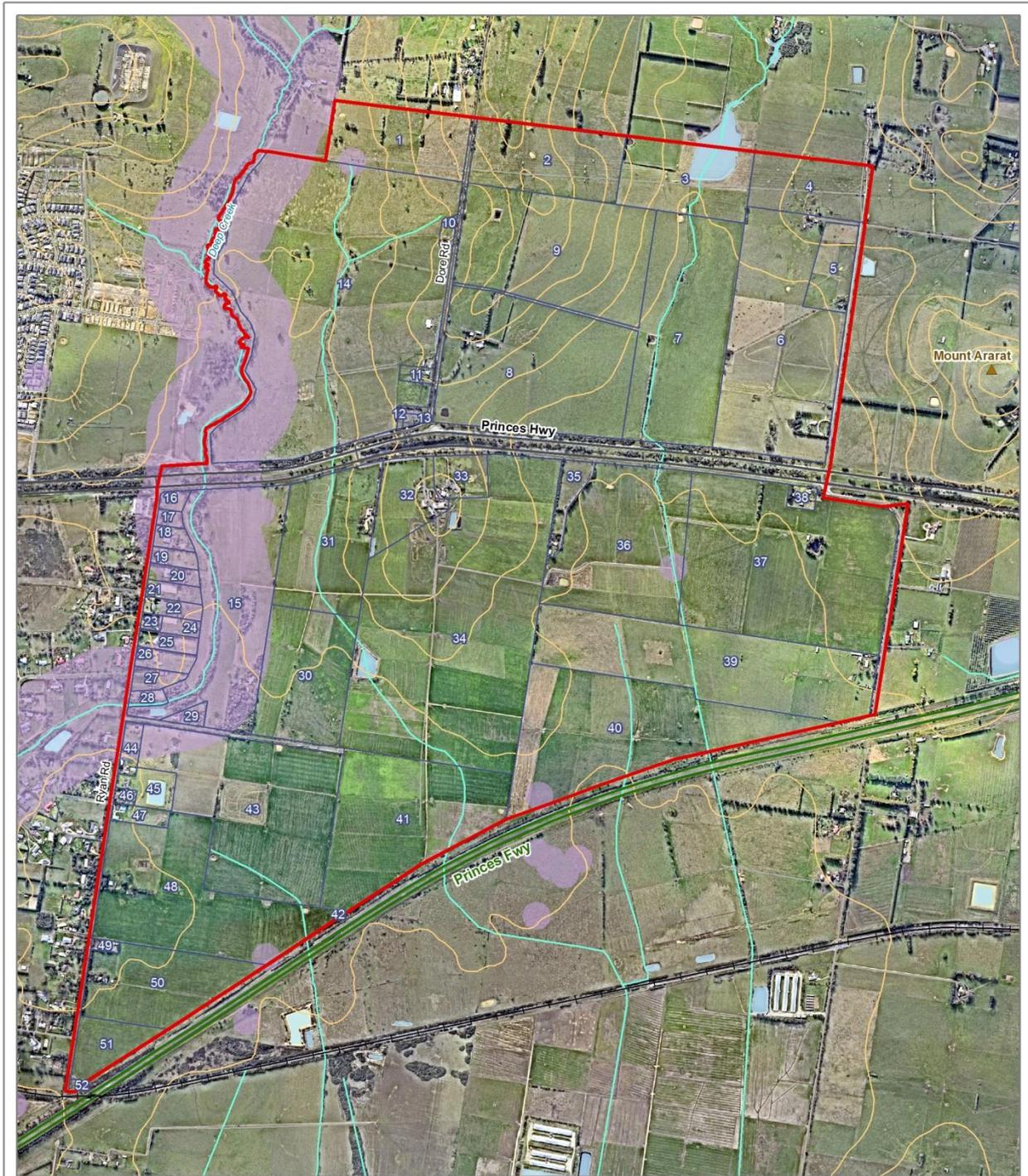
Legend

- | | |
|----------------|---------------------|
| Study Area | Minor Watercourse |
| Railway | Permanent Waterbody |
| Freeway | Parks and Reserves |
| Major Road | Crown Land |
| Collector Road | Localities |
| Minor Road | |
| Proposed Road | |
| Walking Track | |



Local Government: Cardinia Shire
25k Mapsheet: Nar Nar Goon 8021-4-4
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:50,000

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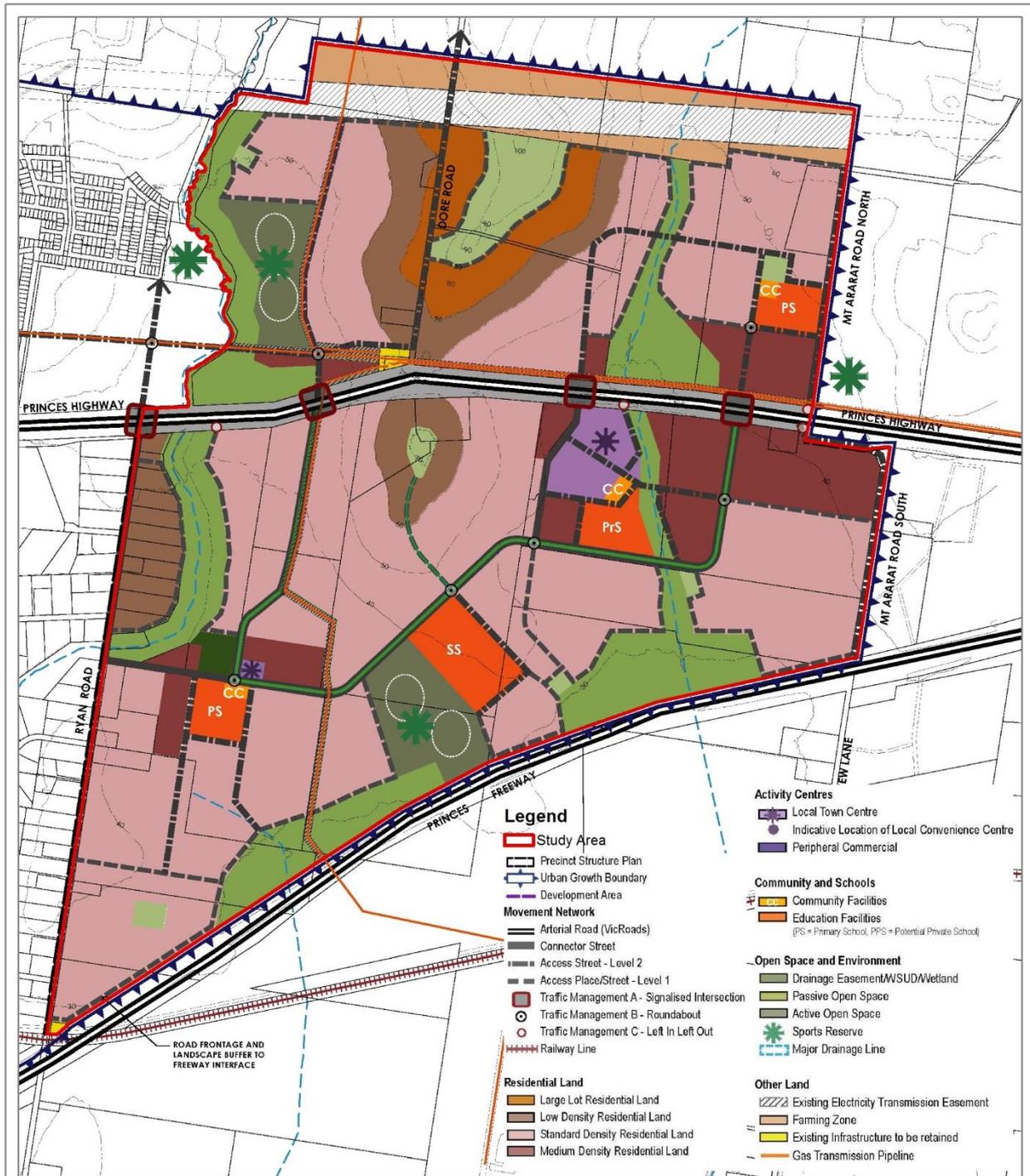
Map 2
Extent of Study Area
and Aboriginal Cultural
Heritage Sensitivity
*Aboriginal and Historical
Heritage Assessment
report for the Pakenham
East PSP, Pakenham
East*

- Legend**
- Study Area
 - Areas of Aboriginal Cultural Heritage Sensitivity
 - Contour (10m)
 - Minor Watercourse
 - Permanent Waterbody
 - PEP property boundaries



Local Government: Cardinia Shire
25k Mapsheet: Nar Nar Goon 8021-4-4
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:18,000

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Map 3
Proposed Development Plan
Aboriginal and Historical Heritage Assessment report for the Pakenham East PSP, Pakenham East



Local Government: Cardinia Shire
25k Mapsheet: Nar Nar Goon 8021-4-4
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:18,000

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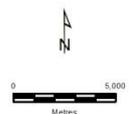
Map 4
Relevant Geographic Region
Aboriginal and Historical Heritage Assessment report for the Pakenham East PSP, Pakenham East

- Legend**
- Study Area
 - Geographic Region
 - Minor Watercourse
 - Major Watercourse
 - Permanent Waterbody
 - Land Subject to Inundation
 - Wetland/Swamp
- Bioregions**
- Gippsland Plain
 - Highlands - Southern Fall
 - Strzelecki Ranges

- Elevation (10m contours divided in natural breaks (Jenks))**
- 10-170
 - 170-300
 - 300-450
 - 450-640
 - 640-920

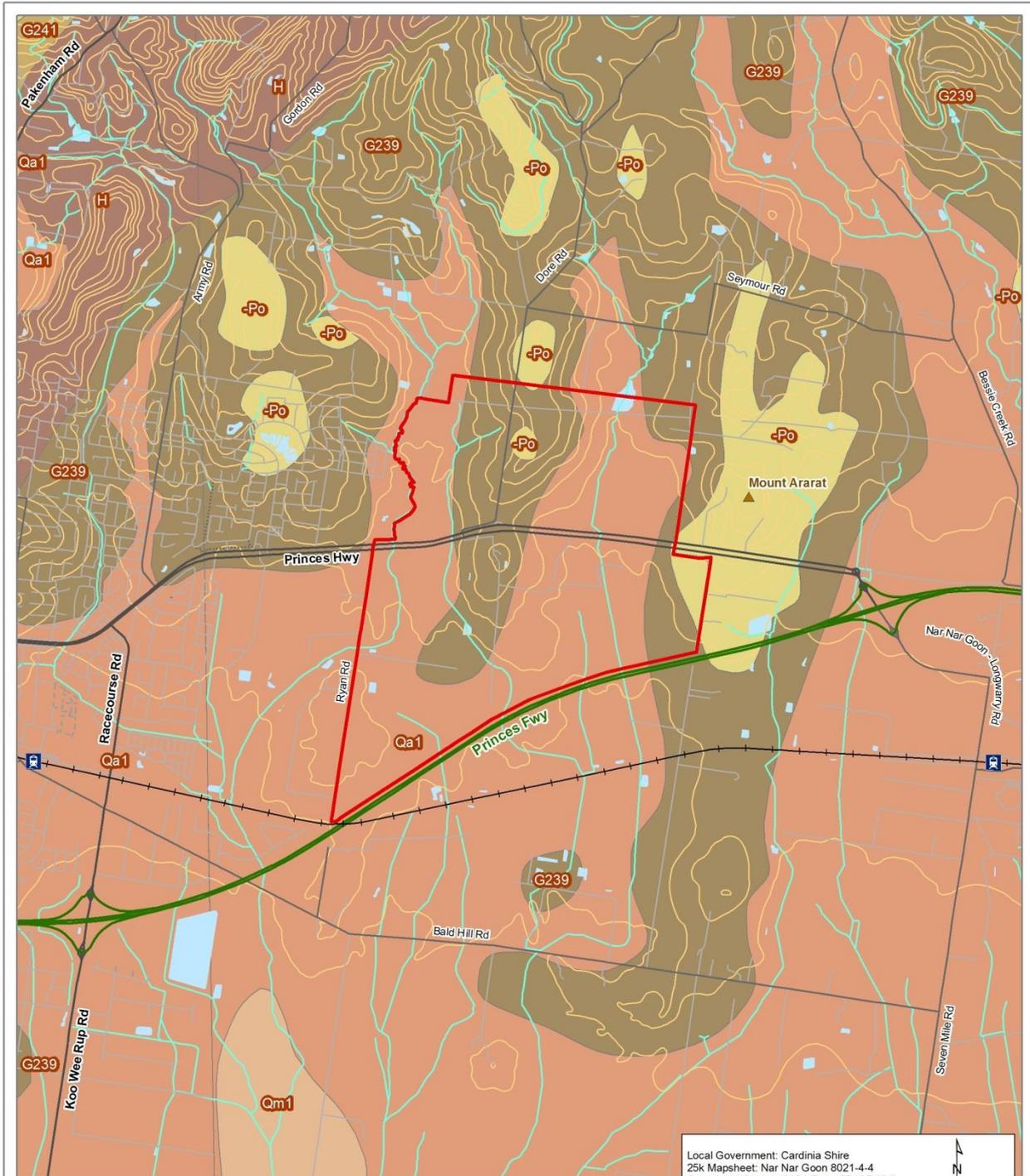


Local Government: Cardinia Shire
 25k Mapsheet: Nar Nar Goon 8021-4-4
 Coordinate System: MGA Zone 55 (GDA94)
 Map Scale: 1:300,000



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7390_Map04_GeogrRegion 6/10/2015 melsley



Map 5
Relevant Geology
Aboriginal and Historical Heritage Assessment report for the Pakenham East PSP, Pakenham East

Legend

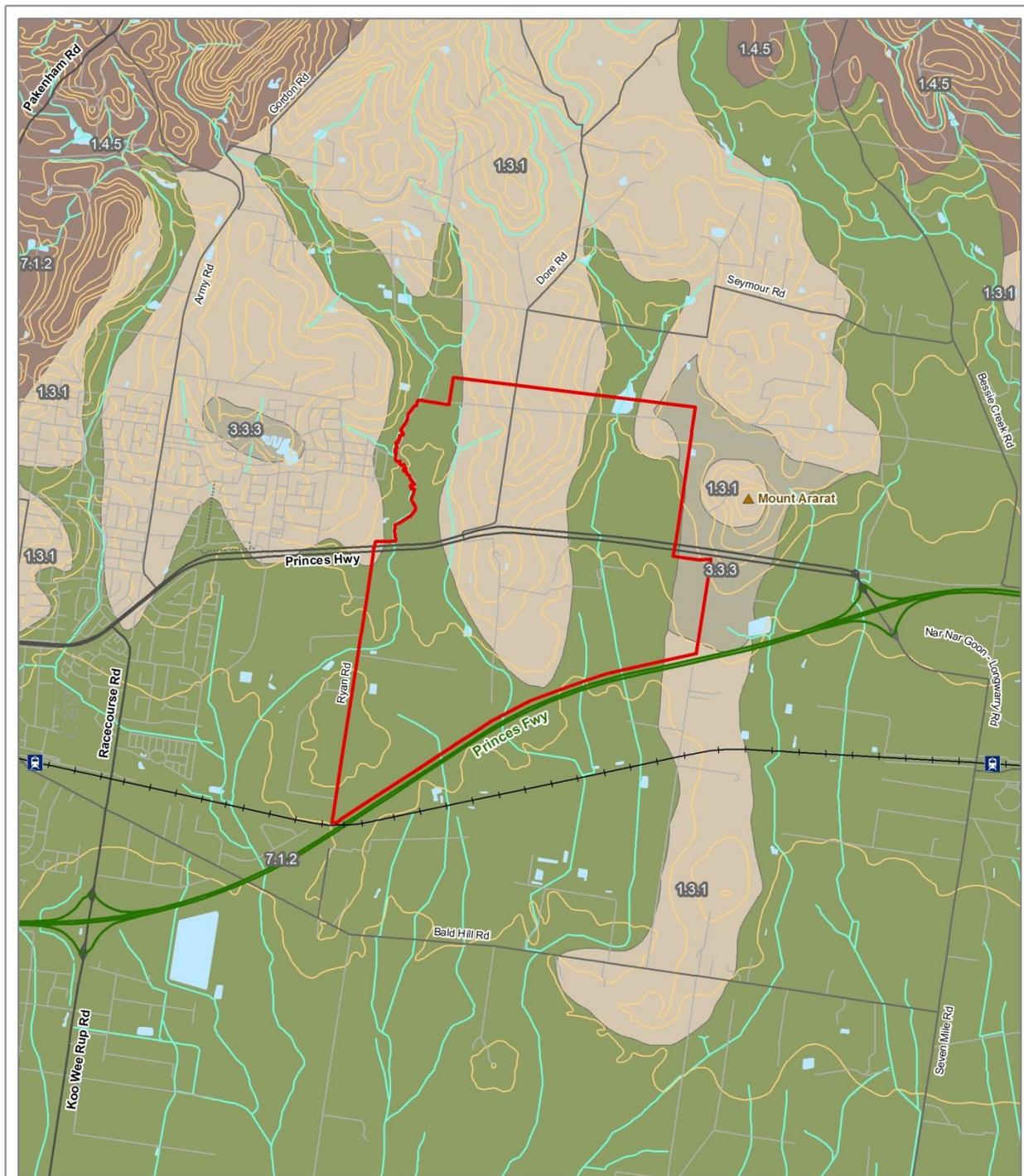
- Study Area
- Contour (10m)

Geology

- Po - Older Volcanic Group, Extrusive: tholeiitic and minor alkaline basalts (Palaeogene (Eocene) to Palaeogene (Oligocene) in age)
- G239 - Tynong Granite (Devonian (Late Devonian) to Devonian (Late Devonian) in age)
- G241 - Lysterfield Granodiorite (Devonian (Late Devonian) to Devonian (Late Devonian) in age)
- H - unnamed hornfels, Metamorphic: hornfels (Devonian (Late Devonian) to Devonian (Late Devonian) in age)
- Qa1 - Unnamed alluvium, Fluvial: alluvium, gravel, sand, silt (Quaternary (Holocene) to Quaternary (Holocene) in age)
- Qm1 - Unnamed swamp and lake deposits, Paludal: lagoon and swamp deposits: silt, clay (Quaternary (Holocene) to Quaternary (Holocene) in age)

Local Government: Cardinia Shire
25k Mapsheet: Nar Nar Goon 8021-4-4
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:40,000

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Map 6
Relevant
Geomorphology
Aboriginal and Historical
Heritage Assessment
report for the Pakenham
East PSP, Pakenham
East



7390_Map06_Geomorph2 6/10/2015 melsley

Legend

- Study Area
- Contour (10m)
- Geomorphological Units**
- Eastern Uplands**
- 1.3.1 Low relief landscapes at low elevation
- 1.4.5 Moderately dissected ridge and valley landscapes
- Southern Uplands**
- 3.3.3 Basaltic residuals
- Eastern Plains**
- 7.1.2 Alluvial plains



Local Government: Cardinia Shire
25k Mapsheet: Nar Nar Goon 8021-4-4
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:40,000

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Map 7
Modelled Pre 1750 Ecological Vegetation Classes
Aboriginal and Historical Heritage Assessment report for the Pakenham East PSP, Pakenham East



7390_Map07_Pre1750_EVCs 6/10/2015 melsley

Legend

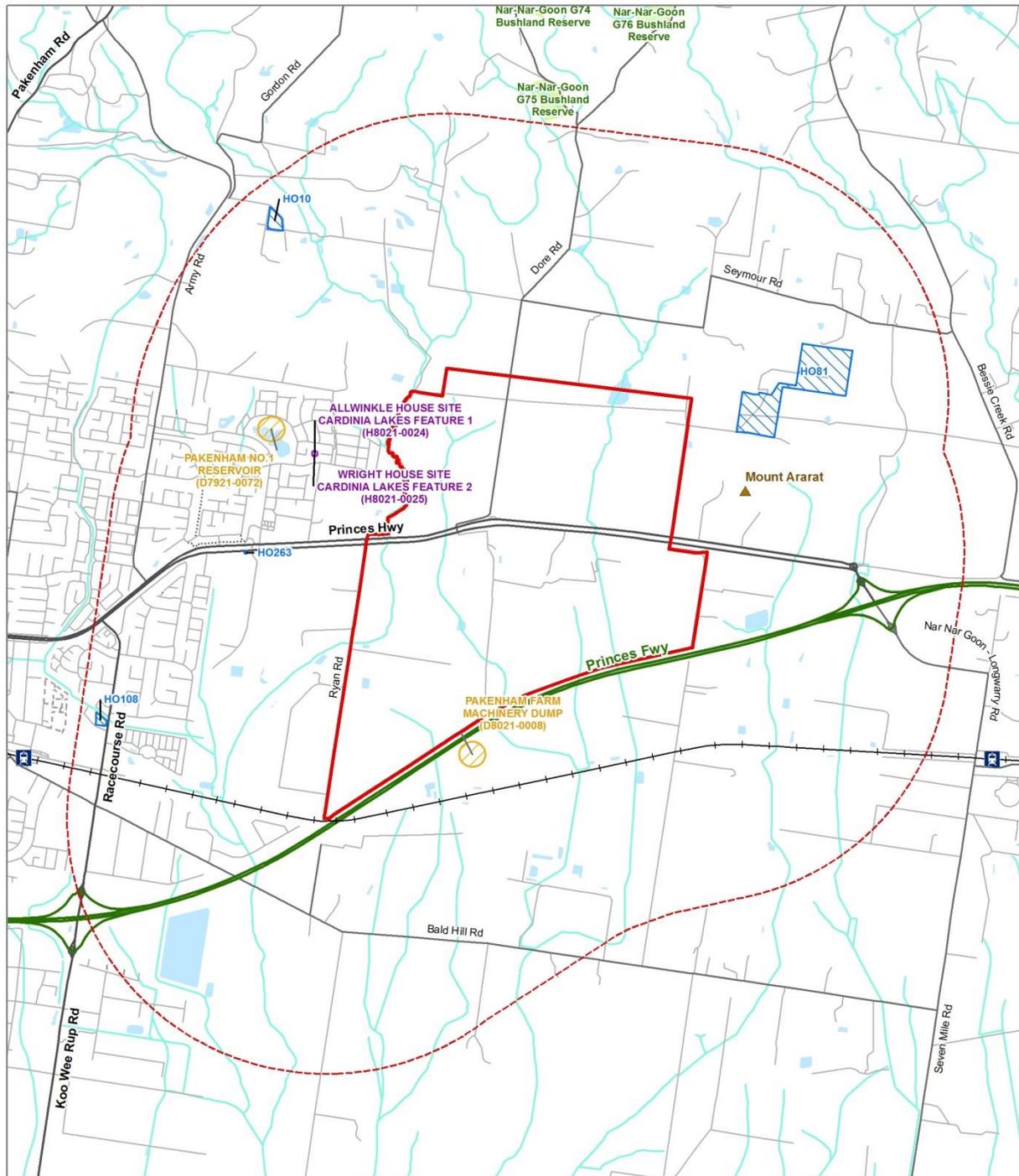
- Study Area
- Ecological Vegetation Classes (pre 1750)**
- EVC 126 Swampy Riparian Complex
- EVC 128 Grassy Forest
- EVC 159 Clay Heathland/Wet Heathland/Riparian Scrub Mosaic
- EVC 16 Lowland Forest
- EVC 17 Riparian Scrub/Swampy Riparian Woodland Complex

- EVC 175 Grassy Woodland
- EVC 18 Riparian Forest
- EVC 29 Damp Forest
- EVC 53 Swamp Scrub
- EVC 59 Riparian Thicket
- EVC 793 Damp Heathy Woodland
- EVC 83 Swampy Riparian Woodland
- EVC 897 Plains Grassland/Plains Grassy Woodland Mosaic
- EVC 937 Swampy Woodland



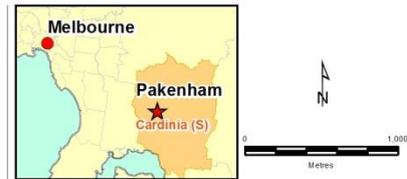
Local Government: Cardinia Shire
25k Mapsheet: Nar Nar Goon 8021-4-4
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:40,000

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Map 8
Previously Recorded Historical Heritage Sites
Aboriginal and Historical Heritage Assessment report for the Pakenham East PSP, Pakenham East

- Legend**
- Study Area
 - Search buffer (2km)
 - Heritage Sites**
 - Heritage Overlay
 - Heritage Inventory
 - Heritage Inventory (delisted)

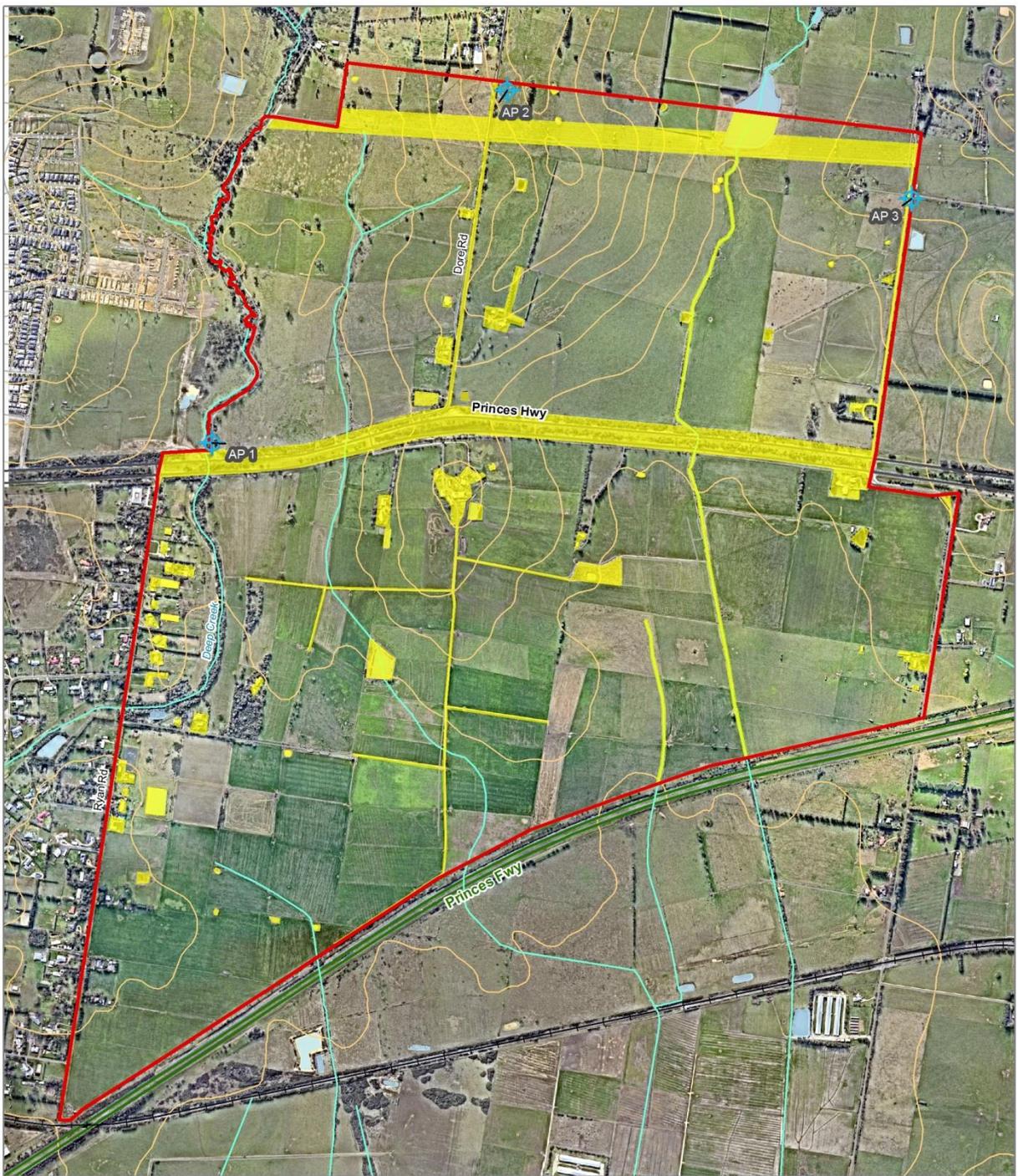


Local Government: Cardinia Shire
25k Mapsheet: Nar Nar Goon 8021-4-4
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:40,000

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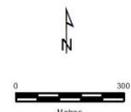
Map 9: Previously Recorded Aboriginal Archaeological Sites In and Around the Study Area

Map 9 has been removed due to its Cultural Heritage sensitivity level.



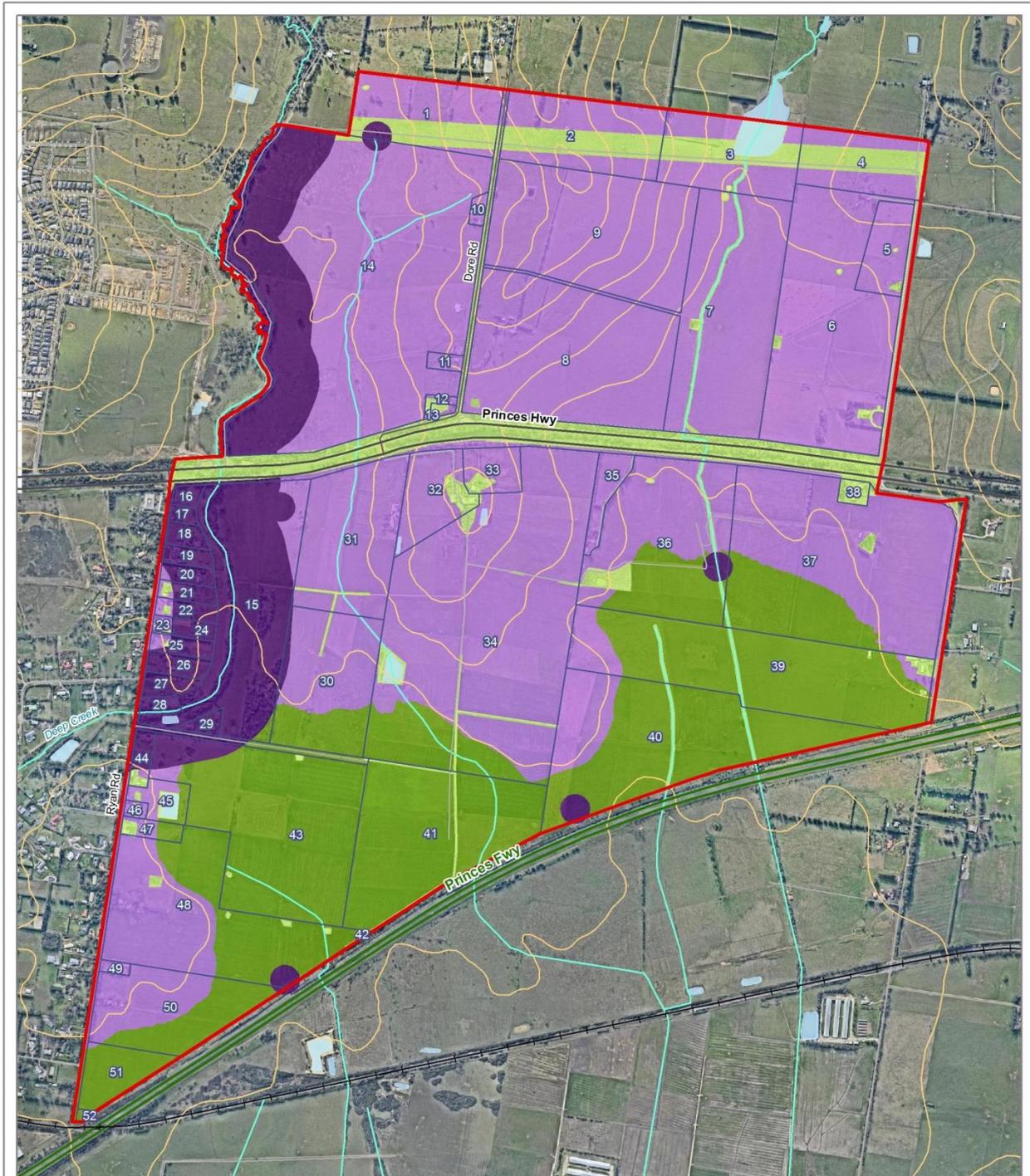
Map 10
Areas of Ground Disturbance
Aboriginal and Historical Heritage Assessment report for the Pakenham East PSP, Pakenham East

- Legend**
- Study Area
 - + Auger Probe location
 - Ground disturbance
 - Contour (10m)



Local Government: Cardinia Shire
25k Mapsheet: Nar Nar Goon 8021-4-4
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:17,000

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Map 11
Areas of Archaeological Likelihood
Aboriginal and Historical Heritage Assessment report for the Pakenham East PSP, Pakenham East

Legend

- Study Area
- PEP property boundaries
- Contour (10m)
- Minor Watercourse
- Permanent Waterbody

Areas of Likelihood

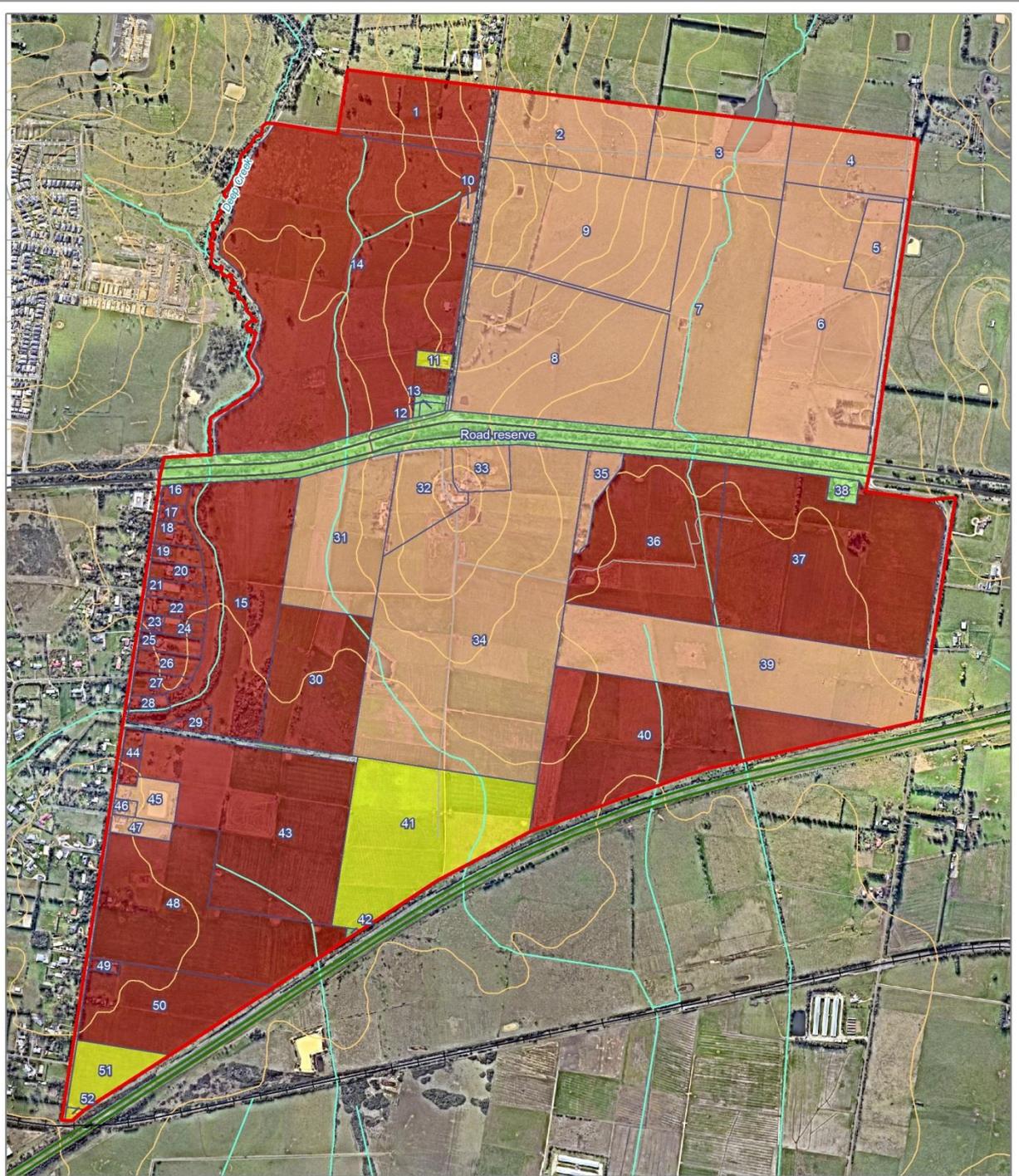
- High Likelihood (and mandatory CHMP)
- Moderate Likelihood
- Low Likelihood
- Unlikely

43 = PEP Property ID



Local Government: Cardinia Shire
25k Mapsheet: Nar Nar Goon 8021-4-4
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:17,000

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Map 12
Areas Recommended for CHMP
Aboriginal and Historical Heritage Assessment report for the Pakenham East PSP, Pakenham East

- Legend**
- Study Area
 - Contour (10m)
 - CHMP recommendations**
 - Mandatory CHMP
 - Voluntary CHMP
 - Inspection / Risk Assessment
 - No Further Investigation



Local Government: Cardinia Shire
25k Mapsheet: Nar Nar Goon 8021-4-4
Coordinate System: MGA Zone 55 (GDA94)
Map Scale: 1:17,000

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.

APPENDICES

Appendix 1: Heritage Legislation

A2.1 *Aboriginal Heritage Act 2006 (State)*

The *Aboriginal Heritage Act 2006* protects Aboriginal cultural heritage in Victoria. A key part of the legislation is that Cultural Heritage Management Plans (CHMPs) are required to be prepared by Sponsors (the developer) and qualified Heritage Advisors in accordance with the *Aboriginal Heritage Act 2006* and the accompanying *Aboriginal Heritage Regulations 2007*. A CHMP is the assessment of an area (known as an 'activity area') for Aboriginal cultural heritage values, the results of which form a report (the CHMP) which details the methodology of the assessment and sets out management recommendations and contingency measures to be undertaken before, during and after an activity (development) to manage and protect any Aboriginal cultural heritage present within the area examined.

The preparation of a CHMP is mandatory under the following circumstances:

- If the *Aboriginal Heritage Regulations 2007* require a CHMP to be prepared (s. 47);
- If the Minister of Aboriginal Affairs Victoria requires a CHMP to be prepared (s. 48); or
- If an Environmental Impact Statement (EIS) is required by the *Environment Effects Act 1978* (s. 49).

The *Aboriginal Heritage Regulations 2007* require a CHMP to be prepared:

- If all or part of the proposed activity is a 'high impact activity'; and
- If all or part of the activity area is an area of 'cultural heritage sensitivity'; and
- If all or part of the activity area has not been subject to 'significant ground disturbance'.

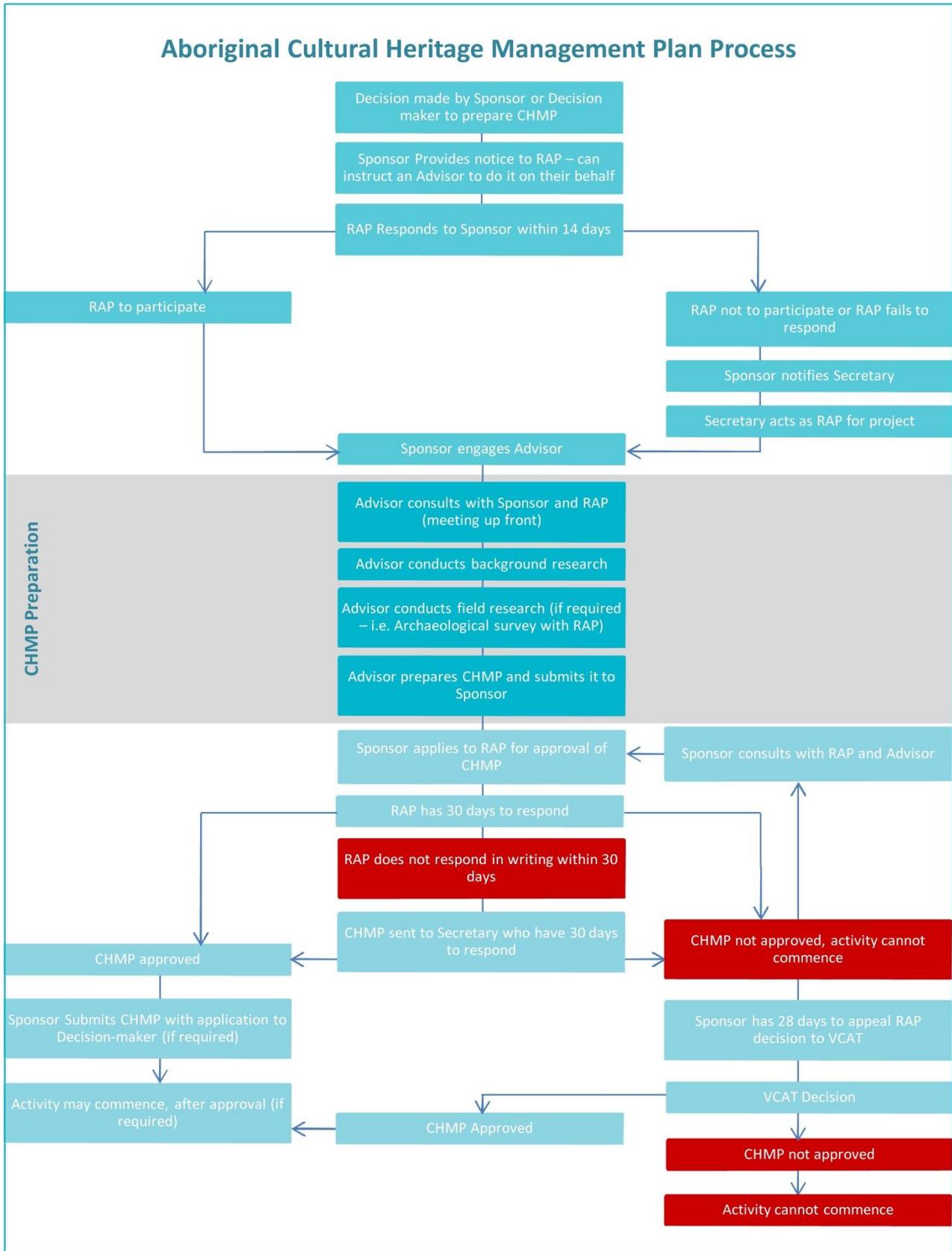
The preparation of a CHMP can also be undertaken voluntarily. Having an approved CHMP in place can reduce risk for a project during the construction phase by ensuring there are no substantial delays if sites happen to be found. Monitoring construction works is also rarely required if an approved CHMP is in place.

Approval of a CHMP is the responsibility of the Registered Aboriginal Party who evaluates the CHMP and then it is lodged with the Secretary of the Department of Planning and Community Development (DPCD) to take effect or, the Secretary of the DPCD (AV)⁵. They will be examining the CHMPs in detail with key points including:

- Addressing whether harm to heritage can be avoided or minimised;
- All assessments (including test excavations) must be completed before management decisions are formulated; and
- Survey and excavation must be in accordance with proper archaeological practice and supervised by a person appropriately qualified in archaeology.

⁵ In 2013, The DPCD was abolished and OAAV (now AV) was transferred to the Department of the Premier and Cabinet (DPC). However the wording within the Act still retains reference to the Secretary of DPCD.

There are three types of CHMPs that may be prepared (*The Guide to Preparing a CHMP 2010*). These are Desktop; Standard; and Complex Assessments.



A desktop CHMP is a literature review. If the results of the desktop show it is reasonably possible that Aboriginal cultural heritage could be present in the activity area, a standard assessment will be required.

A standard assessment involves a literature review and a ground survey of the activity area. Where the results of ground survey undertaken during a standard assessment have identified Aboriginal cultural heritage within the activity area, soil and sediment testing, using an auger no larger than 12 cm in diameter, may be used to assist in defining the nature and extent of the identified Aboriginal cultural heritage (Regulation 59[4]).

Where the results of ground survey undertaken during a standard assessment have identified Aboriginal cultural heritage within the activity area or areas which have the potential to contain Aboriginal cultural heritage subsurface, a complex assessment will be required. A complex assessment involves a literature review, a ground survey, and subsurface testing. Subsurface testing is the disturbance of all or part of the activity area or excavation of all or part of the activity area to uncover or discover evidence of Aboriginal cultural heritage (Regulation 62[1]).

It is strongly advised that for further information relating to heritage management (e.g. audits, stop orders, inspectors, forms, evaluation fees, status of RAPs and penalties for breaching the Act) Sponsors should access the AV website (<http://www.aboriginalaffairs.vic.gov.au/>).

The flow chart above also assists in explaining the process relating to CHMPs.

A2.2 Native Title Act 1993 (Commonwealth)

Native Title describes the rights and interests of Aboriginal and Torres Strait Islander people in land and waters, according to their traditional laws and customs. In Australia, Aboriginal and Torres Strait Islander people's rights and interests in land were recognised in 1992 when the High Court delivered its historic judgment in the case of *Mabo v the State of Queensland*. This decision overturned the legal fiction that Australia upon colonisation was terra nullius (land belonging to no-one). It recognised for the first time that Indigenous Australians may continue to hold native title.

Native Title rights may include the possession, use and occupation of traditional country. In some areas, native title may be a right of access to the area. It can also be the right for native title holders to participate in decisions about how others use their traditional land and waters. Although the content of native title is to be determined according to the traditional laws and customs of the title holders, there are some common characteristics. It may be possessed by a community, group, or individual depending on the content of the traditional laws and customs. It is inalienable (that is, it cannot be sold or transferred) other than by surrender to the Crown or pursuant to traditional laws and customs. Native Title is a legal right that can be protected, where appropriate, by legal action.

Native Title may exist in areas where it has not been extinguished (removed) by an act of government. It will apply to Crown land but not to freehold land. It may exist in areas such as:

- Vacant (or unallocated) Crown land;
- Forests and beaches;
- National parks and public reserves;

- Some types of pastoral leases;
- Land held by government agencies;
- Land held for Aboriginal communities;
- Any other public or Crown lands; and/or
- Oceans, seas, reefs, lakes, rivers, creeks, swamps and other waters that are not privately owned.

Native Title cannot take away anyone else's valid rights, including owning a home, holding a pastoral lease or having a mining lease. Where native title rights and the rights of another person conflict the rights of the other person always prevail. When the public has the right to access places such as parks, recreation reserves and beaches, this right cannot be taken away by Native Title. Native Title does not give Indigenous Australians the right to veto any project. It does mean, however, that everyone's rights and interests in land and waters have to be taken into account.

Indigenous people can apply to have their native title rights recognised by Australian law by filing a native title application (native title claim) with the Federal Court. Applications are required to pass a test to gain certain rights over the area covered in the application. The Native Title Tribunal (NNTT) was established to administer application processes. Once applications are registered, the NNTT will notify other people about the application and will invite them to become involved so all parties can try to reach an agreement that respects everyone's rights and interests. If the parties cannot agree, the NNTT refers the application to the Federal Court and the parties argue their cases before the Court.

As a common law right, native title may exist over areas of Crown land or waters, irrespective of whether there are any native title claims or determinations in the area. Native Title will therefore be a necessary consideration when Government is proposing or permitting any activity on or relating to Crown land that may affect native title⁶.

A2.3 *Planning and Environment Act 1987 (State)*

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 other overlay where appropriate). Places of Aboriginal cultural heritage significance are not often included on local government planning schemes.

A2.4 *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a national framework for the protection of heritage and the environment and the conservation of biodiversity. The EPBC Act is administered by the Australian Government Department of the Environment (DoE). The Australian Heritage Council assesses whether or not a nominated place is appropriate for listing on either the National or Commonwealth Heritage Lists and makes a recommendation to the Minister on that basis.

⁶ The information in this section was taken from the Department of Sustainability and Environment, Fact Sheet on Native Title, 2008

The Minister for the Environment, Water, Heritage and the Arts makes the final decision on listing. DSEWPac also administers the Register of the National Estate.

The objectives of the EPBC Act are:

- To provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance;
- To promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources;
- To promote the conservation of biodiversity;
- To provide for the protection and conservation of heritage;
- To promote a cooperative approach to the protection and management of the environment involving governments, the community, land-holders and indigenous peoples;
- To assist in the cooperative implementation of Australia's international environmental responsibilities;
- To recognise the role of indigenous people in the conservation and ecologically sustainable use of Australia's biodiversity; and
- To promote the use of indigenous peoples' knowledge of biodiversity with the involvement of, and in cooperation with, the owners of the knowledge.

A2.5 Coroners Act 2008 (State)

The Victorian *Coroners Act 2008* requires the reporting of certain deaths and the investigation of certain deaths and fires in Victoria by coroners to contribute to the reduction of preventable deaths. Of most relevance to heritage is the requirement for any “reportable death” to be reported to the police (s. 12[1]). The *Coroners Act 2008* requires that the discovery of human remains in Victoria (s. 4[1]) of a person whose identity is unknown (s. 4[g]) must be reported to the police.

Appendix 2: Significance Assessment

A4.1 The ICOMOS Burra Charter

The standard for determining significance of places is derived from an international formula developed by ICOMOS (International Council on Monuments and Sites). In Australia, the Burra Charter has been developed by ICOMOS which is a Charter for the Conservation of Cultural Significance (Australia ICOMOS 1999).

The Burra Charter defines cultural significance as “aesthetic, historic, scientific, social or spiritual value for past, present or future generations” (Australia ICOMOS 1999: Section 1.2). Cultural significance is a concept which helps in estimating the value of places. The Burra Charter Cultural Significance Guidelines definitions of the values implicit in assessing cultural significance are as follows (Australia ICOMOS 1999):

Aesthetic value: Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with its place and use.

Historic value: historic value encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all the terms set out in this section.

A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives *in situ*, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.

Scientific value: The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information.

Social value: Social value embraces the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group.

National Historic Themes

It is noted that when assessing historic values that the use of historic themes is of benefit. Historic themes are used by heritage professionals to assist in understanding the meanings and connections that historic places may have in addition to the physical fabric of a place. Themes can help explain how particular elements of a place are significant because of their ability to illustrate important aspects of its history (Australian Heritage Commission 2001). The nine theme groups that are most commonly used nationally are:

Theme 1	Tracing the evolution of the Australian environment
Theme 2	Peopling Australia
Theme 3	Developing Local, Regional and National economies
Theme 4	Building settlements, towns and cities
Theme 5	Working

Theme 6	Educating
Theme 7	Governing
Theme 8	Developing Australia's cultural life
Theme 9	Marking the phases of life

These theme groups are further expanded into more focussed sub-themes which will not be expanded on here. The themes are intended to be non-hierarchical and a historic place may have a number of themes, which reflects how we look at the past, allowing for an integrated, diverse and complex human experience (Australian Heritage Commission 2001).

A4.2 The *Heritage Act 1995* Criteria

The *Heritage Act 1995* defines eight criteria against which cultural heritage significance can be assessed. These criteria are used to assist in determining whether places of potential State significance should be included in the Heritage Register. They are as follows:

Criterion A	The historical importance, association with or relationship to Victoria's history;
Criterion B	Good design or aesthetic characteristics;
Criterion C	Scientific or technical innovations or achievements;
Criterion D	Social or cultural associations
Criterion E	Potential to educate, illustrate or provide further scientific investigation in relation to Victoria's cultural heritage;
Criterion F	Importance in exhibiting a richness, diversity or unusual integration of features;
Criterion G	Rarity or uniqueness of a place or object; and
Criterion H	The representative nature of a place or object as part of a class or type of places or objects.

In addition it is appropriate when assessing the significance of a site in Victoria to consider whether it is of Local, Regional or State (or potentially National) significance.

A4.3 Scientific Significance

Scientific significance of a heritage place (particularly archaeological sites) is also assessed in Victoria using a commonly accepted formula developed by Bowdler (1981) and Sullivan and Bowdler (1984). These are relative estimates of significance based on the current knowledge available about sites or places in a region. The assessment uses three criteria; site contents, site condition and representativeness.

Site Contents Rating

- 1 No cultural materials remaining.
- 2 Site contains a small number (e.g. 0-10 artefacts) or limited range of cultural materials with no evident stratification.

- 3 Site contains:
 - a. A larger number, but limited range of cultural materials; and/or
 - b. Some intact stratified deposit.
- 4 Site contains:
 - a. A large number and diverse range of cultural materials: and/or
 - b. Largely intact stratified deposit; and/or
 - c. Surface spatial patterning of cultural materials that still reflect the way in which the cultural materials were laid down.

Site Condition Rating

- 0 Site destroyed.
- 1 Site in a deteriorated condition with a high degree of disturbance but with some cultural materials remaining.
- 2 Site in a fair to good condition, but with some disturbance.
- 3 Site in an excellent condition with little or no disturbance. For surface artefact scatters this may mean that the spatial patterning of cultural material still reflects the way in which the cultural materials were laid.

Representativeness

Representativeness refers to the regional distribution of a site type. It is assessed on whether the site type is common, occasional or rare within a given region. Current knowledge on the number of and distribution of archaeological sites in a region can change according depending on the extent of previous archaeological investigation.

The assessment of representativeness also takes into account the contents and condition of a particular site. An example is that in any region, there may be a limited number of sites of a particular type, which have been subject to minimal disturbance. These sorts of undisturbed sites (containing *in situ* deposits) would therefore be given a high significance rating for representativeness.

The **representativeness ratings** used for archaeological sites are:

- 1 Common occurrence
- 2 Occasional occurrence
- 3 Rare occurrence

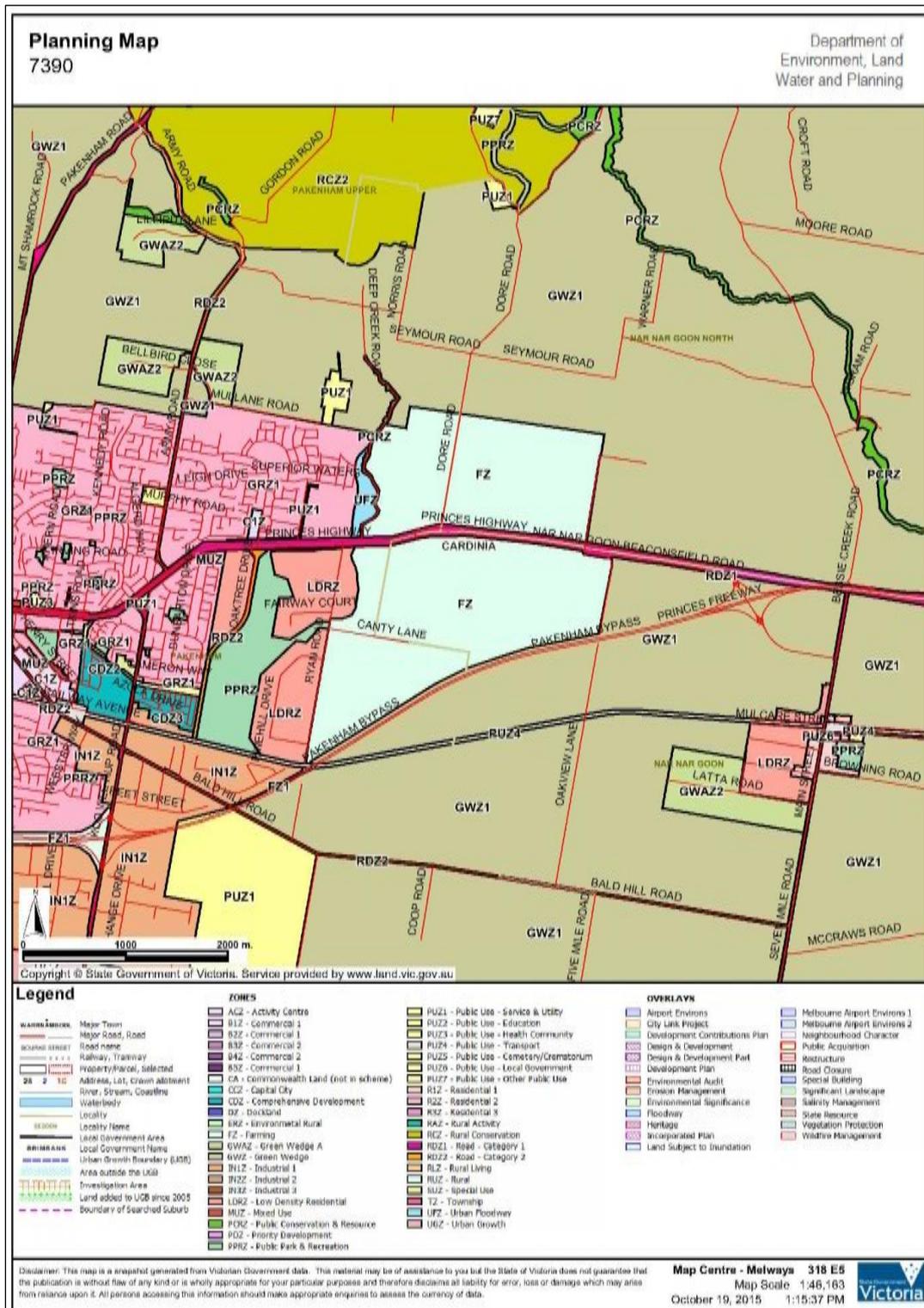
Overall Scientific Significance Rating

An overall scientific significance rating is assigned to the site based on a cumulative score from the assessment. This results in one of the following ratings being assigned for scientific significance:

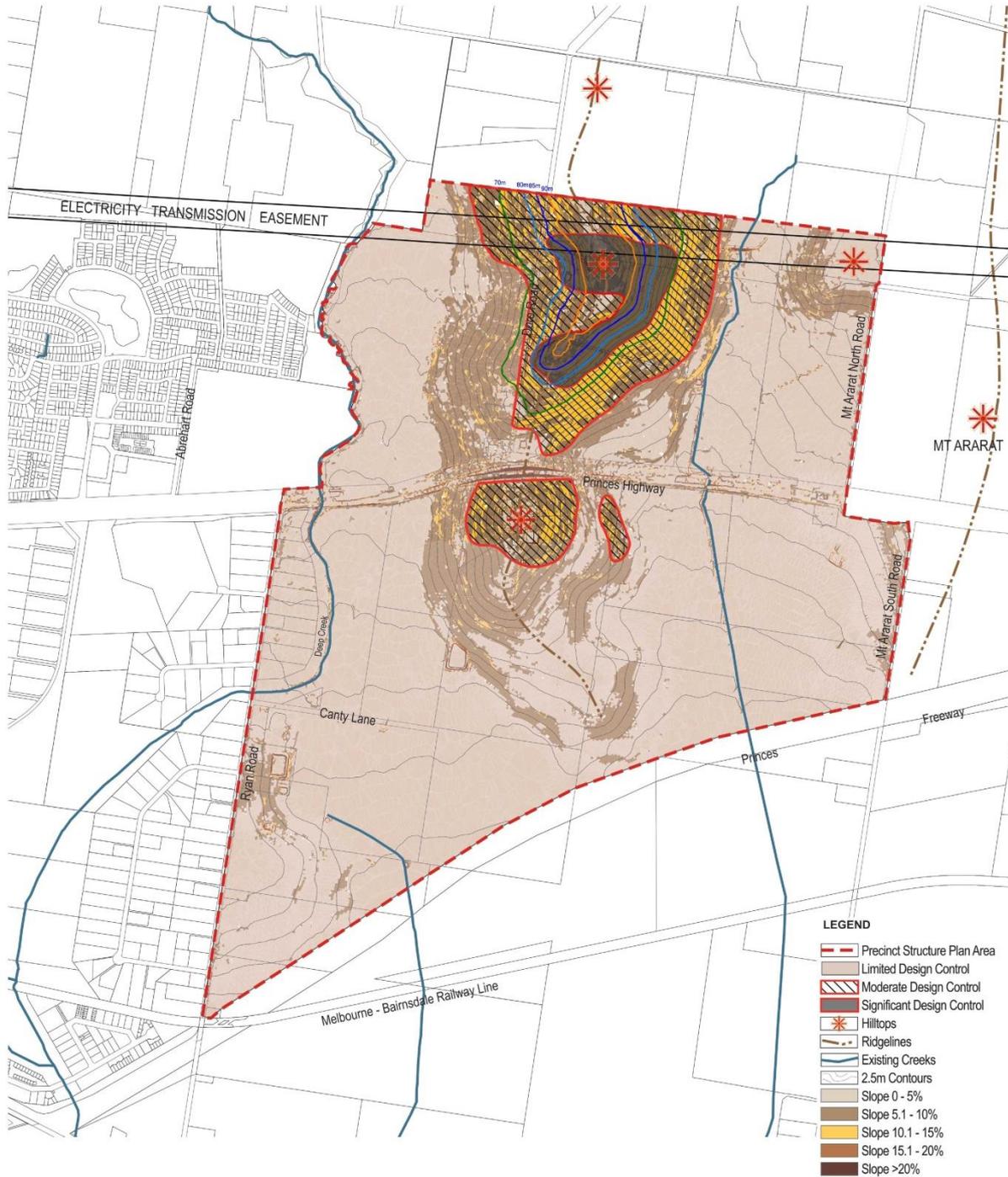
- 1-3 Low
- 4-6 Moderate
- 7-9 High

Appendix 3: Council Zoning Requirements

Zoning Map



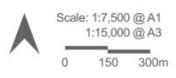
Appendix 4: Slope Analysis and Design Control Areas Plan



Slope Analysis: Design Control Areas
Pakenham East Precinct Structure Plan



Revision	Date	Description	Checked
D	14/06/13	Graphic changes	LS / 14/06/13
D	15/07/13	Graphic changes	LS / 15/07/13



ref.: 3410908U
date: 15 June 2013
rev.: E
drawn: RL/DS
checked: LS

please note:
This plan is based on preliminary information only and may be subject to change as a result of formal Council/Authority advice, detailed site investigations and confirmation by survey

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Appendix 5: 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 <i>legislated areas of cultural heritage sensitivity</i> and areas considered by an archaeologist to be sensitive.
Aboriginal Place	An Aboriginal cultural heritage site registered on the <i>VAHR</i> , cf. <i>Aboriginal Site</i> .
Aboriginal Site	A location containing Aboriginal cultural heritage, e.g. <i>Artefact scatter, isolated artefact, scarred tree, shell midden</i> , whether or not the site is registered in the <i>VAHR</i> , cf. <i>Aboriginal Place</i> .
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 <i>Aboriginal Heritage Regulations 2007</i> .
Artefact Scatter	Stone artefact scatters consist of more than one stone artefact. Activities associated with this site type include stone tool production, hunting and gathering or domestic sites 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.
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 sites with a connection to country and are opposed to disturbance of burials or their associated sites. General considerations for the presence of burial sites 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 sites such as oven mounds, <i>shell middens</i> or <i>artefact scatters</i> .
Chert	A cryptocrystalline siliceous sedimentary stone.
CHMP	Cultural Heritage Management Plan . A plan prepared under the <i>Aboriginal Heritage Act 2006</i> .
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).

Acronym	Description
Deep Ripping	The ploughing of soil using a ripper or subsoil cultivation tool to a depth of 60 cm or more (see <i>significant ground disturbance</i>).
DEPI	Department of Environment and Primary Industries. The Victorian State Government department responsible for management of natural heritage in Victoria.
DoE	Department of the Environment. The Commonwealth Government department responsible for management of heritage sites on the World, National or Commonwealth Heritage lists.
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.
DTPLI	Department of Transport, Planning and Local Infrastructure. The Victorian State Government department, of which HV is a part, responsible for management of historical heritage in Victoria.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
Fabric (Heritage)	Any physical element, feature, material or finish that is associated with the heritage values in all or part of a structure, place, object, feature or site. The original heritage fabric is any such physical element that was an integral part of the original heritage site.
Feature (Archaeological)	A collection of one or more contexts representing some human non-portable activity that generally has a vertical characteristic to it in relation to site stratigraphy.
Flake	An artefact which has technologically diagnostic features and a ventral surface.
High Impact Activity	An activity specified as a high impact activity in Division 5 of Part 2 of the <i>Aboriginal Heritage Regulations 2007</i> .
Heritage Place	A <i>registered</i> historical site listed on a heritage planning instrument that affords statutory protection to the site.
Heritage Values	The values of a heritage site that relate to its historical, social, cultural, spiritual, architectural, archaeological or technological significance.
Historical Heritage Likelihood	An area assessed by a Heritage Advisor as having potential for containing either surface or subsurface historical archaeological deposits or fabric.
Historical Site	An historical site, whether or not recorded in the <i>VHR, VHI</i> or other historical site database (cf. <i>Heritage Place</i>).
HHA	Historical Heritage Assessment. An assessment of the historical heritage values of a defined study area by a qualified heritage consultant.
HO	Heritage Overlay. A list of Heritage Places of local significance with statutory protection under a local government planning scheme.
HV	Heritage Victoria. A division of <i>DTPLI</i> 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 site type can also be indicative of further subsurface archaeological deposits. These site 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 sites.
LDAD	Low Density Artefact Distribution. A category of <i>Aboriginal Place</i> type in the <i>VAHR</i> 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 site.

Acronym	Description
MHA	Maritime Heritage Assessment. An assessment of the maritime heritage values of a defined study area by a qualified heritage consultant.
MPA	Metropolitan Planning Authority. Agency responsible for planning and coordinating infrastructure development in Melbourne's growth areas: Casey, Cardinia, Hume, Melton, Mitchell, Whittlesea and Wyndham.
NHL	National Heritage List. A register of heritage places, under the EPBC Act, of heritage places of national significance.
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).
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).
Procurement	The process of obtaining raw material for reduction.
PSP	Precinct Structure Plan. A master plan to guide development in a specified section of one of Melbourne's growth areas (cf. <i>MPA</i>).
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 site 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 <i>Aboriginal Heritage Act 2006</i> .
Raw Material	The kind of stone the artefacts were manufactured from.
Reduction	The process of removing stone flakes from another piece of stone. Generally this is performed by striking (hard hammer percussion) one rock with another to remove a flake.
Registered Cultural Heritage Place	An Aboriginal site recorded in the <i>VAHR</i> , cf. <i>Aboriginal site</i> .
Retouch	Retouch is when a <i>flake</i> 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.
RNE	Register of the National Estate. A commonwealth-managed register of heritage assets; as of 2012 the RNE no longer provides statutory protection to heritage places.
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.

Acronym	Description
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 & Butler 1964; Mandeville and Flenniken 1974; Purdy 1974; Domanski and Webb 1992; Hiscock 1993; Domanski <i>et al.</i> 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).
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 site 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 cultural heritage 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.
WHL	World Heritage List . A register of heritage places, under the EPBC Act, of heritage places of international significance.

Appendix 6: Bunurong Land Council Comments



April 12, 2017

Marcelle Bell
Growth Area Strategic Planner
Cardinia Shire Council

A RESPONSE TO Pakenham East Precinct Structure Plan, Aboriginal and Historical Heritage Assessment.

Dear Marcelle,

The BLCAC appreciate the invitation to review this document. We have taken the opportunity to do so and would like to make the following comments in response.

We would like to start by suggesting that Map 11 (page 71) titled 'Areas of Archaeological likelihood' should be used as a low resolution starting point only. It is not something to be relied upon exclusively. Map 12 appears that about 50% of the area is void of the need for a mandatory CHMP. This is problematic and will result in harm to Aboriginal sites that exist within the 50% deemed void of the need for a more comprehensive assessment. Our archaeology will almost certainly be patterned all over this activity area.

The contours on map 11 show a ridge extending from the north, through the Activity Area, to the south. This entire landform is sensitive. Every development within this landform has a fair likelihood of harming Aboriginal cultural heritage. In wet periods, this is where people will be within this space, with tributaries on either side. In dry periods they will be closer to Deep Creek as the map 11 suggests, but not exclusively. Some of this area is voluntary only; if individuals choose not to do a voluntary CHMP this will result in harm to Aboriginal sites that exist within the space.

PSPs like this should do a CHMP over the entire area that includes a complex assessment, before allowing any further development, though we understand that would be very difficult given how things currently work. The way the process is at the moment means that many sites will be harmed by development without any investigation required whatsoever. Our cultural heritage seems to be put at risk to accommodate this process and allow it to continue the way it is. It would be nice to think that in time, the process may begin to flex to better accommodate our cultural heritage values.

We agree with and support Recommendation 1: Mandatory Cultural Heritage Management Plans.

To avoid the scenario of CHMPs essentially being written off as Desktop Assessments (no field investigation) we strongly endorse the advice that CHMPs will include an archaeological survey and subsurface testing program to establish the nature, extent and significance of all Aboriginal cultural heritage in the study area (in accordance with r.60 and r.61 of the Aboriginal Heritage Regulations 2007).

Furthermore, we strongly echo the recommendation that this must include consultation with the relevant Traditional Owners. As the relevant Traditional Owner community, the BLCAC consider appropriate consultation a cultural and ethical requirement. Allowing us to participate in the management of our own cultural heritage is considered a relevant human right.

As hard as it is to believe, (particularly following the introduction of the Aboriginal Heritage Act 2006), many Heritage Advisors do not provide appropriate consultation, and many CHMPs are still approved without having fulfilled this vital component. As a guide, the minimum requirement BLCAC expect, include an inception meeting *prior* to fieldwork (particularly for Medium or Large CHMPs) and field representation for each day of fieldwork.

We agree with and support Recommendation 2: Voluntary Cultural Heritage Management Plans.

While the proponent is not legally required by the Aboriginal Heritage Act 2006 and the Aboriginal Heritage Regulations 2007 to prepare a mandatory CHMP in these areas, there is a risk that any future development of the study area may impact potential Aboriginal archaeological sites. Whether mandatory or voluntary a CHMP would provide an appropriate legal and cultural framework to determine the extent of any sites, provide appropriate management recommendations and mitigate risk to the Sponsor.

In relation to Recommendation 3: Inspection and Risk Assessment, we agree with the general advice offered in that effective risk management should be implemented to avoid any damage to Aboriginal places that may exist in these areas. We would prefer that the recommendation be a Voluntary CHMP. We believe this to be the more appropriate framework and most acceptable avenue. As mentioned above this is the most suitable legal and cultural framework to identify and appropriately manage any Aboriginal cultural heritage. Also, as stated in this report, preparing a CHMP is good risk management.

In relation to Recommendation 4, Open Spaces and Parkland, we believe at face value the advice is sound. The recommendation essentially states that all attempts should be made to avoid impacts to Open Spaces and Parkland in sensitive areas. This is certainly in line with the first listed Objective of the Aboriginal Heritage Act which is to recognise, protect and conserve Aboriginal cultural heritage in Victoria.

The Recommendation could perhaps allow for amendments to planning and results of future CHMPs with appropriate contingencies/responses. Allowances for open spaces and parklands in this area is very important however plans are amended, activities do change.

We would certainly agree with and support Recommendation 5: (Contingency for Aboriginal Heritage) if one small adjustment could be made. The recommendation essentially states that if unexpected Aboriginal cultural heritage issues are encountered that a Heritage Advisor or AV should be contacted.

If unexpected Aboriginal cultural heritage issues are encountered the relevant Traditional Owners (BLCAC) should also be contacted.

While a Heritage Advisor may involve relevant Traditional Owners in these circumstances, it can't always be guaranteed. We believe that a more appropriate recommendation would include BLCAC among those to be contacted if unexpected Aboriginal cultural heritage issues are encountered.

Recommendation 6, relates specifically to Contingency for Historical Heritage. As such we would generally not feel obliged to comment on areas specifically covered by the Heritage Act 1995. However, Historical Aboriginal Places such as contact sites may be identified within the PSP area. Should this occur, appropriate consultation with the BLCAC would be expected.

The study area is bounded to the north by agricultural land, to the east by Mount Ararat Road and to the west by Deep Creek Road. The capacity to undertake appropriate management of Aboriginal cultural heritage is exciting. The potential, not unlike like the size of the study area, at over 630 hectares, is considerable.

We are excited by the opportunities the future holds in regard to the management of Aboriginal cultural heritage within the area defined by the Pakenham East Precinct Structure Plan. This document provides a welcome introduction to that process.

Additionally, it would be useful to list the size in hectares of each separate Activity Area (Property ID) listed in Table 5. This would be useful to have a gauge on the size of each of the individual areas and for the future purpose of size (r 68 Definitions).

The report occasionally uses the terms Cultural Heritage Advisor and OAAV. In line with recent changes these should be Heritage Advisor and AV.

Please note incorrect spelling of Management (Managmnet) on page vii.

The first listed purpose of the Aboriginal Heritage Act 2006 (1(a)) is "to provide for the protection of Aboriginal cultural heritage". We hope that this is projected through this document to all future readers.

Thank you for the opportunity to review the Draft Report of the Pakenham East Precinct Structure Plan Aboriginal and Historical Heritage Assessment. We hope the feedback helps.

Kind regards,



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