View of Wagga Wagga Main City Levee.

ABORIGINAL AND HISTORIC HERITAGE ASSESSMENT

Wagga Wagga Levee Upgrade Project

November 2012

Report Prepared by

OzArk Environmental & Heritage Management Pty Ltd

for

GHD Wagga

on behalf of

Wagga Wagga City Council

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EXECUTIVE SUMMARY

GHD Wagga, on behalf of Wagga Wagga City Council has commissioned OzArk Environmental & Heritage Management (OzArk) to conduct an Aboriginal and historic heritage survey in order to identify possible constraints associated with proposed upgrade works to the Main City Levee and the North Wagga Wagga Levee.

The current Subject Area is located within the city of Wagga Wagga and community of North Wagga Wagga, New South Wales. OzArk conducted field survey on 30 August 2012. Aboriginal community consultation was conducted by OzArk and Clive Lyons and Stevie Charles representing the Wagga Wagga Local Aboriginal Land Council attended the field survey on 30 August 2012.

Aboriginal Heritage

No Aboriginal objects or sites were identified during the current field assessment and no areas were assessed as having potential to contain further undetected Aboriginal sites. It is assessed that no further archaeological assessment is required. In light of these findings, Aboriginal heritage presents no constraints to the proposed works.

To ensure no Aboriginal objects or sites are impacted inadvertently in unassessed areas, it is recommended that:

- Proposed works should be limited to the proposed impact footprint as assessed in the current report so as to limit the possibility of encountering Aboriginal objects in unassessed areas; and
- Should any objects or other Aboriginal heritage features be identified during the course of construction the Unanticipated Finds Protocol in this report (**Section 6.2**) should be followed.

Historic Heritage

One previously unrecorded historic heritage site was identified within the impact area during the current assessment, the Wagga Wagga Flood Tree and Levee Monument. Additionally, the Hampden Bridge (a timber truss bridge) is located in close proximity to the proposed works and is listed on the Wagga Wagga Local Environment Plan 2010 (Item No I85) as an item with local heritage significance.

Avoidance of the Hampden Bridge (LEP Item No I85) would ensure that no further management of historic heritage is required. The current impact footprint does not include this site so it should be considered avoidable and precautions should be taken to ensure the Hampden Bridge is not inadvertently impacted.

To ensure no inadvertent impacts, a no-go zone should be established in the vicinity of the Hampden Bridge using nightline and workers should be inducted to ensure that impacts do not go beyond the delineated impact footprint.

The proponent has indicated that complete avoidance of the Wagga Wagga Flood Tree and Levee Monument is unlikely; on the basis of this the following is recommended:

- Investigate whether the Wagga Wagga Flood Tree and Levee Monument can be protected in their current locations and if possible design the proposal so that they are retained
- If the Wagga Wagga Flood Tree and Levee Monument need to be removed:
    - Investigate whether the flood marker should be surveyed to enable using any historic flood data from the site, if it exists;
    - Record to archival standard in its current location; and
    - Dismantle the flood gauge and monument and move to an alternative location to be determined by Council.

Any proposal incorporating impacts to the Wagga Wagga Flood Tree and Levee Monument or Hampden Bridge would require a Section 139 exemption form to be filed with the NSW Heritage Office and the item should be recorded at an archival quality (including photographs and detailed plans) prior to any impact. A copy of the archival records should be deposited with appropriate library in the Wagga Wagga LGA and at the National Library of Australia[1].

[1] A full guide to archival recording published by the NSW Heritage Office can be accessed at: http://www.heritage.nsw.gov.au/03_index.htm#archival.

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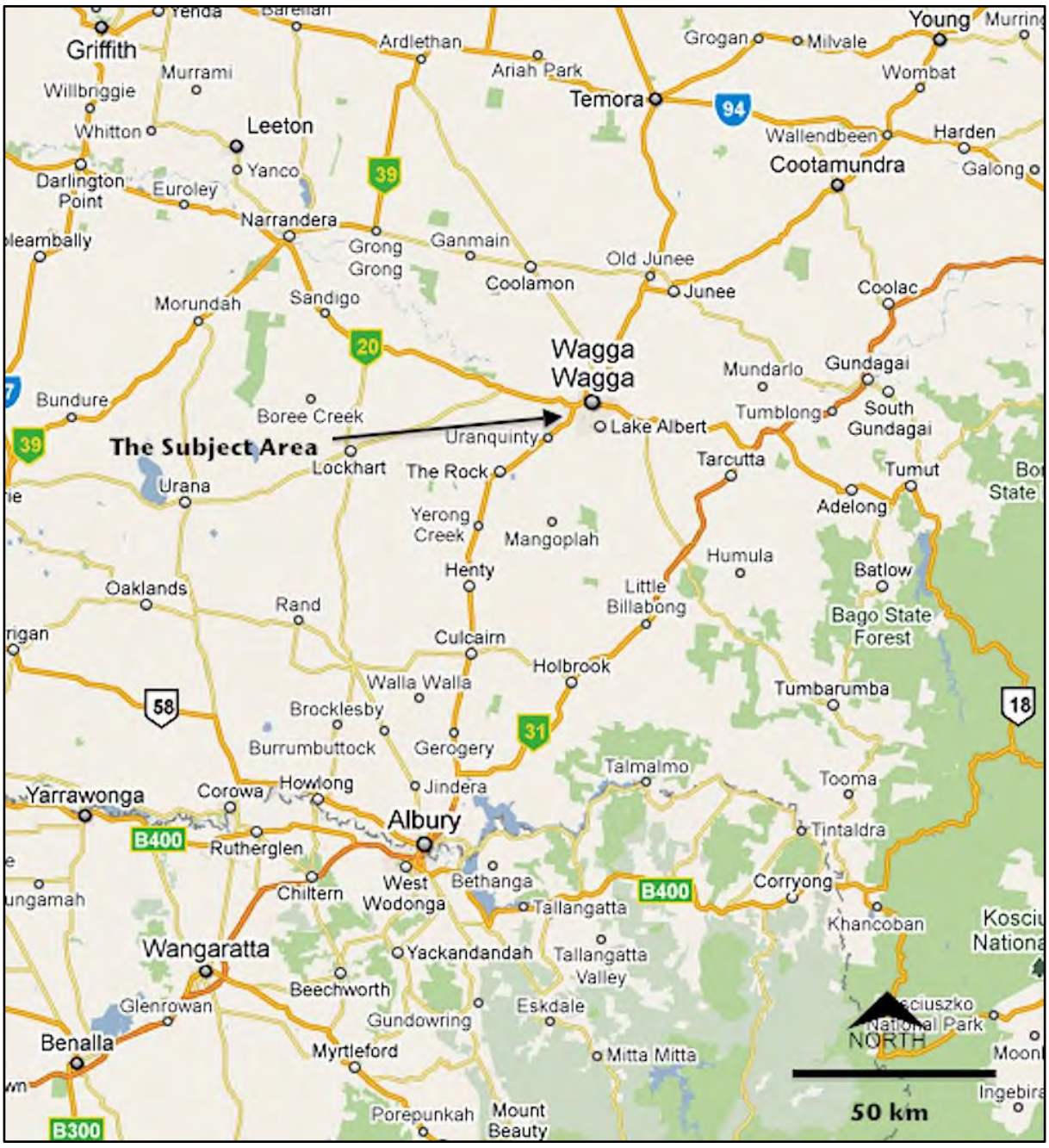
1 INTRODUCTION

1.1 BRIEF DESCRIPTION OF THE PROPOSAL

GHD Wagga, on behalf of Wagga Wagga City Council has commissioned OzArk Environmental & Heritage Management (OzArk) to conduct an Aboriginal and historic heritage survey in order to identify possible constraints associated with proposed upgrade works to the Main City Levee and the North Wagga Wagga Levee (**Figure 1**).

Wagga Wagga City Council (the Proponent) is proposing to provide an agreed level of flood protection plus a suitable freeboard, which was identified as a high priority recommendation in the Wagga Wagga City Council Floodplain Risk Management Plan (WMA Water 2009b).

Figure 1: Location map (Base map source: http://maps.google.com).



1.2 PROPOSED WORKS

The proposed works would comprise raising the Main City Levee and the North Wagga Wagga Levee to provide an appropriate level of flood protection (likely 100 year ARI level for the Main City Levee and 20 year ARI for North Wagga Wagga Levee) plus a suitable freeboard.

The Main City Levee is 8.9km long and is comprised of earthfill embankment levees and reinforced concrete retaining wall levees. The North Wagga Wagga Levee is 4.6km long and consists of an earthfill embankment levee. The Bank Two Levee, which surrounds the eastern end of the North Wagga Wagga Levee, consists of an earthfill embankment levee 1.4km long. A levee upgrade options/feasibility study would develop appropriate options, taking into consideration the following factors:

- Type of levee (including no levee where an extension may be required);
- Height of raising required;
- Flood parameters (e.g. depth of water, velocity);
- Condition of levee (e.g. geotechnical);
- Space available for upgrade works;
- Other requirements (e.g. community, landscaping etc); and
- Site conditions (e.g. close to river bank, road crossings, foundations etc).

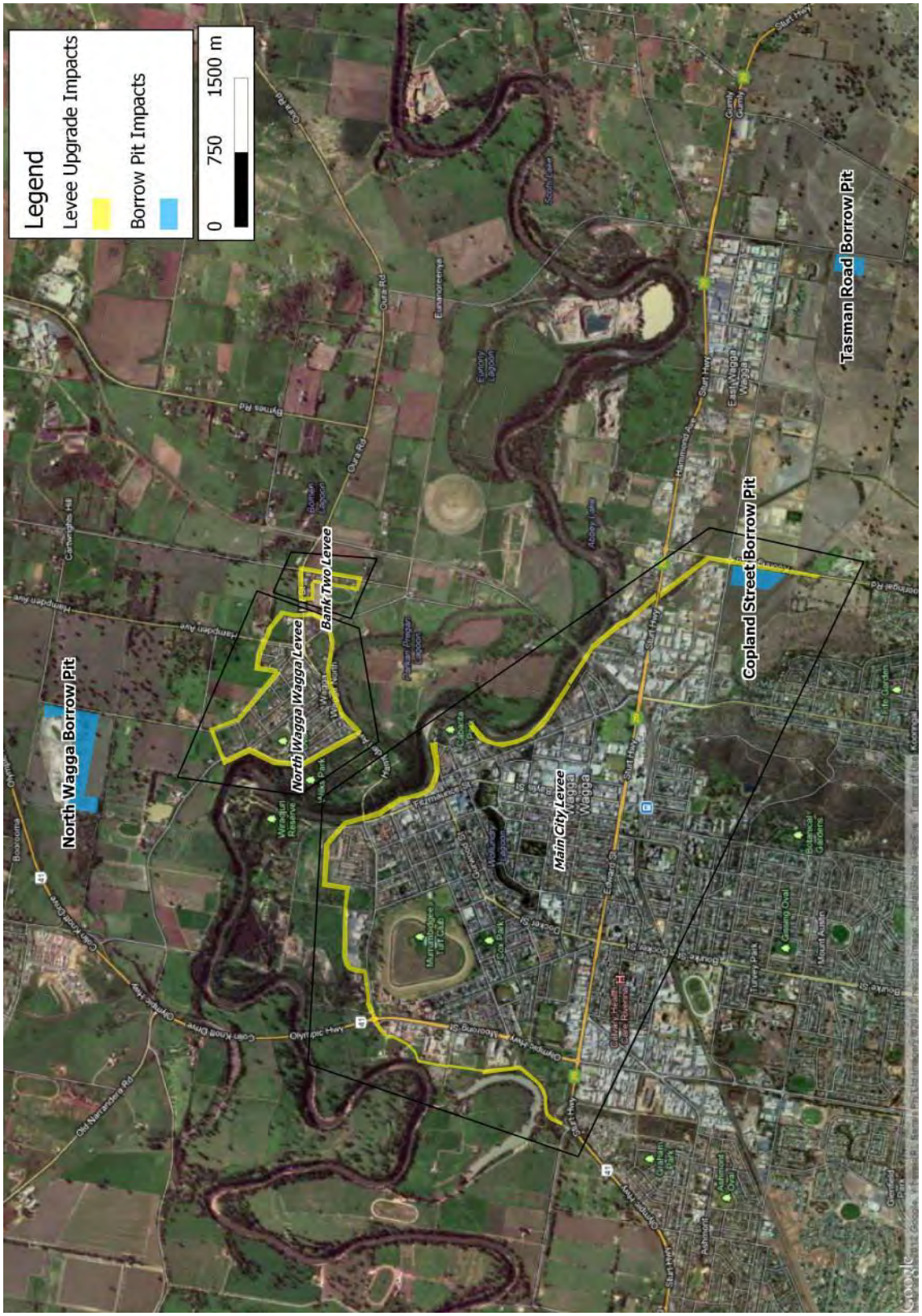
Upgrade options which would be investigated in the feasibility/options study include:

- Raised embankments, using augmentation and raising on either embankment face or direct “centreline” raising methods;
- Raised embankment using supporting walls e.g. crib walls, reinforced concrete walls, sheet piling, rockfill gabions etc;
- Sheet pile extensions to existing earthfill levees. Such arrangements have been used at Deniliquin where space was very limited. The sheet piles are capped with concrete to improve appearance;
- Reinforced concrete cantilever walls;
- New earthfill levees; and
- Replacement of levee where the existing levee is in poor condition (or unknown condition) and where a new levee would be more economical than upgrade of an existing levee.

1.3 SUBJECT AREA

The current Subject Area is located within the city of Wagga Wagga and community of North Wagga Wagga, New South Wales. **Figure 2** illustrates the area assessed during the current field survey.

Figure 2: Proposed works showing impact footprint (base map: Google Earth).



1.4 DESKTOP DATABASE SEARCHES CONDUCTED AND LITERATURE REVIEW

A desktop search was conducted on the following databases to identify any potential issues. The results of this search are summarised here in **Table 1**.

Table 1: Desktop-database search results.

Name of database searched	Date of search	Type of search	Comment
Australian Heritage Database http://www.environment.gov.au/heritage/ahdb/	7 September 2012	Wagga Wagga Local Government Area (LGA).	No places on the search are within the Subject Area
NSW Heritage Office State Heritage Register and State Heritage Inventory http://www.heritage.nsw.gov.au/	7 September 2012	Wagga Wagga LGA.	No places on the search are within the Subject Area
National Native Title Claims Search http://www.nntt.gov.au/Applications-And-Determinations/Search-Applications/Pages/Search.aspx	7 September 2012	Wagga Wagga LGA.	No current Native Title Claims cover the Subject Area.
Department of Environment, Water Resources, Heritage and the Arts (DSEWPaC) Protected Matters (EPBC Act) Database; http://www.environment.gov.au/erin/ert/epbc/index.html	7 September 2012	Wagga Wagga LGA.	None of the Aboriginal places on the RNE occur near the Subject Area.
NSW Office of the Environment anf Heritage (OEH) Aboriginal Heritage Information Management System (AHIMS);	Levee: 29 August 2012 Borrow Pits: 6 September 2012 and 14 September 2012	Levee: 4km x 3km with a 200m buffer centred on the Subject Area Borrow Pits: Both searches were 1400m x 900m centred on the approximate pit locations.	Three AHIMS registered sites located within search areas; No sites within the Subject Area. **Appendix 2**.
Local Environment Plan (LEP)	7 September 2012	Wagga Wagga LEP 2010	No Aboriginal places occur near the Subject Area. One historic item is located adjacent to the Subject Area: the Hampden Bridge.
S170 RTA Heritage and Conservation Register http://www.rta.nsw.gov.au/environment/heritage/heritageconservreg/index.html?elid=2	7 September 2012	South West Region	No places on the search are within the Subject Area.

In addition to the above databases, several research and library databases (Trove, JSTOR, Google, etc.) were also searched, with relevant information gained from these sources included in the heritage context that is presented in **Sections 4.1, 4.2** and **8.2** of this report.

2 LANDSCAPE CONTEXT

The current Subject Area is situated within the New South Wales South Western Slopes Bioregion (SWSB) and the Murrumbidgee Catchment Management Authority (CMA).

2.1 TOPOGRAPHY

The Subject Area of the current assessment is situated within the alluvial flood plain of the Riverina on the Murrumbidgee River (NPWS 2003). The topography of the current Subject Area is relatively flat with low terraces and sand hills that rise above the floodplain.

2.2 GEOLOGY AND SOILS

The SWSB is underlain by Ordovician to Devonian faulted and folded sedimentary sequences. These sequences are inter-bedded with volcanic rocks and intrusive granites.

The main floodplain in the Wagga Wagga area is associated with the Murrumbidgee River and consists of vast deposits of Quaternary alluvium, which have incised through older Tertiary alluvium. The underlying geology north of the Murrumbidgee floodplain consists largely of granites, whereas to the south it consists of a mixture of intrusive granite and sedimentary (NPWS 2003).

Specifically, the Subject Area is located within the Wagga Metamorphic Belt, which consists primarily of quartzose, greywacke, siltstone, slate and chert, and secondarily of quartzite, phyllite, hornfels, schist, sandstone, mudstone and shale (DOM 1970). Geologically, then, the Subject Area and environs are relatively rich in raw materials suitable for stone tool manufacture. It is noted that the current ground surface within the Subject Area displays few outcrops of raw materials suitable for tool manufacture or grinding grooves.

2.3 HYDROLOGY

The Subject Area is located in close proximity to (less than 1km) the Murrumbidgee River a major watercourse that feeds into the Murray River system more than 400km west.

2.4 VEGETATION

Vegetation within the Lower Slopes Subregion is quite varied. On the alluvial loams characteristic of the Subject Area, yellow box, polar box and belah dominate, whilst all streams accommodate river red gum (NPWS 2003). The Subject Area has been largely cleared of native vegetation; however, some isolated mature eucalypts (individuals and stands) are present along the river bank (**Plate 1**).

2.5 CLIMATE

According to the climatic statistics derived from the Wagga Wagga AMO (BOM 2011), the region is characterised by hot summers (mean maximum temperature: 31.6°C in January /

mean minimum temperature: 16.4°C in February) and cold winters (mean maximum temperature: 12.7°C in July / mean minimum temperature: 2.7°C in July). Mean rainfall is highest during spring (59.3 mm in October) and lowest in summer (39.7 mm in February), however winter produces the highest number of rain days per month (9.0 in July). Such temperatures and rainfall conditions are likely to have had a moderate influence on settlement patterns during antiquity, probably inducing people to seek occupation sites that were relatively sheltered from winds and colder temperatures.

2.6 LAND–USE HISTORY

Land use within the current Subject Area has consisted of:

- **Transport corridor.** The Subject Area is adjacent or crosses numerous road and rail routes (**Plate 2**);
- **Levee Construction.** With the exception of the borrow pit locations, the entire Subject Area is located within the impact footprint of the existing Wagga Wagga levee system (**Plate 3**);
- **Urban Development.** The majority of the Subject Area is located directly within the City of Wagga Wagga passing through or adjacent to numerous residential and commercial properties (**Plate 4**); and
- **Recreational walking track.** Large sections of the Subject area run parallel to The Wiradjuri Walking Track (**Plate 5**).

2.6.1 Existing levels of disturbance

Disturbance levels within the Subject Area are very high, urban development and previous levee construction have likely destroyed or removed any evidence of past Aboriginal occupation had it existed.

2.7 CONCLUSION

While the Subject Area is located along the banks of the Murrumbidgee River and would have provided ample resources for past Aboriginal occupation, a number of factors significantly reduce the likelihood of encountering Aboriginal sites; these include:

- High levels of disturbance form urban development;
- High levels of disturbance previous levee construction;
- The relatively narrow survey corridor; and
- Limited, scattered stands of mature remnant vegetation.

3 ABORIGINAL HERITAGE ASSESSMENT: INTRODUCTION

3.1 PURPOSE AND OBJECTIVES OF THE ARCHAEOLOGICAL INVESTIGATION

The purpose of the current study is to identify and assess Aboriginal and historic heritage constraints relevant to the proposed works.

The objectives of the current study are to:

Objective One: Identify and record Aboriginal objects, sites and sensitive landforms within the Subject Area;

Objective Two: Identify and record historical artefacts / features within the Subject Area; and

Objective Three: Assess the likely impacts of the proposed works to any recorded sites and provide management recommendations.

3.2 DATE OF HERITAGE ASSESSMENT

The heritage assessment was conducted entirely on 30 August 2012.

3.3 ABORIGINAL COMMUNITY INVOLVEMENT

Aboriginal community consultation was conducted by OzArk EHM and two Aboriginal community representatives attended the field survey on 30 August 2012:

- Clive Lyons, Wagga Wagga Local Aboriginal Land Council (WWLALC); and
- Stevie Charles, (WWLALC).

Records of Aboriginal community stakeholder participation in fieldwork are presented in **Appendix 1**.

3.4 OZARK EHM INVOLVEMENT

3.4.1 Field assessment

The fieldwork component of the current project was undertaken by:

- Fieldwork director (30 August 2012): Mr Josh Noyer (BA – University of California [Santa Cruz]).

3.4.2 Reporting

The reporting component of the current project was undertaken by:

- Report author: Mr Josh Noyer; and
- Reviewer: Ben Churcher (BA (Hons) University of Queensland, Dip Ed. University of Sydney).

3.5 PROJECT CONSTRAINTS

No project constraints affected the efficacy of the field survey on 30 September 2012.

4 ABORIGINAL HERITAGE ASSESSMENT: BACKGROUND

4.1 ETHNO-HISTORIC SOURCES OF REGIONAL ABORIGINAL CULTURE

The Subject Area is within the southern boundaries of the territory of the Wiradjuri tribal and linguistic group (Tindale 1974). The Wiradjuri tribal area is situated within the Murray Darling Basin and extends across three general physiographic regions: the highlands or central tablelands in the east, the riverine plains in the west, and the transitional western slopes zone in-between.

The Wiradjuri is one of the largest language groups within New South Wales, extending across the districts of Mudgee, Bathurst, Dubbo, Parkes, West Wyalong, Forbes, Orange, Junee, Cowra, Young, Holbrook, Wagga Wagga, Narrandera, Griffith, and Mossgiel. While the area was noted to have a single basic language, various dialects were found throughout the region (Tindale 1974). The current Subject Area is located within the Riverina on the south-western margin of the Wiradjuri territory.

It is important to recognise the use and meaning of the term ‘tribe’ and the designation of lines on a map as ‘tribal boundaries’ as being controversial issues (Bowdler 1983: 22). There is no doubt that there were distinctive groups which can be defined by their linguistic traits, but the designation of lines on a map as boundaries, although useful, must also be accepted as problematic. Unlike Tindale’s map, the map (from NSW NPWS) reproduced in Bowdler (1983: 17, Figure 2) shows a more general relationship of the language groups known to exist in NSW.

Prior to European settlement, the eastern margins of the Murrumbidgee River basin supported woodland and forest habitats that provided home to a wide range of exploitable resources for the Aboriginal population. These resources included possums, which provided a ready source of meat and fur for cloaks (Kabaila 1998: 12). Also used were vegetables including the roots of daisy yams (Myrrnong), the tubers of lilies and orchids, stands of bracken fern, and Kurrajong roots. As the river enters the western slopes of the Wagga Wagga area and out onto the red brown earth plains around Hay and Griffith, the landscape becomes more an open plain woodland becoming increasingly arid with the western flow of the river. The grassland plains were characterised by kangaroos and emus that were hunted, often using the firing of vegetation as a tool (Kabaila 1998: 12). The frequent floods of the Murrumbidgee provided the local Aboriginal population with an abundance of resources: as the flood waters receded they left the drying pools stocked with freshwater mussels, yabbies, fish and waterfowl as well as aquatic plants (Kabaila 1998: 12).

The social organisation of the Wiradjuri appears to have been along the grounds of kinship systems based on totem names and associations. This system governed and controlled marriage and determined ceremonial kinship obligations. Individual identity and clan affiliations were expressed partly through elaborate carvings on wooden implements and on skin cloaks (White & Cane 1986: 61).

From very early in the contact era, as early as the 1790s, disease travelled the rivers of south-eastern Australia and decimated Aboriginal populations even before the earliest physical presence of Europeans. The beginnings of settlement by squatters, selectors, and eventually ex-gold diggers, significantly disrupted the Aboriginal population. From the 1830s the Aborigines became familiar with European foods, tools, and tobacco and began wearing clothes. They often took on the names of the local property owners or landholdings (Green 2002: 105). Conflict arose here due to the same reasons as elsewhere: settlers being unwilling to share their goods and reacting violently to the Aborigines killing sheep or cattle. While the remnant Aboriginal population was eventually provided with rations, they were dying rapidly from disease, starvation, the ill effects of alcohol and as a result of localised massacres. It is thought that by the 1900s there may have been as few as 20 local Aborigines left in the Wagga Wagga LGA (Green 2002: 105[2]).

An extensive study on the ethno-history of the Wagga Wagga area was compiled by Green (2002) for the Wagga Wagga LGA Wiradjuri Heritage Study. In relation to the current Subject Area, the following accounts are relevant:

- On December 2nd 1829, some Wiradjuri guides to Charles Sturt's expedition burned a possum out of dead tree near Wantabadgery (approximately 41km east-north-east of the current Subject Area), much to Sturt's amazement.
- 5th to 8th December 1829, Wiradjuri men, Peter and Jemmie, guide Charles Sturt's expedition from Wantabadgery past the future site of Wagga Wagga to Mount Arthur. The Party camped at Old Oura, Boman Lagoon, Malebo (approximately 10km to the north of the current Subject Area), and Berembed and probably led him past the major billabongs (Kurrajong, Gobbagombalin) which would have been known to them. The Wiradjuri guides at this stage of the trip are concerned about a fearsome individual or group known as Bunony / Eunony or Eunonyhareenya (also Wiradjuri).

According to Mr James Ingram (Waagan Waagan Project Group), the environs of Wagga Wagga contain a number of significant Aboriginal sites / places ranging from The Rock (a significant geological feature), approximately 23km to the south-west, a learning place a few kilometres to the west of Wagga Wagga, and a men's site (Aboriginal quarry AHIMS #56-1-

[2] OzArk accepts that these historical estimates of the Aboriginal population often underestimated the Aboriginal population as they are not based on official figures but are rather based on personal assumptions by particular writers. While Aboriginals in settled areas were included in the census before 1967, the Commonwealth Bureau of Census and Statistics interpreted Section 127 of the Australian Constitution as meaning that they may enumerate "aboriginal natives" but that they must be excluded from published tabulations of population. Thus prior to 1967, Aboriginal population estimates must be treated with extreme caution.

0043 “East Bomen 1”) located approximately 15km to the north-east of the current Subject Area.

4.2 REGIONAL ARCHAEOLOGICAL CONTEXT

Within the Wiradjuri region, the presence of Aborigines in the Darling Basin has been dated to 40,000 years ago (Hope 1981 as cited in Haglund 1985). A spread east into the mountains is thought to have occurred between 14,000 to 12,000 years ago.

Systematic, regional based archaeological studies have not been undertaken in this area. Development driven studies have, however, comprised the bulk of archaeological assessment within the Wagga Wagga district over the past 30 years.

Archaeological assessment undertaken for a proposed pipeline between Wagga Wagga and Young by Witter in 1980 recorded 14 open camp sites, 21 isolated finds, a scarred tree and a possible Aboriginal rock well (Witter 1980). Excavation of some of these sites was recommended if avoidance was not feasible.

In 1981, an extensive survey was undertaken in the Murrumbidgee River corridor between Angle Crossing and Kambah Pool (Barz and Winston-Gregson in Navin Officer 1998: 8). This study focussed on the river corridor and recorded 62 Aboriginal sites, primarily artefact scatters that extended over considerable areas. Unifacially flaked, quartzite river cobble choppers were the most common artefact recorded but artefacts of quartz, chalcedony, jasper and sandstone were also recorded. Seven scarred trees were also present, along with three quarries and seven beaten earth rings that may have been used for ceremonial purposes. In terms of site location, the authors found that, in many cases, sites were not located on valley floors or on the tops of ridges, but on median altitude locations in relation to the surrounding terrain. Sites were focussed on flattened hilltops and small terraces above the valley floor that provided shelter above the cold air drainage of the valley floors.

In 1983, Stage 1 of a study for the Murrumburrah–Yass and Murrumburrah–Wagga Wagga electricity transmission lines was initiated (Hughes & Witter 1983). A 16km section of the former line was assessed, while only a 4km section was surveyed of the latter. Both these survey corridors lie to the north of the Hume Highway at Jugiong. The study areas comprise rolling hills and low granite rises with deeply incised streams that characterise the western slopes of the Great Dividing Range. These corridors lie within the contact area between the Wiradjuri and the Ngunawal tribes. The results of this survey recorded four open camp sites, 13 isolated finds and one possible scarred tree. The open camp sites were all quite large, comprising between forty and seventy artefacts made predominantly from quartz (Hughes & Witter 1983: 7). Estimates made on the effective survey coverage, land systems traversed and sites recorded led the authors to suggest that there is likely to have been fifteen sites along the surveyed corridors, with ten being “invisible” (Hughes & Witter 1983: 8).

Also in 1983, Hiscock located 13 isolated finds and nine scarred trees during a survey of the eastern portion of a proposed transmission line between Wagga Wagga and Darlington Point (Hiscock 1983).

Later in 1983, Stage 2 of the Murrumburrah–Yass electricity line was assessed. The results of this survey recorded 11 isolated finds, five open camp sites and two scarred trees (Packard & Hughes 1983: 3).

The location of a proposed Telecom site at Mount Galore, 50kms west of Wagga Wagga, was surveyed in 1986 (Stone 1986). Only a very small area, approximately 30m x 30m was surveyed and no Aboriginal sites were recorded.

Assessment for a proposed water treatment works was undertaken in Gundagai in 1986 (Koettig 1986). The two options included a site on the Murrumbidgee River bank and the second on a hill to the south of the river. One site was recorded in the latter study area, being an open site containing four artefacts.

Assessment in Wagga Wagga for the establishment of a naval communications base was undertaken in 1992 (Wood 1992). The area assessed comprised approximately 150ha for the receiving station and 1.1ha for the transmitting station. Over both study areas, 14 oven mounds (described as circular to oval mounds used for cooking food in oven pits) were recorded, mostly adjacent to watercourses. Of these only two remained in reasonable condition. Also recorded were ten hearths, some in association with mounds or artefact scatters; eight open camp sites and 14 scarred trees.

Gay (1999) notes that in 1992 Navin Officer Heritage Consultants (Navin Officer) assessed a proposed extension of the Wagga Wagga tip at Gregadoo; approximately 8km to the south-east of the current Subject Area. This assessment recorded four scarred trees (AHIMS #56-1-0035 to 0038). Navin Officer's report was not available for examination.

Williams' survey between Albury and Wagga Wagga for a proposed fibre optic cable route provided confirmation that proximity to water was a factor in open site location (Williams 1993). Williams recorded one scarred tree and three open sites in close proximity to creeks and suggested that sandy, water retaining substrates were more likely to contain sites. Williams' study passed within 5km of the current Subject Area.

A proposed pipeline extending from Wodonga to Wagga Wagga was surveyed in 1996 (SKM 1996). This assessment recorded 25 Aboriginal sites, ten being isolated finds, 12 open artefact scatters and three scarred trees. These include sites within the easement as well as those recorded in close vicinity. Results of the survey deemed that artefact scatters were recorded primarily in well-drained contexts within riparian zones adjacent to water sources. Scarred trees could occur in any landform and that areas that had been heavily used for agriculture and were distant from water had low archaeological potential (SKM 1996: 9–5).

Assessment of a proposed bypass of Coolac along the Hume Highway resulted in the completion of three archaeological assessments, the first two of which were undertaken in 1994 and 1996 respectively and the last of which was undertaken in 2004 (Navin Officer 2004). The most recent assessment recorded two sites, one open camp site and a potential archaeological deposit (PAD). The open site comprised six artefacts (five quartz and one tuff) located on an elevated secondary terrace 150m from the junction of Ginger Beer Creek with Muttama Creek. The PAD was identified in association with the terrace adjacent to Daisy Bed Creek near the junction of Muttama Creek.

During 2007, OzArk (2007a) undertook an Aboriginal heritage assessment of the proposed replacement of Line 990 of the Wagga Wagga-Yass Electricity Transmission Line (ETL). The easement was already owned by TransGrid and an ETL already existed along exactly the alignment that the replacement line would follow. Hence, the corridor had suffered impacts in relation to the establishment of this line and the proposed line replacement aimed to affect only the same tower locations that had already been affected by initial line construction. Access tracks and creek crossings that required upgrade were also assessed. The Aboriginal heritage component of the study recorded four Aboriginal sites. All were open sites, two of which also had PADs. None of the recorded sites were to be harmed directly by the proposed works. Two were to be avoided completely through the alteration of access track locations (WYTL-OS1 and WYTL-OS3 with PAD). Recommended at the remaining two sites was conservation via the implementation of mitigative measures including the fencing off of areas, the covering of site areas with rubber matting during the construction period and through strictly confined activities at these locations. Another series of locations along the 990 ETL was assessed as having either high or moderate-high archaeological sensitivity from a landform perspective. To ensure no adverse impacts to potential heritage at these locations a set of management procedures was designed to minimise impacts at these locations, which included towers and creek crossings.

Later in that same year, OzArk (2007b) conducted an Aboriginal heritage study to investigate TransGrid's proposed construction of Wagga North 132kV Substation, extensions of a private access road and realignment of connecting electricity lines at Bomen, an industrial development area north of Wagga Wagga. The survey did not record any Aboriginal sites or objects within the study area. Due to the nature of the landform occupied by the study area and the high level of existing disturbance, it was assessed that there was a low potential for intact sub-surface archaeological deposits to exist within the study area. On the basis of the results of the study, there were no constraints to the proposed development on the grounds of Aboriginal cultural heritage.

During December 2007, OzArk (2008) conducted an Aboriginal heritage study to investigate proposed cut-in connections to the Wagga North 132kV Substation, north of Wagga Wagga

which would link the proposed substation with existing electricity lines. The study area comprised an area of land south-east of the Wagga Wagga Vinidex factory. The study corridor followed the proposed route of the 991 cut-in connection (Option 2) which ran roughly south from the location of the proposed North Wagga 132 KV substation. An area of 30 metres either side of the centre line of the cut-in connection was surveyed for both Aboriginal and historic heritage items. No Aboriginal archaeological or cultural heritage sites were recorded as a result of the survey. Further, it was assessed that there was low potential for the presence of undetected, intact, sub-surface archaeological deposits to be located within the study area.

Finally, Kelleher Nightingale Consulting Pty Limited (KNC 2008) conducted an Aboriginal Cultural Heritage Assessment as part of a Wagga Wagga Local Environmental Study. This study examined eight areas that were subject to rezoning:

- Lloyd;
- Bomen;
- Estella West;
- Edison Road;
- Hammond Avenue;
- Copland Street;
- Boorooma East; and
- Moorong Street.

Of these, the Copland Street area assessed in the KNC study lies directly within the current Subject Area. No sites were identified in this area and the landscape was assessed as holding low archaeological sensitivity. Of the remaining seven areas, four are also located to the south of the Murrumbidgee River whilst three are located to the north of the Murrumbidgee River. The overall predictive model adopted in the study (KNC 2008: 7) concurs with that presented in Green (2002) and is consistent with that presented below in **Section 4.4**. Only one new site recording occurred as a result of the fieldwork component of KNC's study; namely, Bomen Isolated Find 1 (BIF1)[3], a mid-reddish brown mudstone flake with a flaked platform, multiple dorsal scars, feather termination and 10% cortex on the dorsal surface. BIF1 was located on a gentle north-facing slope at the confluence of two ephemeral streams.

4.3 LOCAL ARCHAEOLOGICAL CONTEXT

A 4km x 3km search (search date: 29 August 2012) of the OEH AHIMS register centred on the levee upgrade portion Subject Area shows that there are three previously recorded Aboriginal

[3] Approximately 14km northeast of the current Subject Area.

sites on land surrounding the Subject Area (**Figure 3**). All three sites are scarred trees (the AHIMS data is shown in **Appendix 2**).

Two additional 1400m x 900m searches were also preformed, centred on the proposed North Wagga borrow pit location (search date: 13 September 2012) and the Tasman Road borrow pit location (search date: 6 September 2012). No sites were identified in either of the searches. A list of Aboriginal site type definitions is presented in **Appendix 3** of the current report. All three of the AHIMS registered sites are located greater than 500m from the proposed impact footprint.

Figure 3: Location of Aboriginal sites identified on the AHIMS database in relation to the proposed impacts.

4.4 PREDICTIVE MODEL FOR SITE LOCATION

Proximity to a permanent water supply is the primary factor appearing to determine the location of Aboriginal campsites. Results of an integrated series of studies including a serious excavation component, suggests a high correlation between the permanence of a water source and the permanence and / or complexity of the area's Aboriginal occupation (McDonald 1997). This was further reflected in the lithic assemblages from sites close to permanent water, which suggested that a greater range of activities were represented (e.g. tool use, manufacture and maintenance, food processing, and quarrying). Sites near ephemeral water sources had

evidence for one-off occupation (e.g. isolated knapping floors or tool discard), and creek junctions were also proven to be foci for site activity.

Using the concept of stream ordering, the following general predictions can be made regarding the nature of sites and their location in the current Subject Area (not taking into account factors of site preservation):

- The area surrounding first order streams and headwaters is most likely to contain evidence of sporadic occupation and may consist of little more than a background scatter of artefactual material;
- In the vicinity of second order creeks, archaeological evidence may be sparse, but may indicate focussed activity (one-off camp sites and knapping events);
- In the lower reaches of tributary creeks (third order), archaeological evidence will be more frequent and intense, indicating more permanent or repeated occupation by small groups and may show evidence of concentrated activities;
- On major creek lines and rivers (fourth order) more permanent and repeated occupation may be evidenced by a more diverse stone tool assemblage indicating greater range of lithic activities. Sites in this location may even be stratified;
- Creek junctions may provide a popular location for occupation and the size of the confluence (in terms of stream ranking nodes) may influence the size of the site; and
- Ridgetop locations between drainage lines are likely to contain limited archaeological evidence in the form of one-off activities.

In terms of landforms, evidence from the background research indicates that locations low on valley floors were not preferred occupation locations in the more elevated southern tablelands. This has been interpreted as relating to the cold, damp air that characterises the valley floors and the desire to escape this by establishing sites on elevated terraces or low spur tops that overlook water sources or are adjacent to them.

More specifically, Green (2002) undertook a survey for the Wiradjuri Heritage Study that involved an extensive level of consultation with government, non-government and Aboriginal interests in the Wagga Wagga LGA. Broadly, the study aimed to interpret the archaeological findings from various assessments over the LGA. In relation to predictive models Green (2002: 77), summarises that:

- Quartz is the primary raw material however chert, silcrete, and quartzite are also known to occur;
- Artefact scatters are likely to be located in well drained areas near permanent water sources such as sand hills and creek levees;
- Hearth stones and artefacts are likely to be exposed by erosion at the base of sand dunes and drifts;
- Mussel shell deposits are often associated with ashy grey material and charcoal;

- Burials are usually only detected after disturbance (machine or natural i.e. erosion) but are usually in naturally elevated sand dunes or alluvial landforms;
- Modified trees can occur anywhere but are more common near water; and
- The Wiradjuri did not always live in transient camps but often concentrated continued or repeated activity around certain camp sites and mounds.

On the basis of the landform context outlined in **Section 2**, the ethno-historical evidence provided in **Section 4.1**, the regional / local archaeological contexts discussed in **Sections 4.2** and **4.3**, and the general predictive model outlined above, it is possible to make the following predictions relating to the Aboriginal heritage resource within the current Subject Area (for a definition of site types refer to **Appendix 3**):

- **Open Sites.** Open sites are most likely on elevated features in the vicinity of water courses, while the Murrumbidgee River and several smaller drainages do flow through the Subject Area, high levels of disturbance from urban development and previous levee construction have likely removed any of this evidence from the landscape, as such open sites are considered unlikely;
- **Isolated Finds.** Isolated stone artefacts may occur in virtually any landscape context and are thus considered possible;
- **Culturally Modified Trees.** Culturally modified trees are likely to occur wherever stands of mature native trees of scar-bearing type are extant. The Subject Area contains some scattered examples of remnant vegetation and scarred trees are known in the vicinity. Culturally modified trees are thus considered possible;
- **Grinding Grooves.** Grinding grooves are likely to occur in locations where there is suitable outcropping rock in the vicinity of creek lines. No such outcrops occur in the Subject Area or environs and the possibility of recording this site type is very low;
- **Ceremonial Sites.** Bora / ceremonial grounds are thought unlikely due to the high levels of disturbance on elevated land suitable for such sites;
- **Rockshelters.** No overhanging rock outcrops are present in the Subject Area that are suitable for rockshelters;
- **Quarries.** No outcrops of raw materials suitable for stone tool manufacture are present in the Subject Area; and
- **Burials.** The high levels of disturbance indicate that there is a low likelihood of burials being present in the Subject Area.

4.5 FIELD METHODS AND SAMPLING STRATEGY

Determination of areas requiring targeted assessment was achieved through consultation with the WWLALC representatives. As much of the proposed works are to occur within heavily disturbed residential and commercial areas and previous levee construction, this consultation determined which areas within the Subject Area still retained archaeological potential. Due

Diligence under the OEH *Code of Practice* and vehicle transects were applied to all areas exhibiting high levels of disturbance.

The survey methodology combined vehicle reconnaissance and pedestrian inspection of the Project Site. Generally, the vehicle-based inspection provided an excellent method to reconnoitre sections of the Subject Area and as such to identify archaeologically sensitive areas requiring targeted assessment. Where these areas were identified, spot-checks of ground surface exposures were employed. Notes on the vegetation, land-use, disturbance, archaeological potential / sensitivity and the need for full survey were made within each area surveyed.

In portions of the Subject Area requiring pedestrian survey, surveyors inspected a 20m wide corridor that consisted of a 5m buffer on either side of the extant levee which is approximately 10m wide. This included all areas where the proposed works are to occur. All mature trees old enough to bear cultural scarring and all ground surface exposures were inspected closely.

5 RESULTS OF ABORIGINAL HERITAGE ASSESSMENT

5.1 EFFECTIVE SURVEY COVERAGE

Two of the key factors influencing the effectiveness of archaeological survey are ground surface visibility (GSV) and exposure. These factors are quantified in order to ensure that the survey data provides adequate evidence for the evaluation of the archaeological materials across the landscape. For the purposes of the current study, these terms are used in accordance with the definitions provided in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales: Part 6 National Parks and Wildlife Act 1974* (DECCW 2010).

Ground surface visibility is defined as:

> *… the amount of bare ground (or visibility) on the exposures which might reveal artefacts or other archaeological materials. It is important to note that visibility, on its own, is not a reliable indicator of the detectability of buried archaeological material. Things like vegetation, plant or lead litter, loose sand, stone ground or introduced materials will affect the visibility. Put another way, visibility refers to 'what conceals' (DECCW 2010: 39).*

Exposure is defined as:

> *… different to visibility because it estimates the area with a likelihood of revealing buried artefacts or deposits rather than just being an observation of the amount of bare ground. It is the percentage of land for which erosion and exposure was sufficient to reveal archaeological evidence on the surface of the ground. Put another way, exposure refers to 'what reveals' (DECCW 2010: 37).*

The current study examined five survey units; the locations of each unit are shown in **Figure 4** while **Table 2** provides a summary of effective survey coverage. The survey zones are:

- **Wagga Wagga Levee** (WL). Consisted of a 5m buffer surrounding the extant Wagga Wagga City levee located on the Murrumbidgee River alluvial floodplain. Disturbance levels were very high; however, occasional stands of mature native trees were noted on the banks of the Murrumbidgee River (**Plates 1** and **6**). Six sections of the levee were surveyed (WL1 to 6) via pedestrian transect (**Plates 7** to **12**) and the location of these areas is shown in **Figure 4.**

- **North Wagga Wagga Levee** (NL). Consisted of a 5m buffer surrounding the extant North Wagga Wagga levee located on the Murrumbidgee River alluvial floodplain. Disturbance levels were very high (**Plate 13**); however, multiple but dispersed mature, native trees were noted on the banks of the Murrumbidgee River (**Plate 14**). The area was assessed via vehicle transects while applying Due Diligence to heavily disturbed portions. Survey unit includes both the North Wagga Wagga Levee and Bank Two Levee.

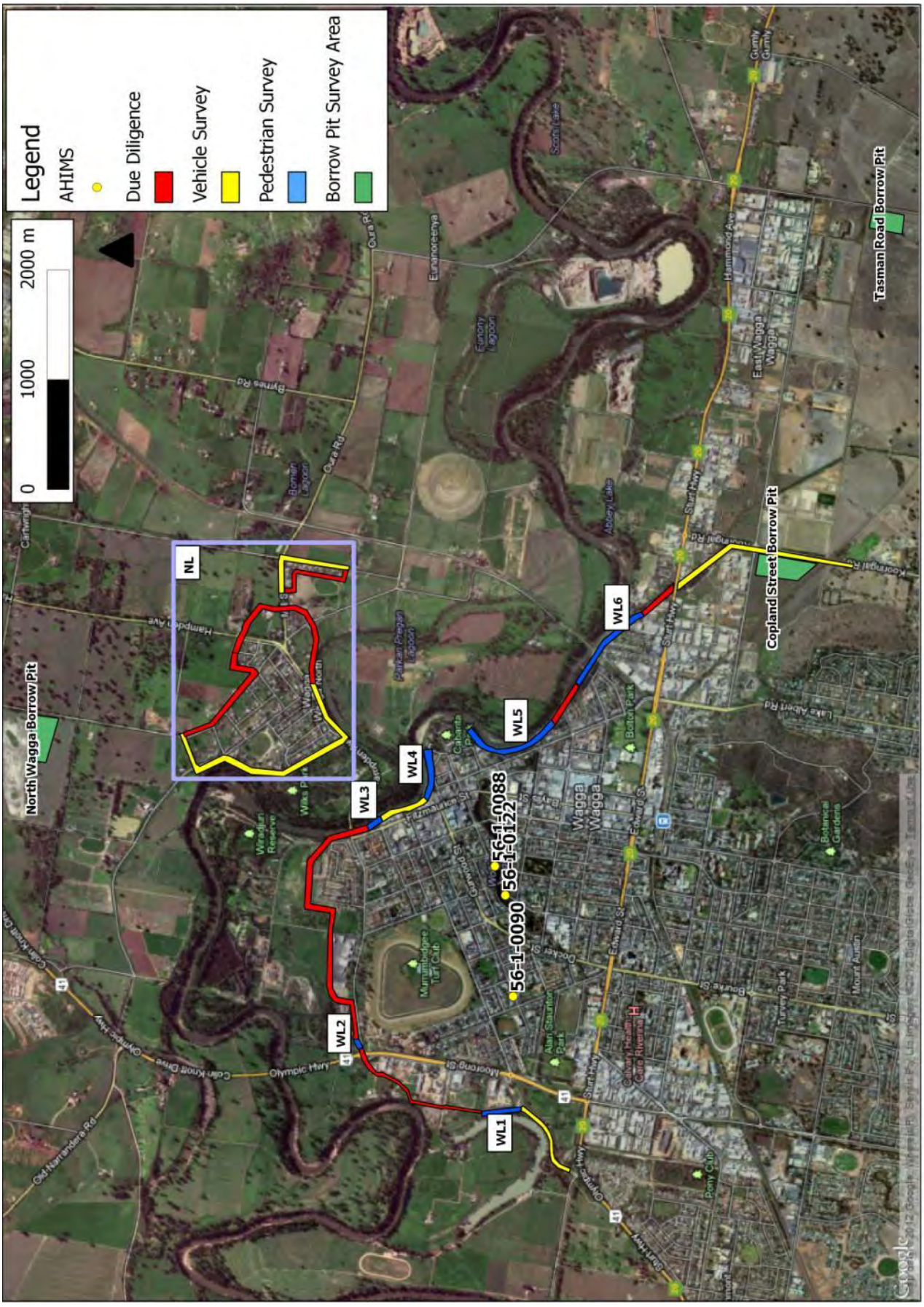
- **Tasman Road Borrow Pit** (TR). Consisted of a flat cleared paddock on the Murrumbidgee floodplain; grasses and weeds obscured more than 95% of the ground surface (**Plate 15**).
- **Copland Street Borrow Pit** (CS). Consisted of a flat cleared paddock on the Murrumbidgee floodplain; grasses and weeds obscured more than 95% of the ground surface (**Plate 16**).
- **North Wagga Borrow Pit** (NW). Heavily disturbed. Consisted of a largely cleared paddock adjacent to an extant borrow pit. Several dispersed mature trees were noted and grass obscured approximately 90% of areas undisturbed by the borrow pit (**Plate 17**).

It is important to note that all areas assessed under Due Diligence were not surveyed via pedestrian transects and were instead assessed via vehicle reconnaissance.

Table 2: Survey coverage data.

Survey Unit	Assessment Method	Landform	Survey Unit Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (= Survey Unit Area x Visibility % x Exposure %)	Effective Coverage % (= Effective Coverage Area / Survey Unit Area x 100)
WL	Vehicle / Due Diligence	Floodplain	132,200	na	na	na	na
WL1	Pedestrian	Floodplain	5,000	20	15	150	3
WL2	Pedestrian	Floodplain	1,400	20	15	42	3
WL3	Pedestrian	Floodplain	2,600	20	10	52	2
WL4	Pedestrian	Floodplain	7,400	20	20	296	4
WL5	Pedestrian	Floodplain	15,000	20	20	600	4
WL6	Pedestrian	Floodplain	14,400	20	20	576	4
NL	Vehicle / Due Diligence	Floodplain	124,000	5	5	310	0.25
TR	Pedestrian / Due Diligence	Floodplain	35,000	5	5	87.5	0.25
CS	Pedestrian / Due Diligence	Floodplain	59,000	5	5	147.5	0.25
NW	Vehicle / Due Diligence	Floodplain	44,000	na	na	na	na

Figure 4: Survey units and methods of survey.



5.2 ABORIGINAL SITES RECORDED

No Aboriginal sites were recorded during the survey. Further, the Subject Area holds little potential for the existence of undetected Aboriginal sites due to the high levels of prior disturbance.

One native tree was inspected during this assessment and exhibited scarring that was not consistent with those of cultural modification. The tree was assessed against the criteria established in Long (2004). The tree assessed was considered mature enough to have been exploited by Aboriginals for past resource procurement; however, all signs of scarring were more consistent with impact / abrasion scarring rather than being the result of cultural modification (**Plate 18**). **Figure 5** shows the location of the tree.

Figure 5: Location tree with scar.

5.3 ABORIGINAL SITES RE-LOCATED

No attempt was made to re-locate any previously recorded AHIMS sites as all were identified greater than 500m from the proposed impacts.

5.4 DISCUSSION

As described in the regional and local archaeological context provided in **Sections 4.1** and **4.2** and the predictive model for site location provided in **Section 4.3**, watercourses formed an important focus for traditional Aboriginal activities in the Wagga Wagga area. While the majority

of the levee corridor runs directly along the Murrumbidgee River and traverses a landscape that would have provided the resources necessary for past Aboriginal occupation, the lack of recorded sites along the current Subject Area is thought likely to be the result of a combination of the following factors:

- The narrow, linear shape of the Subject Area, which comprises a relatively small overall area and which may not have intersected any prehistoric Aboriginal site locations; and
- The proposed works are confined to highly disturbed areas that are part of the existing levee corridor and urban infrastructure which would have destroyed or removed certain Aboriginal site types (e.g. scarred trees) had they ever existed within the corridor in the first place.

5.5 ASSESSMENT OF HERITAGE SIGNIFICANCE

As no Aboriginal sites were recorded during the current study, the remainder of this section has been omitted.

5.6 LIKELY IMPACTS TO ABORIGINAL HERITAGE FROM THE PROPOSAL

As no Aboriginal sites were identified during the current study, and the Subject Area was assessed as holding little potential for the existence of undetected Aboriginal sites. There should be no impacts to Aboriginal heritage as a result of this proposal.

6 MANAGEMENT AND MITIGATION: ABORIGINAL HERITAGE

6.1 GENERAL PRINCIPLES FOR THE MANAGEMENT OF ABORIGINAL SITES

Appropriate management of cultural heritage items is primarily determined on the basis of their assessed significance as well as the likely impacts of the proposed development. As no sites were recorded as a result of the current assessment, the remainder of this section has been omitted.

6.2 UNANTICIPATED FINDS PROTOCOL

An Aboriginal artefact is anything which is the result of past Aboriginal activity. This includes stone (artefacts, rock engravings etc), plant (culturally scarred trees) and animal (if showing signs of modification; i.e. smoothing, use). Human bone (skeletal) remains may also be uncovered while onsite.

Under the *National Parks and Wildlife Act 1974* (NPW ACT), which protects all Aboriginal sites and objects, these artefacts have legislative protection. The significance of any artefact or site must be assessed by trained professionals who will evaluate the social/cultural, scientific, historic and aesthetic values of the artefact or site.

Protocol to be followed in the event that previously unrecorded or unanticipated Aboriginal object(s) are encountered:

1. All ground surface disturbance in the area of the finds should cease immediately the finds are uncovered.
    a. The discoverer of the find(s) will notify machinery operators in the immediate vicinity of the find(s) so that work can be halted; and
    b. The site supervisor will be informed of the find(s).
2. If there is substantial doubt regarding an Aboriginal origin for the finds, then gain a qualified opinion from an archaeologist as soon as possible. This can circumvent proceeding further along the protocol for items which turn out not to be archaeological. If a quick opinion cannot be gained, or the identification is positive, then proceed to the next step.
3. Immediately notify the following authorities or personnel of the discovery:
    a. OEH (Queanbeyan Office; ph. 131 555 or (02) 9995 5555;
    b. WWLALC: ph. (02) 02 6921 4095.
4. Facilitate, in co-operation with the appropriate authorities and WWLALC:
    a. The recording and assessment of the finds;
    b. Fulfilling any legal constraints arising from the find(s). This will include complying with OEH directions; and

c. The development and conduct of appropriate management strategies. Strategies will depend on Aboriginal consultation and the assessment of the significance of the find(s).

5. Where the find(s) are determined to be Aboriginal Objects as defined by the NPW Act, any re-commencement of construction related ground surface disturbance may only resume in the area of the find(s) following compliance with any consequential legal requirements and gaining written approval from OEH (as required).

What to do if you come across any unanticipated suspected human remains during construction work?

6. Cease all ground surface disturbance in the area of the find(s) immediately by notifying machinery operators in the immediate vicinity of the find(s). Also avoid touching the discovered remains.
7. Inform the site supervisor as soon as possible and he/she will organise for a qualified professional opinion: usually the police in the first instance.
8. Create a buffer zone of 50m x 50m around the find spot. No authorised entry or earth disturbance will be allowed until the discovery has been assessed.

7 RELEVANT LEGISLATION

Cultural heritage is managed by a number of State and National Acts. Baseline principles for the conservation of heritage places and relics can be found in the Burra Charter[4], which recognises that there are places worth keeping because they can enrich our lives on many levels. The significance of such places may be embodied in fabric (physical material), environmental setting, contents, use or meaning to people, and should be assessed through methodical data collection. Since its adoption in 1979, The Burra Charter has become the standard of best practice in the conservation of heritage places in Australia, and heritage organisations and local government authorities have incorporated the inherent principles and logic into guidelines and other conservation planning documents. The Burra Charter generally advocates a cautious approach to changing places of heritage significance. This conservative notion embodies the basic premise behind legislation designed to protect our heritage, which operates primarily at a State level.

A number of Acts of parliament provide for the protection of Aboriginal heritage at various levels of government[5]. The three most important statutes in New South Wales are the:

- *Environmental Planning and Assessment Act 1979*, amended by the *Environmental Planning and Assessment Amendment (Infrastructure and Other Planning Reform) Act 2005*.
- *National Parks and Wildlife Act 1974* (NPW Act).

While at Commonwealth level, the following statute is relevant:

- *Environment Protection and Biodiversity Conservation Act 1999* amended by the *Environment and Heritage Legislation Amendment Act (no. 1) 2003*.

7.1.1 State legislation

7.1.1.1 Environmental Planning and Assessment Act 1979

This Environmental Planning and Assessment Act 1979 (EP&A Act) established requirements relating to land use and planning. The Act contains:

- Part 4: local government development assessments, including heritage. May include schedules of heritage items. Includes projects deemed to be of State Significance.
- Part 5: environmental impact assessment requirements (for those developments not requiring consent under Part 4). State owned heritage items listed on LEPs are governed by Part 5.

[4] The Burra Charter defines the basic principles and procedures to be followed in the conservation of all kinds of places such as monuments, buildings, Aboriginal sites, roads, archaeological sites, whole districts or even regions. It was first adopted in 1979, based on the Australian ICOMOS (International Council on Monuments and Sites) review (1977) of the 1966 Venice Charter (Australian ICOMOS Inc. 1998).

[5] NSW Heritage Office 1998: *Living with Aboriginal Culture*, p. 3.

7.1.1.2 National Parks and Wildlife Act 1974

Amended during 2010, the *National Parks and Wildlife Act 1974* (NPW Act) provides for the protection of Aboriginal objects (sites, objects and cultural material) and Aboriginal places. Under the NPW Act (S.5), an Aboriginal object is defined as: any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises New South Wales, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains.

An Aboriginal place is defined under the NPW Act as an area which has been declared by the Minister administering the Act as a place of special significance for Aboriginal culture. It may or may not contain physical Aboriginal objects.

As of 1 October 2010, it is an offence under Section 86 of the NPW Act to 'harm or desecrate an object the person knows is an Aboriginal object'. It is also a strict liability offence to 'harm an Aboriginal object' or to 'harm or desecrate an Aboriginal place', whether knowingly or unknowingly. Section 87 of the Act provides a series of defences against the offences listed in Section 86:

- The harm was authorised by and conducted in accordance with the requirements of an Aboriginal Heritage Impact Permit (AHIP) under Section 90 of the Act.
- The defendant exercised 'due diligence' to determine whether the action would harm an Aboriginal object.
- The harm to the Aboriginal object occurred during the undertaking of a 'low impact activity' (as defined in the regulations).

Under Section 89A of the Act, it is a requirement to notify the OEH Director-General of the location of an Aboriginal object. Identified Aboriginal items and sites are registered with the OEH AHIMS.

7.1.2 Commonwealth legislation

7.1.2.1 Environmental Protection and Biodiversity Conservation Act 1999

Amendments in 2003 to the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) established the National Heritage Council to advise Department of Sustainability, Environment, Water, Populations and Communities (DSEWPaC). DSEWPaC maintains the National Heritage List and the Commonwealth Heritage List. Ministerial approval is required for proposals involving significant impacts to National and/or Commonwealth heritage places.

7.1.3 Applicability to the Subject Area

As no Aboriginal sites or objects are known to exist within the Subject Area no state or national Act specifically applies. Should Aboriginal objects or sites be located in the Subject Area (assessed here as being very unlikely) the NPW Act would apply.

8 HISTORIC HERITAGE ASSESSMENT: BACKGROUND

8.1 INTRODUCTION

The Subject Area is located within Wagga Wagga, NSW. Historic settlement in the Subject Area is closely related to that of the pastoral and agriculture activity that characterises the region's economy.

8.2 HISTORIC SETTLEMENT IN THE REGION

The following is a brief synthesis of relevant sections detailing the early settlement history of the Subject Area from a study by Peter Freeman for the Wagga Wagga City Council (Freeman 2002).

Initial European settlement of the Riverina region and Wagga Wagga area began in the 1830s as pastoral landholders from Sydney began to expand south, first into Goulburn area and by 1836 into the Wagga Wagga area. While these first settlers were considered illegal squatters, they eventually were able to obtain licences to graze stock on their runs.

As pastoral settlement increased in the area, demand for public services grew and at the request of these early settlers a Bench of Magistrates was established at Wagga Wagga in 1847. It was at this time that a village was established on the Murrumbidgee riverbank near the ford used by most of the traffic journeying through the area. A primitive courthouse and lock-up were constructed of slabs tied to a wall plate with green hide and covered with bark roofs. Later in 1856, a hospital was opened in a small slab cottage with a bark roof on the sandhill in Kincaid Street.

Between 1859 and 1869 three denominations built churches on Church Hill while a Wesleyan Church was built in Johnston Street. The earliest of these churches was a Gothic-style brick Roman Catholic Church called St Michael's Roman Catholic Church, built in 1859. Shortly thereafter an Anglican church was built in 1861 and the first Presbyterian church, St Andrew's, was built on Church Hill in 1869. The Wesleyan Methodist Church on Johnston Street was built in 1865 and extended between Fitzmaurice and Tarcutta Streets. These three structures still stand even today.

During this initial pastoral settlement, major routes between Sydney and Melbourne and west to Adelaide were established and by the 1840s these routes had become well defined tracks or roads. The route used by the early explorer Sir Thomas Mitchell during his 1836 journey, eventually became the Port Phillip Road, the main overland route from Sydney to Melbourne passing through Wagga Wagga. By the late the late 1840s horse carried mail routes were established between Tarcutta and Wagga Wagga.

While early traffic through the Riverina region was by horse and wagon, by the 1860s river born steam ships began to enter the area and provided a link to South Australia. Rail transport

further opened up the Riverina region in 1864 as a railway was constructed from Melbourne to Echuca, which intersected the already established steam ship route. In 1869, the Wagga Wagga Steam Navigation Company was established and made several trips each year to South Australia.

By the late 1860s, the New South Wales government became aware of the increasing settlement and agricultural production in the Riverina region. The Wagga Wagga area was incorporated into a municipality in 1870 as the population had reached more than 1200. In light of this, the NSW government expanded the railway from Sydney through Cootamundra and south, eventually reaching North Wagga in 1878. Initially a temporary wood rail bridge was constructed over the Murrumbidgee for light engine use between North Wagga and the city centre in 1879, but was quickly replaced by a more permanent iron bridge in late 1880.

As Wagga Wagga continued to grow so did its need for increasing services and transport. While an early timber bridge was constructed over the Murrumbidgee River in 1862 to replace the ford and accommodate wagon, horse and foot traffic, this was replaced at the behest of the of the NSW government by a much larger timber truss bridge in 1895. The Hampden Bridge, as it was called, served foot, wagon, horse, and eventually vehicle traffic for nearly 100 years until its eventual closure in 1995 when it was replaced by the concrete Wiradjuri Bridge.

8.3 LOCAL CONTEXT

A search of relevant heritage listings identified one historic heritage item (Item No I85: Hampden Bridge along Fitzmaurice Street; **Figure 6** and **Plate 19**) listed on the Wagga Wagga LEP 2010. The Hampden Bridge is located in proximity to the impact footprint of the proposed works.

The bridge is a timber truss bridge designed by Percy Allen and built in 1895. It was constructed to replace a smaller toll bridge known as the Wagga Wagga Company Bridge over Murrumbidgee River that was constructed in 1862.

The bridge was formerly on the Roads and Maritime Services (RMS) S170 register but was removed and the bridge closed amid safety concerns in 1995. Ownership and management of the bridge was transferred to the City of Wagga Wagga immediately following its closure and removal from the RMS S170 register (Timber Research Unit 2008). The bridge's western approach lies directly adjacent to the path of the proposed works; however, the scope of the proposed works should not require any impacts to the bridge. Nor should the bridge's approach be impacted as this is already built to an elevation above that of the proposed levee upgrade.

Additionally, a flood marker tree and a monument to the construction of the Main City Levee is located immediately adjacent to the embankment of the Main City Levee, on the city side of the levee at the corner of Sturt Street and Henley Lane. The item is not currently listed on any heritage database, for a detailed description of this item refer to **Section 9.1**.

8.4 SURVEY METHODOLOGY

The historic heritage assessment of the Subject Area was conducted concurrently with the Aboriginal heritage assessment described in **Sections 3** and **4**.

9 RESULTS OF HISTORIC HERITAGE ASSESSMENT

9.1 HISTORIC SITES RECORDED

One previously unrecorded historic heritage sites was identified within the impact area during the current assessment. Additionally, the Hampden Bridge (Item No I85) is listed on the Wagga Wagga LEP 2010 as a heritage item of local significance. The Hampden Bridge is located in close proximity to the proposed works (**Figure 6).** For a discussion and recording of this item refer to **Sections 8.2** and **8.3.**

Refer to the following for a detailed description of the previously unrecorded heritage item:

Wagga Wagga Flood Tree and Levee Monument

UTM Coordinates: GDA94 Zone 55, Easting: 533898 / Northing: 6115215

Location: Corner of Sturt Street and Henley Lane at chainage 5040, Wagga Wagga, NSW.

Description: A flood marker tree and a monument to the construction of the Main City Levee is located immediately adjacent to the embankment of the Main City Levee, on the city side of the levee (**Figure 6**).

A gauge marked in feet and inches is attached to the flood marker tree (**Plate 20**). The age of the gauge is unknown but it is understood that the site may have been used for flood measurement from before the Hampden Bridge was constructed in 1895.

The monument to the construction of the Main City Levee was constructed on 9 September 1960, after the construction of the levee was completed in July 1960 (**Plates 21** and **22**). The monument includes a commemorative plaque for the unveiling of the monument, a description of the project, a list of the councillors serving at the time and a list of Water Conservation and Irrigation Commission staff and others involved in the project.

Figure 6: Location of the Heritage Items.

9.2 DISCUSSION

One previously unrecorded heritage item was identified during the current survey. The Wagga Wagga Flood Tree and Levee Monument was constructed in 1960. A detailed description for this item is presented in **Section 9.1**. The site represents a record of the Wagga Wagga communities' relationship to the natural landscape.

The Hampden Bridge (Item No I85) a timber truss bridge was identified adjacent to the impact footprint of the proposed works. The bridge is now derelict and Wagga Wagga City Council is soliciting tenders for the bridges demolition; refer to **Section 10.2.1** for greater detail. For a more detailed discussion of the bridges history refer to **Sections 8.2** and **8.3**.

While both heritage items are located in close proximity to the proposed impacts, due to past disturbances related to urban development and construction of the existing levee it is unlikely that deposits of historic artefacts are present.

9.3 ASSESSMENT OF SIGNIFICANCE—GENERAL PRINCIPLES

In determining the appropriate process for significance assessment, it must be determined whether the identified items should be classified as 'archaeological'.

The assessment of heritage significance is a process of examining the various factors and values which bear upon a place, building or structure and determining what level of significance, if any, the item may have with respect to an established set of heritage criteria. Broadly speaking, these criteria are based on the four values set out in the Burra Charter and are the methodology accepted by heritage authorities and professional consultants. These criteria are:

- historic significance;
- aesthetic significance;
- scientific significance; and
- social significance.

The Heritage Council of NSW has defined a set of heritage significance criteria against which the heritage significance of an item may be judged. The use of standardised criteria helps achieve consistency in the assessment process and provides a basis for comparative assessment between types or classes of items.

The Heritage Council significance criteria are as follows.

- **Criterion (a)**—an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area);
- **Criterion (b)**—an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area);
- **Criterion (c)**—an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);
- **Criterion (d)**—an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons;
- **Criterion (e)**—an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);
- **Criterion (f)**—an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);
- **Criterion (g)**—an item is important in demonstrating the principal characteristics of a class of NSW's:
    - cultural or natural places; or
    - cultural or natural environments: or
    - a class of the local area's:
    - cultural or natural places; or
    - cultural or natural environments.

In many cases, items or places will be significant under only one or two of these criteria. Structures or items that do not function in their original context are much less able to demonstrate the qualities for which they were originally designed and this thereby reduces their heritage significance.

9.4 ASSESSMENT OF HISTORIC HERITAGE SIGNIFICANCE

On heritage item was identified during the course of this assessment. The assessed significance of the feature was based on the criteria described in **Section 9.3** and was determined as follows:

- **Criterion (a)**—The historic feature assessed does not to hold any importance in regard to the cultural or natural history of the region as little information on their nature can be identified;
- **Criterion (b)**—The historic feature assessed does not to hold any importance in regard to association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area);
- **Criterion (c)**— The historic feature assessed does not to hold any importance in regard to demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);
- **Criterion (d)**—No association with any community or cultural group in NSW for social, cultural or spiritual reasons can be identified with historic feature recorded in this assessment;
- **Criterion (e)**—The Wagga Wagga Flood Tree and Levee Monument was assessed as holding importance to the local community as it represents a record of how natural events have shaped the surrounding community. An exact date of original construction for the flood tree is unknown but records indicate it was prior to 1895; however, the levee monument construction dates to 1960.
- **Criterion (f)**—None of the historic features assessed appear to have any uncommon, rare or endangered aspects that contribute to NSW's cultural or natural history;
- **Criterion (g)**—none of the defined attributes for this criterion relate to any of the historic features recorded in this assessment.

The Wagga Wagga Flood Tree and Levee Monument has been preliminarily assessed as having **local heritage significance** as it satisfies criterion (e) as the item represents a relationship between the cultural and natural history of the immediate area.

9.5 LIKELY IMPACTS TO HISTORIC HERITAGE FROM THE PROPOSAL

The Wagga Wagga Flood Tree and Levee Monument are located within the footprint of the proposal at chainage 5040. The concept design at this location includes the upgrade of the existing embankment levee to a hybrid embankment/sheet pile levee. It is likely that the flood

marker tree and monument would need to be removed from the proposal site to allow construction to occur. Investigations would be undertaken during detailed design to assess whether the flood marker tree and monument can be retained.

Also, the Proponent has indicated there are no plans to impact the Hampden Bridge or its approach.

10 MANAGEMENT AND MITIGATION: HISTORIC HERITAGE

10.1 GENERAL PRINCIPLES FOR THE MANAGEMENT OF HISTORIC SITES

Appropriate management of heritage items is primarily determined on the basis of their assessed significance as well as the likely impacts of the proposed development.

In this regard it is relevant to note that the initial recording and identification of historic heritage sites provides insufficient information for full significance assessments for these items and all such assessments of significance should be regarded as preliminary.

10.2 MANAGEMENT AND MITIGATION OF RECORDED HISTORIC SITES

10.2.1 Hampden Bridge Management

Avoidance of the Hampden Bridge would ensure that no further management of historic heritage is required. The current impact footprint does not encompass this site so it should be considered avoidable and precautions should be taken to ensure the site is not inadvertently impacted. To ensure no inadvertent impacts, a no-go zone should be established in the vicinity of the sites using nightline and workers should be inducted to ensure that impacts do not go beyond the delineated impact footprint.

Note: Wagga Wagga City Council recently resolved to demolish the Hampden Bridge due to its failing structural integrity. This decision was reached after a number of years of deliberation, which included community consultation, discussion, condition assessments and investigations, cost assessment, data collection, lobbying and reporting. The final determination was that the costs of rehabilitating the bridge for pedestrian access and maintaining the bridge are unaffordable for Wagga Wagga City Council.

The Heritage Council arm of OEH recently inspected the bridge and has concurred with Council's decision to demolish the bridge.

It is envisaged that the pylons, part of the eastern end of the bridge and the western abutment would be retained. The western abutment would most likely be retained as a historic marker and visitor viewing platform.

Council is currently in the process of seeking and assessing tenders for the demolition of the bridge.

10.2.2 Wagga Wagga Flood Tree and Levee Monument

Avoidance of the Wagga Wagga Flood Tree and Levee Monument would ensure that no further management of historic heritage is required. As the project design is not yet finalised, the following is recommended:

- Investigate whether the Wagga Wagga Flood Tree and Levee Monument can be protected in their current locations and if possible design the proposal so that they are retained

- If the Wagga Wagga Flood Tree and Levee Monument need to be removed, investigate whether the flood marker should be surveyed to enable using any historic flood data from the site, if it exists. Dismantle the flood gauge and monument and move to an alternative location to be determined by Council. A Section 139 exemption form is required for this action; for greater detail refer to **Sections 10.3.2.1** and **10.3.4**.

10.3 RELEVANT LEGISLATION

10.3.1 Introduction

Cultural heritage is managed by a number of state and national Acts. **Sections 10.3.2** and **10.3.3** summarise the legislative requirements in relation to heritage assets and development proposals.

10.3.2 State legislation

10.3.2.1 The Heritage Act 1977

The Heritage Act 1977 (Heritage Act) protects the state's natural and cultural heritage and contains measures to protect archaeological remains. More specifically, the Heritage Act provides protection for European/historic relics and sites. Under Section 139, a relic is defined as:

"any deposit, artefact, object or material evidence that:

(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and

(b) is of State or local heritage significance."

Under Section 138 any impacts to such items require a Section 140 permit be issued before impacts occur; alternatively, filing of a Section 139 exemption form can substitute if the appropriate criterion for demonstrating a site's limited research potential is satisfied.3

10.3.2.2 Environmental Planning and Assessment Act 1979

The EP&A Act also applies to historic heritage.

10.3.3 Commonwealth legislation

10.3.3.1 Environmental Protection and Biodiversity Conservation Act 1999.

The EPBC Act also applies to historic heritage items.

10.3.4 Applicability to the Subject Area

The Hampden Bridge and Wagga Wagga Flood Tree and Levee Monument are protected by the Heritage Act and are located adjacent to proposed works. The current project design proposes to impact the Wagga Wagga Flood Tree and Levee Monument and avoid the Hampden Bridge, under Section 138 any impacts to such items require a Section 140 permit be issued before impacts occur; alternatively, filing of a Section 139 exemption form can substitute if the appropriate criterion for demonstrating a site's limited research potential is satisfied.

Should any historic relics be discovered during the proposed works (considered unlikely) these items could have legislative protection from the Heritage Act if they are assessed to be of local or state significance.

11 RECOMMENDATIONS

11.1 ABORIGINAL HERITAGE

The following recommendations are made on the basis of:

- *NPW Act* whereby it is illegal to harm or desecrate an Aboriginal object or place without the prior written consent of the Director, OEH;
- The findings of the current investigations undertaken within the Subject Area; and
- The interests of the Wagga Wagga Local Aboriginal Land Council and other Aboriginal community groups.

It is recommended that:

1 As no Aboriginal objects or sites were identified during the current field assessment, no further archaeological assessment is required, and as such, Aboriginal heritage presents no constraints to the proposed works.

2 Any works should be limited to the proposed impact footprint as assessed in the current report so as to limit the possibility of encountering Aboriginal objects in unassessed areas.

3 Should any objects or other Aboriginal heritage features be identified during the course of construction the Unanticipated Finds Protocol in this report (**Section 6.2**) should be followed.

4 Two copies of this report should be sent to: Office of Environment and Heritage, AHIMS Registrar, Attention: Cheryl Brown, PO Box 1967, Hurstville, NSW, 1481.

5 One copy of this report should be sent to the Wagga Wagga Local Aboriginal Land Council.

11.2 HISTORIC HERITAGE

Avoidance of the Hampden Bridge (LEP Item No I85) would ensure that no further management of historic heritage is required. The current impact footprint does not include this site so it should be considered avoidable and precautions should be taken to ensure the Hampden Bridge is not inadvertently impacted.

To ensure no inadvertent impacts, a no-go zone should be established in the vicinity of the Hampden Bridge using nightline and workers should be inducted to ensure that impacts do not go beyond the delineated impact footprint.

The proponent has indicated that complete avoidance of the Wagga Wagga Flood Tree and Levee Monument is unlikely; on the basis of this the following is recommended:

- Investigate whether the Wagga Wagga Flood Tree and Levee Monument can be protected in their current locations and if possible design the proposal so that they are retained

- If the Wagga Wagga Flood Tree and Levee Monument need to be removed:
    - Investigate whether the flood marker should be surveyed to enable using any historic flood data from the site, if it exists;
    - Record to archival standard in its current location; and
    - Dismantle the flood gauge and monument and move to an alternative location to be determined by Council.

Any proposal incorporating impacts to the Wagga Wagga Flood Tree and Levee Monument or Hampden Bridge would require a Section 139 exemption form to be filed with the NSW Heritage Office.

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PLATES

Plate 1: Remnant vegetation characteristic of the Subject Area.

Plate 2: Land use: Transport corridor.

Plate 3: Land use: Levee.

Plate 4: Land use: Urban development.

Plate 5: Land use: Wiradjuri walking track.

Plate 6: Survey Unit: WL remnant vegetation.

Plate 7: Survey Unit: WL1.

Plate 8: Survey Unit: WL2.

Plate 9: Survey Unit: WL3.

Plate 10: Survey Unit: WL4.

Plate 11: Survey Unit: WL5.

Plate 12: Survey Unit: WL6.

Plate 13: Survey Unit: NL disturbance.

Plate 14: Survey Unit: NL remnant vegetation.

Plate 15: Survey Unit: Tasman Road Borrow Pit.

Plate 16: Survey Unit: Copland Street Borrow Pit.

Plate 17: Survey Unit: North Wagga Borrow Pit.

Plate 18: Tree with scar assessed as having a non-cultural origin.

Plate 19: The Hampden Bridge.

Plate 20: Wagga Wagga Flood Tree.

Plate 21: Wagga Wagga Levee Monument.

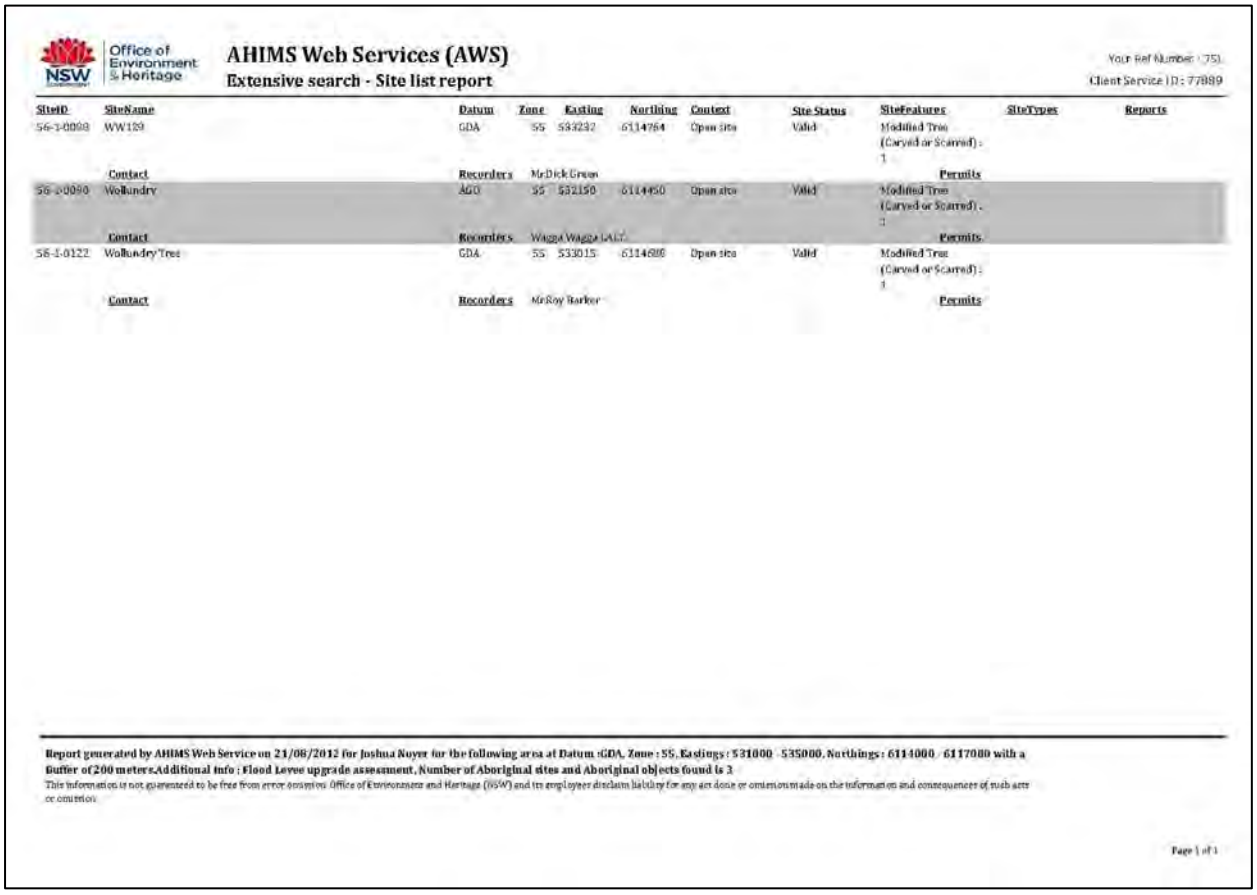
Plate 22: Wagga Wagga Levee Monument.

APPENDIX 1: COMMUNITY CONSULTATION LOG

DATE	ORGANISATION	CONTACT	COMMENT
22.08.12	Wagga Wagga LALC	Lorraine Lyons e: <waggawaggalalc@bigpond.com	emailed Lorraine to advise of project and check availability of WWLALC site officer(s) to participate in survey.
24.08.12	Wagga Wagga LALC	Lorraine Lyons e: <waggawaggalalc@bigpond.com	emailed Lorraine with map of project area and further details, asked for confirmation of availability of Site Officer(s)
24.08.12	Wagga Wagga LALC	Lorraine Lyons e: <waggawaggalalc@bigpond.com	VIA EMAIL Hi Cheryl thanks for your interest in engaging a Cultural Knowledge Holder -SO with us. I will be back in the office next week and will be in touch with you regarding a suitable date. Thanks Lorraine
27.08.12	Wagga Wagga LALC	Lorraine Lyons e: <waggawaggalalc@bigpond.com	left message on mobile and emailed to check if WWLALC have a site officer available.
27.08.12	Wagga Wagga LALC	Lorraine Lyons e: <waggawaggalalc@bigpond.com	VIA EMAIL Hi Cheryl Was able to arrange for both sites officers who's availability would be for this friday the 31st, unfortunately thursday both have other commitments, Give me a call if this does not suit & we'll arrange another time . Thanks. Lorraine
29.08.12	Wagga Wagga LALC	Lorraine Lyons	spoke to Lorraine advising that we could not change the survey date for our Archaeologist, however Council is happy to arrange a date where the WWLALC site officers can do a cultural heritage assessment of the impact areas, potentially Friday 31 August.

30.08.12	Wagga Wagga LALC	Lorraine Lyons	subsequent to survey OzArk archaeologist Josh Noyer visited the WWLALC office to speak with Lorraine and the WWLALC reps were able to discuss the survey and also visit the impact areas Thursday afternoon. SITE OFFICERS - xxxxx ???? xxxxx

APPENDIX 2: AHIMS DATABASE SEARCH RESULTS



Office of Environment & Heritage

NSW

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : 75)

Client Service ID : 77889

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
56-1-0098	WW129	GDA	55	533232	6114764	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Mr Dick Green					Permits		
56-1-0090	Wollundry	AGD	55	532150	6114450	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Wagga Wagga LALC					Permits		
56-1-0122	Wollundry Tree	GDA	55	533015	6114686	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Mr Roy Barker					Permits		

Report generated by AHIMS Web Service on 21/08/2012 for Joshua Noyer for the following area at Datum :GDA, Zone : 55, Eastings : 531000 - 535000, Northings : 6114000 - 6117000 with a Buffer of 200 meters.Additional info : Flood Levee upgrade assessment, Number of Aboriginal sites and Aboriginal objects found is 3

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission

Page 1 of 1

Office of Environment & Heritage

AHIMS Web Services (AWS)
Search Result

Your Ref Number : 751
Client Service ID : 79359

OzArk Cultural Heritage Management
PO Box 2069
Dubbo New South Wales 2830
Attention: Joshua Noyer
Email: josh@ozarkehm.com.au

Date: 06 September 2012

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 55, Eastings : 537500 - 538500, Northings : 6111500 - 6112000 with a Buffer of 200 meters, conducted by Joshua Noyer on 06 September 2012

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

PO BOX 1967 Hurstville NSW 2220
43 BridgeStreet HURSTVILLE NSW 2220
Tel: (02)9585 6345 (02)9585 6741 Fax: (02)9585 6094

ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

Office of Environment & Heritage

AHIMS Web Services (AWS)
Search Result

Your Ref Number : 751
Client Service ID : 80342

OzArk Cultural Heritage Management
PO Box 2069
Dubbo New South Wales 2830
Attention: Joshua Noyer
Email: josh@ozarkehm.com.au

Date: 14 September 2012

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 55, Eastings : 533500 - 534500, Northings : 6118000 - 6118500 with a Buffer of 200 meters, conducted by Joshua Noyer on 14 September 2012

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
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Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

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APPENDIX 3: ABORIGINAL SITE TYPE DEFINITIONS

Open camp sites

Often called stone artefact scatters, these sites (for the purposes of the OEH AHIMS database) were in the past defined by the presence of two or more stone artefacts located within 50 m of one another. Current guidelines, however, delineate no hard and fast determinations on requisite artefact numbers, more loosely describing these campsites as places exhibiting evidence of past human activity. This can be, and is most frequently, in the form of stone artefacts, but may also include other evidence such as hearths or midden material. Such sites provide evidence for the range of activities that may have been undertaken at a particular place, including the production of stone tools and the preparation of food including the butchering of animals or grinding of seeds. However, the distinction between a single, isolated artefact versus a place where numerous artefacts have been recorded together provides a necessary division in terms of the possible information that a site can reveal about past activities. Further information recorded about open sites includes assessments of the sites' integrity (how intact the site is) and subsequently whether sub-surface deposits are thought to be present.

Isolated Finds

An artefact, usually of stone, but possibly of other materials, that is located but has no relationship to other identifiable archaeological features.

Rockshelter sites (with art and/or deposit)

Rockshelter sites can only occur where this is suitable topographic and geological factors present, forming overhangs or caves in the eroding bedrock. The size (both horizontal and vertical dimensions) of the space available, the aspect of the opening and the proximity to resources will determine the length and intensity of human occupation. Art in the form paintings may be found in caves, but often suffer considerably from erosion of the sandstone.

Axe Grinding Grooves

Aboriginal axe heads were usually made from very hard igneous rock, which was first flaked roughly to the appropriate shape and then pecked or ground to an even surface. To keep the edges of these axes sharp, they were ground on the surface of a relatively softer stone (usually sandstone). As the axe is rubbed repeatedly in the same location a groove forms to fit the shape of the axe. This groove has a roughly elliptical shape and a smooth, regular surface along its base. Arrowheads may also have been sharpened in grooves, which generally appear narrower and deeper.

Grinding groove sites are most often located on the floodplains of rivers and creeks, although they can be in elevated positions above water as well. Sometimes, sandstone flats near water may exhibit hundreds of such grooves, and it is thought that once an axe blank has its edge ground in a groove, then it can only be sharpened in the same groove. Hence, if the owner of the axe is away from its place of origin, then a new groove has to be created for the sharpening

of that particular axe head[6]. Grooves are also frequently recorded in smaller groups, especially along more ephemeral water courses.

Scarred Trees

This site type results from the deliberate removal of bark (and sometimes wood) from trees, for the purpose of obtaining raw material for the manufacture of various items of material culture — i.e. shields, coolamons, shelters, canoes, and cradles. They may also result from foraging and hunting - for instance, toe holes cut in trees to allow access to upper branches and hollows, and axe marks around natural hollows for the extraction of small tree-living fauna (such as possums or birds) or honey.

The identification and interpretation of a scar as being Aboriginal in origin can often be difficult, as bark can be removed from trees by a variety of means e.g. animal and bird foraging, the natural breaking off of tree limbs, lightning strikes to the tree, the result of machinery damage to trunks and the removal of bark by Europeans to define land boundaries. To assist archaeologists in the accurate identification of Aboriginal scarred trees, the OEH Western region provides a set of criteria against which each scar must be assessed.

These diagnostic criteria are as follows:

- *The scar must not touch the ground* — (scars resulting from fire, fungal attack or lightning nearly always reach the ground). Such a termination does not necessarily preclude an Aboriginal origin. Ethno-historic accounts of canoe manufacture occasionally demonstrate scarring to ground level. If the scar does run to the ground, the sides must be relatively parallel (i.e. not triangular). It must be noted that discussion with Native Title from other areas suggests that scars may indeed extend to the ground, especially when the bark is planned for use in a shelter. This information is derived from oral histories recorded in Dubbo and observations from further afield;
- *The ends of the scar should be squared off or evenly tapered* — Different shapes at the top and bottom (e.g. pointed at top, squared at bottom; round at top, flaring at bottom) are suggestive of natural processes (e.g. branch loss);
- *The sides of the scar should be parallel or symmetrical* — Few natural scars are likely to have these properties, with the possible exception of fire scars which may be symmetrical but are usually wider at their base. Modern surveyors' marks are typically triangular, and often adzed. These also (regardless of shape) usually have a number carved in the wood, within the scar;
- *The length of the scar must be on the same axis as the tree and not oblique or slanting across the tree or the branch* — Scars which are natural in origin tend to have irregular outlines, sometimes have irregular regrowth and may occur against the axis of the tree.
- *The tree should be reasonably old — i.e. over 100 years* — The tree upon which the scar is found should be old enough (i.e. of sufficient age) to have been used by Aboriginal people in (at least) a semi-traditional manner. This means the tree should

[6] As read at the Terramungamine Reserve grinding groove interpretation sign.

be at least approximately 100 years old. The age of the scar should also be reflected in the thickness of the regrowth. Young scars (e.g. some natural scars caused by branches falling or birds or horses gnawing, have characteristically thin regrowth);

- *There must be no obvious natural or other artificial cause* such as a branch rip, lightening strike, cockatoo chewed bark or healed bark tears from machinery damage or car impact — Any signs that the scar may not be Aboriginal should be carefully assessed; and,
- *The tree must not be an introduced species* – For obvious reasons, the tree upon which the scar is found should be endemic to the region, i.e. this excludes historic (exotic) plantings.
- Also helpful in scarred tree identification, but not within the OEH criteria are the following points:
- *Axe or adze marks* — A scar with cut marks on the original wood is likely to be anthropogenic in nature (i.e. as a result of human actions). The location and shape/size may lend support to the scar's origin. For example stone axe marks would indicate an Aboriginal origin, while steel axe marks post-date the arrival of Europeans. These of course could still have been made by an Aboriginal person in the post-contact era; and,
- *The presence of epicormal growth* — Many scars of Aboriginal origin tend to have an epicormal shoot originating at the base of the scar. This is a new branch shooting from the point of damage and is part of the trees self preservation mechanism.

As noted in the OEH criteria, any tree that does not fit these rules cannot be accepted as likely to be of Aboriginal origin. This may mean that a few authentic scars are omitted from the Aboriginal Sites register, but it is the only means to establish consistency in identification.

However, even when applied, the above criteria cannot always provide a definitive classification, and a natural origin for the scar cannot be ruled out. For this reason interpretations of Aboriginal origin are qualified by the recorders degree of certainty. The following categories are used:

- DEFINITE ABORIGINAL SCAR

This is a scar which conforms to all of the criteria stated above and/or has in addition a feature or characteristic that provides definitive identification, such as diagnostic axe or adze marks, or a historical identification. All conceivably natural causes of the scar can be reliably discounted.

- ABORIGINAL SCAR

This is a scar which conforms to most of the criteria, and where an Aboriginal origin is considered to be the most likely. Despite this, a natural origin cannot be completely ruled out.

- POSSIBLE ABORIGINAL SCAR

This is a scar which conforms to most of the criteria but where an Aboriginal origin would appear unlikely.

For the purposes of the current study, on the advice of OEH Western Region, only scars of the first two categories have been recorded as sites to be entered into the OEH AHIMS. As a general rule, the “Aboriginal scar” and “Probable Aboriginal scar” categories have been collapsed into one, called “Aboriginal scar”.

Natural Mythological or Cultural/Ceremonial sites

Natural mythological sites can be any natural feature and like a cultural/spiritual are not detectable without the traditional knowledge of specific areas.