Beveridge North West PSP 1059, Beveridge

Aboriginal Heritage Impact Assessment (AHIA)

SPONSOR: Metropolitan Planning Authority

CHMP#12766

26 February 2014
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Aboriginal Heritage Impact Assessment (AHIA)

CHMP # 12766

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Sponsor: Metropolitan Planning Authority

Cultural Heritage Advisor: Simon Crocker

Authors: Emma Rae and Simon Crocker

LARGE Sized ACTIVITY

DESKTOP & STANDARD CHMP ASSESSMENT FOR PRECINCT STRUCTURE PLANNING

Prepared by Archaeological & Heritage Management Solutions (AHMS) Pty Ltd on behalf of Metropolitan Planning Authority

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Beveridge North West PSP 1059 Residential Subdivision, Beveridge, Northern Melbourne
Cultural Heritage Management Plan (12766)

REAL PROPERTY
Beveridge North West PSP 1059

DATE
26/02/2014

AUTHOR/HERITAGE ADVISOR
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PROPONENT
Metropolitan Planning Authority

PROJECT NAME
Beveridge North West PSP 1059

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<th>Definition</th>
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<tbody>
<tr>
<td>OAAV</td>
<td>Office of Aboriginal Affairs Victoria</td>
</tr>
<tr>
<td>AHC</td>
<td>Australian Heritage Council</td>
</tr>
<tr>
<td>BP</td>
<td>Before Present (when referring to radiocarbon dating)</td>
</tr>
<tr>
<td>CHMP</td>
<td>Cultural Heritage Management Plan</td>
</tr>
<tr>
<td>AHC</td>
<td>Aboriginal Heritage Council</td>
</tr>
<tr>
<td>EVC</td>
<td>Ecological Vegetation Communities</td>
</tr>
<tr>
<td>LGA</td>
<td>Local Government Authority</td>
</tr>
<tr>
<td>RAP</td>
<td>Registered Aboriginal Party</td>
</tr>
<tr>
<td>SGD</td>
<td>Significant Ground Disturbance</td>
</tr>
<tr>
<td>VAHR</td>
<td>Victorian Aboriginal Heritage Register</td>
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</table>

Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Activity area</td>
<td>The area or areas to be used or developed for the activity</td>
</tr>
<tr>
<td>Sponsor</td>
<td>Metropolitan Planning Authority</td>
</tr>
<tr>
<td>Registered Party (RAP)</td>
<td>Wurundjeri Tribe Land &amp; Compensation Cultural Heritage Council</td>
</tr>
<tr>
<td>Proponent</td>
<td>The person, persons or corporation who undertakes the activity or parts of the activity in accordance with the requirements of this CHMP</td>
</tr>
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</table>
EXECUTIVE SUMMARY

The Metropolitan Planning Authority (The Sponsor) engaged Archaeological and Heritage Management Solutions (AHMS) Pty Ltd to prepare a Cultural Heritage Management Plan (CHMP) to Standard Assessment level for properties situated within PSP 1059, Beveridge North (Figure 1). Beveridge North West PSP is located within Mitchell Shire Council and is 1,259 ha in area. The PSP is situated to the west of the Hume Freeway, north of Cameron's Lane, west of Old Sydney Road and south of Wallan. The approved Lockerbie North PSP is located to the east of the precinct on the opposite side of the Hume Freeway. Beveridge Central and Mandalay is located to the south of the precinct.

The Wurundjeri Tribe Land and Compensation Cultural Heritage Council (WTLCCHC) is the Registered Aboriginal Party (RAP) relevant to the activity area. A notice of intent to prepare the CHMP was lodged with the Office of Aboriginal Affairs Victoria (OAAV) and the RAP on the 5th of September 2013 (Appendix 1). The Office of Aboriginal Affairs Victoria issued the project number 12766. The Wurundjeri Tribe Land and Compensation Cultural Heritage Council formally advised the Sponsor in writing that they would evaluate the CHMP on 2 September 2013 (Appendix 1).

The desktop research identified more than 2,500 Aboriginal places are registered within the geographic region (the Yarra River Basin), the majority of which are located in close proximity to major rivers and creeks. A total of seven Aboriginal places have been previously registered within the activity area. The Aboriginal places consist of artefacts scatters (n=6) and a scarred tree (n=1).

A review of previous Aboriginal archaeological assessment reports in and near the activity area indicated a strong relationship between a higher density of stone artefacts and: crests, slopes and rises, watercourses, and rises overlooking swamps.

A review of historical and recent aerial photography indicates that the prior land-use disturbances that have occurred within the activity area include ploughing, clearing of native vegetation, excavation of dams, and construction of buildings, sheds, tracks, and fences.

The desktop assessment concluded that higher density stone artefact scatters are more likely to be located on the crests and slopes of rises (including stony rises), especially those adjacent to water courses or swamps. Isolated artefact occurrences were considered likely within the undulating plain.

The desktop assessment concluded that past disturbance is likely to have affected the potential for, and integrity of archaeological deposits within most of the activity area.

During the standard assessment, the entire activity area was subject to archaeological survey. More than 95% of the activity area was covered with pasture grasses and had no ground surface visibility. Disturbances identified during the standard assessment include: vegetation clearance, farm dams, farm fences, plantation trees, vehicle tracks, and several buildings and structures.

A total of eight Aboriginal places were investigated during the standard assessment. A total of seven of the Aboriginal places have been previously registered and an additional new low density artefact scatter was recorded during the standard assessment. Of the previously registered Aboriginal places, Gilbo 1 (VAHR 7823 - 0101) could not be relocated and it is considered likely that is has been destroyed as is indicated by the level of erosion present at the Aboriginal place location. Kalkallo Creek 5 IA (VAHR 7823 - 0240) could also not be relocated and has been subject to disturbance through the construction of a vehicle track. It is likely that the artefact was removed from the location prior to this development. The remaining previously registered Aboriginal places were re-located and re-inspected.

The results of the desktop and standard assessment developed for this PSP were used to develop an archaeological sensitivity map to assist in guiding future management of Aboriginal heritage and to
inform development of concept design and constraint analysis. A list of variables considered likely to contribute to archaeological potential within the activity area were determined during the desktop and standard assessments, and consist of: proximity to watercourses, crest and elevated landforms, and areas of cut and fill disturbance.

The model traits for the activity area are:

- Crest and slopes of rises and within 200m of confluence of watercourses = very high sensitivity;
- Within 200m of confluence of two watercourses = high sensitivity
- Within 200m of watercourse or historic wetland = moderate sensitivity
- Crest and slopes of rises = moderate sensitivity;
- Undulating plain = low sensitivity; and
- Cut and fill disturbance = negligible sensitivity.

Drawing on the results of the desktop and standard assessments, we make the following recommendations for planning and decision making in the PSP 1059 Beveridge North West activity area:

**Very High Sensitivity:** The aim of PSP design should be to minimise future development impact on these areas and where possible, to retain these areas in their current form. This approach will protect areas with high potential for significant archaeological deposits and cultural values. The approach will also save time and money in reducing the scope of mitigation and salvage of sensitivity areas.

Options for retention could include inclusion of parts of the very high sensitivity land within open space, riparian, RCZ, bio-link, set-backs and/or asset protection zones. Where possible, the landscape integrity and amenity of these areas should be retained, including appropriate set-backs where this is relevant. Appropriate and robust planning provisions should be established during the PSP design process for areas that are proposed to be retained. Provisions for retention could include specific measures that limit ground disturbance or erosion into the future.

High impact activities such as creek crossings or large drainage works should avoid the areas of very high sensitivity, where possible.

**High and Moderate Sensitivity:** where there is an opportunity, development impact should be minimized where practicable. For instance, where there are opportunities to establish open space, these could be placed on areas of moderate sensitivity to protect Aboriginal heritage and reduce the scope of expensive and time consuming archaeological mitigation measures and salvage. Areas of high sensitivity should take precedence over areas of moderate sensitivity.

**Low Sensitivity:** no design and planning recommendations. These areas are essentially archaeologically ‘neutral’ and are generally compatible with residential subdivision and development.
Negligible Sensitivity: these areas could be the focus of development, particularly high impact features of a subdivision like a town centre, medium or high density residential, industrial or commercial.

The following recommendations set out the key legal requirements that will apply to PSP planning and development within the study area:

Subdivision or development projects (greater than 2 lots and/or two dwellings) located within or partly within areas of legislated cultural heritage sensitivity defined under the Aboriginal Heritage Regulations 2007 (shown on Figure 32) and Aboriginal places marked green on Figure 30 will require completion of mandatory cultural heritage management plans (CHMPs) before Planning Permits can legally be approved for these projects. Prior to subdivision or development projects taking place a search of the Aboriginal cultural heritage sensitivity overlay on the OAAV website should be undertaken to ensure that the proponent has the most up to date version of OAAV Aboriginal cultural heritage sensitivity overlay when determining whether or not a mandatory CHMP is required for an activity.

CHMPs must be prepared by a qualified Cultural Heritage Advisor and must be approved by the WTLCCHC prior to commencement of the activity. A project specific methodology, including proposed testing and sampling, to be carried out as part of any CHMP will be required.

If individual development proponents believe their land has been subject to significant ground disturbance (either mechanical excavation disturbance and/or deep ripping) they could consider engaging a Cultural Heritage Advisor to undertake an assessment and make a determination. Activity areas that have been subject to significant ground disturbance as defined by the Aboriginal Heritage Regulations 2007 may not require a mandatory CHMP.

Areas where no development or ground disturbance is proposed – no Complex Assessment will be required in areas where development and disturbance is not proposed. Inclusion of areas of very high sensitivity in conservation, open space, biolinks and/or riparian corridors will reduce the scope of Complex Assessment required and provide good outcomes in protecting significant Aboriginal heritage;

Known Aboriginal Places (including Low Density Artefact Distributions) (Figure 30) – registered on the Victorian Aboriginal heritage register (VAHR) and places found during the standard assessment described in this report are protected by the Aboriginal Heritage Act 2006. It is an offence to disturb or destroy these places without first obtaining either a Permit to Harm or an approved CHMP from OAAV.

Blanket Protection – Irrespective of whether or not a CHMP is required for a particular development or activity, the Aboriginal Heritage Act 2006 provides blanket protection for all Aboriginal cultural heritage. If any Aboriginal objects (artefacts), sites, places or skeletal remains are identified at any time before or during development works, they cannot be harmed until either a Permit to Harm or a CHMP that specifically permits harm to that place has been approved by OAAV.

Where a CHMP will be required we recommend the use of a landform based approach to complex assessment (test excavation). The landform based approach aims to systematically test each landform within an activity area to establish the extent of cultural material present. This approach is recommended because it is a very efficient and effective means of assessing the nature, extent and significance of Aboriginal cultural heritage across large landscapes. It also provides for a consistent
approach across PSP 1059 and significant sampling efficiencies by using a common approach that can be utilized by all the landowners and proponents within the activity area.

The extent of testing and sample effort should be based on the level of sensitivity shown on the predictive sensitivity mapping shown on Figure 31. Areas which are disturbed or have low sensitivity should not require further test excavation because they are considered ‘unlikely’ to contain Aboriginal cultural heritage (the Aboriginal Heritage Regulations 2007 only require complex assessment in areas that are ‘likely’ to contain Aboriginal cultural heritage). However, areas ranging from moderate to very high sensitivity should be included in a systematic programme of landscape-based archaeological test excavation that aims to establish the extent nature and significance of the Aboriginal cultural material within areas of proposed development impact (NB: Areas set aside as open space, conservation or other uses that do not entail development disturbance will not be included in complex assessment and can therefore be excluded from complex assessment scope of work). Levels of sensitivity ranging from low to very high will need to be included in the scope of complex assessments in order to efficiently test the predictive model.

In addition to test excavation, individual complex assessments should also include consultation with the WTLCCHC to identify site specific cultural values. The WTLCCHC must also be invited to participate in any further survey or test excavation fieldwork.

Proposed sampling densities for complex assessments are outlined below. These densities are based upon previous landform based testing, conducted at Botanic Ridge PSP and Minta Farm PSP for the Metropolitan Planning Authority in which the level of testing outlined below was successfully used to establish the extent, nature and significance of the Aboriginal Cultural Heritage across each landscape and identify statistically robust landform and environmental trait patterning. Whilst the geology and environmental variables at Beveridge North West vary from those at Botanic Ridge and Minta Farm, the fundamental sampling principles are the same. We recommend a minimum sampling density as per Table 19 below.

Table 1: Proposed Sampling Densities

<table>
<thead>
<tr>
<th>Sensitivity Level</th>
<th>Testing Required (per 100 hectare for larger properties)*</th>
</tr>
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<tbody>
<tr>
<td>Low</td>
<td>10 Square Metres</td>
</tr>
<tr>
<td>Moderate</td>
<td>15 square metres</td>
</tr>
<tr>
<td>High</td>
<td>20 square metres</td>
</tr>
<tr>
<td>Very High</td>
<td>25 square metres</td>
</tr>
</tbody>
</table>

* For properties that are less than 100 hectares the same sampling densities would also apply. For example, a 25 hectare property in high sensitivity zoning would still require 20 square metres sample because it is a minimum sample required to understand the nature, extent and significance of subsurface deposits. For properties that include a range of sensitivity zones, the sampling should be weighted according to the proportion of the land in different sensitivity zones.
Part 1: Assessment
1 INTRODUCTION

1.1 Preamble

The Metropolitan Planning Authority (The Sponsor) engaged Archaeological and Heritage Management Solutions (AHMS) Pty Ltd to prepare an Aboriginal heritage impact assessment (AHIA) for the proposed Precinct Structure Plan (PSP) 1059, Beveridge North West (Figure 1). Beveridge North West PSP is 1,259 ha in area and is located within Mitchell Shire Council. It is situated to the west of the Hume Freeway, north of Camerons Lane, west of Old Sydney Road and south of Wallan. The approved Lockerbie North PSP is located to the east of the precinct on the opposite side of the Hume Freeway. Beveridge Central and Mandalay PSPs are located to the south of the precinct.

The Wurundjeri Tribe Land and Compensation Cultural Heritage Council (WTLCCHC) is the Registered Aboriginal Party (RAP) relevant to the activity area. A notice of intent to prepare a standard assessment CHMP was lodged with the Office of Aboriginal Affairs Victoria (OAAV) and the RAP on 5 September 2013 (Appendix 1). The Office of Aboriginal Affairs Victoria issued the project number 12766. The Wurundjeri Tribe Land and Compensation Cultural Heritage Council formally advised the Sponsor in writing that they would evaluate the CHMP on 2 September 2013 (Appendix 1).

This heritage assessment was prepared in accordance with the requirements of the Aboriginal Heritage Act 2006 and associated regulations and guidelines issued by AAV regarding preparation of CHMPs. The overriding purpose of the heritage assessment was to document and assess the Aboriginal heritage (archaeological and cultural) values of the study area to assist in PSP design and planning work. The heritage assessment is also designed to provide management recommendations for future subdivision and development and to provide a desktop and standard assessment that can be utilised by landowners and developers to develop complex CHMPs for specific development projects within the Beveridge North West PSP area.
Figure 1: Location of the activity area
1.2 Reason for the current study

The objective of the Aboriginal cultural heritage assessment was to identify and assess the nature, extent and significance of Aboriginal sites, objects and cultural heritage values within the subject land to inform PSP design and planning work. The heritage assessment also provides recommendations to manage and assess Aboriginal heritage during complex assessment CHMPs for future development projects within the Beveridge North West PSP area.

This Aboriginal cultural heritage assessment has been prepared in accordance with the Aboriginal Heritage Act 2006 and the Aboriginal Heritage Regulations 2007.

Specific aims of the assessment were as follows:

1. Identify any known Aboriginal sites, relics and places of cultural significance to the Aboriginal community within the subject land;
2. Assess the potential for Aboriginal sites and/or relics buried below ground surfaces;
3. Assess the Aboriginal heritage significance of Aboriginal sites, relics, places and areas of archaeological potential in partnership with the local Aboriginal community;
4. Assess the potential impact of the activity on Aboriginal sites, relics, places and significance values;
5. Make recommendations to help inform PSP design and planning; and
6. Make appropriate recommendations for protection of cultural heritage and/or mitigation of development impact, including contingency procedures, in consultation with the local Aboriginal community.

1.3 Acknowledgements

The authors would like to acknowledge the valuable assistance provided by Fiona McDougall of the Metropolitan Planning Authority. The authors would also like to acknowledge the assistance and valuable input provided by WTLCCHC representatives.

1.4 Cultural Heritage Advisor and Authorship

Simon Crocker (B.A. Hons) is the Cultural Heritage Advisor (CHA) and the principal author for this CHMP. Emma Rae (BA Hons) assisted with desktop research and preparation of the report. Jim Wheeler (BA Hons MAACAI) reviewed the report.

2 ACTIVITY DESCRIPTION

The majority of the activity area (Figure 1) is currently zoned Urban Growth Zone, with a minor drainage channel zoned Urban Floodway Zone (UFZ) and areas of Rural Conservation Zone (RCZ) in the north and west.

The Sponsor, the Metropolitan Planning Authority (MPA), does not intend to develop each individual allotment, nor would they undertake subdivision works. The role of the MPA is to undertake master planning and design work to assist in facilitating streamlined and high quality development within the Beveridge North PSP 1059 growth area activity area. Subdivision works and implementation of
development projects within the Beveridge North West PSP 1059 growth area activity area would be undertaken by individual landowners and/or developers.

The PSP forms part of larger-scale development in the North Growth Corridor and will contribute to a projected population increase in the North to between 260,000 to 330,000 residents by 2031.

The North Growth Corridor Plan (GCP) identifies the primary land use is residential with landscape values along the north and west boundary. Kallkallo Creek is within the precinct and runs north south on the western side of the precinct. The GCP identifies two north south arterial roads and two east west arterial roads. The PSP is expected to accommodate over 11,000 residential lots.

This report comprises desktop and standard level heritage assessments designed to assist the MPA in PSP design and planning and to provide a desktop and standard CHMP assessment that can be utilised by landowners and developers to develop complex CHMPs for specific development projects within the Beveridge North West PSP 1059 growth area activity area.

3 EXTENT OF THE ACTIVITY AREA

Beveridge North West PSP is located within Mitchell Shire Council. It is situated to the west of the Hume Freeway, north of Camerons Lane, west of Old Sydney Road and south of Wallan. The approved Lockerbie North PSP is located to the east of the precinct on the other side of the Hume Freeway. Beveridge Central and Mandalay is located to the south of the precinct.

The Beveridge North West comprises 15 properties with a total area of 1,259 hectares (gross). The extent of the activity area is shown overleaf on Figure 2.
Figure 2: Extent of the activity area and location of registered Aboriginal places located within 200m of the activity area.
4 DOCUMENTATION OF CONSULTATION

4.1 Development of consultation

The RAP relevant to the activity area at the time the notice of intent to prepare this CHMP was submitted was the Wurundjeri Tribe Land & Compensation Cultural Heritage Council (WTLCCHC).

Our approach to the Aboriginal community consultation was to undertake all components of the CHMP in partnership with WTLCCHC. In practice, we conducted two meetings with WTLCCHC, including an initial meeting to discuss the scope of the proposed development and results of the desktop assessment and a second meeting to discuss the results of the standard assessment and agree on an approach for future complex assessment methodology. The RAP was also invited to participate in the standard assessment component of the CHMP. The development of consultation with WTLCCHC is set out in Table 2.

Table 2 - Development of consultation with WTLCCHC

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>30/08/13</td>
<td>Notified WTLCCHC of intention to prepare the CHMP</td>
<td>Email</td>
</tr>
<tr>
<td>2/09/13</td>
<td>WTLCCHC indicated that they would evaluate the CHMP</td>
<td>Email</td>
</tr>
<tr>
<td>10/09/13</td>
<td>Inception meeting with WTLCCHC (Delta Freedman and Perry Wandin) and MPA (Fiona McDougall)</td>
<td>Meeting</td>
</tr>
</tbody>
</table>

4.2 Outcomes of consultation

Inception meeting:

An inception meeting was held at the WTLCCHC office on 10 September 2013. The meeting was attended by AHMS, the Sponsor, as well as WTLCCHC staff (Table 3).

Table 3 - Attendees at inception meeting held 10 September 2013

<table>
<thead>
<tr>
<th>Representative</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emma Rae</td>
<td>AHMS</td>
</tr>
<tr>
<td>Simon Crocker</td>
<td>AHMS</td>
</tr>
<tr>
<td>Fiona McDougall</td>
<td>MPA (Sponsor)</td>
</tr>
<tr>
<td>Delta Freedman</td>
<td>WTLCCHC (Heritage advisor)</td>
</tr>
<tr>
<td>Perry Wandin</td>
<td>WTLCCHC (Elder)</td>
</tr>
</tbody>
</table>

The objective of the meeting was to introduce the project and discuss the ongoing methodology for the assessment work. Pertinent subjects discussed at the meeting included:

- Introduction of the proposed activity and the location/topographic features of the activity area;
- Explanation of the proposed procedure for undertaking and completing the CHMP. AHMS explained that the proposed CHMP will include desktop and standard assessment over the entire activity area to assist with early planning and design decision making and that complex assessment CHMP's will be undertaken at a later time;
Discussion of desktop assessment research - seven previously registered Aboriginal places are situated within the activity area and one Aboriginal place within 50m of its boundaries;

Discussion of landforms thought to be sensitive for Aboriginal cultural heritage which should therefore be targeted during the archaeological survey: stony rises, high/eruption points, drainage corridor, areas of good ground surface visibility (i.e. vehicle tracks); and

Incorporation of the information collected during the archaeological survey into archaeological sensitivity mapping across the entire activity area.

During the inception meeting the methodology for the archaeological survey was discussed and it was agreed that the survey would focus on the following landform/features:

Drainage corridor (west extent of the activity area);

Mature Native Eucalypt trees for evidence of cultural scarring;

Stony rises and mounds;

Any areas which demonstrated good ground surface visibility such as the edges of dams, stock tracks and vehicle tracks;

Inspection of previously recorded Aboriginal places; and

Any eruption / high points.
5 DESKTOP ASSESSMENT

5.1 Preamble

This section comprises the 'desktop assessment' required by the *Aboriginal Heritage Regulations 2007*. In accordance with the regulations this section of the report comprises the following:

- A search of the Victorian Aboriginal Heritage Register (VAHR) for information relating to the activity area, including the date(s) the information was accessed;
- An identification and determination of the geographic region of which the activity area forms a part that is relevant to the Aboriginal cultural heritage that may be present in the activity area;
- A concise map or maps showing the geographic region referred to in point 2 and the location of the activity area in that geographic region;
- A review of the registered Aboriginal places in the geographic region referred to in point 2;
- A review of reports and published works about Aboriginal cultural heritage in the geographic region referred to in point 2, relevant to the activity area;
- A review of historical and ethno-historical accounts of Aboriginal occupation of the geographic region referred to in point 2, relevant to the activity area;
- A review of the landforms or geomorphology of the activity area;
- A review of the history of the use of the activity area, including discussion of prior disturbance to ground surfaces and soil deposits if available; and
- A conclusion surmising from the desktop assessment where it is possible Aboriginal cultural heritage may be located in the activity area.

The information obtained during desktop assessment assists in determining the archaeological potential of the activity area in a number of ways. For example, considering the types of natural resources that may have been available within the study area, or in the region, provides an indication of why people may have been present in the area, and of the potential physical traces of such a presence (e.g. the types of stone used for artefact making, whether trees having bark suitable for the manufacture of certain items existed/exist in the area, or whether there exists a known resource - plant animal or otherwise - that may have drawn people to the area).

Information about previously recorded archaeological sites in the region can provide an indication of the types and distribution of archaeological deposits and material that may be present, or may once have been present, in the study area. It also provides comparative information that is essential for the assessment of the archaeological significance of any previously unrecorded archaeological material or deposits.

Environmental and historical information (particularly regarding past and present land use) may indicate the potential for post-depositional processes to have altered or disturbed any archaeological deposits or materials that may have once, or may still, exist within the activity area.

In short, knowledge of the environmental, cultural and historical contexts of the study area is crucial for understanding the archaeological potential and significance of that area.
5.2 Geographic region

The geographic region for the purpose of this CHMP is the Yarra River Basin (Figure 2). The activity area is situated within the greater geological feature of the Western District Plains or Volcanic Plains. The Volcanic Plains are comprised of basaltic lava flows, tuffs and scoriae ranging in age from the Middle Pliocene to geologically recent and are known as the Newer Volcanic Group.

The Yarra River basin covers an area of approximately 4,100km². It begins in the north from the Great Dividing Range, is bound by the Blue Range and Dandenong Ranges in the east and south and extends around 50km north and 120km east of the city of Melbourne. Approximately 42% of the Yarra River basin is forested¹.

Although the geographic region comprises the Yarra River Basin, the desktop assessment summarised in the following sections of this report places a particular focus on the activity area, Merri Creek, and the surrounding basalt plains within a 5km radius. This provides a suitable region for study because it shares common and distinct topographic, drainage, geological and soil landscape characteristics.

Figure 3: Geographic region of the activity area

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5.3 Review of Aboriginal places

A search of the VAHR was undertaken to identify previously registered Aboriginal place types and distribution patterns across the geographic region and within a 10km radius of the activity area (Figure 3). The search was undertaken by Simon Crocker on 10 September 2013.

In excess of 2,500 Aboriginal places have been recorded within the geographic region, with the majority of Aboriginal places situated within close proximity to major rivers and creeks.

The search also identified a total of 138 Aboriginal places within a 10km radius of the activity area. The vast majority of these Aboriginal places consist of artefact scatters; comprising 89% of all Aboriginal place types (this figure includes artefacts scatters and low density artefact distributions (LDADs)). The majority of these were situated in close proximity to drainage corridors (particularly Merri Creek and other unnamed watercourses in the area). The second most frequent Aboriginal place type, within 10km surrounding the activity area, comprises scarred trees (13 registered within 10km radius), followed by earth features (3 registered within 10km radius). The current site distribution pattern is clearly weighted towards areas of higher surface visibility within areas that have previously undergone archaeological assessment.

There are seven Aboriginal places situated within the activity area and one Aboriginal place situated within 50m of its boundaries (Table 4). A further two Aboriginal places are located within 200m of the activity area (Figure 2).

The Aboriginal places within the activity area (and within 50m of its boundaries) are discussed below:

**VAHR 7822-0100 - Gilbo 1:** This Aboriginal place consists of an isolated artefact, specifically a quartz core fragment. The Aboriginal place was registered within the undulating plain by Bell in 2002.

**VAHR 7822 - 0101 - Lewis 1:** This Aboriginal place consists of a scarred tree located on the undulating plain west of Bald Hill. The scar is located on a species of Eucalypt, possibly manna gum. The Aboriginal place was registered by Bell in 2002.

**VAHR 7822-0235 - Camerons Lane 1:** This Aboriginal place is an artefact scatter consisting of 410 stone artefacts. The artefacts were identified within a surface and sub-surface context, on a large stony rise located immediately south of the activity area. Subsurface testing on the undulating plain adjacent to the stony rise indicated that the Aboriginal place is confined to the stony rise landform.

**VAHR 7822-0236 - Kalkallo Creek 1:** This Aboriginal place comprises an artefact scatter of 32 stone artefacts, located on the lower slope of an incised stream that flows northwest/southeast through the activity area. The Aboriginal place was registered by Anderson in 2011 as part of a due diligence assessment.

**VAHR 7822-0237 - Kalkallo Creek 2:** This Aboriginal place comprises an artefact scatter of 7 stone artefacts, located on the lower slope of an incised stream that flows northwest/southeast through the activity area. The artefacts are thought to have eroded out from the bank of the deeply incised stream. The Aboriginal place was registered by Anderson in 2011 as part of a due diligence assessment.

**VAHR 7822-0238 - Kalkallo Creek 3:** This Aboriginal place comprises an artefact scatter of 5 stone artefacts, located on the lower slope of an incised stream that flows northwest/southeast through the activity area. The artefacts are thought to have eroded out from the bank of the deeply incised stream. The Aboriginal place was registered by Anderson in 2011 as part of a due diligence assessment.

**VAHR 7822-0239 - Kalkallo Creek 4:** This Aboriginal place comprises a single stone artefact, located on the lower slope of an incised stream that flows northwest/southeast through the activity area. The artefact consists of a silcrete scraper and is thought to have eroded out from the bank of the deeply incised stream.
incised stream. The Aboriginal place was registered by Anderson in 2011 as part of a due diligence assessment.

**VAHR 7822-0239 - Kalkallo Creek 5:** This Aboriginal place comprises a single stone artefact, located at the confluence of two upper tributaries of Kalkallo Creek. The artefact consists of a silcrete blade and is thought to have been redeposited through water flows. The Aboriginal place was registered by Anderson in 2011 as part of a due diligence assessment.

**Table 4 - VAHR Aboriginal Places within the Activity Area and within 50m of its Boundaries**

<table>
<thead>
<tr>
<th>VAHR #</th>
<th>Site Name</th>
<th>Component Type</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7822-0100</td>
<td>Gilbo 1</td>
<td>Isolated artefact</td>
<td>Within activity area</td>
</tr>
<tr>
<td>7822-0410</td>
<td>Lewis 1</td>
<td>Scarred Tree</td>
<td>Within activity area</td>
</tr>
<tr>
<td>7822-0235</td>
<td>Camerons Lane 1</td>
<td>Artefact scatter</td>
<td>Immediately south of activity area</td>
</tr>
<tr>
<td>7822-0236</td>
<td>Kalkallo Creek 1</td>
<td>Artefact scatter</td>
<td>Within activity area</td>
</tr>
<tr>
<td>7822-0237</td>
<td>Kalkallo Creek 2</td>
<td>Artefact scatter</td>
<td>Within activity area</td>
</tr>
<tr>
<td>7822-0238</td>
<td>Kalkallo Creek 3</td>
<td>Artefact scatter</td>
<td>Within activity area</td>
</tr>
<tr>
<td>7822-0239</td>
<td>Kalkallo Creek 4 IA</td>
<td>Isolated artefact</td>
<td>Within activity area</td>
</tr>
<tr>
<td>7822-0240</td>
<td>Kalkallo Creek 5 IA</td>
<td>Isolated artefact</td>
<td>Within activity area</td>
</tr>
</tbody>
</table>
5.4 Review of regional archaeological context (including reports and published reports)

For the purposes of determining settlement and site distribution patterns, archaeologists examine regional and local trends in the distribution of known sites in relation to environment and topography. This provides evidence about economic and social systems in the past and also assists archaeologists in predicting likely site types, site locations and the nature of the archaeological resource in any given area. Key regional studies are reviewed and discussed below.

5.4.1 General patterns

The distribution, density and size of known Aboriginal archaeological sites is largely dependent on environmental context, post-contact land use and erosion / site formation processes. There is likely to be a correlation between fresh water sources and Aboriginal archaeological deposits. Numerous studies have indicated a higher density and frequency of deposits exist in close proximity to water sources and the level of density and frequency increases with higher stream orders. There is likely to be a higher density and frequency of archaeological deposits in close proximity to former wetlands.

Stone sources are also likely to be associated with a higher density and frequency of archaeological deposits reflecting on-source primary reduction. Resource intersection zones, stream confluences and transitional vegetation may also be associated with a higher density and frequency of archaeological deposits. Other factors (as yet untested in the region) in archaeological potential may include slope gradient, aspect, landform and soil landscape type.

Past disturbance is also likely to have affected the potential for and integrity of archaeological deposits in any given area. Areas that have been permanently or regularly inundated (such as large swamps) may also have a lower level of potential because they were unsuitable for occupation and use.

Goulding 1988

A study on the Melbourne Area District 2 was conducted by Goulding on behalf of the Land Conservation Council of Victoria. The aims of the study were:

To provide a detailed account of Aboriginal society prior to European settlement;

To report on the history of Aboriginal people living in the study area since the settlement of Europeans;

To provide information on known archaeological sites on public land which relate to the post- and pre-contact history of Aboriginal society.

Melbourne Area District 2 comprises a range of diverse environments containing many resources which would have been exploited by Aboriginal people in the past. These environments include: coastal zones, Morning Peninsula and Westernport, coastal plains, river valleys, the Upper Yarra Ranges and the Great Dividing Ranges. Goulding's study area encompasses the westernmost portion of the activity area.

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4 Ibid
Using previous regional assessment work\textsuperscript{5,6,7} Goulding endeavoured to provide information on Aboriginal archaeological sites situated within the study area and list Aboriginal places considered to be of high scientific significance. A total of nine Aboriginal place types were described as occurring within Goulding's study area in public land holdings: shell midden, surface scatter, isolated artefact, scarred tree, quarry/stone source, rock shelter/cave, isolated hearth and burial. Goulding further explored what defined each of these Aboriginal place types and gives a description of where some of them are most likely to occur. Shell middens are common along the coastline and may be found up to a kilometre inland and surface scatters/isolated artefacts may be found across a wide variety of environments. A review of the previous assessments\textsuperscript{8,9,10} identified 49 significant Aboriginal places across Goulding's study area corresponding to each of the Aboriginal place types listed above. Of these significant sites, 32 were shell middens, six comprised surface scatters, six were scarred trees, two were quarry/stone sources and one rock shelter/cave, isolated hearth and burial were also listed. The scientific significance of the Aboriginal places was assessed by evaluating scientific value, representative value, and social value. None of the highly significant sites discussed by Goulding were situated near the activity area.

\textbf{Johnston & Ellender 1993}

A cultural heritage study was undertaken of the Merri Creek from its convergence with the Yarra River at Dights Falls to the northern boundary of Whittlesea. The overarching aim of the study was to create a Concept Plan which would ultimately provide direction for development of linear parkland alongside the creek for use of the broader community. To achieve this, the following tasks were completed:

- Preparation of an updated database of heritage places located along or close to the Merri Creek based on previous studies and other sources;
- Identification of further work required to provide a more complete understanding of the heritage of the Merri Creek, and make recommendations on the conduct of the work;
- Evaluation of protection and management strategies for identified heritage places on the Merri Creek, and recommendations for improvements;
- Identification of areas that may contain evidence of either Aboriginal and historic land uses and activities, and recommendations for planning procedures to reduce the risk of damage to unrecorded sites; and
- Identification of opportunities for the use and interpretation of places\textsuperscript{11}.

A brief survey reconnaissance was undertaken to sample survey for sites within the Merri Creek Metropolitan Park, identify current and potential threats to sites, highlight site protection and

\textsuperscript{8} Sullivan, op cit.
\textsuperscript{9} Gaughwin, op cit.
\textsuperscript{10} Du Cros 1989, op cit.
management and identify any gaps in the information and recommended further work where required. One scarred tree was identified during the survey (VAHR 7822-0656) along with several areas of archaeological sensitivity:\(^{12}\):

*River terraces;*

A flat top of the escarpment overlooking the creek;

Residues of ancient swamps;

Volcanic vents of Bald Hill, Mount Fraser and others;

The exposed metamorphic interface between the basalt and the sedimentary geology;

Stands of old Red Gum woodlands;

A chance of rock overhangs with soil floors in the basaltic cliffs in deeply incised parts of the valley.\(^{13}\)

As a result of the investigation, recommendations were provided with the aim of achieving protection for specific sites, protection for unidentified sites, generating general concerns about heritage issues and understanding and embracing Aboriginal heritage.

**Murphy 1995 & 1996**

The National Estate Grants Program funded the North Western Wurundjeri Region Heritage Study which was undertaken for Wurundjeri and conducted in two stages. The aims of the investigation were to review all available background information in relation to cultural heritage; including ethnography and previously completed archaeological reports. A sample survey was also conducted as part of the study. Murphy used the results of the background research to propose that the study area is potentially archaeologically rich. Undisturbed sections of creek lines and rivers were also highlighted as areas potentially containing Aboriginal cultural heritage\(^{14}\). The results of the study (Stage 1 & 2) are summarised below:

*35 Aboriginal places were registered;*

These new Aboriginal places comprised 11 surface scatters of stone artefacts, 21 isolated artefact occurrences and 3 scarred trees;

A total of 0.4% of the study area was systematically surveyed for Aboriginal places;

75% of all Aboriginal places were recorded within the mountain ranges environmental zone;

84% of all Aboriginal places recorded were situated on level to gently inclined ground;

62% of all Aboriginal places recorded were located within 100 metres of a water supply (generally 3rd order and higher streams);

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\(^{12}\) Ibid
\(^{13}\) Ibid
81% raw materials present in the Aboriginal places recorded were fine-grained silcrete;

81% of the artefacts recorded within the Aboriginal places were flaked pieces;

All surface Aboriginal places recorded were in a highly disturbed location\textsuperscript{15}.

Areas of archaeologically sensitivity were also defined as a result of the investigation:

"Areas of level to gently sloping land in any landform, and level areas (within 200 metres) of either an ephemeral or permanent water supply;

Areas where stands of mature native trees exist;

Outcrops or naturally occurring silcrete, greenstone or quartz;

Outcrops of sandstone or granite;

Areas which possess natural rock shelters or caves\textsuperscript{16}.

It was recommended that any proposed development (affecting an area of more than 2 hectares) be subject to archaeological survey before planning approvals are obtained from the local council in a bid to ensure Aboriginal archaeological sites are not destroyed.

\textbf{Ellender 1997}

Ellender undertook archaeological survey and assessment of the Aboriginal cultural heritage along the Merri Creek from Craigieburn Road to Hernes Swamp.\textsuperscript{17} Ellender's survey included the section of Merri Creek situated within the northern portion of the activity area. Ellender used a predictive model generated by Hall's\textsuperscript{18} survey work of the lower Merri Creek (from Dight's Falls to Craigieburn Road). Hall's predictive model established the following:

\begin{itemize}
    \item \textit{in situ} sites will be rare;
    \item Artefact scatters will contain few artefacts in low density;
    \item Scarred trees will be Red Gums towards the north;
    \item Ground visibility will be a problem;
    \item The conflation of Aboriginal places will make identification of base camps difficult;
    \item Stone was probably traded in to the area;
\end{itemize}

\textsuperscript{15} Murphy, A., North Western Wurundjeri Area Stage 2 Regional Aboriginal Archaeological Heritage Survey. Report to the Wurundjeri Tribe Land Compensation and Cultural Heritage Council, 1996.

\textsuperscript{16} Ibid.

\textsuperscript{17} Ellender, I. \textit{The Aboriginal Cultural Heritage Of The Merri Merri Creek: Including The Archaeological Survey For Aboriginal Sites From Craigieburn Road to Hernes Swamp}. For Merri Creek Management Committee, 1997.

\textsuperscript{18} Hall, R. Merri Creek Parklands: Aboriginal and historic heritage survey. (Two volumes). Report for the Merri Creek Bicentennial Committee, 1989.
Aboriginal places will vary in density according to whether they are on high promontories and how close they are to water\textsuperscript{19}.

Halls results indicated:

Aboriginal places were found where visibility allowed observation of the ground;

Most of the Aboriginal places are low density scatters with concentrations;

There were no substantial \textit{in situ} Aboriginal places;

Locations were predominately high, dry, near the creek and above flood levels;

Scarred trees were found to the north;

Raw materials include fine and coarse grained silcrete, quartz and a fine-grained black basalt and grey chert derived from nodules;

Quartz, chert and basalt are local, the silcrete comes from an undiscovered vein source and streambed.

Artefact types are fragments and flakes (77\%) and cores and tools (5-18\%)\textsuperscript{20}.

Ellender’s archaeological survey targeted three landscape units: the creek easement, native grasslands and hills. As a result of the survey 35 new Aboriginal places were identified and registered for the study area: 17 scatters of stone artefacts, 15 scarred trees and three isolated stone artefacts. All but one of the Aboriginal places were identified within 20m from the banks of Merri Creek. Raw materials identified within the stone artefact scatters comprised silcrete and quartz.

Although Aboriginal places have been found along the entire length of the Merri Creek, Ellender concluded that no reliable statements can be made about the few Aboriginal places remaining in the south other than to say it is clear that Aboriginal people used the creek and its surrounds for resources. Artefact scatters show little variation and seem to only contain small numbers of artefacts. Scarred trees were reported along the creek line but the report indicated that most were in poor health and some were already dead.

\textbf{du Cros \& Rhodes 1998}

du Cros and Rhodes produced a report for Melbourne Water Corporation in 1998 which mapped the sensitivity of waterways within and surrounding Melbourne. A GIS database was constructed with waterways and floodplains graded into different levels of sensitivity and associated recommendations. The predictive models indicated that many waterways in and around Melbourne should be considered archaeologically sensitive\textsuperscript{21}. Sensitive areas identified within the report include high ground near waterways, well drained floodplains and areas containing mature eucalypts\textsuperscript{22}.

\begin{flushleft}
\textsuperscript{19} Ibid.
\textsuperscript{20} Ibid
\textsuperscript{22} Ibid
\end{flushleft}
5.4.2 Review of local studies (pre-Aboriginal Heritage Act 2006)

STUDIES WITHIN THE ACTIVITY AREA:

Chandler 2007b

Chandler conducted an archaeological survey of the study area described above. A total of two Aboriginal places were identified during the survey, consisting of two stone artefacts located on relatively flat ground, and four stone artefacts located on a stony rise. The authors argued the Aboriginal places have been disturbed through agricultural practices. Moreover, the study area was characterised by low ground-surface visibility during the survey and therefore additional, unidentified Aboriginal places may exist within the study area.

Nicolson, Griffin & Ward 2007

An archaeological heritage assessment was undertaken for the Hume Corridor Water Supply System, which was partially located within western extent of the current activity area. The landforms located within the study area included undulating plain and stony rises. Ground-surface visibility was moderate during the survey (50%), during which no Aboriginal places were identified. The authors argued that Aboriginal people would have preferred the more elevated locations located to the east and west of their study area.

STUDIES OUTSIDE THE ACTIVITY AREA:

Bell 2002

Bell conducted an archaeological survey of proposed water infrastructure, located within the central section of the current activity area. Ground-surface visibility was very poor at the time of the survey, during which two Aboriginal places were identified; an isolated artefact (Gilbo 1 - VAHR 7823-0100) and a scarred tree (Lewis 1 - VAHR 7822-0101). The authors argued that the presence of the two Aboriginal places indicated that there is potential for additional, unidentified Aboriginal places to exist within the study area.

Chandler 2007a

Chandler conducted an archaeological sub-surface testing programme for a proposed residential subdivision, located immediately south of the activity area. The study area comprised an undulating plain on the Victorian Volcanic Plain. A total of nine stone artefacts were recovered during the sub-surface testing programme. The majority of artefacts (six) were recovered from a stony rise and a previously registered Aboriginal place, Mandalay 2 (VAHR 7823-0165). The remaining artefacts were recovered from a rise within the north-eastern corner of the study area (two) and on flat ground approximately 100m from a creek. The author concluded that elevated areas (rises and stony rises) and land adjacent to a creek in the north-central part of the study area are of moderate archaeological sensitivity. The author concluded that the remaining parts of the activity area are of low-moderate archaeological sensitivity.


25 Chandler, J. 2007a, Mandalay Estate, remaining precincts, Beveridge, archaeological sub-surface testing programme, unpublished report to Beveridge developments pty ltd.
## Table 5: Summary of Aboriginal cultural heritage assessments undertaken within the local region

<table>
<thead>
<tr>
<th>Report (#)</th>
<th>Assessment Type</th>
<th>Location</th>
<th>Aboriginal Heritage Identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cusack &amp; Freslov 2001 (2036)</td>
<td>Cultural Heritage assessment: survey &amp; monitoring</td>
<td>Approximately 2km east of the activity area</td>
<td>VAHR 7822-1175 Donovans L Rail Res. 3 (situated within the activity area) identified during the monitoring phase of a fibre optic cable installation running from Sydney to Melbourne. The Aboriginal place comprises an isolated silcrete artefact. Aboriginal place is situated within the western portion of the current activity area. Where construction works for the fibre optic cable would impact on the sites identified during this study 'Consents to Disturb' were obtained. A 'Consent to Disturb' was acquired for VAHR 7822-1175; therefore it is highly likely that the site has since been destroyed.</td>
</tr>
<tr>
<td>Hyett 2004 (2919)</td>
<td>Survey</td>
<td>Approximately 2km north-west of the activity area</td>
<td>Three previously registered Aboriginal places within study area, places revisited but could not be re-located due to low ground surface visibility. One Aboriginal place recorded during survey: VAHR 7823-0119. The site comprises an isolated silcrete flake located on visible ground in proximity to a dam which is located below a stony terrace.</td>
</tr>
<tr>
<td>Matthews et al 2005 (3513)</td>
<td>Survey</td>
<td>Approximately 2km east of the activity area</td>
<td>Assessment of the proposed North-South Railway Corridor. For second stage of assessment, see Griffin &amp; Karamanlis 1995. A total of seven Aboriginal places had been registered prior to this survey. A total of fifteen Aboriginal places were registered during survey. Aboriginal places comprised isolated stone artefacts, artefact scatters and scarred trees. Landforms considered to have potential for Aboriginal cultural heritage included high rises situated near a swamp.</td>
</tr>
<tr>
<td>Feldman, Chandler &amp; Howell-Meurs 2007 (3993)</td>
<td>Survey</td>
<td>Approximately 2km east of the activity area</td>
<td>Five Aboriginal places previously recorded within study area: VAHR 7822-0783, 7822-1173, 7822-1174, 7822-1175 &amp; 7823-0077. Study area accorded zones based on degree of sensitivity: Zone 1: (moderate to high) Merri Creek &amp; high rises overlooking Hernes swamp. Zone 2: (moderate) two watercourse crossings (tributary of Merri Creek) at two locations. Zone 3: (low) remainder of subject land (undulating plains and low-lying former swamp.</td>
</tr>
<tr>
<td>Fiddian &amp; Orr 2010 (4284)</td>
<td>Survey</td>
<td>Approximately 3km south of the activity area</td>
<td>Survey undertaken for proposed future residential development. A total of 14 Aboriginal places were identified, including stone artefact scatters and isolated artefacts: VAHR 7822-2024 to 7822-2028 and 7822-0151 to 7822-0159. The isolated artefacts (n=10) were assessed as having low scientific significance and the stone artefact scatters (n=5) moderate scientific significance. A number of areas of archaeological sensitivity were also identified and included the Merri Creek corridor, two drainage lines (tributaries of Merri Creek) and stony rises.</td>
</tr>
</tbody>
</table>

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26 Cusack & Freslov 2001: 87
Hyett & Nicholls 2003 (2633)  | Survey | Approximately 2km north of activity area | Survey undertaken for proposed school site. The study area consisted of a slightly undulating plain with a 'hilly rise; located at the eastern boundary of the property. No Aboriginal places were identified during the survey, which the authors attributed to poor ground surface visibility.  

Nicholls & Chamberlain 2005 (3003)  | Survey | Approximately 2km north of the activity area | Survey undertaken of a proposed Wallan Police station site. The study area consisted primarily of generally flat terrain, which sloped to a dry unnamed creek within the northern portion of the study area. No Aboriginal places were identified within the study area, which the authors attributed to poor ground surface visibility and post-contact disturbances.  

Chamberlain 2005 (3103)  | Survey | Approximately 1.5km north of the activity area | Survey undertaken for proposed re-zoning application for Tomkinson Complete Development Solutions. The study area was generally flat however rose to a low, but prominent hill on the western side. No Aboriginal places were identified during they survey, which the author attributed to poor ground surface visibility.
5.4.3 Review of local studies (cultural heritage management plans)

Chandler & Long 2007 (10027)

Chandler & Long conducted a CHMP for a proposed residential development, located immediately south of the activity area. Chandler & Long's activity area comprised an undulating plain punctuated with occasional stony rises on the West Victorian Volcanic Plains. A total of two Aboriginal places were identified during the archaeological survey, both of which consisted of stone artefact scatters. Archaeological sub-surface testing was conducted within two phases, consisting of broad-scale mechanical testing (Phase 1A) and manual extent testing (Phase 1B). A total of nine stone artefacts were identified during Phase 1A, six of which were identified within the extent of a previously registered Aboriginal place located on a prominent rise. Two additional artefacts were identified on a rise in the north-eastern corner of Chandler & Long's activity area, and an isolated artefact was identified on relatively flat ground approximately 100m from a drainage channel. No Additional artefacts were identified during the extent testing undertaken during Phase 1B.

Additional mechanical and manual sub-surface testing was undertaken during Phase 2 in order to further investigate a prominent ridgeline and the extents of the known Aboriginal places within their activity area. A total of 30 additional stone artefacts were identified during the Phase 2 sub-surface testing, which were associated with registered Aboriginal places and the prominent ridgeline. The authors concluded that the CHMP reinforced the hypothesis that Aboriginal occupation within their activity area was primarily associated with elevated land, prominent rises in particular.

Marshall 2007 (10144)

Marshall conducted a CHMP (discontinued) for the proposed removal of rock outcrops that were dispersed across the Marshall's activity area. Marshall's activity area was located approximately 1km east of the current activity area. Marshall's activity area was comprised of a basalt plain punctuated by stony rises. No Aboriginal places were identified during the archaeological survey or subsequent sub-surface testing. Furthermore, no Aboriginal material culture was identified in association with Beveridge 1 (VAHR 7823-0119), an artefact scatter located within Marshall's activity area, which the author attributed to disturbance caused by recent land-use.

Chandler & Long 2011 (11396)

Chandler conducted a CHMP for a proposed residential subdivision, located north of the current activity area. The majority of Chandler's activity area consisted of undulating plains of the West Victorian Dissected uplands. A total of nine stone artefacts were identified within three discrete areas. All artefacts were identified on the crest or slope of slight rises. A total of 45 stone artefacts were recovered as part of the sub-surface testing programme. The majority of Aboriginal places were identified on the crest of slopes of slight rises.

Light 2012a (11689)

Light conducted a CHMP for a residential and commercial development located immediately south of the current activity area. Light's activity area consisted of an undulating plain punctuated by stony rises. Very poor ground surface visibility was encountered at the time of the survey, during which a total of 60 stone artefacts were identified, all within the large stony rise in the north of Light's activity area. A total of three additional stony rises were identified within the northeast, northwest, and southwest corner of the activity area. A total of 351 stone artefacts were recovered during the

complex assessment. The stone artefacts were identified entirely within the largest stony rise, located within the north of the activity area. No stone artefacts were identified on the plain landform. The large stony rise within the north of Light's activity area is likely to extend into the current activity area.

**Light 2012b (CHMP 11338)**

A CHMP was undertaken for a proposed residential subdivision at Stewart Street, Beveridge, approximately 2.5km north of the current activity area. The desktop assessment identified that one previously recorded place (VAHR 7823-0119: isolated surface stone artefact) was situated within Light's activity area. The desktop assessment also specified that stony rise landforms situated within Light's activity area (n=31) and the margins of a Merri Creek tributary were sensitive for Aboriginal cultural heritage; while the remainder of Light's activity area comprising volcanic plain was considered unlikely to contain Aboriginal cultural heritage.

The archaeological survey undertaken during the standard assessment was unable to relocate VAHR 7823-0119, although another two stone artefacts were identified on the surface of the same stony rise that the Aboriginal place was originally recorded on. Further Aboriginal cultural heritage, comprising surface stone artefacts (n=30), was identified on an additional five stony rises in areas offering good ground surface visibility. The overall ground surface visibility across Light's activity area was generally poor and the effective survey coverage was estimated to be 1.258%. The standard assessment supported the predictions made in the desktop assessment (stony rises are sensitive for Aboriginal cultural heritage) but further investigation was considered necessary to determine the presence, nature, extent and significance of any Aboriginal cultural heritage across the entirety of Light's activity area.

The complex assessment was completed over 48 days and combined excavation pits (EPs) sized from 1m² to 9m², shovel test pits (STPs: 0.25m²) and mechanical transects (MTs: 2 x 1.2m). Excavation pits were initially excavated to determine the stratigraphic nature of landforms present within the activity area and STPs to determine the extent of any Aboriginal cultural heritage found within EPs. During an on-site meeting with Wurundjeri and OAAV it was agreed that recording of Aboriginal places would be defined on the extent of the stony rises on which they were found. Wurundjeri also requested that twenty mechanical transect (MTs) be excavated and 100% sieved on the plain.

A total of 884 stone artefacts were recovered from 13 of the 1m² EPs, four of the larger EPs (4m² and 9m²) and 31 of the STPs. The stone artefacts were identified on 17 of the stony rises situated within the study area and were registered as 17 Aboriginal places. No Aboriginal cultural heritage was identified on the plain. Additionally, the extent of previously recorded Aboriginal place VAHR 7823-0119 was enlarged based on the identification of associated artefacts, therefore 18 Aboriginal places are situated within the activity area.

A total of 30 surface stone artefacts and 884 subsurface stone artefacts were identified and associated with the stony rise landforms present within Light's activity area. The artefacts were registered as 18 Aboriginal places which ranged in size from isolated artefacts to large scatters of 326 stone artefacts. Only six of the Aboriginal places contained 20 artefacts or more. The stone artefact assemblage was dominated by silcrete, followed by quartz with trachytic rock, quartzite and basalt also present. Analysis of the assemblage indicated that the smaller Aboriginal places (less than 20 artefacts) represent opportunistic manufacture and the larger places (20+) were most likely to have...

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29 Light, A. *Stewart Street, Beveridge Residential Development: Cultural Heritage Management Plan 11338*. Sponsor: Nubuild Beveridge P/L, 2012b

30 Ibid

31 Ibid

32 Ibid
been occupied for long periods of time, representing several phases of occupation or perhaps a wider range of activities. As a result of the investigation three zones of archaeological sensitivity were defined within the study area:

"Zone 1: High Aboriginal Archaeological Sensitivity - include the six higher density/larger Aboriginal places considered to be of moderate or high scientific significance (VAHR 7822-0220, 7823-0222, 7823-0225, 7823-0230, 7823-0232, and 7823-0233), all located on stony rises, are included within this zone. It is considered that additional stone artefacts of moderate-high density will occur in a subsurface context within this zone, with the possibility for cultural deposits of relatively good integrity to be present."

"Zone 2: Moderate Aboriginal Archaeological Sensitivity - includes the remaining 12 of the stony rises determined to comprise Aboriginal cultural heritage considered to be of low scientific significance (VAHR 7823-0119, 7823-0217 to 7823-0229, 7823-0221, 7823-0223 7823-0224, 7823-0226 to 7823-0299 and VAHR 7823-0231) are included within this zone as well as eight of the larger stony rises on which Aboriginal cultural heritage was not identified. It is considered that isolated or low density subsurface occurrences of stone artefacts will occur in a subsurface context within this zone."

"Zone 3: Low Aboriginal Archaeological Sensitivity - comprises the four small stony rises on which Aboriginal cultural material was not identified, the large stony rise on which the residence and associated sheds are located and all areas of plain and margin landform within the study area. It is considered that there is low potential for Aboriginal cultural heritage of low scientific significance (e.g. isolated occurrences of subsurface stone artefacts) to be present in this zone."

Specific recommendations were provided for each of the archaeological zones and each of the Aboriginal places. Where harm could not be avoided to sites with moderate to high sensitivity salvage excavation was recommended.

**Feldman et al 2007 CHMP 10142**

A CHMP was undertaken for 'Passing Lane 2: Donnybrook' encompassing part of the Melbourne Sydney Passing Lanes Project, located 3km southeast of the activity area. The Desktop Assessment identified seven previously registered Aboriginal places within their activity area which included VAHR 7822-1175 (situated within the boundaries of the current activity area and previously identified by Cusack & Freslov 2001).

A field survey was undertaken and aimed at re-identifying any previously registered Aboriginal cultural heritage, inspecting any areas demonstrating ground surface visibility and to distinguish and consider the overall archaeological potential of landforms within the study area. No Aboriginal cultural heritage was identified. While the GPS co-ordinates of each previously recorded Aboriginal place was located no artefacts associated with the Aboriginal places were identified. The survey identified 16 areas of

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33 Ibid
34 Ibid
36 Ibid
archaeological potential and it was recommended that further investigation of these areas via sub-
surface testing be undertaken.\(^{38}\)

Phase 1 of the sub-surface testing programme identified additional Aboriginal cultural heritage
situated within 50m of the activity area’s boundaries (VAHR 7822-2217). The Aboriginal place
comprised a sub-surface isolated quartzite scraper located in a highly disturbed context. The artefact
was identified within a dry grey/brown clayey stratigraphic layer at 20-100mm below the current
ground surface. It was considered that the stone artefact represented an isolated discard event and it
was considered highly unlikely that any other Aboriginal cultural heritage associated with it would be
present.

The Phase 1 excavations provided a broad sub-surface assessment of the relatively less disturbed
portions of the study area. It was concluded that the majority of the study area was devoid of
Aboriginal heritage, or any cultural deposits which may have been present; were subsequently
destroyed by prior construction and maintenance work associated with the railway. It was therefore
decided to undertake more detailed excavations at the locations of previously registered Aboriginal
places (Phase 2 excavations). VAHR 7822-1175 (situated within the current activity area) had a
further five shovel test pits excavated within close proximity of its GPS co-ordinates. No additional
stone artefacts were identified.\(^{39}\)

No further investigation of the study area was considered warranted as it was argued that the Phase 2
excavations effectively salvaged any pertinent scientific information associated with the previously
recorded Aboriginal places. Contingency plans were provided in the event that unexpected Aboriginal
cultural heritage was identified.\(^{40}\)

5.4.4 Summary

A total of seven previously registered Aboriginal places are located within the activity area and consist
of six artefact scatters and a scarred tree (Table 4). An additional artefact scatter is located
immediately south of the activity area’s southern border, and is likely to extend north into the activity
area. The majority of these Aboriginal places (VAHR 7822-0236 - VAHR 7822-0240) are located in
association with a deeply incised drainage channel located within the western portion of the activity
area. The remaining two Aboriginal places (VAHR 7822-0100 - VAHR 7822-0101) are located on the
undulating plain.

Previous archaeological assessments within and adjacent to the activity area indicate a strong
correlation between higher density of artefacts and:

- Crests and slopes of rises (including stony rises);\(^{41} 42 43 44 45\)
- Watercourses;\(^{46} 47 48\) and

Lane 2: Wallan. Archaeological and Cultural Heritage Assessment. A Report to Kellogg Brown & Root

\(^{39}\) Ibid, pp. 37-39

\(^{40}\) Ibid, 41-47, 61-68

\(^{41}\) Chandler 2007a, op cit.

\(^{42}\) Chandler & Long 2007 op cit.

\(^{43}\) Chandler 2011 op cit.

\(^{44}\) Light 2012a op cit.

\(^{45}\) Light 2012b op cit.


\(^{47}\) Fiddian & Orr op cit.

\(^{48}\) Light 2012a op cit.
Rises overlooking swamps. 49 50 51

The CHMPs conducted by Chandler, Chandler & Long, and Light are of direct relevance to the current CHMP, as they contain the same landforms that are likely to be present within the activity area. The CHMP’s indicated a correlation between stony rises and watercourses, and higher densities of stone artefacts. The aforementioned studies indicated that the undulating plain is associated with a very low density of stone artefacts. Sub-surface testing conducted as part of CHMP 11689 indicated that artefacts associated with Cameron’s Lane 1 (VAHR 7822-0235) are confined to a stony rise, with test trenches excavated on the adjacent undulating plain being void of stone artefacts.

The CHMP completed by Light52 for Stewart Street, Beveridge is also of direct relevance as it comprises landforms (creek tributaries, stony rise landforms & volcanic plain) which are most likely to be present within the activity area. The investigation identified 30 surface stone artefacts across five stony rises in areas demonstrating good ground surface visibility. However, the complex assessment identified further Aboriginal cultural heritage across more of the stony rises (17 in total) reinforcing the conclusion surmised in the desktop assessment that stony rises have a high potential to contain surface and sub-surface deposits of Aboriginal cultural heritage. It also demonstrated that surface survey is not always a reliable indicator of the presence of sub-surface Aboriginal cultural heritage as the majority of stone artefacts within the activity area were identified within a sub-surface context (surface artefacts: n=30; sub-surface artefacts: n=884).

Assessment of the regional and local studies indicates several key findings relevant to the activity area:

The deeply incised drainage corridor and land within 100m of the corridor is considered to have a high level of archaeological sensitivity for Aboriginal cultural heritage. Land within 100m of tributaries and drainage lines are also considered to have a high level of sensitivity for Aboriginal cultural heritage;

Rises, stony rise landforms, volcanic eruption points and any type of elevated ground situated near water sources such as creeks or swamps are also considered to have influenced subsistence patterns and therefore have a higher potential for Aboriginal cultural heritage;

Isolated stone artefacts and low density stone artefact scatters will be found throughout the basalt plains. Stone artefacts scatters and scarred trees are the most likely Aboriginal place type for the area; and

Stony rise landforms have sub-surface archaeological potential, even where no surface artefacts are present.

50 Fiddian & Orr op cit.
51 Light 2012a op cit.
5.5 Ethno-historical background

5.5.1 Preamble

This section presents a brief history of Aboriginal occupation and use in the region based on documentary evidence and early ethnographic records. This information is important in providing a context to the archaeological investigations, to assist in assessing the cultural heritage values of the area.

5.5.2 The Woi wurrung language group

According to Clark, at the time of contact the activity area lay within the boundaries of the Woi wurrung language group. The boundaries of the Woi wurrung clans are believed to have included the Yarra and Maribyrnong River basins, extending west as far as the Werribee River and north to the Dividing Range, from Mt Baw Baw to Mt William. Howitt, an early European observer, described the boundaries as:

"From the junction of the Saltwater [Maribyrnong] and Yarra Rivers, along the course of the former to Mount Macedon, thence to Mount Baw-Baw, along the Dividing Range, round the sources of the Plenty and Yarra to the Dandenong Mountains, thence to Gardiner's Creek and the Yarra to the starting point".

The Woi wurrung language group was made up of four primary clans, the Gunung-willam balug, Kurung-jang balug, Marin balug and Wurundjeri balug. The Gunung-willam balug contained a sub-group (most likely a patriline) known as Talling willam, and the Wurundjeri balug held two such sub-groups, the Wurundjeri willam, and Bulug willam. Wurundjeri willam was further divided into three smaller groups or 'tracts', each of which were identified as occupying specific areas of land.

Clark's Aboriginal Languages and Clans mapping indicates that the activity area was located within the traditional lands of the Wurundjeri willam clan, and was within the known boundaries of tract 'b', described by Clark as 'Billibillary's mob'. This tract was said to occupy the land on the north bank of the Yarra 'around Kew' and extended east to Darebin Creek, west to the Maribyrnong River and Jackson's Creek, and north to Mt William.

The Woi wurrung clans formed part of the larger East Kulin speakers whose identity was premised on a shared language and connection to country. These groups also shared practices relating to initiation, burial, kinship, marriage and religion, but they also maintained significant social differences. The languages of the Bunwurrung and Daung wurrung speaking people were the most linguistically similar to the Woi wurrung, with whom they held a significant (approximately 75 percent) shared vocabulary.

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53 Clark, I. Aboriginal Languages and Clans: An Historical Atlas of Western and Central Victoria, 1800-1900, Monash Publications in Geography, no. 37, 1990
54 Howitt, A. W. The native tribes of South-East Australia, Aboriginal Studies Press, Canberra, 1996, p. 71
56 Clark op cit. pp. 364
57 Clark op cit, p. 118
58 Clark op cit. p. 385
59 Goulding, M & Manis, M, 'Moreland post-contact Aboriginal heritage study', 2006, p. 27.
60 Howitt op cit, pp. 336-338
5.5.3 Lifestyle of the Traditional Owners

A review of ethno-historical records relating to Aboriginal use and occupation of the region aims to identify ways in which Aboriginal people interacted with, and potentially left archaeological traces on, their environment. Although these early observations have the potential to provide useful information about Aboriginal society at contact, the information they do provide is of necessity incomplete, and subject to varying degrees of bias.

Ethno historical references to the Woi wurrung are fragmentary at best, and no source comparable to the notes made by Assistant Protector William Thomas about the adjacent Bun wurrung exists for Woi wurrung clans\(^62\). The following ethno-history is thus largely based on accounts of wider clan gatherings, or more generalized information about the Aboriginal people of Port Phillip.

5.5.4 Food resources

Although traditional food gathering practices and access to resources were restricted by European occupation of the region at the time, ethno-historical sources record Aboriginal exploitation of a range of plant and animal foods during the contact period. Food resources would have been comparatively plentiful across the region in the pre-contact period. Plant foods comprised an important part of the diet of the local Woi wurrung peoples, having the advantage over animal resources in that they provided a resource that was 'more regular and reliable than that derived from hunting or fishing'.\(^63\)

Of the wide variety of plant foods commonly exploited by local Indigenous peoples, the tuber of the Yam Daisy, or Murnong, was commented upon by European observers as providing a staple food resource. Thomas records the Murnong being eaten both raw (from younger plants), and after being cooked in the ashes of a fire when more mature and fibrous\(^64\). Tubers such as that of the Yam Daisy provided a valuable source of carbohydrate for Indigenous populations of the region in spring and early summer, supported by other common plant foods such as the fern tree (bracken) pulp and 'some parts of a thistle'.\(^65\)

Aboriginal people of Port Phillip also readily exploited the fresh and salt-water animal resources of the region. Thomas\(^66\) noted the plentiful supply of eels in the district during the summer, describing 'sufficient numbers to support the Yarra Tribe for one month each year', which were easily caught with the aid of a spear. Fish were obtained through the use of nets and weirs, and an early (1803) account, prior to European settlement of the area, records the presence of a weir along the Maribyrnong River in the vicinity of Keilor\(^67\). Middens present both along the coastline and lining inland rivers and streams attest to the exploitation of shellfish as an additional food resource.

Local birdlife, reptiles and mammals also provided potential food resources for the Woi wurrung, with kangaroo and possum a popular staple.\(^68\). Gaughwin details an instance where at a gathering of Bun wurrung, Woi wurrung and Daung wurrung tribes, part of the group travelled to the Dandenongs in order to hunt, procuring 'kangaroo, porcupine, 'native bear or sloth', wombats, oppossum and fish'.\(^69\)

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\(^{63}\) Ibid 1983: 20
\(^{64}\) Goulding, M, Aboriginal Occupation of the Melbourne Area, District 2: a report to the Land Conservation Council, Land Conservation Council, Melbourne, 1988, p. 21
\(^{65}\) Presland op cit, p. 35
\(^{66}\) Thomas 1841 cited in Presland op. cit., pp. 32
\(^{67}\) Presland op cit: 33
\(^{68}\) Presland ibid, 34
\(^{69}\) Presland ibid, 34
\(^{70}\) Gaughwin cited in Goulding op cit, p.19
5.5.5 Movements and camps

The Woi wurrung would have moved around the region in a variety of ways and likely on a seasonal basis. Scant ethno-historical information exists about such movements, however, with the exception of ‘comings and goings from Melbourne’.\textsuperscript{71} Most information about the movements of Woi wurrung comes from reports of gatherings between themselves and other clans such as the Bun wurrung. The following account provides a generalized picture of movements and camps across the wider Port Phillip district.

Woi wurrung clans moved around the landscape and interacted with the larger language group and more broadly within the groups that are commonly referred to as the Kulin. Intermarriage was an important part of the social structure and the rules governing marriage led to a highly complex and overarching network of kin relationships between groups. The groups of the Kulin identified with one of two moieties, waa (crow) or bunjil (eaglehawk). Moiety affiliation was inherited, and marriage partners were obtained from the opposite moiety, as Thomas noted:

“...marriages are not contracted in their own tribe:- for instance, a Yarra black must get a wife not out of his own tribe, but either of the other tribes.”\textsuperscript{72}

According to Thomas, part of the affiliation with other groups was through corroborees held at new and full moon, and intertribal meetings, which were held every few months.\textsuperscript{73} Clans would have gathered during specific times of the year for resource gathering to enact social rituals, such as coming-of-age. These meetings were important congregations that fulfilled a myriad of social functions, including arranging marriages, discussing politics and resolving disputes. These meetings also served as a forum for the exchanging of goods between the different groups.\textsuperscript{74}

The following comments by Thomas illustrate facets of the traditional life of the Port Phillip Aboriginal people, and provide insight into some of the purposes of the regular inter-tribal gatherings:

“...what I can learn, long ere the settlement was formed the spot where Melbourne now stands...was the regular rendezvous for the tribes known as the Waworongs, Boonurongs, Barrabools, Niluguons, Goulbourns twice a year of as often as circumstances and emergencies required to settle their grievances, revenge, deaths etc.”\textsuperscript{75}

“...all are employed; the children in getting gum, knocking down birds etc; the women in digging roots, killing bandicoots, getting grubs etc; the men in hunting kangaroos, etc, scaling trees for possums etc. They mostly are at the encampment about an hour before sundown – the women first, who get fire and water, etc. by the time their spouses arrive... in warm weather, while on tramp, they seldom make a miam – they use merely a few boughs to keep off the wind, in wet weather a few sheets of bark make a comfortable house. In one half hour I have seen a neat village begun and finished.”\textsuperscript{76}

Camps were generally established for a few days at a time. Hovell noted that campsites were by-and-large located on areas of higher ground, and often in close proximity to water:

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\textsuperscript{71} Presland op cit, p. 31
\textsuperscript{73} Thomas, W. ML, Private Papers, 16 volumes and 8 boxes of papers, journals, letterbooks, reports etc. Uncatalogued manuscripts, Set 214: items 1-28, Mitchell Library, Sydney, n.d, pp. 97.
\textsuperscript{74} Broome op cit, p. 4
\textsuperscript{75} Thomas, op cit.
"Passed a number of native huts, they are always to be found on the banks of rivers and creeks".77

Huts, or miams, were described by Thomas as variously ‘substantially built’78 in the area of Arthurs Seat and ‘frail but answers well their purpose’79. Thomas also commented that a ‘village of good waterproof huts could be constructed in less than an hour’80. The composition of native huts and encampments were described by Thomas as follows:

“…a few slats of bark cut in a few minutes…these slats of bark are about 6’ long oblique raised to the angle of about 20 degrees windward, every alternate sheet is reversed so no rain can enter the sides are filled up with short pieces of bark and brush and a sheet of bark at the top…A good Miam will hold 2 adults and 3 children- they are not permanent [they] are knocked down or burnt on breaking up the encampment”81.

“…[they are] in a large encampment…divided into hamlets- some influential black taking charge of six or eight Miams, and so on say five hamlets. These hamlets are 50 yards or more from each other, while miams in a single hamlet are not more than 3 or 4 yards apart”82.

5.5.6 Material culture

The Aboriginal people of the region manufactured and employed a wide range of material culture, sourced from animal, plant and earth resources available locally, in addition to resources and implements acquired through trade with neighbouring clans.

Plant resources were used in a wide variety of ways, with wood employed in the manufacture of tools such as boomerangs, spears and digging sticks, bark and reeds in the manufacture of string for bags and nets, and species of rushes in the manufacture of baskets83. The bark of larger trees such as the Red Gum was used to make canoes and shields.

Stone resources, were employed in the manufacture of stone tools, and are the most likely form of Aboriginal material culture to survive in the archaeological record today. Presland notes that the Woi wurrung used a range of what he calls "maintenance tools", usually of stone, which included hatchets, knives and scrapers84. These tools were often employed in the production of other elements of material culture, including clothing and ornaments made from animal skin and bone85.

5.5.7 Early settlement and frontier relations

The first significant exploration into the Mitchell Shire area by Europeans was by Hume and Hovell in 1824. Hume and Hovell were commissioned by Governor Bourke of NSW to explore the inland of Australia in search of agricultural land and rivers which could be used for transporting goods. They passed through the areas surrounding Mitchell Shire and Whittlesea Shire on 14 December 1824, describing the ‘gratifying sight’ of ‘level’ plains and ‘soil of best quality’. Their observations over the course of the south-west journey affirmed the desirability of the land and, effectively, ensured its settlement.

77 Hovell, W. H., 1826-7 Journal on the voyage to and at Western Port, New South Wales’ Original manuscript, Mitchell Library, Sydney, 1826-7
78 Thomas n.d, op. cit. p. 1
79 Thomas n.d, op. cit. p. 88
80 Thomas n.d, op. cit. p. 93
81 Thomas n.d ,op cit. p. 88
82 Ibid
83 Presland, pp. 35-37
84 Presland, p. 37
85 Ibid
Permanent European settlement began in the Port Philip region in 1835. On the 6th June 1835, John Batman arranged the signing of a 'treaty' with spokespersons from Woi wurrung and adjacent clans, in order to purchase the land now occupied by Melbourne. The 'treaty', such as it was, was not considered a legal transaction by the British authorities at the time, and doubts exist over the extent to which the Aboriginal people who signed the document understood the nature of the contract. The rapidly advancing European settlement brought about devastating changes to the already disrupted Aboriginal clans of the Melbourne region.

Dispossession of traditional land occurred as the settlers and their livestock arrived and the pastoral expansion began in earnest. Severe depletion of food resources led to malnutrition within the local Aboriginal communities by the late 1830s. European expansion caused structural changes within Aboriginal societies, affecting traditional lifestyles, living arrangements and social practices as Aboriginal people were forced from their traditional lands and deprived of access to resources.

Throughout the nineteenth century and later, the lives of Aboriginal people in the activity area and across Victoria were greatly influenced by various government policies of Aboriginal “protection” and “management”. The first of these was put in place in an attempt to lessen the impact of European settlement on the Aboriginal people of the then Port Phillip District of New South Wales (now Victoria). As a result of recommendations made by the Select Committee Inquiry into the condition of Aboriginal Peoples, the Port Phillip Aboriginal Protectorate was created. The Protectorate consisted of Chief Protector George Robinson and four Assistant Protectors whose task it was to not only physically protect the Aboriginal people of the district, but also to “civilize them, to teach them agriculture, house-building and other white employments, to educate them to a settled European life style and to convert them to Christianity.”

The Protectorate lasted for only ten years (1839-1849) and was generally deemed to be a failure. By the early 1850s the Aboriginal population of the region had severely declined and following the abolition of the protectorate came a decade of what Christie has described as “almost complete government neglect” of the Aboriginal people of Victoria. In 1863 the Coranderrk Aboriginal Station was established in the area of present-day Healesville on the land of the Wurundjeri willam. The original occupants of the station were Woi wurrung and Daung wurrung speaking people although in later years people from other areas settled at the station. The commencement of the reserve and mission system saw the beginnings of greater government control and regulation of the lives of Aboriginal people. The passing of the 1869 Act for the Protection and Management of the Aboriginal Natives of Victoria provided the Central Board, then changed to the Board for the Protection of the Aborigines (BPA), with greater power over the lives of individuals, making the reserves or mission “prescribed places for Aboriginal people to live [and] set out the form of work contracts and certificates for which they were eligible”. The BPA could stipulate where people could live and decide whether and where they could work. Aboriginal people living within the Port Phillip district were gradually relocated to Coranderrk, which operated until the 1920s.

86 Goulding 1988 op cit, p. 27
87 Presland, op cit, p. 13.
88 Christie, M. Aborigines in Colonial Victoria, 1835-86, Sydney University Press, Sydney, 1979, pp. 85, 89
89 Ibid, p. 136
90 Barwick, D. Rebellion at Coranderrk, Aboriginal History Monograph 5, Aboriginal Affairs Victoria, Melbourne, 1998.
91 Broome op cit, p. 131
92 Goulding, M & Manis, M, ‘Moreland post-contact Aboriginal heritage study’, 2006, pp. 75-9
A search of the AHMS ethnographic database\textsuperscript{93} and the ACHRIS database has identified no direct accounts of any interaction between Traditional Owners and colonists within the study area. The closest registered site is 15km to the west at Green Hills Station.

5.5.8 Environmental context (landforms & geomorphology)

Archaeological assessment reports include information about the environmental context of study areas because of the important role environmental characteristics played in influencing the types of archaeological sites in any given area. Physical environments influence both the type and availability of natural resources and the types of cultural activities that were carried out in the past. Correspondingly, this also influences the types of archaeological sites that may be found.

A determination of the former environmental context is essential to develop accurate models of cultural activity, site distribution patterns and the archaeological potential of any given area. The environmental setting of the activity area is discussed below.

5.5.9 Landscape and published geological mapping

The activity area is characterised by low slope gradients and a broad flat, gently undulating volcanic plain formed from sheetflow basalt parent material associated with the Newer Volcanics.

Geological and soil landscape mapping provides a useful insight into the expected conditions within the activity area, but due to the scale of the mapping (1:100,000) it is not a reliable predictor of conditions on the ground at any place. Ground truthing is usually required to confirm geological and soil types.

Published data produced by DSE interactive map shows the geology of the activity area is comprised largely of an Unnamed sheetflow basalt (Qno1) (Figure 4).\textsuperscript{94}

The Qno1 Newer Volcanic plains that dominate the north and west of Melbourne are usually associated with thin clay loam soil profiles overlaying heavy clay B horizon subsoils formed from decomposing basalt parent material. The landscape is also typically littered with basalt boulders and cobbles.

The activity area also features areas of Kilmore Siltstone (Sxk), in the western portion, associated with the minor drainage corridors in that part of the activity area. This is a thin bedded siltstone with thin sandstone beds. There are also unnamed incised colluvium deposits (Nc1) associated with minor drainage corridors in the western portion of the study area.

\textsuperscript{93} AHMS Mapping Melbourne’s Aboriginal Past
Figure 4: Geological units within the activity area\footnote{Ibid.}
5.5.10 Hydrology

A second order watercourse, Kalkallo Creek, is located within the western extent of the activity area (Figure 5). The creek is oriented north-south within the activity area and is associated with several drainage lines which branch throughout the western extent of the activity area. These drainage lines feed several farm dams distributed throughout the activity area.

A third order watercourse and tributary of Merri Creek is located within the eastern extent of the activity area and is oriented southwest - northeast. Additionally, swampy land is located within the northern extent of the activity area.

A large, artificial farm dam is located within the centre of the activity area.

5.5.11 Vegetation

Published information on vegetation and biodiversity is included on the Victorian Resources Online website (VRO). It provides a good indication of the prevailing vegetation patterns prior to European settlement and clearance of the land. For the purposes of showing the general patterns of vegetation across the activity area, VRO 1750 Vegetation Communities (EVC) are shown on Figure 8.

The predicted 1750 EVCs within the activity area are Plains Grassland, Plains Grassy Woodland, Grassy Woodland and Valley Grassy Forest.

Analysis of current aerial photographs of the activity area confirms that, with the exception of dispersed trees, isolated pockets of vegetation, such as native grasses, and a red gum stand in the north-east corner, the majority of the original vegetation has been largely cleared. The extent of this clearance will be confirmed during the standard assessment.

5.5.12 Landforms within the activity area

The following landforms are located within the activity area:

- Low relief volcanic plain;
- Stony rises;
- Deeply incised creek valley (Kalkallo Creek); and
- Swamp.

The low relief volcanic plain landscape dominates the activity area and is punctuated by stony rises that are distributed throughout, especially within the northwest corner. Additionally, a large, discrete stony rise is located within the northeast portion of the activity area.

A creek (Kalkallo Creek) runs through the western portion of the activity area and, based on current aerial imagery, appears to be deeply incised.

There are three distinct areas of elevation located within the activity area, the highest being within the north and gradually declining in elevation to the south.

An area of former swamp is located on the northern boundary of the activity area, within close proximity to the areas of elevation outlined above.

Figure 5: Watercourses located within the activity area
Figure 6: Prominent rises located within the activity area
Figure 7: Elevation of land located within the activity area
Figure 8: Ecological vegetation classes within the activity area

Ibid.
5.6 Land Use history

In order to identify the extent and nature of past land use disturbance within the activity area we reviewed recent NearMap high resolution aerial photography and a series of historical aerial photographs obtained from the Land Victoria Laverton Aerial Photography Archives. Our analysis of the aerial photography indicates the primary land uses within the activity area were pastoral and agricultural with some cultivation.

Prior land-use disturbances identified during our analysis of current and historical aerial photographs are listed below and are shown on Figure 9 - Figure 11.

- Repeated ploughing;
- Clearing of native vegetation across the majority of the activity area;
- Construction of fences;
- Construction of sheds and out buildings;
- Construction of driveways and tracks throughout the activity area; and
- Excavation of Dams.
Figure 9: 1972 historic aerial (source: Land Victoria Historical Aerial Photographs Archive)
Figure 10: 1976 historic aerial (source: Land Victoria Historical Aerial Photographs Archive)
Figure 11: 1976 historic aerial (source: Land Victoria Historical Aerial Photographs Archive)
Figure 12: Current conditions within the northern portion of the activity area (source: Nearmap)
Figure 13: Current conditions within the southern portion of the activity area (source: Nearmap)
5.7 Desktop assessment conclusions

The desktop assessment described in the preceding chapters of this heritage assessment has been used to identify prevailing Aboriginal place patterns within the region and in the local area surrounding the activity area.

Analysis of historical aerial photographs, maps and plans and early accounts of Aboriginal settlement allowed us to identify original environmental characteristics of the area. This was useful in identifying areas of past ground disturbance that may have affected the integrity and significance of archaeological deposits. It also assisted in identifying portions of the activity area that would have been more attractive places for Aboriginal occupation and use.

The VAHR Aboriginal place distribution patterns and regional studies summarised above indicate the dominant Aboriginal place types within the activity area are likely to comprise stone artefact scatters, sub-surface stone artefact deposits, and scarred trees. Aboriginal place patterning and the results of archaeological investigations conducted within the geographic region indicate a correlation between fresh water sources and Aboriginal places. There is likely to be a higher density and frequency of archaeological deposits in close proximity to the deeply incised stream located within the western extent of the activity area, as well as any drainage channels within the activity area.

The available information indicates that higher density stone artefact scatters will likely be located on elevated land including the crests and slopes of rises (including stony rises), especially those adjacent to water courses or swamps. Furthermore, the confluence of two or more watercourses is likely to be associated with a higher density of stone artefacts. Isolated artefact occurrences are likely within the remaining undulating plain, however this landform is considered to be of low archaeological sensitivity for Aboriginal cultural heritage. Sub-surface testing conducted immediately adjacent to the activity area indicates that artefact scatter extents are likely to correlate with the crests and slopes of rises.

The activity area has been largely cleared of native vegetation, and the presence of un-registered scarred trees is considered unlikely.

Past disturbance is also likely to have affected the potential for and integrity of archaeological deposits in any given area. Areas that have been permanently or regularly inundated (such as large swamps) may have a lower level of potential because they were unsuitable for occupation and use.
6 STANDARD ASSESSMENT

6.1 Survey Details

The following sections describe the results a survey undertaken by AHMS on 23 - 26 September 2013.

The principal aim of the survey by AHMS was to identify exposed Aboriginal cultural material (i.e. surface sites) and to assess disturbance levels. The survey aimed to identify areas of archaeological potential, landforms, vegetation patterns, geomorphic units, and areas of disturbance.

The investigation was also used to assess the extent to which past land-uses may have affected natural soil profiles. This information was used to assess the depth and potential integrity (intactness) of natural soil profiles across the study area and the likely impact of future construction.

The results of the survey were used to assist in development of an excavation methodology, and subsequently were used to inform development of management recommendations for the activity area.

Table 6: Personnel in attendance during the standard assessment

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Organisation</th>
<th>Dates present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrian Burrow</td>
<td>AHMS</td>
<td>23 - 26 September 2013</td>
</tr>
<tr>
<td>Liz Foley</td>
<td>AHMS</td>
<td>23 - 24 September 2013</td>
</tr>
<tr>
<td>Simon Crocker</td>
<td>AHMS</td>
<td>25 - 26 September 2013</td>
</tr>
<tr>
<td>Wade Garvey</td>
<td>WTLCCHC</td>
<td>23 - 26 September 2013</td>
</tr>
<tr>
<td>Rob Jones</td>
<td>WTLCCHC</td>
<td>23 - 26 September 2013</td>
</tr>
</tbody>
</table>

6.2 Methods

The archaeological survey was designed to survey all accessible parts of the activity area.

The standard assessment involved a four stage approach:

1. An analysis of topographic maps and aerial photographs of the study area was undertaken prior to the survey to identify landforms across the activity area and to identify areas of ground surface exposure in the form of tracks, unsealed roads, dams, cuttings and areas of ground exposure (i.e. erosion scours). These areas were targeted during the survey because they provided an opportunity to identify surface artefact scatters and to investigate exposed soil profiles.

2. The second step taken was an initial informal survey around the property in order to identify mature/old growth native trees and areas of ground surface visibility. This assisted in scoping out the approach to survey in each area.

3. Following the initial scoping work, surveying was conducted on foot. The survey used the information obtained from analysis of aerial photographs and topographic maps (Stage 1), as well as the initial scoping work (Stage 2), to survey areas of ground surface visibility (to identify surface artefact scatters) and mature/old growth trees (to identify scarred trees). Areas of erosion and ground exposure were examined for archaeological evidence such as stone artefacts, charcoal and shell. Ground surfaces and cuttings were also examined to determine the degree of soil disturbance, erosion and potential for archaeological deposits.
below current ground. Mature trees were examined for evidence of scarring, axe marks and/or old footholds. The team inspected all areas with ground surface visibility and all mature native trees.

4. Surface artefact scatters found during the survey would then be recorded in detail using a pro-forma developed for field recording. The location and extent of each Aboriginal place would be recorded with a <1 m accuracy Leica RTK differential GPS device. Field notes were made and photographs taken to document landscape configuration, soil profiles, soil disturbance, ground visibility and vegetation types. Areas of soil exposure were also inspected for evidence of archaeological material.

6.3 Results

6.3.1 Survey units

The activity area was divided into nine survey units, according to the nine individual properties which comprise the activity area (Table 7).

6.3.2 Survey Coverage

At the time of the survey, ground surface visibility was very poor. More than 95% of the activity area was covered with pasture grasses and had no ground surface visibility (Figure 14 - Figure 16). Ground surface visibility and exposure was limited to sections of vehicle tracks, farm dams, and the exposed eroded banks of Kalkallo Creek.

Effective coverage across the activity area was less than 5% due to poor ground surface visibility. This indicates the survey was generally ineffective in identifying the extent of cultural material within the activity area.
6.3.3 Landscape characteristics

The activity area consists of three landforms:

- Undulating plain;
- Stony rises; and
- Open depression (Kalkallo Creek).

The vast majority of native vegetation appears to have been removed from the activity area. Several discrete pockets of native vegetation were identified in association with Kalkallo Creek and vehicle tracks. Additionally, several isolated native trees were also identified within the activity area.

6.3.4 Evidence of past disturbance

The survey was used as an opportunity to improve our model of the extent and nature of past ground disturbance which had previously been assessed from historical and recent aerial images.

The survey essentially supported and corroborated the conclusions about past disturbance that were made in the desktop assessment, particularly in the detailed analysis of historical aerial photographs.

The following specific disturbances to the soil profile were observed during the site inspections:

- Virtually the entire activity area has been cleared of original vegetation and has been repeatedly ploughed;
- Farm dams have been constructed throughout the activity area;
- Agricultural and pastoral disturbances (repeated ploughing and stock trampling);
- Fences have been constructed throughout the activity area;
- Plantation trees have been introduced to the activity area;
- Numerous vehicle tracks have been constructed throughout the activity area; and
- Several residential, commercial and farm buildings / structures have been constructed within the activity area.

These impacts have been previously discussed in the desktop assessment. Disturbances including vehicle tracks and ploughing will have affected the integrity of Aboriginal places within the activity area. Additionally, these disturbances have increased exposure and consequently assisted in the identification of Aboriginal places.

6.3.5 Aboriginal cultural heritage

A total of eight Aboriginal places were identified during the investigations for this CHMP. Seven of the Aboriginal places had been previously registered and an additional new low density artefact scatter was recorded during the standard assessment.

Of the previously registered Aboriginal places, Gilbo 1 (VAHR 7823 - 0101) could not be relocated and it is considered likely that it has been destroyed as is indicated by the level of erosion present at the Aboriginal place location. Kalkallo Creek 5 IA (VAHR 7823 - 0240) could also not be relocated and has been subject to disturbance through the construction of a vehicle track. It is likely that the artefact
was removed from the location prior to this development. The remaining previously registered Aboriginal places were re-located and re-inspected.

The new low density artefact scatter recorded during the standard assessment, Beveridge North LDAD (VAHR 7823 - 0307), consists of five artefacts, distributed throughout Survey unit 1. The artefacts were identified within areas of exposure adjacent to Kalkallo Creek.

6.3.6 Mature indigenous tree species

With the exception of Lewis 1 (VAHR 7823 - 0101), a previously registered scarred tree, no mature trees exhibiting Aboriginal scarring were identified within the activity area.

6.3.7 Caves, rock shelters and cave entrances

No caves, rock shelters, or cave entrances were identified within the activity area.
### Table 7: Details of survey units within the activity area

<table>
<thead>
<tr>
<th>Survey unit</th>
<th>Land use</th>
<th>Landforms</th>
<th>Disturbance</th>
<th>Size (ha2)</th>
<th>Aboriginal places (VAHR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agriculture, pastoralism</td>
<td>Undulating plain, stony rises, and open depression (Kalkallo Creek)</td>
<td>Farm dams, agricultural / pastoral land-use, vehicle tracks, property fences, and construction of residential / commercial buildings</td>
<td>743</td>
<td>Beveridge North LDAD</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7823-0236</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7823-0237</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7823-0238</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7823-0239</td>
</tr>
<tr>
<td>2</td>
<td>NA</td>
<td>Undulating plain</td>
<td>Farm dams, residential / commercial buildings</td>
<td>1.9</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Agriculture</td>
<td>Undulating plain</td>
<td>Undulating plain, stony rises</td>
<td>Vehicle tracks, residential / commercial buildings, and pastoralism</td>
<td>40.1</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
<td>------------------</td>
<td>-----------------------------</td>
<td>---------------------------------------------------------------</td>
<td>------</td>
</tr>
</tbody>
</table>

3

4

Agriculture

Undulating plain

Vehicle tracks, residential / commercial buildings, and agriculture

40.2

-
<table>
<thead>
<tr>
<th></th>
<th>Pastoralism</th>
<th>Undulating plain and stony rise</th>
<th>Farm dams, residential / buildings, and pastoralism</th>
<th>15.8</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Pastoralism</td>
<td>Undulating plain</td>
<td>Farm dams and pastoralism</td>
<td>81.6</td>
<td>-</td>
</tr>
<tr>
<td>No.</td>
<td>Environment</td>
<td>Landscape Feature</td>
<td>Cultural Feature</td>
<td>Number</td>
<td>Notes</td>
</tr>
<tr>
<td>-----</td>
<td>-------------</td>
<td>-------------------</td>
<td>------------------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>7</td>
<td>Pastoralism</td>
<td>Undulating plain and stony rise</td>
<td>Farm dams and pastoralism</td>
<td>100.5</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Pastoralism</td>
<td>Undulating plain and stony rises</td>
<td>Vehicle tracks, residential / commercial buildings, plantation trees, and pastoralism</td>
<td>123.8</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Agriculture</td>
<td>Undulating plain and stony rises</td>
<td>Agriculture, plantation trees</td>
<td>141.1</td>
<td>-</td>
</tr>
</tbody>
</table>
Figure 14: Standard assessment survey map
Figure 15: Standard assessment survey map insert A
Figure 16: Standard assessment survey map insert B
**Table 8: Effective survey coverage estimated during the standard assessment**

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>Size (ha)</th>
<th>Ground exposure (%)</th>
<th>Surface</th>
<th>Effective survey coverage (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>743</td>
<td>5</td>
<td>37.15</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1.9</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>40.1</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>40.2</td>
<td>2</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>15.8</td>
<td>2</td>
<td>0.32</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>81.6</td>
<td>2</td>
<td>1.63</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>100.5</td>
<td>2</td>
<td>2.01</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>123.8</td>
<td>2</td>
<td>2.48</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>141.1</td>
<td>2</td>
<td>2.82</td>
<td></td>
</tr>
</tbody>
</table>

**7 ABORIGINAL CULTURAL HERITAGE IN THE ACTIVITY AREA**

A total of eight Aboriginal places were identified during the investigations undertaken for this CHMP. A summary of the extent, nature and significance of each place is included in the following sections.

**Table 9: Aboriginal places located within the activity area**

<table>
<thead>
<tr>
<th>Aboriginal place name and number (VAHR)</th>
<th>Aboriginal place type</th>
<th>Registered/reinspected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilbo 1 (VAHR 7823-100)</td>
<td>Artefact scatter</td>
<td>Re-inspected / destroyed</td>
</tr>
<tr>
<td>Lewis 1 (VAHR 7823-0101)</td>
<td>Scarred tree</td>
<td>Re-inspected</td>
</tr>
<tr>
<td>Kalkallo Creek 1 (VAHR 7823-0236)</td>
<td>Artefact scatter</td>
<td>Re-inspected</td>
</tr>
<tr>
<td>Kalkallo Creek 2 (VAHR 7823-0237)</td>
<td>Artefact scatter</td>
<td>Re-inspected</td>
</tr>
<tr>
<td>Kalkallo Creek 3 (VAHR 7823-0238)</td>
<td>Artefact scatter</td>
<td>Re-inspected</td>
</tr>
<tr>
<td>Kalkallo Creek 4 IA (VAHR 7823-0239)</td>
<td>Isolated artefact</td>
<td>Re-inspected</td>
</tr>
<tr>
<td>Kalkallo Creek 5 IA (VAHR 7823-0240)</td>
<td>Isolated artefact</td>
<td>Re-inspected / destroyed</td>
</tr>
<tr>
<td>Beveridge North LDAD (VAHR 7823-0307)</td>
<td>Low density artefact distribution</td>
<td>Registered</td>
</tr>
</tbody>
</table>
7.1 Gilbo 1 (VAHR 7823-0100)

Table 10: Details of Gilbo 1 (VAHR 7823-0100)

<table>
<thead>
<tr>
<th>Detail</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Grid ref:</td>
<td>319314E 5853840N</td>
</tr>
<tr>
<td>Location:</td>
<td>Survey unit 1: 180 Camerons Lane Beveridge VIC 3753</td>
</tr>
<tr>
<td>Landform:</td>
<td>Undulating plain</td>
</tr>
<tr>
<td>Artefacts:</td>
<td>0</td>
</tr>
<tr>
<td>Average Artefact density per m²:</td>
<td>0</td>
</tr>
<tr>
<td>Place extent:</td>
<td>Na</td>
</tr>
<tr>
<td>Place condition:</td>
<td>Destroyed</td>
</tr>
<tr>
<td>Place type</td>
<td>Isolated artefact</td>
</tr>
<tr>
<td>Scientific significance:</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Figure 17: Registered location of Gilbo 1 (VAHR 7823-0100) (Liz Foley, 24/09/13, east)

7.1.1 Nature

Gilbo 1 (VAHR 7823 - 0100) was registered by TerraCulture in 2002, as a single quartz core fragment located on undulating land. The artefact was registered as part of a cultural heritage assessment for Goulburn Valley Water. The Aboriginal place was located within the designated works area and it was recommended that a consent to destroy or disturb be obtained from WTLCCCHC prior to the commencement of works. It is highly likely that the artefact was collected by WTLCCCHC prior to the commencement of works, or has since been destroyed.

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Bell op cit.
7.1.2 Extent
Gilbo 1 (VAHR 7823 - 0100) was registered as a single artefact which determined the extent of the Aboriginal place. The artefact has most likely been relocated or destroyed during development works.

7.1.3 Scientific significance
Gilbo 1 (VAHR 7823 - 0100) likely reflects casual discard, occasional short stay use or the remains of a low density scatter that has been widely dispersed by ploughing and erosion. The artefact has most likely been relocated or destroyed during development works and therefore has no scientific significance.
7.2 Lewis 1 (VAHR 7823-0101)

Table 11: Details of Lewis 1 (VAHR 7823-0101)

<table>
<thead>
<tr>
<th>Detail</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Grid ref:</td>
<td>318978.41E 5851656.79N</td>
</tr>
<tr>
<td>Location:</td>
<td>Survey unit 1: 180 Camerons Lane Beveridge VIC 3753</td>
</tr>
<tr>
<td>Landform:</td>
<td>Undulating plain</td>
</tr>
<tr>
<td>Place extent m²:</td>
<td>1017m²</td>
</tr>
<tr>
<td>Place condition:</td>
<td>Moderate</td>
</tr>
<tr>
<td>Place type:</td>
<td>Scarred tree</td>
</tr>
<tr>
<td>Scientific significance:</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Figure 18: Location of Lewis 1 (VAHR 7823-0101) (Liz Foley, 24/09/13, northwest)
### Table 12: Scarred tree attributes table

<table>
<thead>
<tr>
<th>Lewis 1 (VAHR 7823 - 0101) Scarred Tree Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trunk girth</td>
</tr>
<tr>
<td>Scar height above ground</td>
</tr>
<tr>
<td>Scar length</td>
</tr>
<tr>
<td>Scar width</td>
</tr>
<tr>
<td>Top regrowth</td>
</tr>
<tr>
<td>Bottom regrowth</td>
</tr>
<tr>
<td>Right regrowth</td>
</tr>
<tr>
<td>Left regrowth</td>
</tr>
<tr>
<td>Drip-line radius</td>
</tr>
<tr>
<td>Scar orientation</td>
</tr>
</tbody>
</table>

#### 7.2.1 Nature

Lewis 1 (VAHR 7823 - 0101) was registered by TerraCulture in 2002, as part of a cultural heritage assessment for Goulburn Valley Water. The scarred tree is eucalypt species, possibly *Eucalyptus viminalis* (manna gum). The tree is living, although is in poor health with the heart wood of the trunk showing signs of decay. Further evidence of decay is provided by the length of the scar, which has increased by approximately 30cm since it was first registered in 2002. Due to rate of decay, it is not possible to determine for what purpose bark was removed.

#### 7.2.2 Extent

Lewis 1 (VAHR 7823 - 0101) includes a living canopy with a radius of 9m. Therefore the Aboriginal place extent has been calculated at 1017m$^2$ (diameter x2).

#### 7.2.3 Scientific significance

The Aboriginal place has some local rarity scarred trees are not common within the geographic region. This is due in part to the deforestation that has occurred during the historic period. The Aboriginal place is in moderate condition as although the tree is living, the trunk and scar exhibit signs of decay. Lewis 1 (VAHR 7823 - 0101) is considered to be of moderate scientific significance at a local level.

---

99 Bell op cir.
7.3 Kalkallo Creek 1 (VAHR 7823-0236)

Table 13: Details of Kalkallo Creek 1 (VAHR 7823-0236)

<table>
<thead>
<tr>
<th>Detail</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Grid ref:</td>
<td>317692E 5853637N</td>
</tr>
<tr>
<td>Location:</td>
<td>170 Lancefield Rd Lot 3 and 4 Section 21</td>
</tr>
<tr>
<td>Landform:</td>
<td>Open depression / creek bank</td>
</tr>
<tr>
<td>Artefacts:</td>
<td>36</td>
</tr>
<tr>
<td>Average Artefact density per m²:</td>
<td>.01</td>
</tr>
<tr>
<td>Place extent m²:</td>
<td>2265</td>
</tr>
<tr>
<td>Place condition:</td>
<td>Moderate</td>
</tr>
<tr>
<td>Place type:</td>
<td>Artefact scatter</td>
</tr>
<tr>
<td>Scientific significance:</td>
<td>Moderate</td>
</tr>
</tbody>
</table>

Figure 19: View of Kalkallo Creek 1 (VAHR 7822-0236) (Liz Foley, 26/09/13, east)
7.3.1 Nature

Kalkallo Creek 1 (VAHR 7823-0236) comprises an artefact scatter located in a surface and subsurface context. The Aboriginal place is located in the central-western extent of the activity area, on the eroding southern bank of Kalkallo Creek.

The assemblage consists of 36 stone artefacts manufactured from silcrete, quartz and quartzite. Debitage within the artefact assemblage consisted of complete flakes, broken flakes, angular fragments, and a core. In addition to debitage, a small number of cores (3.0%) and formal tools (4.5%) were also identified. The formal tools consisted of two bondi points and suggest that the manufacture or use of hafted hunting spears was occurring within the activity area, particularly adjacent to Kalkallo Creek.

The higher artefact density encountered at Kalkallo Creek 1 (VAHR 7823-0236) suggests that this location was likely the centre of focused activity along the creek corridor. This may be in part due to the confluence of Kalkallo Creek and associated tributaries, and the higher elevation of land and numerous rises. The artefacts were all identified on the grounds surface, however artefacts were also identified eroding from the creek bank. It is likely that additional insitu artefacts may be located in buried contexts nearby.

7.3.2 Extent

Kalkallo Creek 1 (VAHR 7823-0236) consists of 36 stone artefacts, with a density of .01 artefacts per m², in a surface and sub-surface context. The Aboriginal place is located on the eroding Kalkallo Creek bank and is 2265m² in extent.

7.3.3 Scientific significance

The Aboriginal place has some local rarity as it has a greater density of artefacts than usually found within disturbed, eroded creek banks within the geographic region. Many similar landforms adjacent to
watercourses within the volcanic plains have been destroyed or heavily compromised by prior disturbance. Therefore, such archaeological deposits are becoming increasingly locally rare.

Spatial integrity of the Aboriginal place was considered moderate, as artefacts were identified eroding from the creek bank. The recorded stone artefacts were identified in a disturbed (eroding creek bank) context.

Kalkallo Creek 1 (VAHR 7823-0236) is of research value due to the density of artefacts (which may be sufficient to provide enough artefacts to overcome small sampling biases) and its potential to provide information regarding the nature of Aboriginal occupation of Kalkallo Creek.

Kalkallo Creek 1 (VAHR 7823-0236) is considered to be of moderate scientific significance at a local level.
7.4 Kalkallo Creek 2 (VAHR 7823-0237)

Table 14: Details of Kalkallo Creek 2 (VAHR 7823-0237)

<table>
<thead>
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<tbody>
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<td>Landform:</td>
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<td>Place extent m²:</td>
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<tr>
<td>Place type:</td>
<td>Artefact scatter</td>
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<tr>
<td>Scientific significance:</td>
<td>Low-Moderate</td>
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</table>

Figure 21: Kalkallo Creek 2 (VAHR 7823-0237) (Liz Foley, 24/09/13, north)
7.4.1 Nature

Kalkallo Creek 2 (VAHR 7822-0237) comprises an artefact scatter in both a surface and sub-surface context. The Aboriginal place is located in the central-western portion of the activity area, on the northern eroding Kalkallo Creek bank.

The assemblage consists of eight stone artefacts manufactured from silcrete, quartz and quartzite. Debitage within the artefact assemblage consisted of complete flakes, broken flakes, angular fragments, and a core. A utilised complete flake were also identified within the assemblage. The artefacts were all identified on the grounds surface, however artefacts were also identified eroding from the creek bank. It is likely that additional insitu artefacts may be located in buried context.

7.4.2 Extent

Kalkallo Creek 2 (VAHR 7823-0237) consists of eight stone artefacts, with a density of eight artefacts per m², in a surface and sub-surface context. The Aboriginal place is located on the eroding Kalkallo Creek bank and is 1m² in extent.

7.4.3 Scientific significance

The Aboriginal place has some local rarity as it has a greater density of artefacts than usually found within disturbed, eroded creek banks within the geographic region. Many similar landforms adjacent to watercourses within the volcanic plains have been destroyed or heavily compromised by prior disturbance. Therefore, such archaeological deposits are becoming increasingly locally rare.

Spatial integrity of the Aboriginal place was considered moderate, as artefacts were identified eroding from the creek bank and therefore an insitu sub-surface component may exist. The recorded stone artefacts were identified in a disturbed (eroding creek bank) context.

Kalkallo Creek 2 (VAHR 7823-0237) is of research value due to the potential density of artefacts (which may be sufficient to overcome small sampling biases) and its potential to provide information regarding the nature of Aboriginal occupation of Kalkallo Creek.
Kalkallo Creek 2 (VAHR 7823-0237) is considered to be of low/moderate scientific significance at a local level.
7.5 Kalkallo Creek 3 (VAHR 7823-0238)

Table 15: Details of Kalkallo Creek 3 (VAHR 7823-0238)

<table>
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<td>Artefacts:</td>
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<td>Average Artefact density per m²:</td>
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<td>Place extent m²:</td>
<td>1</td>
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<td>Place condition:</td>
<td>Poor</td>
</tr>
<tr>
<td>Place type:</td>
<td>Artefact scatter</td>
</tr>
<tr>
<td>Scientific significance:</td>
<td>Low-Moderate</td>
</tr>
</tbody>
</table>

Figure 23: Kalkallo Creek 3 (VAHR 7823-0238) (Liz Foley, 26/09/13, east)
Figure 24: Artefacts registered as part of Kalkallo Creek 3 (VAHR 7823-0238)

7.5.1 Nature

Kalkallo Creek 3 (VAHR 7822-0238) comprises an artefact scatter in both a surface and sub-surface context. The Aboriginal place is located in the central-western portion of the activity area, on the northern eroding Kalkallo Creek bank.

The assemblage consists of three stone artefacts manufactured from silcrete and quartz. Debitage within the artefact assemblage consisted of complete flakes, and broken flakes. A steep-edged scraper was also identified within the assemblage, and suggests that wood working was occurring within the activity area.

The higher artefact density encountered at Kalkallo Creek 4 IA (7823 - 0239) suggest that this location was likely the centre of focused activity along the creek corridor. This may be in part due to the confluence of Kalkallo Creek and associated tributaries, and the higher elevation of land and numerous rises.

The artefacts were all identified on the ground surface, however artefacts were also identified eroding from the creek bank. It is likely that additional insitu artefacts may be located in buried context.

7.5.2 Extent

Kalkallo Creek 3 (VAHR 7823-0238) consists of three stone artefacts, with a density of three artefacts per m², in a surface and sub-surface context. The Aboriginal place is located on the eroding Kalkallo Creek bank and is 1m² in extent.

7.5.3 Scientific significance

The Aboriginal place has some local rarity as it has a greater density of artefacts than usually found within disturbed, eroded creek banks within the geographic region. Many similar landforms adjacent to watercourses within the volcanic plains have been destroyed or heavily compromised by prior disturbance. Therefore, such archaeological deposits are becoming increasingly locally rare.
Spatial integrity of the Aboriginal place was considered moderate, as artefacts were identified eroding from the creek bank. The recorded stone artefacts were identified in a disturbed (eroding creek bank) context.

Kalkallo Creek 3 (VAHR 7823-0238) is of research value due to the potential density of artefacts (which may be sufficient to provide enough artefacts to overcome small sampling biases) and its potential to provide information regarding the nature of Aboriginal occupation of Kalkallo Creek.

Kalkallo Creek 3 (VAHR 7823-0238) is considered to be of low-moderate scientific significance at a local level.
7.6 Kalkallo Creek 4 IA (VAHR 7823-0239)

Table 16: Details of Kalkallo Creek 4 IA (VAHR 7823-0239)

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</thead>
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<td></td>
<td>5853642N</td>
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<td></td>
<td>Lot 3 and 4 Section 21</td>
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<td>Landform:</td>
<td>Open depression / creek bank</td>
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<td>Artefacts:</td>
<td>4</td>
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<tr>
<td>Average Artefact density per m²:</td>
<td>4</td>
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<tr>
<td>Place extent:</td>
<td>1m²</td>
</tr>
<tr>
<td>Place condition:</td>
<td>Poor</td>
</tr>
<tr>
<td>Place type:</td>
<td>Artefact scatter (surface)</td>
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<tr>
<td>Scientific significance:</td>
<td>Low-Moderate</td>
</tr>
</tbody>
</table>

Figure 25: Kalkallo Creek 4 IA (VAHR 7823-0239) (Liz Foley, 26/09/13, east)
Figure 26: Artefacts registered as part of Kalkallo Creek 4 IA (VAHR 7823-0239)

7.6.1 Nature

Kalkallo Creek 4 IA (VAHR 7823-0239) comprises an artefact scatter in both a surface and sub-surface context. The Aboriginal place is located in the central-western portion of the activity area, on the northern eroding Kalkallo Creek bank.

The assemblage consists of four stone artefacts manufactured from silcrete. Debitage within the artefact assemblage consisted of complete and broken flakes. The artefacts were all identified on the ground surface, however artefacts were also identified eroding from the creek bank. It is likely that additional insitu artefacts may be located in buried context.

7.6.2 Extent

Kalkallo Creek 4 IA (VAHR 7823-0239) consists of four stone artefacts, with a density of four artefacts per m², in a surface and sub-surface context. The Aboriginal place is located on the eroding Kalkallo Creek bank and is 1m² in extent.

7.6.3 Scientific significance

The Aboriginal place has some local rarity as it has a greater density of artefacts than usually found within disturbed, eroded creek banks within the geographic region. Many similar landforms adjacent to watercourses within the volcanic plains have been destroyed or heavily compromised by prior disturbance. Therefore, such archaeological deposits are becoming increasingly locally rare.

Spatial integrity of the Aboriginal place was considered moderate, as artefacts were identified eroding from the creek bank. The recorded stone artefacts were identified in a disturbed (eroding creek bank) context.

Kalkallo Creek 4 IA (VAHR 7823-0239) is of research value due to the potential density of artefacts (which may be sufficient to provide enough artefacts to overcome small sampling biases) and its potential to provide information regarding the nature of Aboriginal occupation of Kalkallo Creek.
Kalkallo Creek 4 IA (VAHR 7823-0238) is considered to be of low-moderate scientific significance at a local level.
7.7 Kalkallo Creek 5 IA (VAHR 7823-0240)

Table 17: Details of Kalkallo Creek 5 IA (VAHR 7823-0240)

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<td>Place extent:</td>
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<td>Place type:</td>
<td>Isolated artefact</td>
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<td>Scientific significance:</td>
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</table>

Figure 27: Figure 22: Kalkallo Creek 5 IA (VAHR 7823-0240) (Liz Foley, 26/09/13, northwest)

7.7.1 Nature

Kalkallo Creek 5 IA (VAHR 7823 · 0240) was first registered by Dr Vincent Clark and Associates in 2011, as a single, red, quartzite blade with retouch on both margins. The artefact was registered on a heavily eroded surface to the south of a dam, at the convergence of two upper tributaries of Kalkallo Creek. It was determined that the artefact was deposited by water flows and was not in situ.

The registered Aboriginal place location was inspected during the standard assessment. The artefact could not be relocated and it is highly likely that artefact has been redeposited elsewhere by water flows.
### 7.7.2 Extent

Kalkallo Creek 5 IA (VAHR 7823 - 0240) was registered as a single artefact which determined the extent of the Aboriginal place. The artefact has most likely been relocated further downstream by water flows.

### 7.7.3 Scientific significance

Kalkallo Creek 5 IA (VAHR 7823 - 0240) likely represents the partial remains of an artefact scatter that has been displaced and re-deposited through water flows. It is highly likely that the artefact has been subsequently relocated by water flows and therefore the Aboriginal place is considered to currently have negligible scientific significance.
### 7.8 Beveridge North LDAD (VAHR 7823-0307)

**Table 18: Beveridge North LDAD (VAHR 7823-0307)**

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<td>Landform:</td>
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<td>Place type:</td>
<td>Low density artefact distribution</td>
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<td>Scientific significance:</td>
<td>Very Low</td>
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</table>

*Figure 28: Beveridge North LDAD (VAHR 7823-0307) location (Liz Foley, 26/09/13, north)*
Figure 29: Artefact registered as part of Beveridge North LDAD (VAHR 7823-0307) location (Liz Foley, 26/09/13, north)

7.8.1 Nature

Beveridge North LDAD (VAHR 7823-0307) comprises five stone artefacts, distributed throughout the eroding Kalkallo Creek within the western extent of the activity area. Beveridge North LDAD (VAHR 7823-0307) represents casual discard, occasional short stay use or the remains of a low density scatter that has been widely dispersed by ploughing and erosion.

7.8.2 Extent

Beveridge North LDAD (VAHR 7823-0307) consists of five stone artefacts, located on the eroding Kalkallo Creek bank. The Aboriginal place is a low density artefact distribution, and therefore the individual stone artefacts represent its extent.

7.8.3 Scientific significance

Beveridge North LDAD (VAHR 7823-0307) likely reflects casual discard, occasional short stay use or the remains of a low density scatter that has been widely dispersed by ploughing and erosion. It has a low level of integrity, is a very common occurrence on the volcanic plains and has negligible archaeological research value. Beveridge North LDAD (VAHR 7823-0307) is assessed as having very low scientific significance.
Figure 30: Aboriginal cultural heritage located within the activity area
7.9 Summary of Aboriginal place data

A total of eight Aboriginal places and 62 artefacts were recorded as part of the Beveridge North West PSP Aboriginal Cultural Heritage Assessment. Of these eight Aboriginal places, two have likely been displaced or destroyed since their registration (Gilbo 1 - VAHR 7823 - 0100 and Kalkallo Creek IA 5 - VAHR 7822 - 0240). The remaining Aboriginal places consist of artefact scatters, isolated artefacts, low density artefact distributions, and a scarred tree. All Aboriginal places located within the activity area (with the exception of the scarred tree) are located within elevated land and within 200m of Kalkallo Creek. Furthermore, the Aboriginal places are located within proximity to the confluence of two streams (Kalkallo Creek and several tributaries).

With the exception of Kalkallo Creek 1 (VAHR 7823-0236), the artefact scatters are of low density. Kalkallo Creek 1 (VAHR 7823-0236) is of higher density, containing 36 artefacts. Although the artefacts are distributed across a 2265m² area, the majority of the assemblage is located within an area less than 10m². Several artefacts were identified eroding from the exposed creek bank and it is therefore considered likely that an insitu, sub-surface component of the Aboriginal place may exist. It is considered likely that insitu sub-surface deposits are also associated with Kalkallo Creek 2 (VAHR 7823 - 0237), Kalkallo Creek 3 (VAHR 7823 - 0238), and Kalkallo Creek 4 IA (VAHR 7823 - 0239).

The majority of artefacts were manufactured from silcrete (80.4%), with low percentages of quartz (12.1%), quartzite (10.1%), and basalt (1.5%) (Appendix 4). The most common stone artefacts were those representing by-products, or debitage, created during tool manufacture and maintenance. Artefacts considered debitage include any unmodified (no retouch or usewear) flakes, broken flakes or angular fragments. These categories amount to 84.8% of the artefact assemblage.

In addition to debitage, a small number of cores (3.0%) and formal tools (4.5%) were also identified. The cores were identified within Kalkallo Creek 1 (VAHR 7823 - 0236) and represent the abandoned parent material from which flakes are struck in the manufacture of tools. The formal tools consisted of two bondi points and a steep-edged scraper. All three tools were manufactured from silcrete and were identified within Kalkallo Creek 1 (VAHR 7823 - 0236) and Kalkallo Creek 2 (VAHR 7823 - 0237). The presence of bondi points suggests that the manufacture or use of hafted hunting spears was occurring within the activity area, particularly adjacent to Kalkallo Creek. The presence of the steep edge scraper indicates that wood working was occurring within the activity area.

The variety of artefact types suggest that all stages of stone reduction were occurring within the PSP, including core preparation and reduction, flake blank manufacture and tool resharpening and use. The higher densities encountered at Kalkallo Creek 1 (VAHR 7823-0236) - Kalkallo Creek 4 IA (7823 - 0239) suggest that this location was likely the centre of focused activity along the creek corridor. This may be in part due to the confluence of Kalkallo Creek and associated tributaries, and the higher elevation of land and numerous rises.

As a result of the survey, several aspects of the predictive model were able to be verified regarding where Aboriginal places might be located as part of future investigations.

For example, it was predicted that “higher density stone artefact scatters will likely be located on elevated land including the crests and slopes of rises (including stony rises), especially those adjacent to water courses or swamps”. All stone artefacts recorded during the standard assessment were identified within 200m of Kalkallo Creek and on elevated land. Due to the very low ground visibility and exposure, however, the standard assessment was largely ineffective at determining the nature and distribution of Aboriginal cultural heritage within the activity area.
7.10 Conclusions

The poor ground visibility across the majority of the activity area indicates the survey was generally ineffective in identifying the nature, extent and significance of cultural heritage across the activity area. The results of the survey supported the predictions made in the predictive modelling developed as part of the desktop assessment.

A limited number of conclusions regarding likely archaeological patterning were made drawing on the results of survey:

- Ground surface visibility in the activity area was generally low and was therefore ineffective at determining the nature and density of potential surface Aboriginal cultural material within areas of dense pasture grass coverage or other ground cover;

- Native vegetation was examined (particularly along the creek corridors) and a single scarred tree (Lewis 1 - VAHR 7823-0101) was reinspected. No additional scarred trees were identified during the standard assessment;

- Areas of prior cut and fill disturbance initially identified during the desktop assessment were examined during the survey and the disturbance in these areas has been considerable – likely resulting in the complete removal of any archaeological deposits that may have originally been present. The survey confirmed these areas are unlikely to contain Aboriginal cultural heritage, and therefore should be excluded from the scope of complex assessment;

- All stone artefact scatters within the activity area are located on elevated land, within 200m of Kalkallo Creek, and within 200m of the confluence of two streams (Kalkallo Creek and its tributaries). It is likely that undisturbed soils on elevated land overlooking Kalkallo Creek (particularly at confluences) will contain frequent, and at times dense, sub-surface stone artefact deposits;

- Areas of very high, high, and moderate sensitivity should be included in a programme of landform based test excavation as part of complex assessments prepared for future CHMPs;

- Areas of low sensitivity should be excluded from future complex assessment because the nature, extent and significance of Aboriginal cultural heritage in these areas is well understood as a result of numerous recent investigations in the region and the results of AHMS investigations for the current project. The model in the region is robust and indicates these areas will contain low density, low frequency surface and sub-surface deposits reflective of occasional use and casual discard; and

- In the case of areas of negligible sensitivity, it is considered unlikely that these areas contain cultural heritage deposits, therefore they should therefore be excluded from future CHMP complex assessments.

7.11 Cultural Values

The Wurundjeri representatives were consulted about key cultural and landscape values during the initial inception meeting and during the archaeological field survey.

The aim of this consultation was to gain an indication of the cultural values which may be relevant to the landscape and to assist in developing a scope for more detailed cultural values assessment during complex assessments.
Cultural values are likely to be associated with but not limited to the following:

- Waterways and wetlands;
- Areas of natural habitat (particularly areas of remnant vegetation);
- Habitat of specific plant or animal species that are / were important resources or had spiritual or totemic significance;
- Known archaeological / cultural sites;
- Old Trees;
- Burial Places (including areas that have a higher potential to contain burials, such as soft alluvial soils on terrace landforms);
- Ceremonial sites;
- Former spring sources;
- Tracks and routes;
- Stone sources;
- Hills and high points within the volcanic landscape;
- Rock outcrops, particularly outcropping rock along creek corridors;
- Places of post contact and contemporary importance / history.

During the survey, the representatives were asked to comment on any cultural values, traditional food plants and landscape values. The WTLCCCHC generally consider Kalkallo Creek to be of cultural significance. Furthermore, the Aboriginal places registered or reinspected within the activity area are of high cultural significance to the WTLCCCHC.
8 PREDICTIVE SENSITIVITY MAPPING

8.1 Factors included in the predictive model

The results of the desktop and standard assessment were used to develop an archaeological sensitivity map to assist in guiding future management of Aboriginal heritage and to inform development of concept design and constraint analysis.

The following is a list of variables that are likely to contribute to archaeological potential within the activity area based on the results of our desktop assessment research, analysis of local site patterning and the results of the field survey:

Proximity to Watercourses

Proximity to water is one of the key determinants of archaeological potential. In general, Aboriginal places are larger, more complex and more frequently found in close proximity to water sources. Levels of sensitivity are predicted to increase with higher order drainage lines and more permanent wetlands. Drainage and hydrology patterns have been significantly altered since European settlement in order to retain water in storage dams for agricultural purposes and drain waterlogged areas to open them up for grazing and cultivation. GIS-modelling combined with analysis of topographic maps and historic aerial photos has been used to determine the likely extent of former drainage channels and water sources.

The level of sensitivity is predicted to increase with higher order drainage lines and more permanent wetlands. Kalkallo Creek is situated within the western portion of the activity area. The results of the standard assessment clearly indicate that land within 200m of Kalkallo Creek and its banks have a high potential to contain Aboriginal cultural heritage. Parts of the activity area located within 200m of Kalkallo Creek have a higher density and frequency of archaeological deposits.

Crest and Elevated Landforms

The desktop assessment and review of previous archaeological literature indicates that there is a higher potential for artefact scatters on the crests and slopes of rises, especially those located within 200m of a water course.

Areas of cut and fill disturbance

These areas are considered unlikely to contain Aboriginal archaeological deposits because topsoil units (i.e. artefact bearing soil units) have been removed. These areas include roads, dams and the construction of building platforms for houses and sheds. They are considered to have negligible archaeological sensitivity.

8.2 Factors not included in the predictive model

The following variables were not included in the model, because the desktop assessment research and analysis of the local landscape indicated they are unlikely to be factors that affect local archaeological patterning within the subject land.

Areas of ploughing

Areas of ploughing are considered to have a lower level of archaeological sensitivity because the top 20 – 30cm of topsoil has been disturbed. These areas may contain Aboriginal cultural deposits but they are likely to have a lower level of integrity and a lower level of scientific significance. It is noted,
however, that in deeper soils there is potential for more intact archaeological deposits to survive beneath the plough zone.

Areas of ploughing have not been included in the model as the majority of the activity area has been subject to some level of ploughing in the past.

**The location of surface scatters**

These places/sites have been shown on the sensitivity maps but have not been included as an influence on archaeological sensitivity in the model. This is because most of the sites are surface artefact scatters identified on erosional landforms, in areas of ground exposed by soil disturbance and within areas specifically investigated during previous archaeological studies. Therefore, the current local distribution of known sites is unlikely to accurately reflect the real distribution and nature of subsurface archaeological deposits.

It is important to note that under the *Aboriginal Heritage Act 2006* it is offence to disturb or destroy Aboriginal sites or objects except where a Permit to Harm has been approved by OAAV and/or an approved CHMP allows for the disturbance. It is also important to note that areas within a 50m radius of registered Aboriginal places are considered to be areas of CHS under the *Aboriginal Heritage Regulations 2007* and may have implications for whether or not a CHMP is required for a proposed development activity.

### 8.3 Predictive Sensitivity Mapping

MapInfo GIS software was used to model and map the predictions surrounding archaeological potential. This allowed us to produce maps that show areas of varying archaeological sensitivity graded from high to very low. The modelling and mapping is based on a probabilistic approach, where a combination of traits was used to determine the level of potential.

The model traits for the activity area are:

- Crest and slopes of rises and within 200m of confluence of watercourses = very high sensitivity;
- Within 200m of confluence of two watercourses = high sensitivity
- Within 200m of watercourse or historic wetland = moderate sensitivity
- Crest and slopes of rises = moderate sensitivity;
- Undulating plain = low sensitivity; and
- Cut and fill disturbance = negligible sensitivity.

Figure 31 shows the results of the GIS predictive model. The figure shows areas of very high sensitivity (very dark pink) grading to low sensitivity (very light pink) to nil sensitivity (black).

It is important to note that the predictive model and sensitivity mapping does not include predictions about cultural values to the Aboriginal community. Identification of cultural values and places cannot be predicted by a scientific model, they can only be identified during consultation with traditional owner knowledge holders (WTLCCHC).
Figure 31: Sensitivity model for Aboriginal cultural heritage within the activity area
9 MANAGEMENT RECOMMENDATIONS

9.1 PSP Planning and Design

The predictive model and archaeological sensitivity map shown on Figure 31 is designed to inform PSP design and planning work. The sensitivity map is also designed to provide landowners and development proponents with a guide to archaeological sensitivity within various parts of the activity area to assist in gauging risk and making informed decisions about development design.

In general terms, the risk of impact on significant archaeological and Aboriginal cultural heritage values is likely to increase in accordance with sensitivity level. Therefore, areas that are in the very high sensitivity zones are likely to have the highest level of archaeological significance and as a result these areas are also likely to have the highest level of risk for development proponents. Likewise, areas of very low sensitivity or which are disturbed have a very low risk level.

We would recommend the following PSP design responses with reference to the sensitivity zones shown on Figure 31:

**Very High Sensitivity**: The aim of PSP design should be to minimise future development impact on these areas and where possible, to retain these areas in their current form. This approach will protect areas with high potential for significant archaeological deposits and cultural values. The approach will also save time and money in reducing the scope of mitigation and salvage of sensitivity areas.

Options for retention could include inclusion of parts of the very high sensitivity land within open space, riparian, RCZ, bio-link, set-backs and/or asset protection zones. Where possible, the landscape integrity and amenity of these areas should be retained, including appropriate set-backs where this is relevant. Appropriate and robust planning provisions should be established during the PSP design process for areas that are proposed to be retained. Provisions for retention could include specific measures that limit ground disturbance or erosion into the future.

High impact activities such as creek crossings or large drainage works should avoid the areas of very high sensitivity, where possible.

**High & Moderate Sensitivity**: where there is an opportunity, development impact should be minimized where practicable. For instance, where there are opportunities to establish open space, these could be placed on areas of high or moderate sensitivity to protect Aboriginal heritage and reduce the scope of expensive and time consuming archaeological mitigation measures and salvage. Areas of high sensitivity should take precedence over areas of moderate sensitivity.

**Low Sensitivity**: no design and planning recommendations. These areas are essentially archaeologically ‘neutral’ and are generally compatible with residential subdivision and development.

**Negligible Sensitivity**: these areas could be the focus of development, particularly high impact features of a subdivision like a town centre, medium or high density residential, industrial or commercial.
9.2 Complex Assessments

The proposed activity (residential subdivision) would be a ‘high-impact’ development and would be considered a ‘sub-division’ under Regulation 48 of the Aboriginal Heritage Regulations 2007.

Prior to the commencement of individual development projects within the PSP, projects that are located within or partly within an area of cultural heritage sensitivity as defined by the Aboriginal Heritage Regulations 2007 (this currently includes all the areas shaded green on Figure 32 as well as the Aboriginal place locations indicated on Figure 30) will be required to prepare a Cultural Heritage Management Plan (CHMP).

It is important to note that areas of cultural heritage sensitivity change over time as new Aboriginal places are identified and new landforms added – therefore it is critical that all proponents check the sensitivity overlay mapping included on OAAV’s ACHRIS mapping system to determine whether a management plan may be triggered by their development proposal.

There is an exemption from the requirement to complete a mandatory CHMP if all of the development area has been subject to significant ground disturbance in the past. Significant ground disturbance is defined as disturbance of the 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 or other deep ripping in the Aboriginal Heritage Regulations 2007. In most cases, it is very difficult to demonstrate significant ground disturbance across the entirety of a typical residential sub-division project. Therefore any developments within or partly within the areas of sensitivity shown on Figure 31, and/or within 50m of any known Aboriginal place (see the location of Aboriginal places recorded within the activity area shown on Figure 30) are highly likely to require completion of a complex CHMP before a Planning Permit can be approved for those projects.

Where a CHMP will be required we recommend the use of a landform based approach to complex assessment (test excavation). The landform based approach aims to systematically test each landform within an activity area to establish the extent of cultural material present. This approach is recommended because it is a very efficient and effective means of assessing the nature, extent and significance of Aboriginal cultural heritage across large landscapes. It also provides for a consistent approach across PSP 1059 and significant sampling efficiencies by using a common approach that can be utilized by all the landowners and proponents within the activity area.

The extent of testing and sample effort should be based on the level of sensitivity shown on the predictive sensitivity mapping shown on Figure 31. Areas which are disturbed or have low sensitivity should not require further test excavation because they are considered ‘unlikely’ to contain Aboriginal cultural heritage (the Aboriginal Heritage Regulations 2007 only require complex assessment in areas that are ‘likely’ to contain Aboriginal cultural heritage). However, areas ranging from moderate to very high sensitivity should be included in a systematic programme of landscape-based archaeological test excavation that aims to establish the extent nature and significance of the Aboriginal cultural material within areas of proposed development impact (NB: Areas set aside as open space, conservation or other uses that do not entail development disturbance will not be included in complex assessment and can therefore be excluded from complex assessment scope of work). Levels of sensitivity ranging from low to very high will need to be included in the scope of complex assessments in order to efficiently test the predictive model.

In addition to test excavation, individual complex assessments should also include consultation with the WTLCCHC to identify site specific cultural values, and to discuss proposed methodologies and sampling specific to the complex CHMP. The WTLCCHC must also be invited to participate in any further survey or test excavation fieldwork.
Proposed sampling densities for complex assessments are outlined below. These densities are based upon previous landform based testing, conducted at Botanic Ridge PSP and Minta Farm PSP for the Metropolitan Planning Authority in which the level of testing outlined below was successfully used to establish the extent, nature and significance of the Aboriginal Cultural Heritage across each landscape and identify statistically robust landform and environmental trait patterning. We recommend a minimum sampling density as per Table 19 below.

**Table 19: Proposed Sampling Densities**

<table>
<thead>
<tr>
<th>Sensitivity Level</th>
<th>Testing Required (per 100 hectare for larger properties)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>10 Square Metres</td>
</tr>
<tr>
<td>Moderate</td>
<td>15 square metres</td>
</tr>
<tr>
<td>High</td>
<td>20 square metres</td>
</tr>
<tr>
<td>Very High</td>
<td>25 square metres</td>
</tr>
</tbody>
</table>

* For properties that are less than 100 hectares the same sampling densities would also apply. For example, a 25 hectare property in high sensitivity zoning would still require 20 square metres sample because it is a minimum sample required to understand the nature, extent and significance of sub surface deposits. For properties that include a range of sensitivity zones, the sampling should be weighted according to the proportion of the land in different sensitivity zones.
Figure 32: Properties and current areas of CHS within the activity area
Part 2: Cultural Heritage Management Recommendations
10 MANAGEMENT REQUIREMENTS

10.1 Basis for recommendations

The recommendations are made in accordance with:

- Section 61 of the Aboriginal Heritage Act 2006;
- The Aboriginal Heritage Regulations 2007;
- The results of desktop and standard assessment documented in this report;
- The purpose of the assessment for PSP strategic planning; and
- The views of the Aboriginal community represented by the Registered Aboriginal Party (RAP).

10.2 Definitions

In the Recommendations and Contingencies included in this chapter, the following words have the meanings described below:

- RAP means the Registered Aboriginal Party.
- ‘Office of Aboriginal Affairs Victoria’ or ‘OAAV’ means the Office of Aboriginal Affairs Victoria, Department of Planning and Community Development, or such other government department which has responsibility for the Aboriginal Heritage Act 2006 from time to time.
- Activity means the activity to which this CHMP relates.
- ‘CHA’ or Cultural Heritage Advisor has the same meaning as “Cultural Heritage Advisor” in the Aboriginal Heritage Act 2006.
- Development Proponent means a person or corporation who has responsibility for implementing the activity.

10.3 Recommendations

The following recommendations set out the key legal requirements that will apply to PSP planning and development within the activity area:

1. Subdivision or development projects (greater than 2 lots and/or two dwellings) located within or partly within areas of legislated cultural heritage sensitivity defined under the Aboriginal Heritage Regulations 2007 (shown on Figure 32) and Aboriginal places marked green on Figure 30) will require completion of mandatory cultural heritage management plans (CHMPs) before Planning Permits can legally be approved for these projects. Prior to subdivision or development projects taking place a search of the Aboriginal cultural heritage sensitivity overlay on the OAAV website should be undertaken to ensure that the proponent has the most up to date version of OAAV Aboriginal cultural heritage sensitivity overlay when determining whether or not a mandatory CHMP is required for an activity.
2. CHMPs must be prepared by a qualified Cultural Heritage Advisor and must be approved by the WTLCCHC prior to commencement of the activity.

3. If individual development proponents believe their land has been subject to significant ground disturbance (either mechanical excavation disturbance and/or deep ripping) they could consider engaging a Cultural Heritage Advisor to undertake an assessment and make a determination. Activity areas that have been subject to significant ground disturbance as defined by the Aboriginal Heritage Regulations 2007 may not require a mandatory CHMP.

4. Areas where no development or ground disturbance is proposed – no Complex Assessment will be required in areas where development and disturbance is not proposed. Inclusion of areas of very high sensitivity in conservation, open space, biolinks and/or riparian corridors will reduce the scope of Complex Assessment required and provide good outcomes in protecting significant Aboriginal heritage;

5. Known Aboriginal Places (including Low Density Artefact Distributions) (Figure 30) – registered on the Victorian Aboriginal heritage register (VAHR) and places found during the standard assessment described in this report are protected by the Aboriginal Heritage Act 2006. It is an offence to disturb or destroy these places without first obtaining either a Permit to Harm or an approved CHMP from OAAV.

6. Blanket Protection – Irrespective of whether or not a CHMP is required for a particular development or activity, the Aboriginal Heritage Act 2006 provides blanket protection for all Aboriginal cultural heritage. If any Aboriginal objects (artefacts), sites, places or skeletal remains are identified at any time before or during development works, they cannot be harmed until either a Permit to Harm or a CHMP that specifically permits harm to that place has been approved by OAAV.
REFERENCES

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Chandler, J. 2007b, Mandalay Estate, remaining precincts, Beveridge, archaeological and heritage assessment, unpublished report to Beveridge developments pty ltd.


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Thomas, W. ML, Private Papers, 16 volumes and 8 boxes of papers, journals, letterbooks, reports etc. Uncatalogued manuscripts, Set 214: items 1-28, Mitchell Library, Sydney, n.d

Appendix 1 Notice of Intent
# Notice of Intent to prepare a Cultural Heritage Management Plan for the purposes of the Aboriginal Heritage Act 2006

This form can be used by the Sponsor of a Cultural Heritage Management Plan to complete the notification provisions pursuant to s.54 of the Aboriginal Heritage Act 2006 (the "Act").

For clarification on any of the following please contact Victorian Aboriginal Heritage Register (VAHR) enquiries on 1800-726-003.

## SECTION 1 - Sponsor Information

<table>
<thead>
<tr>
<th>Sponsor:</th>
<th>Growth Areas Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABN/ACN:</td>
<td></td>
</tr>
<tr>
<td>Contact Name:</td>
<td>Fiona McDougall</td>
</tr>
<tr>
<td>Postal Address:</td>
<td>Level 29, 35 Collins Street</td>
</tr>
<tr>
<td>Business Number:</td>
<td>03 9651 9636</td>
</tr>
<tr>
<td>Mobile:</td>
<td></td>
</tr>
<tr>
<td>Email Address:</td>
<td><a href="mailto:fiona.mcdougall@gaa.vic.gov.au">fiona.mcdougall@gaa.vic.gov.au</a></td>
</tr>
</tbody>
</table>

**Sponsor’s agent (if relevant)**

<table>
<thead>
<tr>
<th>Company:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Name:</td>
<td></td>
</tr>
<tr>
<td>Postal Address:</td>
<td></td>
</tr>
<tr>
<td>Business Number:</td>
<td></td>
</tr>
<tr>
<td>Mobile:</td>
<td></td>
</tr>
<tr>
<td>Email Address:</td>
<td></td>
</tr>
</tbody>
</table>

## SECTION 2 - Description of proposed activity and location

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>Beveridge North West PSP 1059 (15 properties)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal district:</td>
<td>Mitchell Shire Council</td>
</tr>
</tbody>
</table>

Clearly identify the proposed activity for which the cultural heritage management plan is to be prepared (ie. Mining, road construction, housing subdivision).

Subdivision

## SECTION 3 - Cultural Heritage Advisor

<table>
<thead>
<tr>
<th>Simon Crocker</th>
<th>AHMS (Archaeological &amp; Heritage Management Solutions Pty Ltd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td><a href="mailto:scrocker@ahms.com.au">scrocker@ahms.com.au</a></td>
</tr>
<tr>
<td>Company:</td>
<td></td>
</tr>
<tr>
<td>Email address:</td>
<td></td>
</tr>
</tbody>
</table>

## SECTION 4 - Expected start and finish date for the cultural heritage management plan

| Start Date:       | 10-Sep-2013       |
| Finish Date:      | 10-Dec-2013       |

Submitted on: 30 Aug 2013
SECTION 5 - Why are you preparing this cultural heritage management plan?

- A cultural heritage management Plan is required by the Aboriginal Heritage Regulations 2007
- What is the high impact Activity as it is listed in the regulations? Subdivision
- Is any part of the activity an area of cultural heritage sensitivity, as listed in the regulations? Yes
- Other Reasons (Voluntary)
- An Environmental Effects Statement is required
- A Cultural Heritage Management Plan is required by the Minister for Aboriginal Affairs.

SECTION 5 - List the relevant registered Aboriginal parties (if any)

This section is to be completed where there are registered Aboriginal parties in relation to the management plan.

Wurundjeri Tribe Land & Compensation Cultural Heritage Council Inc.

SECTION 7 - Notification checklist

Ensure that any relevant registered Aboriginal party is also notified. A copy of this notice with a map attached 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 evaluate the management plan.]

In addition to notifying the Deputy Director and any relevant registered Aboriginal party, a Sponsor must also notify any owner and/or occupier of any land within the area to which the management plan relates. A copy of this notice with a map attached may be used for this purpose.

Submitted on: 30 Aug 2013
2nd September 2012
Our Reference: WF00083

Fiona McDouall
Level 29, 35 Collins Street
Melbourne VIC 3000

Dear Fiona,

CULTURAL HERITAGE MANAGEMENT PLAN: BEVERIDGE NORTH WEST PSP 1059 (15 PROPERTIES)

I refer to your written notification to the Wurundjeri Tribe Land & Compensation Cultural Heritage Council, received on the 30th August 2013, of your intention to prepare a cultural heritage management plan for the above activity.

Your notification has been accepted and the Wurundjeri Council advises that it intends to evaluate this plan when complete. We also advise that during the preparation of this plan, the Wurundjeri Tribe Land & Compensation Cultural Heritage Council Inc. wishes to:

• Consult with you in relation to the assessment of the area for the purposes of the plan
• Participate in the conduct of the assessment
• Consult with the sponsor in relation to the recommendations to be included in the plan.

Please note that before any fieldwork program commences, it will be necessary for your heritage advisor to participate in a Project Establishment Meeting at the Wurundjeri Council office to discuss the project. It is preferable for the project sponsor to attend the Project Establishment Meeting as well. As the Project Establishment Meeting provides an opportunity for all parties to clarify the aims of the CHMP and methodology for any fieldwork program, it is helpful if you and/or your heritage advisor can bring along the following information to expedite these discussions:

• Aerial photo of the Activity Area
• A clear map of the Activity Area
• Aboriginal site location data within a 5km radius of the Activity Area
• Site cards of any sites already recorded in the Activity Area.

If you require any additional information about this advice, please contact Alexander Perminoff by telephone on 03 9418 2903 or by email: ales@wurundjeri.com.au.

We look forward to meeting with you soon to discuss the project.

Yours sincerely,

Stephen Eyako
Chief Executive Officer

Cc: Simon Crocker
Appendix 2 Gazetteer of Aboriginal places
<table>
<thead>
<tr>
<th>Name &amp; VAHR Number</th>
<th>GDA 55 Zone</th>
<th>Aboriginal Type</th>
<th>Place</th>
<th>Cadastral Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilbo 1 (VAHR 7823-100)</td>
<td>319314E 5853840N</td>
<td>Artefact scatter</td>
<td>180 Camerons Lane Beveridge VIC 3753</td>
<td></td>
</tr>
<tr>
<td>Lewis 1 (VAHR 7823-0101)</td>
<td>318978.41E 5851656.79N</td>
<td>Scarred tree</td>
<td>180 Camerons Lane Beveridge VIC 3753</td>
<td></td>
</tr>
<tr>
<td>Kalkallo Creek 1 (VAHR 7823-0236)</td>
<td>317692E 5853637N</td>
<td>Artefact scatter</td>
<td>170 Lancefield Rd Lot 3 and 4 Section 21</td>
<td></td>
</tr>
<tr>
<td>Kalkallo Creek 2 (VAHR 7823-0237)</td>
<td>317593E 5853704N</td>
<td>Artefact scatter</td>
<td>170 Lancefield Rd Lot 3 and 4 Section 21</td>
<td></td>
</tr>
<tr>
<td>Kalkallo Creek 3 (VAHR 7823-0238)</td>
<td>317644E 5853652N</td>
<td>Artefact scatter</td>
<td>170 Lancefield Rd Lot 3 and 4 Section 21</td>
<td></td>
</tr>
<tr>
<td>Kalkallo Creek 4 IA (VAHR 7823-0239)</td>
<td>317746E 5853642N</td>
<td>Isolated artefact</td>
<td>170 Lancefield Rd Lot 3 and 4 Section 21</td>
<td></td>
</tr>
<tr>
<td>Kalkallo Creek 5 IA (VAHR 7823-0240)</td>
<td>317810E 5853677N</td>
<td>Isolated artefact</td>
<td>170 Lancefield Rd Lot 3 and 4 Section 21</td>
<td></td>
</tr>
<tr>
<td>Beveridge North LDAD (VAHR 7823-0307)</td>
<td>317588.68E 5853677.61N</td>
<td>Low density artefact distribution</td>
<td>170 Lancefield Rd Lot 3 and 4 Section 21</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 3 Glossary of technical terms
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeolian</td>
<td>Wind generated geological processes. In an archaeological context it usually refers to wind-blown deposits and sands.</td>
</tr>
<tr>
<td>Backed Artefact / Backing</td>
<td>A retouched tool (maybe a complete, distal, medial or proximal flake) that displays evidence of backing along one lateral margin. This backing may be initiated from the ventral surfaces or alternately may be an example of bidirectional backing initiated from both surfaces (Holdaway and Stern 2004:259). There are four main types of commonly recognised backed artefacts, which include 'Bondi Points; geometric microliths (or 'Backed Blades'), Juan Knives and Eloueras'.</td>
</tr>
<tr>
<td>Bipolar</td>
<td>A method of removing flakes from a core, by striking a core against an anvil (Holdaway and Stern 2004:11). This is often evidenced by crushing at the platform and/or at the termination of the flake; Bipolar flaking is also evidenced as crushing at the base (end opposite the platform) of a core.</td>
</tr>
<tr>
<td>Blade</td>
<td>A flake that is twice as long as its width.</td>
</tr>
<tr>
<td>Bulbar</td>
<td>Refers to a bulb of percussion produced during a conchoidal fracture.</td>
</tr>
<tr>
<td>Chert</td>
<td>‘a dense, extremely hard, microcrystalline or cryptocrystalline, siliceous sedimentary rock, consisting mainly of interlocking quartz crystals, sub-microscopic and sometimes containing opal (amorphous silica). It is typically white, black or grey, and has an even to flat fracture. Chert occurs mainly as nodular or concretionary aggregations in limestone and dolomite, and less frequently as layered deposits (banded chert). It may be an organic deposit (radiolarian chert), an inorganic precipitate (the primary deposit of colloidal silica), or a siliceous replacement of pre-existing rocks’ (Lapidus 1990:102).</td>
</tr>
<tr>
<td>Conchoidal</td>
<td>Where a force strikes the surface of a core forming a circular or ‘ring’ crack that bends back towards the surface of the core, forming a partial bulb of percussion. The fracture frequently moves towards the exterior surface of the core, detaching a flake (Holdaway and Stern 2004:34).</td>
</tr>
<tr>
<td>Core</td>
<td>Andrésfky (1998:80-81) states a core can be understood as ‘an objective piece that has had flakes removed from its surface’; Holdaway and Stern (2004:37; 5-8) provide further clarification ‘artefacts that retain the negative flake scars of previous flake removals’.</td>
</tr>
<tr>
<td>Cortex</td>
<td>The outer layer of patination of rock is known as cortex. It is found on weathered stone (Holdaway &amp; Stern 2004: 26-27). Cortex types (mostly rough, water worn or pebble) can indicate the source that stone material was obtained from.</td>
</tr>
<tr>
<td>Debitage</td>
<td>Small spalls and flakes produced during percussion, bipolar and pressure flaking.</td>
</tr>
<tr>
<td>Fine Grained Basalt</td>
<td>Basalt is a volcanic rock. See Volcanic below.</td>
</tr>
<tr>
<td>Flake</td>
<td>Depending on the completeness of the flake, a flake may have a number of common characteristics which may include: a platform, bulb of percussion, errasure (or bulbar) scar, point of force impact (PFI or umbo), dorsal ridge and ventral surface, fissures (or indentations), ripple marks (which radiate away from the point of force impact/umbo) and a termination. Not all of these features are typically found on every flake, however they are attributes likely to be present from conchoidal fracture.</td>
</tr>
<tr>
<td>Negative Flake Scar</td>
<td>The negative indentation or scar left behind on a flake, core or tool when a flake is removed. The presence and abundance of negative flake scars can reveal information about the process of flaking. For example negative flake scars on a) cores can provide information on how intensely the core has been used, b) on the dorsal surface of a flake can indicate how intensely the core was flaked before this flakes was removed and/or that the core platform was cleaned off to start flaking again (platform rejuvenation), c) along the edge of a flake can indicate retouch/backing (Holdaway and Stern 2004:184).</td>
</tr>
<tr>
<td>Point</td>
<td>A term applied to certain formal types such as Bondi Points.</td>
</tr>
<tr>
<td>Platform</td>
<td>A striking platform or a platform is the surface from which a flake is struck from a Core (Holdaway and Stern 2004:5); flakes retain part of the platform on their proximal end.</td>
</tr>
<tr>
<td>Quartz</td>
<td>‘crystalline silica, SiO2. It crystallizes in the trigonal system, commonly forming hexagonal prisms. For cryptocrystalline varieties of silica see Chalcedony.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Colourless and transparent quartz</td>
<td>is found in good crystals, is known as rock crystal. Varieties that are colours due to the presence of impurities may be used as gemstones, amethyst, purple to blue-violet, rose quartz, pink: citrine, orange-brown; smoky quartz, pale yellow to deep brown’ (Lapidus 1990:429).</td>
</tr>
<tr>
<td>Quartzite</td>
<td>‘a metamorphic rock consisting primarily of quartz grains, formed by the recrystallization of sandstone by thermal or regional metamorphism; a metaquartzite and a sandstone composed of quartz grains cemented by silica; an orthoquartzite’ (Lapidus 1990:430).</td>
</tr>
<tr>
<td>Retouch</td>
<td>Modification of a flake or core prior to use. Retouch is the ‘removal of a series of small, contiguous flakes’ from the edges of the artefact (Holdaway and Stern 2004:33). There are several different types of retouch which are identified as backing; stepped; scalar; invasive; notched and serrated retouch.</td>
</tr>
<tr>
<td>Reduction</td>
<td>By definition stone material is made smaller when it is struck to produce stone flakes and tools. This process is known as stone reduction. ‘Modern stone artefact analyses use the reductive nature of stone artefact manufacture as the basis for reconstructing the processes by which artefacts were made. By analysing the size and form of artefacts, archaeologists can obtain information about how stone was acquired from its source, the form in which the stone was transported to campsites, how it was worked, and the way stone artefacts were used until discarded’ (Holdaway and Stern 2004:3).</td>
</tr>
<tr>
<td>Scarred Tree</td>
<td>A tree that has been marked as a result of bark being removed by Aboriginal people for cultural reasons or for use in making shields, containers, canoes etc. Some trees may also have marks caused by making toe holds for climbing up trees.</td>
</tr>
<tr>
<td>Scraper</td>
<td>‘A minimal definition of a scraper is that it is a flake with one or more margins of continuous retouch’. It also indicates the stage of reduction the flake has reached (see Holdaway and Stern 2004:227).</td>
</tr>
<tr>
<td>Silcrete</td>
<td>‘a hard surface deposit composed of sand and gravel cemented by opal, chert and quartz, formed by chemical weathering and water evaporation in semi-arid climate. Extensive deposits of silcrete are found in S. Africa and Australia. Silcrete is a siliceous duricrust’ (Lapidus 1990:472).</td>
</tr>
<tr>
<td>Termination</td>
<td>There are a number of different flake terminations (or ends of a flake) which are possible through flaking stone material. The main types of flake terminations include step, hinge, feather and plunging. Flake terminations can provide information about how the flake was removed.</td>
</tr>
<tr>
<td>Tool</td>
<td>A tool is an artefact which shows evidence of modification (i.e. by retouch) or without modification (i.e. show signs of usewear) (Holdaway and Stern 2004:33; 39).</td>
</tr>
<tr>
<td>Tuff</td>
<td>‘pyroclastic rock composed mainly of volcanic ash (fragments &lt;2mm in diameter). Tuffs may be classified as crystal tuff if they contain a large proportion of crystal fragments, vitric tuff composed mainly of glass and pumice fragments and lithic tuff, containing mainly rock fragments. A consolidated mixture of lapilli and ash is a lapilli tuff’ (Lapidus 1990:519-520).</td>
</tr>
<tr>
<td>Usewear</td>
<td>‘Evidence of distinctive patterns of wear [which is] sometimes found on the edges of artefacts that were believed to have been used for specific purposes’ (Holdaway and Stern 2004:41). Several types of usewear can be observed. Holdaway and Stern (2004:41; 167) identify ‘chattering’ and ‘edge damage’ as one form of usewear.</td>
</tr>
<tr>
<td>Volcanic</td>
<td>‘All extrusive rocks and associated high-level intrusive ones. The group is entirely magmatic and dominantly basic. Igneous lithic material generally dark in colour and may be glassy (like obsidian) or very fine-grained or glassy igneous rock produced by volcanic action at or near the Earth’s surface, either extruded as lava (e.g. basalt) or expelled explosively’ (Lapidus 1990:535).</td>
</tr>
</tbody>
</table>
Appendix 4 Stone artefact catalogue
<table>
<thead>
<tr>
<th>VAHR 7823</th>
<th>Raw material</th>
<th>Primary Form</th>
<th>Cortex %</th>
<th>% of edge retouch/use wear</th>
<th>Flake Platform</th>
<th>Flake Termination</th>
<th>Number of complete scars</th>
<th>Longest (axial mm) scar</th>
<th>Formal Tool/Core Type</th>
<th>Length (mm)</th>
<th>Wid th (mm)</th>
<th>Thickness (mm)</th>
<th>Maximum dimension (mm)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>0236</td>
<td>Silcrete</td>
<td>Flake - Distal</td>
<td>None</td>
<td>None</td>
<td>Feather</td>
<td>1.557</td>
<td>Core - Blade</td>
<td>31.48</td>
<td>11.23</td>
<td>16.8</td>
<td>2.04</td>
<td>21.46</td>
<td>31.48</td>
<td></td>
</tr>
<tr>
<td>0236</td>
<td>Silcrete</td>
<td>Flake - Complete</td>
<td>None</td>
<td>None</td>
<td>Feather</td>
<td>11.23</td>
<td>Core - Blade</td>
<td>31.48</td>
<td>11.23</td>
<td>16.8</td>
<td>2.04</td>
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