BERRYBANK WIND FARM

DESKTOP CULTURAL HERITAGE ASSESSMENT

A Report to Robert Luxmoore Pty Ltd
On behalf of Union Fenosa Wind Australia Pty Ltd

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Prepared by

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Some information regarding specific site details contained within this report is of a sensitive nature e.g. MGA co-ordinates and site plans.

Before releasing contents of this report to the general public permission should first be obtained from the relevant authorities/communities.

EXECUTIVE SUMMARY

This report outlines the results of an Aboriginal and non-Aboriginal historic (hereafter referred to as historic) desktop cultural heritage investigation of the proposed Berrybank Wind Farm located at Berrybank (Figure 1 - Activity Area Location) situated approximately 125km west-north-west of Melbourne (hereafter referred to as the activity area). The activity area is being considered for a wind farm development which is currently being managed by Robert Luxmoore Pty Ltd on behalf of Union Fenosa Wind Australia Pty Ltd. This desktop assessment reviews the Aboriginal and historic cultural heritage of the area and the potential impact the proposed activity may have on known and potential cultural heritage values. This assessment also provides preliminary management recommendations regarding mitigation of possible impact to heritage values and obligations under the *Aboriginal Heritage Act 2006*; though does not constitute a Cultural Heritage Management Plan under the Act.

Relevant background information is presented in Sections 3 and 4. In summary, Aboriginal archaeological sites can occur on any landform, but the highest density is found in close proximity to water sources. Historic sites can also be found in close proximity to water sources. In addition, historic sites can be found throughout the region, though earliest sites are associated with pre-emptive rights.

As no Registered Aboriginal Party (RAP) has yet been appointed for the activity area, the area is currently administered by the Department for Victorian Communities (DVC) for Aboriginal cultural heritage and Heritage Victoria (HV) for historic cultural heritage. All Consents to Disturb and Permits to undertake archaeological excavation are sought directly from the DVC and HV (Section 9). The Maar Land Council has a RAP application pending that includes the activity area location. If successful, this group will be the primary indigenous consultation group and would evaluate any cultural heritage management plans.

Six regional and one small-scale Aboriginal cultural heritage investigations and only one regional historic investigation have been undertaken within 10km of the present activity area investigation. Of these, five included all or part of the present activity area, though none included ground surface survey of the present activity area and no previously recorded Aboriginal or historic sites were identified during this desktop assessment. These previous studies have only presented limited information associated with pre-contact Aboriginal and historic occupation and of the activity area region. The lack of recorded sites within the activity area reflects a lack of comprehensive survey coverage rather than an accurate indication of site distribution.

The activity area underwent a brief field review by the consultants on October 31, 2007 which consisted of a 'windscreen' survey where all roads/tracks within and adjacent to the activity area were accessed. This level of survey is designed to identify areas of archaeological potential only and is an appropriate level of investigation for this stage of the development. During the survey, initial assessments were made of any areas that may contain archaeological potential and these are summarised in the table below.

Summary of Archaeological Potential within the Activity Area

Heritage Type	Potential Deposits	Level of Potential
Aboriginal	Small numbers of previously disturbed low-density (<10) stone artefact scatters throughout the activity area. Low to moderate density (n. 1-100) stone artefact scatters within 200m of current and previous water courses/drainage lines, hill crests and flood plain perimeters. Elevated locations that offered a dry campsite, adjacent to former wetlands/water sources are the most likely landform for detection of lithic material.	Moderate Moderate-High
Historic	Small numbers of previously disturbed artefacts throughout the activity area Artefacts associated with identified historic structures (i.e. Berrybank township)	Low Moderate-High

The background information indicates that previously disturbed and small (n <10) scatters of stone artefacts are the most probable cultural remains within the activity area. Whilst these sites, evidence of transient and infrequent occupation will have originally been as small discrete clusters, they are now widely distributed across the landscape. Sites such as these provide very little scientific information and require minimal management. However, areas deemed as having archaeological potential (Figure 10) are considered to potentially contain higher density of cultural material that may reflect slightly increased utilisation. These landforms, if they are to be impacted by future ground disturbance should be further investigated to clarify the risk to heritage values. Further investigation would include both surface and sub-surface investigations. If a significant deposit is found, then recommendations would be made to avoid the site via changes in development design. Under condition of the *Aboriginal Heritage Act 2006*, if a site is to be impacted by development, comprehensive salvage would be required. Salvage of archaeological sites is done using a controlled hand method, and includes extensive analysis post field work.

Discussion of cultural heritage management is presented in Section 10 which addresses the importance of implementing a mitigation strategy for protecting any currently obscured archaeological sites that may be affected by future development of the activity area.

The following recommendations are made based on the results of this desktop assessment and brief site visit.

Aboriginal Heritage:

Recommendation 1

All Aboriginal sites are protected under the *Aboriginal Heritage Act 2006* and all Historic sites are protected under the *Heritage Act 1995*. Therefore, all sites must be treated according to requirements of the Act's, which require Permits or Cultural Heritage Management Plans (CHMP) to be in place prior to disturbance.

Any future changes to the activity area should be made in consideration of culturally sensitive land. Any such changes that affect land considered culturally sensitive under the *Aboriginal Heritage Regulations* 2007 will trigger the requirement to conduct a compulsory CHMP.

Recommendation 2

Prior to the brief field review being conducted, precise locations of wind turbines and their associated infrastructure within the activity area had not been established. The review established that provided the wind farm infrastructure and construction zones are more than 200m from any culturally sensitive areas (Figure 10), there would be no requirement to prepare a CHMP (The requirements for CHMP's are discussed in Section 9.3).

Robert Luxmoore Pty Ltd were informed that if any significant ground disturbance works as described under the *Aboriginal Heritage Regulations 2007* (which includes the construction or carrying out of works for a wind energy facility - regulation 43(1)(a)(b)(xxvi)) are to take place within 200m of Gnarkeet Chain of Ponds, a Cultural Heritage Management Plan (CHMP) is required for this area prior to any development works taking place. This area is considered as sensitive for Aboriginal cultural heritage under the *Aboriginal Heritage Act 2006* (regulation 23; see also DVC Sensitive Areas Map at: www1.dvc.vic.gov.au/aav/heritage/Maps/).

This information allowed for the Berrybank Wind Farm design plan to avoid these culturally sensitive areas and therefore avoid the requirement to conduct a Cultural Heritage Management Plan under the *Aboriginal Heritage Act 2006*.

Recommendation 3

Although not required under the *Aboriginal Heritage Act 2006*, it is suggested that the proponent undertake a voluntary CHMP for the wind farm. A voluntary CHMP will address appropriate management of existing and/or potential cultural heritage values and negate the possibility of any delays associated with Cultural Heritage Permit's (CHP's) if cultural material is identified during the works. CHP's can take over 40 days to finalise and are not required if a CHMP is in place. A CHMP would provide certainty of no delays during construction based on heritage issues.

Historic Heritage:

Recommendation 4

It is recommended that further comprehensive ground surface survey of all locations to be directly impacted within the activity area by wind farm construction is undertaken to identify potential historic heritage sites that may be impacted by the proposed wind farm. It is recommended that all existing historic structures are excluded from development impact.

In Addition

The consultant will ensure that copies of this report will be forwarded to Aboriginal Affairs Victoria and Heritage Victoria.

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FIGURES (In Text)

PLATES (In Text)

APPENDICES

ACKNOWLEDGEMENTS

The consultant would like to thank the following people for their assistance during the assessment:

Bindi Thomas, Alex Wisniowiecka - Aboriginal Affairs Victoria
Liz Kilpatrick - Heritage Victoria
Simon Reed – Robert Luxmoore Pty Ltd

ABBREVIATIONS

AAV	Aboriginal Affairs Victoria
AHC	Australian Heritage Commission
CHMP	Cultural Heritage Management Plan
DSE	Department of Sustainability and Environment
DVC	Department for Victorian Communities
HV	Heritage Victoria
H	Heritage Inventory
LV	Land Victoria
NT	National Trust (VIC)
RNE	Register of the National Estate
SLV	State Library of Victoria
VHR	Victorian Heritage Register

** Throughout this report several technical terms are used that may not be familiar to some readers. An extensive glossary has been included as Appendix 2 and should be referenced for an explanation of terms.*

***It should be noted that archaeological reports relating to Aboriginal and historic archaeological sites/places and the recommendations contained therein, may be independently reviewed by the Heritage Services Branch AAV, the relevant Aboriginal community, and Heritage Victoria, DSE. Although the findings of a consultant's report will be taken into consideration, recommendations by a consultant for actions in relation to the management of a site should not be taken to imply automatic approval of those actions by Aboriginal Affairs Victoria, Heritage Victoria or the relevant Aboriginal community.*

1 INTRODUCTION

This report outlines the results of an Aboriginal and non-Aboriginal historic (hereafter referred to as historic) desktop cultural heritage investigation of the proposed Berrybank Wind Farm located at Berrybank (Figure 1 - Activity Area Location) situated approximately 125km west-north-west of Melbourne (hereafter referred to as the activity area). The activity area is being considered for a wind farm development which is currently being managed by Robert Luxmoore Pty Ltd on behalf of Union Fenosa Wind Australia Pty Ltd. This desktop assessment reviews the Aboriginal and historic cultural heritage of the area and the potential impact the proposed activity may have on known and potential cultural heritage values. This assessment also provides preliminary management recommendations regarding mitigation of possible impact to heritage values and obligations under the *Aboriginal Heritage Act 2006*; though does not constitute a Cultural Heritage Management Plan under the Act.

The significance of Aboriginal and historic items, sites and places that comprise the cultural heritage record varies considerably, and can be measured primarily upon their historic, scientific, social, educational, economic and aesthetic values. However, the integrity and significance of cultural heritage items, sites and/or places can be jeopardised by natural (e.g. erosion) and human (e.g. development) activities. In the case of human activities, a range of State and Federal Legislation exists to assure preservation of elements and features of cultural heritage (Section 9). This preliminary report fulfils a range of social and legislative obligations relating to potential cultural heritage sites and places within the activity area. However, it does not constitute a Cultural Heritage Management Plan under the *Aboriginal Heritage Act 2006*.

This investigation has been undertaken in accordance with the *Aboriginal Heritage Act 2006*, *Heritage Act 1995*, Aboriginal Affairs Victoria *Guidelines for Conducting and Reporting upon Archaeological Surveys in Victoria* (AAV 2002), the conservation principles of *The Burra Charter* (Australia ICOMOS 1999) and best current cultural heritage practise as defined by the Australian Association for Consulting Archaeologists.

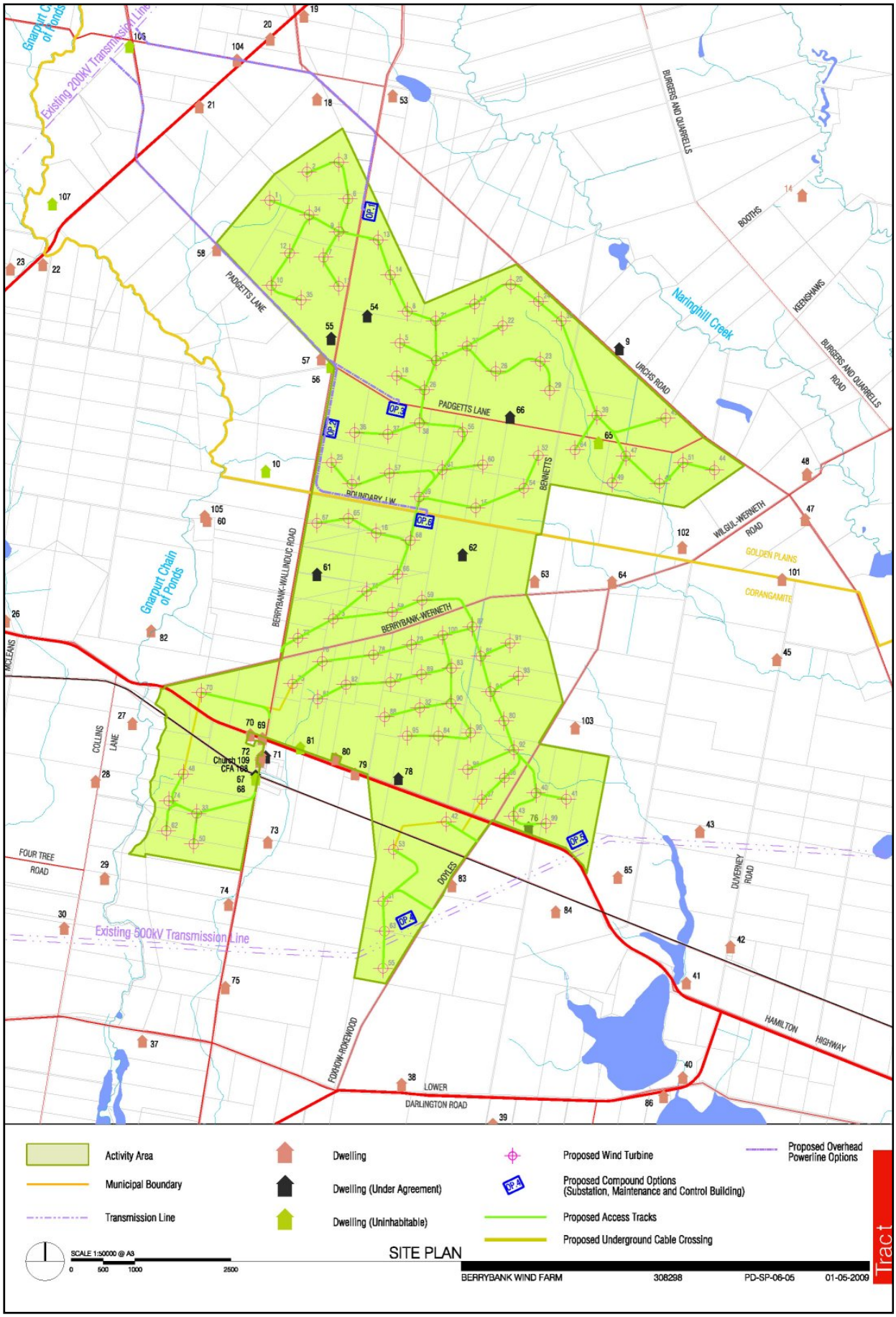


Figure 1 Activity Area Location (VicRoads Ref: 75 J9 – 76 A9)

1.1 Project Aims

The aims of this desktop assessment are defined within the project brief (verbal), and comprise the *Aboriginal Heritage Regulations 2007* desktop assessment guidelines summarised as:

- Investigation of the Victorian Aboriginal Heritage Register for information relating to the activity area;
- Identification and determination of the geographic region of the activity area;
- A review of reports and published works relating to the activity area region, including historical and ethno-historical accounts of Aboriginal occupation of the region;
- A review of the landforms/geomorphology of the activity area;
- A review of land-use history of the activity area.

This assessment also includes:

- A description of the cultural heritage values of the activity area, based on collated existing data and results of the brief site visit;
- An objective assessment of the potential impacts of any activity on these and regional cultural heritage values;
- An appraisal of any implications for the activity arising from relevant State and Commonwealth legislation or policy;
- A description of any opportunities to avoid or mitigate these potential impacts through design or management;
- An assessment of the likely resultant level of impacts if these mitigation measures are adopted;
- The production of a report using the findings in accordance with the guidelines of the Heritage Services Branch, Aboriginal Affairs Victoria (AAV) and Heritage Victoria (HV). Copies of the report are to be forwarded to AAV and HV.

1.2 Consultation

As no Registered Aboriginal Party (RAP) had been appointed for the activity area at the time of report finalisation, no consultation with any Aboriginal group was undertaken as part of this desktop assessment. In areas where no RAP has been appointed, AAV are responsible for administering the *Aboriginal Heritage Act 2006*. The Maar Land Council has a RAP application pending that includes the Berrybank Wind Farm. If successful, this group will be the primary indigenous consultation group and would evaluate any cultural heritage management plans.

The site registers at AAV, HV, National Trust (VIC) and the Register of the National Estate were consulted for the presence of previously recorded Aboriginal or historic cultural heritage sites within the activity area. The Corangamite and Golden Plains Shires planning schemes were also investigated for any information regarding previously undocumented sites and those included within Heritage Overlay. Archival plans and aerial photographs held at the Land Victoria and the State Library were also reviewed.

1.3 The Proposed Development

The activity area is being investigated to assist in the preparation of a development plan that will guide the construction of the proposed Berrybank Wind Farm. In general, wind farms have limited adverse impact due to their small footprint (approximately 17 by 17m) and limited infrastructure (access tracks, underground cables). Due to the possibility of slight alterations to specific turbine locations, wind farms can generally be managed in a manner that minimises adverse impact to local archaeological resources.

Potential impact to archaeological sites by the wind farm development may be either direct or indirect. Direct impact is where sites are located within the construction zone. Indirect impact is where construction activity is adjacent, or the effects of construction may be active over the longer term, such as increasing sediment accumulation or erosion over a surface archaeological site or adversely impacting the root zone of a living tree which posses a cultural scar.

2 THE ACTIVITY AREA

The activity area is bounded by private property and Urches Roads in the north; Hamilton Highway and private property in the south; Bennets, Doyles and Foxhow-Rokewood Roads and private property in the east; and Padgetts Lane, Berrybank-Werneth and Berrybank-Wallinduc Roads and private property in the west. The township of Berrybank is located along Hamilton Highway approximately 2km east from where the highway crosses the western boundary of the activity area. The locality of Naringhil South is approximately central to the eastern boundary of the activity area; however there is no township associated with this location.

The majority of the activity area is currently being used for either grazing pasture or crops (Plates 1 to 3). The land is undulating from between 154m and 210m above sea level and relatively barren of trees except around residences and where they have been planted as wind breaks (Plates 1, 4 & 5). No pre-contact mature gums were identified during the site visit. Also, several ephemeral drainage lines with adjacent flood plains and several dams are located within the activity area (Plates 4, 6 & 7).

Piles of basalt floaters have been gathered by local farmers indicating ground surface disturbance of the fields (Plates 4 & 8). Basalt outcropping also occurs in various locations throughout the area.

Surfaced roads and dirt tracks are located throughout and along the boundaries of the activity area (Plates 4, 5 & 7), and the township of Berrybank is divided by part of the southern boundary of the proposed wind farm. The township contains several buildings

with potential historic value which area situated within and adjacent to the activity area and include a 1954 church and train station (Plates 9 & 10).

Additionally, crossing the south-eastern corner of the activity area are transmission lines with large towers (Plate 11); and a rail line oriented in an approximate north-west/south-east crosses the southern section of the activity area. This rail line also forms part of the southern boundary at, and east from the township of Berrybank and is currently operational (Plate 12).

2.1 Environmental Background

The importance of understanding the past and present environment is two-fold. Firstly, it is the pre-European settlement environment that was the evolving context for Aboriginal land use in the region. Secondly, to understand the changes in the environment since European settlement is to bring an understanding of what Aboriginal archaeological sites may have survived and their potential location.

2.2 Pleistocene and Early Holocene Environment

The Pleistocene and early Holocene environment within the activity area was one of gradual and continuous change. As Aboriginal people are known to have occupied south-eastern Australia during the late Pleistocene (c. 40,000 to 10,000 years B.P.) from archaeological evidence at Keilor (Coutts *et al* 1976) and Hunter Island (Bowdler 1979), it is necessary to consider the environment of Western Port and Bass Strait at this time to determine where Pleistocene and later sites may be located. During the Pleistocene, sea levels were in general much lower than present. During this period, the South Gippsland coast was part of a plain that stretched to Tasmania. This ancient plain would have provided a different set of resources from those available within the present coastal configuration. During the Pleistocene the resource rich coastal zone would have been over 150 km to the south.

Approximately 18,000 years B.P., sea levels began to rise slowly and it was not until approximately 10,000 years B.P. that Western Port became inundated by the sea (Marsden & Mallet 1975: 114-116). This resulted in the loss of large areas of territory for the Aboriginal population and the severing of connections between Tasmania and the mainland. During this time many archaeological sites were inundated. About 5,000 to 6,000 years B.P., the sea reached a maximum of 1.5 to 2m higher than at present, during which time Phillip Island was formed. The archaeological implications of these periods are that they provided different sets of resources for the human populations inhabiting the area. Pleistocene and Early Holocene coastal sites would be expected to be either submerged or further inland. The current coastal formation stabilised approximately 4,000 years B.P. Any site found on the ground surface would most likely date to the last 1,000 years.

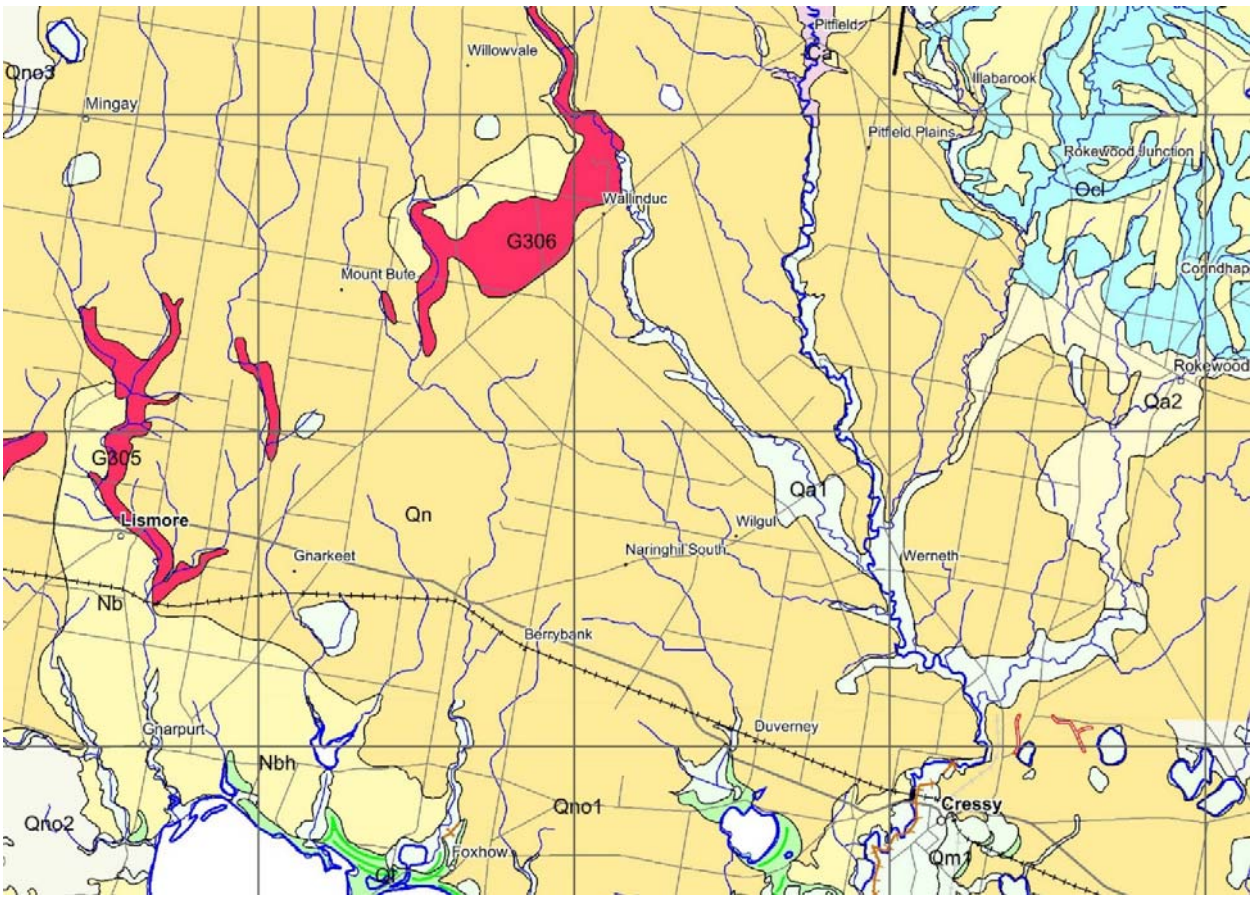
In a study of pollens from forest areas in south-eastern Australia (Dodson *et al* 1992), a general picture of climatic change in the region of the activity area has been formulated. Briefly these changes are:

20,000 - 15,000 years	Dry, cold and windy with reduced vegetation and water sources;
15,000 - 12,000 years	Drier still but slightly warmer;
12,000 - 8,000 years	Becoming wet and mild;
8,000 - 5,000 years	Wetter and warmer than at present;
5,000 to present	Cooler and drier.

The past climate indicates that due to the more moderate conditions, the last 12,000 years may have been more conducive to exploitation of the coastline region by Aboriginal people than the earlier period between 12,000 – 20,000 years. Due to the geomorphic history of the South Gippsland coast, the greatest exploitation by pre-contact Aboriginal people would have occurred during the mid to late Holocene.

2.3 Geology and Landform

The activity area is located in the broader geological feature of the Western District or Volcanic Plains. These plains are made up of basaltic lava flows, tuffs and scoriae that cover their surface and range in age from Middle Pliocene to recent. However, even though these deposits have a broad age range, they area collectively known as the Newer Volcanic Group (Figure 2). The lava flows that are considered geologically recent such as those extending into Lake Corangamite and include the present activity area are known as Stony Rises. These are flows of lava that have “broken out from the front of the main flow after a surface crust had formed on it” (Hills 1964: 189) and consist of fine-grained, moderately weathered basalt (Geoscience Australia website). In areas where the crust was not breached and magma continued to flow to exhaustion, lava tunnels or caves have been known to form. Caves of this type are found in nearby Skipton to the north-west. In other instances, the caves/chambers left by such magma flows have collapsed and left winding troughs between the ridges evident in the Stony Rises landscape along the Princes Highway west from Colac. Such collapses have also been suggested to have occurred over large areas and formed broad shallow depressions. Lake Corangamite approximately 7km south of the activity area has been suspected of being the result of one such occurrence (Hills 1964: 189, 197, 198 & 261).



Legend:

-Ca	St Arnaud Group	G305	Illoura Granodiorite
G306	Wallinduc Granodiorite	Nb	Brighton Group
Nbh	Hanson Plain Sand	Ocl	Castlemaine Group – Lancefieldian
Qa1 & Qa2	Unnamed alluvium	Qn	Newer Volcanic Group
Qno1	Unnamed sheetflow basalt	Qno2	Unnamed stony rises
Qno3	Unnamed valley-filling basalt	Qm1	Unnamed swamp and lake deposits

Figure 2 Geology of the Activity Area (DSE Website – Interactive Map)

2.4 Flora and Fauna

In an 1841 plan of the Woady Yaloak River, the area to the west which is the location of the present activity area is described as "good grazing land for sheep, devoid of timber". The plan also shows the surrounding region to be mostly consisting of open plain with limited areas of Casuarina forest and lightly wooded ‘good country’ (Figure 3).

Virtually all of the original vegetation of the area has been clear-felled by pastoralists establishing grazing and cropping properties. Native grassland and scattered Eucalypts is the main type of vegetation that characterises undeveloped Newer Volcanics area. Prior to European settlement, it is believed that Aboriginal people carried out the practice of burning grass to encourage growth and attract game. The rich volcanic soils are known to support over 57 families of plant native to the area (Starr n.d.: 9). Murnong, or Yam daisy, was a prolific plant staple for Aboriginal people occupying the plains region, until it was decimated by grazing stock. Rivers and creeks would have supported a variety of Eucalypt species, such as the River Red Gum as well as aquatic plants. Closer to Ballarat, the original vegetation of the area is open forest that includes tree types such as

Messmate, Stringy Bark, Casuarina, Manna Gum, and Narrow Leaf Peppermint and, in areas of poorer drainage, Swamp Gum. The heathy under-storey of this open forest type originally comprised Blackwood, bracken, Wattle and Clematis (Land Conservation Council 1980).

The grassland plains, Lake Corangamite and its surrounding lakes, Naringhil Creek, Gnarkeet Chain of Ponds, Woady Yaloak River and their tributaries would have supported high populations and a great variety of fauna. Historic records indicate a wide variety of native animals in the area. Horace Wheelwright, a professional hunter in the Port Phillip region in the 1850s noted the presence of Tasmanian pademelon, eastern grey kangaroo, potoroo and quoll (Land Conservation Council 1991: 107). The presence and abundance of fauna would have been seasonal with the greatest numbers being present after periods of rain. The fauna originally associated with open forest and nearby grassland plains include: eastern grey kangaroo, wallaby, white footed dunnart, southern brown and long nosed bandicoot, brushtail possum, koala, bat, echidna, wombat, brown goshawk, wedge tail eagle, peregrine falcon, cockatoo, Rosella, and reptiles such as skink and copperhead snake (Land Conservation Council 1980: 100). Around swampland associated with the flood plain of nearby permanent lakes, rivers and creeks, the density of fauna would have increased dramatically. These areas would have sustained vast numbers of migratory birds, waterfowl, fish, crustaceans and shellfish as well as attracting larger herbivores.

The region in which the activity area is located is therefore highly attractive places for both pre-contact Aboriginals and early settlers. The region was well watered, contained stands of eucalypt and extensive grassland areas. This combination of attributes will mean that a large number of both Aboriginal and historic sites will have existed in the region. The impact of post-contact activities (see below) will have eliminated many of these sites due to a range of activities.

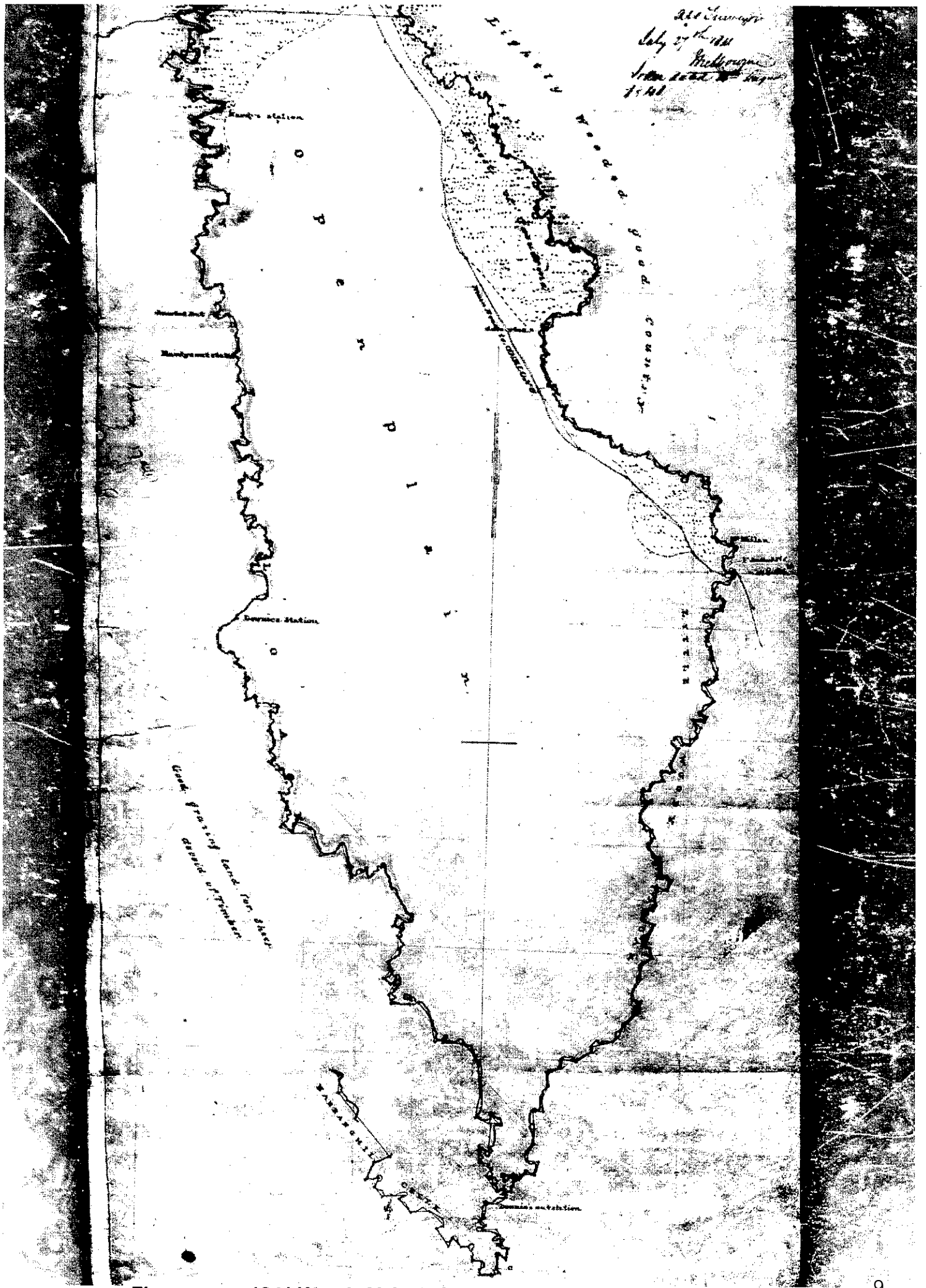


Figure 3 **1841 Woady Yaloak Creek – Loddon 17A1, Parish Wallinduc**

2.5 Climate

The annual average annual rainfall of the activity area is approximately 600mm to 800mm with daily temperatures averaging between 3° and 21°. The average daily relative humidity calculated on an annual basis is between 60% and 80%. The climate of the activity area would not have constrained either Aboriginal or early European occupation.

2.6 European Impact on the Activity Area

Since European settlement of the activity area in the 1840s much change has occurred. These changes include clearing of scrub and timber, and the construction of roads, fences, dams/reservoirs, bridges and installation of a variety of services, including electricity, communications and water.

These activities will have adversely impacted on any Aboriginal sites that may have existed. In these instances, cultural material (such as stone tools) would have been disturbed, re-deposited, or even destroyed. Any scarred tree sites that existed in these areas prior to clearance will also have been destroyed. However, any remaining mature native trees within the activity area may potentially contain scars.

After initial road construction, subsequent maintenance and improvement of the roads (e.g. realignment), will also have resulted in significant ground disturbance. Frequent grading of un-surfaced roads within the activity area has resulted in heavily disturbed road shoulders that contain a high proportion of introduced stone materials.

The construction of farm complexes and activities such as ploughing for crops have caused significant ground disturbance of the area. Figure 4 shows part of the activity area in 1970 as devoid of trees with scattered residences and evidence of ploughing (lines in paddocks) throughout the entire area.

Additionally, the construction of the Berrybank township, with its small residential lots, church and industrial buildings, and the rail line in the southern section of the activity area have significantly altered these locations. Installation of the transmission line crossing the south-eastern corner of the activity area will also have caused disturbance to the area.

The types of land use within the activity area have been of high impact in specific locations (e.g. Berrybank township) and low to moderate in others (i.e. ploughing, farm complexes). Few areas of the proposed Berrybank Wind Farm would contain original old growth forest or undisturbed top soils. This past land use has resulted in an area that is significantly changed from its pre-settlement form.

In summary, activities that may have degraded archaeological resources within the activity area are:

- Initial clearing of vegetation;
- Repeated ploughing;
- Development of land for crops;
- Excavation of shallow drainage lines associated with cropping;
- Residential Development;
- Township development.

Figure 4 1970 Aerial Photograph of the Activity Area (after State Aerial Survey, Run 6, Film 2392, Photo's 143 & 144)

3 HISTORIC BACKGROUND

This section briefly outlines significant documented historic activity within the activity area. The information presented provides a social and environmental context for known sites as well as defining the nature of potential historic sites within the activity area.

The historic background is also highly relevant in terms of examining the landscape for potential Aboriginal sites. The historic background can provide valuable information regarding likely pre-contact campsite locations (often correlating to early pastoral sites), the pre-settlement local topography (where food resources and elevated and/or dry potential campsites may have been) and early contact locations with local Aboriginal groups.

In 1802, Mathew Flinders viewed the basalt plains from the summit of the You Yangs. He thought the area showed great promise, noting that the country was "low, grassy and very slightly covered with wood, presenting great facility to a traveller desirous of penetrating inland" (Flinders in Peterson & Catrice 1995: 13). When Hume and Hovell crossed through the Werribee Plains in 1824, they provided a favourable description of the "abundant game and water, the luxuriant growth of grasses and the general prosperity of the blacks" (du Cros & Watt 1993: 8). Descriptions of the area such as these led to land speculation and attracted the attention of John Batman's Port Phillip Association.

The earliest pastoral runs in the Werribee Plains region were taken up from 1836 after the Port Phillip Association entered Port Phillip looking for the fine sheep grazing land described by the earlier explorers (Garden 1984: 31; Peterson & Catrice 1995: 13). The location of the present activity area was divided by three runs. 'Nairngal', 'Glenfine' and 'Gheranghemarajh' covered some of the area in the north, east and west respectively, though the majority was taken up by Frenchmans (Spreadborough & Anderson 1983: 355-356). The 12,284 acre Nairngal run was held by William Rowe from 1841 to 1865. Glenfine (31,440 acres) was also held by Rowe from 1857 to 1860 when his son was included on the licence. Before 1857 Glenfine was held first by TW Downie from prior to official licensing in 1847 to 1848, then T Chirnside to 1853 followed by J Chirnside to 1857. The 19,107 acre Gheranghemarajh run was first held by CA Synott to 1848; then Francis Ormond to 1851; James and Thomas Austin to 1860, and finally JG Mack to 1872 when it was then forfeited (Spreadborough & Anderson 1983: 102, 103, 126).

There is no evidence to suggest that any of these land holders constructed any buildings within any part of the activity area during their periods of occupation. At this time, runs were unfenced and shepherds who tendered stock would construct rough bark huts often some distance from the main homestead. It is highly unlikely that any remains from this early pastoral period of occupation would exist within the activity area. However, Gheranghemarajh run incorporated the township of Berrybank within its boundary which included the railway line and station.

Berrybank has a recent history; being developed in the early to mid 1900's to service local surrounding rural properties. The township developed on Collins' block as a result of the railway station. The Maroona-Gheringhap railway was opened in 1920.

By far the most important historic phase to occur near the activity area, and within Australia, was the discovery of gold in 1851. The earliest focus of gold exploration was at Golden Point north of Ballarat. The development of many of the towns, such as Bacchus Marsh, Gordon and Ballan, were either directly or indirectly influenced by the gold rush and are along the original route from Melbourne to Ballarat. Initially, roads to the west of Melbourne would have been tracks made by squatters between their runs and the larger towns where supplies could be transported from, such as Melbourne and Geelong (Peterson & Catrice 1995: 24).

Largely as a result of the gold rush, farming of wheat, hay and other crops including Lucerne, which grew well and supplied fodder for the dairying industry, became well established in the western plains. During the gold rush, this produce provided the much needed food supply for the increasing population passing through to the gold fields. Flourmills were established in several locations around the area from the 1860s to 1880s. The dairying industry peaked in 1891 (Peterson & Catrice 1995: 21 & 33)

Timber felling and working of the creeks and drainage lines occurred in the region later in the gold working period of the district. Between 1852 and 1854 miners concentrated on gold deposits that could be obtained from the surface via alluvial mining (McConville & Oliver n.d.: 120). It was not until the second 'rush' to the area in the 1880s that miners targeted deeper lead deposits. The later gold working areas are also those that contain deep shafts and extensive water race and aqueduct systems.

The small scale farming that followed the first phase of alluvial mining has probably left the most numerous historic remains on the landscape near the activity area. During this period of settlement, land sizes were small and the occupiers involved themselves in a variety of farming activities. This was the first phase of owner occupation of the area, as prior to this pastoralists would base themselves at one main homestead that was situated on often many thousands of acres. Many pastoral runs during the earliest period were also unoccupied or leased. However, after the initial land sales, the land was divided into small lots as indicated in Figures 6 and 7.

The first landowners of the activity area included: T Binmore; J Black; A Boyd; J Boyd; J Buchanan; J Buckland; S Buckland; D Cameron; H Cameron; W Collins; E Keep; H King; J Mac Bain; J Mack; A Mac Vean; C Mac Vean; H Mac Vean; M Mac Vean; T Maidment with others; W Martyr; A Mitchell; W Rowe who also owned land with W Challand and W Faris; D Scott; W Sharp; W Smith; and T Taylor. Property sizes in the activity area varied between 271 hectares and nine hectares, though most landowners held multiple properties.

There is no readily available documentation that suggests that any significant historic activity/construction has occurred within the activity area. Being intensively settled in the late 1800's it is most likely that only minor features, such as stock handling facilities *etc*. would exist within the activity area. Figure 5 shows a hut located at Wallinduc called 'Naringhil' which is an example of the type of early construction found in the activity area region.

Figure 5 'Naringhil' Located at Wallinduc (Photo taken in 1982 – SLV website)

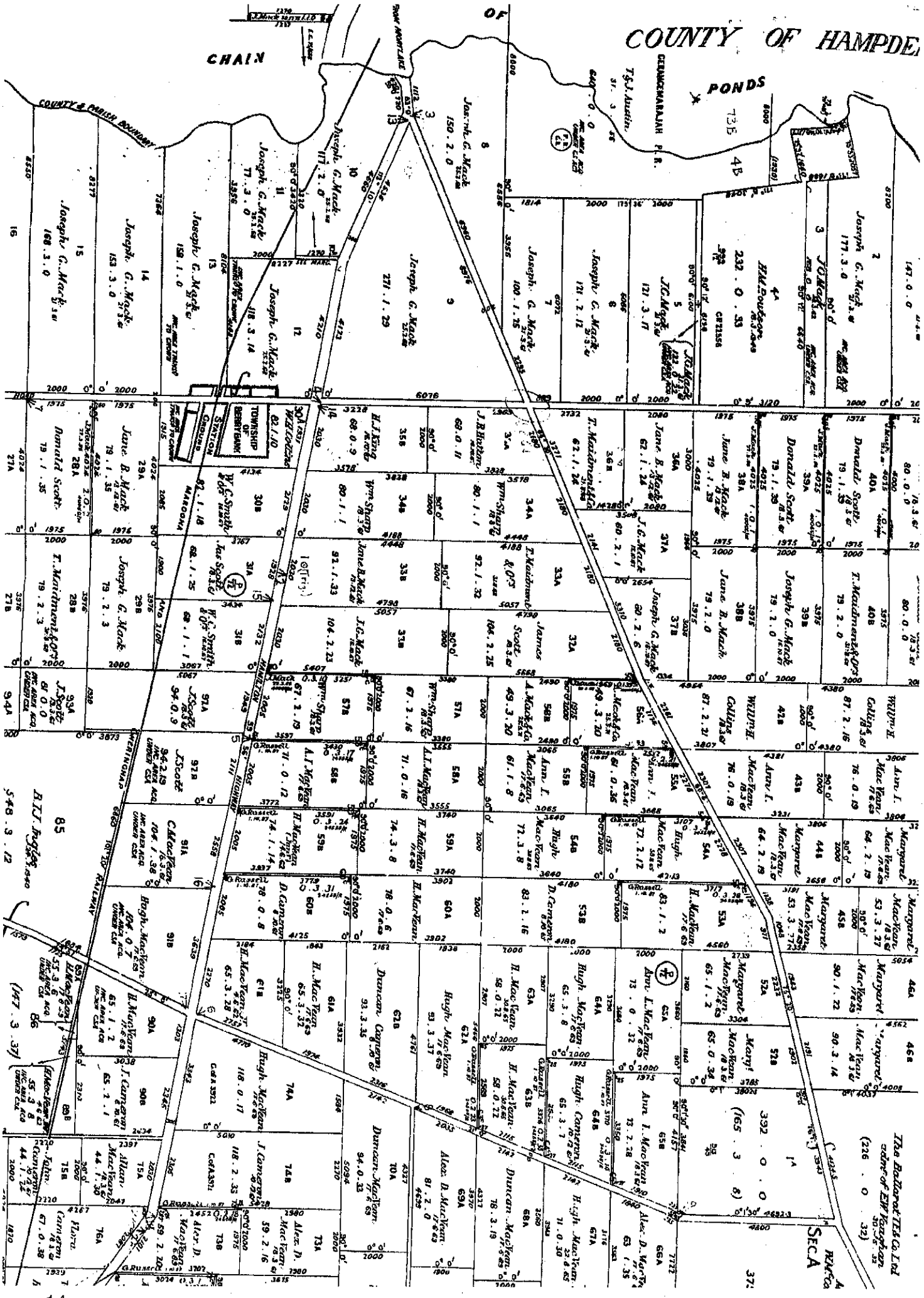


Figure 6 Parish Poliah North (3403, P72(3), n.d.)

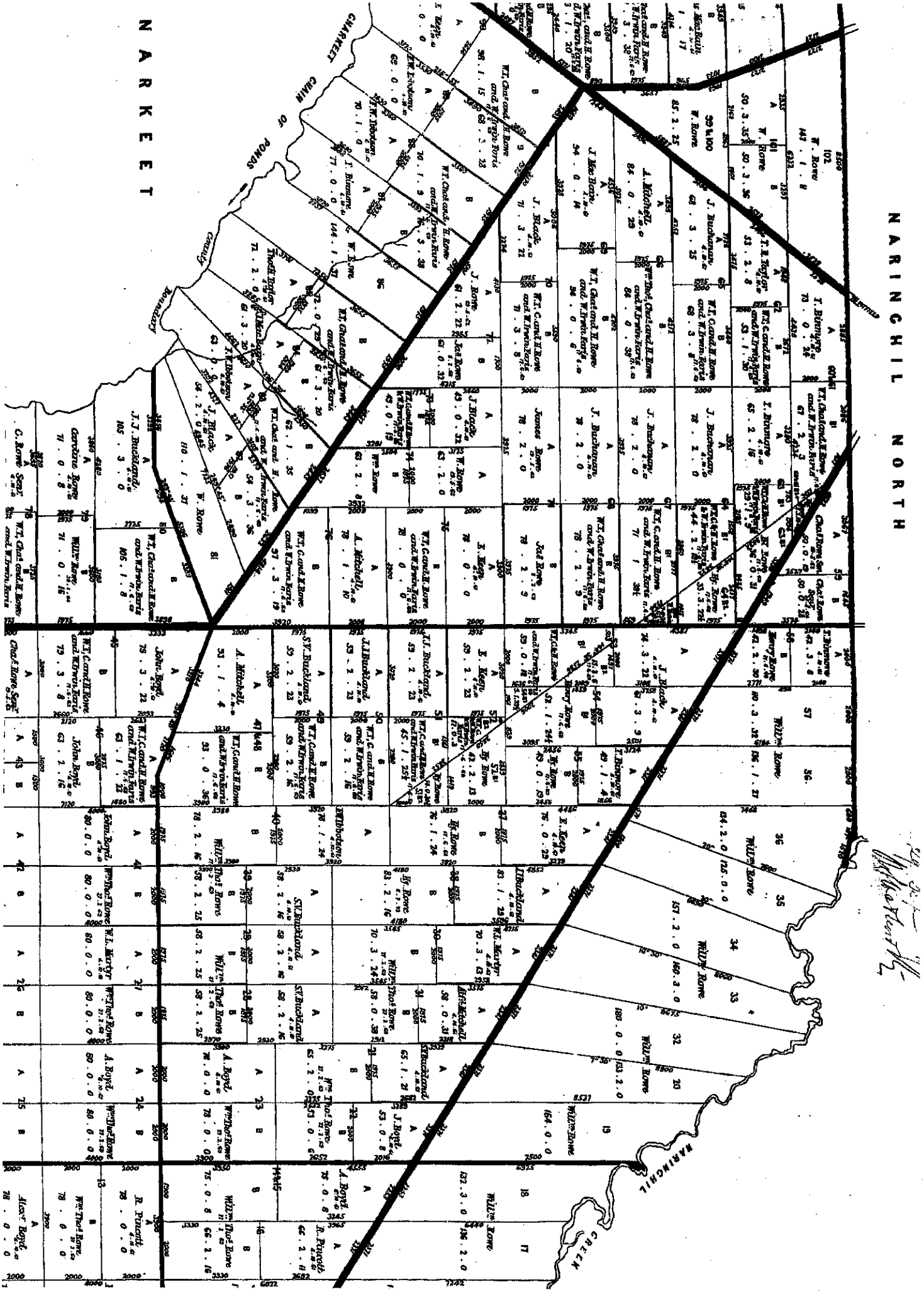


Figure 7 Parish Naringhil South (Proc Roads N24, n.d.)

3.1 Previously Recorded Historic Sites

As part of this desktop assessment, the Victorian Heritage Register and Inventory, National Trust Register, Australian Heritage Database (Register of the National Estate) and both the Corangamite and Golden Plains Shire's Planning Schemes Heritage Overlay's were investigated for registered/listed historic sites. There are no recorded historic sites within 5km of the activity area. The closest site is the Glenfine Mining and Homestead Complex (Victorian Heritage Register No. H7622-0017) located approximately 7km north-east of the activity area at Glenfine Road, Werneth.

3.2 Previous Historic Cultural Heritage Investigations

There has only been one previous historic cultural heritage investigation undertaken within 10km of the activity area. This investigation included two sections of the present activity area: the northern Hamilton Highway road reserve from the Berrybank township west to the western boundary; and a section of Crambs Road from the north-western corner of the activity area to where it intersects with Lismore-Scarsdale Road. Following is a summary of this investigation.

Regional Investigation:

McNiven (1996a) undertook a desktop study of Telstra optical fibre cable routes in the Camperdown District for potential impacts on cultural heritage sites which included part of the present activity area. This study was based on previously documented sites and a brief vehicular reconnaissance of the area. McNiven found that only one historic site (Camperdown Courthouse) had been recorded in the cable route's region. This site is listed with the Australian Heritage Commission. It was predicted that historic homesteads and other European structures/facilities may exist in the region. However, McNiven believed that such sites are likely located away from the cable route within adjacent properties. As the cable route was to be within road reserves and Telstra had a general practice of avoiding damage to existing structures such as dry stone walls, McNiven made no further recommendations regarding historic cultural heritage.

In summary, very little historic site survey has been conducted in the activity area region and no historic sites have been recorded within the present activity area. However, there is a high probability that historic sites will exist in the general area. Most of these sites will be associated with early pastoral and Berrybank township settlement. Thus, the number of historic archaeological and heritage sites that have been previously recorded within the district should be seen to reflect the extent and nature of past investigations rather than an accurate indication of historic site distribution. The amount of survey coverage for historic archaeological sites in the district would be less than 1%. The early European settlement of the district and low level of development the area has incurred in general suggests that a high number of historic archaeological and heritage sites may potentially exist.

3.3 Historic Site Prediction Model for the Activity Area and Implications for this Investigation

- There are no previously recorded historic archaeological or heritage sites within or adjacent to the present activity area;

- With the identification of possible historic structures located within the activity area at the township of Berrybank, there is a moderate probability that as yet unrecorded minor historic features (e.g. stockyards, fencing *etc*.) will exist within the activity area.

4 ABORIGINAL BACKGROUND

4.1 Ethnohistory

The information used to establish pre-settlement Aboriginal spatial organisation is mostly based on observations made by Europeans during the initial period of Contact and subsequent settlement of the activity area region. Early specific historical accounts of Aboriginal land use near the activity area are scant.

The *Wada wurrung* were the Aboriginal language group who occupied land to the west of the Werribee River, covering the country from Ballarat and "south-westward to about 50 miles beyond Lake Corangamite (Koenig 1985: 3, Clark 1990: 312) (Figure 8). The *Wada wurrung* clans were part of a larger regional group of clans who shared some common language, marriage and social ties, and who collectively called themselves the '*Kulin*' (Barwick 1984: 105; Presland 2001: 36-37). The *Kulin* nation occupied much of central Victoria between Airey's Inlet and Cape Liptrap and north almost to the Murray River. Clark (1990: 277) considered the ethnographic information suggested that the *Wada wurrung* mortuary practices and distinctive facial and body markings at corroborees could distinguish them from other language groups.

The *Wada wurrung* clans shared a system of organisation with clans to the north and east. They intermarried with the *Djab wurrung*, *Djargurd wurrung*, *Gulidjan* (Clark 1990: 265, 277) and the *Bun wurrung*, with whom they also had ceremonial links (Gaughwin 1981: 59). Clan heads of the *Wada wurrung* were either *Arweet* or *Noure-nit*/*Nare* (Clark 1990: 277).

The language group of the *Wada wurrung* was divided into 25 clans. Two of these clans were recorded in areas near the activity area at the time of Contact. These clans were; the *Carninje balug* from 'Emu Hill' station at Linton's Creek (Linton), whose clan head was *Ly-je-worroke* (alias Old Sam) and moiety was *Waa* (crow), and the *Pakeheneek balug*, who were recorded as belonging to the tribe at 'Weerteerung', the hill at Anderson's [Mt. Widderin at Henry Anderson's 'Borriyallock', 57,750 acres on Mt. Emu Creek near Skipton (see Figure 8). The clan head was King Billy who died in 1882 and believed to be "fully 70 years of age" (Clark 1990: Figure 11, 321, 326-327). In 1859, a settler in the Borriyallock area considered the 'Friendly Creek Tribe' (Weerteerung) to number ten. At the death of King Billy, the tribe was thought to be extinct except for one remaining member (Clark 1990: 326-327).

Clan estates were not clearly defined or tightly restricted to one specific area (Stanner 1965). The *Wada wurrung* clans in the region would have moved through their country in small mobile bands of between 20 and 120 people (Dawson 1981, Lourandos 1977). Band sizes would be largely dependent on seasonal availability of resources and social and ceremonial obligations. In times of seasonal abundance, large intertribal and clan gatherings were possible. Bands could be comprised of members from different clans, most of who would be related through kinship ties. In times of stress, clans would retreat to their own estate and move in a seasonal pattern dictated by the availability of resources.

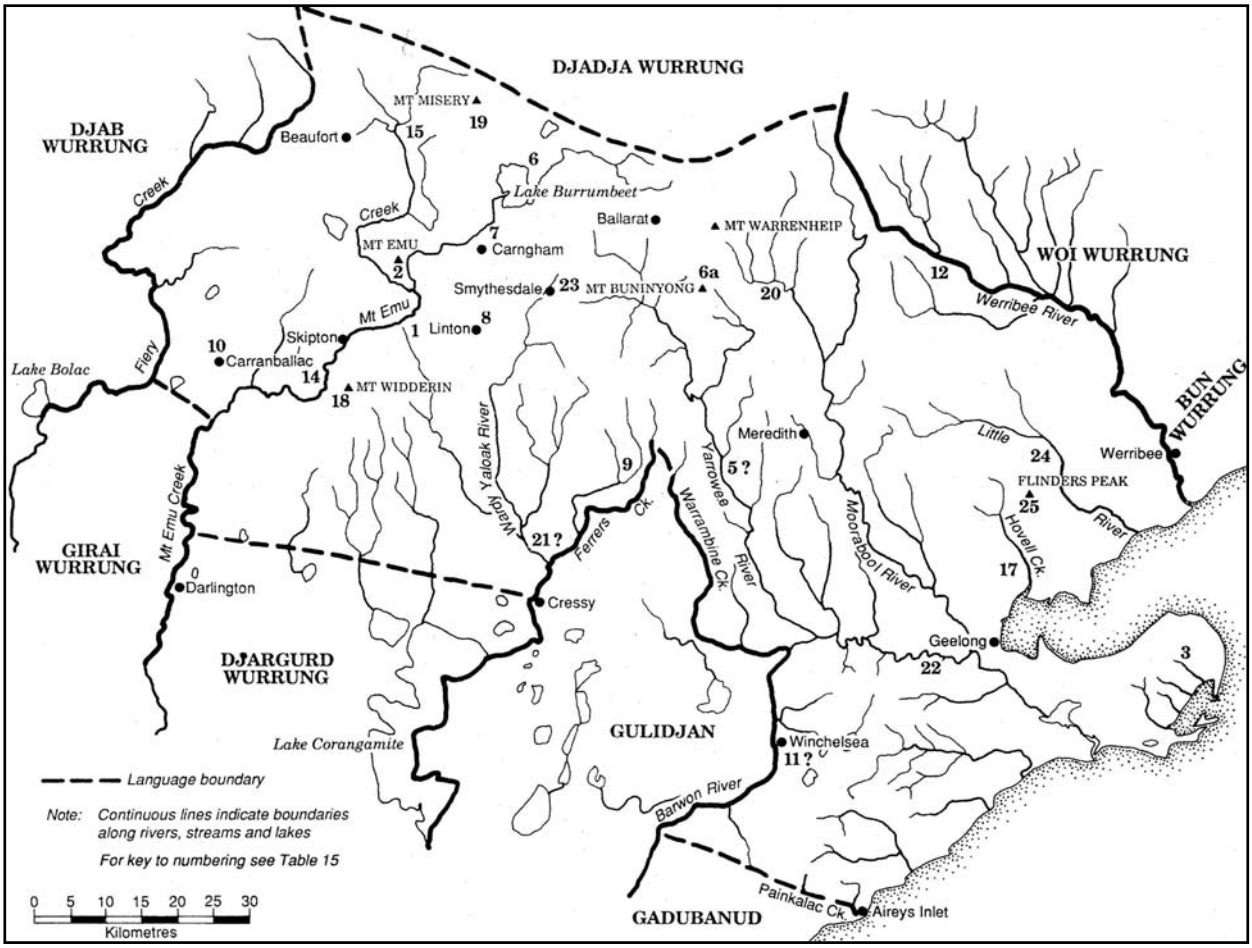


Figure 8 ***Wada wurrung*** **Language Area and Clan Locations (from Clark 1990: Figure 11)**

Mortuary practices of the *Kulin* included either burial of their dead or placement of the body in tree hollows that were then often burnt. When burial was chosen, the dead were tied up in their cloaks and interred lying on their side, with arms and legs doubled-up or flexed. Dead whom were placed in trees were also tied up using their cloaks, and some time later; part or all of the remains were cremated. Although burial locations have been identified within ancient terraces of major rivers in the region, these are generally an extremely rare archaeological site type. Thus, based on this scant information, burial sites may still exist in undisturbed sand hills or deep alluvial locations within the region.

The creeks and rivers flowing through the basalt plains would have provided easy access routes for Aborigines. Parker (in Cannon 1983: 693) noted that the river valleys were often

used as travelling routes, describing such areas as "their ordinary place of resort" where Aboriginal people would utilise their most abundant resources. It is likely that 'Gnarkeet' is the Aboriginal name for the watercourse now known as Gnarkeet Chain of Ponds which is part of the western boundary of the activity area (Figure 7). Clan members rarely numbered more than thirty during their day-to-day activities, only forming large groups for particular social functions or to exploit abundant seasonal food resources. During the 1840s and 1850s, corroborees were held close to settlements where Aborigines received provisions (du Cros 1989: 28). Clark (1995: 7) noted that 80 to 100 Aboriginal people would gather to catch eels and fish and to hold corroborees on the hill near the former Ballanee homestead and near the Presbyterian Church at Ballan.

With the discovery of gold in the region and subsequent expansion of European population and stock numbers, the numbers of local Aboriginal people dramatically declined. These people were amongst the first Victorian groups to feel the full impact of European settlement. Camping reserves at Steiglitz and Bacchus Marsh were set aside for Aboriginal people to provide areas not impacted by gold miners and their habits (Caldere & Goff 1991: 11). Steiglitz was 640 acres on the Little River and was reserved from 1859 to 1901 (Clark 1998: 75, 81). As the plains west of Melbourne were among the first areas to be explored and settled by Europeans, the indigenous populations residing there were first to feel the impact of European settlement. Those who did not move away were compelled to rely on rations given or stolen from the squatters, as their traditional food resources were greatly depleted. Honorary Correspondent depots were set up around Victoria to dispense food and other supplies to Aboriginal people.

Those Aboriginal people, who survived the effects of European occupation on their lands, were forcibly moved to the Framlingham or Coranderrk Aboriginal Stations. Today, the interests of Aboriginal cultural heritage are in the custodianship of the Framlingham Aboriginal Trust.

4.2 Resources Available to Aboriginal People

The resource base available to Aboriginal people in the activity area region in the past would have been rich and varied. The activity area and surrounding region contains a variety of productive ecological zones, such as, riverine, mountainous, lacustrine and terrestrial, that would have been attractive for hunter-gatherers.

The water sources near the activity area such as Lake Corangamite and its surrounding lakes, Naringhil Creek, Gnarkeet Chain of Ponds, Woady Yaloak River and their tributaries, would have attracted Aboriginal people to the area. It is likely that these reliable water sources would have been the focus for Aboriginal resource exploitation and habitation. Within the lake and riverine ecological zone, there would have been variations in staple species diversity and abundance, and this in turn would have influenced site location and visitation frequency (Walsh 1987).

Prior to European settlement, the activity area would have contained a number and variety of faunal species associated with the basalt grasslands. Some of the food resources that may have been utilised by Aboriginal people are; wetland root crops (such as *Typa, Triglochin*), dry land root crops (such as *Microseris scaigera*), fresh water fish, eels and crustaceans, waterfowl and land mammals. With the demise of native habitat, the number and range of species that once existed has greatly reduced. Land mammal species that

would have been commonplace throughout the activity area were tiger quoll, possum, native rats, wallaby, kangaroo and echidna. Within wetlands and associated waterways, black swans, ducks, ibis, quail, fish and crustaceans would have been present in the pre-contact period (Land Conservation Council 1991: 111). Along some watercourses in the western region, fish traps were constructed from stone, few of which have survived (Vines 1993: 9). Yam daisy formed one of the important staple foods, and prior to its destruction by introduced grazing animals, was widespread on the grasslands. In 1873, Thomas Winter observed Aboriginal people around Melbourne, and noted "Their natural food consists of the meat of the country when they kill it, but chiefly roots, of which the favourite is a plant very much like dandelion. This they roast or eat raw" (Winter in Bride 1968: 395). Ephemeral swamp plants such as bull rushes and sedges were also an important source of food as well as fibre for woven bags and decorative items. Detailed lists of plant and animal species available within the Port Phillip area can be obtained from Presland (2001) and Gott (1983).

Red gum trees were common along watercourses and within the floodplain areas of the region. The smooth bark and large size of this species led to their common use by Aboriginal people for the manufacture of bark and wooden implements (Edwards 1972: 31). The bark from the trees would have also been removed for shelter and social or ceremonial purposes.

Stone implements were an integral tool used by Aboriginal people throughout Australia for a variety of functions including cutting, scraping and carving, as axes and spear barbs and for ceremonial purposes. The most accessible nearby sources of stone included the basalt from the plains and silcrete would have been found in outcrops, such as that recorded near Coimadai Creek at Bacchus Marsh (AAV 7722-0102; Cupper 2002: 13). Quartzite would have been quarried from areas such as the cave recorded by Debney (2003: 35, AAV 7722-0528) at Yalock and, along with quartz, found as pebbles from the rivers and creeks near the activity area. The *Wada wurrung* would also have had trading rights with the nearby *Woiwurrung* clan who managed the highly valued Mt William greenstone quarry at Lancefield. Stone from the quarry was exchanged through a barter system for other prized possessions such as possum skin cloaks, one of which would have been exchanged for three to four greenstone axe blanks. The value of the stone was evidently high as a cloak often contained as many as 28 skins and took considerable time and effort to make (McBryde 1984; Barwick 1984).

4.3 Previously Recorded Aboriginal Sites/Places

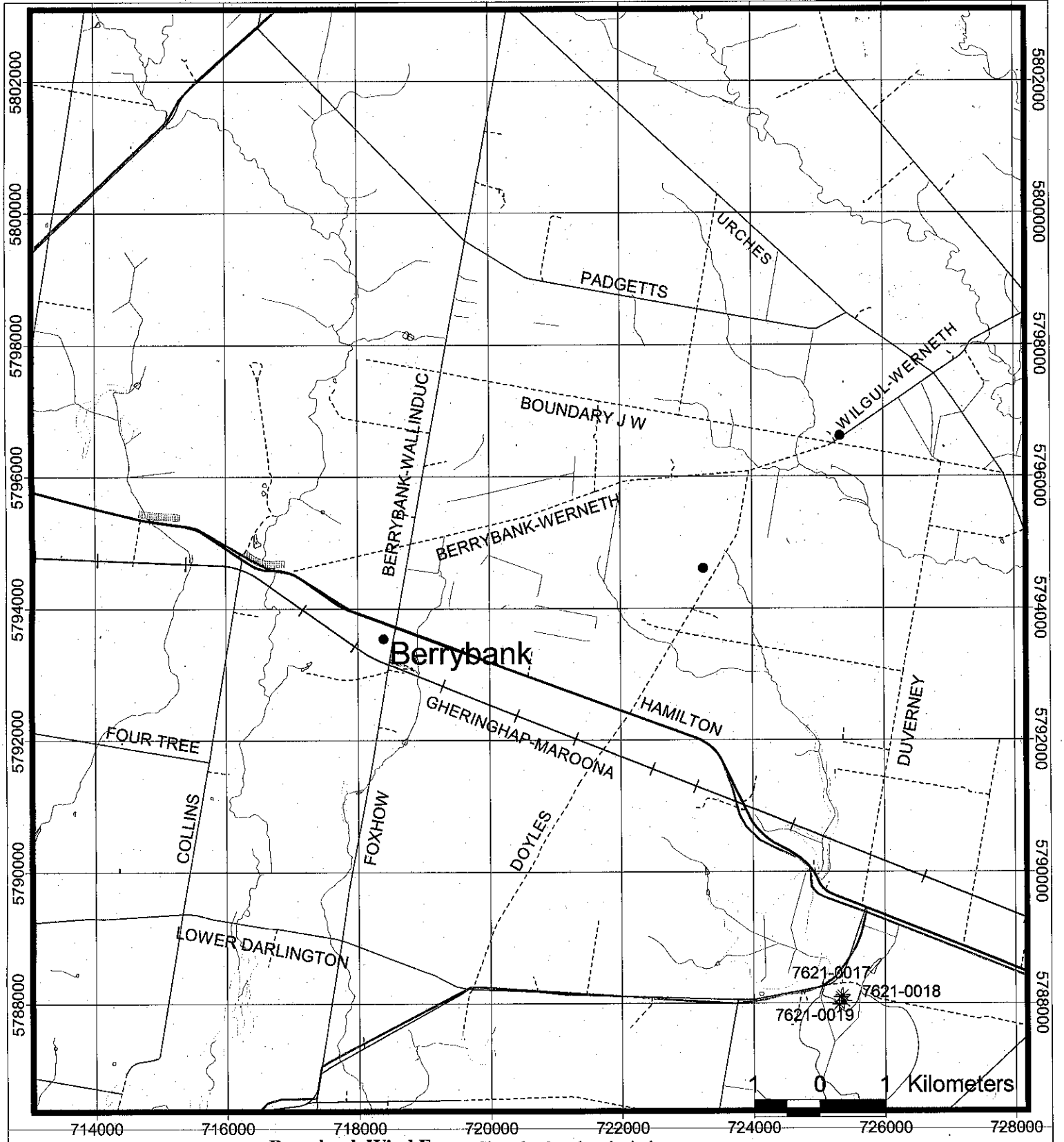
There are no previously recorded Aboriginal sites within the activity area and only four within 5km (Figure 9). The Aboriginal archaeological sites comprise stone artefact scatters combined with earth features. These sites are presented in Table 1. The lack of recorded sites within the activity area reflects a lack of comprehensive survey coverage rather than an accurate indication of site distribution.

Figure 9 also shows areas that have been subject to previous cultural heritage survey, indicating that very limited survey has been undertaken in the area. Both cultural heritage survey and good ground surface visibility are major factors allowing for the identification of Aboriginal cultural heritage sites.

Table 1 Aboriginal Cultural Heritage Sites within 5km of the Activity Area

AAV Site Name, # & Reference	Site Type	Location	Significance Assessment*
Lake Rosine 1 7621-0017 (Clark 1993)	Stone artefact scatter & earth feature	Approximately 20m north of Lake Rosine & 1.5km east-north-east from Strathhaven & Cundare-Duverney Rds (725180E 5787810N)	NA
Lake Rosine 2 7621-0018 (Clark 1993)	Stone artefact scatter & earth feature	Approximately 150m north of Lake Rosine & 1.5km east-north-east from Strathhaven & Cundare-Duverney Rds (725250E 5787860N)	NA
Lake Rosine 3 7621-0019 (Clark 1993)	Stone artefact scatter & earth feature	Approximately 180m north of Lake Rosine & 1.5km east-north-east from Strathhaven & Cundare-Duverney Rds (725210E 5787920N)	NA
Lake Rosine 4 7621-0020 (Clark 1993)	Stone artefact scatter & earth feature	Approximately 200m north of Lake Rosine & 1.5km east-north-east from Strathhaven & Cundare-Duverney Rds (725230E 5787950N)	NA

* As attributed by original recorder



Berrybank Wind Farm Sites plot & archaeological surveys

DQS View - MGA Zone 54

Post-contact Places
Pre-contact Places
* Multiple Feature Types
Water courses
River
Stream
Drain/Channel
connector through water areas
Roads
Highway
Minor road

Vehicular track - unsealed
Rail
towns and localities
Archaeological survey areas and transects

N

GDA94

Date: 03 Oct 0

ABORIGINAL AFFAIRS VICTORIA

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Figure 9 Previously Recorded Aboriginal Sites in the Activity Area (AAV Map)

4.4 Previous Aboriginal Cultural Heritage Investigations

As with most parts of Australia, the activity area would have been well known, if not utilised by Aboriginal people for at least the last 30,000 years. As outlined in section 2.2, the region has evidence for this period of occupation at Keilor (Bowler 1976: 63-65), and burial sites in the Maribyrnong and Werribee River Valley dating back 7,000 years (Mulvaney 1970, Coutts 1977, 1980). While slightly more favourable climatic conditions during the early Holocene period may have seen increased use of the region during this time, greatest use is most likely to have occurred during the last 5,000 years. Like many parts of Victoria, the activity area may have experienced population increases and reorganisations of social groupings due to a series of complex internal changes in society (Lourandos 1993).

Within the activity area region, sites that date to the Pleistocene would be difficult to locate, though are typically found within river terraces, rock shelters and caves. However, the geology of the activity area indicates that it is unlikely that surface sites older than 6,000 years will be found. Caves and rock shelters do not exist and little of the land surface is of Pleistocene age with the exception of volcanic outcrops.

Seven Aboriginal cultural heritage investigations have been undertaken within 10km of the present activity area. All of these are summarised below.

Regional Aboriginal Investigations:

McNiven (1996a) undertook a desktop study of Telstra optical fibre cable routes in the Camperdown District for potential impacts on cultural heritage sites which included part of the present activity area. This study was based on previously documented sites and a brief vehicular reconnaissance of the area. McNiven found that 162 Aboriginal sites had been recorded in the cable route's region and predicted that there is moderate potential for further stone artefact scatters, isolated stone artefacts and mound sites to exist in the region. In addition, burial sites were predicted to have low to remote potential of being present. McNiven suggested that any remaining sites may be disturbed via European land-use practices, jeopardising their social (Aboriginal) and scientific significance. It was recommended that field survey be undertaken as Stage 2 of the assessment process.

The Stage 2 (McNiven 1996b) survey of the Telstra optical fibre cable routes in the Camperdown District resulted in identifying one stone artefact scatter (AAV7522-0068) and three isolated stone artefacts (AAV7522-0069, AAV7522-0070, AAV7522-0071). As a result of these finds, the cable route was diverted around the scatter site. The isolated stone artefact sites were not jeopardised by the cable route and no further recommendations or constraints were made.

McNiven conducted an archaeological survey of the Corangamite Basin in 1998 designed to refine a predictive site location model in order to establish areas of heritage sensitivity to use as a basis for heritage management plans. McNiven's study area included the present activity area within its broader boundaries. As part of his study, McNiven sample ground surface surveyed selected areas based on geologically based land units. Ground surface survey of the present activity area was not undertaken. The study resulted in the identification of five land units exhibiting different levels of sensitivity for archaeological sites. Quaternary Sediments were assessed as having high sensitivity; Stony Rises, Basalt

Plains and Tertiary Sands as having medium sensitivity, and Palaeozoic Metamorphics as having low sensitivity. 28 separate recommendations were made by McNiven that included expanding site inventories, developing a chronological structure for the archaeological record, conservation needs for sites, Aboriginal people's involvement and recommendations for future developments and public education.

Cekalovic and Tulloch (2001) conducted a 'community survey' within the Corangamite Basin which focussed on the location of 25 potential sites reported by members of the public to Aboriginal Affairs Victoria. All of these potential sites are located around lake margins in the basin south and south-west of the present activity area. As part of the study, the authors compared their findings with relation to McNiven's 1998 study. Of the potential sites, 19 were identified and included stone surface scatters, isolated stone artefacts, stone quarries and fish traps. The results were found to support McNiven's predictive model for site patterning. However, Cekalovic and Tulloch pointed out that their survey was not systematic and only focussed on specific locations. Nevertheless, the authors refined the model to include that:

- Large dense artefact sites may be found on saline lakes and area not necessarily associated with any reliable freshwater sources. They are likely to be associated with food resources;
- Quarry sites, especially axe quarries, may be found along lake shores where basalt outcrops exist;
- Fish traps may be found along lake edges and not confined exclusively to creek outlets (Cekalovic & Tulloch 2001: 3).

In 2002a, McConnell, Buckley and Wickman attempted to develop a predictive Aboriginal heritage sensitivity zoning model for the West Victoria Region which includes the present activity area within its broader boundaries. Their study was essentially desktop based and reviewed a broad range of Aboriginal cultural heritage information including previous assessments in the area, landforms, previously recorded site distribution and contemporary places. The aim of attributing sensitivity to zones was so that areas believed to likely contain Aboriginal heritage ("primarily traditional values & archaeological sites and/or broad-scale values such as historical usage or contemporary values", p. 11) could be mapped. These maps could then be utilised to identify Aboriginal heritage sensitive areas for management purposes when required. Overall, the authors suggested the model include area 'zones' and that the maps (GIS) include three 'layers'. The layers included showing archaeological sensitivity, identified and other potential values and previous survey coverage. As this was a subsidiary study, the authors recommended further refining of the model's aspects such as the protocols for its use and the directions ('prescriptions') for how to treat the identified high sensitive areas before the mapping is undertaken. Further consultation with relevant Aboriginal groups was also recommended.

From the subsidiary desktop study, McConnell, Buckley and Wickman (2002b) produced a main report for a predictive Aboriginal heritage sensitivity zoning model for the West Victoria Region. This study was also desktop based and brought together all the available information from the original study to develop an Aboriginal heritage Management System. This system was to divide the West Victoria Region into smaller regions and sub-regions; consist of a three layered map system showing zones of sensitivity for archaeological values, potential Aboriginal heritage values and areas previously surveyed. However, the

authors believed their system required further work due to heritage data constraints, the need for more consultation with Aboriginal groups and time limitations experienced during the study. No maps, prescriptions or protocols were developed at the completion of their work. The authors recommended that the Department of Natural Resources and Environment endorse their system providing that they commit to negotiated and agreed protocols for its use with relevant Aboriginal groups.

Small-Scale Aboriginal Archaeological Investigation:

Presland conducted an archaeological survey of a transmission line route which spanned an area between Sydenham and Portland in 1981 for Aboriginal archaeological sites and areas of Aboriginal archaeological significance. Part of the route crosses through the south-eastern corner of the present activity area. Some ground surface survey was undertaken along the transmission route; however, it is unclear whether the present activity area was subject to this. No cultural heritage sites were identified within the present activity area by Presland during his study, though four stone artefact scatters (AAV7621-0005, AAV7321-0271, AAV7622-0005 & AAV7822-0084) and two isolated stone artefact sites (AAV7521-0027 & AAV7721-0027) were identified within his broader study area boundary. Site AAV7622-0005 located near the junction of Woady Yaloak River and Kuruk-a-ruk Creek is also possibly the remains of a mound site. This site was also reported to have had skeletal remains unearthed during road re-surfacing around 1966. All of these sites had been disturbed via cultivation or other earth movement. Presland recommended that all sites should be fenced and avoided during the construction of the transmission line.

In summary, six regional and one small-scale Aboriginal cultural heritage investigations have been undertaken within 10km of the present activity area. Of these, five included all or part of the present activity area, though none included ground surface survey of the present activity area. These studies have only presented limited information associated with pre-contact Aboriginal occupation of the activity area region.

4.5 Aboriginal Site Prediction Model for the Activity Area and Implications for this Investigation

The implications of the environmental, ethnographic and archaeological background for the present investigation are:

- There are no previously recorded Aboriginal cultural heritage sites within the present activity area;
- The activity area has an Aboriginal archaeological sensitive area at its south-western boundary along Gnarkeet Chain of Ponds;
- The most likely landform on which sites will be located are sandy and/or elevated areas and level land in close proximity to more than one resource zone (transitional areas);
- The most likely site types for the activity area are low density stone artefact scatters. Low density stone artefact scatters are typically dominated by flakes and waste flakes manufactured from silcrete, quartz and quartzite;

- Any site located within the activity area will most likely have been recently formed (last 5-6000 years, but more probably the past 1,000);

- Apart from lithic (stone) sites, no other site type is considered likely for the activity area;

- The potential for significant sites within the activity area is directly related to the level of past soil disturbance. Areas of low disturbance will have a higher potential for *in situ* sites, whilst areas of high disturbance will have little potential. Where the topsoil within the activity area has been modified (e.g. ploughing for crops, road/track construction, past vegetation clearing, building construction *etc*.), there is limited potential for *in situ* material in the top 60cm of soil;

- Any sites found of a good to excellent state of preservation within the activity area are a rarity within the region, and are to be considered of high scientific significance.

5 FIELD RECONAISSANCE

The consultant conducted a site visit of the activity area on October 31, 2007. This consisted of a 'windscreen' survey where all roads/tracks within and adjacent to the activity area were accessed. This level of survey is designed to identify areas of archaeological potential only and is an appropriate level of investigation for this stage of the development. During the visit, detailed notes were made and photographs (Plates 1 to 12) were taken. Additionally, initial assessments were made of any areas that may contain archaeological potential.

Archaeological visibility refers to the amount of ground surface that is clearly visible for site inspection. The greater the ground surface visibility, the more effective are surface site surveys. Examples of high surface visibility are recently ploughed paddocks (100% per square metre); and examples of poor visibility are areas of heavy vegetation cover (0-10% per square metre). Unfortunately, it is often the case that highly visible archaeological sites are also often highly disturbed. High ground surface visibility is therefore often related to the amount of disturbance that has occurred. This disturbance may be man made (such as ploughing, road construction, residential development); by stock (overgrazing, tracks) or due to natural processes (erosion by wind or water).

Due to current land use of grazing pasture, crops, residential development *etc*., the overall ground surface visibility likely to be encountered during a comprehensive survey would be varied. The majority of the activity area will be of poor to very poor visibility conditions (0-30% per square metre) (Appendix 2 – Glossary). However, there were a number of areas in which high ground surface visibility could be encountered such as beneath trees, around sheds, tracks, along fence lines, within plough lines, within areas of very dry or cleared grass cover and within drainage lines. Areas of highest potential visibility will be areas of grass removal and recently ploughed paddocks (Plate 4).

Plate 1

General view of the activity area from its north-western corner (Wollowvale/ Crambs Rds intersection); facing south-east.

Plate 2

General view of the activity area from Berrybank-Wallinduc/Berrybank-Werneth Roads intersection; facing south-east.

Plate 3

General view of the activity area immediately north of Hamilton Highway; facing north-west.

Plate 4

Example of a row of Gum trees, basalt floater piles and a dam within the activity area; facing north. Note: road reserve (left) has been ploughed enabling good ground surface visibility.

Plate 5

Row of pines along Berrybank-Wallinduc Road and within the activity area; facing south.

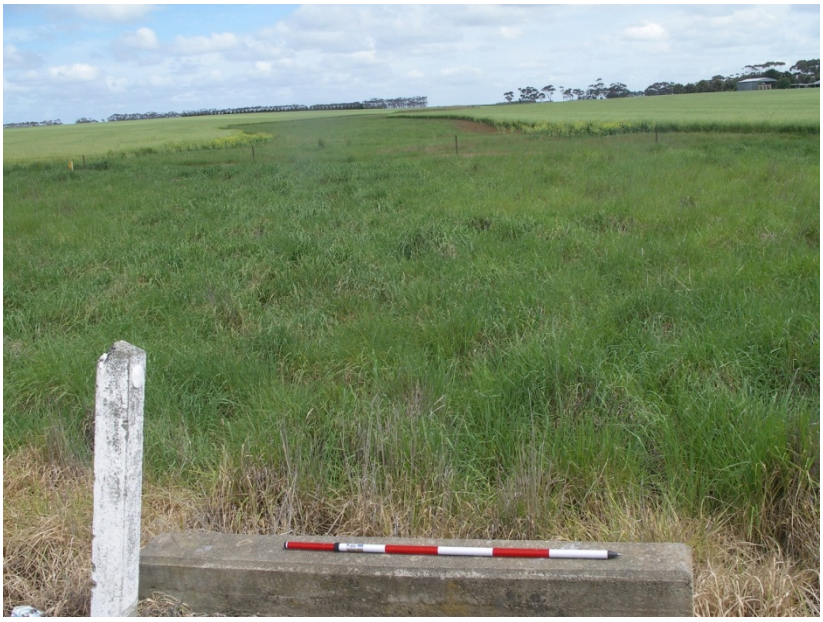


Plate 6

Drainage line which crosses Doyle's Road; facing west.

Plate 7

Drainage line connected to Gnarkeet Chain of Ponds where it crosses Padgetts Road; facing west-north-west.

Plate 8

Piles of basalt floaters within the activity area; facing south-south-west.

Plate 9

Berrybank Uniting Church, erected 1954; facing west (within the activity area).

Plate 10

Possible historic railway station immediately south of the activity area in Berrybank; facing south.

Plate 11

Transmission lines and towers crossing the south-eastern corner of the activity area; facing north-east.

Plate 12

Rail line where it enters the activity area at the eastern boundary; facing west.

6 DESKTOP ASSESSMENT RESULTS

No previously recorded Aboriginal sites were relocated and no new Aboriginal sites were identified during this desktop assessment. However, several historic structures of possible cultural heritage value are located within the township of Berrybank. Discussion on both Aboriginal and historic cultural heritage is presented below.

6.1 Discussion – Aboriginal Cultural Heritage

In summary, six regional and one small-scale Aboriginal cultural heritage investigations have been undertaken within 10km of the present activity area. Of these, five included all or part of the present activity area, though none included ground surface survey of the present activity area. These studies have only presented limited information associated with pre-contact Aboriginal occupation of the activity area region.

However, the background Aboriginal archaeological information presented in Section 4 indicated that the present activity area is located in an area of low to moderate archaeological potential. The activity area contains landforms that have been demonstrated to be of archaeological potential (Section 7).

The lack of recorded sites in the region does not reflect the absence of Aboriginal occupation of the area, rather it attests to the absence of cultural heritage survey. Systematic cultural heritage survey along with good ground surface visibility conditions are major factors allowing for the identification of Aboriginal cultural heritage sites.

Parts of the activity area's ground surface has been significantly disturbed in the past (see Section 2.6), resulting in reduced Aboriginal cultural heritage values. Additionally, past modification of surface soils within the activity area have disturbed the majority of its soil surface. However, with the presence of local reliable water sources, it is likely that low to moderate density stone artefact scatters will exist in close proximity to the water sources within the activity area, and will reflect transient use of the landscape by Aboriginal people prior to European settlement. Isolated stone artefacts are ubiquitous over the entire Victorian landscape, and there is no effective sampling strategy that could be used to locate individual stone artefacts within the activity area. There is limited potential for any other site type (e.g. scarred trees, rock arrangements) to be present within the activity area.

6.2 Discussion – Historic Cultural Heritage

In summary, very little historic site survey has been conducted in the activity area region and no historic sites have been recorded within the present activity area. However, there is a high probability that historic sites will exist in association with early pastoral and Berrybank township settlement.

During the site visit, several extant historic structures were identified immediately adjacent to the activity area that may possess cultural heritage value and possibly contain archaeological deposits. These included the Berrybank Uniting Church and outbuilding (Plate 9), and residences within the Berrybank township. Additionally, an historic (c. 1920's) railway station (Plate 10) exists at the southeast of the township area. Although not

being directly impacted by the activity these areas should be identified as 'no-go zones' during wind farm construction to avoid any inadvertent damage to them.

Historic sites, such as those associated with early pastoral activities may also be present within the activity area. Therefore, the activity area is considered to have moderate to high potential for visible and currently obscured historic archaeological sites at specific locations. These locations can only be clarified via a comprehensive ground surface survey.

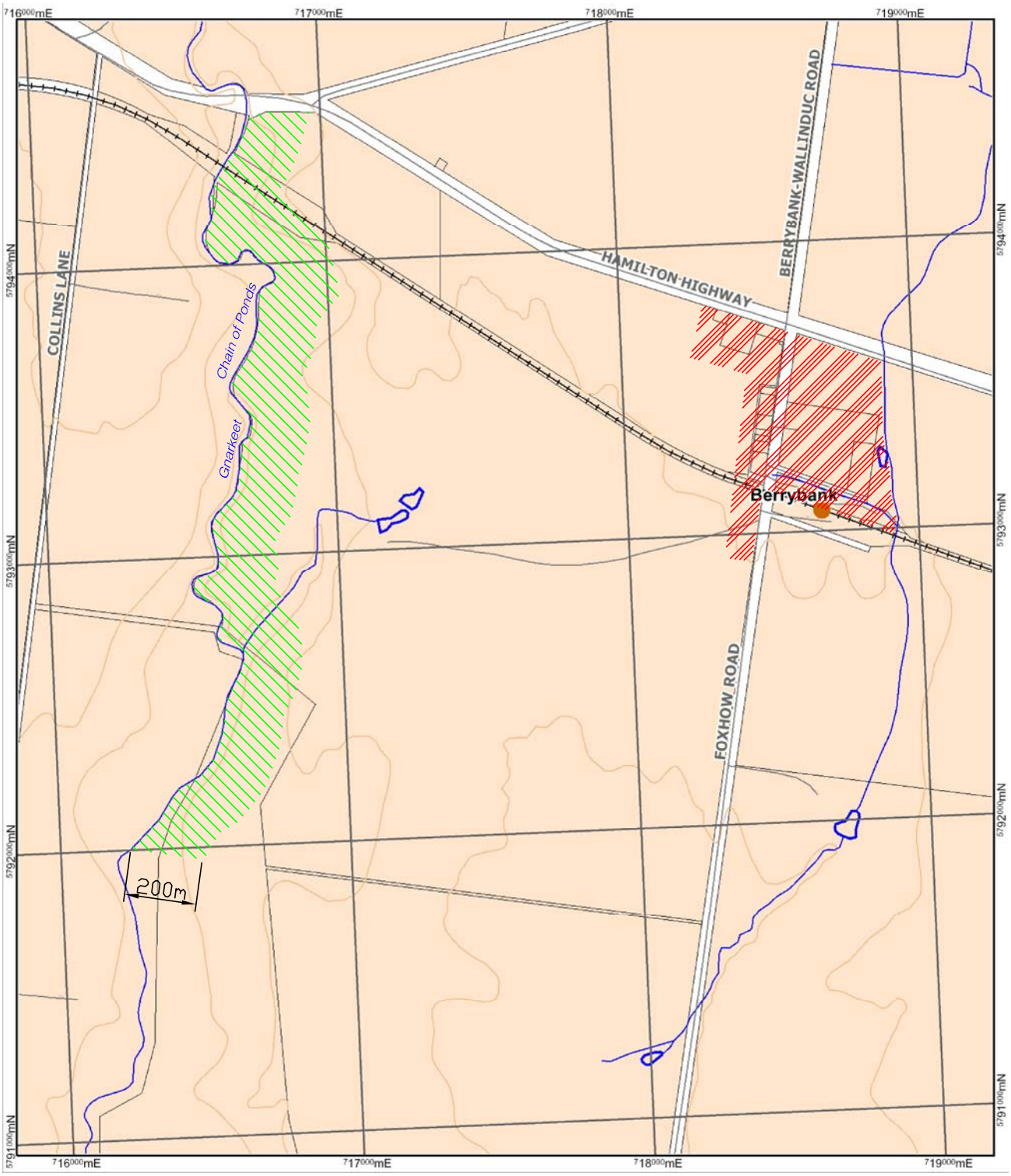
7 ARCHAEOLOGICAL SENSITIVITY/POTENTIAL WITHIN THE ACTIVITY AREA

Areas of archaeological sensitivity are those designated as containing potential for archaeological sites. These are usually areas that have poor ground surface visibility so that it is possible that surface and/or sub-surface deposits may exist but are currently obscured. Archaeologically sensitive areas are also those that may not have been previously surveyed, but within which sites might occur. Decisions regarding archaeological sensitivity/potential are based on historic information, geomorphology and geology, vegetation, post-contact disturbance and data from previous relevant research. The final aspect in assessing potential is based on the results on a ground surface or sub-surface inspection. Areas deemed archaeologically sensitive may be considered low, medium or highly sensitive.

Table 2 and Figure 10 present areas identified as having archaeological potential within the activity area based on the results of this desktop assessment and brief site visit.

Table 2 Summary of Archaeological Potential within the Activity Area

Heritage Type	Potential Deposits	Level of Potential
Aboriginal	Small numbers of previously disturbed low-density (<10) stone artefact scatters throughout the activity area.	Moderate
	Low to moderate density (n. 1-100) stone artefact scatters within 200m of current and previous water courses/drainage lines, hill crests and flood plain perimeters. Elevated locations that offered a dry campsite, adjacent to former wetlands/water sources are the most likely landform for detection of lithic material.	Moderate-High
Historic	Small numbers of previously disturbed artefacts throughout the activity area	Low
	Artefacts associated with identified historic structures (i.e. Berrybank township)	Moderate-High



Base Map Courtesy of Victorian Department of Primary Industries

Legend:

Aboriginal Archaeological Potential

Historic Archaeological Potential

N

GDA

Figure 10 Areas of Archaeological Sensitivity/Potential

8 SCIENTIFIC AND CULTURAL SIGNIFICANCE

As no sites were re-inspected or recorded as part of this desktop assessment, scientific and cultural significance assessment is not required. Although the Berrybank township has been identified as having potential historic significance, assessment of sites within the township are outside the scope of this desktop.

9 STATUTORY REQUIREMENTS

This section relating to the statutory requirements associated with archaeological sites has been included to inform users of this report of the legal obligations regarding heritage sites. Any breach of this legislation is cause for prosecution.

9.1 Aboriginal Heritage Legislation

The following is a summary of the *Aboriginal Heritage Act 2006* as described in the *Aboriginal Heritage Regulations 2007 Regulatory Impact Statement*. The Act commenced operation on 28 May, 2007.

> In 2006 the Victorian Government passed the *Cultural Heritage Act 2006*, to provide more effective protection of Aboriginal cultural heritage and broaden Aboriginal community involvement in decision-making arrangements.
>
> The *Aboriginal Heritage Act 2006*:
>
> - Replaces outdated State and Federal legislation governing the protection and management of Aboriginal cultural heritage in Victoria;
> - Ensures that the protection of Aboriginal cultural heritage is an integral part of planning and land development processes;
> - Provides increased certainty for developers and land managers in relation to the types of developments that require cultural heritage management plans;
> - Establishes an Aboriginal Heritage Council, comprised of traditional owners, to provide a state wide voice for Aboriginal people in the management of cultural heritage. The council will register Aboriginal parties as cultural heritage decision makers for areas in Victoria, and advise the Minister for Aboriginal Affairs in relation to the protection of Aboriginal cultural heritage;
> - Gives Registered Aboriginal Parties responsibility for protecting and maintaining Aboriginal places and objects of cultural heritage significance within their areas, through providing cultural heritage management plans, advising on heritage permits, entering into heritage agreements and negotiating the repatriation of Aboriginal human remains;
> - Provides dispute resolution and review mechanisms through mediation and the Victorian Civil and Administrative Tribunal;
> - Provides a range of measures to improve compliance with, and enforcement of, the legislation, including cultural heritage audits, stop orders, modernised offences and penalties, and increased responsibility and accountability for inspectors;

- Retains the power of the Minister for Aboriginal Affairs to make interim and ongoing protection declarations over significant Aboriginal places or objects;

- Broadens Aboriginal community involvement in heritage protection to include traditional owners (The Allen Consulting Group 2007: 2-3).

Further information regarding the Act can be obtained from the AAV website at:

http://www1.dvc.vic.gov.au/aav/

9.2 Aboriginal Heritage Regulations

Regulations have been developed to support the operation of the *Aboriginal Heritage Act 2006*. They provide further information on aspects of the Act, clarifying roles and expected standards that are required under the Act to:

- Maximise certainty about when and how to prepare a cultural heritage management plan, thereby better protecting Aboriginal cultural heritage and reducing delays to development;

- Ensure that fair payment is made for the evaluation of a cultural heritage management plan and that Government receives appropriate payment for assessing applications for permits and advice on the Register (The Allen Consulting Group 2007: 4).

The regulations also specify:

- The circumstances in which a cultural heritage management plan is required;

- The standards for the preparation of a cultural heritage management plan and for a map in a cultural heritage agreement;

- Fees for evaluating a cultural heritage management plan;

- Fees for an application for a cultural heritage permit;

- Fees for an application to the Secretary for advice as to whether a record exists on the Register in relation to a nominated area of land (The Allen Consulting Group 2007: 3).

Further information regarding the Regulations can be obtained from the AAV website at:

http://www1.dvc.vic.gov.au/aav/

In summary, All Aboriginal cultural heritage is protected under the *Aboriginal Heritage Act 2006*.

Part 4, Division 2 of the *Aboriginal Heritage Act 2006* states that certain activities will require a Cultural Heritage Management Plan (CHMP) to be prepared. A CHMP is required for an activity if all or part of the activity area is deemed as culturally sensitive and that the activity is of high impact to the area. High impact activities are described in the *Aboriginal Heritage Regulations 2007* Part 2, Division 5 and include wind energy facility development. Aboriginal cultural heritage sensitive area maps are available from the Department for

Victorian Communities website (www1.dvc.vic.gov.au/aav/heritage/Maps/). Those relevant to the activity area are presented in Figure 11.

Alternatively, the proponent may prepare a voluntary CHMP. A voluntary CHMP can avoid delays if any Cultural Heritage Permit's (CHP's) are required over the course of development works.

CHP's are required if an activity will harm, or is likely to harm, Aboriginal cultural heritage and can be applied for from the Department for Victorian Communities. This process can take in excess of 30 days.

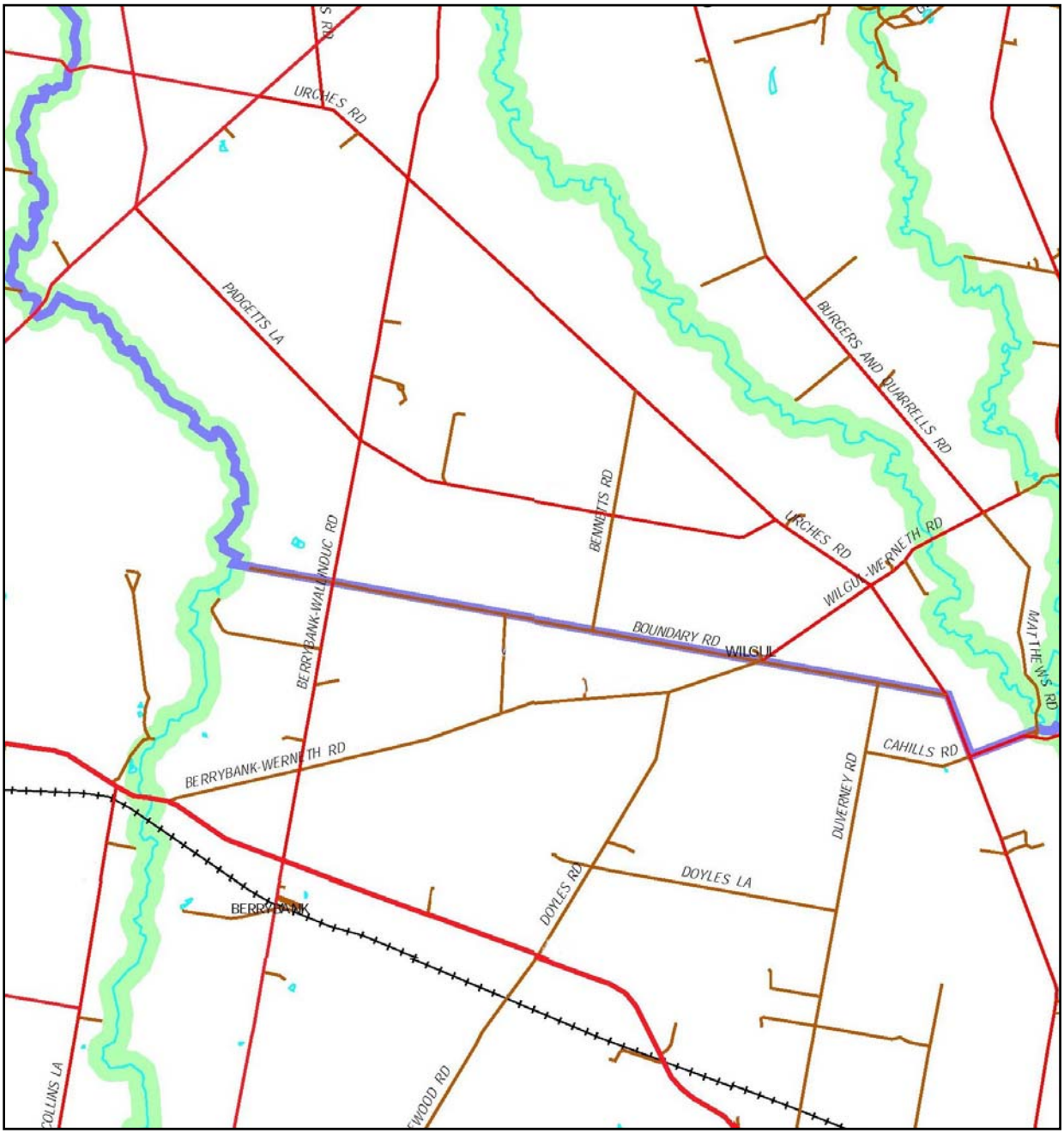


Figure 11 AAV Aboriginal Cultural Heritage Sensitive Areas Map (DVC website)

9.3 Cultural Heritage Management Plans

"A Cultural heritage Management Plan (CHMP) is required for an activity if all or part of the activity area is in an area of cultural heritage sensitivity; and all or part of the activity is a high impact activity" as described in the *Aboriginal Heritage Regulations 2007* (regulation 6).

Under the *Aboriginal Heritage Act 2006* (section 42), "the preparation of a CHMP for an area involves an assessment of the area to determine the nature of any Aboriginal cultural heritage present in the area, and a written report setting out the results of the assessment and recommendations for measures to be taken before, during and after an activity to manage and protect the Aboriginal cultural heritage identified in the assessment. The written report is the CHMP".

For the purposes of a CHMP there are three types of assessments described under the *Aboriginal Heritage Regulations 2007*. These are a desktop assessment, a standard assessment and a complex assessment. However, both standard and complex assessments are required to include a desktop assessment.

A desktop assessment "must include research into information relating to Aboriginal cultural heritage in or associated with the activity area, including a search of the Victorian Aboriginal Heritage Register for information relating to the activity area; 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 review of reports and published works about Aboriginal cultural heritage in the geographic region; a review of historical and ethno-historical accounts of Aboriginal occupation of the geographic region; a review of the landforms or geomorphology of the activity area; and a review of the history of the use of the activity area" (regulation 57).

"A standard assessment is required if the results of a desktop assessment show that it is reasonably possible that Aboriginal cultural heritage is present in the activity area" (regulation 58) and "must include ground surface survey (as described in regulation 59(3) & (4)) of all or part of the activity area to detect the presence of Aboriginal cultural heritage in or associated with the activity area" (regulation 58).

"A complex assessment is required if the desktop or standard assessment shows that Aboriginal cultural heritage is, or is likely to be, present in the activity area, and it is not possible to identify the extent, nature and significance of the Aboriginal cultural heritage in the activity area unless a complex assessment is carried out" (regulation 60). A complex assessment involves "the disturbance or excavation (as described in regulation 61) of all or part of all or part of the activity area to uncover or discover Aboriginal cultural heritage" (regulation 61) and must include the establishment of the stratigraphy and general sub-surface nature of the area being investigated by controlled excavation as described in regulation 61(7) before any other disturbance or excavation is carried out (regulation 61(4)). Additionally, "if the use of machinery in a disturbance or an excavation results in the finding of occupation deposits or features, the deposits or features must be uncovered and assessed by controlled excavation (regulation 61(6)).

9.4 Historic Archaeological Sites

Non-Aboriginal archaeological sites in Victoria are protected by the *Heritage Act 1995*. The following is a summary of the latest statutory obligations regarding non-Aboriginal historic archaeological sites:

- All historical archaeological sites in Victoria (not included on the Heritage Register) are protected under Section 127 of the *Heritage Act 1995*. Under this section it is an offence to excavate, damage or disturb relics and sites whether they are included on the Heritage Inventory or not, unless a consent has been issued under Section 129;

- Under Section 64 of the *Heritage Act 1995* it is an offence to damage, disturb, excavate or alter a place or object on the Heritage Register, unless a permit is granted under Section 67;

- Under Section 132 of the *Heritage Act 1995* any person discovering or uncovering an archaeological relic is required to report the discovery to the Executive Director of the Heritage Council;

- Schedule 5 of the Heritage (General) Regulations 2005 prescribes fees to undertake specified activities with respect to archaeological relics. These are currently $225.00 for Consent to uncover or excavate a relic; $420.00 for Consent to damage or disturb less than 50% of a relic or site $635.00 for Consent to damage or disturb more than 50% of a relic or site. Fees for permits to carry out works *etc*. to a registered place or object are detailed in Schedule 3 of the Regulations. These fees range in scale from $100.00 to $7,160.00, depending on the nature of the works involved and the cost of the proposed works.

In addition, Heritage Victoria requires that funds be made available by developers to ensure the responsible management of all significant artefacts that are recovered during an excavation. As a condition on any consent or permit, there will be a requirement that a specified sum of money is submitted to Heritage Victoria prior to the commencement of works. The funds will be used to ensure the cataloguing and conservation of any significant artefacts that are recovered. Any unexpended funds will be returned to the client, minus a 15% levy that is used for the management of all excavation projects in Victoria.

Written application to disturb such sites should be lodged as early as possible in the planning stages of any works program, and must be directed to:

Mr Ray Tonkin
The Director
Heritage Victoria
Department of Sustainability and Environment
Level 7/8 Nicholson Street
EAST MELBOURNE
Victoria 3002

Ph: (03) 9637 9476

Enquires relating to the *Heritage Act 1995*, works, site management etc should be directed to:

Jeremy Smith
Senior Archaeologist
Heritage Victoria
Department of Sustainability and Environment
Level 7/8 Nicholson Street
EAST MELBOURNE
Victoria 3002

Ph: (03) 9637 9773

General enquires relating to sites, the Heritage Inventory/Register, reports, permits or consents, including application procedures and fees should be directed to:

Liz Kilpatrick
Heritage Victoria
Department of Sustainability and Environment
Level 7/8 Nicholson Street
EAST MELBOURNE
Victoria 3002

Ph: (03) 9637 9285

Heritage Victoria has also recently requested that the following statements relating to sites listed on the Heritage Inventory be included within consultant's reports.

All archaeological sites in Victoria are protected by the *Heritage Act 1995*. All known archaeological sites are listed in the Heritage Inventory. Regardless of whether they are listed in the Inventory no one can knowingly excavate or disturb an archaeological site without the consent of the Executive Director.

Prior to the *Heritage Act 1995* sites were protected under the *Archaeological and Aboriginal relics Preservation Act 1972*. Thus since 1972 there has been protection in Victoria for archaeological sites. The protection was not about the preservation and conservation of all sites. Under the AARP there was provision for archaeological areas to be declared an archaeological area that was intended to protect and conserve an archaeological site (S15). Activities for the remainder of archaeological sites were controlled through the requirement to gain a permit (S22).

With the advent of the *Heritage Act 1995* archaeological sites continued to be protected in two ways. Sites, which were considered to be of significance to the State, were recommended to be placed on the Victorian Heritage Register (VHR). The VHR exists to protect and conserve places and objects. All other archaeological sites are protected through the requirement to gain consent from the Executive Director to disturb, destroy, or excavate an archaeological site.

Thus the Victorian Heritage Register enables Heritage Victoria to preserve and conserve archaeological sites which are of significance to the State of Victoria while the Heritage

Inventory enables Heritage Victoria to record and monitor sites which are not considered to be of State significance or where the significance is unknown. Heritage Victoria also registers sites under a 'D' listing, which accommodates sites of very low archaeological value though they may have local historic value. 'D' listed sites are typically those that have little structural or artefactual features such as earthen formations (i.e. dams, railway formations). Sites registered under this system do not require Consent prior to any proposed development, but apart from this are managed in the same way as Heritage Inventory sites. 'D' Listed sites therefore, may be subject to a variety of conditions prior to impact, such as detailed recorded, additional historic research and archaeological monitoring.

The two levels of protection enable two different principles in issuing consents and permits to be followed. The guiding principal for places on the Register is to protect and conserve as much of the fabric of the place and the relics/artefacts as is possible. While for places listed in the Heritage Inventory recording, excavating and monitoring are the usual methods of assessing and managing the heritage values of a site.

Consultation with Heritage Victoria, Department of SE, should occur at least 4 months prior to lodgement of a permit application to disturb or destroy a historic archaeological site. In the event of a site or relic being uncovered or discovered during works, any works that would damage the relic object or place should cease and either the consulting archaeologist or Heritage Victoria be notified.

10 MANAGEMENT OF CULTURAL HERITAGE AND RECOMMENDATIONS

Appropriate cultural heritage management seeks to avoid any adverse impact to cultural heritage sites and places. An adverse impact is any activity that reduces the scientific or cultural significance of a site or archaeological area. Any activity that exposes or disturbs in any way the fabric or content of a site reduces its heritage value. Similarly, sites can be impacted if their context is reduced to a point where there are no other related reference features in the local landscape to provide context and therefore interpretation of a site. This is referred to as the level of cultural landscape integrity.

Best cultural heritage practise seeks to avoid any impact to cultural heritage sites and places by appropriate input into development design and to improve the integrity of the cultural landscape. As this is not always possible, a mitigation strategy must be developed by a heritage consultant, in conjunction with all relevant stakeholders, to mitigate/reduce adverse impact to cultural heritage sites. Typical mitigation measures may include partial excavation to further assess a site in terms of its content, extent and significance. If a site demonstrates higher significance levels (cultural or scientific) a complete salvage excavation may be required prior to any redevelopment. Some sites such as scarred trees; monuments *etc*. can be relocated to an appropriate location. In other instances monitoring of initial ground disturbance activities (such as clear, grade, level) may be an adequate mitigation measure. Monitoring is appropriate when the risk to a significant site has been eliminated, though collection, identification, recording and assessment of possible exposed artefacts are warranted. Monitoring is a method by which a sample of previously disturbed cultural material can be recovered and assessed.

Aboriginal:

The background information indicates that previously disturbed and small scatters of stone artefacts are the most probable cultural remains within the activity area. Whilst these sites, evidence of transient and infrequent occupation will have originally been as small discrete clusters, they are now widely distributed across the landscape. Sites such as these provide very little scientific information and require minimal management. Additionally, this assessment has identified areas deemed as having archaeological potential (Figure 10) to contain higher density of cultural material that may reflect slightly increased utilisation. This has resulted in the wind farm design being able to avoid these areas. However, if Aboriginal cultural heritage is identified during the activity it must be managed in accordance with the *Aboriginal Heritage Act 2006*. If a significant deposit is found, then recommendations would be made to avoid the site via changes in development design. Under condition of the *Aboriginal Heritage Act 2006*, if a site is to be impacted by development, comprehensive salvage would be required. Salvage of archaeological sites is done using a controlled hand method, and includes extensive analysis post field work.

Historic:

During the site visit undertaken as part of this desktop assessment, the township of Berrybank has been identified as having several structures with potential historic heritage value. However, this specific area is not to be disturbed as part of the proposed Berrybank Wind Farm development. Therefore, no restrictions regarding heritage management of this area is considered warranted.

Additional historic structures may be present throughout the activity area that relate to post-contact settlement of the region. Although no such structures were identified during the site visit, large areas of the activity area were not able to be accessed at the time. Only comprehensive survey of all areas to be impacted by the activity will determine if any historic structures are at risk of being affected.

10.1 Recommendations

The following recommendations are made based on the results of this desktop assessment and brief site visit.

Aboriginal Heritage:

Recommendation 1

All Aboriginal sites are protected under the *Aboriginal Heritage Act 2006* and all Historic sites are protected under the *Heritage Act 1995*. Therefore, all sites must be treated according to requirements of the Act's, which require Permits or Cultural Heritage Management Plans to be in place prior to disturbance.

Any future changes to the activity area should be made in consideration of culturally sensitive land. Any such changes that affect land considered culturally sensitive under the *Aboriginal Heritage Regulations* 2007 will trigger the requirement to conduct a compulsory CHMP.

Recommendation 2

Prior to the brief field review being conducted, precise locations of wind turbines and their associated infrastructure within the activity area had not been established. The review established that provided the wind farm infrastructure and construction zones are more than 200m from any culturally sensitive areas (Figure 10), there would be no requirement to prepare a CHMP (The requirements for CHMP's are discussed in Section 9.3).

Robert Luxmoore Pty Ltd were informed that if any significant ground disturbance works as described under the *Aboriginal Heritage Regulations 2007* (which includes the construction or carrying out of works for a wind energy facility - regulation 43(1)(a)(b)(xxvi)) are to take place within 200m of Gnarkeet Chain of Ponds, a Cultural Heritage Management Plan (CHMP) is required for this area prior to any development works taking place. This area is considered as sensitive for Aboriginal cultural heritage under the *Aboriginal Heritage Act 2006* (regulation 23; see also DVC Sensitive Areas Map at: www1.dvc.vic.gov.au/aav/heritage/Maps/).

This information allowed for the Berrybank Wind Farm design plan to avoid these culturally sensitive areas and therefore avoid the requirement to conduct a Cultural Heritage Management Plan under the *Aboriginal Heritage Act 2006*.

Recommendation 3

Although not required under the *Aboriginal Heritage Act 2006*, it is suggested that the proponent undertake a voluntary CHMP for the wind farm. A voluntary CHMP will address appropriate management of existing and/or potential cultural heritage values and negate the possibility of any delays associated with Cultural Heritage Permit's (CHP's) if cultural material is identified during works. CHP's can take over 40 days to finalise and are not required if a CHMP is in place. A CHMP would provide certainty of no delays during construction based on heritage issues.

Historic Heritage:

Recommendation 4

It is recommended that further comprehensive ground surface survey of all locations to be directly impacted within the activity area by wind farm construction is undertaken to identify potential historic heritage sites that may be impacted by the proposed wind farm. It is recommended that all existing historic structures are excluded from development impact.

In Addition

The consultant will ensure that copies of this report will be forwarded to Aboriginal Affairs Victoria and Heritage Victoria.

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Geoscience Australia	www.ga.gov.au/ (accessed 7.11.2007)
Heritage Victoria DSE	www.heritage.vic.gov.au/page_239.asp?ID=239&submit_action=ss (accessed 30.10.2007)
National Trust Australia (Victoria)	www.nattrust.com.au (accessed 30.10.2007)
Planning Schemes Online	www.dse.vic.gov.au/planningschemes/ (accessed 30.10.2007)
State Library of Victoria	www.slv.vic.gov.au/ (accessed 12.11.2007)

APPENDIX 1 – GLOSSARY

Types of Aboriginal Archaeological Sites

Artefact Scatter: A surface scatter of stone artefacts is defined as being the occurrence of five (5) or more items of cultural material within an area of about 100 square metres (AAV 1993). Artefact scatters are often the only physical remains of places where Aborigines have camped, prepared and eaten meals and worked stone material.

Burials: Burial sites may occur in association with campsites, in mounds or shell middens or in specific burial grounds that lack any other cultural material. Softer ground was chosen for burials, and any sandy area can be expected to contain burials. Burial sites can contain one or a number of individuals. Burials sites and cemeteries are a common archaeological site type in the sand country adjoining the Murray River, though are a rare feature in the southern part of Victoria.

Ceremonial Site: An area used as a meeting place where large groups gathered for feasts, ceremonies or settlement of disputes, but they are difficult or impossible to identify from material evidence. In some instances they are mentioned in historical sources, or may be known to Aboriginal people through oral tradition. These sites will be highly significant to Aboriginal communities.

Contact Site: These are sites relating to the period of first contact between Aboriginal and European people. These sites may be associated with conflict between Aborigines and settlers, mission stations or reserves, or historic camping places. The artefact assemblage of contact sites will often include artefacts manufactured from glass.

Grinding Grooves: These sites generally occur on sandstone outcrops and to a lesser extent granite outcrops and result from the sharpening of ground stone hatchets/axe heads. Grinding grooves are often located on prominent hilltops.

Hearth: Usually a sub-surface feature found eroding out of a river or creek bank or in a sand dune - it indicates a place where Aboriginal people cooked food. The remains of a hearth are usually identifiable by the presence of charcoal and sometimes clay balls (like brick fragments) and hearth stones. Remains of burnt bone or shell are sometimes preserved within a hearth.

In Situ: Refers to cultural material that is discovered as being undisturbed and considered to be in its original context. That is, material which, when identified is considered to be in the same location when the site was abandoned.

Isolated Artefact Occurrence: An isolated artefact is defined as being the occurrence of four (4) or less items of cultural material within an area of about 100 metres (AAV 1993: 1). It/they can be evidence of an ephemeral (or one off) activity location, the results of an artefact being lost or discarded during travel or evidence of an artefact scatter which is otherwise obscured by poor ground surface visibility.

Midden Sites: 'Midden' is a term borrowed from the Danish. It originally applied to the accumulations of shell and other food remains left by Mesolithic man in that country. Australian Midden sites are an accumulation of hearth and food debris, which has built up a deposit on the ground surface over a length of time. Middens are generally comprised of charcoal and either freshwater or coastal shell species, depending on the site's location. Midden sites may also contain stone artefacts, and the food refuse of other native animals such as small mammals. Their thick deposit of burnt shells and dark grey/black deposit can distinguish midden sites within the landscape. Coastal shell middens are often found in close association with rock platforms. Freshwater shell middens are found in close proximity to areas that provided freshwater mussels.

Mound Sites: Mound sites are accumulation of hearth (fire place) debris, which has over time built a thick deposit on the ground's surface. Mounds are generally comprised of charcoal; burnt clay balls and burnt food refuse such as native animal bones. Mound sites may also contain stone artefacts. On rare occasions mound sites may also contain human burial remains. Mound sites can be distinguished in the landscape by their characteristic dark grey/black deposit and height above surrounding land. Mounds that have been utilised over long periods can obtain dimensions of over 100 metres in length and 1 metre in height. Mound sites are generally situated close to major streams, and large water bodies. In times of flood, mound sites are often become marooned, and provide dry land points from which surrounding resources could have been exploited.

Rock Shelter/Cave: These are sites that are located within a rock shelter/overhang or caves. The archaeological deposits within such sites can vary considerably but are often predominantly lithic. Depending on their location, the archaeological deposit may also include midden deposits of shellfish, fish or terrestrial fauna. Due to the often undisturbed deposits at these sites, they are potentially very valuable sites and are generally considered of high scientific significance. Instances where rock shelter sites also possess art work on the stone walls are considered as rock shelter/art site combined.

Rock Wells: Rock Wells are natural cavities in rock outcrops that hold water. They are characterised by relatively narrow openings that limit evaporation. These water sources were commonly known to Aboriginal people and were kept clean and maintained by them. Since they are natural features, they are difficult to identify as Aboriginal sites. The most reliable indicator is the existence of a strong local oral tradition of Aboriginal use.

Scarred Tree: Scars on trees may be the result of removal of strips of bark by Aborigines for the manufacture of utensils, canoes or for shelter; or resulting from small notches chopped into the bark to provide toe and hand holds for climbers after possums, koalas and/or views of the surrounding area. A scar made by humans as opposed to naturally made by branches falling off, *etc*. is distinguished by the following criteria: symmetry and rounded ends, scar does not extend to the ground, some re-growth has occurred around the edges of the scar, and no holes or knots present in the heartwood.

Stone Arrangements: These sites are specifically patterned rocks located on the ground's surface. It is often difficult to identify these sites within the field and even more difficult to define their function unless Aboriginal oral tradition exists.

ABORIGINAL ARTEFACT TYPES

Anvil: A portable flat stone, usually a river pebble, which has been used as a base for working stone. Anvils that have been used frequently have a small circular depression in the centre where cores were held while being struck. An anvil is often a multifunctional tool used also as a grindstone and hammer stone.

Artefact: Any product made by human hands or caused to be made through human actions.

Axe: A stone artefact that has been ground on one or more sides to produce a sharp edge.

Backed Blade (Geometric Microlith): A blade flake that has been abruptly retouched along one or more margins opposite an acute (sharp) edge. Backed pieces include backed blades and geometric microliths. Flakes that have been backed along one lateral margin and that come to a point at their distal end; they have a length of less than 80mm and are asymmetrical around the longitudinal axis. They are thought to have been hafted onto wooden handles to produce composite cutting tools or spears. Backed blades are a feature of the 'Australian Small Tool Tradition' dating from between 5,000 and 1,000 years ago in southern Australia (Mulvaney 1975).

Bipolar: A core or a flake, which, presumably, has been struck on an anvil. That is, the core from which the flake has been struck has been rotated before the flake has been struck off. Bifacial platforms tend to indicate that the flake has come off a heavily worked core.

Blade: A long parallel sided flake from a specially prepared core. Blade flakes are twice as long as they are wide.

Broad Platform: This a term used to describe the shape of the platform on a flake. A broad platform is wider than the body of a flake. Broad platform flakes are produced when flakes are struck off back from the edge of the platform on a core.

Broken Flake: Defined by the part of the flake remaining, i.e. proximal (where the platform is present), medial (where neither the platform nor termination is present), or distal (where the termination is present).

Bulb of Percussion: This is the conchoidal protuberance (percussion rings) formed under the point of impact when a flake is struck off the core.

Burin: A truncated flake (truncated either by snapping or retouch) whose resulting flat end is used as a platform from which to strike a single flake from one of its corners, forming a triangular scar that runs down the margin of the original flake. This forms a chisel-like working edge.

Complete Flake: An artefact exhibiting a ventral surface (where the flake was originally connected to the core), dorsal surface (the surface that used to be part of the exterior of the core, platform, termination and bulb of percussion.

Core: An artefact from which flakes have been detached using a hammer stone. Core types include blade, single platform, multiplatform and bipolar forms. These artefacts exhibit a series of negative flake scars, each of which represents the removal of a flake.

Core Types:

Unidirectional cores - These cores have scars originating from a single platform, and all the flakes struck from the core have been struck in the same direction from that platform.
Bidirectional cores - These cores have two platforms, one opposite the other; flakes have been struck from each of the platforms, and thus from opposite directions.
Bifacial cores - These kinds of core have a single platform, but the flakes struck from it have been detached from two core faces.
Multidirectional cores - These cores have two or more platforms and there is no clear pattern, either in the orientation of the platforms or in the orientation of the scars resulting from the striking of flakes from those platforms.
Bipolar Core - Nodules or cobbles that are flaked using an anvil. The resulting artefacts exhibit crushing on their proximal, distal and often their lateral margins, where they have been rotated.

Cortex: Original or natural (non-flaked) surface of a stone.

Flaked Piece/Waste Flake/Debitage: A piece of stone with definite flake surfaces that cannot be classified as a flake or core. These artefact types are generally refuse materials discarded during the working of stone material.

Focal Platform: This is a term used to describe the shape of the platform on a flake. A focal platform is narrower than the body of the flake. Focal platform flakes are produced when flakes are struck off near the edge of the platform on a core.

Geometric Microlith: Artefacts less than 80mm in maximum dimension which are backed at one or their end, sometimes at both ends, and sometimes on one lateral margin as well, the result being a form that is symmetrical around its transverse axis.

Hammerstone: A cobble or cobble fragment exhibiting pitting and abrasion as a result of percussion.

Implement: A general term for tools, weapons, *etc*. made by people.

Lithic: Anything made of stone.

Microlith: Small (1-3cm long) stone tools with evidence of retouch that includes 'Bondi Points', segments, scrapers, backed blades, triangle and trapezoid.

Mortar: The lower stone associated with grinding plants for food and medicine and/or ochre for painting. These stones are usually large and flat, and when well used show deep grooves from repeated grinding.

Notched Tool: Flakes that exhibit a small area of retouch, forming a concave edge, on their lateral or distal margins.

Pestle: The "upper stone", used to grind plants for food and medicine and/or ochre for painting. A pestle stone often doubles as a hammer stone and/or anvil

Piercer: Artefacts with projections that have been created by retouch and extend up to 15mm beyond the body of the flake.

Primary Flake: The first flakes struck off a core in order to create a platform from which other flakes can then be struck.

Scraper: A flake with one or more margins of continuous retouch used as a tool for scraping.

Secondary Flaking/Retouch: Secondary working of a stone artefact after its manufacture. This was often done to re-sharpen stone tools after use, or in the production of formal tool types such as blade flakes and scrapers.

Thumbnail Scraper: A small flake with a convex scraper edge shaped like a thumbnail and located opposite the flake's platform.

OTHER TERMS

Archaeological Site: A place/location of either Aboriginal or non-Aboriginal origin. Aboriginal archaeological sites have been formed prior to the European settlement of Australia, and may be in any of the forms outlined in section 1.

Artefact Horizon: A discernable horizontal distribution of artefacts within an environmental deposit. An artefact horizon has generally suffered a degree of post depositional disturbance that has affected the spatial and temporal integrity of the deposits and associated artefact assemblage.

B.P.: Before present. The 'Present' is defined as 1950.

Continuous Monitoring: Continuously on site during clear, cut, grade and level to record sites.

Cultural Heritage: Something that is inherited or passed down because it is appreciated and cherished. Categories of cultural heritage include; built structures and their surrounds, gardens, trees; cultural landscapes; sites; areas; precincts; cemeteries; ruins and archaeological sites; shipwrecks; sites of important events; commemorative sites; contents of buildings and significant relics, objects artefacts and collections of objects.

Cultural Landscape Integrity: The level of which the local landscape reflects the environment in which pre-contact Aboriginal people or early European settlers lived. The integrity includes all relevant aspects such as level and type of vegetation cover, hydrology, landforms and structures. A site located in a landscape of high cultural integrity has greater heritage value as it remains in context, and is therefore able to impart a greater level of information to the broader community.

Environmental Deposit: A stratigraphic layer formed by the laying down of deposits by environmental agents such as wind and water. These may bury human artefacts to form stratigraphic layers but do not form occupation deposits.

Ethnography: The scientific description of living cultures.

Heritage Place/Site: An area or region of land that represents a particular focus of past human activity or concentration of *in situ* cultural material. A place includes any structures, buildings or works upon or integral with the land, and any artefacts or other physical relic associated with the land, or it may have no visible evidence of human activity, being rather the site of a past event of importance or the embodiment of a particular belief or legend. Examples might range from an Aboriginal ceremonial ground, a pioneers house and contents, a shop, the remains of an early whaling station or a recent fish farm, Captain Cook's landing place, a 40,000 year old Aboriginal campsite or a 1990s brick-veneer house, a shipwreck, an industrial or mining landscape, a bus stop, a Macassan trepanger campsite or the Surfer's Paradise Caravan Park, a garbage dump, the local war memorial, a garden, an Aboriginal rock painting or a band rotunda.

Historic Archaeological Site: These are places where non-Aboriginal activities have occurred, and which little extant (standing) features remain. The bulk of evidence for historic occupation/utilisation is comprised of remains (artefacts/foundations etc) that are located on the ground's surface or in a sub-surface context. The primary heritage value of an archaeological site is scientific.

Historic Site: Sites/Areas that contain extant (standing) remains of pre-1950 non-Aboriginal occupation. Historic sites may or may not also contain archaeological remains (Aboriginal and/or historic).

Holocene, Recent or Postglacial Period: The time from the end of the Pleistocene Ice Age (c. 10,300 BP) to the present day.

Horizon: A term used to describe a layer of archaeological material that is *in situ*.

Integrity: The completeness of the place or site. Sites/places of high integrity will adequately demonstrate the significance of a place/site. Integrity is reduced by the disturbance of fabric/deposits or the introduction of unrelated materials/sediments.

0%	No Integrity
0-10%	Very Poor
10-30%	Poor
30-50%	Fair
50-75%	Good
75-95%	Very Good
90-100%	Excellent

Mechanical Salvage: Controlled mechanical removal of ground surface by excavator and trimming bucket in 5 to 10cm layers to record sites using at a minimum a handheld GPS.

Obtrusiveness: refers to how conspicuous a site is within a particular landscape, and thus the possibility of positive identification within a field environment. Some site types are more conspicuous than others are. Thus a surface stone artefact scatter is generally not obtrusive, especially in areas of low ground surface visibility, while a scarred tree is (Bird 1992).

Occupation Deposit: The laying down of deposits (artefacts and/or sediments) by human activities that bury artefacts to form distinct stratigraphic entities such as layers (e.g. dense lens of stone artefacts & bone between environmental deposits, stratified shell deposits) or features (hearths, occupation mounds). Occupation deposits have a high degree of spatial and temporal integrity.

Occupation Surface: A distinct layer or interface between depositional strata upon which human activities were carried out and artefacts/features deposited. Most commonly this may be a prior land surface (e.g. soil horizon) that has been subsequently buried by later environmental deposits (e.g. dune deposits).

Ordovician: The geological time period dating from 439-510 million years ago.

Pleistocene: The geological period corresponding with the last or Great Ice Age. The onset of the Pleistocene is marked by an increasingly cold climate, by the appearance of *Calambrian mollusca* and *Villafranchian* fauna with elephant, ox, and horse species, and by changes in foraminifera. The oldest form of man had evolved by the Early Pleistocene, and in archaeological terms the cultures classed as Palaeolithic all fall within this period. The date for the start of the Pleistocene is not well established, and estimates vary from 3.5 to 1.3 million years ago. The period ends with the final but gradual retreat of the ice sheets, which reached their present conditions around 10,300 BP.

Post-Contact Aboriginal Site: Also referred to as Historic Aboriginal Site. These area sites/places/localities that indicate contact has been made with European culture during the period of initial European settlement (glass in tool assemblage, massacre sites), or where activities culturally significant to Aboriginal people has occurred (camping, employment, travelling routes).

Potential: Based on collated existing data and site inspection an area or specific site may contain the potential for extant or archaeological deposits. Background research will present the most likely site types, contents and state of preservation. Relative levels of potential are described as Low (10-30% probability), Moderate (40-60% probability) and High (70% and above probability).

Raw Material: Organic or inorganic matter that has not been processed by people.

Retain Site: Site is to be retained in open space with strict management controls on the future use of the land to prevent damage to subsurface archaeological deposits. For sites rated moderate to high some of the less significant portions of the site may be destroyed in conjunction with continuous monitoring, mechanical salvage and salvage excavation.

Salvage Excavation: Salvage excavation involves controlled hand excavation to recover a representative sample of sites.

Silurian: A geological time period from 408 to 439 million years ago.

Site Inspection: Weekly or fortnightly site visits during clear, cut, grade and level.

Slope Wash: A term used to describe a specific process of re-deposition of cultural material. Cultural material (most often stone artefacts) that is situated on any sloping land is vulnerable to the affects of slope wash. The term relates to the downward movement of cultural material primarily due to erosion of their original context. This downward movement is most often caused by clearing of vegetation that exposes the ground surface to the affects of water erosion. The result is that cultural material will move down the slope over a period of time. How far material may move is dependent on the gradient and the intensity of the erosion.

Stratigraphy: Layering

Use Wear: Tiny flakes or chips that have been broken of the edges of a stone artefact during use.

Visibility: Refers to the degree to which the surface of the ground can be observed. This may be influenced by natural processes such as wind erosion or the character of the native vegetation, and by land use practices, such as ploughing or grading. It is generally expressed in terms of the percentage of the ground's surface visible for an observer on foot (Bird 1992). For example 10% visibility equates to 10cm^2 per 1m^2 of ground surface that is not covered by vegetation or soil deposit. The following applies to descriptions of ground surface visibility within this report.

0%	=	No visible ground surface
0 – 10%	=	Very Poor
10 – 30%	=	Poor
30-50%	=	Fair
50 – 70%	=	Good
70 –90%	=	Very Good
90 – 100%	=	Excellent

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APPENDIX 2 – CONSERVATION PRINCIPLES OF THE BURRA CHARTER

The Burra Charter

The Australia ICOMOS charter
for the conservation of places
of cultural significance

1.4	*Conservation* means all the processes of looking after a *place* so as to retain its *cultural significance*.	
Conservation Principles		
Article 2	**Conservation and management**	
2.1	*Places* of *cultural significance* should be conserved.	
2.2	The aim of *conservation* is to retain the *cultural significance* of a *place*.	
2.3	*Conservation* is an integral part of good management of *places* of *cultural significance*.	
2.4	*Places* of *cultural significance* should be safeguarded and not put at risk or left in a vulnerable state.	
Article 3	**Cautious approach**	
3.1	*Conservation* is based on a respect for the existing *fabric*, *use*, *associations* and *meanings*. It requires a cautious approach of changing as much as necessary but as little as possible.	The traces of additions, alterations and earlier treatments to the fabric of a place are evidence of its history and uses which may be part of its significance. Conservation action should assist and not impede their understanding.
3.2	Changes to a *place* should not distort the physical or other evidence it provides, nor be based on conjecture.	
Article 4	**Knowledge, skills and techniques**	
4.1	*Conservation* should make use of all the knowledge, skills and disciplines which can contribute to the study and care of the *place*.	
4.2	Traditional techniques and materials are preferred for the *conservation* of significant *fabric*. In some circumstances modern techniques and materials which offer substantial conservation benefits may be appropriate.	The use of modern materials and techniques must be supported by firm scientific evidence or by a body of experience.
Article 5	**Values**	
5.1	*Conservation* of a *place* should identify and take into consideration all aspects of cultural and natural significance without unwarranted emphasis on any one value at the expense of others.	Conservation of places with natural significance is explained in the Australian Natural Heritage Charter. This Charter defines natural significance to mean the importance of ecosystems, biological diversity and geodiversity for their existence value, or for present or future generations in terms of their scientific, social, aesthetic and life-support value.
5.2	Relative degrees of *cultural significance* may lead to different *conservation* actions at a place.	A cautious approach is needed, as understanding of cultural significance may change. This article should not be used to

		justify actions which do not retain cultural significance.
Article 6	**Burra Charter Process**	
6.1	The *cultural significance* of a *place* and other issues affecting its future are best understood by a sequence of collecting and analysing information before making decisions. Understanding cultural significance comes first, then development of policy and finally management of the place in accordance with the policy.	The Burra Charter process, or sequence of investigations, decisions and actions, is illustrated in the accompanying flowchart.
6.2	The policy for managing a *place* must be based on an understanding of its *cultural significance*.	
6.3	Policy development should also include consideration of other factors affecting the future of a *place* such as the owner's needs, resources, external constraints and its physical condition.	
Article 7	**Use**	
7.1	Where the *use* of a *place* is of *cultural significance* it should be retained.	
7.2	A *place* should have a *compatible use*.	The policy should identify a use or combination of uses or constraints on uses that retain the cultural significance of the place. New use of a place should involve minimal change, to significant fabric and use; should respect associations and meanings; and where appropriate should provide for continuation of practices which contribute to the cultural significance of the place.
Article 8	**Setting**	
	Conservation requires the retention of an appropriate visual *setting* and other relationships that contribute to the *cultural significance* of the *place*. New construction, demolition, intrusions or other changes which would adversely affect the setting or relationships are not appropriate.	Aspects of the visual setting may include use, siting, bulk, form, scale, character, colour, texture and materials. Other relationships, such as historical connections, may contribute to interpretation, appreciation, enjoyment or experience of the place.
Article 9	**Location**	
9.1	The physical location of a *place* is part of its *cultural significance*. A building, work or other component of a place should remain in its historical location. Relocation is generally unacceptable unless this is the sole practical means of ensuring its survival.	
9.2	Some buildings, works or other components of *places* were designed to be readily removable or already have a history of relocation. Provided such buildings, works or other components do not have	

	significant links with their present location, removal may be appropriate.	
9.3	If any building, work or other component is moved, it should be moved to an appropriate location and given an appropriate *use*. Such action should not be to the detriment of any *place* of *cultural significance*.	
Article 10	**Contents**	
	Contents, fixtures and objects which contribute to the *cultural significance* of a *place* should be retained at that place. Their removal is unacceptable unless it is: the sole means of ensuring their security and *preservation*; on a temporary basis for treatment or exhibition; for cultural reasons; for health and safety; or to protect the place. Such contents, fixtures and objects should be returned where circumstances permit and it is culturally appropriate.	
Article 11	**Related places and objects**	
	The contribution which *related places* and *related objects* make to the *cultural significance* of the *place* should be retained.	
Article 12	**Participation**	
	Conservation, interpretation and management of a *place* should provide for the participation of people for whom the place has special *associations* and *meanings*, or who have social, spiritual or other cultural responsibilities for the place.	
Article 13	**Co-existence of cultural values**	
	Co-existence of cultural values should be recognised, respected and encouraged, especially in cases where they conflict.	For some places, conflicting cultural values may affect policy development and management decisions. In this article, the term cultural values refers to those beliefs which are important to a cultural group, including but not limited to political, religious, spiritual and moral beliefs. This is broader than values associated with cultural significance.