EES Cultural Heritage Report

Report on Assessment for Aboriginal and Historic Sites for Mid-West Options 2A to 2D Second Murray River Crossing at Echuca-Moama

Report Prepared for VicRoads
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Executive Summary

E1 Introduction

This is a draft cultural heritage EES prepared for VicRoads of four road alignments in Victoria. The four alignments are options for a new road connecting with a bridge across the Murray River at Echuca, Victoria. They are within a broader road corridor identified as Mid-West 2 and comprise Options 2A-2D. The EES report contains the preliminary results of the cultural heritage assessment, a preliminary assessment of the potential impacts of each road option and preliminary management recommendations for each option.

E2 Results of the Cultural Heritage Assessment

Desktop Assessment

The aim of the desktop assessment was 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:

- The site registry at AAV and previous archaeological studies, to identify any previously registered Aboriginal archaeological sites either within or surrounding the Study corridors and the results of previous archaeological assessments;

- Standard ethnographic sources to identify the likely traditional owners and a review of any written and oral local history regarding Aboriginal people in the Echuca area;

- The landforms or geomorphology of the Study corridors and identification and determination of the geographic region of which the Study corridors forms a part that is relevant to the Aboriginal cultural heritage that may be present in the Study corridors;

- Environmental resources available to Aboriginal people within the geographic region of the Study corridors; and

- The land-use history of the Study corridors, particularly evidence for the extent and nature of past land disturbance.

This information was used to produce an archaeological site prediction model (Section 5.1.8).

The main conclusions drawn from the desktop assessment are as follows:

- A search of the AAV site registry indicated that there are 61 recorded Indigenous archaeological sites located within the geographic region, the township of Echuca. The vast majority (n=48, 79%) of the Indigenous archaeological sites located in the geographic region are scarred trees. There are also a small number of shell middens, artefact scatters and mixed sites. The highest density of recorded Indigenous archaeological sites in the geographic region occurs in close proximity to the junction of the Murray River and the Campaspe River, to the north of Warren Street.

- Previous archaeological research has demonstrated that the Murray River floodplain has been occupied for 30,000 years. From approximately 7,000 years ago there is evidence for large social groupings along the Murray River which is likely a response to the establishment of rich riverine resources. Previous archaeological research has commented on high site densities in close proximity to watercourses and low site densities on the floodplain,, with the majority of sites on the floodplain being scarred trees. In particular, previous archaeological research has commented on the impact of post-contact land clearance on Indigenous archaeological site distribution. More recent archaeological research, in the form of Cultural Heritage Management Plans, have commented on the high level of ground disturbance in the Echuca township.

- The traditional Indigenous owners of the geographic region are the 'Wollithiga' clan of the Yorta Yorta people. The lifestyle and culture of the Yorta Yorta was based on hunting, fishing and collecting food from the variety of food sources in the Yorta Yorta ancestral lands.

- The Study corridors is located within two geomorphic units. The western half of the Study corridors is located on 'Older Alluvium – Shepparton' and the eastern half is located on 'Riverine Plain Present Floodplain – Murray Valley'.

- The Study corridors is located within two geological formations. The western half of the Study corridors is located on 'Shepparton Formation' and the eastern half is located on 'Unnamed Alluvium'.

- The Study corridors is located on two landforms. The western half of the Study corridors is located on 'Plain above flood level' and the eastern half is located on 'Present floodplain'.

- The climate of the geographic region is temperate and would not have placed any restrictions on either Indigenous or European occupation.

- Fresh water was readily available within the geographic region. The Murray River and the Campaspe River both run through the geographic region and would have provided a reliable source of potable water to Indigenous occupants.

- The vegetation within the geographic region was extremely diverse and would have provided many food and utilitarian resources to Indigenous occupants.

- The fauna within the geographic region was extremely diverse comprising of terrestrial and riverine species and would have provided many food and utilitarian resources to Indigenous occupants.

- Stone resources were not readily available within the geographic region and would have been traded for with people to the south of the Yorta Yorta ancestral lands.

- The land use history of the geographic region indicates that the European activities that would have impacted on Indigenous archaeological sites are i) initial clearance of native vegetation; ii) cattle grazing; iii) sand mining; iv) grading of the floodplain; and v) construction of the township of Echuca.

The results of the desktop assessment of the geographic region indicated that the site prediction model developed by Rhodes (2000) for the Murray River floodplain is highly applicable and is as follows:

- There will be higher density of archaeological site types close to the banks of the Murray River and Campaspe River. This site distribution may be partly a reflection of post-contact land clearance during the nineteenth century.

- There will be a greater range of archaeological site types and complex occupation sites near river banks including scarred trees, shell middens, mounds and human burials. Land clearance may have disturbed sites.
- Scarred trees are likely to occur on all landforms.

- Human burials may be located near river banks.

- Aboriginal occupation sites are most likely to date from the mid-Holocene (5000 years ago).

Field Assessment

Aboriginal Archaeological Sites

Field surface surveys of a study corridor shown in Map 6 were conducted in May and December 2011. A total of nine new scarred trees were recorded during the field survey. This brings to a total of 22 the number of Aboriginal archaeological sites recorded in the study corridor, during the present and previous archaeological surveys.

All of the Aboriginal archaeological sites within the study corridor are scarred trees.

An extensive sandhill and borrow pits within the sandhill were mapped in detail during the field surveys. The sandhill extends between the site of the former Echuca Secondary College on Crofton St and Reflection Bend on the Murray River (see Map 6). Some of the scarred trees recorded during the current and previous surveys were found on the sandhill. The sandhill is an area of very high potential sensitivity for buried Aboriginal archaeological sites, including ancient (ie. Pleistocene) archaeological sites and human burials.

A small natural levee on the north bank of the Campaspe River was also mapped during the field survey, as it was thought that the levee had some potential to contain the remains of recent (Holocene) Aboriginal campsites.

Victorian Aboriginal Heritage Register (VAHR) site cards have been completed and lodged for the scarred trees identified during the current assessment. AAV have not yet issued VAHR site registry numbers for these sites so they are referred to by field, rather than VAHR numbers, in the draft report.

Non-Aboriginal Historic Sites

Two non-Aboriginal historic sites were recorded during the field survey. These sites were pylons and brick rubble associated with an 1886 wooden irrigation weir constructed on the Campaspe River and a small surface artefact scatter of nineteenth century bottle glass and non descript white-bodied ceramics. The artefact scatter was located in a road reserve to the west of the Echuca Cemetery.

Heritage Inventory forms have been completed for both sites and have been lodged with Heritage Victoria. HV have not yet issued Heritage Inventory numbers for the two sites.

E3 Assessment of Potential Impacts

A preliminary assessment of potential impacts is contained in Section 6.0 of the report. This has been prepared with reference to a VicRoads impact reference table (see Table 2). In summary, the assessment of impacts of the different options has been:

Option 2A

Option 2A may potentially be very poor to poor depending on the method of construction used over the sandhill and satisfactory measures being developed to mitigate impacts on the scarred trees. It will require statutory approval in the form of a CHMP. There is a high risk that significant archaeological sites and human remains may be found in the sandhill which could impede the approval of a CHMP under the *Aboriginal Heritage Regulations 2007* and/or require substantial archaeological salvage.

There is also some concern about indirect impacts of the construction of Option 2A. Construction of the latter option would effectively turn the sandhill into an 'island' sandwiched between the road and the edge of Echuca's residential precinct and the sporting and recreational facilities on the precinct. This will potentially mean that the area will become more accessible and more difficult to manage effectively. There are scarred trees situated on the sandhill and these plus any cultural materials in the sand deposits themselves are potentially at risk from visitation and inadvertent development, if this option is constructed.

Option 2B

Option 2B ranks very well in terms of performance. Although a statutory approval in the form of a CHMP will be required for this option, it avoids impacts to any Aboriginal or historic archaeological sites and avoids impacts on the sandhill. This option also crosses the sandhill in a location and using a construction method that was previously agreed to with the Yorta Yorta Nation Aboriginal Corporation when assessing an earlier alignment.

Option 2B does not impact on any of the historic sites recorded during the field survey.

Option 2C

Option 2C ranks very poor to poor in terms of performance, principally for the same reasons as Option A, but also because it potentially affects four scarred trees, although it will be possible to mitigate impacts on the latter. As with Option A, there is also a greater risk of indirect impacts Option 2C also directly impacts on the historic site MW2-H2 which is of low scientific and historical value. However, it will still be necessary to obtain a Consent to Disturb a site on the Heritage Inventory if this Option is constructed. It is unlikely that a Consent would be refused, but there may be some minor salvage requirements.

Option 2D

Option 2D performs well. It does not impact on any Aboriginal heritage places or the sandhill, for the same reasons as Option 2B. However it does impact on the historic archaeological site MW2-H1. The site is of low scientific and historical value, but it will still be necessary to obtain a Consent to Disturb a site on the Heritage Inventory if this Option is constructed. It is unlikely that a Consent would be refused, but there may be some minor salvage requirements.

E4 Management Recommendations

The preparation of a mandatory Cultural Heritage Management Plan (CHMP) for all options will be required by the *Aboriginal Heritage Regulations 2007* (see Sections 7.1 and 7.1.1). It is not yet possible to provide detailed management recommendations for heritage sites on each alignment, given that the construction methods to be used have not been identified. Some general recommendations for each option are provided here, but more detailed recommendations must be included in the future CHMP for the preferred alignment.

Recommendation 1

If Options 2A or 2C are adopted, the method of construction will need to avoid, as far as possible, any excavation on the sandhill. Any areas where excavation is necessary will need to undergo further investigation in the form of sub-surface testing prior to the approval of any CHMP. Sub-surface testing will be required irrespective of whether there has been prior excavation of the sandhill, since there is a considerable depth of sand at Reflection Bend. There is also a greater risk that significant archaeological sites or human burials may be discovered during testing for or construction of this Option.

VicRoads will be required to obtain an approved CHMP pursuant to the *Aboriginal Heritage Act 2006 and Aboriginal Heritage Regulations 2007* if this alignment is adopted.

Recommendation 2

If Options 2A or 2C are adopted, there may be a requirement to develop a long-term heritage management strategy for the balance of the sandhill between the tennis club and the road alignment. The heritage management strategy would need to be negotiated with the Yorta Yorta Nation Aboriginal Corporation. The heritage management strategy would need to address the indirect impacts of either alignment and the long-term heritage management of the sandhill. VicRoads would need to negotiate with any future management authorities about adoption of the management plan.

Recommendation 3

Of the four alignments currently under consideration, Option 2B is the preferred from a heritage perspective. This is because it has no impacts on Aboriginal or non-Aboriginal historic cultural heritage, because it avoids impacts to the sandhill and will be constructed over the sandhill on a route and by a method previously agreed to with the Yorta Yorta Nations Aboriginal Corporation. No further sub-surface testing will be required for this Option.

VicRoads will be required to obtain an approved CHMP pursuant to the *Aboriginal Heritage Act 2006 and Aboriginal Heritage Regulations 2007* if this alignment is adopted.

Recommendation 4

If Option 2D is selected, VicRoads will need to apply to Heritage Victoria for a Consent to Disturb site MW2-H2, which is currently in the process of being listed on the Heritage Inventory. Option 2D avoids impacts on Aboriginal or non-Aboriginal historic cultural heritage, because it avoids impacts to the sandhill and will be constructed over the sandhill on a route and by a method previously agreed to with the Yorta Yorta Nations Aboriginal Corporation. No further sub-surface testing will be required for this Option.

VicRoads will be required to obtain an approved CHMP pursuant to the *Aboriginal Heritage Act 2006 and Aboriginal Heritage Regulations 2007* if this alignment is adopted.

Recommendation 5

The scarred tree site 7825-0398 should be retained within the roundabout at the intersection of the Murray Valley Highway and Warren Street, which will be constructed for all options. The method of long term preservation should be developed in consultation with Yorta Yorta Nation. Specific recommendations for the conservation of the tree should be included in any future CHMP.

Recommendation 6

The scarred tree 7825-0386 is situated within an embankment adjoining the north side of the road on all road options. A retaining wall must be built within the embankment around the tree. A qualified arborist must be employed to advise on the construction of the embankment, the most appropriate method of conservation and drainage of the tree, lopping of branches and treatment for insects. The arborist's report should contain recommendations for the long term management and maintenance of the tree. VicRoads must implement the maintenance schedule.

Recommendation 7

The scarred trees with the ROW for Options 2A-2C should all be retained. It is not possible to recommend the specific method by which the trees should be retained at this stage. Recommendations for the conservation of these trees should be developed in consultation with Yorta Yorta Nation and should be included in any future CHMP.

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1.0 Introduction

VicRoads have requested the preparation of an Aboriginal and Historic assessment of four alignment options for a crossing of the Murray River. All four options are situated at Echuca in Victoria. The location of the study corridors is shown in Map 1. The exact length and width of the options have not been determined at this stage, but they may be up to 90-100m wide in places. There are four proposed Options:

- Mid-West 2 Option 2A commences at the intersection of the Murray Valley Highway and Warren Street. It passes close to Reflection Bend in the Murray River and exits near the boat ramp in Victoria Park.

- Mid-West 2 Option 2B commences at the intersection of the Murray Valley Highway and Warren Street. It passes to the north of the Echuca Cemetery, crosses the Campaspe River near the former Echuca Secondary College and the Echuca Tennis Courts, then exits near the boat ramp in Victoria Park.

- Mid-West 2 Option 2C commences at Warren Street immediately west of the Echuca Cemetery. It also passes close to Reflection Bend on the Murray River and then exits near the boat ramp in Victoria Park.

- Mid-West 2 Option 2D also commences on Warren Street immediately west of the Echuca Cemetery. From this point it passes north of the cemetery and follows the approximately alignment of Option 2B, and exits near the boat ramp in Victoria Park.

The locations of the four alignment options are shown in Maps 2-5. At this stage, the alignment options are not finalised.

This report is not a Cultural Heritage Management Plan (CHMP) pursuant to the Aboriginal Heritage Act 2006. The assessment has been carried out in association with the Yorta Yorta Nation Aboriginal Corporation. The Yorta Yorta Nation Aboriginal Corporation is a Registered Aboriginal Party under the Aboriginal Heritage Act 2006 (Vic), and has responsibilities under that Act in relation to the management and administration of Aboriginal Cultural Heritage matters in the study corridors where the works will take place.

A separate CHMP will be prepared by VicRoads for the activity.

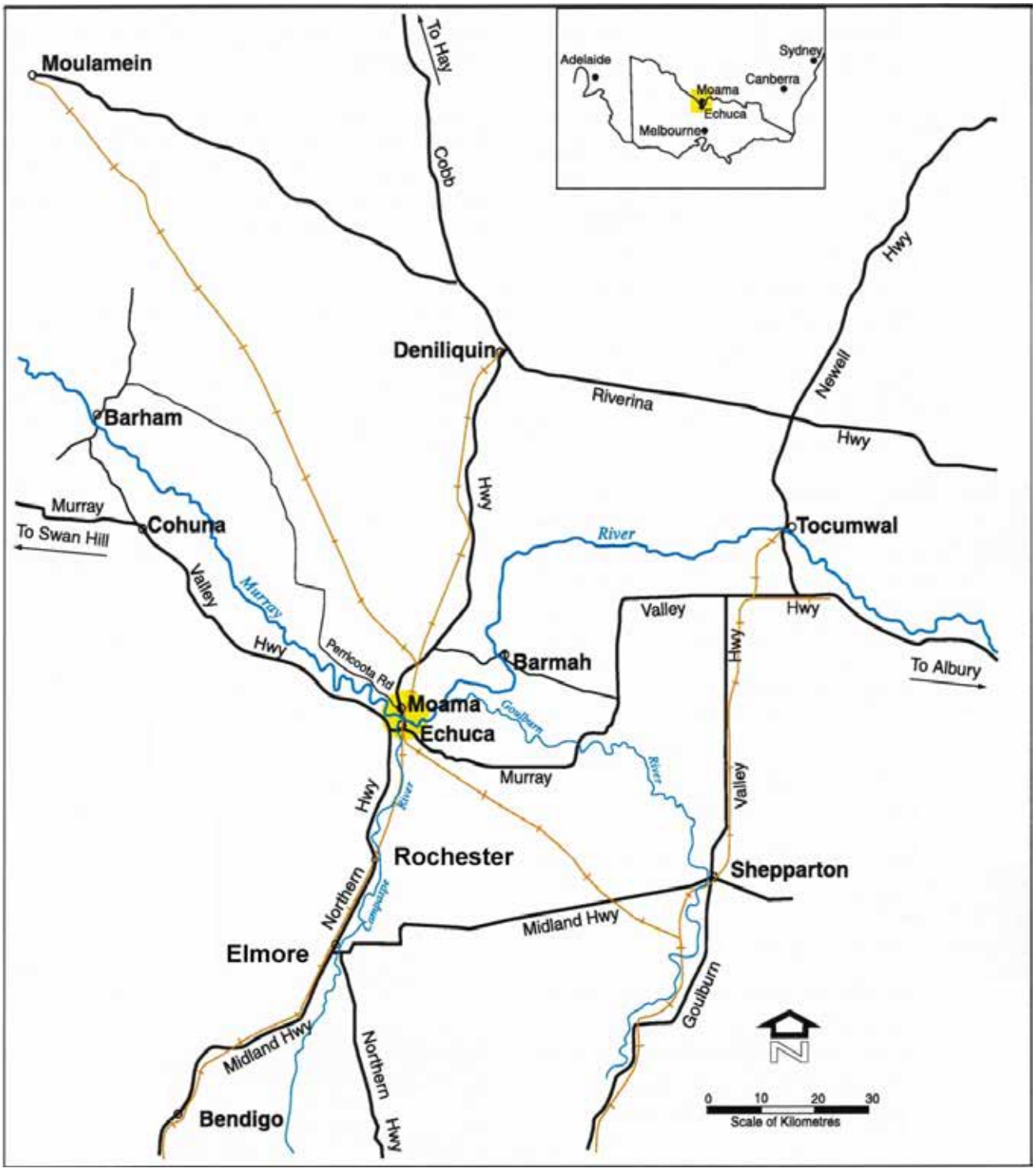
The objectives of the EES assessment as defined in the project brief issued by VicRoads are:

- A clear description of the cultural heritage values of the study corridors based on collated existing data the provider's field investigations and consultation with cultural heritage stakeholders;
- Appropriate liaison with cultural heritage stakeholders regarding the identification, significance and management of cultural heritage within the study corridors;
- An objective assessment of the potential impacts of proposed alignments on identified cultural heritage values;
- A description of any opportunities to avoid or mitigate potential impacts through design or environmental management processes prior to or during construction;
- An assessment of the likely resultant level of impacts if mitigation measures were

adopted; and

- An appraisal of any implications for the project arising from relevant State and Commonwealth legislation or policy;
- Provide recommendations for any subsurface testing required.

This report describes the commission of the above tasks, the results of fieldwork, an assessment of potential impacts on Aboriginal heritage and preliminary management recommendations for the alignments.



Map 1: Location of the Study corridors

Map 2: Echuca Mid-West 2 Alignment Option 2A

Map 3: Echuca Mid-West 2 Alignment Option 2B

Map 4: Echuca Mid-West 2 Alignment Option 2C

Map 5: Echuca Mid-West 2 Alignment Option 2D

2.0 Location and Description of Study Corridors

These proposed major roadworks are located in Echuca in the Shire of Campaspe in Central Northern Victoria and provide for the construction of a second crossing of the Murray River between Echuca in Victoria and Moama in New South Wales.

The road alignments are located on the western side of the township of Echuca which is considered to be that area which is located to the north of the east-west section of the Northern Highway, also known as Ogilvie Avenue and east of Wharparilla Drive. The road alignments commence at Warren Street, on the western side of Echuca. They pass through both freehold and Crown Land situated on the floodplain of the Murray River. The Crown Land is open eucalypt woodland. There is an extensive sandhill which extends between the former Echuca Secondary College and Reflection Bend on the Murray River. All of the proposed options cross the sandhill at some point. The sandhill also contains stands of remnant Murray Pine. Options 2B and 2D cross a small section of the sandhill near the former Echuca Secondary College. Options 2A and 2C cross a longer section of the sandhill near Reflection Bend.

Although it has been formerly logged, the current land use of the Crown Land is largely passive recreation. The Echuca Scenic Drive extends from Victoria Park to the junction of the Murray and Campaspe Rivers, then follows the north bank of the Campaspe eastwards to Victoria Park. There are several other vehicle tracks throughout the study corridors. Much of the freehold land is regenerated open eucalypt woodland or grey box and more rarely, black box.

3.0. Aboriginal Cultural Heritage Assessment

3.1. Desktop Assessment

The aim of the desktop assessment was 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:

- The site registry at AAV and previous archaeological studies, to identify any previously registered Aboriginal archaeological sites either within or surrounding the Study corridors and the results of previous archaeological assessments. AAV Registry searches were carried out in 2007, 2008 and 2009 during the preparation of due diligence assessments of a broader study corridor and route options. The site registry was most recently accessed on 27/54/2010 to review the registered Aboriginal archaeological sites within the Study corridors;

- Standard ethnographic sources to identify the likely traditional owners and a review of any written and oral local history regarding Aboriginal people in the Echuca area;

- The landforms or geomorphology of the Study corridors and identification and determination of the geographic region of which the Study corridors forms a part that is relevant to the Aboriginal cultural heritage that may be present in the Study corridors;

- Environmental resources available to Aboriginal people within the geographic region of the Study corridors; and

- The land-use history of the Study corridors, particularly evidence for the extent and nature of past land disturbance.

This information was used to produce an archaeological site prediction model (Section 5.1.8). The site prediction model assists in determining the type of archaeological sites which may potentially occur within the Study corridors, 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 to design a fieldwork strategy for investigating the Aboriginal archaeological sites, by, for example, allowing the field team to target areas which have a high probability of containing archaeological sites. However, areas or landforms which were assessed as having a low probability of containing Aboriginal archaeological sites were also assessed, in order to test the effectiveness of the site prediction model. No obstacles were encountered during the preparation of this desktop assessment.

3.1.1. Search of the Victorian Aboriginal Heritage Register

A search of the Victorian Aboriginal Heritage Register (VAHR) for sites and reports relating to the geographic region of the Study corridors was undertaken on 16/05/2011. The results of this search are discussed and summarised below in Sections 3.1.3 and 3.1.4.

3.1.2. The Geographic Region

The geographic region, in which the Study corridors is located, is that of the township of Echuca which, for the purposes of this Cultural Heritage Management Plan, is considered to be that which is located to the north of the east-west section of the Northern Highway, also known as Ogilvie Avenue and east of Wharparilla Drive. The township of Echuca contains environmental conditions that can be considered to be a microcosm of the broader Murray River floodplain.

3.1.3. Aboriginal Places in the Geographic Region

As part of the desktop assessment for this EES, a search of the Victorian Aboriginal Heritage Register [VAHR] was undertaken on 16/05/2011.

There are 61 registered Aboriginal archaeological sites located within the geographic region of the study corridors.

The vast majority of Indigenous archaeological sites located within the geographic region of the Study corridors are scarred trees or have a scarred tree component (n=48, 79%). Shell middens (n=8), artefact scatters (n=3), earth features (n=2), Aboriginal places (n=1), and human burials (n=1) are also represented in the archaeological record of the geographic region.

Owing to the large size of the study corridors, the small size of the geographic region and the large number of Indigenous archaeological sites located in close proximity to the Study corridors, it is not logical to discuss each of the previously recorded Indigenous archaeological sites within a given radius i.e. 1km, of the Study corridors. Instead, a brief summary of those Indigenous archaeological sites located immediately adjacent to the study corridors are presented below in Table 2.

Table 1: Previously registered Aboriginal archaeological sites within or near the study corridors.

VAHR No.	Site Name	Site Type	Proximity to Study corridors
7825-0378	Murray Scar Tree 10	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0381	Murray Scar Tree 13	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0377	Murray Scar Tree 9	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0379	Murray Scar Tree 11	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0383	Murray Scar Tree 15	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0380	Murray Scar Tree 12	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0382	Murray Scar Tree 14	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED

VAHR No.	Site Name	Site Type	Proximity to Study corridors
7825-0406	River Walk Scarred Tree 1	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0369	Murray Scar Tree 1	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0395	Murray Scar Tree 20	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0384	Murray Scar Tree 16	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0370	Murray Scar Tree 2	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0405	Murray Scar Tree 29	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0387	Murray Scar Tree 19	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0372	Murray Scar Tree 4	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0373	Murray Scar Tree 5	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0038	Victoria Park 2	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0040	Victoria Park 4	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED
7825-0374	Murray Scar Tree 6	Scarred Tree	THIS INFORMATION HAS BEEN REMOVED

Human Burials

All of the alignments cross a sandhill which is situated between the former Echuca Secondary college and the Murray River. There has been some concern expressed about the potential of the alignments to impact on human burials within the sandhill. Therefore, a search of human burials recorded in a wider area around Echuca was carried out, to help assess the likelihood that burials could be found in the sandhill.

This wider search around the Echuca Township covered a rectangular area with Echuca in the centre. The search covered an area of 1321.6km^2 around the location once covered by paleo Lake Kanyapella and the related sand dunes that still exist in the region today. The rectangle covered 23kms to the west and 23kms to the east and 15kms in both north and south directions. As Echuca is on the border with New South Wales, both the Victorian Aboriginal Heritage Register (Using the Aboriginal Cultural Heritage Register Information System (ACHRIS) portal) and the Aboriginal Heritage Information Management System (AHIMS) of New South Wales was searched on 30th July 2012.

The search found that there was a pattern in the landforms selected for burials in Victoria. The majority of burials were found to be located on sand hills or lunettes that were once associated with paleo Lake Kanyapella. A smaller number of burials are located on lowland and alluvial plains. Further, the majority of the registrations on the VAHR were multiple burials in the sand hills or lunettes. It was found that there were up to 12 registrations of burials on the AHIMS system in the area of NSW searched. The landforms upon which these burials sit was not found during the search. Table 2 summarises the land forms and the approximate number of registrations associated with them.

Table 2: The number of Burials found in the search area around the Echuca Township and Lake Kanyapella and the landform(s) upon which they occur.

Number of Burials	Landform	State
>3	Sand Bank	Victoria
>2	Lunette	Victoria
1	Recent Alluvial Plain	Victoria
1	Lowland Plain	Victoria
12	Unknown	New South Wales

A previous study by Colin Pardoe (1998) investigated the distribution, sex and grave goods of burials in far north Victoria and southern New South Wales. Pardoe (1998: 7) found that burials occurred on "…sandy country, single burials are very common. Most sand dunes have one or a few graves". Further, single burials are often found in proximity to dense scatters of stone tools and hearths which are all buried at different stratigraphic levels that cover huge time spans (Pardoe 1998: 7). At cemeteries, the remnants/evidence of campsites, revisited over long periods of time, are absent (Pardoe 1998: 7). Pardoe (1998) found that burials in proximity to the Murray River were even numbers of men and women. There is a chance that a cemetery may occur, as cemeteries occur on the same landforms (Pardoe 1998).

3.1.4. Previous Archaeological Work in the Geographic Region

There have been a number of previous archaeological studies in the geographic region of the township of Echuca . Early archaeological research in the region tended toward broad regional studies of the Murray River floodplain i.e. Thorne (1975), Nelson (late 1980s), Craib (1991), and Pardoe (1995) however, more recently there have been a number of archaeological studies, including Cultural Heritage Management Plans, for proposed developments within the geographic region. A synthesis of the previous archaeological studies in the geographic region most relevant to the current Study corridors is presented below.

Previous archaeological research in the geographic region and the broader Murray River floodplain has provided evidence of human occupation dating to at least 30,000 years (Pardoe 1995).
Archaeological excavations by Alan Thorne at Kow Swamp, 50 km north-west of Echuca in the central Murray Valley, between 1968 and 1972 recovered the partial skeletal remains of more than 22 individuals (Thorne 1975, 1976; Thorne and Macumber 1972). Radiocarbon dates obtained dated to between 6500 BP -13,000 BP. The Kow Swamp remains are consistent with well dated skeletons like Nacurrie 1 and support a terminal Pleistocene date for some of the burials. Several years ago the Kow Swamp skeletons were reburied at the request of Aboriginal communities in northern Victoria.
After 30 years the age of the Kow Swamp burials, particularly KS 9 which was the only burial excavated in situ, has recently been revisited. Stone and Cupper (2003) report optically stimulated luminescence (OSL) dates for Kow Swamp which they argue are at odds with the published radiocarbon dates. Their OSL dates indicating to them that the cemetery was in use between 22,000 and 19,000 years ago.

A recent synthesis of archaeological information on the development of Aboriginal society along the cental Murray over the past 30,000 years ago is provided by Pardoe (1995). He argues that site locations and contents reveal that lakes have always been 'nodes for occupation and group affiliation' for the region. This pattern is particularly evident after 16,000 years ago with the development of shell middens. The most dramatic changes occur 7000 years ago with the

development of large numbers of social groupings along the Murray, which Pardoe argues is a response to the establishment of rich riverine resources. Pardoe argues that increased social differentiation and territoriality is reflected in a decrease in skeletal size caused by localised gene pools, the use of cemeteries, headbinding and tooth avulsion as related markers of group association (Pardoe 1995). Webb later noted that bone pathologies on burials within the last 1000 years in the Central Murray reveal patterns consistent with a high and segregated population. Webb states that late Holocene stresses in Aboriginal skeletal remains from the Central Murray are a reflection of the 'the health of a large, sedentary population intensifying its economy to feed itself' (Webb 1995).

In the late 1980s, an archaeological field survey on the floodplain of the Murray River within and around the present study corridors was carried out by Gary Nelson, a former Aboriginal site officer with the former Victoria Archaeological Survey (VAS). Yorta Yorta Aboriginal community representatives stated that during this survey, a number of scarred trees had been recorded; however, it appears that these trees were not registered with either the VAS or AAV.

In 1989, Weaver undertook an archaeological assessment of a proposed pipeline between Kyabram and Echuca. It was predicted that likely site types would be mounds located in 'undisturbed areas of bushland, creek banks and high, dry areas in swamp land'. A survey of the route later confirmed this site prediction model, with two artefact scatters, five isolated artefacts and five scarred trees located.

Craib's (1991) study of the Moira, Millewa and Gulpa State Forests resulted in the recording of 149 sites comprising 68 cultural deposits, 61 scarred trees, 15 shell middens, 2 cemeteries, 2 traditional areas and only 1 stone artefact scatter. High site densities were noted along watercourses (1.5/km) whereas site densities for floodplains were extremely low and consisted of mostly scarred trees.

In 2000, Rhodes surveyed part of the land within the current Study corridors on the NSW side of the Murray River during an assessment of the Central Option for the second Murray River Crossing (Terra Culture Pty Ltd, 2000). On the NSW side of the Study corridors, the previous survey of the private land found that the area had been extensively disturbed by earthworks, including the construction of drains which criss-cross the area and the construction of earth levees (TerraCulture Pty Ltd, 2000). The native vegetation across much of this area was regenerated Eucalypt woodland, with very little understorey. No sites were located in the section of the present study corridors that was surveyed in 2000. It was considered highly unlikely that significant Aboriginal sites would have survived in this area, due to the extent of ground disturbance on the floodplain. There are no specific landforms of high archaeological significance, such as sandhills, within this area.

On the Victorian side of the Murray River, it was found that there is a high probability that Aboriginal archaeological sites would be found, particularly on the floodplain of the Murray River. Site types are most likely to consist of scarred trees and shell middens. In addition to this, the sandhill on which Warren Street is located and the sandhill to the north of the Echuca Secondary College were identified as being areas of high archaeological sensitivity for Indigenous human burials.

Rhodes (2000) generated a site prediction model for the Murray River floodplain which is as follows:

- There will be higher density of archaeological site types close to the banks of the Murray River and Campaspe River. This site distribution may be partly a reflection of post-contact land clearance during the nineteenth century.
- There will be a greater range of archaeological site types and complex occupation sites near river banks including scarred trees, shell middens, mounds and human burials. Land clearance may have disturbed sites.
- Scarred trees are likely to occur on all landforms.
- Human burials may be located near river banks
- Aboriginal occupation sites are most likely to date from the mid-Holocene (5000 years ago).

Bell (2005) conducted an investigation of the proposed residential Wharparilla estate approximately 1km west of the current Study corridors. The archaeological survey located four scarred trees on the Murray River floodplain. Bell considered that poor ground surface visibility obscured archaeological sites, and land modification activities associated with European activities within the Study corridors would have severely disturbed Indigenous archaeological sites.

Rhodes (2008) prepared a Cultural Heritage Management Plan to a complex assessment for a proposed footbridge and pedestrian pathway crossing the east and west banks of the Campaspe River at Anstruther Street, Echuca. No Aboriginal cultural materials or evidence of Aboriginal archaeological sites was found in either the test pit or the augur holes. The excavation of the test pit demonstrated that the soil at the site of the screw pile on the east bank of the Campaspe River is extensively disturbed. The soil in the test pit was comprised entirely of fill (Rhodes 2008: iv).

Rhodes (2009) prepared a Cultural Heritage Management Plan to a complex assessment for a proposed footpath and footbridge alignment linking Eyre Street to Campaspe Boulevard and crossing the Campaspe River. No archaeological sites were found within the Study corridors. The complex assessment demonstrated that the study corridors has been significantly disturbed (Rhodes 2009: v).

Young and Rhodes (2009) prepared a Cultural Heritage Management Plan to a complex assessment for a proposed shared walking and cycling track along the west bank of the Campaspe River between Anstruther Street and Warren Street, Echuca. A single Aboriginal archaeological site, a scarred tree was identified during the standard assessment. The scarred tree was registered with the VAHR as River Walk Scarred Tree 1 (7825-0406 [VAHR]) and is a grey box scarred tree located on the alluvial flat of the west bank of the Campaspe River, Echuca. No Aboriginal cultural materials or evidence of Aboriginal archaeological sites was found in either the test pit or the auger probes. Glass (clear and brown beer bottle) was consistently found in the top 400mm of the auger probes. This suggests that the top 400mm of the soil profile is likely to be recent alluvium deposited in historical flooding events (Young and Rhodes 2009: vi).

Thus, previous archaeological research has shown that the geographic region has been occupied by humans for at least 30,000 years. Human occupation in the geographic region has been consistently related to the proximity of fresh water sources. Indeed, of the many previous archaeological studies undertaken in the geographic region, the vast majority has concluded that a strong correlation exists between proximity to major watercourses and Indigenous archaeological sites. It has been shown (Craib 1991 and Rhodes 2000) that in close proximity to major watercourses Indigenous archaeological sites are more numerous and the site types more varied, whereas on the floodplain sites are less numerous and scarred trees tend to be only site type represented. The most recent archaeological research in the geographic region (Bell 2005,

Rhodes 2008, Rhodes 2009 and Young and Rhodes 2009) has commented on the high level of ground disturbance in close proximity to the major watercourses of the Murray River and the Campaspe River.

3.1.5. Ethnography

Few written published descriptions of 'traditional' Aboriginal life ways for the current Study corridors exist, but a detailed account is provided by Edward M. Curr who established the 'Tongala' Station on the lower Goulburn in 1841 (Curr 1883, 1887a). Curr made detailed recordings of Aboriginal culture along the Murray Valley. Other researchers have considered his accounts to be consistent with Aboriginal people living in a resource rich environment (Craib 1991: 67).

The Study corridors is situated within the clan estates of the Yorta Yorta language group (Clark 1990: 398). The Yorta Yorta all spoke related dialects and were thought to number around 1200 people in 1841 (Curr 1883: 234).

The Yorta Yorta were reportedly located at a place, which is now Echuca and went 'out to join some of the Goulburn River tribes' (Morgan 1952: 3 cited in Clark 1990: 398, Curr 1883, 1887a). This is supported by Robinson's account of the Yorta Yorta occupying 'the country extending east from the junction of the Goulburn with the Murray Rivers for 20 miles' (In Clark 1990: 399).

It is believed the Yorta Yorta language group was comprised of 15 clans, and although the earliest reference to the group dates from 1839, most of the information does not include specific locational data for clans (Clark 1990: 398). Uncle Henry Atkinson, an elder of the Yorta Yorta, has indicated that members of the Wollithiga clan are the traditional owners in the region of the Study corridors (cited in Bell 2005: 5). Curr (1883) noted that the region of Echuca belonged to the 'Wollithiga' who numbered 50 people. Curr believed that the Wollithiga had seceded from the core area of the Bangerang language group, which was located further east.

Curr's ethnographic accounts of the traditional owners of the Echuca region indicate that subsistence activities were variable, drawing on riverine and terrestrial resources. Curr did not comment on the Wollithiga people specifically, but noted that the neighbouring Towroonban were mostly 'opossum hunting people', while the Wongatpan 'lived chiefly on fish and roots', and rarely left the banks of the Murray and the swamps and reed beds in the immediate vicinity. It is likely therefore that the primary subsistence activity of different groups was influenced by environmental setting.

Dr. Wayne Atkinson states that the Yorta Yorta peoples' lifestyle and culture was based on hunting, fishing and collecting food from the variety of food sources provided by the ancestral lands. He further states that being river based people the majority of time was occupied by fishing, as the majority of food that was provided came from the rich network of rivers, lagoons, creeks and wetlands which are still regarded as the life source and the spirit of the Yorta Yorta Nation (Atkinson on YYNAC Website, Accessed 30/07/2010).

The emphasis on fish for riverine groups is also emphasised by Locke (1878: 290). Curr noted that fish were speared, poisoned or trapped in weirs (1883: 240-241), and kangaroo, emu, a wide range of birds, reptiles, amphibians and insects were also eaten (Curr 1883: 240-266).

Stone suitable for the manufacture of tools is rare within the region. Curr (1883: 273, McNiven and Russell 1996: 12) observed that Yorta Yorta territory was devoid of stone suitable for the manufacture of stone tools. He noted that stone for cutting and scraping implements was obtained from the Ngooraialum and Pimpandoor people further to the south, spear barbs were obtained by 'barter'. Locke (1878: 298-99) alludes to the exchange of reed spears from the lower Goulburn and Murray River area, and stone axes from Mount William near Lancefield, Central Victoria.

The arrival of Europeans had a devastating impact on the Yorta Yorta people. It is estimated that within the first generation of the European invasion, the Yorta Yorta population of approximately 6,000 was reduced by 85% (Atkinson on YYNAC Website, Accessed 30/07/2010).

In 1858, the Board for the Protection of Aborigines was established following a Parliamentary Select Committee inquiry. This moved to relocate Aboriginal people to missions and stations throughout the state. Aboriginal people living in the vicinity of the Study corridors were relocated to Coranderrk, near Healesville. When Maloga mission was established near Barmah in 1874, many people returned to traditional country. In 1883, 1800 acres adjacent the Maloga site, was gazetted by the NSW government for the purpose of accommodating the Murray River tribes. It was renamed Cummeragunja in 1889 and has continued in some form to the present day (Atkinson and Berryman 1983; Yorta Yorta Aboriginal community v The State of Victoria and Others 1998: 17-19, TerraCulture 2000:8; Bell 2001: 10).

In 1939, the residents of Cummeragunja 'walked off' in protest against the living conditions, the leasing of most of the reserve land to a European, and the oppressive laws of the reserve system (Bennett 1991: 5).

Between 1860 and 1994 there were approximately 18 separate attempts to claim land and compensation by the Yorta Yorta community. The only land that has been returned is 1200 acres of the former Cummeragunja Reserve, which was originally 2965 acres.

The formal structure of representation for Yorta Yorta rights and interests in their ancestral lands has been an evolving process. Since 1999, the Yorta Yorta people have been represented by the Yorta Yorta Nations Aboriginal Corporation (Atkinson on YYNAC Website, Accessed 30/07/2010).

3.1.6. Environmental Conditions in of the Study corridors

Landforms and Geomorphology

The Study corridors is located on two geomorphic units; the western half being located on 'Older Alluvium – Shepparton' and the eastern half being located on 'Riverine Plain Present Floodplain – Murray Valley'.

The Study corridors is also located on two landforms; the western half being located on 'Plain above flood level (relative relief <9m)' and the eastern half being located on 'Present Floodplain'.

The Study corridors is located on two geological formations. Much of the western half of the Study corridors, that which runs along Warren Street, is aligned along a low-lying floodplain formed by Cainozoic deposits of alluvium that form part of the Shepparton Formation. The Shepparton Formation within the Study corridors comprises floodplain deposits of clay, sand, silt and gravel (DPI Geovic Interactive Map Accessed 2008). In areas of better drainage the soil profile on the Shepparton Formation consists of red-brown sodic duplex soils.

A prominent sandhill, a relict aeolian landform, is situated north of Warren Street. The sandhill extends across the area between Nolan Street, Homan Street and about 50 metres north of Jarman Street and is the site of the Echuca cemetery (Map 2). The sandhill and cemetery are outside and north of the Study corridor.

The section of the Study corridors from the intersection of Warren Street and Campaspe Esplanade and north to the Campaspe River , is located on the geological formation 'Unnamed Alluvium'. 'Unnamed Alluvium', is comprised of recent Quaternary alluvium containing such deposits as gravel, sand, silt and clay and forms part of the present floodplain of the Murray River and the Campaspe River (DPI Geovic Interactive Map, Accessed 14/1/2009).

To the west of the Echuca Secondary College is a second sandhill, a relict aeolian landform. The sandhill is covered with largely regenerated red gum and box woodland, but also contains the only remnant stand of Murray Pine in the local area. Damien Morgan-Bulled (pers. comm. 2009) stated that the sandhill is a source bordering dune created after the breaching of Lake Kanyapella. Approximately 30,000 years ago, tectonic movements along the Cadell Fault resulted in the formation of a natural dam across the Murray River (VEAC, n.d. 21). An ancient shallow lake, referred to as Lake Kanyapella, formed to the west of the natural dam (VEAC, n.d. 21). At drier times, sand and clay from the lake floor has blown into lunettes, the largest of which is the Barmah Sandhill which is situated on the east and north-east edges of the former Lake Kanyapella (VEAC, n.d. 29). Some 8000 years ago, the lunette bordering Lake Kanyapella was breached, diverting water from the Murray into the Goulburn River. Damien Morgan-Bulled pointed out that the source bordering dune is likely to be more recent than c. 8000 years ago, as it would be associated with a more recent course of the Murray River.

In NSW, the study corridors crosses the floodplain of the Murray River, which is entirely formed on 'Unnamed Alluvium'. A sandhill, a relict aeolian landform, probably associated with a prior stream, is situated about 300 metres to the east of the Study corridors. The floodplain is covered with recently regenerated red gum woodland (Plates 5 and 10) with almost no understorey vegetation. Near the intersection with Meninya Street in Moama, the Study corridors is again located on the alluvial plain associated with the Shepparton Formation. In NSW the study corridors crosses the floodplain near a large sand hill identified during the 2007 field survey, but

does not cross the sandhill itself. The sandhill has been extensively mined, but there are remnant sand deposits around the boundaries of the mining pit.

Climate

Temperature averages at Echuca indicate a warm maximum average of 5°C in July to 30°C in January. Minimum average temperatures throughout the year range from 3.0°C in July to 15°C in February. The annual average rainfall for the area is 700mm. These climatic conditions would have placed no restrictions on Indigenous or European occupation of the area (Bureau of Meteorology Website, Accessed 2008).

Water Sources

Two major watercourses, the Murray River and the Campaspe River flow through the current Study corridors. The Murray River and the Campaspe River provided a permanent water source, thus freshwater is likely to have been available during all seasons. The proximity of two major watercourses to the Study corridors is likely to have influences both Indigenous and European settlement of the Study corridors and the geographic region more generally. In addition to the Campaspe River and the Murray River, there were two 1788 wetlands located within the geographic region. These wetlands, both shallow freshwater marshes, were located in close proximity to the Murray River and would, like the Murray River, have undoubtedly provided not only a potable fresh water source but also wetland species of flora and fauna as resources to Indigenous people.

Description of Pre-Contact and Existing Vegetation

The vegetation communities which survive in the study corridors today have been substantially modified since European settlement. Prior to and at the time of European settlement, the land at the western end of Warren Street would have been characterised by Plains Grassland (EVC 132) (DPI Biodiversity Interactive Map, Accessed 29/07/2010). The vegetation of the land along Warren Street would have been Riverine Chenopod Woodland (EVC 103) (DPI Biodiversity Interactive Map, Accessed 29/07/2010). Near the Campaspe River crossing, the alignment would have run through Grassy Riverine Forest (EVC 106), Riverine Grassy Woodland (EVC 295) and Floodplain Riparian Woodland (EVC 56). Between the north side of the Campaspe River and the Murray River, the vegetation was predominantly Plains Grassland (EVC 132), with a Riverine Grassy Woodland/Sedgy Riverine Forest mosaic (EVC 255) charactering the banks of the Murray River (DPI Biodiversity Interactive Map, 14/1/2009).

Plains Grassland (EVC 132) occurs on lowland plains on fertile clay loams of Quaternary and Tertiary origin. It is a treeless vegetation dominated by largely grass and herb life forms. Shrubs and trees may be also occasionally present. Historically, the most significant feature of Plains Grassland was the Kangaroo Grass Themeda triandra dominated ground cover.

Riverine Chenopod Woodland (EVC 103) is a eucalypt woodland with a diverse shrubby and grassy understorey occurring on most elevated riverine terraces. Confined to heavy clay soils on higher level terraces within or on the margins of riverine floodplains (or former floodplains), naturally subject to only extremely infrequent incidental shallow flooding from major events if at all flooded (Department of Sustainability and Environment Website, Accessed 29/07/2010).

Grassy Riverine Forest (EVC 106) occurs on the floodplain of major rivers, in a slightly elevated position where floods are infrequent, on deposited silts and sands, forming fertile alluvial soils.

River Red Gum forest to 25 m tall with a groundlayer dominated by graminoids. Occasional tall shrubs present (Department of Sustainability and Environment Website, Accessed 29/07/2010).

Riverine Grassy Woodland (EVC 295) occurs on the floodplain of major rivers, in a slightly elevated position where floods are rare, on deposited silts and sands, forming fertile alluvial soils. River Red Gum woodland to 20 m tall with a groundlayer dominated by graminoids and sometimes lightly shrubby or with chenopod shrubs (Department of Sustainability and Environment Website, Accessed 29/07/2010)

Floodplain Riparian Woodland (EVC 56) is an open eucalypt woodland over a medium to large shrub layer with a ground layer consisting of amphibious and aquatic herbs and sedges. Occurs along the banks and floodplains of the larger meandering rivers and major creeks, often in conjunction with one or more floodplain wetland communities. Elevation and rainfall are relatively low and soils are fertile alluviums subject to periodic flooding and inundation (Department of Sustainability and Environment Website, Accessed 29/07/2010).

Riverine Grassy Woodland/Sedgy Riverine Forest (EVC 255) is a mosaic of Riverine Grassy Woodland (EVC 295) described above and Sedgy Riverine Forest (EVC 816) which is a eucalypt forest with understorey dominated by larger sedges. Understorey composition indicative of at least occasional shallow flooding and a tolerance of gaps between floods of several years. Typically on heavy soils which can become wet in winter. It is considered to occupy areas infrequently flooded and in which flood duration may be short, typically areas that are the last to flood and the first from which floods quickly recede. Soils are typically heavy clays. The major understorey species Hollow Sedge Carex tereticaulis is intolerant of total immersion (at least in turbid water) (Department of Sustainability and Environment Website, Accessed 29/07/2010).

The vegetation in the Study corridors today is dominated by eucalypt and box trees with little or no understorey vegetation.

Fauna

A number of animals would have been present within the Study corridors 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. The Murray and Campaspe Rivers would have been a significant source of marine fauna, including fish and shellfish, such as the freshwater mussels which are commonly found in shell middens along the river (Viridians Biological Database).

Resources

Prior to European settlement, the Study corridors and surrounding land would have contained a number of resources that could have been utilised by the traditional Indigenous owners. The region would have supported a diverse range of fauna including 30 species of marsupial, 150 species of birds, and numerous reptiles (McNiven and Russell 1996: 9). The Murray and Campaspe Rivers contain several edible fish species including Bony Bream, Macquarie Perch, Silver Perch, Trout Cod, Murray Cod and catfish.

Freshwater would have been available from the evident watercourses, namely the Murray River and Campaspe River that flow through the current Study corridors. The lowland and grassy

forest that covered the Study corridors would have provided protection for camping during wet winter months. A number of plants would have been seasonally available, especially along the river and the fresh supply of water would have also attracted animals to the area.

Stone suitable for the manufacture of tools is rare within the region. Curr (1883: 273, McNiven and Russell 1996: 12) observed that Yorta Yorta territory was devoid of stone suitable for the manufacture of stone tools. He noted that stone for cutting and scraping implements was obtained from the Ngooraialum and Pimpandoor people further to the south, spear barbs were obtained by 'barter'. Locke (1878: 298-99) alludes to the exchange of reed spears from the lower Goulburn and Murray River area, and stone axes from Mount William near Lancefield, Central Victoria.

3.1.7. Land Use History of the Study corridors

Initial European occupation of the land around Echuca and Moama was associated with the overland cattle routes between Victoria and NSW. Hawdon and Bonney first drove stock through Echuca in 1838, in the area around Radcliffe Street, situated south of the study corridor and then crossed the Campaspe, near the Rotary Park (Coulson, 1995: 4).

The early settlement of Echuca and Moama, stems largely from the rivalry between James Maiden and Henry Hopwood. In 1842, James Maiden was the superintendent of Perricoota Station on the NSW side of the Murray River, and, taking advantage of the traffic to meat and wool markets in Melbourne, constructed a punt across the Murray River, in the present-day town of Moama (Coulson, 1995:20-21). Maiden's punt was located well to the east of the present-day road bridge. In 1846, he constructed the Junction Inn at Moama, which was situated near the punt (Coulson, 1995:20-21).

Henry Hopwood arrived on the Murray River in 1849, and initially attempted to establish a bush inn on the Tattalia Run (Coulson, 1995: 31). This initial venture failed, and in 1852, he obtained a licence for the portion of the Wharparilla Run in Victoria, on the Junction of the Murray and Campaspe Rivers (Coulson, 1995: 35). Between 1854 and 1857 Hopwood established a punt, inn, two stores, two smiths, a doctor and a bakery to cater for travellers and residents (Coulson, 1995: 35). He subsequently constructed a pontoon and the still extant Bridge Hotel, on the corner of Hopwood Place in Echuca (Coulson, 1995: 38). The locations of Hopwood's original punt and hotel are shown on an 1857 map of Echuca township. The latter were situated within the boundaries of the township of Echuca, around 550 metres south-east of the study corridor.

The area currently known as Victoria Park, which is traversed by the study corridor, was originally part of the Wharparilla Run and was leased by Hopwood. This area of land, between the west bank of the Murray River, the junction of the Campaspe and Murray Rivers and the north bank of the Campaspe River, was known as the 'Junction Paddock' prior to being named Victoria Park (Coulson, 1995: 35, Priestley, 1965: 21). There is no evidence from historical sources, however, that any structures or buildings associated with Hopwood's settlement were associated with the Junction Paddock. The western half of the paddock was used by the police to graze their horses, and some early attempts at cultivation were made in the paddock near the Campaspe River (Priestley, 1965: 21).

The bush park area north of the Victoria Park oval and tennis courts has been used for a range of activities, including cattle grazing, sand mining, a shooting range, timber cutting for firewood, a hockey field and a reserve for social gatherings (Heather Rendle, pers. comm. 14/8/2008).

During WWII an army camp was established on the oval and the adjacent bushland was used for training (Heather Rendle, letter to David Rhodes, 20/8/2008).

The original township of Echuca was laid out to the north and east of the Campaspe River and a small section of the corridor passes through the original township area at the western end of Crofton Street. A large extant homestead, grounds and outbuildings, now known as St Leonards, is situated in this area. Parts of the original homestead were built as early as 1857, but all of these are situated east of the study corridor.

There do not appear to be any historically documented sites or places associated with the Echuca wharf precinct within the study corridor.

The Echuca Cemetery was gazetted in 1860 and the first official burial took place on 30/6/1860 (Heather Rendle, pers. comm. 14/8/2008). However the land containing the cemetery was set aside for cemetery use when the town was first surveyed in 1853 and burials took place within the cemetery between c. 1853-1860 (Heather Rendle, pers. comm. 14/8/2008, Priestley, 1965: 21). The exact location of the graves is not known, but Heather Rendle (pers. comm. 14/8/2008) believes that they would have been within 'The Circle', which is the oldest part of the cemetery. The original access to the cemetery was from Jarman Street to the north (Heather Rendle, pers. comm. 14/8/2008). The current access from Homan Street on the east side of the cemetery was established after the cemetery reserve was expanded to Homan Street (Heather Rendle, pers. comm. 14/8/2008).

Very little historical evidence for past land use has been found for the section of the study corridor which traverses the land between the east bank of the Murray River and Meninya Street in Moama. Anecdotal history provided to Bob Adams of VicRoads by a current Murray Shire Councillor, indicates that this area was repeatedly logged until recently, and that timber milling also occurred within it. There was extensive logging and removal of timber on this land after floods in 1956 and there was possibly some cropping on the site after this time (Heather Rendle, pers. comm. 14/8/2008).

3.1.8 Historic Archaeological Sites in the Study Corridors

A search was carried out of the Victorian Heritage Inventory, the Victorian Heritage Register, the Register of the National Trust and the National Heritage List. A search was also made of the local government heritage overlay. There were no historic places listed within any of the study corridors.

3.1.9. Conclusions from the Desktop Assessment

The main conclusions that can be drawn from the desktop assessment are as follows:

- A search of the AAV site registry indicated that there are 61 recorded Indigenous archaeological sites located within the geographic region, the township of Echuca. The vast majority (n=48, 79%) of the Indigenous archaeological sites located in the geographic region are scarred trees. There are also a small number of shell middens, artefact scatters and mixed sites. The highest density of recorded Indigenous archaeological sites in the geographic region occurs in close proximity to the junction of the Murray River and the Campaspe River, to the north of Warren Street.

- Previous archaeological research has demonstrated that the Murray River floodplain has been occupied for 30,000 years. From approximately 7,000 years ago there is evidence for large social groupings along the Murray River which is likely a response to the establishment of rich riverine resources. Previous archaeological research has commented on high site densities in close proximity to watercourses and low site densities on the floodplain,, with the majority of sites on the floodplain being scarred trees. In particular, previous archaeological research has commented on the impact of post-contact land clearance on Indigenous archaeological site distribution. More recent archaeological research, in the form of Cultural Heritage Management Plans, have commented on the high level of ground disturbance in the Echuca township.
- The traditional Indigenous owners of the geographic region are the 'Wollithiga' clan of the Yorta Yorta people. The lifestyle and culture of the Yorta Yorta was based on hunting, fishing and collecting food from the variety of food sources in the Yorta Yorta ancestral lands.
- The Study corridors is located within two geomorphic units. The western half of the Study corridors is located on 'Older Alluvium – Shepparton' and the eastern half is located on 'Riverine Plain Present Floodplain – Murray Valley'.
- The Study corridors is located within two geological formations. The western half of the Study corridors is located on 'Shepparton Formation' and the eastern half is located on 'Unnamed Alluvium'.
- The Study corridors is located on two landforms. The western half of the Study corridors is located on 'Plain above flood level' and the eastern half is located on 'Present floodplain'.
- The climate of the geographic region is temperate and would not have placed any restrictions on either Indigenous or European occupation.
- Fresh water was readily available within the geographic region. The Murray River and the Campaspe River both run through the geographic region and would have provided a reliable source of potable water to Indigenous occupants.
- The vegetation within the geographic region was extremely diverse and would have provided many food and utilitarian resources to Indigenous occupants.
- The fauna within the geographic region was extremely diverse comprising of terrestrial and riverine species and would have provided many food and utilitarian resources to Indigenous occupants.
- Stone resources were not readily available within the geographic region and would have been traded for with people to the south of the Yorta Yorta ancestral lands.
- The land use history of the geographic region indicates that the European activities that would have impacted on Indigenous archaeological sites are i) initial clearance of native vegetation; ii) cattle grazing; iii) sand mining; iv) grading of the floodplain; and v) construction of the township of Echuca.

It is considered to be highly likely that Indigenous archaeological sites will be located within the Study corridors.

3.2 Archaeological Site Prediction Model

A site prediction model is intended to be used as a guideline to designing the field survey and as an indication of the types of archaeological sites which may occur in a given area. The site prediction model is tested against the results of the field survey.

The results of the desktop assessment of the geographic region have indicated that the site prediction model developed by Rhodes (2000) for the Murray River floodplain is highly applicable and is as follows:

- There will be higher density of archaeological site types close to the banks of the Murray River and Campaspe River. This site distribution may be partly a reflection of post-contact land clearance during the nineteenth century.
- There will be a greater range of archaeological site types and complex occupation sites near river banks including scarred trees, shell middens, mounds and human burials. Land clearance may have disturbed sites.
- Scarred trees are likely to occur on all landforms.
- Human burials may be located near river banks
- Aboriginal occupation sites are most likely to date from the mid-Holocene (5000 years ago).

4.0 Field Assessment, Aboriginal Archaeological Sites

Two stages of the field assessment for Aboriginal archaeological sites were carried out. The first stage was a survey of a broad corridor, which was conducted on 30/5/2011. The location of the corridor is shown in Map 6. Portions of this corridor had been surveyed in previous assessments for the mid-west alignment. During the field inspection, several new scarred trees were identified. As there was not sufficient time to record them in detail during May, a second field survey was carried out between 12-14/12/2011 to record the scarred trees in detail.

During May 2011 the extent of a large sandhill in the corridor and the locations of former borrow pits were mapped using a differential GPS. This sandhill was identified in an incomplete assessment of a road corridor along Warren Street.

The field survey did not include the NSW section of the corridor showed in Map 6.

The field survey during May 2011 was carried out by David Rhodes of Heritage Insight Pty Ltd, Neville Hallam from VicRoads Northern Region and Freddie Firebrace from the Yorta Yorta Nations Aboriginal Corporation. The field survey during December 2012 was carried out by David Rhodes and Melissa Dunk from Heritage Insight Pty Ltd and Steven Morrison and Leon Wacker from the Yorta Yorta Nations Aboriginal Corporation.

4.1 Survey Methodology

In both cases, the field survey was a pedestrian survey, carried out by the team walking regularly spaced transects through the survey corridor. Because some land in the corridor surveyed in May 2011 had been surveyed previously, particular attention was given to land which had not been previously inspected.

The field team walked the areas in as closely spaced transects as possible, although at some points the thick scrub made this difficult. It was evident that the area had been logged, possibly several times, and that sand extraction had occurred on the sandhill, between the crest of the hill and Reflection Bend. The location of the sandhill is shown in Map 6.

The location of all scarred trees was recorded with differential GPS using MGA Co-ordinates. Scarred trees were recorded on Victorian Aboriginal Heritage Registry (VAHR) forms in the field. Photographs were taken of each tree and the scar. All of the scars were drawn. Place registration forms were completed and lodged with AAV on completion of the field survey.

4.2. Survey Results

4.2.1 Survey Dates and Participants

The field surveys were carried out on 30/5/2011 and 12-14/12/2011. The survey on 30/5/2011 was carried out by David Rhodes from Heritage Insight Pty Ltd, Freddie Firebrace from the Yorta Yorta Nations Aboriginal Corporation and Neville Hallam from Vic Roads. The survey between 12-14/12/2011 was carried out by David Rhodes and Melissa Dunk (Heritage Insight Pty Ltd) and Steve Morrison and Leon Wacker from the Yorta Yorta Nations Aboriginal Corporation.

4.2.2 Survey Methodology

The study corridor shown in Map 6 was subject to an archaeological survey on 30/5/2011. The total survey area was approximately 93.25ha. The purpose of the initial survey was to locate any previously unrecorded Aboriginal archaeological sites within the study corridor and to identify any landforms of potential archaeological sensitivity. It was intended to provide site locations and sensitive landform locations as GIS data to VicRoads, in order to assist them with the design of specific alignments within the road corridor. As was noted earlier, portions of the study corridor had been surveyed in previous surveys for the Murray River Crossing and these areas were not reinspected.

Because of the limited amount of time available for the survey (one day) the focus of the field team was to record the locations of any undocumented Aboriginal archaeological sites in the study corridor. Shape files showing the boundaries of the study corridor were loaded onto a differential GPS, which was then used by the field team to ensure that they were inspecting the correct area on the ground.

The sections of the study corridor which had not previously been surveyed, were then walked systematically by the field team. This was largely the section of the study corridor between the north bank of the Campaspe River and Reflection Bend on the Murray River. GPS points were taken at the locations of scarred trees (the only site type recorded). Two areas of high potential sensitivity for Aboriginal archaeological sites were also mapped. These were the sandhill immediately west of Victoria Park and a raised natural levee on the north bank of the Campaspe River. Areas of land disturbance (ie. borrow pits) within the sandhill were also mapped with the GPS.

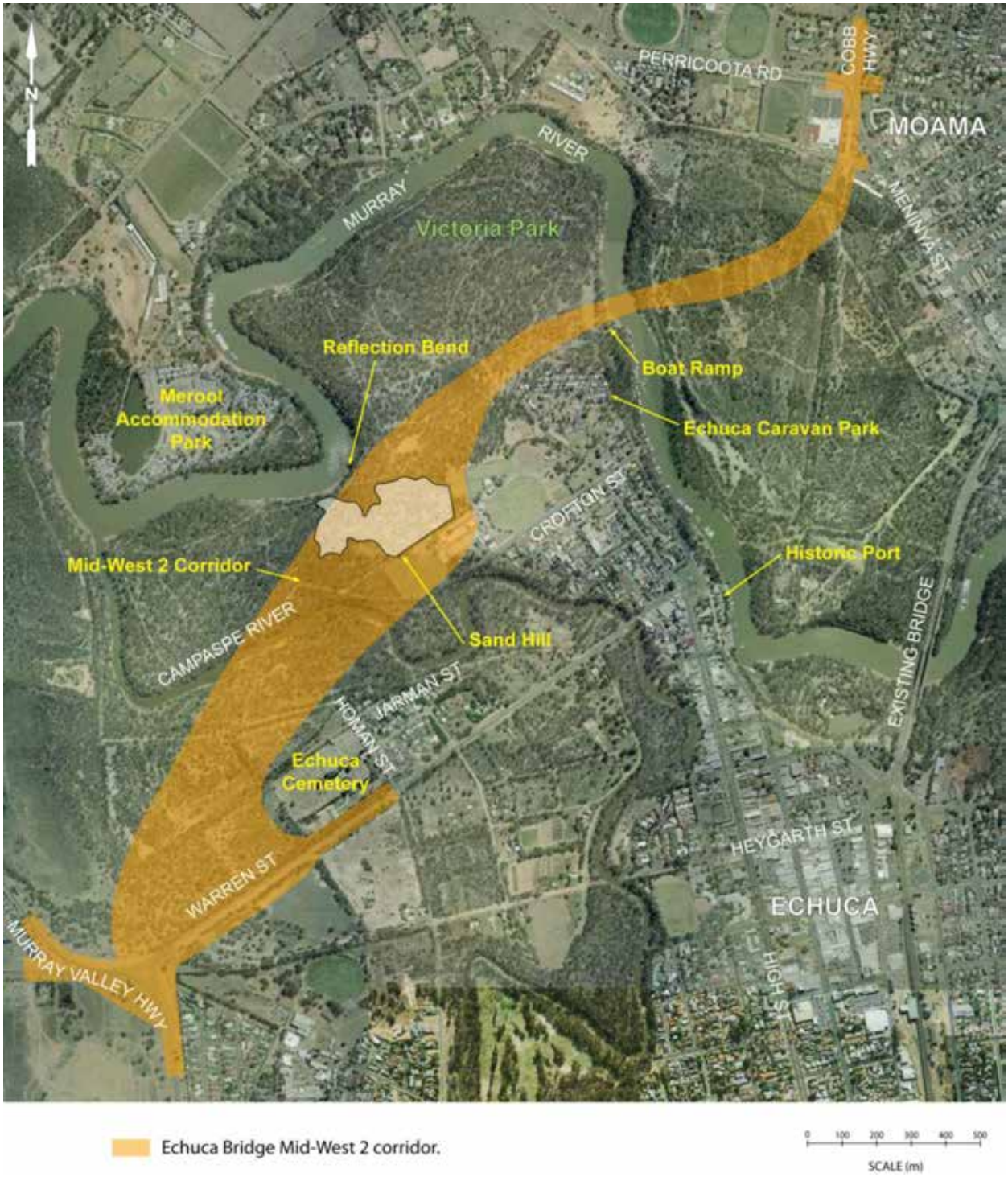
Much of the study corridor was clear and easily traversed, with little or no understorey cover. However, the northern end of the sandhill at Reflection Bend contained some dense scrub cover which impeded the progress of the survey. In some instances it was necessary to crawl under dense scrub in order to access mature eucalypts.

The purpose of the second survey carried out in December 2011 was to record scarred trees located in the road corridor to standards that would be required for registration with Aboriginal Affairs Victoria. In this case, the field team navigated their way to specific sites using mapping uploaded onto the GPS and then recorded them in some detail. Victorian Aboriginal Heritage Registry (VAHR) site cards were subsequently completed after the field survey.

Ground surface visibility during both surveys was considerably variable, ranging from 100% in some areas, even in open woodland, to almost zero in other locations, particularly at the northern end of the sandhill. In the latter area, it is highly likely that poor ground visibility would preclude the discovery of any surface exposures of Aboriginal cultural materials.

4.2.3 Survey Results

A total of nine Aboriginal scarred trees were recorded during the field assessment. These trees are described in the site gazetteer, Appendix 1. The locations of these sites are shown in Map 7 (not for public disclosure). These sites have been registered with AAV as sites XXXX-XXXX VAHR **(site numbers pending).**



Map 6: Echuca Mid-West 2 Corridor

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Map 7: Location of new scarred trees recorded in the Echuca MW2 Corridor
(Map to be drafted)

All of the archaeological sites recorded were scarred trees. All are situated within the study corridor. This brings the total number of scarred trees recorded between the Murray Valley Highway, Warren Street and the bank of the Murray River at Victoria Park to 28.

While some of the scarred trees were dead, all of the scars were in a good to fair condition. One exceptional scarred tree (MW2-ST5) was a dead red gum, containing a large canoe scar plus two smaller canoe scars. This tree was situated near the north bank of the Campaspe River, not far from its junction with the Murray River.

The sandhill was also mapped during the fieldwork (Map 6). The sandhill extends from the site of the former Echuca Secondary College in Crofton Street to Reflection Bend on the Murray River. A section of the sandhill is visible in the bank of the river. The perimeter of the sandhill is approximately 712m. The area of land covered by the sandhill is approximately 25.033ha. A small natural levee on the north bank of the Campaspe River was also noted. This would have been a suitable location for campsites during times of high floodwater.

The sandhill is an area of high cultural heritage sensitivity. Although it has been mined in the past, there are intact portions remaining. The section of the sandhill exposed in the bank of the Murray River at Reflection Bend is over 1m in depth, indicating that the sand extends to well below the surface level of the floodplain. The sandhill contains some of the scarred trees recorded in the current and previous surveys and despite disturbance in the recent past, has a high potential to contain human burials.

4.2.4 Archaeological Sites – Assessment of Significance

A preliminary assessment of Aboriginal archaeological sites against Burra Charter criterion has been carried out, although there has been no detailed consultation with the Yorta Yorta regarding their significance to date.

All of the Aboriginal archaeological sites located during the field survey are assessed as having high aesthetic, historic, scientific and social value. All of the trees are located in remnant red gum and box woodland on the floodplains of the Campaspe and Murray Rivers. All of the scars are in good to fair condition. They are part of a larger grouping of trees on the floodplain between the Murray Valley Highway, Warren Street and the banks of the Murray River, which are indicative of past Aboriginal occupation and use of the land. MW2-ST5 in particular is a rare example of a surviving Aboriginal canoe tree in the local area, and contains multiple scars associated with the removal of bark for different technological purposes. It is situated close to the junction of the Murray and Campaspe Rivers, an area likely to have been of considerable significance to the traditional Yorta owners. Along with a rich oral history, the scarred trees are one of the most visible and tangible heritage assets to contemporary Yorta Yorta people of the occupation and use of the floodplain around Echuca by their ancestors.

5.0 Survey Results, Historic Archaeological Sites

Two historic archaeological sites were identified during the course of the fieldwork. Site MW2-H1 comprised 16 timber pylons exposed in the north bank and bed of the Campaspe River, along approximately 17m of the riverbank. The riverbank and bed of the river at this point were packed with broken hand made brick rubble, presumably to stabilise the banks.

The structure is the remains of a timber weir constructed in 1886 to harness water from the Campaspe River for irrigation (Priestley, 1965: 158). The weir was destroyed the following year in a severe flood and was not rebuilt (Priestley, 1965: 158). It is not known whether there are other structural elements of the weir surviving below the water level at the time of the field survey, but it is likely.

Site MW2-H2 comprised a small surface scatter of dark olive bottle glass and ceramics within a road reserve to the west of the cemetery. The artefact scatter is approximately 18.4m N-S x 22.9m E-W. Average artefact density is less than $1/m^2$. Two bottle bases were identified with pontil marks and mould seams indicating they were produced on three piece Rickett's moulds. The ceramics were non-descript white-bodied stoneware. The site is likely the remains of a small dump or campsite, which occur commonly on the floodplain of the Murray River. It has likely been extensively disturbed and probably dug over by bottle collectors.

Site locations are shown in Map 8. Both of the historic sites have been registered with Heritage Victoria.

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Map 8: Locations of Non-Aboriginal Historic Archaeological Sites

6.0 Current Road Alignment Options – Assessment of Impacts

VicRoads have currently produced four road alignment options within the W2 corridor. These options and the construction techniques required to build the road have not yet been finalised, and so the following assessment of impacts must be regarded as preliminary.

The options and Aboriginal archaeological sites located within the vicinity of each option, are shown in Maps 9-12 following.

Option 2A

There are eight scarred trees within the ROW for Option 2A (Table 3, Map 9). None of the trees are directly impacted on by the alignment. Site 7825-0398 will be retained in a roundabout. Site 7825-0386 is a dead scarred tree (Plate 1) and is in an embankment. This site would be adversely impacted on by construction of the road if mitigation measures were not adopted. Provided mitigation measures recommended in Section 7.0 are adopted, Option 2A will not impact on any known Aboriginal cultural heritage.

Option 2A crosses the sandhill close to Reflection Bend. The sandhill has been identified in the existing and previous studies as an area of high potential sensitivity for buried archaeological deposits and human burials. It also contains scarred trees, although none of the latter are on the road alignment.

Further archaeological investigation in the form of sub-surface testing would be required in any areas of the sandhill where excavation is contemplated, even if the latter occur in areas which have already been used as borrow pits. This is because the sand is considerably deeper than the surface of the floodplain. The testing would be required to determine whether buried Aboriginal archaeological sites, potentially ancient archaeological sites and human remains were contained within the excavation footprint. This work would be required before Option 2A could be fully assessed and in order to obtain both an approved CHMP and comply with Sections 27-28 of the Aboriginal Heritage Act 2006, which provide blanket protection for all Aboriginal cultural heritage.

No historic sites are impacted on by Option 2A.

VAHR Site Number	Site Type
7825-0398	Scarred tree
7825-0418	Scarred tree
7825-0375	Scarred tree
7825-0424	Scarred tree
7825-0386	Scarred tree
7825-0387	Scarred tree
7825-0396	Scarred tree
7825-0404	Scarred tree

Table 3: Aboriginal sites within the ROW for Option 2A

Option 2B

There are five scarred trees within the ROW for Option 2B (Table 4, Map 10). Site 7825-0398 will be retained in a roundabout. Site 7825-0386 is a dead scarred tree (Plate 1) and is in an embankment. This site would be adversely impacted on by construction of the road if mitigation measures were not adopted. While this option crosses the sandhill near the site of the former Echuca Secondary College, there will be no disturbance to the sandhill, as it is possible to use a bridging structure which requires no excavation in order to cross the sandhill.

VAHR Site Number	Site Type
7825-0398	Scarred tree
7825-0396	Scarred tree
7825-0371	Scarred tree
7825-0386	Scarred tree
7825-0404	Scarred tree

Table 4: Aboriginal sites within the ROW for Option 2B

No historic sites are impacted on by Option 2A.

Option 2C

There are six scarred trees within the ROW for Option 2C (Table 5,. Map 11). Site 7825-0398 will be retained in a roundabout. Site 7825-0386 is a dead scarred tree (Plate 1) and is in an embankment. This site would be adversely impacted on by construction of the road if mitigation measures were not adopted. Provided that mitigation measures recommended in Section 7.0 are adopted to protect the scarred trees, this option will not impact on the trees. Option 2C also crosses the sandhill in the same location as Option 2A with the same potential impacts and requirements for additional heritage investigation.

VAHR Site Number	Site Type
7825-0398	Scarred tree
7825-0424	Scarred tree
7825-0396	Scarred tree
7825-0387	Scarred tree
7825-0386	Scarred tree
7825-0404	Scarred tree

Table 5: Aboriginal sites within the ROW for Option 2C

This information has been removed

Map 9: Alignment of Option 2A and locations of Aboriginal and historic archaeological sites recorded in the current and previous surveys

This information has been removed

Map 10: Alignment of Option 2B and locations of Aboriginal and historic archaeological sites recorded in the current and previous surveys

Map 11: Alignment of Option 2C and locations of Aboriginal and historic archaeological sites recorded in the current and previous surveys

This information has been removed

Map 12: Alignment of Option 2D and locations of Aboriginal and historic archaeological sites recorded in the current and previous surveys

Option 2D

There are five scarred trees within the ROW for Option 2D (Table 6, Map 12). Site 7825-0398 will be retained in a roundabout. Site 7825-0386 is a dead scarred tree (Plate 1) and is in an embankment. This site would be adversely impacted on by construction of the road if mitigation measures were not adopted. Option 2D would not impact on the sandhill since it crosses the latter in the same location as Option 2B and could be built by bridging over the sandhill.

Option 2D wlll directly impact on the Historic Archaeological site MW2-H2. There is no need to retain this site.

VAHR Site Number	Site Type
7825-0398	Scarred tree
7825-0396	Scarred tree
7825-0371	Scarred tree
7825-0386	Scarred tree
7825-0404	Scarred tree

Table 6: Aboriginal sites within the ROW for Option 2B

Plate 1: Site 7825-0386 scarred tree which would be located in a road embankment

6.1 Overall Assessment of Impacts

VicRoads have requested an overall assessment of the impacts of each option based on the criterion shown in Table 7. If either Option 2B or 2D is constructed, the impacts will be minimal. Both options have few scarred trees within the ROW. It will be possible to bridge over a very small section of the sandhill without excavation, and the road construction will therefore have minimal impacts on the sandhill. The risk of impacting on sub-surface Aboriginal sites and human burials is also minimal.

Options 2A and 2C may require more detailed assessment of the sandhill, depending on the method of construction used. There is a risk that further assessment of the sandhill may expose

significant Aboriginal archaeological sites, including ancient archaeological sites and human burials. The identification of any such sites may prove to be a significant obstacle to the project.

Option 2A

Option 2A may potentially be very poor to poor depending on the method of construction used over the sandhill and satisfactory measures being developed to mitigate impacts on the scarred trees. It will require statutory approval in the form of a CHMP. There is a high risk that significant archaeological sites and human remains may be found in the sandhill which could impede the approval of a CHMP under the *Aboriginal Heritage Regulations 2007* and/or require substantial archaeological salvage.

Rating	Defined Values	Colour
Very Well	Best practice, strong level of compliance, major positive impact	Green
Well	Improved practice, good policy compliance, positive impact	Light Green
Moderately Well	Partial policy compliance, no distinct positive or negative impact	Yellow
Poor	Policy non-compliance and negative impact	Orange
Very Poor	Major policy non-compliance and major negative impact	Red

Table 7: VicRoads ranking criterion for the road options

There is also some concern about indirect impacts of the construction of Option 2A. Construction of the latter option would effectively turn the sandhill into an 'island' sandwiched between the road and the edge of Echuca's residential precinct and the sporting and recreational facilities on the precinct. This will potentially mean that the area will become more accessible and more difficult to manage effectively. There are scarred trees situated on the sandhill and these plus any cultural materials in the sand deposits themselves are potentially at risk from visitation and inadvertent development, if this option is constructed.

There are also eight scarred trees within the ROW for Option 2A. Although none of these trees are directly impacted on by the alignment, there is a greater risk that the trees could be damaged during construction or operation of the road, even if mitigation measures are adopted.

Option 2B

Option 2B ranks very well in terms of performance. Although a statutory approval in the form of a CHMP will be required for this option, it avoids impacts to any Aboriginal or historic archaeological sites and avoids impacts on the sandhill. This option also crosses the sandhill in a

location and using a construction method that was previously agreed to with the Yorta Yorta Nation Aboriginal Corporation when assessing an earlier alignment.

Option 2B does not impact on any of the historic sites recorded during the field survey.

Option 2C

Option 2C ranks very poor to poor in terms of performance, principally for the same reasons as Option A, but also because it potentially affects four scarred trees, although it will be possible to mitigate impacts on the latter. As with Option A, there is also a greater risk of indirect impacts Option 2C also directly impacts on the historic site MW2-H2 which is of low scientific and historical value. However, it will still be necessary to obtain a Consent to Disturb a site on the Heritage Inventory if this Option is constructed. It is unlikely that a Consent would be refused, but there may be some minor salvage requirements.

Option 2D

Option 2D performs well. It does not impact on any Aboriginal heritage places or the sandhill, for the same reasons as Option 2B. However it does impact on the historic archaeological site MW2-H1. The site is of low scientific and historical value, but it will still be necessary to obtain a Consent to Disturb a site on the Heritage Inventory if this Option is constructed. It is unlikely that a Consent would be refused, but there may be some minor salvage requirements.

7.0 Statutory Legislation and Management Recommendations

Statutory legislation and management recommendations for each alignment are presented below. The management recommendations are designed to ensure statutory compliance in the event of the construction for each option. The management recommendations are also based on the outcome of negotiations between VicRoads and Yorta Yorta Nation and a consideration of the design opportunities and constraints in relation to each alignment.

7.1 Statutory Legislation and Requirements for the Project

Blanket projection to all Aboriginal cultural heritage in Victoria is provided by the *Aboriginal Heritage Act 2006*, which is supported by the *Aboriginal Heritage Regulations 2007*. The Aboriginal Heritage Act 2006 provides for:

- The ownership and custody of Aboriginal Cultural Heritage;
- The protection of Aboriginal Cultural Heritage;
- The preparation of mandatory and voluntary Cultural Heritage Management Plans for Aboriginal Cultural Heritage;
- The making of Cultural Heritage Agreements;
- Provision of cultural heritage audits, stop orders and protection declarations;
- Resolution of disputes regarding Aboriginal Cultural Heritage;
- Administration of the Act, including the appointment of an Aboriginal Heritage Council and Registered Aboriginal Parties; and
- Enforcement provisions.

Under Sections 27-28 of the Act, harming Aboriginal cultural heritage or doing an Act likely to harm Aboriginal cultural heritage is unlawful. Penalties may apply for a breach of Sections 27 or 28. In addition, the Act provides for the issue of Stop Orders (Part 6, Division 2) and Interim or On-Going Declarations of Preservation (Part 7 Divisions 1-2) where the Act has been breached.

Harm to Aboriginal cultural heritage is permitted when either a Permit to Harm Aboriginal Cultural Heritage is issued or an approved Cultural Heritage Management Plan (CHMP) which allows for harm to Aboriginal Cultural Heritage is completed. In some circumstances the preparation of a mandatory CHMP is required. These circumstances are set out in Part 2 of the *Aboriginal Heritage Regulations 2007*.

The preparation of a mandatory CHMP is required where an activity is carried out within an area of cultural heritage sensitivity defined in Part 2, Division 3 of the Regulations and where that activity is a high impact activity defined in Part 2, Division 5 of the Regulations.

The CHMP must comply with standards set out in Part 3 and Schedule 2 of the Regulations. Once completed, the CHMP must be submitted for evaluation. Where a Registered Aboriginal Party is appointed, the plan will be evaluated by the RAP. Where no RAP is appointed, the plan is evaluated by the delegate of the Secretary, Department of Planning and Community Development.

7.1.2 Statutory Requirements for this Project

The preparation of a mandatory CHMP will be required by the *Aboriginal Heritage Regulations 2007* for any of the road options selected. The CHMP will be required because;

- The activity area (road corridors) are within 200m of a named watercourse, specifically the Murray and Campaspe Rivers. Land within 200m of a named watercourse is an area of cultural heritage sensitivity specified in Part 2, Division 3, Regulation 23.

- The proposed activity is a high impact activity, as defined in Part 2, Division 5, Regulation 44(1)(e), specifically the construction of a road with a length exceeding 100m.

None of the road corridors have been subject to significant ground disturbance as defined in the Regulations along their entire length. Consequently the proposed road options are not exempted from a CHMP because they have undergone significant ground disturbance.

There is a Registered Aboriginal Party (RAP) appointed for the region in which Echuca and the road options are located. The RAP is the Yorta Yorta Nation Aboriginal Corporation. Consultation with the RAP is required during the preparation of the CHMP, including consultation regarding the project methodology and management recommendations. Once the CHMP has been completed, it must submitted to the Yorta Yorta Nation for evaluation. A fee prescribed in the legislation is payable to the Yorta Yorta for evaluation of the plan.

It should be noted that consultation between VicRoads and Yorta Yorta Nation has been on-going throughout the course of this project. The management recommendations presented below have been developed in consultation with Yorta Yorta Nation.

7.2 Options 2A and 2C

Recommendation 1

If Options 2A or 2C are adopted, the method of construction will need to avoid, as far as possible, any excavation on the sandhill. Any areas where excavation is necessary will need to undergo further investigation in the form of sub-surface testing prior to the approval of any CHMP. Sub-surface testing will be required irrespective of whether there has been prior excavation of the sandhill, since there is a considerable depth of sand at Reflection Bend. There is also a greater risk that significant archaeological sites or human burials may be discovered during testing for or construction of this Option.

VicRoads will be required to obtain an approved CHMP pursuant to the *Aboriginal Heritage Act 2006 and Aboriginal Heritage Regulations 2007* if this alignment is adopted.

Recommendation 2

If Options 2A or 2C are adopted, there may be a requirement to develop a long-term heritage management strategy for the balance of the sandhill between the tennis club and the road alignment. The heritage management strategy would need to be negotiated with the Yorta Yorta Nation Aboriginal Corporation. The heritage management strategy would need to address the indirect impacts of either alignment and the long-term heritage management of the sandhill. VicRoads would need to negotiate with any future management authorities about adoption of the management plan.

7.3 Options 2B and 2D

Recommendation 3

Of the four alignments currently under consideration, Option 2B is the preferred from a heritage perspective. This is because it has no impacts on Aboriginal or non-Aboriginal historic cultural heritage, because it avoids impacts to the sandhill and will be constructed over the sandhill on a route and by a method previously agreed to with the Yorta Yorta Nations Aboriginal Corporation. No further sub-surface testing will be required for this Option.

VicRoads will be required to obtain an approved CHMP pursuant to the *Aboriginal Heritage Act 2006 and Aboriginal Heritage Regulations 2007* if this alignment is adopted.

Recommendation 4

If Option 2D is selected, VicRoads will need to apply to Heritage Victoria for a Consent to Disturb site MW2-H2, which is currently in the process of being listed on the Heritage Inventory. Option 2D avoids impacts on Aboriginal or non-Aboriginal historic cultural heritage, because it avoids impacts to the sandhill and will be constructed over the sandhill on a route and by a method previously agreed to with the Yorta Yorta Nations Aboriginal Corporation. No further sub-surface testing will be required for this Option.

VicRoads will be required to obtain an approved CHMP pursuant to the *Aboriginal Heritage Act 2006 and Aboriginal Heritage Regulations 2007* if this alignment is adopted.

Recommendation 5

The scarred tree site 7825-0398 should be retained within the roundabout at the intersection of the Murray Valley Highway and Warren Street, which will be constructed for all options. The method of long term preservation should be developed in consultation with Yorta Yorta Nation. Specific recommendations for the conservation of the tree should be included in any future CHMP.

Recommendation 6

The scarred tree 7825-0386 is situated within an embankment adjoining the north side of the road on all road options. A retaining wall must be built within the embankment around the tree. A qualified arborist must be employed to advise on the construction of the embankment, the most appropriate method of conservation and drainage of the tree, lopping of branches and treatment for insects. The arborist's report should contain recommendations for the long term management and maintenance of the tree. VicRoads must implement the maintenance schedule.

Recommendation 7

The scarred trees with the ROW for Options 2A-2C should all be retained. It is not possible to recommend the specific method by which the trees should be retained at this stage. Recommendations for the conservation of these trees should be developed in consultation with Yorta Yorta Nation and should be included in any future CHMP.

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Appendix 1: Aboriginal Site Gazetteer

VAHR and Field Site No	Aspect	Cultural Materials	Dimensions N-S (m)	Dimensions E-W (m)	Scar Condition	Scar Integrity	Sources of Disturbance	Scarred Tree Data
VAHR No. **TBA** **Field No.** MW2-ST 1	352°	Single cultural scar	N/A	N/A	Fair – Tree Dead	Intact	Vehicular and pedestrian visitation, fire disturbance	Tree height (est.): 15m Girth at 1.5m high : 6.3m Species: Red Gum HAG: 0.8m Scar length: 2.5m Scar width: 0.25m Regrowth T= 0.14m M= 0.14m B= 0.05m
VAHR No. **TBA** **Field No.** MW2-ST 2	225°	Single cultural scar	N/A	N/A	Good – Tree dying	Intact	Vehicular and pedestrian visitation, fire disturbance	Tree height (est.): 18m Girth at 1.5m high : 1.87m Species: Red Gum HAG: 0.32m Scar length: 0.24m Scar width: 0.22m Regrowth T=0.03m M=0.03m B= 0.03m
VAHR No. **TBA** **Field No.** MW2-ST 3	70°	Single cultural scar	N/A	N/A	Good – Tree Healthy	Intact	Vehicular and pedestrian visitation, fire disturbance	Tree height (est.): 20m Girth at 1.5m high : 4.45m Species: Red Gum HAG: 0.05m Scar length: 0.86m Scar width: 0.34m Regrowth T= 0.26 M= 0.26 B= 0.23
VAHR No. **TBA** **Field No.** MW2-ST 4	185°	Single cultural scar	N/A	N/A	Good – Tree Healthy	Intact	Vehicular and pedestrian visitation, fire disturbance	Tree height (est.): 17m Girth at 1.5m high : 4.7m Species: Red Gum HAG: 0.24m Scar length: 1.46m Scar width: 0.53m Regrowth T= 0.02m M= 0.02m B= 0.02m

VAHR and Field Site No	Aspect	Cultural Materials	Dimensions N-S (m)	Dimensions E-W (m)	Scar Condition	Scar Integrity	Sources of Disturbance	Scarred Tree Data
VAHR No. **TBA** **Field No.** MW2-ST 4	185°	Single cultural scar	N/A	N/A	Good – Tree Healthy	Intact	Vehicular and pedestrian visitation, fire disturbance	Tree height (est.): 17m Girth at 1.5m high : 4.7m Species: Red Gum HAG: 0.24m Scar length: 1.46m Scar width: 0.53m Regrowth T= 0.02m M= 0.02m B= 0.02m
VAHR No. **TBA** **Field No.** MW2-ST 5	**Scar 1** 20° **Scar 2** 285° **Scar 3** 245°	Single cultural scar	N/A	N/A	Fair – Tree Dead	Intact	Vehicular and pedestrian visitation, fire disturbance	Tree height (est.): 18m Girth at 1.5m high : 4.40m Species: Red Gum **Scar 1:** HAG: 0.42m Scar length: 0.35m Scar width: 0.57m Regrowth T= 0.03m M= 0.04m B= 0.04m **Scar 2** HAG: 0.40m Scar length: 0.33m Scar width: 0.35m Regrowth T= 0.03m M= 0.025m B= 0.2m **Scar 3** HAG: 1.2m Scar length: 5m Scar width: 0.60m Regrowth T= 0.04m M= 0.12m B= 0.04m

VAHR and Field Site No	Aspect	Cultural Materials	Dimensions N-S (m)	Dimensions E-W (m)	Scar Condition	Scar Integrity	Sources of Disturbance	Scarred Tree Data
VAHR No. **TBA** **Field No.** MW2-ST 6	200°	Single cultural scar	N/A	N/A	Good – Tree Healthy	Intact	Vehicular and pedestrian visitation, fire disturbance	Tree height (est.): 20 Girth at 1.5m high : 3.3m Species: Red Gum HAG: 0.22m Scar length: 0.35m Scar width: 0.20m Regrowth T= 0.07m M= 0.05m B= 0.07m
VAHR No. **TBA** **Field No.** MW2-ST 7		2 cultural scars	N/A	N/A	Good – Tree Dead	Intact	Vehicular and pedestrian visitation, fire disturbance	Tree height (est.): 14m Girth at 1.5m high : 1.0m Species: Red Gum HAG: 1.06m Scar length: 0.48m Scar width: 0.18m Regrowth T= 0.015m M= 0.015m B= 0.010m
VAHR No. **TBA** **Field No.** MW2-ST 8	W	Single cultural scar	N/A	N/A	Dead (standing)	Intact	Pedestrian visitation, fire disturbance	Tree height (est.): 17m Girth at 1.5m high : 3.0m Species: Red Gum HAG: 3m Scar length: 2.52m Scar width: 0.33m Regrowth T= 0.18m M= 0.20m B= 0.23m

VAHR and Field Site No	Aspect	Cultural Materials	Dimensions N-S (m)	Dimensions E-W (m)	Scar Condition	Scar Integrity	Sources of Disturbance	Scarred Tree Data
VAHR No. TBA **Field No.** MW2-ST 9		Single cultural scar	N/A	N/A	Poor health (dying)	Intact	Pedestrian visitation, fire disturbance, water erosion	Tree height (est.): 16 Girth at 1.5m high : 2.25m Species: Red Gum HAG: 2.25m Scar length: 1.63m Scar width: 0.36m Regrowth T= 0.05m M= 0.03m B= 0.03m

Appendix 2: Aboriginal Site Plans

This information has been removed

MW2 – ST1 Site Plan

This information has been removed

MW2 – ST2 Site Plan

This information has been removed

MW2-ST3 Site Plan

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MW2 – ST4 Site Plan

This information has been removed

MW2 – ST5 Site Plan

This information has been removed

MW2 – ST6 Site Plan

This information has been removed

MW2 – ST7 Site Plan

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MW2 – ST8 Site Plan

This information has been removed

MW2 – ST9 Site Plan

Appendix 3- Historic Site Plans

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MW2 – H1 Site Plan

This information has been removed

MW2-H2 Site Location. There is no site plan for this site.