66-90 Bena Road, Korumburra: Desktop Due Diligence

Sponsor: Sure Constructions P/L
Date: 4th of March 2016
Author: Matthew Barker
Title Page

STUDY AREA: 66-90 Bena Road, Korumburra
LEVEL OF ASSESSMENT: Due Diligence Assessment
SPONSOR: Sure Constructions P/L
AUTHOR: Matthew Barker
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Disclaimer

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Abbreviations

ACHP: Aboriginal Cultural Heritage Place

BHM: Benchmark Heritage Management

CHMP: Cultural Heritage Management Plan

VAHR: Victorian Aboriginal Heritage Register
Executive Summary

The Study Area is located at 66-90 Bena Road, Korumburra, Victoria, and covers an approximate area of 15.58ha.

Recommendations

Aboriginal Heritage

Based on the results of the due diligence assessment, the following management recommendations are made.

The study area contains an Aboriginal Place; a surface scatter and therefore covered by a cultural heritage sensitivity (CHS) overlay (Map 2). The study area remains largely undisturbed (other than the footprint of the dams) and displays some potential for buried sub-surface Aboriginal cultural material to be present. The likelihood of locating further Aboriginal cultural material is high.

Implications for Development

An Aboriginal Cultural Heritage Management Plan (CHMP) is required under Section 47 of the Victorian Aboriginal Heritage Act 2006 if any high impact activity is planned in an identified area of cultural heritage sensitivity, or within 50 metres of a registered cultural heritage place (as defined in the Victorian Aboriginal Heritage Regulations 2007):

A mandatory CHMP is therefore required as the following conditions have been triggered under the Aboriginal Heritage Regulations 2007 (r5, Division 1, 6);

1. all or part of the activity area for the activity is within an area of cultural heritage sensitivity and;
2. all or part of the activity is a high impact activity.

Specifically, the activity area is located within an area of cultural heritage sensitivity which, in this case, is defined as land within 50 metres of a registered cultural heritage place (r22, Division 3, 2). The high impact activity defined in relation to the current activity area is a residential subdivision.

Historic Heritage

There are no historic sites in the study area. The study area is considered to have very low potential sensitivity for historic archaeological sites. No further investigation is required.
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1.0 Introduction

Location of the Study Area

The Study Area is located at 66-90 Bena Road, Korumburra, Victoria, and covers an approximate area of 15.58ha.

Specifically, the Study Area is located in the Township of Korumburra. The Study Area is located in Zone 55. The Study Area is situated approximately 120km southeast of the Melbourne CBD (see Map 1).

The land comprising the Study Area is owned by Sure Constructions P/L.

Details of Cultural Heritage Advisors

The Cultural Heritage Advisors who have undertaken this CHMP are Matthew Barker and Dr Maya Barker. Matthew holds a BA Hons [Archaeology] from La Trobe University and has had seven years’ experience working in the field of Aboriginal archaeology. Dr Maya Barker (BA Hons [Arch]/BSc/PhD [Arch]) holds degrees from both Monash and La Trobe Universities and also has over seven years’ experience working in the field of Aboriginal archaeology.

Registered Aboriginal Party (RAP) with Responsibility for the Study Area

At the time of preparation of this assessment no Registered Aboriginal Party has been appointed for the Study Area.
Map 1: Study Area Location and Development Plan

The Study Area is located in Zone 55.
**2.0 Extent of the Study Area**

The Study Area is located at 66-90 Bena Road, Korumburra, Victoria and covers an approximate area of 15.58ha. The extent of the Study Area covered by this CHMP is shown in Map 2.

The Study Area comprises an undeveloped irregular block of land south of Bena Road and agricultural land to the north, east and west (Map 2). Two natural ephemeral watercourses traverse the property from west to east.

The Study Area comprises both sections of cleared pasture characterised by dense grass coverage and cropped land with rows of vegetables (see Map 2). Ground disturbance is within the Study Area has occurred as a result of pastoral practices involving clearance of native vegetation, ploughing and grazing, It is likely these activities have caused disturbance to the topsoils.

**3.0 Aboriginal Cultural Heritage Assessment**

**3.1 Desktop Assessment**

This section contains the results of the desktop assessment. The aim of the desktop assessment is to produce an archaeological site prediction model, which would assist in the design of the fieldwork, the interpretation of the fieldwork results, the assessment of cultural significance and the design of the management recommendations. The desktop assessment involved a review of:

- Standard ethnographic sources to identify the likely traditional owners and a review of any written and oral local history regarding Aboriginal people in the geographic area;
- Environmental resources available to Aboriginal people within the region of the Study Area;
- The site registry at AAV and previous archaeological studies, to identify any previously registered Aboriginal archaeological sites either within or surrounding the Study Area and the results of previous archaeological assessments;
- The land-use history of the Study Area, particularly evidence for the extent and nature of past land disturbance; and
- The landforms or geomorphology of the Study Area and identification and determination of the geographic region of which the Study Area forms a part that is relevant to the Aboriginal cultural heritage that may be present in the Study Area.

This information was used to produce an archaeological site prediction model (Section 3.1.1). The site prediction model assists in determining the type of archaeological sites which may potentially occur within the Study Area, the possible contents of these sites, the possible past use of the landscape by Aboriginal people and the likely extent of ground disturbance to archaeological sites. The information provided by the site prediction model is used constructively
in designing the survey strategy, by, for example, allowing the field team to target areas which have a high probability of containing archaeological sites. No obstacles were noted during the preparation of this desktop assessment.

**Search of the Victorian Aboriginal Heritage Register**

The Victorian Aboriginal Heritage Register (VAHR) on-line database maintained by Aboriginal Affairs Victoria was searched to identify any previously registered Indigenous archaeological sites within the Study Area and surrounding geographic region, as well as the results of previous archaeological assessments. The Register was accessed on February 25th 2016.

**The Geographic Region**

The geographic region in which the Study Area is located is the township of Korumburra.

**Registered Aboriginal Places in the Geographic Region**

The Study Area has not been subject to previous archaeological assessment and no Aboriginal Cultural Heritage Places (ACHP) are located on the property, however many Indigenous sites have been recorded in the surrounding geographic region. No previously recorded Indigenous archaeological sites listed on the VAHR site registry are present within the Study Area. A total of 10 Indigenous archaeological sites have been recorded within Korumburra (see Table 1).

**Table 1: Site types in the region of the Study Area**

<table>
<thead>
<tr>
<th>Site Type</th>
<th>Frequency (No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artefact Scatter</td>
<td>7</td>
</tr>
<tr>
<td>Scarred Tree</td>
<td>3</td>
</tr>
</tbody>
</table>

There are no Aboriginal Cultural Heritage Places within 200m of the Study Area.
Map 2: ACHPs in the Korumburra Region
Previous Works in the Geographic Region Relevant to the Study Area

Regional Investigations

There have been few regional archaeological investigations in the surrounding region and none of these has incorporated the Study Area. In general, these studies have shown that there is a high probability that Aboriginal Cultural Heritage Places will occur in landforms such as creek banks and dry elevated rises bordering watercourses and floodplains that the most common Aboriginal Cultural Heritage Place types are likely to be artefact scatters and, where suitable trees remain, culturally modified trees.

The Aboriginal archaeology of the region indicates that the Study Area would have been known about, even if not utilised for at least 20,000 years (Murphy 2007). Radiocarbon dates of 17,000 years BP have been obtained from Clogg’s Cave near Buchan (Flood 1980), and artefacts located within Mitchell River terraces are considered to date form the Pleistocene (Murphy 1999 following Pickering 1977: 3). The occupation of Clogg’s Cave was intermittent between 17,000 BP and 13,000 BP, at which point climatic conditions became warmer. From 13,000 BP to 8,500 BP occupation intensified, followed by a decrease in occupation as climatic conditions became similar to present, until only the overlying rockshelter at the entrance was utilised, a practice that continued until European colonisation (Mulvaney 1975). The analysis of stone tools in the different occupation layers at Clogg’s Cave indicate a distinct change in technology. The lower levels of occupation (over 8,700 BP) that are characterised by steep edged scrapers and carbonate encrusted pebble tools to Holocene levels that are dominated by microlithic tools that reflect the Small Tool Tradition (Mulvaney 1975).

The following projects have allowed only a general pattern of Aboriginal exploitation to be generated for the Korumburra area. A summary of the results of these previous investigations is presented below to indicate the nature and extent of these studies and from which a predictive model regarding Aboriginal heritage values within the Study Area will be generated. There has been no regional investigation of Aboriginal archaeological values that has included Korumburra.

Dr. Vincent A. Clark and Associates Pty Ltd. (Amorosi and Clark 2002) conducted a survey of the proposed South Gippsland Highway route from Korumburra to Leongatha. The proposed activity area was 12.6 kilometres in length and up to 300 metres in width on either side of the highway. Seven new Aboriginal archaeological sites were located during the survey on the 5th, 6th and 14th of March 2002. Of these seven sites; three were scarred trees, two were isolated artefacts and two surface artefact scatters. Ground visibility was very poor during the survey. All new sites which were located were within 200 metres of tributaries of Coal Creek.

Sub-surface testing was recommended in order to establish whether cultural material existed sub-surface as the majority of the activity area was located in areas that were classified as possessing medium to high sensitivity for the presence of Aboriginal heritage. No follow-up report that contained results of the recommended testing could be found.
Tardis Enterprises (Murphy 2003) conducted a pedestrian survey of the proposed Korumburra Wind Farm. The proposed activity area was 1km x 200m in size and was situated on the ridge lines, hill slopes and hill tops associated with the South Gippsland Hills and which descend into the Powlett River Valley. No new Aboriginal archaeological sites were located during the survey on October 7, 2002, although poor visibility was noted as a possible reason for this.

Tardis Enterprises (Murphy 2007) conducted a pedestrian survey of a proposed residential subdivision at Lot 2 Bena Road, Korumburra. The report was commissioned by Beveridge Williams on behalf of Rossi Group Pty Ltd. Ground visibility was very poor. No new Aboriginal archaeological sites were located during the survey.

However, areas of sensitivity that were identified during the pedestrian survey were recommended for further testing prior to development if these areas cannot be excluded from these activities. These areas are creek banks and ridge lines. It was suggested that controlled machine scrapes of these areas would be sufficient. No follow-up report containing the results of this testing could be found.

In 2010 Berelov et al undertook a CHMP for directional drilling at 4 impact locations in the Korumburra Botanic Park, Korumburra. ACHMP Korumburra Botanic Park (VAHR 8021-0357) was recorded during the sub-surface testing program. The site consisted of two lithic artefact flakes recovered in the sieve, and was assessed as being of low scientific significance due to the narrow range of artefact types and their common occurrence in the region.

The stratigraphy of Test Pit 1 was representative of the activity area. Dense grass covered the entire surface with a silty loam topsoil (Horizon 1) ranging in depth from between 20mm and 40mm, overlying a moderately compacted silty clay (Horizon 2a) ranging in depth from between 90mm and 190mm and also producing a marked distinction in compaction within the silty clay deposit, overlying extremely compacted silty clay (Horizon 2b) that extends between 310mm and 380mm.

An undulating orange/brown clay base was reached at a varying depth of between 530mm and 580mm.

In 2013 Stone and Statin undertook a CHMP for the Northern Towns Supply Pipeline from the Lance Creek Reservoir to the Korumburra Water Treatment Plant (WTP) and from the Korumburra WTP to the Poowong WTP. Controlled excavation of five 1 m x 1 m test pits and 46 40 cm x 40 cm shovel probes targeted raised landforms with Aboriginal site potential overlooking Lance Creek, Foster Creek, Bellview Creek and the Little Bass River. One of the shovel probes was excavated in the inset, modern floodplain of Foster Creek to further test the predictive model. One Aboriginal cultural heritage place represented by ten silcrete artefacts was uncovered by a shovel probe adjacent to Lance Creek (8020-0278, VAHR). A 1 m x 1 m test pit and 8 40cm x 40cm shovel probes were excavated on the western border of the current activity area. The stratigraphy comprised 0-36cm: Pale brown loam; overlying from 36-40 cm: weathered sandstone regolith. No Aboriginal cultural material was located in this section.
The sub-surface testing that has been undertaken in Korumburra has demonstrated that the soil horizons comprise thin silty brown clay soils, overlying dense brown/orange clays. The majority of registered sites located within the 2km of the Study Area were located on slopes in well drained locations; bordering tributaries of Coal Creek. Artefacts located during archaeological excavation are consistently located within the upper 40cm of soil profile, indicating a recent period of site formation. No burial sites have been previously recorded, and it is unlikely that this site type will exist within the present Study Area.

The local distribution of Aboriginal archaeological sites clearly indicates that Indigenous people established campsites over a wide area of the alluvial plains and adjacent to existing watercourses. The archaeological sites which have been recorded within previous studies are indicative of past campsites established by Indigenous people exploiting resources in the riverine environment of Hazel Creek.

Because of the close proximity of the Study Area to the riverine environments of Coal Creek and its associated wetlands and tributaries, it is likely that Indigenous people would have established campsites in the local area, including the Study Area, during the past. This is supported by the archaeological sites which have been found in the locality surrounding the Study Area.

There is, therefore, some potential for remains of past Indigenous campsites to occur within the Study Area, especially within the vicinity of the unnamed watercourse. Archaeological site types are most likely to comprise of surface scatters of stone artefacts and scarred trees. Any surface or near surface archaeological sites within the Study Area, are likely to be highly disturbed by land clearance, grazing and agricultural activity.

**The Environmental Determinants of the Study Area**

The desktop assessment included a review of the physical context and natural resources present within the Study Area. These environmental variables can determine how people used the landscape in the past. This information is used to gain an understanding of past human behaviours and provides an indication of where archaeological sites and heritage places may be located within the landscape. These environmental factors are summarised below.

**Climate**

Temperature averages at Korumburra indicate a cold to hot maximum average of 6.8°C in July to 22.9°C in February. Minimum average temperatures throughout the year range from 6.8°C in July to 13.9°C in February. The annual average rainfall for the area is 687mm. These climate conditions would have placed no restrictions on Indigenous or European occupation of the area (BOM accessed 28/2/15).
**Water Sources**

Sources of fresh water would have existed in close proximity to the present Study Area. Two ephemeral watercourses traverse the study area and would have provided water during winter only.

**Description of Existing and Pre-Contact Vegetation**

The Study Area falls within the Gippsland Plains bioregion (Victorian resources online, dpi website, 2009). The Pre-1750 vegetation comprised a mixture of EVC 53 Swamp Scrub, EVC 126 Swampy Riparian Complex and EVC 16 Lowland Forest (DPI Biodiversity Interactive Map, Accessed 28/2/2015).

The overstorey is generally dominated by Eucalyptus Muelleriana but can also include Messmate *Eucalyptus obliqua*, and Narrow-leaf Peppermint *Eucalyptus radiata*. Understorey vegetation likely consisted of a sparse to moderate shrub layer, comprising plants such as Prickly Tea-tree Leptospermum conintentale and Narrow-leaf Geebung Persoonia Linearis, Sallow Wattle A. longifolia and Sunshine Wattle A. terminalis occur beneath a canopy of White Stringybark E. globoidea, Red Stringybark E. macorrhyncha (Oates & Taranto, 2000).


The existing vegetation of the Study Area bears little resemblance to the description of the above vegetation communities although both are present on the boundaries of the Study Area (north and west) and comprise dense woodland.

Wattles were important sources of gum, used for food, technological items and some medicines (Zola & Gott, 1996: 51). The gum of the black wattle was dissolved in water to make a sweet drink or was eaten on its own. It was also used as a treatment for indigestion. The bark of the paper-bark trees was utilized as a blanket for wrapping up babies while the timber of the trees were used in making spears, clubs and digging sticks (Zola & Gott 1996: 63). Burls were also cut out of eucalypts for use as bowls. The brittle bark of the messmate trees was powdered and used as tinder in fire making while the coarse and stringy inner bark was made into bags and fishing nets (Zola & Gott 1996: 60). The bark of the blackwood was employed in the treatment of arthritis and the timber was used to manufacture spear-throwers, shields and clubs (Zola & Gott 1990: 53). Aboriginal ‘scarred trees’ are the result of bark being cut from the tree for these and other purposes.
Silver wattle may have been employed by local Indigenous peoples in the production of stone axe handles, its gum used as a food source or ‘mixed with ash to make a waterproof paste, used for fixing holes in bark water vessels’ (Zola and Gott, 1996: 38). Tussock grasses may have been used to make baskets and mats, and the tubers of water-ribbons had the potential to provide a valuable food source for local inhabitants (Zola and Gott, 1996: 58, 12). River red gums potentially provided Indigenous inhabitants with bark for a variety of uses including the building of shelters and canoes, and its gum was also employed for medicinal purposes (Zola and Gott, 1992: 14, 55). The red gum was popular amongst European settlers as well, who used it primarily for construction (Zola and Gott, 1996: 14).

Water plants including cumbungi (Typha spp.) and water ribbons (Triglochin) would also have been gathered from creeks. The roots and tubers of lilies would have been collected and roasted and would have provided a staple food. The fruits of plants such as the native raspberry and the common apple-berry provided a common and sweet food source (Zola & Gott 1996: 49-50).

Information on Fauna of the Study Area

The Study Area would have contained a large number and great variety of fauna, many of which would have congregated within the dense vegetation along the drainage lines. Prior to post-settlement activities of clearing and drainage works, the streams within the Study Area are unlikely to have had a clearly defined course other that in times of peak flows. The drainage lines were most likely part of an extensive wetland that expanded and contracted with runoff/water level conditions. The abundance of fauna along creeks and around wetlands in the region would have been seasonal, with the greatest concentrations occurring during the summer periods.

Fauna native to the region would have provided Indigenous inhabitants with a potential source for food and clothing, among other things. Walsh (1987, Murphy 2007: 25) considered that the Moe River and the extensive former swamp that existed north of Yarragon Areas would be the focus of Aboriginal exploitation within the region. Within this ecological zone, there would have been variation in staple species diversity and abundance, and this would have in turn influenced site location. Seasonal congregations would have provided the highest food potential, such as eels, nesting birds and their eggs within wetland areas with larger mammals such as kangaroos would have frequented the drier lands.

A number of animals would have been present within the Study Area and are likely to have been hunted by traditional owners. These include the Eastern Grey Kangaroo (Macropus giganteus), Common Brushtail Possum (Trichosurus vulpecula), Common Ringtail Possum (Pseudocherinus peregrinus), Short Beaked Echidna (Tachyglossus aculeatus) and the Wombat (Vomatus Ursinus). Birds, bird eggs and reptiles may have also been utilised.

Stone Resources

No stone resources and outcrops suitable for the manufacture of stone tools are found within the Study Area. The geology within the region of the Study Area is relevant when considering the
availability of stone material suitable for manufacture of tools and may influence aspects of Aboriginal occupation. The nearest geological formation to the Study Area is the Haunted Hills Formation to the south which would have provided potential raw materials (e.g. silcrete) for pre-contact Aboriginal stone tool manufacture. The hills to the north and east would also have provided potential sources of basalt, quartz, granite and quartzite (Murphy 2007).

The Study Area however, does not contain any naturally occurring outcrops of stone material and would therefore be an unlikely location where raw stone materials were once extracted, quarried or collected for the manufacture of stone implements by pre-contact Aboriginal people. This indicates that any Indigenous archaeological stone artefacts located within the Study Area will be comprised entirely of imported stone.

The southern extent of the Study Area is comprised of alluvial silts, sands, clays and gravels deposited during past flood events.

**Historical and Ethno-historical Accounts of the Geographic Region**

No specific references to Aboriginal use of the Study Area have been found in published sources. A brief review of Aboriginal history in the region of the Study Area is set out below.

According to Clark (1990), the Western Strzelecki Foothills were traditionally in the territory of the Bunurong or Bun wurrung people of south central Victoria. Thomas estimated that in 1839 the Bunurong consisted of around 500 people. The Bunurong were a part of the wider Kulin Nation, with the Yowenjerre clan most closely associated with the land between the Bass and Tarwin rivers (Clark, 1990). The Bunurong intermarried with other Kulin tribes (e.g. Wurundjeri) but apparently not the Gunai/Kurnai with whom they did not share cultural beliefs and were apparently hostile (Howitt, 1904). The only known ‘direct’ account of the Yowenjerre clan is that of Maud (a diarist) and Murray Black whose father George established the Tarwin Meadows Cattle Run in 1851. Murray (in Massola, 1974) wrote:

“The Tarwin Aboriginals were very numerous at some time judging by the extensive camping sites between Cape Liptrap to Anderson Inlet. The north Gippsland blacks made a raid shortly before the white men arrived. They killed several near the Meadows Homestead, but could not have practically exterminated the tribe, who were forced to live in small family groups in order to hunt game. There were only six Aboriginals at Tarwin in 1851 when George Black arrived and they said that their enemies killed some of them.

The Tarwin aborigines were the tomahawk makers for the surrounding tribes and were all friendly through periodic barter. They secured a red flinty stone from Mornington Peninsula for instance and would exchange axe heads and flint implements which were made at Tarwin. The principle diorite quarries were about a mile north west of Inverloch, Ruttle’s Quarry and near Pound Creek and McCaughan’s Hill. The flint was secured along the ocean beach, washed up attached to the roots of kelp and seaweed”.
Post-Contact History

The Study Area has been settled by Europeans since the 1840s. From this time various landscape changes have been made, such as clearing of scrub and timber and ploughing. These initial impacts would have resulted in the possible destruction of culturally scarred trees and a variety of surface archaeological sites such as stone arrangements and the spatial and temporal integrity of stone artefact scatters. Aboriginal stone artefacts may have survived however little information will now remain regarding how these artefacts were originally deposited. The potential for an archaeological site of high scientific significance (as significance is linked to condition) is therefore low.

In summary, the recent activities within the Study Area that would have actively degraded archaeological resources are:

- Initial land clearance;
- Grazing; and
- Cropping.

Conclusions from the Desktop Assessment

The local distribution of Aboriginal archaeological sites clearly indicates that Indigenous people established campsites over a wide area of the alluvial plains and adjacent to existing watercourses. The archaeological sites which have been recorded in previous studies are indicative of past campsites, established by Indigenous people exploiting resources in the riverine environments, as well as resources which would have been available on the grassy plains.

Because part of the watercourse traverses the Study Area, it is likely that Indigenous people would have established campsites in the local area, including the Study Area, during the past. This is supported by the large number of archaeological sites which have been found in the locality surrounding the Study Area.

There is, therefore, some potential for remains of past Indigenous campsites to occur within the Study Area. Archaeological site types are most likely to comprise of surface scatters of stone artefacts and scarred trees. Any surface or near surface archaeological sites within the Study Area, are likely to be highly disturbed by land clearance, grazing, slope wash and siltation.

Very little is known about the Yallock balug and land use practices within the region of the Study Area. A number of archaeological assessments have been undertaken within the region and some of these studies have resulted in site prediction models for the occurrence of Indigenous archaeological sites on the alluvial plain and within creek and river valleys. It is suggested that stone artefact scatters are most likely to occur on the alluvial plains within 200m of a water body (Hall 1988).

In summarising our current knowledge of the geographic region in which the Study Area is located, the following predictive statements should be taken into account:
• There are no registered Aboriginal Cultural Heritage Places located in the Study Area and 10 ACHPs are located within the Korumburra region;
• Previous archaeological assessments in the region have indicated that Aboriginal archaeological sites within the region are likely to be located on high ground adjacent to riverine environments. Sites are more likely to be situated on the crests and upper slopes, adjacent to creeklines and swamps, than the lower slopes;
• There would have been a range of plant, animal and mineral resources available for Indigenous people living in, or in the region of, the Study Area;
• Artefact scatters are the most likely predominant site types.
• The Study Area was most likely subject to burning-off following land-clearing. Thus any surface sites and shallow sub-surface sites existing at the time are likely to have been highly disturbed and distributed.
• Aboriginal cultural heritage sites will be no more than 4000 years old;
• There still exists a potential for intact sub-surface archaeological deposits in areas that have experienced minimal disturbance.

3.1.1 Site Prediction Model

As there have been so few studies undertaken within the surrounding area, it is difficult to draw on surrounding patterns when forming the site prediction model. However, the sites which have been recorded within the region do suggest a pattern in which artefact scatters will be located on rises overlooking ephemeral and permanent watercourses.

The probability of locating Indigenous sites within the Activity Area is low to moderate. This likelihood is based on the current land use history, previous studies undertaken within 200m of the same watercourse, and the proportion of sites located within proximity to the area. It is possible that the existence of cultural heritage may have been adversely affected. This is because:

1. Based on the regional history it is likely that past land use activities occurred within the study area including clearance of native vegetation and grazing. If these activities have taken place, they would have adversely impacted on any Indigenous archaeological sites.

2. The property is traversed by two ephemeral watercourses;

3. There are no registered Aboriginal archaeological sites located in the Study Area;

4. There has been no previous archaeological assessment of the Study Area;

5. Previous archaeological assessments in the region have indicated that Aboriginal archaeological sites within the region are likely to be located along rivers and creeks or on elevated rises associated with swamps and watercourses. Sites are more likely to be situated on the crests and upper slopes adjacent to swamps and watercourses, than the lower slopes; and
6. There is a very low likelihood of culturally scarred trees remaining within the Study Area due to previous land clearance.

We must also take into account the impact of recent land use on any deposits of Aboriginal cultural material. Most if not all of any Aboriginal archaeological sites within the property are likely to have been impacted on by past land use activities, such as the clearance of native vegetation. As much of the Study Area has been farmed since the early 1850s, it is likely that any surface or near-surface remains of past Indigenous campsites will be highly disturbed.

4.0 Standard Assessment

The aims of the standard assessment (archaeological survey) were to:

- Attempt to identify Aboriginal cultural heritage;
- Identify any areas of potential archaeological sensitivity deposit (that may require sub-surface testing) and;
- Document the extent of significant ground disturbance in the Study Area.

A standard assessment of the Study Area was undertaken by cultural heritage advisor Matthew Barker on the 26th of February 2016, (see Plates 1-16).

Standard Assessment Methodology

Linear transects were walked with personnel spaced approximately 10m apart across the Study Area from the southwest of the Study Area to the northeast corner extent of the property. Focus was concentrated on areas of high ground surface visibility. All mature Aboriginal trees were inspected to determine if they were culturally scarred. Areas of potential archaeological sensitivity/deposits and significant ground disturbance were recorded. Ground surface visibility and surface exposure was recorded in order to determine the effective ground survey coverage. There were no significant constraints to carrying out the survey.

Results of Ground Survey

No visible remnant native vegetation remains in the Study Area. The majority of the Study Area contains introduced tree species, grass, vegetable crops and weeds (Plates 1-16), which is typical of the region.

No new Aboriginal archaeological ACHPs were identified within the Study Area during the ground survey (this includes artefact scatters, scarred trees or rock shelters).

No caves, rock shelters, or cave entrances were noted within the Study Area.

The centre of the Study Area is traversed by two natural watercourses with a series of low undulating hills and ridgelines running to the north and south of the drainage line.
The Study Area comprises mostly cleared pasture and cropped areas and is characterised by dense grass coverage (see Plates 1-16 - Section 5.2). Ground disturbance is within the Study Area has occurred as a result of pastoral practices involving clearance of native vegetation, cropping and grazing. It is likely these activities have caused disturbance to the topsoils, especially as the entire property would have covered in dense woodland.

Map 3: Study Area and location of Aboriginal Stone Artefacts

The Study Area has been cleared of native vegetation apart from a few eucalypts. This would have contributed to soil erosion and the movement of any Aboriginal cultural material that may have existed on the ground surface; thus the removal of topsoils and the destruction of any surface or near surface Aboriginal cultural materials. Vegetation clearance is not considered to be significant ground disturbance.

Aboriginal cultural material was identified within the Activity Area during the field investigation including an extensive surface scatter. No caves, rock shelter or cave entrances were noted in the activity area. No obstacles were encountered during the standard assessment.

Several stone artefacts were located within 50m of the two watercourses which traverse the activity area. In total 12 stone artefacts were located on the surface; Plates 5, 7, 9, 11 and 13
show examples of these stone artefacts. They include several artefact types including complete flakes, cores (used to make stone tools), tools including round edged scraper and debitage (waste flakes created during the making of stone tools).

The low rise between the two watercourses (Plates 14-15) in the centre of the activity area is considered to be of high archaeological sensitivity for sub-surface stone artefacts. In general the following levels of archaeological sensitivity relate to Stages 1-4:

Stage 1: The northern half of Stage 1 is assessed as being of low to moderate archaeological sensitivity for sub-surface stone artefacts based on proximity to a watercourse and comprises a relatively flat to a gently sloping landform. The southern half of this stage is assessed as being of low archaeological sensitivity for sub-surface stone artefacts based on the steep sloping landform.

Stage 2: Stage 2 is assessed as being of moderate to high archaeological sensitivity for sub-surface stone artefacts based on proximity to both watercourses and comprises a low rise and represents a landform ideally suited to establishing campsites.

Stage 3: Stage 3 is assessed as being of low to moderate archaeological sensitivity for sub-surface stone artefacts based on proximity to a watercourse and comprises a relatively flat to a gently sloping landform.

Stage 4: This stage is assessed as being of low archaeological sensitivity for sub-surface stone artefacts based on the steep sloping landform.
Plate 1: Floodplain in the southeast of the study area (M. Barker 8/12/15), facing east.

Plate 2: View from water-course facing southeast to Bena Road (M. Barker 8/12/15).
Plate 3: Creek line in centre east of activity area (M. Barker 8/12/15) facing north

Plate 4: Steep slope to ridgeline in centre east of the activity area (M. Barker 8/12/15)
Plate 5: Artefact located on north floodplain of creek in centre east (M. Barker 8/12/15).

Plate 6: Water-course and low rise in centre west showing location of stone artefact (M. Barker 8/12/15); facing west.
Plate 7: Quartz flake located on north floodplain (Plate 6) of creek in centre west (M. Barker 8/12/15).

Plate 8: Low rise in centre west showing (M. Barker 8/12/15); facing east
Plate 9: Artefact located on south floodplain of creek in northwest of activity area (M. Barker 8/12/15).
Plate 10: Watercourse and low rise in north-west showing location of stone artefacts (M. Barker 8/12/15); facing east

Plate 11: Silcrete scraper located on south floodplain of creek in centre north (M. Barker 8/12/15).
Plate 12: Water-course and low rise in centre north showing location of stone artefacts (M. Barker 8/12/15); facing west.

Plate 13: Artefacts located on north floodplain of creek in northwest of activity area (M. Barker 8/12/15).
Plate 14: Water-course and low rise in northwest considered to be highly sensitive (M. Barker 8/12/15); facing west

Plate 15: Water-course and low rise in southwest considered to be highly sensitive (M. Barker 8/12/15); facing west

Table 2: Standard Assessment Photographs
Ground Surface Visibility and Effective Survey Coverage

Effective coverage is quantified to account for ground surface visibility and exposure limitations to survey coverage, and gives a good estimate of the actual proportion of the Study Area investigated.

Ground surface visibility is a major factor in obscuring archaeological materials, and can be defined as how much of the surface is visible and what other factors (such as vegetation, gravels or leaf litter) may limit the detection of archaeological materials (Burke and Smith 2004). The higher the level of ground surface visibility, the more it is that Aboriginal cultural material can be identified; therefore a good level of ground surface visibility enables a better representation of places than areas where the ground surface is obscured (Ellender and Weaver 1994).

Ellender and Weaver (1994) attempted to quantify ground surface visibility for a 1m² area:

- 0-5%: Unable to see soil;
- 5-10%: Occasional glimpse of soil;
- 10-20%: Occasional patch of bare ground;
- 20-50%: Frequent patches of bare ground;
- 50-70%: About half the ground bare;
- 75-100%: More than half the bare ground; ploughed fields.

Ground surface visibility in the entire Study Area (Plates 1-6 in Table 4) was fair (10-20%), and therefore there was a good possibility of identifying archaeological deposits on the surface. It is estimated that the effective survey coverage on the grassed area was less than 15%, due to poor ground surface visibility, and it is not considered adequate for effective field assessment.

Ground Disturbance

A number of factors observed during the survey indicated that the Study Area has been subject to ground disturbance. These factors are:

- Clearance of native vegetation
  The Study Area has been cleared of native vegetation (Plates 1-15), and consequently may have caused the movement of any Aboriginal cultural material that existed on the ground surface.

- Pasture Improvement and Ploughing
  The Study Area is pasture has been subject to ploughing and pasture improvement over the last 100 years which would have had a significant impact on the shallow soils.

These ground disturbance activities would likely have resulted in the removal of topsoils and the destruction of any surface or near surface Aboriginal cultural materials. Vegetation clearance is not considered to be deep excavation. Pastoral practices have been a major cause of land disturbance and have been caused by the clearance of native vegetation, including the removal
of mature native trees which is likely to have exacerbated soil erosion, ploughing and animal grazing.

Conclusions of the Ground Survey

The results of the standard assessment indicate that the Study Area comprises land that has been disturbed as a result of vegetation clearance of the entire property and pastoral activity. Overall it was considered that due to a lack of ground surface visibility across the Study Area and the presence of an ephemeral watercourse; that there is potential for buried archaeological ACHPs within the Study Area.
5.0 Specific Cultural Heritage Management Requirements

5.1 Aboriginal Heritage
Based on the results of the due diligence assessment, the following management recommendations are made.

The study area contains an Aboriginal Place; a surface scatter and therefore covered by a cultural heritage sensitivity (CHS) overlay (Map 2). The study area remains largely undisturbed (other than the footprint of the dams) and displays some potential for buried sub-surface Aboriginal cultural material to be present. The likelihood of locating further Aboriginal cultural material is high.

Implications for Development

An Aboriginal Cultural Heritage Management Plan (CHMP) is required under Section 47 of the Victorian Aboriginal Heritage Act 2006 if any high impact activity is planned in an identified area of cultural heritage sensitivity, or within 50 metres of a registered cultural heritage place (as defined in the Victorian Aboriginal Heritage Regulations 2007):

A mandatory CHMP is therefore required as the following conditions have been triggered under the Aboriginal Heritage Regulations 2007 (r5, Division 1, 6);

1. all or part of the activity area for the activity is within an area of cultural heritage sensitivity and;
2. all or part of the activity is a high impact activity.

Specifically, the activity area is located within an area of cultural heritage sensitivity which, in this case, is defined as land within 50 metres of a registered cultural heritage place (r22, Division 3, 2). The high impact activity defined in relation to the current activity area is a residential subdivision.

5.2 Historic Heritage
There are no historic sites in the study area. The study area is considered to have very low potential sensitivity for historic archaeological sites. No further investigation is required.
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Appendix 1: Glossary

A
Angular fragment: A piece of stone that is blocky or angular, not flake-like.

Archaeology: The study of the remains of past human activity.

Area of Archaeological Sensitivity: A part of the landscape that contains demonstrated occurrences of cultural material. The precise level of sensitivity will depend on the density and significance of the material.

Artefact scatter: A surface scatter of cultural material. Aboriginal artefact scatters are defined as being the occurrence of five or more items of cultural material within an area of about 100m² (Aboriginal Affairs Victoria 1993). Artefact scatters are often the only physical remains of places where people have lived, camped, prepared and eaten meals and worked.

B
BP: Before Present. The present is defined as 1950.

Backed blade (geometric microlith): Backing is the process by which one or more margins contain consistent retouch opposite to the sharp working edge. A backed blade is a blade flake that has been abruptly retouched along one or more margins opposite the sharp working edge. Backed pieces include backed blades and geometric microliths. 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).

Blade: A stone flake that is at least twice as long as it is wide.

Burial: Usually a sub-surface pit containing human remains and sometimes associated artefacts.

C
Core: A stone piece from which a flake has been removed by percussion (striking it) or by pressure. It is identified by the presence of flake scars showing the negative attributes of flakes, from where flakes have been removed.
**E**

**Ethnography:** The scientific description of living cultures.

**Exposure:** Refers to the degree to which the sub-surface of the land 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 sub-surface visible for an observer on foot.

**F**

** Flake:** A stone piece removed from a core by percussion (striking it) or by pressure. It is identified by the presence of a striking platform and bulb of percussion, not usually found on a naturally shattered stone.

**Formal tool:** An artefact that has been shaped by flaking, including retouch, or grinding to a predetermined form for use as a tool. Formal tools include scrapers, backed pieces and axes.

**G**

**GDA94 or Geocentric Datum of Australia 1994:** A system of latitudes and longitudes, or east and north coordinates, centred at the centre of the earth’s mass. GDA94 is compatible with modern positioning techniques such as the Global Positioning System (GPS). It supersedes older coordinate systems (AGD66, AGD84). GDA94 is based on a global framework, the IERS Terrestrial Reference Frame (ITRF), but is fixed to a number of reference points in Australia. GDA94 is the Victorian Government Standard and spatial coordinates for excavations, transects and places in CHMP documents.

**H**

**Hearth:** an organic sub-surface feature; 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.

**Holocene, recent or postglacial period:** The time from the end of the Pleistocene Ice Age (c. 10,300 BP) to the present day.
**In situ:** A description of any cultural material that lies undisturbed in its original point of deposition.

**Land System:** Description for an area of land based on an assessment of a series of environmental characteristics including geology, geomorphology, climate, soils and vegetation.

**Midden:** Shell middens vary widely in size composition and complexity. Deposits vary in complexity, they range from being homogenous to finely stratified deposits. Material which may be found in middens includes different shell species, stone artefacts, hearths and animal bones.

**Quarry (stone/ochre source):** A place where stone or ochre is exposed and has been extracted by Aboriginal people. The rock types most commonly quarried for artefact manufacture in Victoria include silcrete, quartz, quartzite, chert and fine-grained volcanics such as greenstone.

**Quartz:** A mineral composed of silica with an irregular fracture pattern. Quartz used in artefact manufacture is generally semi-translucent, although it varies from milky white to glassy. Glassy quartz can be used for conchoidal flaking, but poorer quality material is more commonly used for block fracturing techniques. Quartz can be derived from waterworn pebble, crystalline or vein.

**Pleistocene:** The dates for the beginning and end of the Pleistocene generally correspond with the last Ice Age. That is from 3.5 to 1.3 million years ago. The period ends with the gradual retreat of the ice sheets, which reached their present conditions around 10,300 BP.

**Pre-contact:** Before contact with non-Aboriginal people.

**Post-contact:** After contact with non-Aboriginal people.
**R**

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

**Registered Aboriginal Cultural Heritage Places**: These are Aboriginal sites registered on the Victorian Aboriginal Heritage Register (VAHR).

**Regolith**: The mantle of unconsolidated soil/sediments/weathered rock materials forming the surface of the land that rests upon the bedrock.

**S**

**Scarred trees**: Aboriginal derived scars are distinct from naturally occurring scars by their oval or symmetrical shape and occasional presence of steel, or more rarely, stone axe marks on the scar's surface. Other types of scarring include toeholds cut in the trunks or branches of trees for climbing purposes and removal of bark to indicate the presence of burials in the area. Generally, scars occur on River red gums (Eucalyptus camaldulensis) or grey box (E. microcarpa) trees. River red gums are usually found along the margins of rivers, creeks and swamps with grey box on near and far floodplains. Size and shape of the scar depended on the use for which the bark was intended. For example, bark was used for a variety of dishes and containers, shields, canoes and construction of huts.

**Significance**: The importance of a heritage place or place for aesthetic, historic, scientific or social values for past, present or future generations.

**Silcrete**: Soil, clay or sand sediments that have silicified under basalt through groundwater percolation. It ranges in texture from very fine grained to coarse grained. At one extreme it is cryptocrystalline with very few clasts. It generally has characteristic yellow streaks of titanium oxide that occur within a grey and less commonly reddish background. Used for flaked stone artefacts.

**Spit**: Refers to an arbitrarily defined strata of soil removed during excavation.

**Stratification**: The way in which soil forms in layers.

**Stratified deposit**: Material that has been laid down, over time, in distinguishable layers.

**Stratigraphy**: The study of soil stratification (layers) and deposition.

**Stone Artefact**: A piece of stone that has been formed by Aboriginal people to be used as a tool or is a by-product of Aboriginal stone tool manufacturing activities. Stone artefacts can be flaked such as points and scrapers or ground such as axes and grinding stones.
**T**

**Tool:** A stone flake that has undergone secondary flaking or retouch.

**Transect:** A fixed path along which one excavates or records archaeological remains.

**V**

**Victorian Aboriginal Heritage Register:** A list of all registered Aboriginal cultural heritage places (Aboriginal Places) in Victoria.

**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 surface visible for an observer on foot.

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