Draft Report

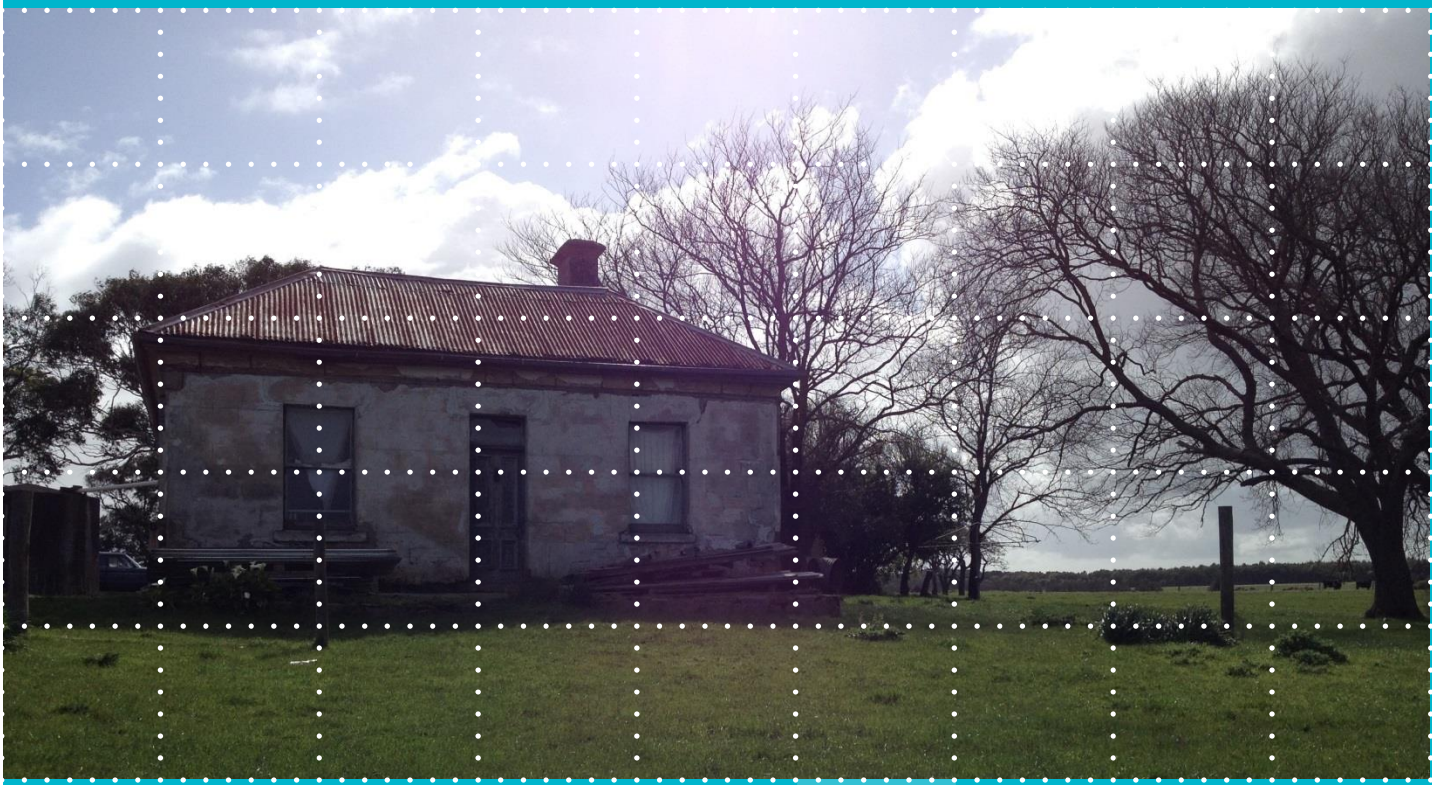
Aberline to Horne Growth Corridor, Warrnambool, Victoria: Aboriginal and Historical Heritage Assessment

HV Number: 4865

Client

Warrnambool City Council

19 March 2018



Ecology and Heritage Partners Pty Ltd

Authors

Rick Bullers and Austen Graham

MELBOURNE: 292 Mt Alexander Road, Ascot Vale VIC 3032 GEELONG: 230 Latrobe Terrace, Geelong West VIC 3218
BRISBANE: Level 22, 127 Creek Street, Brisbane QLD 4000 ADELAIDE: 22 Greenhill Road, Wayville SA 5034
CANBERRA: PO Box 6067, O'Connor ACT 2602 SYDNEY: Level 5, 616 Harris Street, Ultimo, NSW, 2007
www.ehpartners.com.au | (03) 9377 0100

ACKNOWLEDGEMENTS

We thank the following people and organisations for their contribution to the project:

- Warrnambool City Council for project and site information.
- The Eastern Maar Aboriginal Corporation for assistance in the field and cultural heritage information.
- The Gunditj Mirring Traditional Owners Aboriginal Corporation for assistance in the field and cultural heritage information.
- Aboriginal Victoria for information regarding Aboriginal Places.
- Heritage Victoria for information regarding historical heritage places.

Cover Photo: 174 Aberline Road, Warrnambool, sandstone residence, facing north-east.

(Photo by Ecology and Heritage Partners Pty Ltd)

DOCUMENT CONTROL

Activity	Aberline to Horne Growth Corridor
Address	Aberline Road to Horne Road, Warrnambool
Project number	9643
Project manager	Rick Bullers and Austen Graham
Report author(s)	Rick Bullers and Austen Graham
Report reviewers	Oona Nicolson and Annie Ayres
Other EHP staff	Joshua Flynn
Mapping	Monique Elsley
File name	9643_EHP_AberlineGrowthCorridor-Warrnambool_AHHA_Finalv1_AG_19032018
Client	Warrnambool City Council
T/O Groups	Eastern Maar Aboriginal Corporation and Gunditj Mirring Traditional Owners Aboriginal Corporation
Bioregion	Warrnambool Plain (VIC)
CMA	Corangamite
Council	Warrnambool City Council

Report versions	Comments	Comments updated by	Date submitted
Draft v1	Draft for QA Review	Annie Ayres	24.11.2017
Draft v2	Draft to Client for Comment	Austen Graham	30.11.2017
Final v1	Final Report	Austen Graham	19.03.2018

Protocols for Handling Sensitive Information

Some of the information contained within this Aboriginal and Historical Heritage Assessment (AHHA) is culturally sensitive. Before releasing the contents of this AHHA to the public, permission should be sought from the relevant authorities and communities.

Disclaimer

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

ABBREVIATIONS

Acronym	Description
Act, the	*Aboriginal Heritage Act 2006*
AHHA	Aboriginal and Historical Heritage Assessment
AV	Aboriginal Victoria
CHL	Commonwealth Heritage List
CHMP	Cultural Heritage Management Plan
CHP	Cultural Heritage Permit
CMA	Catchment Management Authority
DBH	Diameter at Breast Height
DELWP	Department of Environment Land Water and Planning (Victoria)
DoEE	Department of the Environment and Energy (Commonwealth)
DPC	Department of the Premier and Cabinet (Victoria)
EES	Environment Effects Statement
EMAC	Eastern Maar Aboriginal Corporation
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EVC	Ecological Vegetation Class
GMTOAC	Gunditj Mirring Traditional Owners Aboriginal Corporation
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
AV	Aboriginal Victoria
PMST	Protected Matters Search Tool
PSP	Precinct Structure Plan
RAP	Registered Aboriginal Party
RNE	Register of the National Estate
Regulations, the	*Aboriginal Heritage Regulations 2007*
SGD	Significant Ground Disturbance
SLV	State Library of Victoria
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

EXECUTIVE SUMMARY

Introduction

Ecology and Heritage Partners Pty Ltd was commissioned by Warrnambool City Council to prepare a desktop Aboriginal and Historical Heritage Assessment (AHHA) for the proposed Aberline to Horne Growth Corridor in Warrnambool, Victoria (Warrnambool City Council) (Map 1).

The Activity

Warrnambool City Council is preparing a Structure Plan for the Aberline to Horne Growth Corridor. The future growth area encompasses approximately 360 ha of land located approximately 4 km north east of Warrnambool Central Business District (CBD). Council has identified the site as a significant growth area with the potential to support population growth and provide increased diversity of housing stock.

The subject site is bisected by an identified area of Aboriginal cultural heritage sensitivity, being the land within 200 m of Russells Creek (under the *Aboriginal Heritage Regulations 2007*). Should future developments be regarded as high impact activity by the *Aboriginal Heritage Regulations*, such as multi-lot subdivision and residential development, a Cultural Heritage Management Plan will be required in particular areas of the subject site. Additionally, Warrnambool City Council has identified the presence of potential post-Contact and European historical heritage sites within the subject area. Prior to development commencing, an assessment of the nature, extent and significance of potential historical heritage sites and consultation with Heritage Victoria is required.

The Study Area

The study area is approximately 360 ha in size and is bounded west by Aberline Road and Gateway Road, east by Horne Road, south by Boiling Down Road and north by Wangoom Road (Map 2). The northern, southern and eastern borders are bounded by rural properties, whilst the south-western and western borders are bounded by residential housing estates. The study area comprises of rural properties, Tozer Memorial Reserve in the mid-northern section and Warrnambool water storage facility (Wannon Water) in the south.

Methods

The assessments undertaken as part of this AHHA were a desktop assessment and a field survey. 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 and historical cultural heritage occurring in the study area.

The field survey consisted of a ground surface survey of the study area by qualified archaeologists, in conjunction with representatives of the Registered Aboriginal Party (RAP), 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).

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

Results

Desktop Assessment

The Aboriginal Heritage desktop assessment identified 47 previously registered Aboriginal places within 5 km of the study area (Map 8). The desktop assessment also indicated that there have been 16 historical heritage places previously recorded within 2 km of the study area (Map 9). No previously registered Aboriginal sites and no previously registered historical places were located in the study area. The desktop assessment concluded that shell middens and artefact scatters were the types of Aboriginal Places and built domestic (built heritage) sites were the types of historical heritage places most likely to occur within the study area.

Field Survey

The field survey was undertaken on 19-20 September 2017 by Austen Graham (Archaeologist) and Joshua Flynn (Archaeologist/ Heritage Advisor), with Caleb Clarke representing the Eastern Maar Aboriginal Corporation (EMAC) and Keicha Day representing the Gunditj Mirring Traditional Owners Aboriginal Corporation (GMTOAC). The area surveyed was 35.6 ha (9.9%), the surface visibility was approximately 12% (43.2 ha) with the resulting total effective coverage estimated at 1.2% (4.32 ha).

The survey identified four primary landforms; slopes, undulating plains, creek terrace and a crest. Nine areas were identified as having previous ground disturbance, meeting the definition of significant ground disturbance (SGD) as per the *Regulations* (r.4) (Map 10). Four of these areas of SGD are found within an area of Aboriginal cultural heritage sensitivity and high archaeological likelihood.

Aboriginal Cultural Heritage

Areas of archaeological likelihood were identified and classified as having high, moderate or low likelihood (Map 11). One area of high likelihood was identified along Russells Creek. The remainder of the study area was determined to be of low likelihood, with the exception of the crest landform, identified as having moderate likelihood.

No Aboriginal cultural heritage was identified in the study area.

Historical Heritage

No historical heritage places were located in the study area.

Two sites within the study area had potential to be historical heritage sites; 174 Aberline Road, Warrnambool (Sandstone residence and associated sandstone building) and 78 Boiling Down Road Warrnambool. Site cards for each of these sites were submitted to Heritage Victoria (HV). HV responded that these sites would not be listed the Victorian Heritage Inventory (VHI) as they did not meet the threshold for registration.

The below table shows the location and site type of the above sites;

Table 1: Location and Site Type of Historical Heritage Non-registrations

Site Name	Site Type	Location	Site Identified During:	Site card submitted to HV?	Registered as historical sites through HV?
174 Aberline Road, Warrnambool	Built: Domestic	174 Aberline Road, Warrnambool	Field Survey	YES	NO
78 Boiling Down Road, Warrnambool	Built: Agricultural	78 Boiling Down Road, Warrnambool	Field Survey	YES	NO

Summary of Management Recommendations

Aboriginal Cultural Heritage

Recommendation 1: Mandatory Cultural Heritage Management Plans

In properties where areas of Aboriginal cultural heritage sensitivity (as identified by *Aboriginal Heritage Regulations 2007*) are present (Map 11 and Table 12) and a high impact activity will take place, a mandatory CHMP must be undertaken. The CHMP will include an archaeological survey (standard assessment) and subsurface testing program (complex assessment) 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 *high and moderate* 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.

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 an area of *moderate* archaeological likelihood is present (Map 11 and Table 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* archaeological likelihood outside of the voluntary and mandatory CHMP areas, it is recommended that a detailed inspection and risk assessment be undertaken. 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: 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.

Historical Heritage

Recommendation 5: No Requirement for Further Archaeological Investigation

As there are no known historical heritage sites or areas considered to have historical heritage likelihood there is no requirement for any further historical heritage investigations.

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 Cultural Heritage Advisor (or Heritage Victoria) should be contacted to investigate.

Table 2: Summary of Management Recommendations

Council Property Identification Number (PIN)	Property ID (Parcel SPI)	Aboriginal Heritage		Historical Heritage
		CHMP Required	Site Inspection and Risk Assessment Recommended	Further Consultation with Heritage Victoria and/or Council Required
1	1\PS311792		✓	
2	2\PS311792		✓	
3	1\PS710426		✓	
4	1\TP222898	✓		
	2\TP222898	✓		
	1\PS724360	✓		
	2\PS724360		✓	
	1\PS724373	✓		
5	3\PS311792	✓		
6	1\TP398817	✓		
7	2\PS710426	✓		
	1\TP244571		✓	
	2\TP244571		✓	
8	1\TP808681	✓		
9	1\PS510707		✓	
10	2\PS510707	✓		
11	1\PS406836	✓		
12	2\PS406836	✓		
13	2017\PP3729		✓	
	2018\PP3729		✓	
14	2\LP116579	✓		

Council Property Identification Number (PIN)	Property ID (Parcel SPI)	Aboriginal Heritage		Historical Heritage
		CHMP Required	Site Inspection and Risk Assessment Recommended	Further Consultation with Heritage Victoria and/or Council Required
15	1\LP116579		✓	
16	6~E\PP3729	✓		
17	5~E\PP3729	✓		
18	3\PS433295		✓	
19	1\TP21740		✓	
20	2\TP21740		✓	
21	1\PS431510		✓	
22	2\PS431510		✓	
23	1\PS719899		✓	
24	4\PS433295		✓	
25	1\TP16129		✓	
	1\TP883382		✓	

CONTENTS

Appendices

Tables

Figures

Plates

Maps

1 INTRODUCTION

1.1 Background and Scope of Works

Ecology and Heritage Partners Pty Ltd was commissioned by Warrnambool City Council to prepare an Aboriginal and Historical Heritage Assessment (AHHA) for the proposed Aberline to Horne Growth Corridor in Warrnambool, Victoria (Warrnambool City Council) (Map 1).

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

- Review the relevant heritage databases (e.g. Victorian Aboriginal Heritage Register [VAHR] at the 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 assessment 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, the Registered Aboriginal Party (RAP) applicants, the Eastern Maar Aboriginal Corporation and the Gunditj Mirring Traditional Owners Aboriginal Corporation, local government, AV and HV; and
- Production of an AHHA report.

1.2 Location and Extent of Study Area

The study area is approximately 360 ha in size and is bounded west by Aberline Road and Gateway Road, east by Horne Road, south by Boiling Down Road and north by Wangoom Road (Map 2). The northern, southern and eastern borders are bounded by rural properties, whilst the south-western and western borders are bounded by residential housing estates. The study area comprises of rural properties, Tozer Memorial Reserve in the mid-northern section and Warrnambool water storage facility (Wannon Water) in the south. The study area is located in the Parish of Wangoom in the County of Villiers. The cadastral details of the study area are shown in Table 1. For ease of reference, Council has allocated Property Identifier

Numbers (PINs) to all land parcels in the study area. These numbers will be used for the remainder of this report when referring to specific properties. The PINs are shown in Table 3, Figure 1 and Map 3.

Table 3: Cadastral Details of the Study Area

Council Property Identifier	Lot	Title Plan	Address	Size (ha)
1	1	PS311792	220 Wangoom Road, Warrnambool	1.2
2	2	PS311792	222 Wangoom Road, Warrnambool	1.2
3	1	PS710426	286 Wangoom Road, Warrnambool	0.4
4	1	TP222898	174 Aberline Road, Warrnambool	34.7
	2			
	1	PS724360	80 Aberline Road, Warrnambool	
	2			
5	3	PS311792	250 Wangoom Road, Warrnambool	44.1
6	1	TP398817	256 Wangoom Road, Warrnambool	19.6
7	2	PS710426	270-288 Wangoom Road, Warrnambool	50.6
	1	TP244571		
	1	TP244571		
8	1	TP808681	235 Horne Road, Warrnambool	27.5
9	1	PS510707	310 Horne Road, Warrnambool	1.5
10	2	PS510707	246 Horne Road, Warrnambool	14.5
11	1 (Pt)	PS406836	214 Horne Road, Warrnambool	16.7
12	2 (Pt)	PS406836	214 Horne Road, Warrnambool	16.0
13	2017	PP3729	43 Boiling Down Road, Warrnambool	1.9
	2018			
14	2	LP116579	75 Boiling Down Road, Warrnambool	22.0
15	1	LP116579	79 Boiling Down Road, Warrnambool	1.9
16	6	TP304260	105 Boiling Down Road, Warrnambool	23.8
17	5	TP304307	135 Boiling Down Road, Warrnambool	20.6
18	3	PS433295	70 Boiling Down Road, Warrnambool	0.8
	4	PS433295	78 Boiling Down Road, Warrnambool	6.2
19	1	TP21740	94 Boiling Down Road, Warrnambool	5.9
20	2	TP21740	110 Boiling Down Road, Warrnambool	2.8
21	1	PS431510	124 Boiling Down Road, Warrnambool	2.0
22	2	PS431510	140 Boiling Down Road, Warrnambool	5.9
23	1	PS719899	48 Boiling Down Road, Warrnambool	14.1
24	1	TP16129	83-119 Dales Road, Warrnambool	6.1
25	1	TP883382	81 Horne Road, Warrnambool	23.8

Also included in the study area, but not provided with a PIN, are the Boiling Down and Horne Road reserves.

Figure 1: Study Area, Land Parcels and council Property Identifier Numbers (PINs)

1.3 Activity Description

Warrnambool City Council (Council) is preparing a Structure Plan for the Aberline to Horne Growth Corridor. The future growth area encompasses approximately 360 ha of land located approximately 4 km north east of

the Warrnambool CBD. Council has identified the site as a significant growth area with the potential to support population growth and provide increased diversity of housing stock.

The subject site is bisected by an identified area of cultural heritage sensitivity, being the land within 200 m of Russells Creek (under the *Aboriginal Heritage Regulations 2007*). Should future developments be regarded as high impact activity by the *Aboriginal Heritage Regulations*, such as multi-lot subdivision and residential development, a CHMP will be required in particular areas of the subject site. Additionally, Warrnambool City Council has identified the presence of potential post-Contact and European historical heritage sites within the subject area. Prior to development commencing, an assessment of the nature, extent and significance of potential historical heritage sites and consultation with Heritage Victoria is required.

1.4 Name of Client

This report was commissioned by Warrnambool City Council (ABN: 44 594 264 321).

1.5 Name of Heritage Advisors

This report was prepared by Rick Bullers (Senior Heritage Advisor/Archaeologist) and Austen Graham (Archaeologist). The quality assurance review was undertaken by Annie Ayres (Senior Heritage Advisor/ Archaeologist) and Oona Nicolson (Director/Principal Heritage Advisor). The field work was undertaken by Austen Graham (Archaeologist) and Joshua Flynn (Archaeologist/ Heritage Advisor). Mapping was provided by Monique Elsley (GIS Coordinator).

Rick Bullers

Rick has more than 22 years of natural and cultural resource management experience. Rick has specialised in archaeology and built heritage since 2004, and has worked as a heritage consultant since 2007. He has managed numerous Aboriginal and historic heritage projects for a variety of Agents and developments within Victoria, NSW and SA. Projects include heritage assessments and/or excavations for linear construction projects such as pipelines, sewerage lines and transmission lines, large area heritage assessments for Greenfield developments (e.g. residential subdivision and mining operations), as well as cultural heritage assessments and heritage management plans for large Department of Defence sites. To date Rick has authored more than 50 CHMPs.

Rick has experience in a variety of tasks, including 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, Historical Heritage Assessments and desktop, standard and complex Aboriginal CHMPs. Rick has published widely in refereed scientific journals including *International Journal of Nautical Archaeology*, *Bulletin of the Australasian*

Institute for Maritime Archaeology and *Papers and Proceedings of the Tasmanian Historical Society*. His formal qualifications include:

- Bachelor of Applied Science (Conservation and Park Management), University of South Australia (1994);
- Graduate Diploma of Maritime Archaeology, Flinders University (2005);
- Master of Maritime Archaeology, Flinders University (2006);
- Full Member: Australian Association of Consulting Archaeologists Inc. (AACAI);
- Member; Victorian Planning and Environmental Law Association (VPELA);
- Member: Australasian Institute for Maritime Archaeology (Treasurer 2014-2015, Committee Member 2013-2014); and
- Member, Anthropological Society of South Australia.

Austen Graham

Austen is a technical officer at Ecology and Heritage Partners Pty Ltd with over two years' experience in Australian archaeology. Austen completed her archaeology degree at La Trobe University in 2015, and is currently completing her Master of Professional Archaeology. Her thesis focuses on Aboriginal archaeology, in particular heritage management procedures for canoe scarred trees in north-western Victoria. Austen was trained in artefact analysis and pottery analysis during her undergraduate and post-graduate studies at La Trobe University.

Austen has been involved in historical and Aboriginal excavations since 2010. Austen as a field archaeologist has participated in the investigation of large and complex archaeological sites, also contributing to the research of Ancestral Puebloan sites with the University of Nevada Las Vegas. She has also been involved in large scale Aboriginal salvage operations, and has assisted with numerous tasks including the identification of Aboriginal cultural heritage material. As a consultant, Austen has helped work on Cultural Heritage Management Plans. Her formal qualifications include:

- Bachelor of Archaeology, La Trobe University (2015), completing Master of Professional Archaeology in 2018.
- Associate Member: Australian Anthropological Society (AAS).

Joshua Flynn

Joshua is a technical officer at Ecology and Heritage Partners Pty Ltd with over three years' experience in Australian archaeology, working primarily in the Pilbara region of Western Australia. Joshua completed his archaeology degree at La Trobe University in 2010. His Honours thesis focused on Stamper Battery sites in the Castlemaine region of Victoria.

Joshua has been involved in historical and Aboriginal excavations since 2008. Joshua as a field archaeologist has participated in the investigation of large and complex archaeological sites. He has worked to assist on long term indigenous survey projects involving extensive salvage operations and excavations. He has assisted

with numerous tasks including the identification of Aboriginal cultural heritage material. As a consultant Joshua has helped work on the production of reports for a variety of clients. His formal qualifications include:

- Bachelor of Archaeology (Hons), La Trobe University (2010).

Monique Elsley

Monique has extensive experience with ArcGIS desktop software for the production of mapping products and data analysis. Her first stint in the spatial industry was as a Cartographer at Lonely Planet Publications, in 2006 - 2007. Responsibilities included creating maps for and assisting with the finalisation of regional and city maps for soon to be released guidebooks, and updating the existing database with information obtained from aerial imagery and provided by authors. Following this, Monique gained employment as a Geomatics Research Scientist at the Department of Primary Industries from 2007 – 2009, and again in 2010 - both in a full-time and part-time capacity. Her work involved producing GIS data layers and maps for various projects, analysing results, undertaking a literature review, and contributing to technical reports and journals. Projects she was involved in focussed on climate change adaptation, Victorian land use and developing agricultural ecological zones. Most recently, whilst completing her PhD, Monique undertook casual lecturing and tutoring roles at RMIT. This included developing materials for a new practical exercise with the aim of teaching students how to produce quality maps using ESRI's ArcGIS software. Her formal qualifications include:

- Doctor of Philosophy, RMIT (2013);
- Bachelor of Applied Science (Geospatial Science) (Honours), RMIT (2008); and
- Bachelor of Applied Science (Multimedia Cartography), RMIT (2007).

Annie Ayres

Annie has ten years' experience in project management, including over seven years' experience in cultural resource management in Victoria. She has extensive experience in the preparation of Cultural Heritage Management Plans (CHMPs) for evaluation and approval by Aboriginal Victoria (AV) and Registered Aboriginal Parties (RAPs), as well as the provision of cultural heritage advice under the *Aboriginal Heritage Act 2006* and the *Heritage Act 1995 and 2017* in the form of Preliminary Aboriginal Heritage Tests (PAHTs); Heritage Assessments; Salvage Excavations; Audits; and Due Diligence Assessments. Annie has provided advice for Environment Effect Statements, corporate environmental policies and conducted a pilot site reassessment project for Heritage Victoria. Annie has managed Aboriginal and historical heritage assessments for a range of projects, including but not limited to, roads, railways, pipelines and large-area heritage assessments for residential and business subdivisions.

Annie has been the primary author and cultural heritage advisor on over 60 heritage assessments and CHMPs in Victoria, as well as the supervising heritage advisor on numerous projects. Her formal qualifications include:

- Bachelor of Archaeology (Honours), Latrobe University (2006).

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 20 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);
- Past 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 past National President);
- Member, Australian Archaeological Association (AAA);
- Fellow and Board Member of the Victorian Planning and Environmental Law Association;
- Accredited UDIA EnviroDevelopment Professional (Accredited August 2012)
- UDIA Urbanisation and Infrastructure Committee; and
- Heritage member of the South Australian Chamber of Mines and Energy (SACOME) Sustainability and Development Committee.

1.6 Name of Owner and Occupiers of the Study Area

The study area is owned and occupied by various private landholders. Road reserves are generally owned/managed by Warrnambool City Council.

1.7 Consultation with Aboriginal Parties

Registered Aboriginal Parties or Traditional Owner Groups

There is no RAP for the study area however there are two Aboriginal stakeholder groups who have previously applied to the Aboriginal Heritage Council for RAP status. These groups are the Eastern Maar Aboriginal Corporation (EMAC) and The Gunditj Mirring Traditional Owners Aboriginal Corporation (GMTOAC). These two organisations were invited to take part in the archaeological survey of the study area

and provide any information they wished to share on the cultural significance of the study area. A draft of the report was provided to each group with a request to comment. A summary of the consultation is shown in Table 4.

Table 4: Consultation in Relation to the Assessment

Date	Participants			Details and Outcomes of Consultation
	Ecology & Heritage Partners	T/O Groups	Client	
23.06.2017	Rick Bullers	-	Julie Glass (Warrnambool City Council)	**Telephone/e-mail** Project commencement conversation held discussing scope of project.
27.07.2017	Austen Graham	John Clarke (EMAC) Bill Bell (GMTOAC)	-	**E-mail** Request for representatives to attend survey.
04.08.2017	Rick Bullers	-	Julie Glass	**Meeting** Project inception meeting held discussing scope of project.
19.09.2017-20.09.2017	Austen Graham Joshua Flynn	Caleb Clarke (EMAC) Keicha Day (GMTOAC)	-	**Survey** A pedestrian survey of the study area was undertaken by Austen Graham (archaeologist), Joshua Flynn (archaeologist/heritage advisor), Caleb Clarke (EMAC) and Keicha Day (GMTOAC). No Aboriginal cultural heritage sites were found, yet two historical sites were located and areas of cultural heritage likelihood were identified.
09.10.2017	Austen Graham	John Clarke (EMAC) Bill Bell (GMTOAC)	Julie Glass	**E-mail** Request for invoicing details to be forwarded to each Aboriginal stakeholder group.

1.8 Native Title

There are currently no Native Title claims extending over the study area. The majority of the study area comprises privately owned land and therefore Native Title has been extinguished. Part of the study area (e.g. #13) is designated as Crown Land therefore Native Title has not been extinguished.

In addition the study area contains road reserves. The date on which a road reservation was created affects the Native Title determination (VicRoads 2007). Native Title will generally be extinguished in relation to all road reservations created before 31 October 1975, regardless of having a road constructed within them. For roads reservations created between 31 October 1975 and 23 December 1996, Native Title determination is dependent on whether the reservation is vacant or constructed (has a road built within it). If vacant, Native Title is not extinguished. If constructed, and the reservation area is or was necessary for or incidental to the construction, establishment or operation of the road, Native Title will be extinguished. Native title will generally not be extinguished in relation to road reservations created after 23 December 1996.

A review of the history of the road reserves shows that they were first subdivided and gazetted in the original 1850 subdivision (see Figure 4 in Section 2.4.1.2); therefore Native Title has been extinguished in the road reserves (see Appendix 2 for a summary of the Commonwealth *Native Title Act 1993*).

1.9 Notice of Intention to Survey to Heritage Victoria

A Notice of Intention to Conduct an Archaeological Survey (NOI) was submitted to Heritage Victoria on 1 August 2017. A copy of this NOI is attached in Appendix 1. Heritage Victoria sent a written response to this NOI to Ecology and Heritage Partners on 25 August 2017. A copy of this response is attached in Appendix 1. The HV reference number for this project is 4865. Note that the survey was undertaken as per the requirements of the *Heritage Act 2017*; however, this legislation was superseded on 1 November 2017 by the *Heritage Act 2017*. Recommendations made as a result of the findings of this report (including the survery) are made as per the requirements of the *Heritage Act 2017*.

In accordance with s.63A of the *Aboriginal Heritage Regulations 2007*, a Notice of Intention to Carry Out a Survey for Aboriginal Cultural Heritage was submitted to Aboriginal Victoria on 1 September 2017. A copy of this NOI is attached in Appendix 1. Aboriginal Victoria sent a written response to this NOI to Ecology and Heritage Partners on 4 September 2017. A copy of this response is attached in Appendix 1.

1.10 Report Review and Distribution

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

- Warrnambool City Council;
- Eastern Maar Aboriginal Corporation;
- Gunditj Mirring Traditional Owners Aboriginal Corporation;
- Aboriginal Victoria; and
- Heritage Victoria.

1.11 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 2017* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* is included in Appendix 2. This legislation is subordinate to the Victorian *Coroners Act 2008* in relation to the discovery of human remains.

Note that the *Heritage Act 1995* was superseded by the *Heritage Act 2017* on 1 November 2017.

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 for assessing Aboriginal cultural heritage in this AHHA is defined on a 5 km buffer of the study area extending Mortlake Road to the Hopkins River. The region includes plains with poorly developed drainage and shallow regolith, plains with well-developed drainage and deep regolith, terraces, floodplains and lakes, swamps and lunettes and their deposits and plains with ridges. The region (and the study area itself) forms part of the Warrnambool Plain bioregion (DELWP 2017a). This geographic region shows broadly similar environmental characteristics that may have influenced Aboriginal occupation. Therefore it is relevant to any Aboriginal cultural heritage that may be present within the study 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

Geology

The study area is located within a single geographic region, Victorian Volcanic Plains (DEDJTR 2017a) (Map 5), with the Warrnambool Plain geographic region to the south of the study area. Victorian Volcanic Plain is dominated by Cainozoic volcanic deposits. These deposits formed an extensive flat to undulating basaltic plain with stony rises, old lava flows, numerous volcanic cones and old eruption points and is dotted with shallow lakes both salt and freshwater (DEDJTR 2017a).

Warrnambool Plain extends along the coast from Portland to Moonlight Head. It consists of a distinctive cliffed coastline and low calcareous dune formations, dissected by rivers, inlets and swamplands (Map 5). The Cainozoic sediments and volcanic deposits dominate the area giving rise to sandy soils (Calcarosols and Tenosols and Podosols) on the dunes and cliff line, Brown earths and texture contrast soils (Dermosols, Sodosols) on the flat plain, and texture contrast soils and fertile peats (Hydrosols) in the swamplands. Much of the limestone has been overlain by more recent sediments, and between the limestone dunes, areas of swamplands are characterised by highly fertile peats and seasonal inundation. The area east of Warrnambool is characterised by deeper soils of volcanic origins overlying limestone, which are dissected by streams. The Port Fairy area also features basalt flows with associated basalt coastal outcrops (DELWP 2017).

Geomorphology and Soils

Within the Victorian Volcanic Plains geomorphological framework of the study area there is one distinct geomorphological landform unit; Plains with poorly developed drainage and shallow regolith (Wingeel) (Map 4). The plains developed on the older Newer Volcanic lavas that formed in the Late Pliocene and during the Pleistocene, from about two million year ago and up to one million years ago, are generally characterised by thin regolith development and poorly developed drainage. In these landscapes, flow boundaries are obvious, and corestones ('floaters') are often seen at the surface. Shallow drainage lines have developed, often along the boundaries of lava flows. Discontinuous drainage lines may end in ephemeral wetlands and swamps. Examples of this landform occur in the region from Warrambine to Armytage, with the best examples immediately north of the Wingeel Swamp.

The soils are variable ranging from red friable earths and acidic texture contrast soils (Ferrosols and Kurosols) on the higher fertile plain to scoraceous material, and support Plains Grassy Woodland and Plains Grassland ecosystems. Calcareous sodic texture contrast soils grading to yellow acidic earths (Chromosols and Sodosols to Dermosols), on the intermediate plain, and grey cracking clays (Vertosols) on the low plains, support Stony Knoll Shrubland, Plains Grassy Woodland and Plains Grassy Wetland ecosystems (DEDJTR 2017).

2.2.2 Landforms and Hydrology

The region is dominated by flat volcanic plains, characteristic of what is known as the Western Districts (DEDJTR 2017b). These plains comprise the southern two-thirds of the region. The north is dominated by the Grampians, the Dundas and Merino Tablelands and the West Victorian Uplands. The uplands include sedimentary rises which are the western extremity of the Great Dividing Range (Rees 2000). There are undulating limestone areas to the region's west, northwest and north-east of Portland. Undulating sandy deposits occur to the north of Dartmoor below the level of the Tablelands. The lower sandy plains with ridges, are of fairly recent origin and are linked to the retreat of a higher sea from the Murray River Basin, between 2 and 6 million years ago. There are a number of occurrences of coastal plains to the east and west of Warrnambool. Major streams, such as the Hopkins River and Mt Emu Creek, cut through the basalt rocks creating U-shaped valleys. In contrast, the Tablelands are generally flat to gently undulating, occasionally undulating to rolling hills, dissected in places by deep V-shaped valleys. A range of geological material is exposed such as Cretaceous sandstones, granites of various ages and acid volcanics (rhyolite).

Consequently, there are four primary landforms in the study area:

- *Creek terrace (with associated narrow floodplain)*;
- *Slopes*;
- *Undulating plains*; and
- *Crest*.

2.2.3 Vegetation

According to the Department of Environment, Land, Water and Planning's (DELWP) Ecological Vegetation Classes (Pre-1750 EVCs), the study area would have historically supported vegetation classified as Plains Grassy Woodland (EVC 55) and Swamp Scrub (EVC 53), under the Department of Sustainability and

Environment's Ecological Vegetation Classes (EVCs) (DELWP 2017c; Map 7). This community comprises an open, eucalypt woodland to 15 m tall. It occupies poorly drained, fertile soils on flat or gently undulating plains at low elevations. The understorey consists of a few sparse shrubs over a species-rich grassy and herbaceous ground layer. Within the Plains Grassy Woodland ecosystem, larger trees were sparse comprising less than 10% cover. These were predominantly River Red Gums (*Eucalyptus camaldulensis*). Beneath the canopy, a medium shrub layer consisted of Golden Wattle (*Acacia pycnantha*) and Hedge Wattle (*A. paradoxa*). The predominant vegetation in these areas comprised largely tufted graminoid (grass) and herb species, representing some 60% cover. Common species included Kangaroo Grass (*Themeda triandra*), Bristly Wallaby-grass (*Austrodanthonia setacea*) and Common Rice-flower (*Pimelea humilis*) (DSE 2004).

The margins of Russels Creek would have supported vegetation classified as Swamp Scrub (EVC 53) (Map 7). This community comprises closed scrub to 8 m tall at low elevations on alluvial deposits along streams or on poorly drained sites with high nutrient and water availability. Soils vary from organic loams to fine silts and peats which are inundated during the wetter months of the year. It is dominated by either Woolly Tea-tree (*Leptospermun lanigerum*) and/or Paperbarks (*Melaleuca* spp,) or Blackwood (*Acacia melanoxylon*) which often form a dense impenetrable thicket, out-competing other species to 50% cover. Emergent trees (e.g. Swamp Gum [*Eucalyptus ovata*]) may sometimes be present. Where light penetrates to ground level, a moss/lichen/liverwort herbaceous ground cover is often present. The ground story is often dominated by various reed and sedge species.

Many of these types of vegetation would have been utilised by Aboriginal people in the area for food and the creation of weapons and vessels, and would have supported a range of game that could be hunted for food. In particular, the leaves of some eucalypt species were crushed and soaked in water for medicinal purposes. Bowls and dishes were made from the heavy bark. Those gnarled round growths on the trunk were used as well. The Kulin people in southern Victoria made bowls called 'tarnuks' from the gnarls on gum trees to carry water. Hard eucalypt wood was also used to make spear-throwers, boomerangs and shields (Nash 2004). Kangaroo Grass seeds ripen in summer and can be ground into a flour for the preparation of damper. Rice-flower bark could be made into string and nets (Nash 2004). Some Acacia species were used for making spear-throwers and shields, and according to Gott and Conran (1991: 50) the bark was heated and infused in water to bathe rheumatic joints. Other plants and fungi were also valuable food and medicine however, the ethnobotanical records of their use are limited. Eucalypt and tea tree leaves were crushed and soaked in water to prepare medicinal ointments. Bowls and dishes were made from the bark and gnarled growths, for food and water transportation. Canoes were also made from the bark of gum trees. The removal of bark characteristically results in visible modification of the trees that make them identifiable as scarred or culturally modified trees (Nash 2004).

2.2.4 Climate

The climate of Warrnambool is currently characterised by cool summers and wet winters; temperatures range between an average maximum of 24.8°C and minimum of 12.4°C in February to an average maximum 13.5°C and minimum 5.9°C in July. Rainfall varies between a maximum of 97.1 mm in August and 31 mm in February, with annual average rainfalls of 728.9 mm (BOM 2017). The climate was conducive to Aboriginal people living in the region in the past throughout the year.

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 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. The coastal regions of Victoria were highly utilised by Aboriginal people, and therefore their use can be extrapolated at least as far back as the results of these investigations. It is likely that the landscape including the current study area was occupied by Aboriginal people from very early after their arrival to what would become the state of Victoria, continuously up until the occupation of the region by European settlers.

2.3.2 History and Ethnohistory

At the time of European contact, the study area was occupied by the *Dhauwurd wurrung (Gundidjmara)* people (Clark 1990: 20). The language group name preferred by linguists for the larger Aboriginal community in which study area falls is *Dhauwurd wurrung*. But the popular name *Gundidj mara* is used more widely by Aboriginal descendants throughout the area today. Their traditional lands extended from approximately the western Victorian border, east along the coast to Warrnambool and north close to Hamilton (Clark 1990: 20). The *Gundidj mara* clan which was documented as living near the current study area at the time of European contact was the *Yarrer gundidj*.

The *Yarrer gundidj* were documented as residing between the Campbell's Station on the Merri River and Allan Allandale's station on the Hopkins River at Warrnambool (Clark 1990:88). According to Dawson, their clan name contained the meaning 'belonging to salt water fish', which was attributed to their coastal location (Dawson 1881). The *Yarrer gundidj* utilised a range of food from the meerteeyt (sea), including crayfish, abalone and saltwater fish. Adjacent lakes, rivers and wetlands were also rich in perennial and seasonal foods such as eel and Yam Daisy (Parks Victoria 2007:20). There were three recorded *Yarrer gundidj* clan heads in 1841; *Par.de.we.dung*, *Mine cap* who had one wife and child, and *Pee.pi* who also had one wife and three children. The moiety of the *Yarrer gundidj* clan remains unknown (Clark 1990:88).

Coastal *Dhauwurd wurrung* clans first came into contact with European people from 1810 when sealers and whalers first began to visit the Portland Bay area (Clark 1990: 33). Sealing had begun near Port Fairy by as early as 1802, and whaling began in earnest around Portland in the 1820s (Coroneos *et al*. 2010: 24-25). The earliest of these groups were predominantly British, French and American but over time were replaced by a predominantly colonial population, moving out of the area as animal numbers declined (Coroneos *et al*. 2010: 25). These men were some of the first to come into contact with the Indigenous inhabitants of the area. This led to much conflict between the two communities as the colonial explorers took Aboriginal women by force, and began to encroach on the coastal land over time. Whalers began to make more permanent camps in the area from the early 1830's, and during the next decade they began cultivation of the area.

In 1834 the Henty brothers arrived in Portland and settled permanently. Over the next five years the relationship between the new arrivals and the *Dhauwurd wurrung* was reportedly generally amenable apart from the killing of at least three Aboriginal people in mid and late 1838 (Clark 1990: 33). Throughout the 1840s the *Dhauwurd wurrung* fought a sustained guerrilla war against the European settlers. Sheep were regularly taken from stations to supplement the diet of Aboriginal people in the face of being denied access to their traditional lands. Conflict ensued with deaths on both sides.

In 1865 the Church of England set up the first mission in the western district, at Framlingham. However many Aboriginal people from Portland and Lake Condah refused to live there. As a result, in 1867 a new mission was set up at Lake Condah (Clark 1990: 48). The Lake Condah Mission was closed in 1919 although many people continued to live there until the 1950s when the land was subdivided for returned soldiers (Koorie Heritage Trust 2010).

As the coastal region of west Victoria grew so did opportunities for cooperation with the local Aboriginal communities. Examples of this cooperation include a number of Indigenous people from the 'Goose Lagoon' area situated to the west of Port Fairy, who worked for Mr John Ritchie on his 'Aringa' property in a variety of roles (Coroneos *et al*. 2010: 33). William Rutledge also used a great deal of Aboriginal labour on his land in Port Fairy (Coroneos *et al*. 2010: 32-33). Today the descendants of the *Dhauwurd wurrung* clan are represented by the Traditional Owner groups for the study area, the Gunditj Mirring Traditional Owners Aboriginal Corporation and the Eastern Maar Aboriginal Corporation.

2.3.3 Oral History

Caleb Clarke from the Eastern Maar Aboriginal Corporation offered oral histories relating to the surrounding region of the study area, during the field survey. Specifically, Caleb noted the location of a quarry to the west

of the study area, which has been used as a source of sandstone for the region. Research was undertaken to determine if this quarry site was a historical place related to the study area. Limestone and sandstone quarries were and still are common in the Warrnambool region. The location referred to by Caleb Wilson is believed to be a modern sandstone quarry (Holcim Australia - Warrnambool Quarry), located at 3282 Tarrone Lane, Tarrone. Evidence from historical reports suggests quarries were once located in populated areas in the Warrnambool region, such as the Hider Street and Ryot Street North Precinct (Warrnambool City Council 2015).

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 25 July 2017 for sites within a 5 km radius of the study area. Searching an area with this extent ensured that a relevant and representative sample of information was obtained.

The search identified a total of 47 registered Aboriginal places[1] within the search area. These sites consist of a total of seven site components comprising four site component types (Table 3). Table 3 shows that shows that stone artefact sites, either isolated artefacts or artefact scatters, and shell middens account for all but one of the site component types in the search area and are by far the most prevalent site type in the region (n=97.87%). It should also be noted that due to changing conventions for the recording of archaeological sites over time, some of the sites listed as 'artefact scatters' may in fact represent 'isolated artefacts', as early recording forms made no distinction between the two site types. Furthermore, isolated artefacts are today recorded as a form of LDADs.

The difference between the number of sites and number of site components is because several sites contain two or more site component types.

None of these sites are located within the study area (Map 8).

A site located in close proximity to the study area is:

- VAHR 7421-0226 (Rodgers Road LDAD). This site is approximately 300 m east of the study area. The site was recorded during a complex CHMP for proposed industrial subdivision at 80 Rodgers Road, Warrnambool. The site is a Low Density Artefact Distribution, comprising three isolated basalt flakes.

A summary of the Aboriginal archaeological site component types appears in Table 5 and Figure 2 and a list of all sites in the search area is shown in Table 6.

[1] Note: the terms used in this report, Aboriginal place, Aboriginal cultural heritage and Aboriginal archaeological site, are used interchangeably and essentially are referring to an Aboriginal place that is an archaeological site.

Table 5: Summary of Previously Identified Aboriginal Site Component Types within 5 km of the Study Area

Site Type	Quantity	Percentage (%)
Artefact Scatter	17	36.17
Low Density Artefact Distribution	4	8.51
Object Collection	1	2.13
Shell Midden	25	53.19
Total	**47**	**100.00**

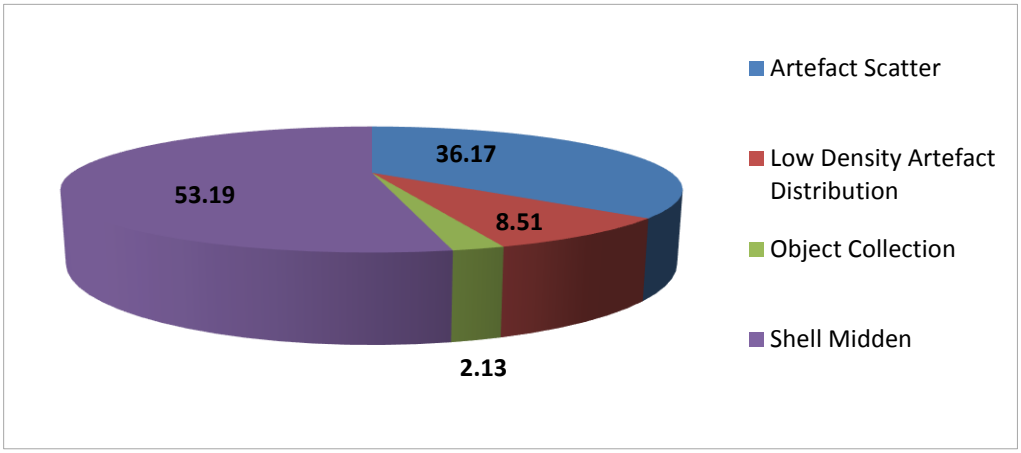


Figure 2: Pie Chart summarising Aboriginal Places/Components in the Geographic Region

Table 6: List of Previously Identified Sites within 5 km of the Study Area

VAHR Site Number	Site Name	Component Number	Component Type	Within Study Area?
7321-0114	Warrnambool 1	7321-0114-1	Artefact Scatter	No
7321-0347	Roache 1	7321-0347-1	Artefact Scatter	No
7321-0348	Roache 2	7321-0348-1	Artefact Scatter	No
7321-0349	Roache 3	7321-0349-1	Artefact Scatter	No
7321-0350	Roache 4	7321-0350-1	Artefact Scatter	No
7321-0451	Wollaston Road 2	7321-0451-1	Artefact Scatter	No
7321-0482	Wollaston Road 4 IA	7321-0482-1	Artefact Scatter	No
7321-0483	Wollaston Road 5 IA	7321-0483-1	Artefact Scatter	No
7321-0486	Wollaston Road 3 AS	7321-0486-1	Artefact Scatter	No
7321-0487	Wollaston Road 6 AS	7321-0487-1	Artefact Scatter	No
7321-0493	Botanic Road LDAD	7321-0493-1	Low Density Artefact Distribution	No
7421-0006	Moyjil Aboriginal Place	7421-0006-1	Shell Midden	No
		7421-0006-2	Object Collection	No
		7421-0006-3	Shell Midden	No

VAHR Site Number	Site Name	Component Number	Component Type	Within Study Area?
		7421-0006-4	Shell Midden	No
7421-0007	Hopkins Mouth 2	7421-0007-1	Artefact Scatter	No
7421-0008	Hopkins Mouth 3	7421-0008-1	Shell Midden	No
7421-0009	Hopkins Mouth 4	7421-0009-1	Shell Midden	No
7421-0010	Hopkins Mouth 5	7421-0010-1	Shell Midden	No
7421-0011	Hopkins Mouth 6	7421-0011-1	Shell Midden	No
7421-0024	Hopkins River Shelter 1	7421-0024-1	Shell Midden	No
7421-0025	Hopkins River 2	7421-0025-1	Shell Midden	No
7421-0026	Hopkins River 3	7421-0026-1	Artefact Scatter	No
7421-0111	Hopkins Lookout 1	7421-0111-1	Shell Midden	No
		7421-0111-2	Artefact Scatter	No
7421-0194	Hopkins Point 1	7421-0194-1	Artefact Scatter	No
7421-0212	Hopkins Rd Path Shell Midden 1	7421-0212-1	Shell Midden	No
		7421-0212-2	Artefact Scatter	No
7421-0213	Point Ritchie Road Shell Midden 1	7421-0213-1	Shell Midden	No
		7421-0213-2	Artefact Scatter	No
7421-0214	Granny's Grave Shell Deposit	7421-0214-1	Shell Midden	No
		7421-0214-2	Artefact Scatter	No
7421-0215	Hopkins River Path Shell Midden 1	7421-0215-1	Shell Midden	No
7421-0216	Hopkins River Path Shell Midden 2	7421-0216-1	Shell Midden	No
7421-0217	Hopkins River East Bank Shell Midden 1	7421-0217-1	Shell Midden	No
7421-0219	Logans Beach Road Midden 1	7421-0219-1	Shell Midden	No
7421-0220	Logans Beach Road Midden 2	7421-0220-1	Shell Midden	No
		7421-0220-2	Shell Midden	No
		7421-0220-3	Shell Midden	No
		7421-0220-4	Shell Midden	No
7421-0221	Logans Beach Road Midden 3	7421-0221-1	Shell Midden	No
		7421-0221-2	Shell Midden	No
		7421-0221-3	Shell Midden	No
		7421-0221-4	Shell Midden	No
7421-0226	Rodgers Road LDAD	7421-0226-1	Low Density Artefact Distribution	No, but within 500 m
		7421-0226-2	Low Density Artefact Distribution	No, but within 500 m
		7421-0226-3	Low Density Artefact Distribution	No, but within 500 m

2.3.4.2 *Local Council*

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

The Heritage Overlay of the Warrnambool Planning Scheme was examined (DELWP 2017). No Aboriginal heritage places listed on the Heritage Overlay are present within the study area (Map 9).

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.

Below are summaries of selected archaeological investigations which are relevant to the study area;

Schell (2007) conducted an archaeological survey along the Wangoom Road sewer, Warrnambool. This report presents the results of an Aboriginal archaeological assessment carried out of a c. 1 km extension to the Wangoom Road sewer, on the north east outskirts of Warrnambool. No Aboriginal sites were identified during the field survey. The area the report covers is in close proximity to the Aberline to Horne Growth Corridor study area (approximately 500 m west of the study area).

Matic (2008) presents a complex CHMP for proposed Roof Water Harvesting Pipeline to Russell Creek in Warrnambool (approximately 500 m west of the study area). Initial survey resulted in no new Aboriginal sites being identified; however three areas were identified as having low potential for the presence of Aboriginal archaeological sites. Sub-surface testing was conducted in these areas of potential significance. No Aboriginal archaeological sites were identified during the complex assessment. It was determined that there is no likelihood that unidentified sites will be disturbed by the proposed activity. Russell Creek intersects the current Aberline to Horne Growth Corridor study area.

Luebbers (2010) conducted a complex CHMP to test potential cultural significance of a proposed residential development between Whites Road and Aberline Road, Warrnambool (within 20 m west of the study area). A Complex Assessment was undertaken first with hand excavation in a single 1.0 x 1.0 m test square near Russell Creek. No artefacts were recovered. Utilizing sedimentary profiles obtained from the hand excavated test pit, the river banks, and from the geotechnical study, 17 test pits were mechanically excavated. The pits were strategically located across the development property to sample all possible topographic and sedimentary features. No Aboriginal heritage materials were located in these test pits. This archaeological investigation was conducted along the south-west border of the current study area.

A complex CHMP was undertaken by O'Reilly & McAlister (2011) to test potential cultural significance for residential development along Wangoom Road and Aberline Road, Warrnambool (within 20 m west of the study area). Sub-surface testing was conducted in the activity area in areas of potential sensitivity that are to be impacted by the proposed activity and where poor ground surface visibility inhibited a comprehensive assessment of the Aboriginal cultural heritage sensitivity during the standard assessment. The results of the sub-surface testing indicate that the activity area has not been subject to major sub-surface disturbance. No Aboriginal cultural heritage materials, features or potentially sensitive deposits were identified in any of the

excavations within the activity area. This archaeological investigation was conducted along the northern and western borders of the current study area.

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

Table 7: Archaeological Reports Relevant to the Study Area

Author, Date, Report #	Description and Location	Results
Coutts, P.J.F. et al 1977 #53	Assessment of sites of special scientific interest in the Victorian coastal region.	This study aimed to identify sites not yet recorded and fully document all sites of special significance. It was hoped that the results would enable generalisations to be made about site classifications, locations, conditions and site contexts for entire coast of Victoria. Implications could then be drawn about variability, significance and ages of coastal sites. In the Port Fairy area, 21 shell midden sites have been previously recorded, half of which are fronted by sandy beaches. Most lie within 400 m of rock platform areas and most have a predominance of rock platform shellfish species.
Zallar, S. Siow, K. & Coutts, P 1979 #123	A research study of the methods of stabilisation of archaeological sites along the Victorian coastline.	Nine study areas were chosen as representative areas for possible archaeological degradation along the Victorian Coast. These sites were classified in terms of cultural significance and risk of degradation. Six experimental areas within these areas were used to conduct stabilisation techniques to control archaeological degradation. This research presents stabilisation methods for varying levels of significance of coastal Victorian archaeological sites.
Critchett, J. 1984 #156	A closer look at cultural contact, using the example of the squatter's station at "Yambuck", in the western district, Victoria.	This study examines written evidence for the impact of European settlement on Aboriginal Victorians, particularly at Yambuk Station. The main source is dairies of Annie Marie Baxter (later Dawbin) who lived at Yambuk. Her diaries reflected on the effects of European settlement on Aboriginal people of the area. Yambuk is located 16 miles from Port Fairy. Her diaries discuss the population of Aborigines in the area, and numerous incidents between Aborigines and European settlers.
Coutts et al. 1977 #165	A literature study and survey of mounds known as earthen heaps or ovens in Western Victoria covering an area of 247,000ha.	Location of mounds are suggested to be related to environment as most were located within a woodland or grassland, complemented by potentially important food resource habitats; swamps, lakes, creeks and areas subject to inundation. 207 mounds located during the survey. Excavation results from several sites found the presence of burials, stone tools, faunal remains, bone tools, stone structures and suggested food preparation.
Mulvaney, D.J. 1964 #187	Reviews the population, relics and trade of the basalt plains in Victoria.	When the first census was taken in 1877 there was 774 Victorian full-blooded Aborigines recorded, 170 lived in the W. District. This paper suggests a higher population by discussing the Aborigines of the Basalt Plain using environmental adaptation, archaeological and anthropological references.
Ellender, I. 1989 #227	Survey for a proposed power line from Heywood to South Australian border.	No new sites were found during the survey, but one previously recorded site was relocated. This site, the Crawford River campsite, is the only known large site in the area. It is thought to contain further subsurface deposits. Artefacts were collected from the surface during the survey, and the site was subsequently covered with crushed rock for protection. Most of the artefacts are flint, which was carried 30 km in from the coast.

Author, Date, Report #	Description and Location	Results
Home, G. 1921 #243	An overview of the Aboriginal coastal tribes of Eastern Victoria.	Home confirmed that almost anywhere along Vic coast, shell middens can be found. Stone tools and hearth stones are also often present. Mussel is most common shell.
Coutts, P. Witter, D. and Parsons, D. 1977 #265	Fourteen archaeological sites were excavated over three years as part of a research paper on the effects of European colonization in the Western district.	The study concluded that the arrival of Europeans prompted a shift in settlement patterns which can be seen in the archaeological record such as a move away from mound dwelling other occupation sites such as rock shelters. Although information was sparse, there appeared to be traditional practices which remained into the contact period such as burial styles, production of stone tools and the use of ochre (although in decreased frequency). The research was unable to make conclusions on population density changed based on the archaeological record.
Bird, C. and Frankel, D. 1991 #332	A literary critique of the methods used to determine dates and social organization in the archaeological research undertaken in western Victoria and south-eastern South Australia.	Bird and Frankel conclude that reliance on degradable site types (such as fish traps and mounds) as an indication of recent social change is erroneous, and that the current wide-scale models of social organization and change are inaccurate, and different site types may in fact support separate hypotheses.
Witter, D.C. 1977 #393	An assessment requested for the purpose of developing guidelines for archaeological resource management within Discovery Bay Coastal park (approximately 108 km west of study area).	Two cultural horizons are contained within the study area. The latest is the Late Prehistoric, characterised by shell middens, flint workshops and lithic scatters within sand dunes. The earlier horizon is associated with highly oxidised stone artefacts which are typically Early Prehistoric (or Gambierian [McCarthy 1967]) contained within red terra rossa soils. These soils underlie the loose sand. Most of the area's shell middens occur within the recent unconsolidated sand dunes associated with the Late Prehistoric, and tend to contain predominately rock platform species.
Lane, L. and Fullager, R.L.K. 1980 #410	An assessment of three previously unrecorded Aboriginal stone alignments in Victoria.	Lane and Fullager report the discovery of three stone alignments and compare them to others in Victoria. The sites were: • Wurdi Youang (Mt Rothwell archaeological area). This site comprises an oval ring, up to 75 cm high. Most stones are embedded in the ground. Three stone artefacts were found within the ring. • Lake Bolac 1- the Glenaber Alignment. The alignment is comprised of two arcs forming part of an ellipse. • Lake Bolac 2, north of Glenaber alignment on the edge of a large marsh. The alignment contains similar proportions to Lake Bolac 1 site. It is thought that it was an Aboriginal site, but has been adapted by early settlers to suit their needs. Lake Bolac 1 and Wurdi Youang are thought to be ceremonial sites.
Bird, C.F.M. and Frankel, D. 1991 #431	The study area is 400km by 200km and includes the south-eastern corner of South Australia and the south-west corner of Victoria.	A deconstruction of chronology for Holocene events is presented; a decline in the number of sites for the study area coincides with a period of wetter conditions between 7000-6000 cal. BP, there is then an increase in sites from 4000 cal. BP, a wet change around 2500 cal. BP is associated with an increase of mounds in South Australia whereas, in Victoria a shift of population occurred to drier areas. There is a patchy history of occupation in coastal rock-shelters reflecting the local conditions of fluctuating sea levels.

Author, Date, Report #	Description and Location	Results
Coutts, P. 1977 #446	A field school undertaken in the Western District, involving classroom studies, survey and 2 main excavations at The Craigs/Thunder Point and Tower Hill Beach (approximately 8 km south-west of study area).	Five cultural layers were identified at Thunder Point, and two at the Craigs. Tower Hill Beach also had a distinct layer of cultural material. Hearths were identified at the Craigs/Thunder Point, as well as shell material at all three locations. The report details the method of the excavations, but at time of writing no analysis had been done. The stone tools of Tower Hill Beach are noted as being quite different from those found at the Craigs/Thunder Point, but no descriptions are given.
Coutts, P.J.F., Witter, D.C. & Parsons, D.M. 1977 #447	An outline of evidence for the construction of cultural history and the impact colonisation on the Western District of Victoria.	Excavations and literature review postulates a major change in settlement patterns where a shift from mounds to other types of occupation sites occurred. Few post contact sites were found however, this is discussed as not representative as suggested post contact sites normally adjacent to rivers, creeks or swamps could have been destroyed by natural processes. Post contact traditional burial practices were maintained, ochre, pits, ovens were still used however, a decreasing frequency of stone tool manufacture occurs. Population, economy and social structure are also discussed.
Presland, G. 1980 #552	Journals of G. A. Robinson, detailing his engagement with the Aboriginal peoples during his tour from Portland to Melbourne in August 1841.	The journal was written during his time as Chief Protector of the Victorian Aborigines. Every detail of his interaction with the various Aboriginal tribes was recorded, as well as drawings he sketched whilst in their company. Robinson's journal includes details of his journey to Melbourne via the Grampians and Pyrenees Ranges.
Presland, G. 1977 #652	Journals of G. A. Robinson, detailing his engagement with the Aboriginal peoples during his tour from Melbourne to Portland in March-May 1841.	The journal was written during his time as Chief Protector of the Victorian Aborigines. Every detail of his interaction with the various Aboriginal tribes was recorded, as well as drawings he sketched whilst in their company. This journal details his 6 month journey to the Western District, during which time he visited many stations on his way to Portland.
Schell, P. 1995 #698	An archaeological survey was undertaken at Hopkins River by environmental science students from Monash university. The survey aimed to document and establish past and present threats to eel traps and other sites.	An archaeological survey was undertaken at Hopkins River by environmental science students from Monash university. The survey aimed to document and establish past and present threats to eel traps and other sites. Ethnohistorical, previous archaeological records and oral histories were used to gain a better understanding of the potential for harm of eel traps and other sites.
Amorosi, L. 1998 #1260	A personal collection of Aboriginal artefacts of W.L. Koenig.	The W. L. Koenig Collection is primarily made up of Aboriginal stone artefacts from the area surrounding his home in Winchelsea which is approximately 37 km west of Geelong, Victoria. This collection contains Aboriginal stone artefacts, two ground axes from New Guinea, skeletal remains, a Tjurunga stone, a basket, boomerangs, a spear thrower and cord made from vegetable matter. 139 of the 651 artefacts have a provenance or name provided, usually by the name of a town or landmark. Koenig's collection contains a high frequency of complete artefacts and interesting examples of artefact types. However, this report is only a broad indicator of areas where the artefacts were traded or collected due to the lack of provenance.

Author, Date, Report #	Description and Location	Results
Marshall, B. & Schell, P. 1998 #1370	A desktop investigation of thirty six locations along the Victorian coastline aimed at assessing the impact on cultural heritage by CA/CCG projects and providing future management of Aboriginal resources by CA/CCG projects.	Some project areas were defined as having high densities sites and scientifically important due to deposits of Pleistocene age. Isolated artefacts, surface scatters and shell middens were the dominant sites; rarer sites were scarred trees, isolated hearths, quarry/stone sources, fish traps, art sites and human remains.
Gunn, R.G. & Harradine, G. 1999 #1579	An archaeological survey was conducted to test the archaeological significance of a paddock to be developed.	A single paddock was surveyed at Hopkins Point near Warrnambool, locating a single isolated artefact (site 7421-194). The single artefact was a chert flake which was accompanied by a burnt clay ball.
Luebbers, R. 2000 #1599	An archaeological impact assessment was conducted along culturally sensitive sand dunes along Lady Bay, Warrnambool (approximately 5 km south of study area).	An impact assessment was conducted on six existing registered Aboriginal sites along a 2.1km stretch of coastal sand dunes along Lady Bay, Warrnambool. The study area covers the extension and upgrade of a footpath along these dunes. The assessment concluded that the sites, all shell middens, are to be undisturbed and that the footpath is to be constructed above ground to avoid any harmful impact.
Luebbers, R. 2000 #1623	An archaeological survey for proposed upgrades to whale watching site at Blue Hole along the Hopkins River, Warrnambool.	Survey of the study area found deposits of dispersed marine shells from Aboriginal middens buried in the embankment of the Hopkins River near the amenity block at Blue Hole. No existing register historical or aboriginal sites were located within the study area. No constraints to the proposed development were located during the survey.
Luebbers, R 2000 #1735	An archaeological examination of areas surrounding a 19th Century timber bridge, Hopkins River, Warrnambool.	A sub-surface archaeological examination was conducted in two surrounding areas of a 19th Century timber bridge which is located along the Hopkins River, Warrnambool. This archaeological examination was conducted due to proposed demolition and reconstruction of a new bridge/ A small collection of historical artefacts were collected from the excavation, resulting in the bridge having high local significance. Further excavations were recommended before demolition and alterations were to occur to the bridge.
Luebbers, R 2001 #2082	An archaeological inspection of areas of impact of a proposed pipe alignment, Lady Bay, Warrnambool (approximately 5 km south of study area).	An archaeological prediction statement was created for the areas surrounding a proposed pipe alignment along Lady Bay, Warrnambool. Geotechnical data, past archaeological reports and information obtained through survey determined that there would be little to no potential Aboriginal archaeological material within the activity area.
Wood, V. 2001 #2199	An archaeological investigation and survey for proposed gas pipeline from Iona, Victoria to Adelaide, South Australia.	The archaeological investigation presented a predictive model for Indigenous and non-Indigenous site types along the proposed study area. The investigation and survey relied heavily upon previously written reports for recommendations for protecting cultural heritage along the proposed study area.
Gunn, RG. 2002 #2291	Archaeological monitoring of a trench line along Lake Pertobe, Warrnambool, Victoria.	Archaeological monitoring of a trench line along Lake Pertobe was undertaken to collect and record any archaeological remains that were revealed by the trench excavation.

Author, Date, Report #	Description and Location	Results
McConnell, A., Buckley, K. and Wickman, S. 2002 #2704	This report sets out a proposal for an Aboriginal Heritage Management System for the West Victoria Region State forest area based on previous projects.	The sensitivity for archaeological sites in the area is presented in the subsidiary report (AAV report number 2705) as the reason for the recommendation of this report; which is for the endorsement urgently of the AHMS register.
McConnell, A., Buckley, K. and Wickman, S. 2002 #2705	A predictive sensitivity zoning model for the West Victoria Region.	Archaeological sites are stated to be virtually everywhere in the study area with the challenge of the report to identify patterns of differing density. The predictive model defined 3 zones of sensitivity. 1) Southern periphery, 2) Northern periphery and 3) Interior. Factors affecting site location in decreasing importance are; proximity to an ecotone, proximity to fresh water, elevation below 200m and flatness of ground. Distance from coast, location of water and elevation were all relative factors in the number of sites. The highest density of sites was located at 0-5km from the water, coastal basins at river mouths and damp sclerophyll forest and wet heathland appear to contain high densities.
Paynter, N. and Rhodes, D. 2005 #3396	An archaeological assessment for Wollaston Road, Warrnambool (approximately 5 km west of the study area).	Two Aboriginal places were located, including an isolated silcrete artefact (VAHR 7321-0450) and three silcrete artefacts (7321-0451). Both places were located near Merri River. The survey and site prediction model suggests that along the Merri River, floodplains, bank terraces, ridgelines, hill slopes and dunes are the areas of highest archaeological potential.
Schell, P 2007 #4003	An archaeological survey conducted along the Wangoom Road sewer, Warrnambool (immediately north of study area).	This report presents the results of an Aboriginal archaeological assessment carried out of a c. 1 km extension to the Wangoom Road sewer, on the north east outskirts of Warrnambool. No Aboriginal sites were identified during the field survey
Long, A. 2007 #4070	An Aboriginal archaeological survey at North Dennington and Dales Road for two Wannon Region Water projects (immediately west of study area).	Both sites are located in between calcarenite dune ridges. No Aboriginal sites were identified during the survey.
Matic, A 2008 #10495	A complex CHMP for proposed Roof Water Harvesting Pipeline to Russell Creek in Warrnambool (Russels Creek intersecting the study area).	Initial survey resulted in no new Aboriginal sites being identified; however three areas were identified as having low potential for the presence of Aboriginal archaeological sites. Sub-surface testing was conducted in these areas of potential significance. No Aboriginal archaeological sites were identified during the complex assessment. It was determined that there is no likelihood that unidentified sites will be disturbed by the proposed activity.
Luebbers, R 2014 #10928	A complex CHMP was conducted to test cultural significance for proposed residential development along Logans Beach, Warrnambool (approximately 5 km south of study area).	Systematic excavation was undertaken to sample heritage content at 22 key locations across the Development Envelope to sample for heritage materials. Two locations with Aboriginal middens were identified in the sub-surface sample, VAHR 7421-0221-3 and VAHR 7421-0221-4. Both places were identified as being confined to a remnant of the sand dune and could not extend beyond a short distance from the test pits. Another deposit, labelled Warrnambool 19th century Deposit, while confined to the dark sandy loam, is covered by sand that is used here to date dune migration to the 20th century.

Author, Date, Report #	Description and Location	Results
Luebbers, R 2010 #11029	A complex CHMP was undertaken to test potential cultural significance of a proposed residential development between Whites Road and Aberline Road in Warrnambool in the States Southwest (immediately west of study area).	A complex assessment was undertaken first with hand excavation in a single 1.0 x 1.0 m test square near Russell Creek. No artefacts were recovered. Utilizing sedimentary profiles obtained from the hand excavated test pit, the river banks, and from the geotechnical study, 17 test pits were mechanically excavated. The pits were strategically located across the development property to sample all possible topographic and sedimentary features. No Aboriginal heritage materials were located in these test pits.
O'Reilly, S & McAlister, R 2011 #11591	A complex CHMP to test potential cultural significance for residential development along Wangoom Road and Aberline Road, Warrnambool (immediately west of study area).	Sub-surface testing was conducted in the activity area in areas of potential sensitivity that are to be impacted by the proposed activity and where poor ground surface visibility inhibited a comprehensive assessment of the Aboriginal cultural heritage sensitivity during the standard assessment. The results of the sub-surface testing indicate that the activity area has not been subject to major sub-surface disturbance. No Aboriginal cultural heritage materials, features or potentially sensitive deposits were identified in any of the excavations within the activity area.
O'Reilly, S. and McAlister, R. 2011 #11662	A complex CHMP for a residential subdivision north of the Merri River on Wollaston Road (approximately 5 km west of study area).	A review of previously registered sites in the geographic region indicates a strong concentration of sites on the banks of the Merri River and along the coastline. Aboriginal archaeological sites are most likely to occur on the margins of large swamps and on or close to the banks of major streams such as the Merri River. The survey confirmed that the entire activity area is considered to have moderate to high potential for the location of Aboriginal cultural heritage places in areas that have not been subject to prior disturbance due to its location adjacent to a major waterway. The complex assessment identified five low and moderate density stone artefact scatters (Wollaston Road 1, 3 AS, 4 IA, 5 IA and 6 AS; VAHR 7321-0450, 0486, 0482, 0483 and 0487). All the sites are located on the floodplain or the adjacent more elevated volcanic plains associated with the Merri River the western part of the activity area.
Dugay-Grist, L & McAlister, R 2011 #11721	A complex CHMP was undertaken to test potential cultural significance for a residential subdivision at Hopkins Point Road, Warrnambool (approximately 8 km south-east of study area).	Sub-surface testing was conducted in the activity area in areas of potential sensitivity that are to be impacted by the proposed activity and where poor ground surface visibility inhibited a comprehensive assessment of the Aboriginal cultural heritage sensitivity during the standard assessment. The results of the sub-surface testing indicate that the activity area has not been subject to major sub-surface disturbance below the 20–30 cm plough zone. One previously registered Aboriginal Place VAHR 7421-0194 was investigated through the excavations. No Aboriginal cultural heritage materials, features or deposits were identified during the excavation at VAHR 7421-0194 or at any other excavation area across the activity area at Hopkins Point Road.
Van Der Linde, S 2012 #12032	A complex CHMP was conducted to test potential cultural significance for proposed housing development at Deakin University, Warrnambool (approximately 5 km south-east of the study area)..	Subsurface testing (complex assessment) was carried out in this instance because the desktop and standard assessment were insufficient to accurately determine whether Aboriginal cultural heritage was likely to exist within the activity area. The subsurface testing was undertaken in order to determine whether subsurface deposits in the activity area were likely to contain Aboriginal cultural heritage. No Aboriginal places were identified in the activity area as a result of the desktop, standard and complex assessments.

Author, Date, Report #	Description and Location	Results
O'Reilly, S 2012 #12329	A desktop CHMP for Wannon Water pipeline development, Woollaston Road, Warrnambool (approximately 5 km west of study area).	A desktop review was conducted, reviewing previously registered sites and ethnographies to create a cultural significance prediction statement. Based on the results of this desktop assessment, it was determined that the activity area has low sensitivity for Aboriginal cultural heritage material and that no further assessments of the activity are deemed necessary.
Thomas, S 2014 #12882	A complex CHMP for maintenance on Hickford Parade sewer main, Warrnambool (approximately 5 km south of study area).	The complex assessment revealed the disturbed nature of the soil profile. No Aboriginal material remains were found during the complex excavations.
Chandler, J 2014 #12906	A complex CHMP for residential subdivision, Warrnambool North.	A complex assessment was undertaken to test the prediction model and areas of archaeological potential within the activity area. The subsurface testing program was designed to sample both the rise and flood zone landforms within the activity area, to determine if subsurface disturbance had occurred, and determine the nature, extent and significance of any Aboriginal archaeological material present. No new Aboriginal cultural heritage places were recorded as a result of the complex assessment
Burch, J 2014 #12923	A desktop CHMP for proposed development of three existing dwellings at 45-457 Barkly St, Warrnambool (approximately 4 km south of study area).	The results of the desktop assessment suggest that it is highly unlikely that Aboriginal cultural heritage may be present within the activity area. This is because; the activity area is not situated within an archaeologically sensitive landform or close to any areas known to be archaeologically sensitive for Aboriginal archaeological sites; and more than 90% of the land has been severely disturbed from the historical dwellings.
Stevens, J 2014 #12937	A complex CHMP for proposed sewer duplicate pipeline along Harris Street, Warrnambool (approximately 7 km south-west of study area).	No Aboriginal cultural heritage sites were located during the survey. A combination of three 50cm² test pits and four 40 cm² shovel test pits were undertaken to facilitate the assessment of Aboriginal cultural heritage places in a subsurface context. No Aboriginal cultural material was found within the test pits.
Mitchell, J 2014 #13111	A complex CHMP for residential subdivision at 17-19 Mortlake Road, Warrnambool, Victoria (approximately 2 km west of study area).	The results of the complex assessment support the conclusions of the desktop assessment, which predicted that there has been some disturbance to the surface and subsurface deposits within the activity area. There is a low potential that any further Aboriginal cultural heritage material is present in the activity area, therefore no further archaeological work is required.
Burch, J 2014 #13296	A complex CHMP for industrial subdivision at 80 Rodgers Road, Warrnambool (approximately 1 km east of study area).	A complex assessment (archaeological sub surface testing) of the activity area was undertaken. No Aboriginal cultural heritage or areas of Aboriginal archaeological sensitivity are located within the activity area; therefore no specific cultural heritage management recommendations are required.

Author, Date, Report #	Description and Location	Results
Burch, J 2015 #13473	A complex CHMP for remainder of proposed industrial subdivision at 80 Rodgers Road, Warrnambool (approximately 1 km east of study area).	A complex assessment (archaeological sub surface testing) of the activity area was undertaken to determine cultural significance. One Aboriginal archaeological site was discovered during the complex assessment: • Rodgers Road LDAD (7421-0226 [VAHR]). This Aboriginal archaeological site comprises a low density artefact distribution on a rise in the northern central portion of the activity area. No ground disturbing works are to take place within Rodgers Road LDAD (7421-0226 [VAHR]) or within ten metres of Rodgers Road LDAD (7421-0226 [VAHR]) before the activity.
Burch, J 2015 #13510	A complex CHMP for proposed residential subdivision at 20 Botanic Road, Warrnambool (approximately 3 km west of study area).	A complex assessment (archaeological sub surface testing) of the activity area was undertaken to determine cultural significance of site. One Aboriginal archaeological site was discovered during the complex assessment: • Botanic Road LDAD (7321-0493 [VAHR]) This Aboriginal archaeological site comprises an isolated artefact/low density artefact distribution located in a disturbed context in the centre of the activity area. The place is considered to be of low scientific significance.
Burch, J 2015 #13513	A standard CHMP for Trunk Sewer between Logans Beach Road and 5-9 Hopkins (approximately 6 km south of study area).	No Aboriginal archaeological sites or areas of Aboriginal archaeological sensitivity were identified during the standard assessment. The activity area has been heavily disturbed by the construction of Logans Beach Road, including associated underground utilities situated within the road reserve, the construction of multiple driveways and the excavation of land within the portion of the activity area situated within 5-9 Hopkins Road, Warrnambool, for the purposes of drainage. It is considered highly unlikely that Aboriginal cultural heritage may be present within the activity area; therefore no further assessment was undertaken.
Burch, J 2015 #13683	A standard CHMP for Trunk Sewer between Logans Beach Road and 5-9 Hopkins (approximately 6 km south of study area).	This CHMP examines part of the activity area examined for CHMP 13513 (Burch 2015). The activity area for the current CHMP is largely identical to the activity area that was examined for approved CHMP 13513, however the westernmost 250 metres of the activity area has been realigned and therefore this new alternative CHMP has been prepared. The results are the same as those found in CHMP 13513. No Aboriginal archaeological sites or areas of Aboriginal archaeological sensitivity were identified during the standard assessment.
James-Lee, T 2015 #13856	A complex CHMP for extensions to Gillin Park Retirement Village, Mahoneys Road, Warrnambool (approximately 3 km south of study area)	A total of one test pit (1.0x1.0 metres) and 24 shovel test pits (0.4x0.4 metres) were included in the Complex Assessment. No Aboriginal cultural heritage places were recorded during the course of this CHMP. This CHMP has determined that here is extremely low potential for Aboriginal cultural heritage to be present within the Activity Area.
Burch, J 2016 #13996	A standard CHMP for proposed installation of gas pipeline and a National Broadband Network (NBN).	The activity area has been highly disturbed through the construction of the road proper and the reserves either side of the road have been heavily modified through the construction of the road proper. No Aboriginal archaeological sites or areas of Aboriginal archaeological sensitivity were identified during the standard assessment. It is considered highly unlikely that Aboriginal cultural heritage may be present within the activity area; therefore no further assessment was undertaken.

Author, Date, Report #	Description and Location	Results
Stevens, J 2016 #14189	A complex CHMP for proposed eastern subdivision and land development at Huntingfield Drive, Warrnambool (approximately 2 km south of study area).	Four 1 x 1 m stratigraphic test pits and thirty-five 40 cm x 40 cm shovel probes were excavated within the activity area as part of the complex assessment. No Aboriginal cultural heritage remains or potentially sensitive deposits were identified in any of the four stratigraphic test pits or thirty-five 40cm x 40 cm shovel test pits.
Cavanagh, T & Oataway, K 2016 #14193	A complex CHMP prepared for proposed NBN 3WBO-05, Fibre Optic Cable Installation, Allansford.	To substantiate the results of the desktop and standard assessments, the complex assessment subsurface testing program was designed to test the area of archaeological potential on the slight rise at the eastern end of the activity area where it overlooks the Hopkins River. One Aboriginal cultural heritage site was found: VAHR 7421-0229 (Hopkins River IA1), containing one isolated artefact.

2.3.6 Aboriginal Archaeological Site Prediction Statement

The following site prediction statement[2] 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 AV2017).

The review of the previously recorded Aboriginal archaeological sites and previous archaeological investigations indicates that the most likely[3] site types in the study area are shell middens and artefact scatters (Table 5). Other likely site types to occur are low density artefacts distributions and isolated artefacts. Site types considered unlikely to occur in the study area are scarred trees, mounds, quarries, stone arrangements and Aboriginal burials. Other site types (e.g. scarred trees, Aboriginal burial sites, mounds, quarries and stone arrangements) are considered unlikely to occur due to post-Contact land management practices (ground disturbance and tree clearance) or, unsuitable geology or geomorphology.

Stone Artefact Scatters are considered likely to occur in the study area. With an understanding of surrounding registered sites, stone artefact scatters are a comparatively common site type within a 5 km radius of the study area (n=36%). The study area includes land within 200 m of Russels Creek, resulting in the proposed development to be located within a culturally sensitive area. Stone artefact scatters are more likely to occur within 200 m of a culturally sensitive water body than beyond this parameter. The combination of stone artefact scatters as a common site type and the culturally sensitive Russels Creek within the study area, there is a likely chance they will occur within the study area.

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.

[2] 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.

[3] 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.

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 study area. With an understanding of surrounding registered sites, low density artefact distributions are a comparatively common site type within a 5 km radius of the study area (n=9%). The study area includes land within 200 m of Russels Creek, resulting in the proposed development to be located within a culturally sensitive area. Low density artefact distributions are more likely to occur within 200 m of a culturally sensitive water body than beyond this parameter. The combination of low density artefact distributions as a common site type and the culturally sensitive Russels Creek within the study area, there is a likely chance they will occur within the study area.

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 map sheet. 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 unlikely to occur in the study area. The vegetation structure in the study area prior to European contact suggests that larger canopy trees are sparse in this landscape. A review of aerial images of the study area indicates that few examples of native trees occur in the study area. There are also no registered scarred trees within a 5 km radius of the study area, suggesting the unlikely possibility of any scarred trees being within the study area.

Aboriginal people caused scars on trees by removing bark for various purposes.

The scars, which vary in size, expose the sapwood on the trunk or branch of a tree. Scarred trees are found all over Victoria, wherever there are mature native trees, especially box and red gum. They often occur along major rivers, around lakes and on flood plains.

Shell Middens are considered possible to occur in the study area. Although there are no registered shell middens along Russels Creek, there are 25 shell middens within a 5 km radius of the study area to the south

along Hopkins River. Shell middens comprise a comparatively high percentage of site types within a 5 km radius of the study area (n=53%). As the study area is within 5 km of the Warrnambool coastline, it is possible that the study area could contain shell middens.

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

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

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

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

Mounds are considered unlikely to occur in the study area due to the historical agricultural and pastoral use of the study area.

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 because the geological structure suggests that raw material suitable for stone tool manufacture does not occur.

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 due to the historical agricultural and pastoral use of the study area.

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 as a specific landform are considered unlikely to occur in the study area. This is due to the topography of the landscape within the study area.

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 because the geomorphological character of the landscape is considered unsuitable for burials.

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 there are no registered Aboriginal mortuary trees within a 10 km radius of the study area.

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

The Aboriginal heritage desktop assessment identified 47 previously registered Aboriginal places within 5 km of the study area. No previously registered Aboriginal places were located within the study area. The most likely Aboriginal site types to occur within the study area are shell middens and artefact scatters. This prediction is based on the landforms within the study area and the most common site types and site component types within a 5 km radius of the study area. Based on the literature sourced through this desktop assessment, survey needs to be conducted to gain a greater understanding of potential Aboriginal cultural heritage within the study area.

2.4 Historical Context

This 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

Exploration

The first Europeans to land at Warrnambool were sealers and whalers, who established temporary beach huts in the bay by the mid-1830s. The Henty's, established at Portland in the 1830s, set up a number of successful pastoral properties inland (Sayers and Yule 1987). The rich pastoral lands of Western Victoria were explored by New South Wales Surveyor General, Major Thomas Mitchell on his expedition in 1836. Major Mitchell's exploration was aimed at gaining access to new pastoral lands. His highly favourable reports of 'Australia Felix' caused a rush of settlers into the Western District from New South Wales and Van Diemen's Land. The occupation of the Western District occurred at a rapid pace (Doyle and Context Pty Ltd 2003: 6).

Early Settlement

The first pastoralists to establish their home station within what is now the City of Warrnambool were the brothers James, William and John Allan, who arrived late in 1839 and established a temporary camp at the mouth of the Hopkins River on the east bank. This later became the pastoral run 'Tooram' (Billis and Kenyon 1974). Thomas Augustus Strong and Henry Foster took up land between the Merri and Hopkins River in 1841, naming the selection Saint Mary's. This run was located on what would become the centre of Warrnambool (Sayers and Yule 1987: 8; Doyle, Aitken and Honman 2001: 21).

European settlement was resisted by local Aboriginal populations, beginning with the arrival of the Henty family and others between 1834 and 1838. In 1842, squatters between Warrnambool and Lake Condah appealed to Governor La Trobe for protection against the *Gunditjmara*, stating that 'their numbers, their ferocity, and their cunning, render them peculiarly formidable'. This sustained fighting became known as the 'Eumeralla war' (Lovett-Gardiner 1993; Critchett 1990: 2).

Superintendent Charles La Trobe selected the site for the Warrnambool Township in 1845 on one of his several visits to the area. The government surveyor William Pickering laid out the town, and the first Warrnambool land sales were held in Melbourne in 1847 (Sayers 1970; Philip 1854).

Land Selection Acts and Closer Settlement

From as early as 1856 the colonial government began to implement a series of closer settlement policies aimed at placing farmers on small-holdings with a community focus. These schemes were not successful at

first. The policies rewarded the squatters and wealthier landowners, who were successfully able to secure their land holdings through the Land Selection Acts (Powell 1970). Small-scale farmers took up more modest parcels of land in the area, particularly near the Merri River, as early as 1850. These farmers typically cleared, cultivated and sowed their farms to pasture. The families also often operated a small business, such as a general store or public house (Neylon and Hubbard 2005: 22).

The 1862 Closer Settlement Land Act, however, began to change the circumstances in favour of the selectors. By the late nineteenth century the Government had the authority to re-acquire large areas by purchase and subdivide it into smaller farm allotments. Under the Act, several large properties in the Warrnambool area were divided. By 1906, fourteen estates had been purchased and broken up into 497 small farms, containing over 2,500 people. This form of closer settlement changed the look of the landscape. It became more heavily concentrated with farm houses, windmills, dairies and their farm buildings (Neylon and Hubbard 2005: 22).

Industries

The land around Warrnambool contained a range of rich natural resources (timbers and a variety of types of stone), which allowed for a number of early industrial endeavours. Bluestone, limestone and tufa found in and around Warrnambool were used extensively in public and private buildings. Extraction of this stone became an important industry between the late 1840s until the 1920s. Scoria and stone was extracted from a variety of pits on the edges of the township (O'Callaghan undated).

Wheat was an important early industry; a flourmill was constructed in Woodford as early as 1847. This mill, known as the Struth Flour Mill, was built on the Merri River, and was the first water powered mill in the area. The growing wheat industry led to the construction of the three substantial flour mills which were operating in Warrnambool by 1854 (Sayers and Yule 1987: 10, 91, 110). Sheep and cattle were grazed for their meat; however cattle became increasingly important for milk production. Technological improvements in dairying allowed for the industrialisation of milk production and saw the development of factories such as Nestlé, in Dennington (Neylon and Hubbard 2005: 10).

2.4.1.2 Land Use History

From the 1800s to the 1830s, sealers and whalers established huts around the Warrnambool area, but did not choose to settle in the inland areas (Yule & Sayers 1987:1, 3, 6; Sayers commentary in Boldrewood 1969: 27, in Murphy & Amorosi 2003). However, by the 1840s, squatters had begun to move into the area, and the first runs in the Warrnambool area were taken along the Merri and the Hopkins rivers (Yule & Sayers 1987, in Murphy & Amorosi 2003). The location that would become the township of Warrnambool was likely decided by Charles LaTrobe, and the area was extensively surveyed by Charles Pickering up to 1847 (Yule & Sayers 1987: 8, in Murphy & Amorosi 2003). Warrnambool has a long-standing dairy industry, and has more recently branched into tourism associated with its coast line and the presence of whales during June to September each year.

The area surrounding the subject site was used to run cattle and sheep. This necessitated the clearing of land for pasture and farm housing. In addition to the clearing and removal of trees and bushland from the area, pastoralist practise would have also resulted in some disturbance of the ground for the construction of fence lines and dams, stockyard pens, bores and wells.

The study area consists of twenty-five parcels. Lot sizes within the study area range from 4,000 sq. m to 50 ha in area. The average lot size within the growth area is approximately 14 ha in area. Tozer Memorial Reserve is located central to the study area and is owned by the Minister for Education.

Figure 3 and Figure 4 shows the original 1850s subdivision of the study area within the Warrnambool and Belfast region, Parish of Wangoom.

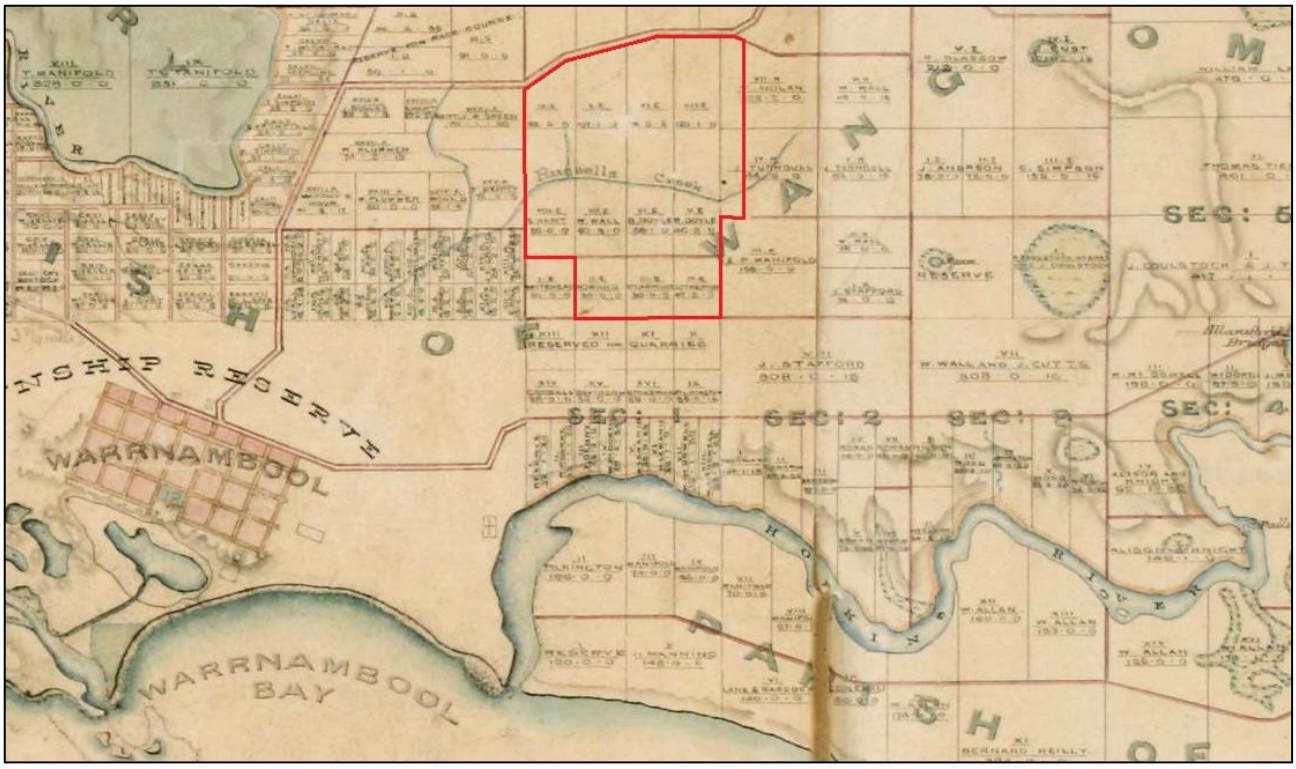


Figure 3: 1858 map of Warrnambool and Belfast region showing the original 1850s subdivision (Source: SLV ma000712)

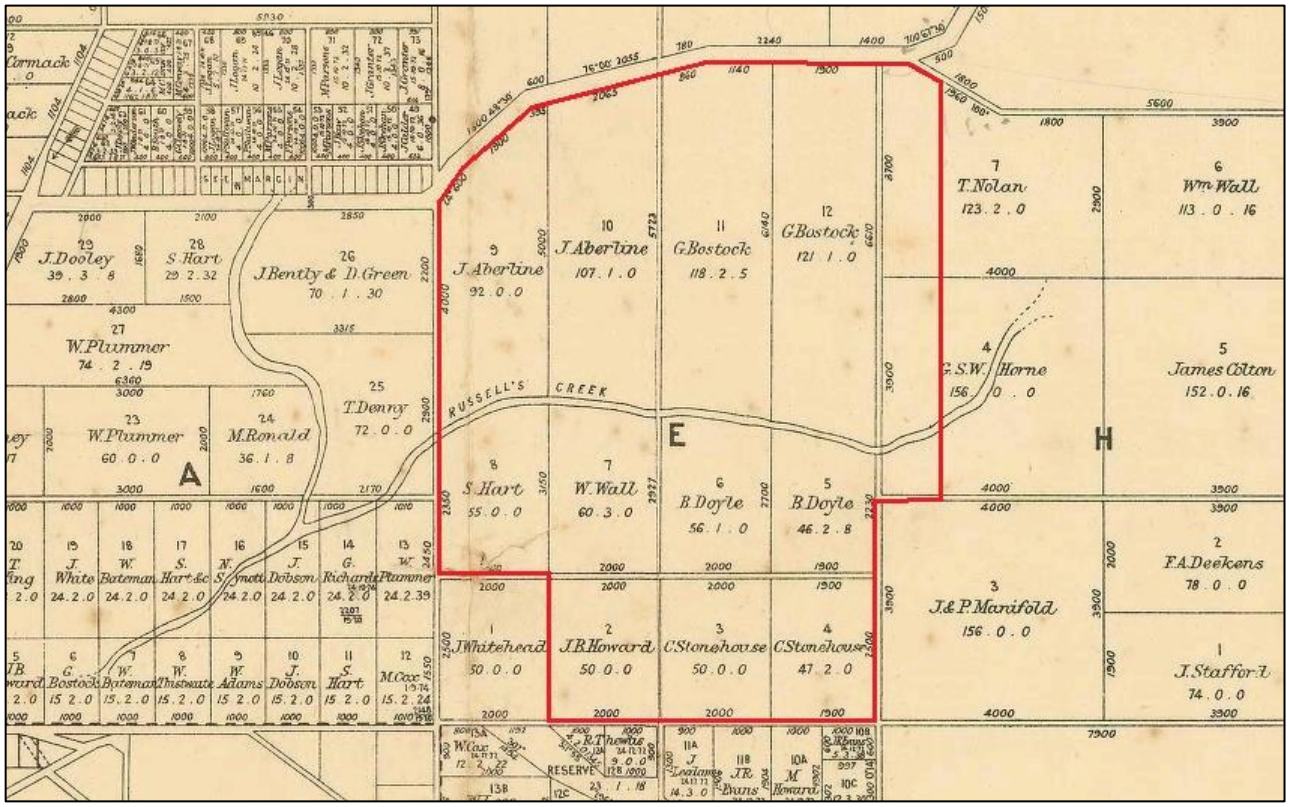


Figure 4: 1891 Parish of Wangoom plan showing the original 1850s subdivision and landholders (Source: SLV dq007101)

2.4.2 Database Searches

2.4.2.1 Victorian Heritage Register

The Victorian Heritage Register (VHR), established initially by the Victorian *Heritage Act 1995* and now by the *Heritage Act 2017*, 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 2017*, all shipwrecks in Victorian State waters that wrecked 75 years[4] 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 identified a total of one registered historical heritage place in the search area (Map 9). The site includes;

- H0620 (Proudfoot's Boathouse).

This site (H0620 (Proudfoot's Boathouse)) is not located within the study area.

[4] 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

2.4.2.2 Victorian Heritage Inventory

The Victorian Heritage Inventory (VHI), established initially by the Victorian *Heritage Act 1995* and now by the *Heritage Act 2017*, 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 two historical archaeological places included on the VHI in the search area (Map 9). These sites include:

- H7421-0013 (Former Warrnambool Toll House) and;
- H7421-0016 (Sherwood Homestead Complex).

Neither 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 places listed on the VWHI within the search area (Map 9).

2.4.2.4 Local Council

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

The Heritage Overlay (HO) of the Warrnambool Planning Scheme was examined for a 2 km radius area centred on the study area. The search identified a total of fourteen registered historical heritage places in the search area (Map 9). These sites include:

- HO326 (Verdon Street Precinct);
- HO205 (Former Half-way Hotel);
- HO226 (Street Tree Precinct);
- HO25 (Former Farm House);
- HO335 (Milestone);
- HO350 (236 Moore Street, Warrnambool);
- HO343 (Waikato);
- HO140 (Dwelling, 356 Raglan Parade, Warrnambool);

- HO158 (Waveney);
- HO42 (Weeripnong);
- HO151 (Proudfoot's Boathouse);
- HO145 (Former Napthine Residence);
- HO360 (60 Jukes Street, Warrnambool);and
- HO377 (Warrnambool Cemetery, Sexton's Cottage, Stone Wall and Rotunda).

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 identified a total of two registered historical heritage places in the search area (Map 9). These sites include:

- B5525 (Proudfoot's Boathouse); and
- B1625 (Weeripnong).

Neither of these sites are located within the study area.

2.4.2.6 Commonwealth and International Heritage Lists

The Commonwealth Department of the Environment and Energy(DoEE) maintains the National Heritage List (NHL), a register of exceptional natural, Aboriginal and historical heritage places which contribute to Australia's national identity. DoEE 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.

The 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 DoEE.

The DoEE 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 registered historical heritage places in the search area (Map 9).

2.4.2.7 *Summary*

A summary of the relevant historical heritage sites appears in Table 8.

Table 8: Summary of Previously Identified Historical Heritage Sites within 2 km of the Study Area

Register & Site Number	Site Name	Site Type	Within Study Area?
VHR H0620	Proudfoot's Boathouse	Built Heritage: Community	No
NTR B5525			
VHI H7421-0013	Sherwood Homestead Complex	Built Heritage: Community - Domestic	No
VHI H7421-0016	Former Warrnambool Toll House	Built Heritage: Community	No
HO326	Verdon Street Precinct	Built Heritage: Community - Domestic	No
HO205	Former Half-way Hotel	Built Heritage: Community - Domestic	No
HO226	Street Tree Precinct	Tree Planting	No
HO25	Former Farm House	Built Heritage: Community - Domestic	No
HO335	Milestone	Built Heritage: Community	No
HO350	236 Moore Street, Warrnambool	Built Heritage: Community - Domestic	No
HO343	Waikato	Built Heritage: Community - Domestic	No
HO140	Dwelling, 356 Raglan Parade, Warrnambool	Built Heritage: Community - Domestic	No
HO158	Waveney	Built Heritage: Community - Domestic	No
HO145	Former Napthine Residence	Built Heritage: Community - Domestic	No
HO360	60 Jukes Street, Warrnambool	Built Heritage: Community - Domestic	No
HO377	Warrnambool Cemetery, Sexton's Cottage, Stone Wall and Rotunda	Built Heritage: Community	No
NTR B1625	Weeripnong	Built Heritage: Community - Domestic	No

2.4.3 Previous Historical Archaeological Investigations

Regional and localised archaeological investigations have established the general character of historical archaeological sites located within the same geographic region as the study area and, a heritage study has been conducted for the Warrnambool Local Government Area (LGA). These studies often define the historical character of the LGA or for a specific township, predominantly for built heritage but also for

archaeological heritage. This information, together with the information gathered in Section 2.4.2 can be used to form the basis for a site prediction statement (Section 2.4.4)

An archaeological assessment conducted by **MacManus and Nicolson (2010)** was undertaken immediately east of the study area. The assessment was undertaken for a proposed re-zoning of the property at the corner of Horne Road and Rodgers Road, Warrnambool. Background research indicated that there have been no Aboriginal archaeological sites previously recorded within a 2 km radius of the activity area, and that there have been no historical archaeological sites previously recorded within a 2 km radius of the activity area. No Aboriginal or historical archaeological sites were identified during the survey.

A summary of archaeological reports relevant to the geographical region of the study area appears below (Table 9).

Table 9: Historical Archaeological Reports Relevant to the Study Area

Author, Date & HV Report #	Description and Location	Results
Murphy, A. 1994 HV #219	An archaeological survey for the proposed relocation of the Elliot St Rifle Range to a site at Lake Gillear in Warrnambool (approximately 15 km south-east of the study area).	No historical sites were identified during the archaeological survey conducted by Murphy for the proposed relocation of the Elliot St Rifle Range to a site at Lake Gillear in Warrnambool.
Smith, J. 1998 #663	Archaeological excavations in the Warrnambool botanical gardens (approximately 5 km south-west of the study area).	Excavations were carried out to clarify aspects of the gardens' previous design and layout. Excavations uncovered features from the garden's historic period. A development plan to re-establish a large eastern garden bed and reconstruction of a pathway is proposed.
Luebbers, R. 2000 #1054	Subsurface excavation of the 19th century timber bridge crossing the Hopkins River, Warrnambool.	The original timber bridge was constructed in 1862, and the standing bridge established in 1894/95. The extent of the demolition of the timber bridge is not known. Excavations uncovered a large amount of domestic refuse, dating from 1880-1910. These deposits occurred within fill, close to the river embankment. The artefacts are thought to have been introduced to the site within the fill used to construct the abutment, or it may have been an open refuse tip that formed in situ during the construction of the standing bridge.
Luebbers, R. 2001 #1277	Archaeological investigations of the proposed pipe alignment, for the Pertobe Road sewerage pump station in Warrnambool (approximately 8 km south-west of the study area).	A desktop assessment confirmed that low-lying land adjacent to colonial wharves and beaches were typically used for informal residential and industrial purposed prior to Warrnambool town planning laws. However, no historical archaeological sites were identified during the ground survey.
Murphy, A. and Amorosi, L. 2003 #1912	An archaeological survey of a proposed pipeline between the Nestle Plant in Drummond Street and the Warrnambool Wastewater Treatment Plant, Warrnambool (approximately 8 km west of the study area).	Seven previously recorded historical heritage sites occur within 5 km of the study area. These sites include the Nestle factory and workers cottages, a railway bridge, Merri River Cutting, the Breakwater at Lady Bay, and domestic sites. No historical sites were identified during the survey.

Author, Date & HV Report #	Description and Location	Results
Paynter, N. and Rhodes, D. 2005 #2573	An archaeological assessment of 23 lots on Wollaston Road, Warrnambool, affronting the Merri River (approximately 5 km west of the study area).	Two historical sites were identified during a site inspection: Merri River hut site (H7321-0033) and Wollaston Road Quarries (D7321-0032). The Merri River hut site is visible on an 1856 plan of the settled district of Warrnambool, in the form of two huts close together. No clear evidence of these sites was found, but a potential row of *in-situ* bluestones was identified south of a water trough. The Wollaston Road Quarry site comprises a number of former quarries fronting Wollaston Road. This site is visible on a 1922 Parish Plan. A bluestone weir crossing the Merri River at Bromfield Street was also noted, and a number of dry stone walls and exotic tree plantings were also visible, but not recorded.
Dig International Pty Ltd 2007 #3162	An archaeological assessment for the proposed development of a new arts and administration building for TAFE Victoria in Warrnambool.	A desktop assessment and site inspection showed that the land was reserved by the Government prior to the original survey of Warrnambool in 1850. A court house and watch house, built between 1850 and 1853, previously sat on the eastern side of the study area. Historical maps show four additional buildings once occupied the study area prior to the AMP building in 1907 and the Technical School in 1913. The southern portion of the study area was once occupied by Warrnambool's original gaol, also constructed in the 1850s. The former AMP building was once the site of stables thought to be built prior to 1870. It is expected that archaeological deposits and foundations associated with all these buildings will be present. The site inspection identified ceramic and glass artefacts on the ground surface, including some 19th century artefacts. Stone foundations were observed abutting the eastern wall of the former AMP building.
Clark, V and Noble, A 2008 #3353	This report details the results of archaeological excavations at Victorian Heritage Inventory Site H7321-0036 (Old Courthouse and Police Complex, Former Civic Buildings, Warrnambool).	Historical background research, controlled archaeological excavation, preparation of a detailed site plan of the 1853 courthouse remains, cataloguing and analysis of artefacts recovered from the excavations and construction monitoring were undertaken as part of this report. The site contains some of the wall footings associated with the 1853 courthouse, but these are only partially intact, and restricted to the northern section of the old courthouse site.
Hyett, J. 2011 #3677	An archaeological assessment of 7-9 Stanley Street, Warrnambool. The study area adjoins the Merri River (approximately 7 km south-west of study area).	The street trees in Stanley Street adjacent to the study area are included in the City of Warrnambool heritage overlay (HO226). The building rubble found across the centre of the study area was consistent with the 20th century houses being demolished and the material graded across the area. No historical sites were identified.

Author, Date & HV Report #	Description and Location	Results
MacManus, T. and Nicolson, O. 2010 #3726	An archaeological assessment for the proposed re-zoning of Horne Road, Warrnambool (immediately east of the study area)..	Background research indicated that there have been no Aboriginal archaeological sites previously recorded within a two kilometre radius of the activity area, and that there have been no historical archaeological sites previously recorded within a two kilometre radius of the activity area. No Aboriginal or historical archaeological sites were identified during the survey.
Webb, C and Tseng, B. 2012 #4129	An Archaeological Management Plan was undertaken for the proposed construction of retirement apartment buildings and other works at Lyndoch, an aged care facility located at Hopkins Road, Warrnambool (approximately 5 km south of study area).	A preliminary assessment of low cultural heritage significance was given by Coroneos et al. 2010. The site was considered to have historical significance relating to the different activities that took places over time; aesthetic significance relating to the hostel and its setting; and social or spiritual significance, through being a meeting place and serving as visitor accommodation, as well as its 50 plus years of use as an aged care facility. The field investigation undertaken by Webb and Tseng has not changed this assessment. Given the extensive disturbance across the site over recent decades, the assessment of low significance is confirmed.
Barker, A and van der Linde, S. 2013 #4275	An historical archaeological investigation commissioned by Deakin University as part of the preparation for a proposed student housing development at its Warrnambool Campus (approximately 5 km south-east of the study area).	An archaeological excavation was carried out over three days on 17-19 May 2012 in order to: uncover any further archaeological remains within the vicinity of the proposed activity impact zone and determine the nature, extent and significance of any archaeological remains uncovered, including potential archaeological occupation deposits associated with Sherwood Homestead Complex (H7421-0016).
Burch, J. 2016 #4697	A Historical Heritage Assessment (HHA) of part of Hopkins Point Road, Warrnambool, Victoria (Warrnambool City Council) (approximately 7 km south-east of study area)..	No historical archaeological sites or areas of historical archaeological sensitivity were identified during the survey. It is considered highly unlikely that historical cultural heritage may be present within the activity area; therefore no further assessment is required.

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 likely[5] site type in the study area is domestic sites (built heritage – community). Other likely site types to occur are other built heritage sites including tree plantings. There is a likelihood of farming sites and pastoral sites to occur within the study area due to land use history, although these site types do not occur within a 2 km buffer of the study area.

Domestic Sites are likely to occur in the study area as they are the most common site type within a 2 km buffer of the study area (n=68.75%). Evidence of domestic occupation may include structural remains or

[5] 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).

ruins of homesteads and/or outbuildings, domestic rubbish dumps or bottle dumps, wells or underground storage tanks.

Dry stone walls are unlikely to occur in the study area because there are no dry stone walls within a 4 km radius of the study area. Although dry stone walls are unlikely to occur within the study area, remnants of dry stone walls have been found to line internal property divisions or external property boundaries.

Tree Plantings are likely to occur in the study area as there is a known tree plantings site (HO226 – Street Tree Precinct) within a 2 km radius of the study area. The landforms present (undulating plains, slopes and creek terrace) are suitable to this site type. 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 because of the known land use history within and surrounding 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 because of the known land use history within and surrounding the study area. Breeding of livestock and dairying may be evidenced by the remains of stockyards, stables, barns and holding pens.

Road and Rail Infrastructure Sites are unlikely to occur in the study area because there are no known sites within a 2 km radius. There is no known evidence of this site type from the land use history of the study area and surrounds. Old road or railway routes may be evidenced by bridges, railway tracks or road or railway embankments.

Gold Mining Sites are unlikely to occur in the study area because there are no known historical gold mining sites within a 2 km radius of the study area. Evidence of gold mining may include deep mine shafts, adits and spoil heaps, mining equipment and machinery such as puddling machines, batteries and engines, and water races.

Shipwreck Sites are unlikely to occur in the study area because there are no known shipwreck sites within 2 km of the study area. Shipwreck sites are also not likely to occur as the study area is 4.6 km from the closest coastline. Evidence of shipwrecks may include pieces of worked timber (particularly if evidence of steam-bending is present), ballast, coal, pieces of iron, fired bricks and machinery such as engines, drive-gear (shafts and propellers), winches, and stoves.

War Heritage Sites are unlikely to occur in the study area because there are no known War Heritage Sites within a 2 km radius of the study area. War heritage sites may include standing monuments and marked locations, but may also include avenues of honour, grave sites, ex-military sites and local memorial sites.

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

The historical heritage desktop assessment identified 16 previously registered historical places within 2 km of the study area. No previously registered historical heritage places were located within the study area. The most likely[6] site type in the study area is domestic sites (built heritage – community). Other likely site types to occur are other built heritage sites and tree plantings. There is a likelihood of farming sites and pastoral sites to occur within the study area due land use history and prior historical archaeological investigations, although these site types do not occur within a 2 km radius of the study area.

[6] **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).

3 FIELD ASSESSMENT AND RESULTS

A ground survey of the study area was conducted to detect the presence of Aboriginal and/or historical cultural heritage, or areas of archaeological likelihood, in or associated with the study area.

3.1 Aims and Objectives

The aim of the survey was to:

- 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
- To verify the results of the background review and site predictive statement; and
- To assess the cultural heritage significance of any historical sites identified in the survey.

3.2 Methodology of the Survey

The study area was surveyed on 19-20 September 2017 by Austen Graham (Archaeologist) and Joshua Flynn (Archaeologist/ Heritage Advisor), with Caleb Clarke representing the Eastern Maar Aboriginal Corporation and Keicha Day representing the Gunditj Mirring Traditional Owners Aboriginal Corporation.

The survey took the form of a pedestrian survey in which four participants walked in a stratified random sampling strategy whereby an average of 9.9% of each landform in the study area was sampled. The study area was assessed for the presence of any mature native trees that may have cultural scarring. The geomorphological character of the study area was surveyed for evidence of caves, cave entrances and/or rock shelters. The primary landforms were identified (Map 10) and areas of Aboriginal archaeological likelihood were determined (Map 11).

A summary of the archaeological survey attributes appears in Appendix 3.

3.3 Visibility, Exposure and Coverage

Ground surface visibility (GSV) varied throughout the study area, while also varying throughout each identified landform.

The GSV within the slope landform varied across the study area. Most of this landform was agricultural land with long, thick pastoral crops (Plate 4 to Plate 5). This resulted in poor GSV across the majority of the slope landform. The slope landform is dissected from the centre of the study area heading south by Tozer Memorial Reserve (Plate 6). The GSV in Tozer Memorial Reserve is poor due to dense vegetation and undergrowth. Some areas within the reserve had good GSV and these areas were targeted for intensive ground surface survey.

The slope landform is also dissected west to east by Russells Creek, which comprises the creek terrace landform (Plate 7). The creek terrace landform has poor GSV due to long, thick pastoral grasses reaching right up to the creek bed itself. Stratigraphic exposure was identified along Russells creek, providing important insight into stratigraphic horizons within the creek terrace landform (Plate 11).

The GSV within the undulating plains landform varied across the study area. Most of this landform was agricultural land with long, thick pastoral crops (Plate 1 to Plate 2). This resulted in poor GSV across the majority of the undulating plains landform. The south-eastern section of the study area within the undulating plains landform is currently used as the Warrnambool Water Storage by Wannon Water. The areas surrounding the water storage dams (Plate 3) has poor GSV due to thick grass coverage. The water storages dams are classified as having Significant Ground Disturbance (SGD).

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

An overview of the effective survey coverage in each landform within the study area is provided in Table 10.

Table 10: Effective Survey Cover Calculations within the Study Area

Landform	Total Approximate Area (ha)	Average Landform GSV (%)	Area of Study area Surveyed (ha)	Percentage of Study area Surveyed (%)	Effective Survey Coverage (%)
Slope	163.50	10	16.00	9.8	1.0
Undulating Plains	160.10	15	16.00	10.0	1.5
Creek Terrace	16.30	15	1.60	9.8	1.5
Crest	20.10	10	2.00	10.0	1.0
Total	**360**	**12**	**35.60**	**9.9**	**1.2**

3.3.1 Limitations of the Survey

Parts of the study area were difficult to survey due to dense vegetation, primarily within Tozer Memorial Reserve. Ground surface visibility was poor across all landforms due to long, thick pastoral grasses. Poor GSV resulted in difficulties during identification of cultural heritage sites. With this limitation presented, areas of fair-excellent GSV were targeted and intensely surveyed.

3.4 Results of the Survey

3.4.1 Landforms

The survey confirmed the landforms identified during the desktop assessment (Table 8) with four main landforms present (Map 10).

Slope

The primary landform found within the study area is the slope landform (Map 10). This area is defined as the slope landform due to the change in gradient between the undulating plains landform and the creek terrace landform. The slope landform primarily comprises agricultural pastures used for grazing and crop production (Plate 4). Dissecting the slope landform from west to east is Russells Creek, comprising the creek terrace landform (Plate 7). The southern area of the slope landform south of the creek terrace is predominantly pastoral paddocks with the exception of Horne Road and reserves to the east. North of the creek terrace landform, the slope landform consists of pastoral paddocks, various rural homesteads and residences, Tozer Memorial Reserve (Plate 6) and man-made irrigation channels (Plate 9). Horne Road and reserves are again found within this landform to the east of the study area. Small sections across the landform have mature pines and dense vegetation, primarily used as wind-rows or paddock division (Plate 4). Various vehicle tracks between paddocks and private residential roadways are found within the study area. Private fences are found throughout the slope landform. Tozer Memorial Reserve comprises mainly of native revegetation and graded driveways and walkways.

Undulating Plains

The undulating plains landform is the secondary predominant landform within the study area (Map 10). This landform is found within the northern and southern sections of the study area. The southern section of the undulating plains landform is dissected by Boiling Down Road. Various residential properties stem from Boiling Down Road. The south-eastern corner of the landform comprises the Warrnambool Water Storage facility of Wannon Water. The water storage facility occupies a large portion of the undulating plains landform and constitutes Significant Ground Disturbance (SGD) (Plate 3 and Map 10). One dam is located in the western quarter of this southern section of the landform, which also constitutes SGD. The southern section of the undulating plains landform is predominantly agricultural pastoral land used for grazing and crop production (Plate 2). Various vehicle tracks between paddocks and private residential roadways are found within the study area. Private fences are found throughout the undulating plains landform.

Creek Terrace

The creek terrace landform dissects the southern section of study area west to east (Map 10). The creek terrace landform comprises Russells Creek and associated floodplain (Plate 7). Edges of Russells Creek have been subject to erosion due to impacts from cattle grazing. The most southern section of Tozer Memorial Reserve is found in the centre of the creek terrace landform. Due to natural erosion of the creek walls along Russells Creek, a stratigraphic profile of the soil is exposed. This suggests that the soil profile within this landform has an A horizon of approximately 300 mm deep, with the B horizon (clay) extending to unknown depths below 300 mm.

Crest

The crest landform is situated in the north-eastern section of the study area (Map 10). This landform is distinguished by a circular elevated crest within the slope landform. This landform comprises mainly of pastoral paddocks, including associated residential rural buildings (Plate 8).

Plate 1: Study area facing west showing poor GSV of undulating plains landform.

Plate 2: Study area facing east from Tozer Memorial Reserve showing poor GSV of undulating plains.

Plate 3: Study area facing west showing poor GSV of undulating plains landform at Wannon Water storage facility and SGD.

Plate 4: Study area facing north-west showing poor GSV of slope landform and tree windrows.

Plate 5: Study area facing south-east showing poor GSV of slope landform, sloping downward toward creek terrace landform.

Plate 6: Study area facing south showing eastern border of Tozer Memorial Reserve and poor GSV of slope landform.

Plate 7: Study area facing south-west showing poor GSV of creek terrace landform.

Plate 8: Study area facing east showing crest landform.

Plate 9: Study area facing north-east showing irrigation channel/ drainage line.

Plate 10: Example of SGD in north-western section of study area (ruins).

Plate 11: Study area facing south showing stratigraphic horizons, exposed at Russells Creek.

3.4.2 Aboriginal Cultural Heritage and Areas of Aboriginal Cultural Heritage Likelihood

One main area of Aboriginal cultural heritage sensitivity is located within the study area (Map 2). This area of sensitivity includes the creek terrace landform, comprising of Russells Creek and associated floodplains, and the slope landform immediately surrounding the creek terrace landform. Complex assessment (subsurface testing) is required in this area of Aboriginal cultural heritage sensitivity because it is not possible to determine presence of Aboriginal cultural heritage in the study area without complex assessment.

All mature native trees were examined and no cultural scarring was located.

There are no caves, cave entrances or rock shelters present within the study area.

No Aboriginal sites/artefacts were identified during the survey (Map 10).

Areas of Aboriginal Likelihood

Areas of Aboriginal cultural heritage likelihood have been divided into three categories; high, moderate and low likelihood.

One area of *high* Aboriginal likelihood was identified during the survey (Map 11):

- Russells Creek (and associated slope landform); Russells Creek has been identified as an area of high Aboriginal likelihood as it is included within the mapped area of Aboriginal cultural heritage sensitivity (Map 2). This area of high likelihood includes Russells Creek and the associated slope landform, 200 m north and south of Russells Creek itself. The southern-most section of Tozer Memorial Reserve is included within this area of high Aboriginal likelihood.

One area of *moderate* Aboriginal likelihood was identified during the survey (Map 11):

- Crest landform; this area of moderate Aboriginal likelihood is defined by the boundary of the crest landform. This area currently consists of agricultural properties including pastoral paddocks and associated agricultural building and residences. This area is of moderate likelihood as the landform is seen a vantage point within the landscape, overlooking Russells Creek and southern undulating plains and slopes.

One area of *low* Aboriginal likelihood was identified during the survey (Map 11):

- Slope and undulating plains landforms; this area of low Aboriginal likelihood comprises the majority of the study area. This area currently consists of agricultural properties including pastoral paddocks and associated agricultural building and residences. This area also includes the land subject to SGD in the south-eastern section of the study area, Wannon Water storage facility.

3.4.3 Historical Heritage Sites and Areas of Historical Archaeological Likelihood

Two potential historical heritage sites were identified during the survey; 174 Aberline Road, Warrnambool and 78 Boiling Down Road, Warrnambool (Map 10).

As potential historical heritage sites, a site card will need to be submitted to HV to determine whether the sites represent a level of significance high enough to be registered as historical sites.

Potential Sites

- 174 Aberline Road, Warrnambool: The site consists of the primary sandstone house structure (and associated modern extensions), horse cart/buggy and sandstone structure/kitchen. The site extent comprises these structures and the artefact, spanning approximately 1040 m². The site is bounded to the north-east, east and south-east by unknown mature introduced trees, yet is not bounded by vegetation to the north and south and is unfenced and open to pastoral paddocks. The site is bound to the west by a large modern corrugated tin shed.
- 78 Boiling Down Road, Warrnambool: The site consists of four primary historical structures/buildings including; 1) large wooden & corrugated tin barn, 2) sandstone barn and associated wooden & corrugated tin extension with sandstone footing, 3) wooden & corrugated tin shed with sandstone footing and 4) medium wooden & corrugated tin barn. The site also consists of 5) bluestone paving in the south-western section of the site boundaries, approximately 4 x 15 m. Various modern structural additions/extensions are found within the site. The entire site spans approximately 2775 m².

Potential Areas of Historical Archaeological Likelihood

The site extents of both 174 Aberline Road, Warrnambool and 78 Boiling Down Road, Warrnambool were identified as potential areas of historical archaeological likelihood. The site extent of 174 Aberline Road, Warrnambool is shown in Section 4.2.1, Figure 5. The site extent of 78 Boiling Down Road, Warrnambool is shown in Section 0, Figure 6.

No additional areas of historical archaeological likelihood were identified during the survey.

3.4.4 Previous (Significant) Ground Disturbance

The term Significant Ground Disturbance (SGD) is defined under r.4 of the *Aboriginal Heritage Regulations 2007* (see Glossary). The assessment of 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.

Nine areas of previous (significant) ground disturbance were identified during the survey (Map 10):

Table 11: Areas of previous (significant) ground disturbance within study area

Area of previous SGD	Council Property Identifier	Lot	Title Plan	Address	Within area of cultural heritage sensitivity?
Wannon Water storage facility	24	1	TP16129	83-119 Dales Road, Warrnambool	No
	25	1	TP883382		
Dam	4	1	PS724360	80 Aberline Road, Warrnambool	Yes

Area of previous SGD	Council Property Identifier	Lot	Title Plan	Address	Within area of cultural heritage sensitivity?
Dam	4	2	PS724360	80 Aberline Road, Warrnambool	No
Dam	13	2017	PP3729	43 Boiling Down Road, Warrnambool	No
		2018	PP3729		
Dam	4	1	TP222898	174 Aberline Road, Warrnambool	No
Ruins	4	1	TP222898	174 Aberline Road, Warrnambool	No
Ruins	12	2	PS406836	214 Horne Road, Warrnambool	Yes
Large soil stockpile	12	2	PS406836	214 Horne Road, Warrnambool	Yes
Large soil stockpile	12	2	PS406836	214 Horne Road, Warrnambool	Yes

Various other forms of previous ground disturbance, *not* meeting the definition of SGD are found through the study area including fenced, roads, power-lines, rural housing structures, rural farming structures and livestock soil impact/erosion.

Non-human previous ground disturbance was identified along Russells Creek (Plate 12). This ground disturbance is caused by erosion from the water flow of Russells Creek, creating an exposed stratigraphical profile either side of the creek.

3.4.5 Survey – Summary of Results and Conclusions

The standard assessment identified four primary landforms; slopes, undulating plains, creek terrace and a crest. No Aboriginal cultural heritage sites were identified during the standard assessment. Areas of archaeological likelihood were identified and classified as having high, moderate or low likelihood (Map 11). One area of high likelihood was identified along Russells Creek. The remainder of the study area was determined to be of low likelihood, with the exception of the crest landform, identified as having moderate likelihood.

Nine areas were identified as having previous ground disturbance, meeting the definition of SGD (Map 10). Four of these areas of SGD are found within an area of Aboriginal cultural heritage sensitivity and high archaeological likelihood. Two potential historical heritage sites were identified; 174 Aberline Road, Warrnambool and 78 Boiling Down Road, Warrnambool.

The presence of known areas of Aboriginal cultural heritage sensitivity and high archaeological likelihood means that complex assessment is mandatory in these areas.

4 DETAILS OF CULTURAL HERITAGE IN THE STUDY AREA

4.1 Aboriginal Cultural Heritage in the Study Area

No Aboriginal Places were located within the study area (Map 8).

4.2 Historical Heritage in the Study Area

Two potential historical archaeological sites were located within the study area (Map 10):

- 174 Aberline Road, Warrnambool; and
- 78 Boiling Down, Warrnambool;

Site cards for each of the above sites were submitted to HV to determine whether each site as a level significance high enough for registration as historical sites.

Please note: these sites were not registered as historical heritage sites as they did not meet the threshold for registration, therefore, there is no requirement for any further historical heritage investigations.

4.2.1 174 Aberline Road, Warrnambool

4.2.1.1 Location of 174 Aberline Road, Warrnambool

Primary Grid Coordinate: AGD66 Zone 54, E 632919.1, N 5752704.1.

Cadastral details are:

- Lot: 1, Title Plan: TP222898, Parish: Wangoom and County: Villiers.

4.2.1.2 Extent of 174 Aberline Road, Warrnambool

The extent of 174 Aberline Road, Warrnambool is based around three features; 1) Primary sandstone residence; the primary sandstone residence consists of an original sandstone structure (10 x 9 m with 4 x 4 m kitchen attachment) (Plate 12) and additional modern asbestos extension (4 x 2.5 m) (Plate 15). There is a large bluestone slab at the foot of the entranceway, indicative of early-mid 19th century architecture; 2) Secondary sandstone structure; the secondary sandstone structure/kitchen is located approximately 10 m east of the primary sandstone residence. This structure is approximately 4 x 3 m and comprises a corrugated tin roof (Plate 13). This structure also has a large bluestone slab at the foot of the entranceway, indicative of early-mid 19th century architecture; and 3) Wooden horse cart/buggy; this artefact is located approximately 60-80 m west of the primary sandstone residence. It is currently situated in an open paddock (Plate 14). The extent of the site has been defined on the above features and a thorough inspection for any further potential archaeological deposits.

4.2.1.3 Nature of 174 Aberline Road, Warrnambool

The primary function of the site as a whole would have been an agricultural residence. Residential activities would have occurred within the primary sandstone residence. Activities such as stock feeding, stock holding and agricultural storage would have occurred in the secondary sandstone structure. It is evident through thorough inspection of the site that development of structures within the site has occurred at various points in history. The wooden cart/buggy is in good condition and was believed to be used for agricultural purpose on the property it is located.

4.2.1.4 Significance of 174 Aberline Road, Warrnambool

For information regarding the methodology for assessing historical heritage significance, please refer to Appendix 4.

What is Significant?

174 Aberline Road, Warrnambool in Warrnambool contains the archaeological remains of a primary sandstone house structure (and associated modern extensions), horse cart/buggy and sandstone structure/kitchen.

Archaeological features include primary sandstone house structure (and associated modern extensions), horse cart/buggy and sandstone structure/kitchen. There is potential for further archaeological evidence, yet poor GSV due to thick grass has covered any evidence of this.

The site has the potential to provide information about post-contact agricultural activities in relation to the geographic region. The site also has potential to provide information about early-mid 19th century architectural construction processes and designs.

How is it Significant?

The site is of historical, scientific, aesthetic and social significance to the Warrnambool City Council, at a local level.

Why is it Significant?

The site is significant to the Warrnambool City Council for the following reasons:

174 Aberline Road, Warrnambool is of historical significance because of the representativeness of features within the site boundary. The intact sandstone structures within the site boundaries are representative of early-mid 19th century residential and agricultural structures. The primary sandstone house would have been used for residential purposes, and activities such as stock feeding, stock holding and agricultural storage would have occurred in the secondary sandstone structure. The site possesses moderate historical significance. The site is of moderate historical significance because of the intact structural remains, yet lacks written histories surrounding the site itself.

174 Aberline Road, Warrnambool is of scientific significance because there is archaeological potential for the site. There is potential for archaeological materials to be present within the site boundary. Such potential materials could be previous pavements within the site boundary, prior landscaping, subsurface cellars and artefactual materials. The presence of intact, in situ structural remains means the site has good archaeological potential. The archaeological significance of the site is based solely on the intact structural content of the site. As there are no known written histories specific to the site itself, archaeological

significance is based on structural and archaeological integrity of the site. Therefore, the scientific significance of the site is moderate as archaeological material remains are unknown.

174 Aberline Road, Warrnambool is of aesthetic significance because of the architectural styles of the primary residential sandstone structure and the secondary sandstone structure. The primary and secondary sandstone structures possess low-moderate aesthetic significance. Aesthetic significance is based on the 19th century architecture of both structures. These two structures are a good representation of architecture of the time. The architecture of both structures is predominantly intact and is at low risk of rapid deterioration and loss of structural integrity.

174 Aberline Road, Warrnambool is of social significance because the site has potential to possess significance to the local community of Warrnambool on a social level. Because of the estimated age of the site, there is potential for social significance and/or association with the site.

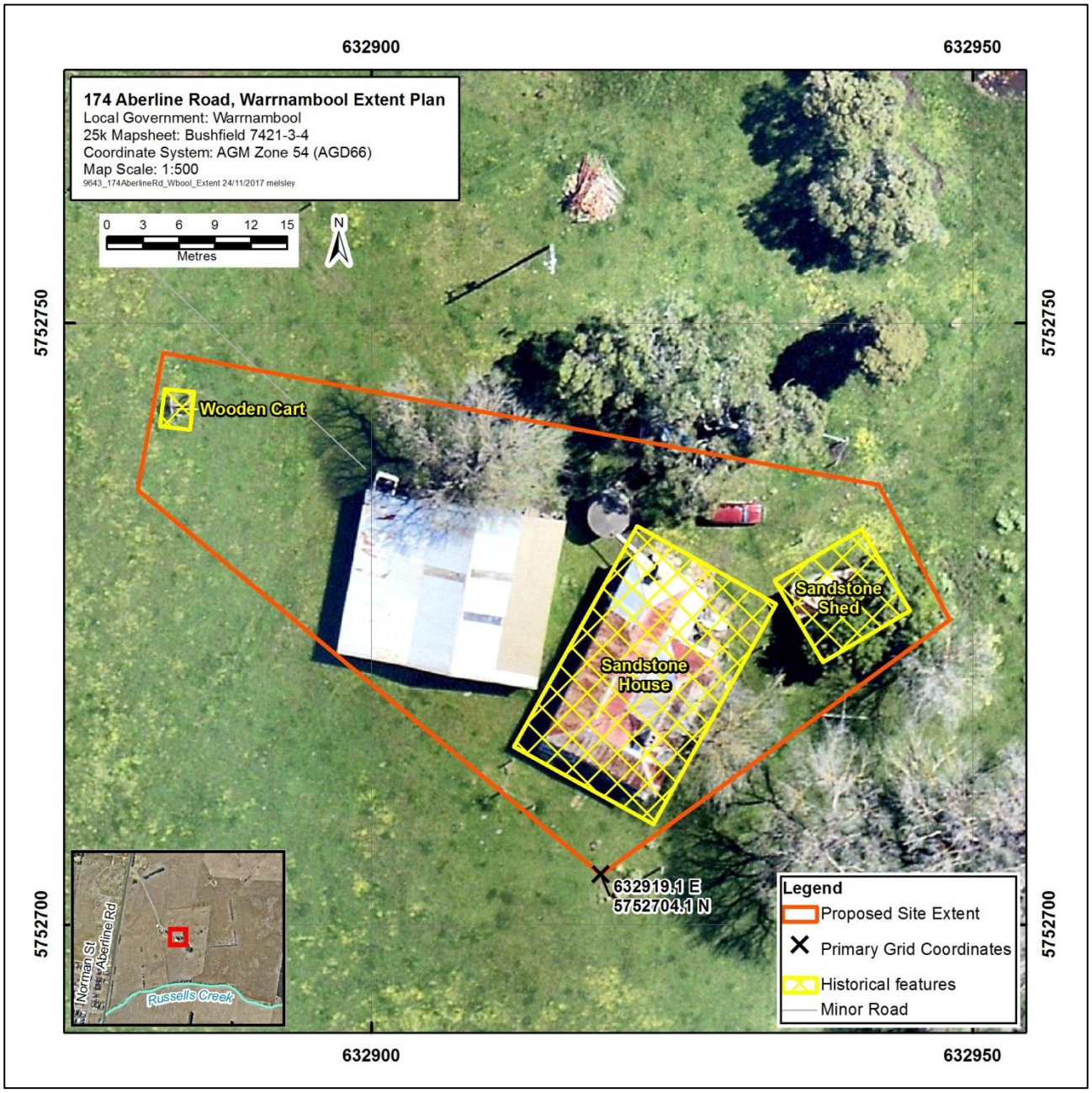


Figure 5: Extent of 174 Aberline Road, Warrnambool

Plate 12: View of 174 Aberline Road, Warrnambool facing north – primary sandstone structure.

Plate 13: View of 174 Aberline Road, Warrnambool facing south-east – secondary sandstone structure.

Plate 14: View of 174 Aberline Road, Warrnambool facing south-east – wooden horse cart.

Plate 15: View of 174 Aberline Road, Warrnambool facing south-west - primary sandstone structure with extension.

4.2.2 78 Boiling Down Road, Warrnambool

4.2.2.1 Location of 78 Boiling Down Road, Warrnambool

Primary Grid Coordinate: AGD66 Zone 54, E 633292.8, N 5751799.5.

Cadastral details are:

- Lot: 4, Title Plan: PS433295, Parish: Wangoom and County: Villiers.

4.2.2.2 Extent of 78 Boiling Down Road, Warrnambool

The extent of 78 Boiling Down Road, Warrnambool is based on five primary features;

1) Large wooden & corrugated tin barn; this primary footprint of this structure (8 x 4 m) is believed to have remained the same, with modern inclusions of wood and corrugated tin for structure maintenance (Plate 16).

2) Sandstone barn and associated wooden & corrugated tin extension with sandstone footing; this structure is south-east of the large wooden & corrugated tin barn. The sandstone barn (5 x 3 m) is believed to have been constructed prior to the associated wooden & corrugated tin extension (Plate 17). The wooden and corrugated tin extension (3.5 x 2 m) is believed to post-date the sandstone barn, yet is still believed to have been built during early-mid 19th century. The wooden & corrugated tin extension is set upon a sandstone footing..

3) Wooden & corrugated tin shed with sandstone footing; this structure is east of above sandstone barn. The wooden & corrugated tin shed with sandstone footing (2.5 x 2 m) is situated in the centre of the structure complex and is believed to have been used for agricultural storage (Plate 17). To the south of this structure is a modern addition, not believed to be part of the original historical complex.

4) Medium wooden & corrugated tin barn; this structure is situated east of all above structures (Plate 18). This structure does not have a sandstone footing, yet includes a large bluestone slab at the foot of the entranceway. The primary purpose of this barn is believed to have been for stock holding and feeding. There have been various modern additions to this structure, including metal fencing to the east and corrugated fencing to the south (Plate 20).

5) Bluestone paving; the bluestone runs north to south, east of the above medium wooden & corrugated tin barn. The footprint of this bluestone paving is approximately 4 x 15 m. Modern fencing has been placed at the northern and eastern boundaries of the paving (Plate 19). This bluestone paving is believed to define an entranceway into the historical structure complex from the southern and eastern pastoral paddocks.

NOTE: corrugated tin for all structures are believed to be installed post-original construction of structures 1), 2), 3) and 4) (Plate 16 to Plate 20).

4.2.2.3 Nature of 78 Boiling Down Road, Warrnambool

The primary function of the site as a whole would have been agricultural. No section of the site was used for residential purposes. Activities such as stock feeding, stock holding and agricultural storage would have occurred in these structures. It is evident through thorough inspection of the site that development of structures within the site has occurred at various points in history.

4.2.2.4 Significance of 78 Boiling Down Road, Warrnambool

For information regarding the methodology for assessing historical heritage significance, please refer to Appendix 4.

What is Significant?

The archaeological site at 78 Boiling Down Road, Warrnambool contains the structural remains of agricultural structures, believed to be constructed during early-mid 19th century.

The site is approximately 2775 m² and includes multiple features. These features include; 1) large wooden & corrugated tin barn, 2) sandstone barn and associated wooden & corrugated tin extension with sandstone footing, 3) wooden & corrugated tin shed with sandstone footing, 4) medium wooden & corrugated tin barn and 5) bluestone paving. There are no known written historical accounts for the site and the sites significance is largely based on the archaeological integrity of the site. The is situated amongst agricultural and pastoral land which has been used for agricultural purposes since European contact and occupation

No archaeological excavations of the site have occurred to date.

The site has the potential to provide information about post-contact agricultural activities in relation to the geographic region. The site also has potential to provide information about early-mid 19th century architectural construction processes and designs.

How is it Significant?

The site is of historical, scientific and social significance to the Warrnambool City Council, at a LOCAL level.

Why is it Significant?

The site is significant to the Warrnambool City Council for the following reasons:

78 Boiling Down Road, Warrnambool is of historical significance as an example of an agricultural structural complex built during the early-mid 19th century. They demonstrate original design qualities for 19th century farm structures including the sandstone brickwork, sandstone footings, weatherboard and horizontal timber paling construction, and the timber doors. The site possesses moderate historical significance. The site is of moderate historical significance because of the intact structural remains, yet lacks written histories surrounding the site itself.

The site is of scientific significance because there is archaeological potential for the site. Such potential archaeological materials could be previous pavements within the site boundary, prior landscaping, subsurface cellars and artefactual materials. The presence of intact, in situ structural remains means the site has good archaeological potential. The archaeological significance of the site is based solely on the intact structural content of the site. As there are no known written histories specific to the site itself, archaeological significance is based on structural and archaeological integrity of the site. Therefore, the scientific significance of the site is moderate.

The site is of social significance because the site has potential to possess significance to the local community of Warrnambool on a social level. Because of the estimated age of the site (early-mid 19th century), there is potential for social significance and/or association with the site

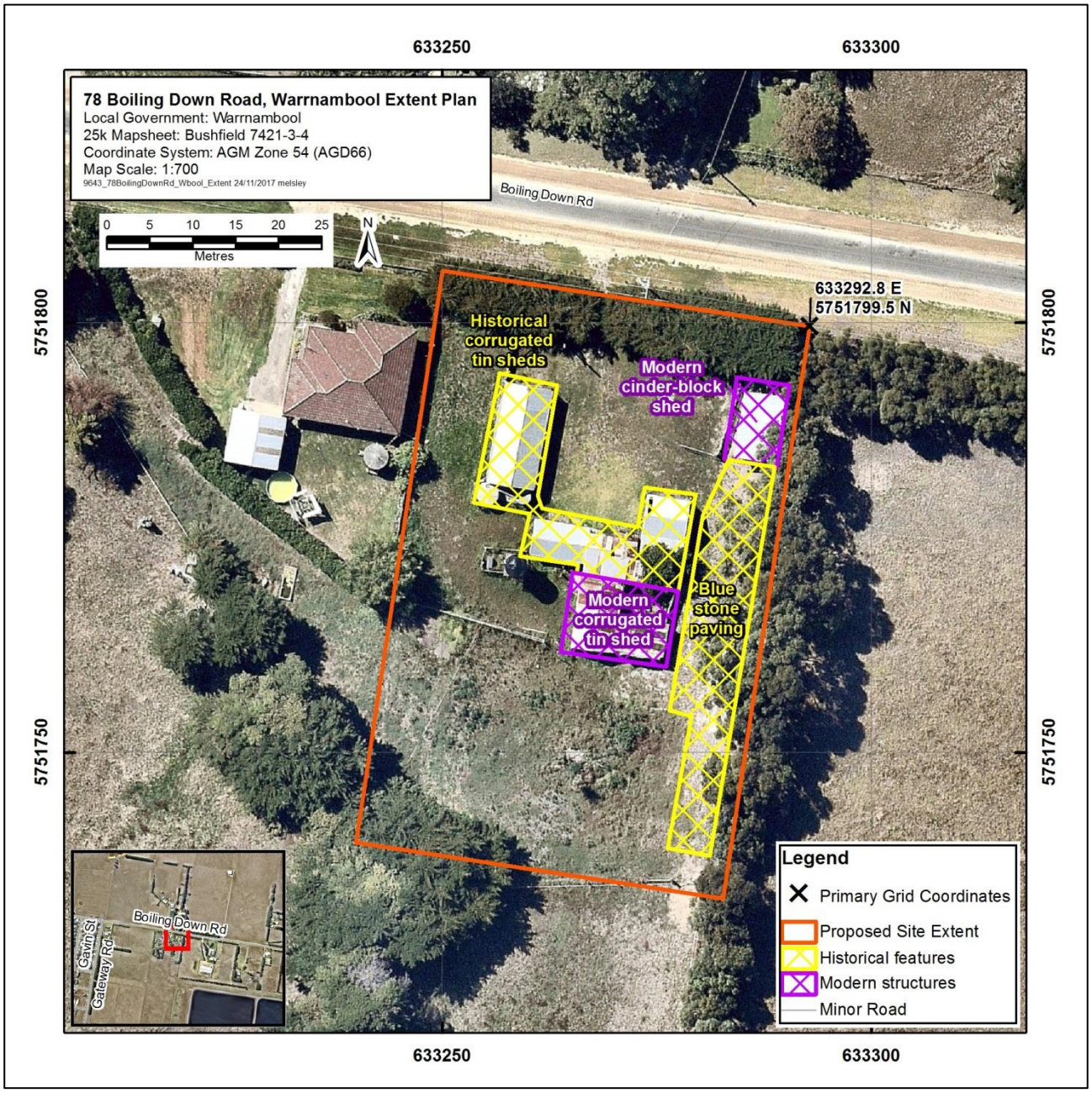


Figure 6: Extent of 78 Boiling Down Road, Warrnambool

Plate 16: View of 78 Boiling Down Road, Warrnambool facing south-east – large wooden and corrugated tin barn.

Plate 17: View of 78 Boiling Down Road, Warrnambool facing south - sandstone barn and associated wooden & corrugated tin extension.

Plate 18: View of 78 Boiling Down Road, Warrnambool facing south-east – medium wooden and corrugated tin shed.

Plate 19: View of 78 Boiling Down Road, Warrnambool facing south – bluestone pavement.

Plate 20: View of 78 Boiling Down Road, Warrnambool facing north-west – modern tin extension within site boundary.

Plate 21: View of 78 Boiling Down Road, Warrnambool facing north-east – modern cinderblock structure within site boundary.

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. In areas where it is considered that a CHMP is not required, this will be because that area was considered to have no Aboriginal cultural heritage likelihood (archaeological sensitivity) and/or because the study area has been subject to previous significant ground disturbance. Note that planning requirements may require a CHMP to be prepared for all of the study area.

The results of the initial survey and subsequent field inspection show that there is potential for 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. The areas requiring a complex CHMP (i.e. archaeological subsurface investigation) are therefore discussed below.

A summary of the Recommendations is provided at the end of this section (Table 12).

5.1 Aboriginal Cultural Heritage

Recommendation 1: Mandatory Cultural Heritage Management Plans

In properties where areas of Aboriginal cultural heritage sensitivity (as identified by *Aboriginal Heritage Regulations 2007*) are present (Map 11 and Table 12) and a high impact activity will take place, a mandatory CHMP must be undertaken. The CHMP will include an archaeological survey (standard assessment) and subsurface testing program (complex assessment) 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 *high and moderate* 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.

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 an area of *moderate* archaeological likelihood is present (Map 11 and Table 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* archaeological likelihood outside of the voluntary and mandatory CHMP areas, it is recommended that a detailed inspection and risk assessment be undertaken. 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: 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.

5.2 Historical Heritage

Recommendation 5: No Requirement for Further Archaeological Investigation

As there are no known historical heritage sites or areas considered to have historical heritage likelihood there is no requirement for any further historical heritage investigations.

Recommendation 6: Contingency for Historical Heritage

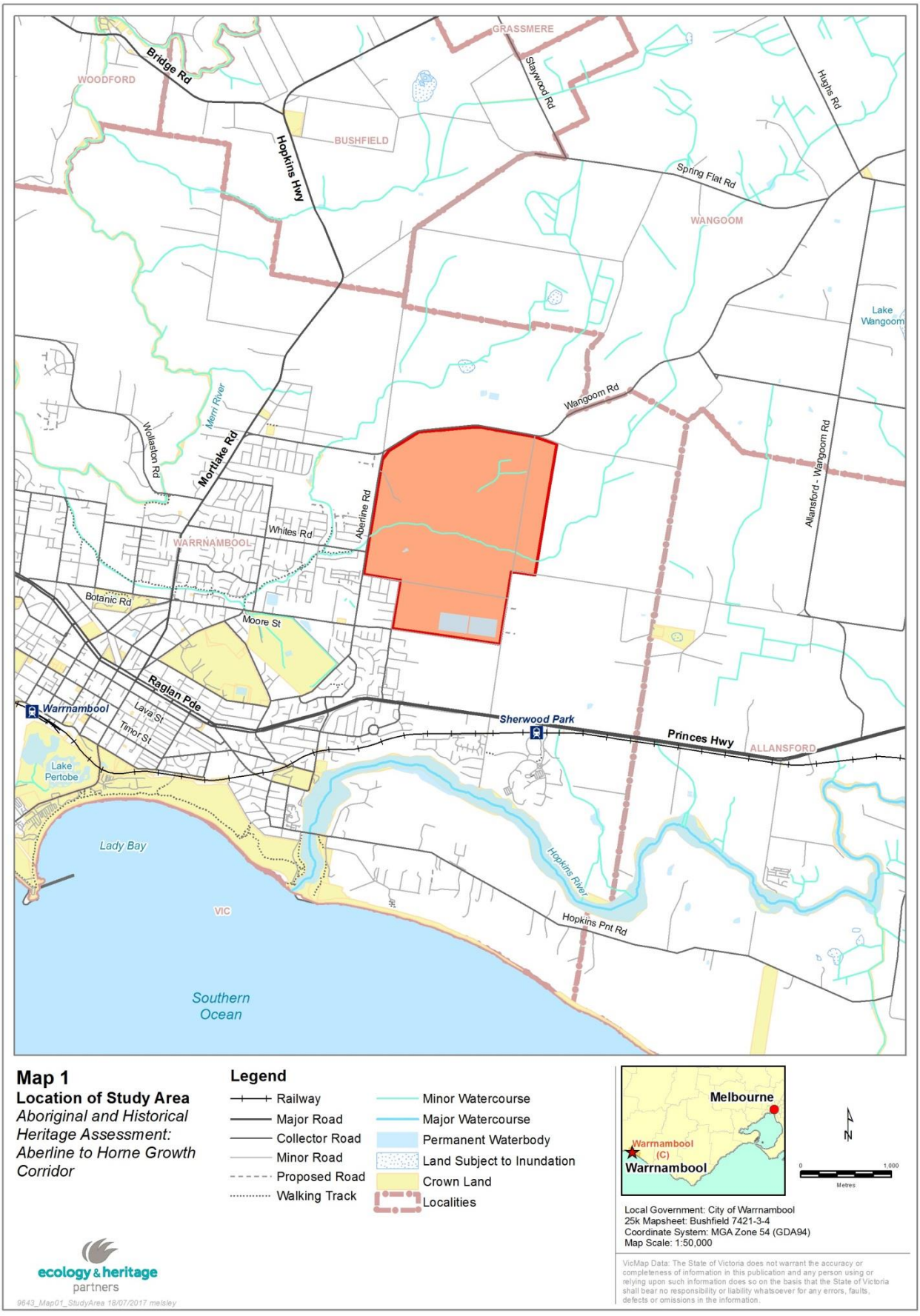
There are no other known historical heritage issues in regard to the proposed development. If any historical heritage issues are encountered during the course of construction then works should cease within 10 m of the area of concern and a qualified Cultural Heritage Advisor (or Heritage Victoria) should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

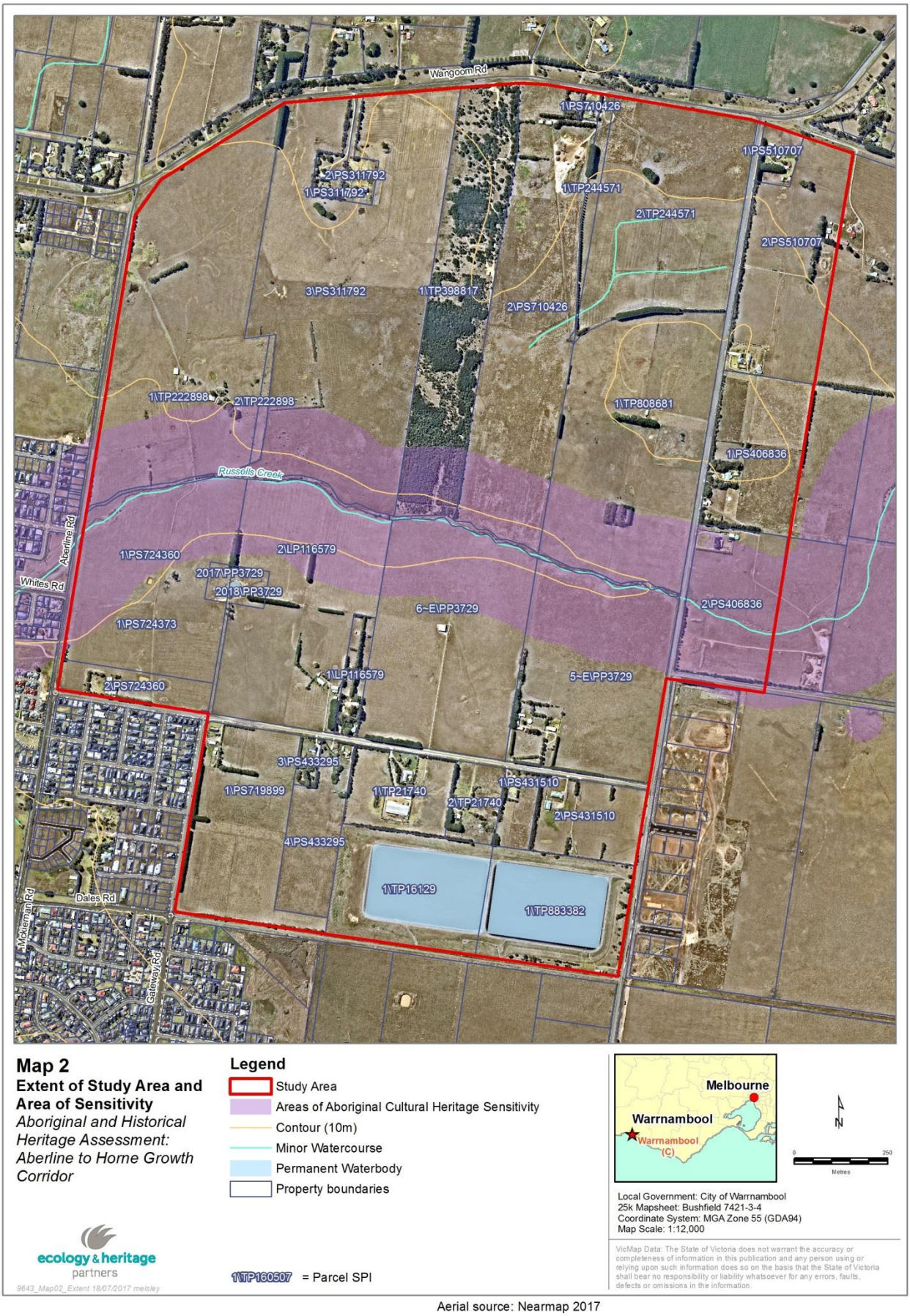
Table 12: Summary of Management Recommendations

Council Property Identification Number (PIN)	Property ID (Parcel SPI)	Aboriginal Heritage		Historical Heritage
		CHMP Required	Site Inspection and Risk Assessment Recommended	Further Consultation with Heritage Victoria and/or Council Required
1	1\PS311792		✓	
2	2\PS311792		✓	
3	1\PS710426		✓	
4	1\TP222898	✓		
	2\TP222898	✓		
	1\PS724360	✓		
	2\PS724360		✓	
	1\PS724373	✓		
5	3\PS311792	✓		
6	1\TP398817	✓		
7	2\PS710426	✓		
	1\TP244571		✓	

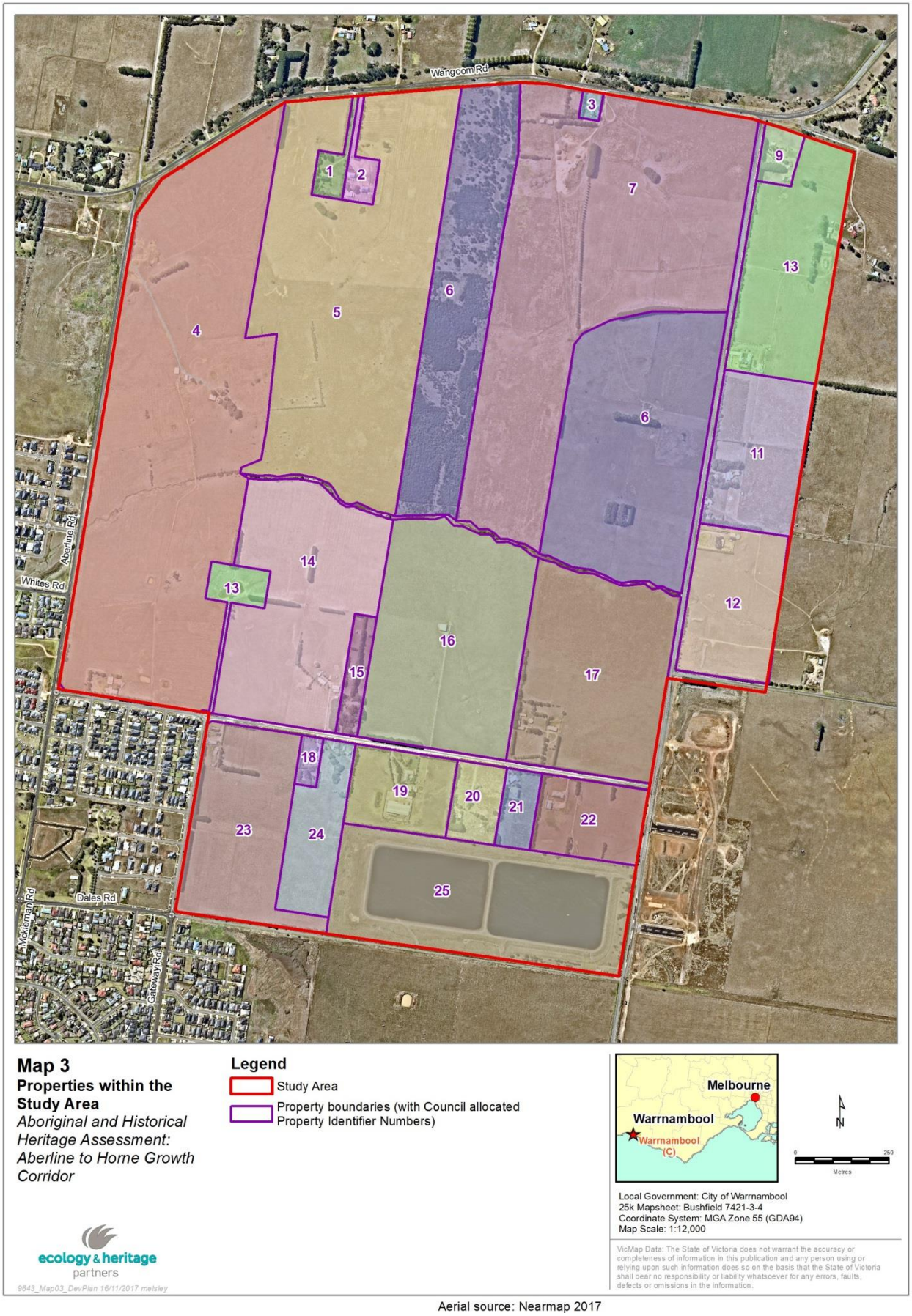
	2\TP244571		✓	
8	1\TP808681	✓		
9	1\PS510707		✓	
10	2\PS510707	✓		
11	1\PS406836	✓		
12	2\PS406836	✓		
13	2017\PP3729		✓	
	2018\PP3729		✓	
14	2\LP116579	✓		
15	1\LP116579		✓	
16	6~E\PP3729	✓		
17	5~E\PP3729	✓		
18	3\PS433295		✓	
19	1\TP21740		✓	
20	2\TP21740		✓	
21	1\PS431510		✓	
22	2\PS431510		✓	
23	1\PS719899		✓	
24	4\PS433295		✓	
25	1\TP16129		✓	
	1\TP883382		✓	

MAPS

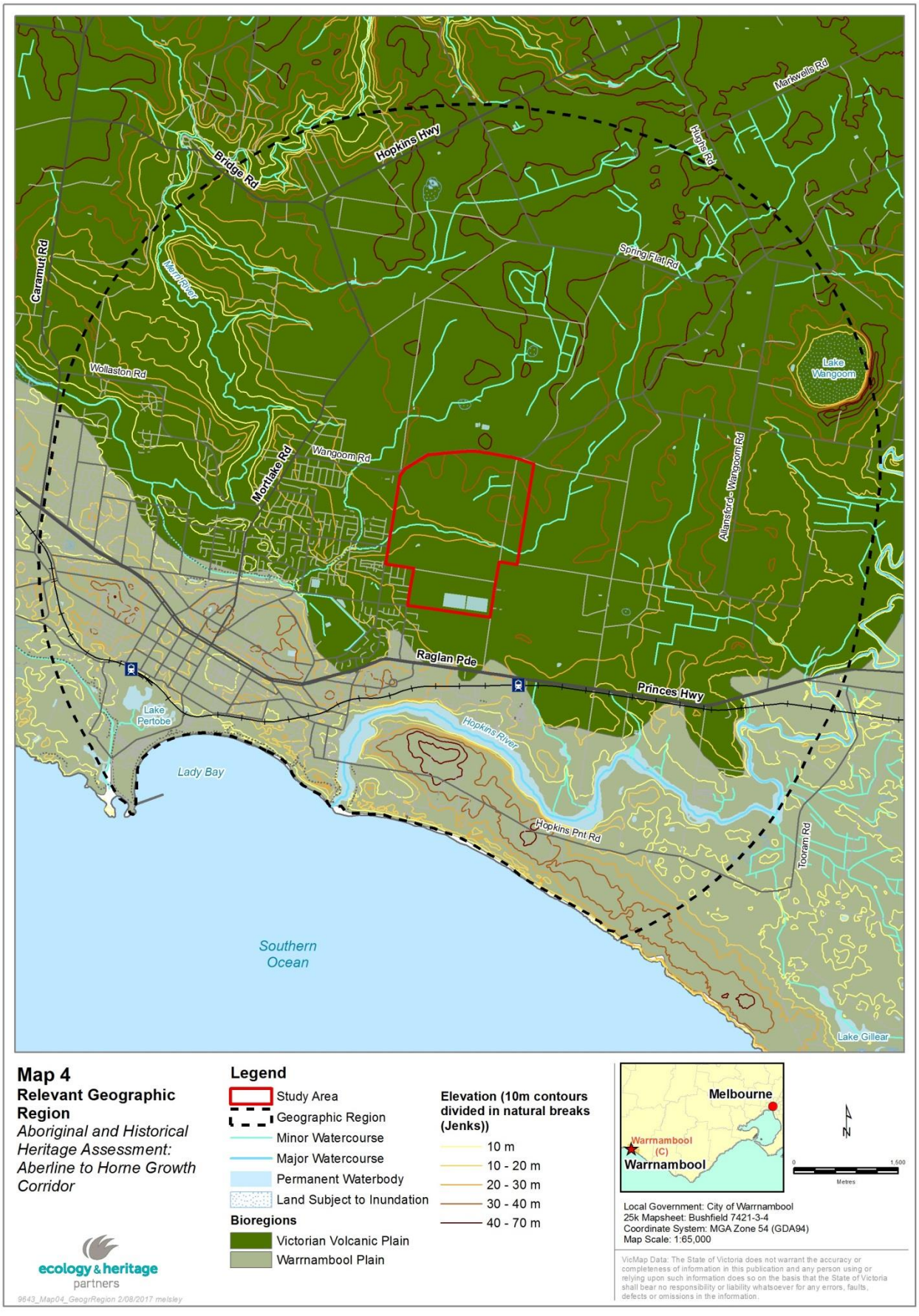

GRASSMERE
WOODFORD
Bridge Rd
Staywood Rd
Hughs Rd
BUSHFIELD
Hopkins Hwy
Spring Flat Rd
WANGOOM
Lake Wangoom
Wangoom Rd
Merri River
Wollaston Rd
Mortlake Rd
Aberline Rd
Allansford - Wangoom Rd
Whites Rd
WARRNAMBOOL
Botanic Rd
Moore St
Raglan Pde
Warrnambool
Lava St
Timor St
Sherwood Park
Princes Hwy
ALLANSFORD
Lake Pertobe
Lady Bay
Hopkins River
VIC
Hopkins Pnt Rd
Southern Ocean
Map 1
Location of Study Area
Aboriginal and Historical Heritage Assessment: Aberline to Horne Growth Corridor
Legend
Railway
Major Road
Collector Road
Minor Road
Proposed Road
Walking Track
Minor Watercourse
Major Watercourse
Permanent Waterbody
Land Subject to Inundation
Crown Land
Localities
Melbourne
Warrnambool (C)
Warrnambool
N
0
1,000
Metres
Local Government: City of Warrnambool
25k Mapsheet: Bushfield 7421-3-4
Coordinate System: MGA Zone 54 (GDA94)
Map Scale: 1:50,000
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.
ecology & heritage partners
9643_Map01_StudyArea 18/07/2017 melsley

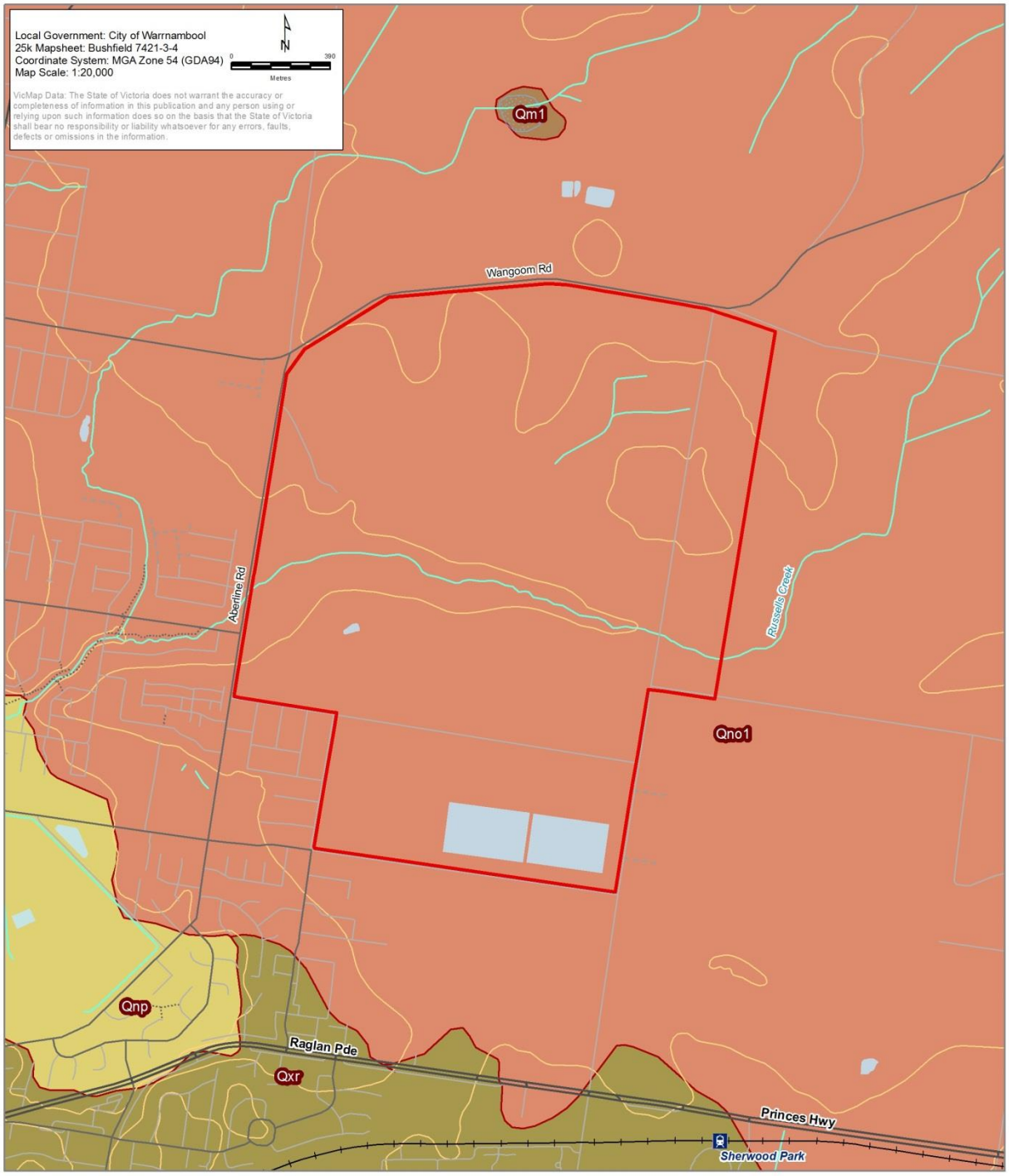


Aerial source: Nearmap 2017



Aerial source: Nearmap 2017


Markwells Rd
Hopkins Hwy
Bridge Rd
Hughes Rd
Caramut Rd
Merrivale
Spring Flat Rd
Lake Wangoom
Wollaston Rd
Mortlake Rd
Wangoom Rd
Allansford - Wangoom Rd
Raglan Pde
Princes Hwy
Lake Pertobe
Hopkins River
Lady Bay
Hopkins Pnt Rd
Tooram Rd
Southern Ocean
Lake Gillear
Map 4
Relevant Geographic Region
Aboriginal and Historical Heritage Assessment: Aberline to Horne Growth Corridor
Legend
Study Area
Geographic Region
Minor Watercourse
Major Watercourse
Permanent Waterbody
Land Subject to Inundation
Bioregions
Victorian Volcanic Plain
Warrnambool Plain
Elevation (10m contours divided in natural breaks (Jenks))
10 m
10 - 20 m
20 - 30 m
30 - 40 m
40 - 70 m
Melbourne
Warrnambool (C)
Warrnambool
N
0
1,500
Metres
Local Government: City of Warrnambool
25k Mapsheet: Bushfield 7421-3-4
Coordinate System: MGA Zone 54 (GDA94)
Map Scale: 1:65,000
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.
ecology & heritage partners
9643_Map04_GeogrRegion 2/08/2017 melsley



Map 5
Geology
Aboriginal and Historical Heritage Assessment: Aberline to Horne Growth Corridor

ecology & heritage partners

9643_Map05_Geology 19/07/2017 melsley

Legend

Study Area

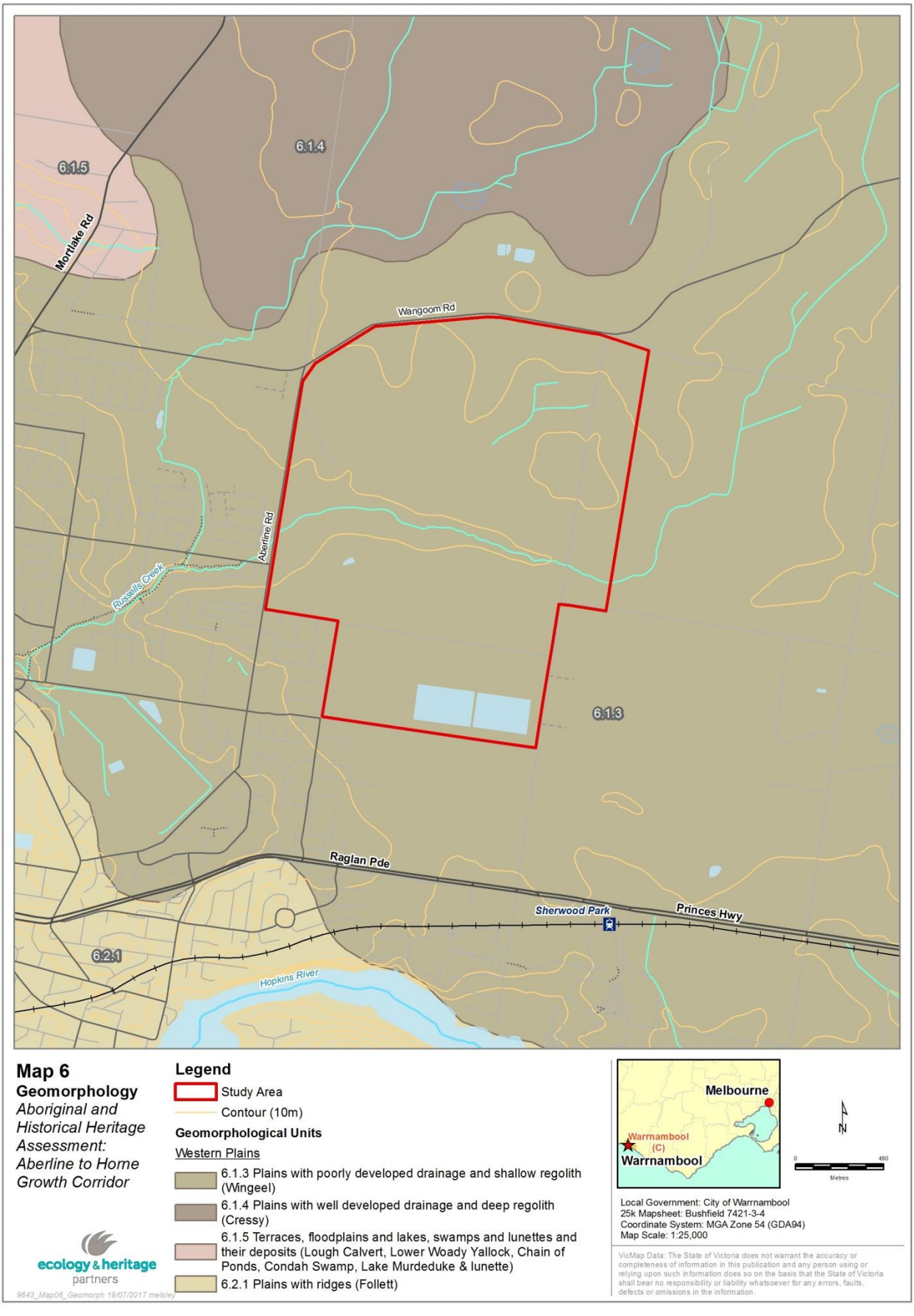
Geology

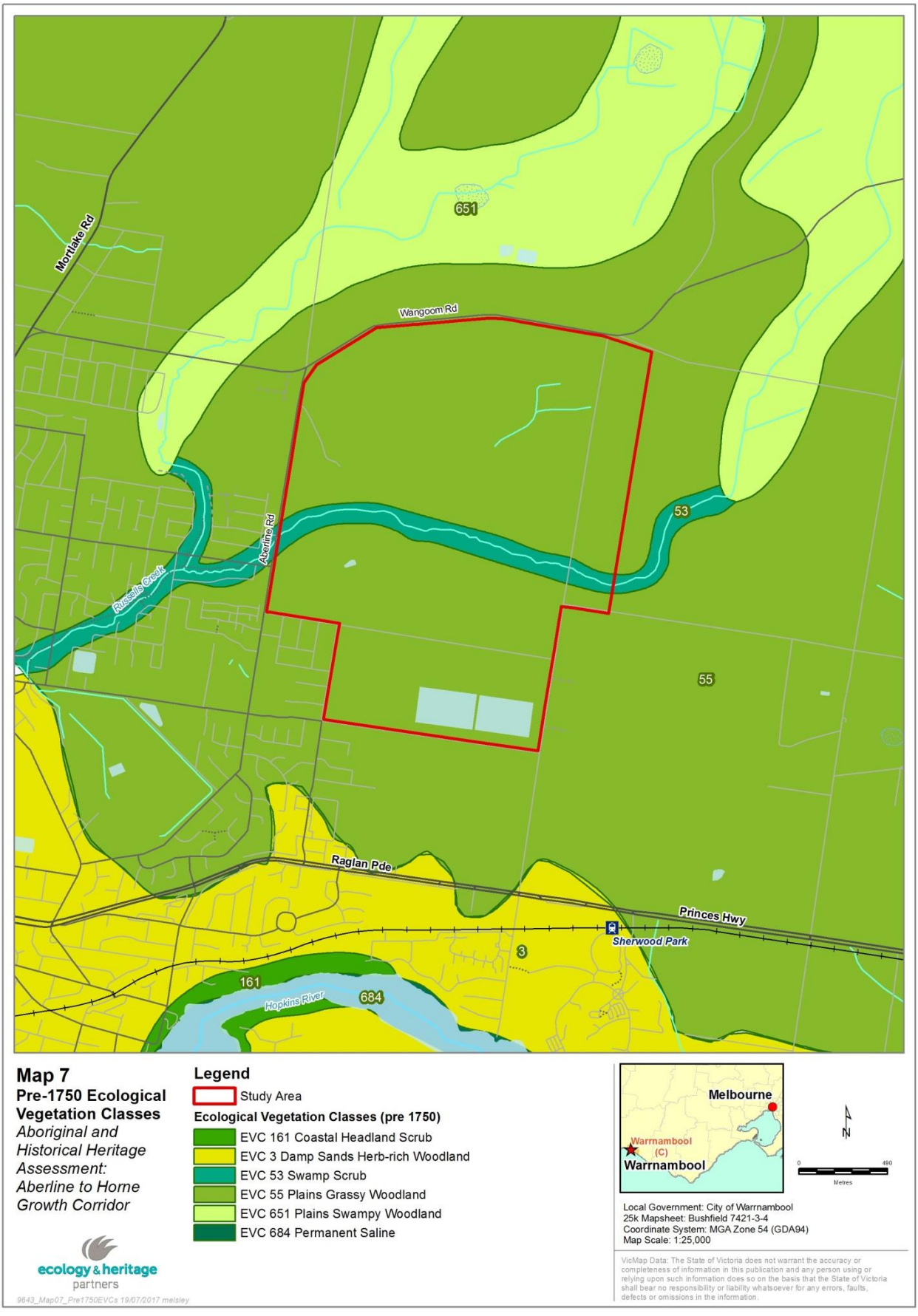
Qm1 - Unnamed swamp and lake deposits, Swamp, lake and estuarine deposits: clay, silt, sand, humic sand, peat, locally calcareous, minor Coxiella sand beds: moderately sorted and unconsolidated (Quaternary (Pleistocene) to Quaternary (Holocene) in age)

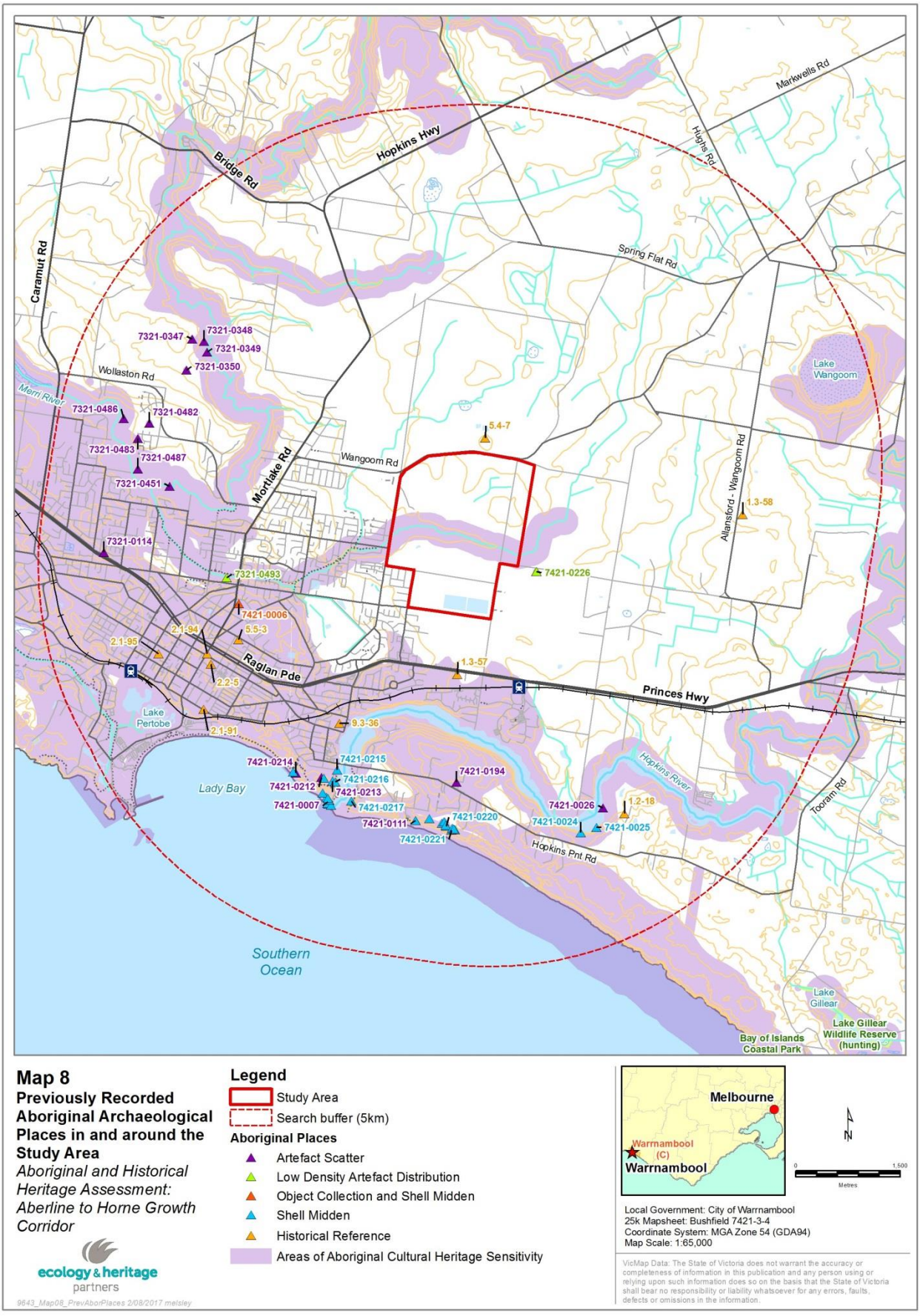
Qno1 - Unnamed sheetflow basalt, Undifferentiated lava flows, lava ridges and valley flows; olivine basalt; commonly microvesicular, minor columnar jointing (Neogene (Pliocene) to Quaternary (Pleistocene) in age)

Qnp - Unnamed phreatomagmatic deposits, Tuff rings: pyroclastic base surge and fall deposits consisting of ash, lapilli, scoria, volcanic bombs and calcareous lithic fragments; well-bedded, well sorted, moderately consolidated (Quaternary (Holocene) to Quaternary (Holocene) in age)

Qxr - Bridgewater Formation, Coastal dune deposits: calcarenite composed of medium to coarse grained shell fragments andminor quartz; consolidated, thin interbedded red palaeosols, minor hard calcrete capping, prominent dune cross-bedding (Quaternary (Pleistocene) to Quaternary (Pleistocene) in age)


6.1.4
6.1.5
Mortlake Rd
Wangoom Rd
Aberline Rd
Russells Creek
6.1.3
Raglan Pde
Sherwood Park
Princes Hwy
6.2.1
Hopkins River
Map 6
Geomorphology
Aboriginal and Historical Heritage Assessment: Aberline to Horne Growth Corridor
Legend
Study Area
Contour (10m)
Geomorphological Units
Western Plains
6.1.3 Plains with poorly developed drainage and shallow regolith (Wingeel)
6.1.4 Plains with well developed drainage and deep regolith (Cressy)
6.1.5 Terraces, floodplains and lakes, swamps and lunettes and their deposits (Lough Calvert, Lower Woady Yallock, Chain of Ponds, Condah Swamp, Lake Murdeduke & lunette)
6.2.1 Plains with ridges (Follett)
ecology & heritage partners
9643_Map06_Geomorph 19/07/2017 melsley
Melbourne
Warrnambool (C)
Warrnambool
N
0
490
Metres
Local Government: City of Warrnambool
25k Mapsheet: Bushfield 7421-3-4
Coordinate System: MGA Zone 54 (GDA94)
Map Scale: 1:25,000
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of information in this publication and any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.


651
Mortlake Rd
Wangoom Rd
53
Aberline Rd
Russells Creek
55
Raglan Pde
Princes Hwy
Sherwood Park
3
161
Hopkins River
684
Map 7
Pre-1750 Ecological Vegetation Classes
Aboriginal and Historical Heritage Assessment: Aberline to Horne Growth Corridor
Legend
Study Area
Ecological Vegetation Classes (pre 1750)
EVC 161 Coastal Headland Scrub
EVC 3 Damp Sands Herb-rich Woodland
EVC 53 Swamp Scrub
EVC 55 Plains Grassy Woodland
EVC 651 Plains Swampy Woodland
EVC 684 Permanent Saline
Melbourne
Warrnambool (C)
Warrnambool
N
0
490
Metres
Local Government: City of Warrnambool
25k Mapsheet: Bushfield 7421-3-4
Coordinate System: MGA Zone 54 (GDA94)
Map Scale: 1:25,000
VicMap Data: The State of Victoria does not warrant the accuracy or completeness of infomation 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.
ecology & heritage partners
9643_Map07_Pre1750EVCs 19/07/2017 melsley



Map 8
Previously Recorded Aboriginal Archaeological Places in and around the Study Area
Aboriginal and Historical Heritage Assessment: Aberline to Horne Growth Corridor

ecology & heritage partners

9643_Map08_PrevAborPlaces 2/08/2017 melsley

Legend

- Study Area
- Search buffer (5km)

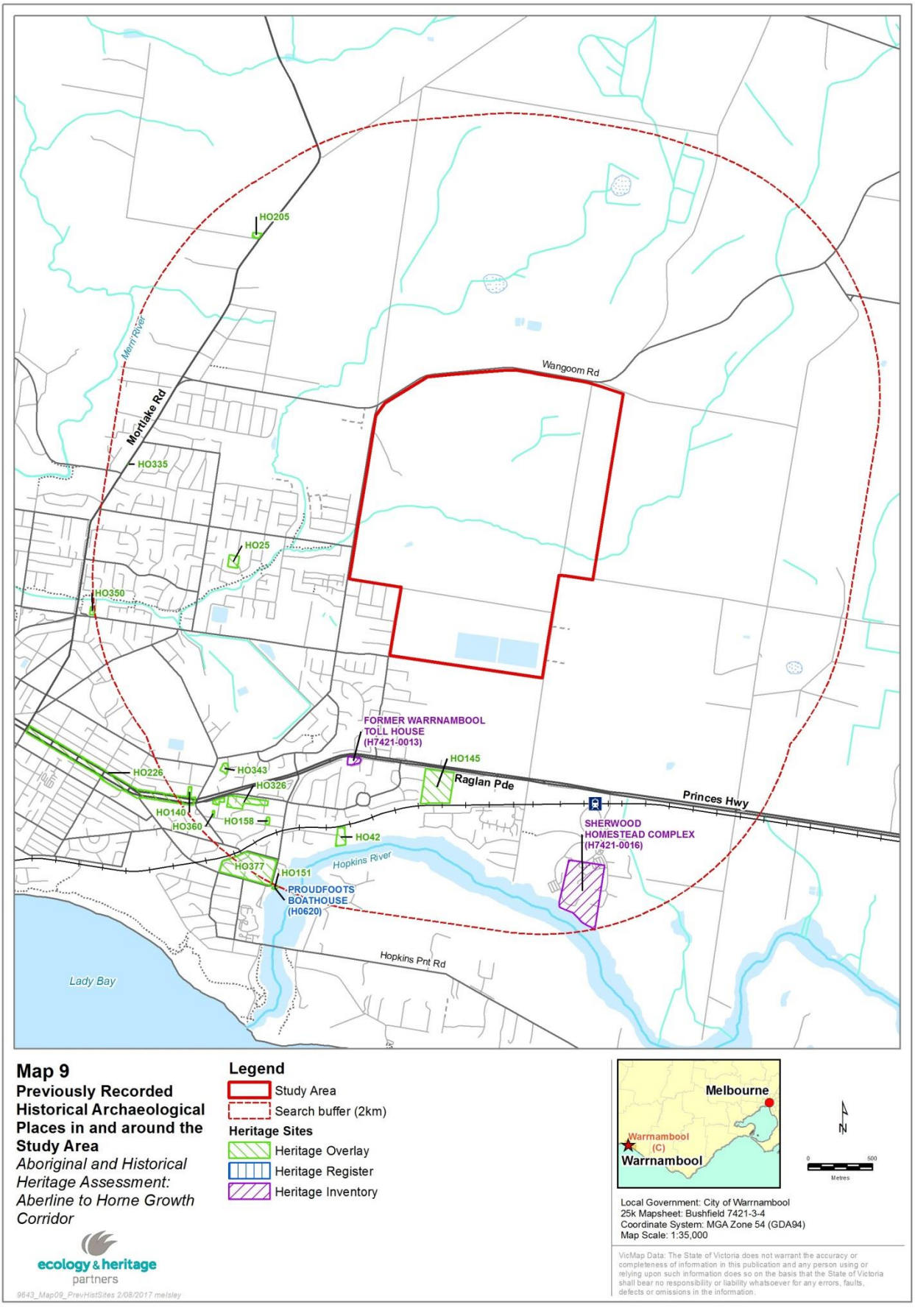
Aboriginal Places

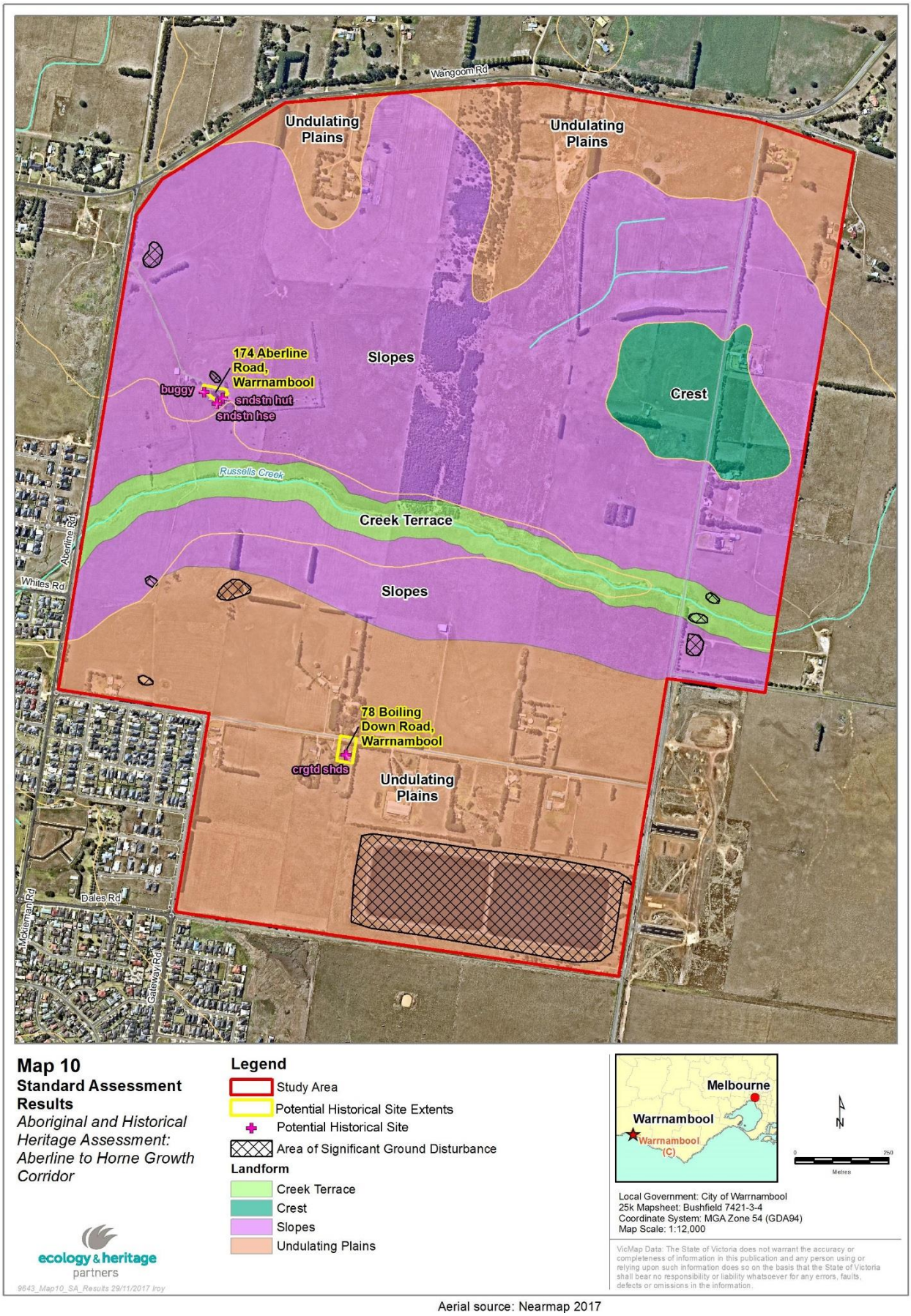
- Artefact Scatter
- Low Density Artefact Distribution
- Object Collection and Shell Midden
- Shell Midden
- Historical Reference
- Areas of Aboriginal Cultural Heritage Sensitivity

N

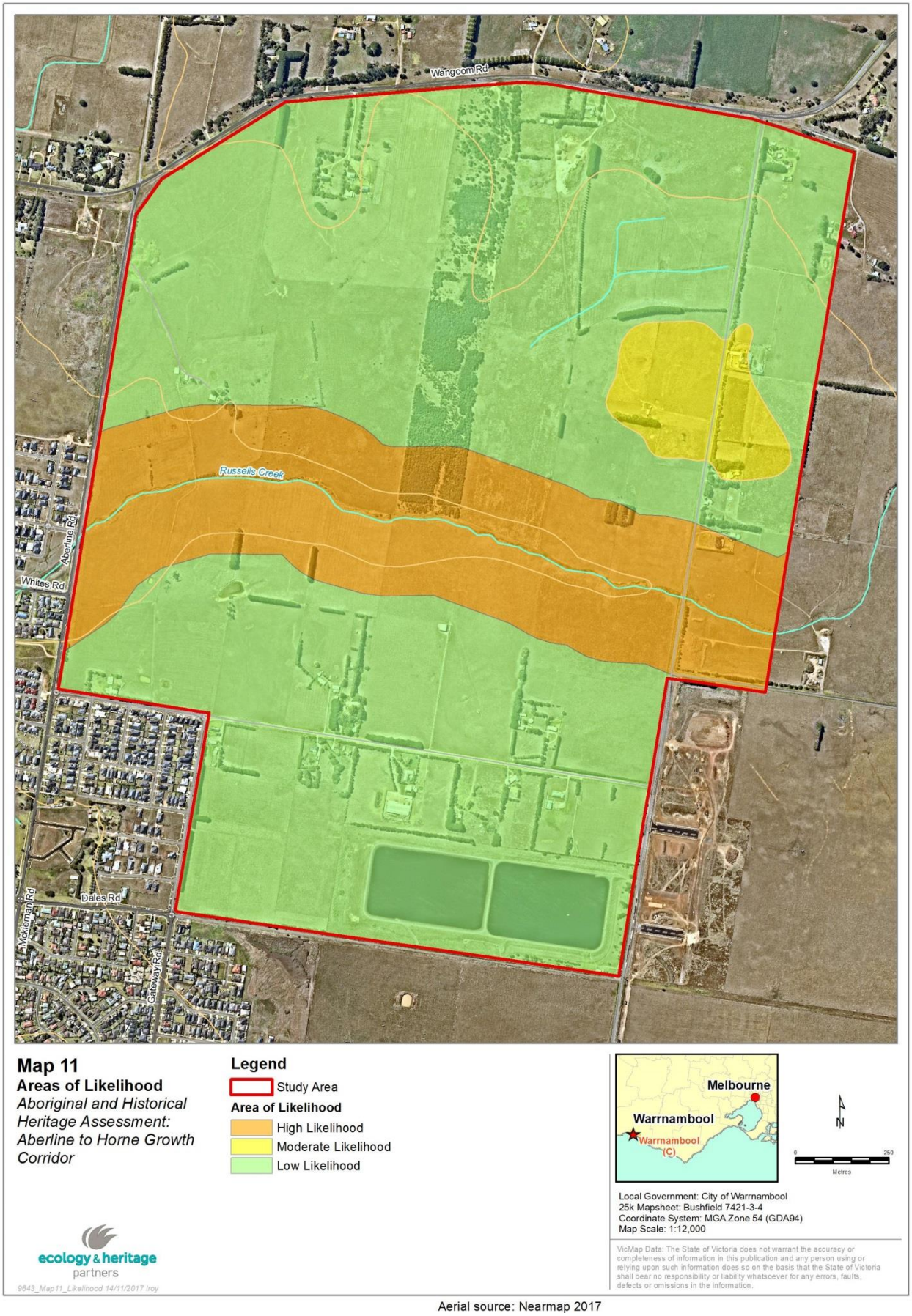
0 1,500 Metres

Local Government: City of Warrnambool
25k Mapsheet: Bushfield 7421-3-4
Coordinate System: MGA Zone 54 (GDA94)
Map Scale: 1:65,000


HO205
Merri River
Wangoom Rd
Mortlake Rd
HO335
HO25
HO350
FORMER WARRNAMBOOL TOLL HOUSE (H7421-0013)
HO145
Raglan Pde
Princes Hwy
HO226
HO343
HO326
HO140
HO360
HO158
HO42
SHERWOOD HOMESTEAD COMPLEX (H7421-0016)
Hopkins River
HO377
HO151
PROUDFOOTS BOATHOUSE (H0620)
Hopkins Pnt Rd
Lady Bay
Map 9
Previously Recorded Historical Archaeological Places in and around the Study Area
Aboriginal and Historical Heritage Assessment: Aberline to Horne Growth Corridor
ecology & heritage partners
9643_Map09_PrevHistSites 2/08/2017 melsley
Legend
Study Area
Search buffer (2km)
Heritage Sites
Heritage Overlay
Heritage Register
Heritage Inventory
Melbourne
Warrnambool (C)
Warrnambool
N
0
500
Metres
Local Government: City of Warrnambool
25k Mapsheet: Bushfield 7421-3-4
Coordinate System: MGA Zone 54 (GDA94)
Map Scale: 1:35,000
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.



Aerial source: Nearmap 2017



Aerial source: Nearmap 2017

APPENDICES

Appendix 1: Notice of Intention to Conduct an Archaeological Survey

HERITAGE VICTORIA HERITAGE VICTORIA HERITAGE VICTORIA

Archaeological Survey Notification

Pursuant to Section 131(1) of the *Heritage Act* 1995, this form must be completed in full and submitted to Heritage Victoria prior to conducting an archaeological survey. Please note that approval to access the survey area must be arranged by the applicant.

1. Applicant details

Name: Rick Bullers
Email address: rbullers@ehpartners.com.au
Company: Ecology & Heritage Partners
Postal address: 230 Latrobe Terrace, Geelong West Postcode 3218
Telephone (business hours): (03) 9377 0100 Mobile: 0400 990 887
Commissioning agent: Warrnambool City Council
Reason for survey: Aboriginal & Historical Heritage Assessment

2. Survey location

A map clearly identifying the survey area must be attached to this form. For larger, or linear, surveys more than one map may be required. If surveying the seabed, attach a chart clearly identifying the survey area and location.

Location name: Aberline to Horne Growth Corridor
Address: Aberline Rd to Horne Rd, Warrnambool, 3280
Mapsheet number (1:100,000): 7421 - 3-4
Mapsheet name (1:100,000): BUSHFIELD

3. Survey dates

It is intended that the survey will be conducted between the following dates:
From: 04/09/2017 To: 08/09/2017
Applicant's signature: Date: 01/08/2017

This form must be lodged with Heritage Victoria's Archaeology Team at:
Archaeology.admin@delwp.vic.gov.au
Heritage Victoria
PO Box 500
East Melbourne Vic 8002

Any personal information about you or a third party in your correspondence will be collected, held, managed, used, disclosed or transferred in accordance with the provisions of the Information Privacy Act 2000 (Vic) and applicable laws. Enquiries about access to information about you held by the Department should be directed to the Privacy Officer, Department of Environment, Land Water and Planning, PO Box 500, East Melbourne, VIC 8002.

Notwithstanding the above, please note that information provided to enable the administration of the Heritage Act 1995 may be disclosed to persons with an interest in the heritage place or object particularly, and information provided as part of a permit application may be made available on-line where the application has been publicly advertised under section 68 of the Heritage Act 1995.

Rick Bullers

From: Brandi.Bugh@delwp.vic.gov.au on behalf of Archaeology.Admin@delwp.vic.gov.au
Sent: Friday, 1 September 2017 10:01 AM
To: Rick Bullers
Subject: Re: 9600 - Follow up on HV NOI

Hi Rick

Maddi is away for the next 3 weeks, so I am keeping an eye on this email for urgent matters.

It looks like Maddi assigned report number 4864 for the works.

The number for Aberline to Horne Growth Corridor is 4865.

Cheers

Brandi Bugh | Archaeologist | Heritage Victoria
Planning | Department of Environment, Land, Water and Planning
Level 7 / 8 Nicholson Street, East Melbourne Victoria 3002
T: 03 9938 6864 | **E**: brandi.bugh@delwp.vic.gov.au

This office is located on the land of the Kulin Nations.

From: Rick Bullers <rbullers@ehpartners.com.au>
To: "Archaeology.Admin@delwp.vic.gov.au" <Archaeology.Admin@delwp.vic.gov.au>,
Date: 28/08/2017 02:58 PM
Subject: 9600 - Follow up on HV NOI

Hi Maddi

Just following up on an NOI sent by Austen Graham on 1 August (attached) – do you have a report number available for that survey yet? The report is pretty well finished and needs that to complete it.

Many thanks

Kind regards
Rick Bullers MAACAI | Geelong Resource Manager / Senior Heritage Advisor
Ecology and Heritage Partners
230 Latrobe Tce, Geelong West, VIC 3218
P (03) 5221 8122 | M 0400 990 887 | E rbullers@ehpartners.com.au
Melbourne|Adelaide|Brisbane|Canberra|Geelong |Sydney
www.ehpartners.com.au | Twitter | LinkedIn | Facebook

ecology & heritage partners

1

Notice of Intent to carry out a survey for Aboriginal cultural heritage for the purposes of the *Aboriginal Heritage Act 2006*

This form has been prepared for use by a person intending to carry out a survey for Aboriginal cultural heritage ('Survey') to complete the notification provisions pursuant to s.34A of the *Aboriginal Heritage Act 2006* (the 'Act').

For clarification on any of the following please contact Victorian Aboriginal Heritage Register (VAHR) enquiries on 1800-762-003.

SECTION 1 – Person intending to carry out survey (applicant)

Applicant (*natural person or body corporate seeking to carry out survey*):	Warrnambool City Council
ABN/ACN:	44 594 246 321
Contact name:	Julie Glass
Postal Address:	PO Box 198, Warrnambool Vic 3280
Telephone Number	5559 4800 Fax number:
Mobile:	0408 208 342
Email Address:	jglass@warrnambool.vic.gov.au

SECTION 2 –Survey supervisor

Name: Rick Bullers

Provide a description of the supervisor's qualifications and experience relevant to surveys for Aboriginal cultural heritage:

Supervisor has more than 10 years experience as an archaeologist, primarily working in the field of Aboriginal cultural heritage. He has prepared numerous reports on Aboriginal cultural heritage, including CHMPs, cultural heritage assessments, due diligence assessments, salvage excavations, etc. He has a Masters degree in archaeology.

SECTION 3 – Description of proposed activity and Survey location

Project Name: Aberline to Horne Growth Corridor

List the relevant municipal district/s (ie, Local Council or Shire): Warrnambool City Council

Clearly identify the proposed **activity** for which the survey relates (ie, cultural heritage or due diligence assessment, preliminary Aboriginal heritage test, research):

The survey is for a high level strategic plan (Precinct Structure Plan) to determine potential cultural heritage values to inform the PSP.

There is currently no high impact activity associated with the activity.

Clearly identify the **location** (such as listing cadastral information, attaching a copy of a title search, or indicating the street address):

The activity area includes multiple land parcels, bounded to the west by Aberline Road, to the north by Wangoom Road and to the east and south by private rural land, but roughly around Horne Road and Boiling Down Road (see attached map)

Attach a map (to scale, with a north arrow and indicating the municipal district - if any) that clearly identifies the survey area.

- Please ensure the map refers to existing roads and features, rather than proposed roads and features, and includes their names.
- Please ensure the map has the survey area outlined on it.
- The map should have a legend; at least three readily identifiable geographical locations (such as road intersections, parcel boundaries, or road/river crossings) and should state the map's projection.

SECTION 4 – Expected start and finish date for the survey

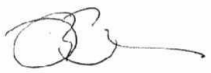
Start date 4 / 8 / 2017 *Finish date* 24 / 8 / 2017

SECTION 5 – List any relevant registered Aboriginal party (if any)

This section is to be completed only where there is a registered Aboriginal party in relation to the survey area

SECTION 6 – Signature of applicant

I certify that to the best of my knowledge and belief that the information supplied is correct and complete.

Signed:  *Date:* 1 / 9 / 2017

[applicant]

SECTION 7 – Notification checklist

☐ Ensure appropriate attachment/s are completed and attached to this notification (see section 3 of this form).

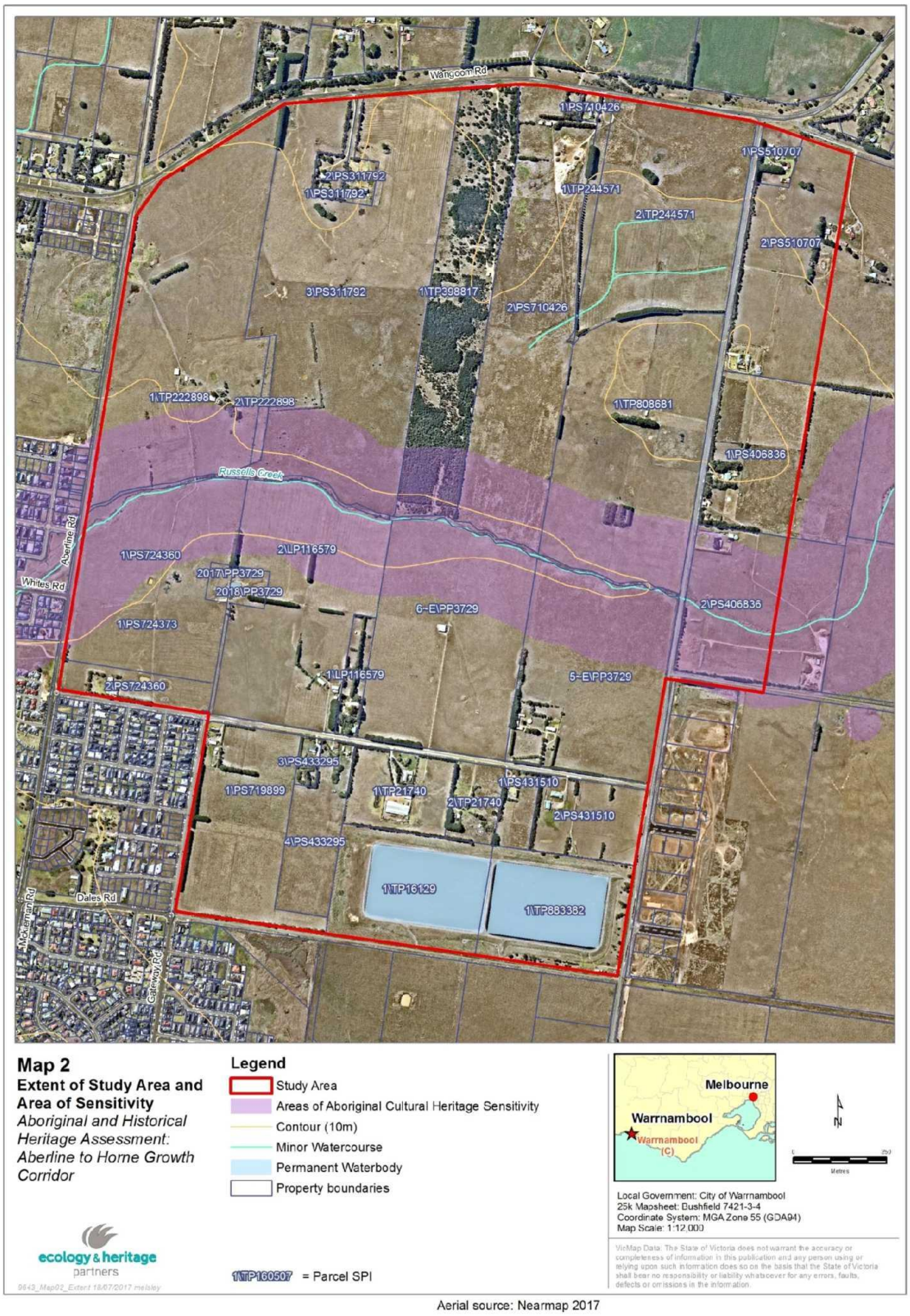
Please ensure this notice and all attached items are sent to the:

Director Heritage Services
Aboriginal Victoria
Department of Premier and Cabinet
GPO Box 2392
MELBOURNE VIC 3001

OR **Email: vahr@dpc.vic.gov.au**

Notes:

- **Ensure that any relevant registered Aboriginal party is also notified. A copy of this notice may be used for this purpose. (A registered Aboriginal party is allowed up to 14 days to provide a written response to a notification specifying whether or not it intends to participate in the survey).**
- **In addition to notifying the Director Heritage Services and any relevant registered Aboriginal party, a Sponsor must also notify any owner and/or occupier of any land within the survey area. A copy of this notice may be used for this purpose.**
- **A copy of any documentation relevant to the survey must be given to the Secretary for recording on the Victorian Aboriginal Heritage Register within 30 days of producing the final report relating to the survey, or within 12 months of submitting this application, whichever is earlier.**
- **Relevant documentation means any site records, photographs, maps and plans relating to the survey and a copy of any final report.**
- **The applicant must notify the Secretary if the survey did not occur within 12 months of submitting this application.**



Aerial source: Nearmap 2017

Appendix 2: 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 Cultural 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 'study 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 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 study area is an area of 'cultural heritage sensitivity'; and
- If all or part of the study area has not been subject to 'significant ground disturbance'.

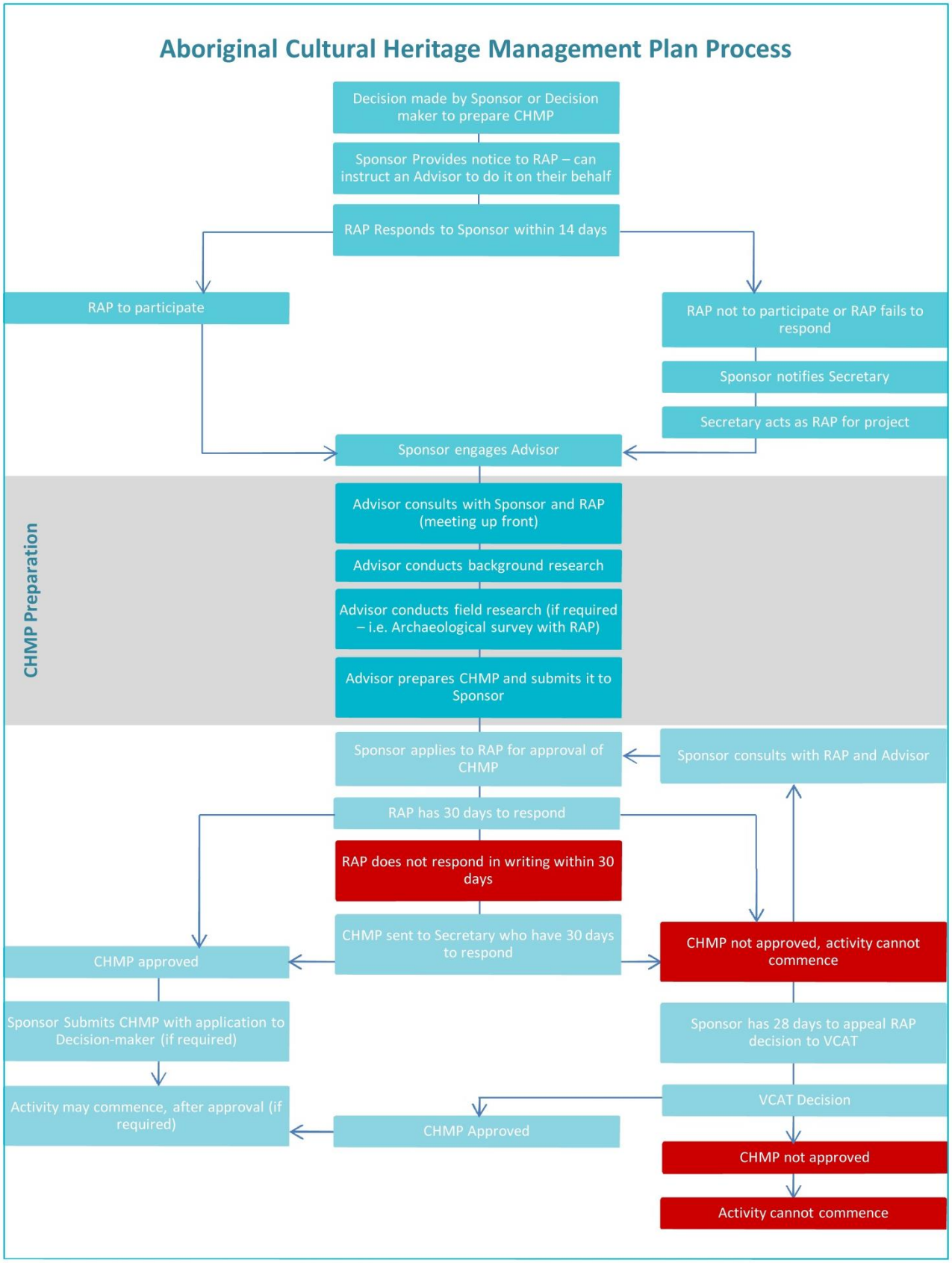
The preparation of a CHMP can also be undertaken voluntarily. Having an approved CHMP in place can reduce risk for a project during the construction phase by ensuring there are no substantial delays if sites happen to be found. Monitoring construction works is also rarely required if an approved CHMP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

There are three types of CHMPs that may be prepared (*The Guide to Preparing a CHMP* 2010). These are:

- Desktop; Standard; and Complex.


Aboriginal Cultural Heritage Management Plan Process
Decision made by Sponsor or Decision maker to prepare CHMP
Sponsor Provides notice to RAP – can instruct an Advisor to do it on their behalf
RAP Responds to Sponsor within 14 days
RAP to participate
RAP not to participate or RAP fails to respond
Sponsor notifies Secretary
Secretary acts as RAP for project
Sponsor engages Advisor
CHMP Preparation
Advisor consults with Sponsor and RAP (meeting up front)
Advisor conducts background research
Advisor conducts field research (if required – i.e. Archaeological survey with RAP)
Advisor prepares CHMP and submits it to Sponsor
Sponsor applies to RAP for approval of CHMP
Sponsor consults with RAP and Advisor
RAP has 30 days to respond
RAP does not respond in writing within 30 days
CHMP sent to Secretary who have 30 days to respond
CHMP approved
CHMP not approved, activity cannot commence
Sponsor Submits CHMP with application to Decision-maker (if required)
Sponsor has 28 days to appeal RAP decision to VCAT
Activity may commence, after approval (if required)
CHMP Approved
VCAT Decision
CHMP not approved
Activity cannot commence

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 study area, a standard assessment will be required.

A standard assessment involves a literature review and a ground survey of the study area. Where the results of ground survey undertaken during a standard assessment have identified Aboriginal cultural heritage within the study 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 study 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 study area or excavation of all or part of the study 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 (https://www.vic.gov.au/aboriginalvictoria.html/).

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 title[7].

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.

[7] 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.

A2.6 *Heritage Act 2017* (State)

The *Heritage Act 2017* protects all heritage places on the VHR and all non-Aboriginal archaeological sites older than 50 years. If a site is of State Significance it is listed on the VHR and a Permit from Heritage Victoria (HV) is required to disturb it. If an archaeological site is not of State significance it is usually listed on the VHI and Consent from Heritage Victoria would be required to disturb it.

Appendix 3: Archaeological Survey Attributes

ABORIGINAL CULTURAL HERITAGE PLACE ASSESSMENT:
ARCHAEOLOGICAL SURVEY AND EXCAVATION ATTRIBUTES FORM

Project Name: Aberline to Horne Growth Corridor

Author/Consultant: Rick Bullers and Austen Graham

Cultural Heritage Permit #: 4865

Survey Attributes

Survey Date: 19.09.2017-20.09.2017 Ground Surface Visibility: 20%

Actual Survey Coverage (ha): 35.60 Effective Survey Coverage (ha): 1.2

Survey Spacing (m): RANDOM Transect Width (m): RANDOM Number in Crew: 4

Landform: Undulating Plains, Slope, Crest & Creek Terrace
Vegetation: Pastoral paddocks across; Plains Grassy Woodland (EVC 55) and Swamp Scrub (EVC 53).

Disturbance: Agricultural disturbance and various locations with SGD

Survey Method	Survey Design	Sample	Survey Type
☑ Pedestrian	☐ Opportunistic	☑ Area	☑ Surface
☐ Remote sensing (specify)	☑ Random	☐ Transect	
	☐ Systematic	☐ Locality	
	☐ Stratified	☐ Haphazard	
	☐ Other	☐ Other	

Appendix 4: 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-hierarchal 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 2017* Criteria

The *Heritage Act* 2017 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, bit 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 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 Cultural Heritage Advisor as having potential for containing either surface or subsurface Aboriginal archaeological deposits. This term is used in this report to differentiate between *legislated* ***areas of cultural heritage sensitivity*** and areas considered by an archaeologist to be sensitive.
Aboriginal Place	An Aboriginal cultural heritage site registered on the ***VAHR***, cf. ***Aboriginal Site***.
Aboriginal Site	A location containing Aboriginal cultural heritage, e.g. ***Artefact scatter***, ***isolated artefact***, ***scarred tree***, ***shell midden***, whether or not the site is registered in the ***VAHR***, cf. ***Aboriginal Place***.
Angular Fragment	An artefact which has technologically diagnostic features but has no discernible ventral or dorsal surface and hence is unidentifiable as either a flake or a core
Area Of Cultural Heritage Sensitivity	An area specified as an area of cultural heritage sensitivity in Division 3 or Division 4 of Part 2 of the *Aboriginal Heritage Regulations 2007*.
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, ***shell middens*** or ***artefact scatters***.
Chert	A cryptocrystalline siliceous sedimentary stone.
CHMP	Cultural Heritage Management Plan. A plan prepared under the *Aboriginal Heritage Act 2006*.
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 ***significant ground disturbance***).
DELWP	**Department of Environment, Land, Water and Planning.** The Victorian State Government department, of which ***HV*** is a part, responsible for management of historical 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.
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 *Aboriginal Heritage Regulations 2007*.
Heritage Place	A *registered* 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 ***VHR***, ***VHI*** or other historical site database (cf. ***Heritage Place***).
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 ***DTPLI*** 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 ***Aboriginal Place*** type in the ***VAHR*** comprising single stone artefacts and/or distributions of multiple stone artefacts at concentrations of less than 10 artefacts in a 10 x 10 m area.
Manuport	An object which has been carried by humans to the site.
NHL	**National Heritage List**. A register of heritage places, under the EPBC Act, of heritage places of national significance.
AV	**Aboriginal Victoria**. Formerly the Office of Aboriginal Affairs Victoria, a division of ***DPC*** responsible for management of Aboriginal cultural heritage in Victoria.

Acronym	Description
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. ***MPA***).
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 *Aboriginal Heritage Act 2006*.
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 ***VAHR***, cf. ***Aboriginal site***.
Retouch	Retouch is when a ***flake*** is removed after the manufacture of the original flake. This sequence can be observed when a flake scar is present and encroaches over the ventral surface and thus must have been made after the initial flake removal. Recorded whether retouch was absent or present on the artefact.
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.
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***.

Acronym	Description
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 *et al*. 1994). Similar to indurated mudstone, it has also been demonstrated that silcrete from the hunter valley often turns a red colour after being exposed to heat (Rowney 1992; Mercieca 2000).
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.

REFERENCES

Amorosi, L., 1998. W.L. Koenig Collection; Documentation of Stone Artefacts from a private Collection. Unpublished report for Aboriginal Affairs Victoria.

Australia ICOMOS, 1999. *Burra Charter: Charter for Places of Cultural Significance*. Australia ICOMOS, Canberra.

Billis, R. V. and Kenyon, A. S., 1974. *Pastoral Pioneers Of Port Phillip.* Stockland Press, Melbourne.

Bird, C. and Frankel, D. 1991a. Problems in Constructing a Prehistoric Regional Sequence: Holocene South-East Australia. *World Archaeology* 23 (2):179-192.

Bird, C. and Frankel, D. 1991b. Chronology and explanation in western Victoria and south-east South Australia. Archaeology of Oceania 26: 1 – 16.

Bureau of Meteorology (BOM), 2017. http://www.bom.gov.au. Accessed 01 August 2017.

Bride, T. F., ed. 1983 [1898]. *Letters from Victorian Pioneers: A Series of Papers on the Early Occupation of the Colony, the Aborigines, Etc*. Melbourne, Gordon and Gotch.

Burch, J 2014a, Stage 1 Industrial Subdivision, 80 Rodgers Road, Warrnambool, Victoria. Unpublished Report.

Burch, J 2014b, Three Dwellings, 45-47 Barkly St, Warrnambool. Unpublished Report.

Burch, J 2015a, Balance of Industrial Subdivision, 80 Rodgers Road, Warrnambool. Unpublished report submitted to NBD Properties Pty Ltd by Jem Archaeology.

Burch, J 2015b, Residential Subdivision, 20 Botanic Road, Warrnambool. Unpublished report prepared for Stephen Timms by Jem Archaeology.

Burch, J 2015c, Trunk Sewer, Logans Beach Road and 5-9 Hopkins Point Road, Warrnambool. Unpublished Report prepared for Warrnambool Project Design and Development Pty Ltd by Jem Archaeology.

Burch, J 2016, Gas Pipeline and National Broadband Network Fibre, Hopkins Point Road, Warrnambool. CHMP prepared for Warrnambool Project Design and Development Pty Ltd by Jem Archaeology.

Burke, H. and Smith, C., 2004. *The Archaeologists Field Handbook*. Allen & Unwin, Crows Nest, Australia.

Cavanagh, T & Oataway, K 2016. NBN 3WBO-05, Fibre Optic Cable Installation, Allansford Victoria. CHMP prepared for NBN Co by Biosis.

Chandler, J 2014, Residential Subdivision, 123 Queens Road, Warrnambool, Victoria. Unpublsihed Report.

Clark, I. D. 1987. ''The Spatial Organisation of the Chap Wurrung: A Preliminary Analysis,'' in M. Clark, I. Clark, J. Critchett, B. Gott, B. Gunn, and J. R. Poynter, eds., *Australia Felix: The Chap Wurrung and Major Mitchell*. Dunkeld: Dunkeld and District Historical Museum, 1–36.

Clark, I. D., 1990. *Aboriginal languages and Clans: An Historical Atlas of Western and Central Victoria, 1800-1900, Number 37*. Department of Geography and Environmental Science, Monash University, Melbourne, Victoria.

Clark, I. D, ed. 1998. *The Journals of George Augustus Robinson, Chief Protector, Port Phillip Aboriginal Protectorate,* Vol. 2: 1 October 1840–31 August 1841. Melbourne, Heritage Matters.

Clark, V and Noble, A. 2008. Archaeological Excavations and Monitoring at Victorian Heritage Inventory Site H7321-0036: The Former Courthouse and Police Complex. Unpublished report for South West TAFE by Dr. Vincent Clark & Associates Pty Ltd.

Coroneos, C., Wilby, C., Lewczak, C. & Tuck, D. 2010. South West Historic and Maritime Archaeology Assessment Project Volume 1 – Report Body. Unpublished report for Heritage Victoria.

Coutts, P., 1977. Summer Field Programme of the Victoria Archaeological Survey 1976/77. Records of the Victorian Archaeological Survey 4: 1-16.

Coutts, P. J. F., Witter, V. C., Cochrane, R. M., Patrick, J. 1977. Sites of Special Scientific Interest in the Victorian Coastal Region. Unpublished report to the Town and Country Planning Board by the Victorian Archaeological Survey.

Coutts, P.J.F., Witter, D.C., McIlwraith, M.A., and Frank, R.K. 1977. The Mound People of Western Victoria. Records of the Victorian Archaeological Survey 1, April 1976, Victoria.

Coutts, P. J. F., Witter, D. C. & Parsons, D. M., 1977. Impact of European Settlement on Aboriginal Society in Western Victoria. *Records of the Victorian Archaeology Survey*, **4**: 17-58.

Crabtree, D. E. and Butler, B. R., 1964. Notes on experiments in flint knapping: 1. Heat treatment of silica minerals. *Tebiwa*, **7:** 1–6.

Critchett, J., 1984. A closer look at cultural contact: some evidence from 'Yambuck', Western District, Victoria. Aboriginal History Vol. 8: 12-20.

Critchett, J., 1990. A Distant Field of Murder. Melbourne University Press, Victoria.

Dawson, J. 1881. *Australian Aborigines; the languages and customs of several tribes of Aborigines in the Western District of Victoria.* Melbourne, Robertson.

Department of Economic Development, Jobs, Transport and Resources (DEDJTR), 2017a. *Geomorphological Framework*. vro.depi.vic.gov.au/dpi/vro/vrosite.nsf/pages/landform geomorphological framework, accessed 24 July 2017.

Department of Economic Development, Jobs, Transport and Resources (DEDJTR), 2017b, *Glenelg-Hopkins Landform,* http://vro.agriculture.vic.gov.au/dpi/vro/glenregn.nsf/pages/glenelg_landform, accessed 24 July 2017.

Department of Environment, Land, Water and Planning (DELWP), 2017a. *Biodiversity Interactive Map*. http://mapshare2.dse.vic.gov.au /MapShare2EXT/imf.jsp?site=bim, accessed 18 July 2017.

DELWP, 2017b. *Environmental Vegetation Classes*. http://www.depi.vic.gov.au/environment-and-wildlife/biodiversity/evc-benchmarks, a*ccessed 11 September 2017.*.

DELWP, 2017c. *Planning Schemes*. http://www.dse.vic.gov.au/planningschemes, accessed 18 July 2017.

Department of the Environment, 2017. *Australian Heritage Places Inventory.* http://www.heritage.gov.au/cgi-bin/ahpi/, accessed 25 July 2017.

Dig International Pty Ltd. Archaeological Impact Assessment of Proposed Development of New Arts and Administration Building on Timor Street, Warrnambool, Victoria. Unpublished report to South West Institute of TAFE.

Domanski, M. and Webb, J. A., 1992. Effect of heat treatment on siliceous rocks used in prehistoric lithic technology. *Journal of Archaeological Science*, 19: 601–614.

Domanski, M., Webb, J. A. and Boland, J., 1994. Mechanical properties of stone artefact materials and the effect of heat treatment, *Archaeometry*, 36: 177–208.

anski, 2012. *Aboriginal Cultural Heritage in Victoria.* http://www.dpcd.vic.gov.au/indigenous/aboriginal-cultural-heritage, accessed 18 July 17.

DSE, 2004a. *EVC/Bioregion Benchmark for Vegetation Quality Assessment: Warrnambool Plain Bioregion: EVC 53: Swamp Scrub*. Department of Sustainability and Environment, Melbourne, Victoria

DSE, 2004b. *EVC/Bioregion Benchmark for Vegetation Quality Assessment: Warrnambool Plain Bioregion: EVC 55: Plains Grassy Woodland*. Department of Sustainability and Environment, Melbourne, Victoria

Doyle, H. and Context Pty. Ltd., 2003. Moyne Shire Heritage Study, Vol. 2. Moyne Shire, Port Fairy.

Doyle, H., Aitken, R. and Honman, L., 2001. Warrnambool Heritage Study- A report on selected sites at Allansford, Bushfield, Woodford and Farnham. Warrnambool City Council.

Dugay-Grist, L & McAlister, R, 2011, Hopkins Point Road, Warrnambool. Unpublished Report.

Ellender, I. 1989. An Archaeological Survey in S.W. Victoria. Unpublished report to the Kerrup-Jmara Council of Elders.

Flood, J., 1995. *Archaeology of the Dreamtime*. Angus & Robertson, Sydney.

Gott, J. and Conran, B., 1991. *Victorian Koorie Plants: some plants used by Victorian Koories for food, fibre, medicines and implements*. Yangennanock Women's Group

Gunn, R.G. & Harradine, G. 1999, Hopkins Point Extractive Industry Site: Archaeological Survey.

Gunn, RG 2002, 'Allansford Rising Main, Warrnambool; Sub-surface monitoring', Unpublished report for Mitchell Australasia by Gunn, RG.

Hewitt, G. and De Lange, J., 2007. Bend Road 2 Phases 1 to 4; Report on Bend Road Archaeological Investigations. Unpublished report for Thiess John Holland by Archaeology Program La Trobe University, Bundoora, Victoria.

Hewitt, G. and Allen, J., 2010. Site Disturbance and Archaeological Integrity: the Case of Bend Road, an Open Site in Melbourne Spanning Pre-LGM Pleistocene and Late Holocene Periods. *Australian Archaeology*, 70: 1-16.

Hiscock, P., 1993, Bondaian technology in the Hunter Valley, New South Wales, *Archaeology in Oceania* 28: 65–76.

Howitt, A. W., 1996 [1904]. *The Native Tribes of South-East Australia.* Facsimile edition. Canberra, Aboriginal Studies Press.

Horne, G. 1921. Aboriginal Coast Camps of Eastern Victoria. The Victorian Naturalist, XXXVIII.

Hyett, J. 2011. Short Historical Report, Archaeological Investigations of 7-9 Stanley Street, Warrnambool. Unpublished report for James Tait and Heritage Victoria by TerraCulture Pty Ltd.

James-Lee, T 2015, Extensions to Gillin Park Retirement Village, 21-57 Mahoneys Road, Warrnambool. CHMP prepared for Stockland Development Pty Ltd by Biosis.

Johns, R. E., 1877. Unpublished Diary of R. E. Johns. Melbourne: MSF 10075, La Trobe Library, State Library of Victoria.

Joyce, E. B., 2003. *Western Volcanic Plains.* CRC LEME, School of Earth Sciences, University of Melbourne.

Lane, L. and Fullager, R. L. K. 1980. Previously unrecorded Aboriginal stone alignments in Victoria. Records of the Victorian Archaeological Survey 10: 134-151.

Long, A. 2007. North Dennington Trunk Sewer and Dales Road Water Storage Duplication, Warrnambool. Unpublished report to Wannon Region Water Authority by Andrew Long and Associates.

Lovett-Gardiner, I., 1993. People of the lake: the story of Lake Condah mission. Aboriginal Affairs Victoria, Melbourne.

Luebbers, R., 2000a, Archaeological Impact Assessment, Lady Bird, Warrnambool, Victoria.

Luebbers, R 2000b, 'Archaeological Impact Assessment at Blue Hole , Warrnambool, Victoria', Unpublished report for Warrnambool City Council by Luebbers and Associates.

Luebbers, R., 2000c, Archaeological Assessment Hopkins River Bridge, Warrnambool, Vic. Unpublished report to the Warrnambool City Council.

Luebbers, R, 2001, Archaeological Investigation: Allansford Rising Main, Warrnambool, Victoria. Unpublished report to Hyder Consulting Pty Ltd by Luebbers and Associates.

Luebbers, R, 2010, Cove Land Developments-Russell Creek Residential Estate Aberline Road And Whites Road, Warnambool, Victoria

Luebbers, R, 2014. Cultural Heritage Management Plan Logans Beach Subdivision Warrnambool Victoria

MacManus, T. and Nicolson, O. 2010. Horne Road Re-Zoning, Warrnambool, Victoria: Aboriginal and Historical Heritage Assessment. Unpublished report to CPG Global by Ecology Partners Pty Ltd.

Mandeville, M. D. and Flenniken, J. J., 1974. A comparison of the flaking qualities of Nehawka chert before and after thermal pretreatment. *Plains Anthropologist* 19: 146–148.

Marshall, B. and Schell, P., 1998. Coast Action/Coast Care 1998/99 Aboriginal Archaeological Desktop Study, Victoria. Unpublished report prepared for DNRE Coast Division.

Matic, A, 2008, Russell Creek Roof Water Harvesting Pipeline, Warrnambool, Victoria

McConnell, A., Buckley, K. and Wickman, S., 2002a. Aboriginal Heritage Management in Victorian Forests; Main Report (Volume 4) West Victoria Region. Unpublished report prepared for the Department of Natural Resources and Environment Victoria by Cultural Heritage Management, Archaeology & Quaternary Geoscience, Hobart, Tasmania.

McConnell, A., Buckley, K. and Wickman, S., 2002b. Aboriginal Heritage Management in Victorian Forests; Subsidiary Report - Aboriginal Heritage Sensitivity Zoning, West Victoria Region. Unpublished report prepared for the Department of Natural Resources and Environment Victoria by Cultural Heritage Management, Archaeology & Quaternary Geoscience, Hobart, Tasmania.

Mercieca, A., 2000. Burnt and broken: an experimental study of heat fracturing in silcrete. *Australian Archaeology* 51, 40–47.

Mitchell, J 2014, Proposed Residential Subdivision at 17-19 Mortlake Road, Warrnambool. Unpublished Report.

Mulvaney, D.J. 1964. Prehistory of the Basalt Plain. Royal Society of Victoria 77 (2): 427-432

Mulvaney, J. and Kamminga, J., 1999. *The Prehistory of Australia*. Sydney, Allen and Unwin.

Murphy, A. 1994. Archaeological Survey of a Proposed Rifle Range Site, Warrnambool, Victoria. Unpublished report to the City and Shire of Warrnambool but du Cros and Associates.

Murphy, A. & Amorosi, L. (2003) Warrnambool Golf Course Re-Use Project Cultural Heritage Assessment. Unpublished report to GHD Pty Ltd by Tardis Enterprises Pty Ltd.

Nash, D., 2004. *Aboriginal Plant Use in south-eastern Australia*. Australian National Botanic Gardens, Canberra.

Neylon, A. and Hubbard, T., 2005. Warrnambool Heritage Gap Study- Stage Two. Preliminary Indicative List. Unpublished report to the Warrnambool City Council by Annabel Neylon and Timothy Hubbard Pty Ltd.

AV, 2017. http://www.dpcd.vic.gov.au/indigenous/publications-and-research/aboriginal-cultural-heritage-mini-posters Accessed 18 July 2017.

O'Callaghan, L. A undated, *Short History Of Warrnambool – Timeline*, unpublished manuscript held by the Warrnambool Historical Society.

O'Reilly, S & McAlister, R, 2011, 104-140 Wangoom Road and 185 Aberline Road Warrnambool, Unpublished Report.

O'Reilly, S. and McAlister, R. 2011. Wollaston Road, Warrnambool: Housing Subdivision. CHMP 11662. Unpublished report to Graeme Rodger, Rodger Constructions Pty Ltd and Peter Wilson, Wannon Region Water Corporation by Urban Colours.

O'Reilly, S 2012, Woollaston Road Development Infrastructure Works: Pipeline, Warrnambool. Unpublished Report.

Paynter, N. and Rhodes, D. 2005. An Archaeological Assessment, Wollaston Road, Warrnambool. Unpublished report to Earth Tech by Heritage Insight.

Purdy, B. A., 1974. Investigations concerning the thermal alteration of silica minerals: an archaeological approach. *Tebiwa* 17, 37–66.

Philip, J. (Surveyor), 1854. Extension of the Township of Warrnambool, Parish of Wangoom, County of Villiers, 26th August 1854.

Powell, J. M., 1970. The Public Lands of Australia Felix. Oxford University Press, Melbourne.

Presland, G. (ed.), 1977. Journals of George Augustus Robinson March – May 1841. Records of the Victorian Archaeological Survey 6, September 1977.

Presland, G. (ed.), 1980. Journals of G. A. Robinson May to August 1841. Records of the Victorian Archaeological Survey 11 October 1980.

Rees, D 2000, (Soil Scientist, Centre for Land Protection Research). pers. comm., December 2000.

Rowney, M., 1992. Heat treatment on the rocks: A study of heat treatment detection methods. Unpublished B.A. (Hons) thesis, Department of Prehistoric and Historical Archaeology. University of Sydney, Sydney.

Sayers, C. E., in Bonwick, J., Western Victoria, Its Geography, Geology and Social Condition, first published by Thomas Brown, Geelong, 1858, facsimile edition with an introduction and notes by C. E. Sayers, Heinemann Australia, Melbourne, 1970.

Sayers, C. E and Yule, P. L.,1987. *By these we flourish; A history of Warrnambool*. Warrnambool Institute Press, Warrnambool.

Schell, P 1995, 'An Archaeological Survey of the Hopkins River; A Report to the Framlingham Aboriginal Trust and Aboriginal Affairs Victoria'

Smith, J. 1998. Warrnambool Botanic Gardens Excavation Project. Unpublished report to the Warrnambool Botanic Gardens.

Sprague, R., 2005. *Burial Terminology. A Guide for Researchers*. Oxford, AltaMira Press.

Stevens, J 2014, 'Harris Street, Warrnambool, Sewer Duplication', Unpublished report for Wannon Water by Urban Colours

Stevens, J 2016, Huntingfield Drive, Warrnambool East Subdivision and Development of Land. CHMP prepared for Beveridge Williams by U. C. A. Pty Ltd Cultural Heritage Planners

Sullivan, S. and Bowdler, S. (eds.) 1984. *Site Surveys and Significance Assessments in Australian Archaeology, Proceedings of the 1981 Springwood conference on Australian Prehistory*. Research School of Pacific Studies, Australian National University, Canberra.

Thomas, S 2014, Hickford Parade Sewer Main Replacement, Warrnambool. Unpublished Report.

Van Der Linde, S, 2012, Deakin University Warnambool Campus Student Housing. Unpublished Report.

Warrnambool City Council 2015, "Heritage Guidelines", Grieve Gillett Pty Ltd

Webb, C and Tseng, B 2012. Lyndoch Home and Hospital for the Aged (H7421-0012), Hopkins Road Warrnambool Archaeological Management Plan. Unpublished report to Lyndoch Living, Lyndoch Warrnambool Inc. by Terra Culture Heritage Consultants.

Witter, D. 1977. The Archaeology of the Discovery Bay Area, Victoria. In Coutts, P. J. F. And Brooks, R. A. (eds) Memoirs of the Victorian Archaeological Survey. A collection of papers presented to ANSAAS 1977. August 29th-September 2nd: 51-72.

Wood, V 2001, 'A Study of the indigenous and non-indigenous cultural heritage along the proposed SEA pipeline from Iona, Victoria to Adelaide, South Australia', Unpublished report to Ecos Consulting (Australia) Pty Ltd. Vivienne Wood, Parkside.

Yule, P. L. & C. E. Sayers (1987). By These We Flourish: A History of Warrnambool. Warrnambool Institute Press, in Murphy, A. & Amorosi, L. (2003) Warrnambool Golf Course Re-Use Project Cultural Heritage Assessment. Unpublished report to GHD Pty. Ltd.

Zallar, S.A., Siow, K. & Coutts, P.J.F, 1979 'Stabilisation Of Coastal Archaeological Sites In Victoria: A Pilot Study

Maps and Images

State Library of Victoria (SLV), Plan of district near Belfast & Warrnambool [cartographic material], 1858, image no. ma000712.

SLV, Wangoom, County of Villiers [cartographic material] / drawn and reproduced at the Department of Lands and Survey, Melbourne by T. F. McGauran, 1891, image no. dq007101.