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**ABBREVIATIONS**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACHA</td>
<td>Aboriginal Cultural Heritage Assessment</td>
</tr>
<tr>
<td>AHIMS</td>
<td>Aboriginal Heritage Information Management System</td>
</tr>
<tr>
<td>AHIP</td>
<td>Aboriginal Heritage Impact Permit</td>
</tr>
<tr>
<td>BP</td>
<td>Before present (AD 1950)</td>
</tr>
<tr>
<td>CHL</td>
<td>Commonwealth Heritage List</td>
</tr>
<tr>
<td>DP</td>
<td>Deposited Plan</td>
</tr>
<tr>
<td>DPE</td>
<td>Department of Planning and Environment</td>
</tr>
<tr>
<td>EP&amp;A Act</td>
<td>Environmental Planning and Assessment Act 1979</td>
</tr>
<tr>
<td>EPBC Act</td>
<td>Environment Protection and Biodiversity Conservation Act 1999</td>
</tr>
<tr>
<td>GMIA</td>
<td>Greater Macarthur Investigation Area</td>
</tr>
<tr>
<td>ka</td>
<td>Abbreviation for thousands of years ago (e.g. 1 ka equals 1,000 years ago)</td>
</tr>
<tr>
<td>LALC</td>
<td>Local Aboriginal Land Council</td>
</tr>
<tr>
<td>LEP</td>
<td>Local Environmental Plan</td>
</tr>
<tr>
<td>LGA</td>
<td>Local Government Area</td>
</tr>
<tr>
<td>LTO</td>
<td>Land Titles Office</td>
</tr>
<tr>
<td>NHL</td>
<td>National Heritage List</td>
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<tr>
<td>NPW Act</td>
<td>National Parks and Wildlife Act 1974</td>
</tr>
<tr>
<td>OEH</td>
<td>Office of Environment and Heritage (formerly DECCW)</td>
</tr>
<tr>
<td>PAD</td>
<td>Potential Archaeological Deposit</td>
</tr>
<tr>
<td>RAP</td>
<td>Registered Aboriginal party</td>
</tr>
<tr>
<td>RARDMS</td>
<td>Regional Archaeological Research and Design Management Strategy</td>
</tr>
<tr>
<td>REP</td>
<td>Regional Environmental Plan</td>
</tr>
<tr>
<td>RNE</td>
<td>Register of the National Estate</td>
</tr>
<tr>
<td>SEPP</td>
<td>State Environment Planning Policy</td>
</tr>
<tr>
<td>SHR</td>
<td>State Heritage Register</td>
</tr>
<tr>
<td>SHI</td>
<td>State Heritage Inventory</td>
</tr>
<tr>
<td>WHL</td>
<td>World Heritage List</td>
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Executive Summary

The Department of Planning and Environment (DPE) is investigating the potential for greenfield development south and south-west of Campbelltown-Macarthur region referred to as the Greater Macarthur Investigation Area (GMIA) in A Plan for Growing Sydney. Preliminary analysis has identified an urban capable boundary (Figure 1) that varies slightly from that in the aforementioned plan. The land use and infrastructure strategy to which this current heritage assessment contributes, will identify the urban suitable boundary for further action by government. If the area is considered suitable, a long-term growth strategy will be developed to assist with the future orderly release of land, allowing efficient delivery of infrastructure. It will also allow the cumulative effects of development to be carefully considered and addressed. As part of this project, Archaeological and Heritage Management Solutions Pty Ltd (AHMS) was commissioned by the DPE to undertake an Aboriginal and Historic Heritage Gap Analysis of the GMIA as a first step in characterising the cultural heritage values of the area and identifying any further investigation required. This analysis is undertaken, in part, in response to a recent review of DPE's Aboriginal heritage processes (AHMS, 2013b), which recommended that an over-arching consideration of cultural and archaeological values for the Growth Centres be undertaken, rather than a piecemeal approach. This gap analysis used the same methodology as that employed for the concurrent gap analyses being carried out for the South-west Growth Centre and the North-west Growth Centre. This is the first attempt to develop a regional study to highlight the cultural heritage knowns and unknowns for these precincts. The draft version of this report was publically exhibited between 22nd September and 18th November 2015 and has been updated to address submissions (see Appendix 7) and to include new data provided in response to the draft report.

This report aims to:

a) Compile and review existing documentation and listings for Aboriginal and historic heritage within the GMIA.

b) Identify areas where previous assessment has been minimal or lacking.

c) Identify areas of key Aboriginal and historical cultural heritage interest and/or significance.

d) Propose future priorities for subsequent investigation should GMIA be progressed as a growth area.

e) Identify areas of high conservation value in relation to cultural heritage.

Key Findings

- The area formed part of the early agricultural expansion outside the immediate area of the early colony of Sydney. The majority of the better soils in the area were settled by Macarthur at Camden Farm (part of which lies within the study area); and large pastoral estates were also established throughout the Appin, Menangle and Douglas Park areas, at Mount Gilead, Glenlee, Glen Lorne, Beulah, and Meadowvale. The agricultural/pastoral mix of the area changed over the course of the 19th Century but the rural nature was largely maintained until the post-WW2 period. Only two townships within the study area provided commercial and service hubs for this landscape: Appin and Menangle.

- There are no listings on the World Heritage List, National Heritage List or Commonwealth Heritage List (CHL) within the study area.

- The State Heritage Register (SHR), [former] Register of the National Estate (RNE), State Heritage Inventory (SHI), Local Environmental Plan (LEP) listings and National Trust listings for the study area reflect the rural environment. Many of the listings relate to large and small scale agricultural/pastoral establishments. Other items listed relate to transport, religious institutions and water and other infrastructure and services.
• There are significant omissions from these lists. For example, Mount Gilead with its early substantial sandstone convict built structures and remnants of early roads is not listed on the SHR and while it is listed on the Campbelltown LEP 2015, the curtilage is considered inadequate to protect the property in its landscape setting, and the potential associated archaeology. 'Meadowvale' is another example, which does not appear in the current LEP.

• Environmentally, the GMIA is dominated by the Cumberland Plain subregion. This area has several key waterways, including the Nepean, Cataract and Georges rivers, along which there is potential for significant cultural sites. To the south and east, the Sydney Cataract subregion is dominated by dissecting sandstone and has potential for rock shelters, engravings and grinding grooves. It is likely to be archaeologically comparable with the North Kellyville precinct within the north-west growth centre.

• AHMS' ethnographic database includes several instances of early Aboriginal interactions with Europeans which occurred around Menangle and Menangle Park. This area was formerly a well-used series of swamps and waterways, and is likely to have formed a focus of activity and occupation in the past. It has remained largely unmodified since European arrival.

• Aboriginal objects/sites have been documented within the GMIA. Known sites are clustered consistent with the limited compliance-based archaeological investigations that have occurred, but their distribution also suggests some other patterns. Specifically, the Cumberland Plain subregion, encompassing the majority of the study area, is dominated by surface and sub-surface artefactual material generally found within 200m of the larger river systems within the region. Distances of sites up to 500m away are documented, but remain relatively few. Along the eastern margins, within the Sydney Cataract subregion, rock shelters and other closed sites dominate, and are located along creek lines where the sandstone geology has been incised to form such features.

• Based on a review of heritage studies, and archaeological predictive modelling developed for this project, there is high potential for Aboriginal objects/sites to occur along the banks of the Nepean, Cataract and Georges rivers, and Allens, Elladale, Clemens, Cascade, Oosedale and Wallandoola, creeks. The Georges River, Allens Creek, Elladale Creek and headwaters of the Cataract River (including Wallandoola Creek) reveal the highest potential for significant cultural material, primarily due to frequent elevations along these corridors and a general absence of development. Recent excavations by AHMS along Georges River have demonstrated deeply stratified and old (>20ka) cultural materials on an elevated ridgeline at Moorebank, and it is considered more would be found along other parts of the river system. Conversely, large areas of the Nepean River are highly flood prone, and while Aboriginal people would have carried out activities along the river, thereby creating what archaeologists record as ‘sites’, there is a lower likelihood that such sites would have survived due to the history of flooding.

• Aboriginal consultation including a cultural mapping workshop with a selection of stakeholders resulted in the identification of six areas of cultural value along with areas of observed Aboriginal site abundance and diversity. These included areas particularly important for subsistence activities along the lagoons and creeks, a traditional story place near Menangle, and a massacre event southwest of Appin. A number of other areas were also identified in other parts of the GMIA near Gilead, Menangle Park, Bingara Gorge and Elladale Creek. All of these areas would require further investigation prior to development being considered.

• The traditional story place (sometimes referred to as an Aboriginal mythological or 'Dreaming' site) should be considered for long term protection from development.1

• Further historic research should be undertaken to clarify the exact provenance and boundary of the massacre site and consideration given to its long term protection.

---

1 This is included as an area of high conservation value and is recommended for permanent protection.
Areas Where Research Has Not Occurred

This study found that there are a number of gaps in both geographic coverage of past studies and in the information that was available for this gap analysis as summarised below:

- The review of Aboriginal and historic heritage reports while thorough is not regarded as exhaustive - further information may emerge as investigation of the GMIA progresses.
- Both Wollondilly and Campbelltown Local Government Areas (LGAs) have been subject to initial heritage studies (focussing on non-indigenous heritage) and subsequent reviews. Details supporting the findings of the Wollondilly heritage study such as the inventory sheets remain unavailable.
- Both the Campbelltown and Wollondilly heritage studies establish and highlight local historic themes relevant to their respective LGAs. However, while they address the built heritage aspects, neither adequately address archaeological sensitivity. Some archaeological sites are noted in the Wollondilly LEP but none are specifically noted in the Campbelltown LEP. More detailed analysis will be needed to determine accurate locations, significance and potential survival of archaeological remains that would be covered by the Heritage Act 1977 within these LGAs. Any historic archaeological assessments undertaken in these LGAs to date have primarily focussed on specific impacts and developments related to existing allotments/cadastral boundaries and do not provide a broad regional picture of the archaeological potential of the study area.
- While there have been some broad-scale heritage assessments for specific developments generally the briefs for cultural heritage studies in the study area have limited their scope so as to effectively consider heritage structures in isolation from their cultural landscape context.
- The historical archaeological potential the area has been inadequately considered in the planning context in the past across the study area.
- In relation to Aboriginal heritage the studies generally reflect preliminary sample surveys for specific developments. Also, the majority of assessments were completed pre 2000 and do not conform to current guidelines.
- Several parts of the study area have yet to undergo any Aboriginal heritage investigation, including along the Cataract River between Brooks Point and Douglas Park, and south and west of Appin. The periphery of the GMIA (around Maldon, the Dharawal State Recreation area, and near the Cordeaux River) does not appear to have been investigated. Several of these areas are predicted to contain extensive and/or significant cultural material.
- Many previous Aboriginal heritage assessments have had limited field investigation, such as focussing on a selected gas wells within a much wider area.

Conclusions

It is clear that there has been only limited Aboriginal and historic heritage investigation in the GMIA to date. Many of these studies have been for exploratory works (such as gas wells, or coal seams) and are therefore dominated by desktop research, with only minimal field investigation. Further, many of the reports are quite dated, and fail to conform to current guidelines. It is therefore likely that any future planning and development would need to incorporate heritage investigation from a very early stage.

The key areas of heritage constraint are highlighted in Section 5. It is likely that extensive and/or significant Aboriginal sites would be prevalent along the large river systems and their riparian corridors throughout the GMIA. Based on the model developed for this project, key areas appear to be the Georges River and many of the tributaries of the Nepean River in the southern parts of the study area. In areas where the river banks are steepest and consist of sandstone gorges, Aboriginal sites are likely to cluster around the upper reaches of tributaries where sandstone shelters begin to form. The northern part of the study area appears to have been more heavily impacted by urban spread, and is generally more swampy and low-lying, such as around Menangle. It must be noted,
however, that the Menangle area was used and occupied by Aboriginal people as observed by explorers at European contact and Aboriginal activity continues through particular families as indicated in the cultural values workshop.

Notwithstanding the above constraints and limitations, there appear opportunities for development which may have minimal impact on cultural heritage values across much of the GMIA, especially in areas between Douglas Park and Menangle along the Nepean River; in the vicinity of Gilead; south and west of Appin, and surrounding Wilton.

In relation to the efficient development of the GMIA and the adequate management of its Aboriginal and historic heritage resources, the following recommendations are made to adequately address cultural heritage concerns in the event that the GMIA continues to be explored as a future growth centre:

- Consultation with the Aboriginal community should be maintained and opportunities provided to build on the cultural values layer.
- Areas which have been identified by the Aboriginal community should form the focus of subsequent research to ensure they are managed appropriately in any future development context.
- Areas identified as having high archaeological sensitivity in Figure 9 should be considered for inclusion in permanent conservation areas.
- Areas identified as having high conservation value in Figure 11 should be set aside from development and permanently conserved. Further it is recommended that these areas be added to the LEP (with expanded curtilages where indicated) and that appropriate caveats on land title are created to ensure that future owners are aware of heritage interests.
- Further investigation of previous studies and databases, and the development of new assessments should be undertaken on individual locations or precincts when they are proposed for planning and development. This process could be streamlined through development of an integrated Aboriginal and historic regional archaeological research design and management strategy (RARDMS) for the GMIA (see below).
- Tasks 1 through 4 identified in Section 6.2 should be implemented at least 6-12 months prior to the overall re-zoning program for the precincts.
- DPE should contact the relevant State Government agencies to request data (S170 registers) to assist future planning and development. This data should be integrated into the project mapping during later phases of this project.
- A regional cultural heritage framework should be developed to guide and optimise future investigations. Such an integrated RARDMS should, therefore, be completed for the development precincts covering both Aboriginal and historical archaeological heritage. This would serve as an holistic framework for future archaeological investigation in the GMIA. All future Aboriginal and historic heritage assessments in the area should be consistent with, and feed into that framework, maximising opportunities to create knowledge of value to the Aboriginal and broader community and facilitating more efficient assessment and management of the heritage resource. The RARDMS should include an Archaeological Zoning Plan.
1 INTRODUCTION

1.1 Background and Purpose

A Plan for Growing Sydney (Dept., Planning and Environment 2014) requires that the NSW Government develop a framework for the identification of new Growth Centres (Action 2.4.2). The framework is needed to improve the management of future land release, stimulate competition to keep downward pressure on prices, and help prevent speculative investment and land-banking. In response to this action, the Department of Planning & Environment (DPE) is undertaking the Greater Macarthur Investigation Area (GMIA) project. The overarching objective of this project is to investigate the potential for greenfield development south and south-west of Campbelltown-Macarthur region. If the area is considered suitable, a long-term growth strategy will be developed to assist with the future orderly release of land, allowing efficient delivery of infrastructure. It will also allow the cumulative effects of development to be carefully considered and addressed.

As part of this project, Archaeological and Heritage Management Solutions Pty Ltd (AHMS) was commissioned by the DPE to undertake an Aboriginal and Historic Heritage Gap Analysis of the GMIA. This analysis is undertaken, in part, in response to a recent review of DPE’s Aboriginal heritage processes (AHMS, 2013b), which recommended that an over-arching consideration of cultural and archaeological values for the Growth Centres be undertaken, rather than a piecemeal approach. This is the first attempt to develop a regional study to highlight the knowns and unknowns for a potential Growth Centre.

This report originally aimed to:

a. Compile a review of existing documentation and listings for Aboriginal and historic heritage within the GMIA.

b. Identify areas where previous assessment has been minimal or lacking.

c. Identify areas of key Aboriginal and historical interest and/or significance.

d. Propose future priorities for subsequent investigation should the GMIA be progressed as a growth area.

Following submissions on the publically exhibited draft and further assessment a fifth aim has been added:

e. Identify areas of high conservation value in relation to cultural heritage.

This report provides a review of all literature for the study area made available by the two relevant local councils and the Office of Environment and Heritage (OEH) and considers reports and data held in-house. Key assessments and reports have been used to determine the ‘hot spots’ of Aboriginal and historic value, and to identify obvious gaps in the information, which are then recommended for further, more detailed investigation. Information about Aboriginal cultural heritage gleaned from reports has been complemented with information provided by Aboriginal people through a preliminary cultural values workshop and follow up discussions.

As part of the Greater Macarthur Land Release Investigation Preliminary Strategy and Action Plan (DPE 2015) the previous version of this report was placed on public exhibition between 22 September 2015 and 18 November 2015. Submissions were received from a number of stakeholders in both the public and private sectors. These comments primarily relate to the identification of heritage items, archaeological sites and Aboriginal sites and their appropriate protection and management, and,
where relevant, have been incorporated within this report. After reviewing submissions, the predictive model has been refined. A log of all comments received relating to Aboriginal and historic heritage, and our subsequent response, is provided in Appendix 7.

1.2 Study Area

The GMIA as defined in the document *A Plan for Growing Sydney* (DPE:2014) covers an area of 180.2km² within the Campbelltown and Wollondilly Local Government Areas (LGAs), approximately 50km south east of Sydney. The adjusted boundaries of the GMIA called the Urban Capable Area (Figure 1) is slightly smaller in total area but includes the same localities, which include Glenlee, Appin, Gilead, Brooks Point, Wilton Menangle Park, Menangle, and parts of Glen Alpine, Rosemeadow, Douglas Park and Pheasants Nest.

1.3 Project Methodology

To achieve the objectives outlined above, the methodology consisted of:

- Reviewing the range of Aboriginal and historical reports for the region to determine the general archaeological patterns for the GMIA.
- Reviewing existing Aboriginal and historical databases and listing to identify previously recorded and documented items and sites within the GMIA. These include: World Heritage List, Commonwealth Heritage List, National Heritage List, State Heritage Register (SHR), Local Environmental Plan (LEP) heritage schedules for the Campbelltown and Wollondilly LGAs, State Government Agency Section 170 Heritage and Conservation Registers, State Heritage Inventory (SHI), Register of the National Trust of Australia (NSW), Register of the National Estate (RNE), Office of Environment and Heritage’s Aboriginal Heritage Information Management System (AHIMS), AHMS Mapping Greater Sydney’s Aboriginal Past dataset and OEH Aboriginal Sites Decision Support Tool (ASDST) GIS dataset.
- Mapping the extent of previous heritage studies across the GMIA to identify where areas have been intensely investigated versus those that have not.
- Developing an archaeological model using environmental data and known cultural heritage sites to ‘predict’ where significant Aboriginal objects and/or sites may be present and to assist in consideration of areas that should be conserved focussed on areas of high potential.
- Reviewing that model in the light of new data received post exhibition of the draft report.
- Conducting a preliminary workshop with Aboriginal people to map cultural values that should be considered for protection.
- Identifying areas of high conservation value in relation to historic heritage that should be set aside for permanent conservation.

1.4 Limitations

This report is based on existing and publicly available environmental and archaeological information and reports about the subject area. The background research did not include any independent verification of the results and interpretations of externally sourced existing reports (except where the fieldwork indicated inconsistencies).

Information from the AHIMS was obtained from OEH. Information in the assessment reflects the scope and the accuracy of the AHIMS site data, which in some instances is limited. This report has been updated to address public submissions some of which indicated that the AHIMS data on which the report relied was inaccurate. The original report relied on data provided in 2015. Since that time
the predictive model has been adjusted and takes into account AHIMS data provided in October 2016. At any given time it is possible that commercially-in-confidence studies have been or are being undertaken that are not yet in the AHIMS system and therefore not publically available.

The brief allocated ten person days for ground truthing of models and conclusions. No archaeological excavation was undertaken as part of this study.

At the time of original reporting, the Wollondilly Heritage Study (1992) had not been provided for consideration but rather a review copy - the Wollondilly Heritage Study Management Report (Oehm 2006) that did not contain substantive information. Since then additional information has been obtained including mapping details related to the study. However, the volume listed as comprising the inventory sheets for the study could not be located by Council. Hence, it is not possible to validate the findings contained within (year). This report is one of many detailing specialist studies feeding into the DPE’s assessment of the area. In the course of the investigation, the study area boundary altered slightly from the original GMIA study area to the ‘Urban Capable’ area as shown in Figure 1. As a result of this iterative process some elements of the investigation may not have specifically covered the adjusted boundary, most notably north of Douglas Park, and south of Maldon.

### 1.5 Authorship

This report was written by Alan Williams (MAACAI) and Matthew Kelly, Senior Heritage Advisors and Ngaire Richards, Heritage Advisor. Susan McIntyre-Tamwoy and Ben Christensen contributed to the sections relating to Aboriginal cultural values. Laressa Berehowyj and Anita Yousif updated the report following the consideration of public submissions. The report was reviewed by Susan McIntyre-Tamwoy (Associate Director).
Figure 1. The GMIA following preliminary analysis to identify the Urban Capable Boundary.
2 EXISTING ENVIRONMENT

A full description of the existing environment of GMIA is provided in Appendix 1. A summary is included below.

The GMIA is located within the Sydney Basin Bioregion, on the central east coast of NSW. There are two subregions within the GMIA: the Cumberland and the Sydney Cataract (Figure 2). The GMIA is predominantly within the Cumberland subregion, which is characterised by low rolling hills and wide valleys on Triassic Wianamatta group shales and sandstones. The eastern and southern margins of the GMIA are within the Sydney Cataract subregion, the extent of which is defined by the Triassic Hawkesbury sandstone plateau on the coastal edge of the Sydney Basin (Morgan, 2001). From an historical perspective, the Cumberland subregion would have been more suitable for settlement and pastoralism in the 19th Century, with the Sydney Cataract being composed of inaccessible deep disjointed sandstone valleys and escarpments. Conversely, when considering Aboriginal heritage, the Sydney Cataract has high potential for the presence of rock shelters and overhangs – a key repository for past human activity.

The GMIA extends across several different soil landscapes: residual Blacktown and Lucas Heights landscapes, colluvial Hawkesbury and Picton landscapes, erosional Luddenham landscape, and fluvial Theresa Park landscape. In the Cumberland subregion, these types of soils are often shallow, and can be significantly disturbed by historical and modern activities. This has significant implications for the survivability of historical and Aboriginal deposits. Further, it is rare for these types of soil to contain significantly deep, stratified or old archaeological deposits. In the Sydney Cataract, soil landscapes have greater potential to contain deeply stratified and old cultural materials – usually of greater scientific significance. However, in incised sandstone valleys, scouring and water erosion often means these soils are of a very young age, being frequently re-cycled and re-deposited along the main river systems.

Much of the GMIA with the exceptions of the steep river and creek gullies, has been subject to vegetation clearance in the historic past and as a result, remnant vegetation now occurs mostly as small and fragmented patches. From an Aboriginal heritage perspective, remnant and old vegetation is important for two reasons: 1) it is in these locations that culturally modified trees (if present) may be found; and 2) these areas have been subject to fewer disturbances in the last 200 years than other parts of the study area and therefore there is a greater chance that sites (if they occurred there) survived intact.

The GMIA is within the Hawkesbury-Nepean and Georges River catchments (Figure 3). Major permanent watercourses (from west to east) include the Nepean, Cataract and Georges rivers. These large water-courses would have been key resources for both Aboriginal and historic settlement and movement through the GMIA. As such, all of these rivers are highlighted throughout the report as of key importance.
Figure 2. The bioregions of the GMA.
Figure 3. The hydrology of the GMIA. This figure shows the size of creek lines based on Strahler (1951), with the stream order shown as described in the legend.
3 HISTORIC HERITAGE

This section presents an assessment of the historical heritage items, places and potential within the GMIA.

3.1 General Development of the South-West

The search for productive agricultural land saw the expansion of the early settlement at Sydney to include areas such as Parramatta, the Hawkesbury and 'Cowpastures'. The fertility of the latter was centred on the rich alluvial soils of the Nepean River. Much of the best land at Cowpastures was occupied by John Macarthur's Camden Park.

Early town development was stimulated by Governor Macquarie who laid out the sites of Campbelltown and Appin to supplement his proposed capital of the south-west - Liverpool. Both these towns were expanded and replanned by T.L. Mitchell in the early 1830s. Macarthur also initiated the private town of Camden in the 1830s to compete with the Government foundation at Narellan. It was not to become a concrete proposition until the 1840s.

The agricultural base in the south-west changed in the 1830s and 1840s and both diversified, with the introduction of vines and fruit growing, and the general movement from grain to grazing - especially on the larger holdings. By the 1860s the area capitalised on an opportunity to grow hay for sale in Sydney and supplemented this move with a growing butter industry from the 1880s. By the 1880s the Camden Estate was also being broken up, tenants moved out, and allotments sold - some as hobby farms.

Transport in the area remained focussed on the small scale and horse powered vehicle for many years. While other regions in the Greater Sydney area saw the introduction of rail, the south west had to be satisfied with the tramway between Camden and Campbelltown. The old railway line south of Sydney had finished at ‘Menangle North’ station but was extended south in 1863 with the construction of the Menangle Railway Viaduct over the Nepean and its floodplain and a new station at Menangle. The rail line was introduced from Sydney, south to Wollongong in the 1880s.

The small scale rural nature of the south-west persisted through the early part of the 20th century with the towns of Campbelltown, Picton, Appin, Wilton, etc. providing commercial and service centres for the rural population. The 1945 “Map of Existing Land Use in the County of Cumberland” shows much of the study area still overwhelmingly used for arable and grazing purposes. The post war expansion of suburbs, the growth of private car use and the County of Cumberland Plan (1947) have all had their effect on the development of the region. Campbelltown developed as a regional service centre on a larger scale by the 1980s and 1990s.

3.1.1 Historical Themes

Campbelltown LGA

The Campbelltown Heritage Study Review (Paul Davies Pty Ltd: 2009) was undertaken in 2009 and identified the following overarching themes related to the historical development of the LGA (see also Appendix 2):

- Early European Settlement
- Establishment of Campbelltown
- Notable Figures
- Communication
- Transport
  - Roads
Railway
- Camden Tramway
- Mail Coaches
- Agriculture and pastoralism
- Water Supply
- Servicing Sydney
- Development of Campbelltown as a Regional City

Wollondilly LGA

The Wollondilly Heritage Study was undertaken in 2006 and identified the following overarching themes related to the historical development of the LGA (see also Appendix 2):

- Exploration
- Settlement
- Pastoral Expansion
- Transport
- Law and Order
- Religion
- Rest and Recreation
- Education
- Services and Utilities
- Industry
- Water

3.2 Listings

Further details of historical listings are included in Appendix 2. A summary of the findings are presented below. Unfortunately, Wollondilly Council has reported that the volume of their heritage study believed to contain the inventory sheets for all heritage items has not been recovered.

A search of a wide range of historic heritage lists identified 13 sites on the Register of National Estate (RNE), approximately 50 on the State Heritage Inventory (SHI – and duplicated on the LEPs and Section 170 registers), and 33 sites on the National Trust of Australia. Of note, for the purposes of future planning are nine (9) sites listed on the State Heritage Register (SHR - Table 1 and Figure 4), eight (8) of which are within the study area. These listings focus on rural complexes such as Beulah, Glenlee, Sugarloaf Farm, and Camden Park, but also include the late 19th Century Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) and the Menangle Railway Station Group and the Menangle Rail Bridge. These listings are afforded the highest level of protection in NSW, and would form the greatest constraints to or inhibit any development within or in close proximity to their curtilages. Following subsequent assessment by Collen Morris and Geoffrey Britton (1999) on behalf of the National Trust of Australia (NSW), a number of other locally listed items were assessed as potentially having state heritage significance, and include Glen Lorne, Mount Gilead, Meadowvale, and St Mary’s Towers (Parkhall).

Listings in the Campbelltown and Wollondilly LEPs are afforded a moderate level of protection in NSW, and, depending on their level of significance (as local or state heritage items), may constrain or inhibit development within or in close proximity to their curtilages. A range of historical items and sites are listed in the surrounding area on LEPs and the National Trust of Australia and RNE registers, reflecting the pastoral history outlined in Section 3.1 above (Table 2 - Table 5 and Figure 4).
Table 1. SHR items within the study area and immediate surrounds.

<table>
<thead>
<tr>
<th>Name of Item</th>
<th>Group/Collection</th>
<th>Primary Address</th>
<th>LGA</th>
<th>Item #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glenlee; outbuildings, garden and gate lodge</td>
<td>Farming and grazing</td>
<td>Glenlee Road, Menangle Park, NSW 2563</td>
<td>Campbelltown</td>
<td>00009</td>
</tr>
<tr>
<td>Sugarloaf Farm (Mt Huon)</td>
<td>Farming and grazing</td>
<td>Menangle Road, Gilead, NSW 2560</td>
<td>Campbelltown</td>
<td>01389</td>
</tr>
<tr>
<td>Beulah</td>
<td>Landscape cultural</td>
<td>767 Appin Road, Gilead, NSW 2560</td>
<td>Campbelltown</td>
<td>00540</td>
</tr>
<tr>
<td>Camden Park Estate and Belgenny Farm ^</td>
<td>Farming and grazing</td>
<td>Elizabeth Macarthur Avenue, Camden South, NSW 2568 (within 5m of Study Area)</td>
<td>Camden</td>
<td>01697</td>
</tr>
<tr>
<td>Camden Park ^</td>
<td>Farming and grazing</td>
<td>Elizabeth Macarthur Avenue, Camden Park, NSW 2568 (within 5m of Study Area)</td>
<td>Wollondilly</td>
<td>00341</td>
</tr>
<tr>
<td>Menangle Rail Bridge over Nepean River</td>
<td>Transport - Rail</td>
<td>Main Southern Railway, Menangle, Gilead, NSW 2571</td>
<td>Wollondilly</td>
<td>01047</td>
</tr>
<tr>
<td>Menangle Railway Station group</td>
<td>Transport - Rail</td>
<td>Main Southern Railway, Menangle, Gilead, NSW 2571</td>
<td>Wollondilly</td>
<td>01191</td>
</tr>
<tr>
<td>Upper Canal System (Pheasants Nest Weir to Prospect Reservoir)</td>
<td>Utilities - Water</td>
<td>Various</td>
<td>Various</td>
<td>01373</td>
</tr>
<tr>
<td>Windmill Hill Group, including Ruins (other names: North Farm, Middle Farm aka Larkin Farm and Windmill Hill, South Farm, Steven's Homestead)</td>
<td>Farming and grazing</td>
<td>Wilton Road, Appin, NSW 2560</td>
<td>Wollondilly</td>
<td>01931</td>
</tr>
<tr>
<td>Wilton Park</td>
<td>Farming and grazing</td>
<td>Wilton Park Road, Wilton, NSW 2571</td>
<td>Wollondilly</td>
<td>00257</td>
</tr>
</tbody>
</table>

^ Immediately adjacent to the study area.

Table 2. Campbelltown LEP 2015 Heritage Items within the study area and immediate surrounds.

<table>
<thead>
<tr>
<th>Suburb</th>
<th>Item Name</th>
<th>Address</th>
<th>Item No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilead</td>
<td>Humewood Forest</td>
<td>Lot 21, DP 1132464</td>
<td>53</td>
</tr>
<tr>
<td>Gilead</td>
<td>Brookdale site</td>
<td>Lot 7001, DP 1055415</td>
<td>54</td>
</tr>
<tr>
<td>Gilead</td>
<td>Glen Lorne</td>
<td>Part Lot 1 and Part Lot 2, DP 603674</td>
<td>55</td>
</tr>
<tr>
<td>Gilead</td>
<td>Hume Monument</td>
<td>Road Reserve Appin Road, adjacent to Lot 2 DP 547457</td>
<td>56</td>
</tr>
<tr>
<td>Gilead</td>
<td>Mount Gilead</td>
<td>901 Appin Road</td>
<td>58</td>
</tr>
<tr>
<td>Location</td>
<td>Name of Item</td>
<td>Address</td>
<td>Property Description</td>
</tr>
<tr>
<td>----------------</td>
<td>------------------------------------------------------------------</td>
<td>----------------------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>Gilead</td>
<td>Kilbride</td>
<td>Lot 3 DP 1065919</td>
<td></td>
</tr>
<tr>
<td>Glen Alpine</td>
<td>Glen Alpine, site of original house</td>
<td>Lot 756, DP 787316 (140m outside the study area)</td>
<td></td>
</tr>
<tr>
<td>Wedderburn</td>
<td>“Morning Glory” House</td>
<td>208 Minerva Road (225m outside the study area)</td>
<td></td>
</tr>
<tr>
<td>Gilead</td>
<td>Beulah</td>
<td>Lot 23, DP 1132464</td>
<td></td>
</tr>
<tr>
<td>Gilead</td>
<td>Sugarloaf Farm, homestead group and rural landscape setting</td>
<td>Lot 2, DP 842735; Lot 3, DP 1007066; Part Lot 200, DP 1046336</td>
<td></td>
</tr>
<tr>
<td>Menangle Park</td>
<td>Glenlee, outbuildings, garden and gate lodge</td>
<td>Lots 1, 2 and 3, DP 713646</td>
<td></td>
</tr>
<tr>
<td>Menangle Park</td>
<td>Menangle Railway Viaduct</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. **Wollondilly LEP 2011 Heritage Items within the study area and immediate surrounds.**
<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Address</th>
<th>DP</th>
<th>Local/State</th>
<th>LGA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appin</td>
<td>St Mark’s Anglican Rectory (former)</td>
<td>5 Toggerai Street</td>
<td>Lot 27, DP 747041</td>
<td>Local</td>
<td>I14 Wollondilly</td>
</tr>
<tr>
<td>Appin</td>
<td>Upper Nepean Scheme—Broughton Pass Weir</td>
<td>Wilton Road West</td>
<td>Lots 7–10, DP 1085929</td>
<td>Local</td>
<td>I15 Wollondilly</td>
</tr>
<tr>
<td>Appin</td>
<td>Upper Nepean Scheme—Upper Canal</td>
<td>Lots 1 and 2, DP 625921; Lots 1–3, DP 719562</td>
<td>State</td>
<td>I16 Wollondilly</td>
<td></td>
</tr>
<tr>
<td>Camden Park</td>
<td>Camden Park Estate—Dairy No 8, cottages and orchard site</td>
<td>445 Remembrance Drive (within 5m of Study Area)</td>
<td>Lot 2 DP 1050479</td>
<td>Local</td>
<td>I54 Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>Railway Cottage</td>
<td>3 Camden Road</td>
<td>Lot 1, DP 828396</td>
<td>Local</td>
<td>I69 Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>Stone Cottages</td>
<td>380 Douglas Park Drive</td>
<td>Lot 27, DP 5152</td>
<td>Local</td>
<td>I70 Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>St Mary’s Towers</td>
<td>415 Douglas Park Drive</td>
<td>Part Lot 11, DP 1068393</td>
<td>Local</td>
<td>I71 Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>Mountbatten Group—house, chapel and garden building</td>
<td>655 Menangle Road and off Duggan Street</td>
<td>Part Lot 1, DP 576136; Lot A, DP 421246</td>
<td>Local</td>
<td>I72 Wollondilly</td>
</tr>
<tr>
<td>Maldon</td>
<td>Maldon Weir</td>
<td>Nepean River</td>
<td>Lot 119, DP 751297</td>
<td>Local</td>
<td>I77 Wollondilly</td>
</tr>
<tr>
<td>Maldon</td>
<td>Suspension Bridge over the Nepean River</td>
<td>Maldon Bridge Road and Wilton Park Drive</td>
<td>Nil</td>
<td>Local</td>
<td>I78 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Menangle Rail Bridge over Nepean River</td>
<td>Menangle Road (Main Southern Railway)</td>
<td>Nil</td>
<td>State</td>
<td>I80 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Camden Park Estate—Central Creamery Manager’s Cottage</td>
<td>15 Menangle Road</td>
<td>Part Lot 201, DP 590247</td>
<td>Local</td>
<td>I82 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Camden Park Rotolactor</td>
<td>15 Menangle Road</td>
<td>Part Lot 201, DP 590247</td>
<td>Local</td>
<td>I83 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Dairy No 4 (EMAI Cottage 29)</td>
<td>60 Woodbridge Road (within 5m of Study Area)</td>
<td>Lot 2 DP 1133910</td>
<td>Local</td>
<td>I84 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Bungalow</td>
<td>92 Menangle Road (within 5m of Study Area)</td>
<td>Lot A, DP 940830</td>
<td>Local</td>
<td>I86 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Bungalow</td>
<td>96 Menangle Road (within 5m of Study Area)</td>
<td>Lot 1, DP 305932</td>
<td>Local</td>
<td>I87 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>House</td>
<td>100 Menangle Road (within 5m of Study Area)</td>
<td>Lot 1, DP 587187</td>
<td>Local</td>
<td>I88 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Cottage</td>
<td>102 Menangle Road (within 5m of Study Area)</td>
<td>Lot A, DP 322713</td>
<td>Local</td>
<td>I89 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Bungalow</td>
<td>106 Menangle Road (within 5m of Study Area)</td>
<td>Lot B, DP 322713</td>
<td>Local</td>
<td>I90 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>St Patrick’s Catholic Church</td>
<td>119 Menangle Road</td>
<td>Lot 100, DP 790213</td>
<td>Local</td>
<td>I91 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Cottage</td>
<td>124 Menangle Road (within 5m of Study Area)</td>
<td>Lot 1, DP 979893</td>
<td>Local</td>
<td>I92 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Cottage</td>
<td>128 Menangle Road</td>
<td>Lot B, DP 398310</td>
<td>Local</td>
<td>I93 Wollondilly</td>
</tr>
</tbody>
</table>
(within 5m of Study Area)

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
<th>Address</th>
<th>Details</th>
<th>Level</th>
<th>Place Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menangle</td>
<td>St James' Anglican Church</td>
<td>131 Menangle Road</td>
<td>Lot 1, DP 306367</td>
<td>Local</td>
<td>I94 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Cottage</td>
<td>138 Menangle Road</td>
<td>Lot 1, DP 963033</td>
<td>Local</td>
<td>I95 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Gilbulla (Anglican Conference Centre)</td>
<td>710 Moreton Park Road</td>
<td>Lot 1, DP 370921</td>
<td>Local</td>
<td>I96 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Dairy Cottage</td>
<td>1370 Moreton Park Road</td>
<td>Part Lot 202, DP 590247</td>
<td>Local</td>
<td>I97 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Menangle Weir</td>
<td>Station Street</td>
<td>Lot 2, DP 775452</td>
<td>Local</td>
<td>I101 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Menangle Railway Station Group</td>
<td>Station Street (Main Southern Railway)</td>
<td>Nil</td>
<td>State</td>
<td>I81 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Menangle Store</td>
<td>2 Station Street</td>
<td>Lot 8, DP 531899</td>
<td>Local</td>
<td>I98 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Menangle gate Lodge (former)</td>
<td>60 Woodbridge Road</td>
<td>Lot 2 DP 1133910</td>
<td>Local</td>
<td>I99 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Menangle School of Arts Community Hall</td>
<td>4 Station Street</td>
<td>Lot 1, DP 306368</td>
<td>Local</td>
<td>I292 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Menangle Public School (former)</td>
<td>28 Station Street</td>
<td>Lot 1, DP 795181</td>
<td>Local</td>
<td>I291 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Camden Park Estate Central Creamery</td>
<td>45 Stevens Road</td>
<td>Part Lot 21, DP 581462</td>
<td>Local</td>
<td>I100 Wollondilly</td>
</tr>
<tr>
<td>Menangle</td>
<td>Dairy No 9 (EMAI Cottage 24)</td>
<td>240 Woodbridge Road</td>
<td>Lot 1, DP 130288</td>
<td>Local</td>
<td>I85 Wollondilly</td>
</tr>
<tr>
<td>Wilton</td>
<td>Cottage</td>
<td>1090 Argyle Street</td>
<td>Lot 32, DP 814280</td>
<td>Local</td>
<td>I275 Wollondilly</td>
</tr>
<tr>
<td>Wilton</td>
<td>St Luke’s Anglican Church</td>
<td>1096–1099 Argyle Street</td>
<td>Lots 4–7, Sec 1, DP 759094</td>
<td>Local</td>
<td>I276 Wollondilly</td>
</tr>
<tr>
<td>Wilton</td>
<td>Kedron</td>
<td>305 Wilton Park Road</td>
<td>Lot 2 DP 572157</td>
<td>Local</td>
<td>I280 Wollondilly</td>
</tr>
<tr>
<td>Wilton</td>
<td>Aboriginal shelter sites</td>
<td>80 Condell Park Road (Wilton Park)</td>
<td>Part Lot 1, DP 270536</td>
<td>Local</td>
<td>I285 Wollondilly</td>
</tr>
<tr>
<td>Wilton</td>
<td>Upper Nepean Scheme—Pheasants Nest Weir</td>
<td>Nepean River</td>
<td>Nil</td>
<td>Local</td>
<td>I278 Wollondilly</td>
</tr>
<tr>
<td>Wilton</td>
<td>Cottage</td>
<td>180 Wilton Park Road</td>
<td>Lot 105, DP 794081</td>
<td>Local</td>
<td>I279 Wollondilly</td>
</tr>
<tr>
<td>Wilton</td>
<td>Wilton Park—stables, coachhouse, water tanks, stallion boxes, covered yards</td>
<td>370 Wilton Park Road</td>
<td>Lot 8, DP 243079</td>
<td>State</td>
<td>I277 Wollondilly</td>
</tr>
<tr>
<td>Appin</td>
<td>Darcy’s House Site</td>
<td>51 Appin Road</td>
<td>Lot 2, DP 594426</td>
<td>Local</td>
<td>A1 Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>Stone ruin</td>
<td>45 Whitticase Lane</td>
<td>Lot 390, DP 800151</td>
<td>Local</td>
<td>A4 Wollondilly</td>
</tr>
</tbody>
</table>

Table 4. National Trust of Australia (NSW) Register items within the study area.
<table>
<thead>
<tr>
<th>Suburb/Location</th>
<th>Name of Item</th>
<th>Address</th>
<th>Listing ID</th>
<th>LGA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appin</td>
<td>Mount Gilead including windmill, store and stable</td>
<td>Appin Road</td>
<td>R616</td>
<td>Campbelltown</td>
</tr>
<tr>
<td>Appin</td>
<td>Beulah, former Summer Hill</td>
<td>Appin Road</td>
<td>R515</td>
<td>Campbelltown</td>
</tr>
<tr>
<td>Appin</td>
<td>Timber Beam Bridge on ‘Beulah’</td>
<td>Appin Road off over Woodhouse Creek on Beulah</td>
<td>R714</td>
<td>Campbelltown</td>
</tr>
<tr>
<td>Gilead</td>
<td>Sydney Water Supply: Upper Canal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menangle Park</td>
<td>The Pines</td>
<td>Menangle Road</td>
<td>S10491</td>
<td>Campbelltown</td>
</tr>
<tr>
<td>Menangle Park</td>
<td>Glenlee including park-like setting, with outbuildings and gate lodge</td>
<td>Menangle Road</td>
<td>S7769</td>
<td>Campbelltown</td>
</tr>
<tr>
<td>Menangle Park</td>
<td>Menangle House formerly Horse &amp; Jockey Inn, including rear sandstone wing that was formerly a school</td>
<td>Menangle Road</td>
<td>S8936</td>
<td>Campbelltown</td>
</tr>
<tr>
<td>Menangle Park</td>
<td>Menangle Viaduct Rail Bridge</td>
<td>Main Southern Railway Line, Over Nepean River, North of Town</td>
<td>S11457</td>
<td>Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>Circular Brick Garden Structure (part of Morton Park Group - Card 6 of 6)</td>
<td>Dowle Street</td>
<td>R2155</td>
<td>Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>Stone Stables (part of Morton Park Group - Card 5 of 6)</td>
<td>Dowle Street</td>
<td>R2156</td>
<td>Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>Early Dwelling (part of Morton Park Group - Card 4 of 6)</td>
<td>Dowle Street</td>
<td>R2157</td>
<td>Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>Bakery (part of Morton Park Group - Card 3 of 6)</td>
<td>Dowle Street</td>
<td>R2158</td>
<td>Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>Homestead (part of Morton Park Group - Card 2 of 6)</td>
<td>Dowle Street</td>
<td>R2159</td>
<td>Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>Morton Park Group (Morton Park Group - Card 1 of 6)</td>
<td>Dowle Street</td>
<td>R2160</td>
<td>Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>St Mary’s Towers, formerly Park Hall/Nepean Towers</td>
<td></td>
<td>R2161</td>
<td>Wollondilly</td>
</tr>
<tr>
<td>Douglas Park</td>
<td>Mountbatten and Outbuildings</td>
<td></td>
<td>R2162</td>
<td>Wollondilly</td>
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<tr>
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3.3 Adequacy of the Lists and Potential for Archaeology and other values

While at first glance the length of the lists of heritage places suggests that historic heritage has been well considered in the GMIA, some of the comments received from the public during the exhibition phase of the project indicated dissatisfaction with the quality of the listing information. Several submissions received related to the Mt Gilead, Meadowvale, and Beulah properties. For this reason these were selected for a site visit as part of the limited ground truthing conducted for this phase of work. It should also be noted that Wollondilly LEP data had not been made available by Council at the time that the draft report was exhibited. This data has since been considered and added to the listings in preceding tables. However, the volume of the Wollondilly Heritage Study (1992) containing the data sheets for all heritage items remains unrecovered. Hence, independent assessment of the basis for listing items within the Wollondilly LGA cannot be made.

In relation to the Campbelltown LEP, it is noted that the Meadowvale site was listed on the previous version of the LEP\(^2\) and is absent from the recently updated 2015 LEP (and therefore absent from Table 2 and Figure 4). The rationale for this is unknown; as it is an early Hume property, it is unlikely to be supported on a rigorous assessment of its historic values. The consideration of Meadowvale also raises concerns about the impact on the neighbouring Beulah property; the boundary shared by the two properties is on a ridge line and any development on Meadowvale is therefore likely to impact visually on the Sydney Living Museums property.

Based on the ground truthing inspections conducted (Mt Gilead, Meadowvale, and Beulah), it is suggested that previous consideration of these sites had taken a narrow focus on built structures rather than understanding them in their cultural landscape setting. Mt Gilead is an extreme case of this with the LEP listing narrowly focussing on the extant structures of the house, barn and the windmill and including the nearby dam as a discrete separate listing. There is no consideration given to the property within its setting and significant features such as the historic ford across the creek, views to Camden Park Estate and the connection of the property to the river which sustained it through its history. While it is outside the scope of the current study to carry out such an assessment it is likely that an objective assessment of the significance of this property would conclude that it meets the threshold for listing on the State Heritage Register.

For the purpose of identifying areas of high conservation value in relation to cultural heritage, curtilages mirroring property boundaries rather than building footprints are ideally recommended. Considering the stage of this investigation within the GMIA, for Mt Gilead specifically, a minimum curtilage that includes the major heritage items of the house, outbuildings, windmill, lake and constructed ford is proposed; and which considers the buildings within their rural cultural landscape setting, maintaining a link with the Nepean River (see Figure 11).

In the case of all three properties (as in most other properties on the LEP of both Campbelltown and Wollondilly), there has been no consideration of archaeological potential associated with their historic use and consideration of an archaeological zoning plan for the entire GMIA is recommended to ensure that this is adequately considered prior to development (see Figure 10). This would be elaborated on through the development of the Regional Archaeological Research Design and Management Strategy (RARDMS).

Overall there are a number of heritage places that may on further assessment be found to be of heritage significance. These include Glen Lorne, Mount Gilead, Meadowvale, and St Mary’s Towers (Parkhall). Development within the curtilages of these sites may be restricted subject to review by the NSW Heritage Council, while development adjacent to these items may also be subject to review

\(^2\) Address Part Lot 1, DP 602888, item number 57 (Campbelltown LEP 2002)
should it be determined that view lines, significant corridors or extended curtilages were at risk. Further heritage assessment would be required to determine the significance and curtilage boundaries of these potential SHR sites.
Figure 4. Historical heritage listings within the GMA and in immediate surrounds (see Appendix 2 for details and inset maps).
4 ABORIGINAL HERITAGE

4.1 Aboriginal Consultation

Aboriginal consultation was undertaken for this project. To enhance the outcomes of the consultation process a dual approach was undertaken. This involved the basic steps as outlined in OEH’s guideline: Aboriginal Consultation Requirements for Proponents (2010), plus a preliminary cultural values mapping workshop targeting willing participants with specific knowledge of the area.

This process is specified for projects which require an Aboriginal Heritage Impact Permit (AHIP). It provides an inclusive process to identify all Aboriginal people with an interest in the area and the project. Specifically, pre-notification and notification processes were undertaken to identify the Aboriginal individuals and organisations who will be included in the consultation process for the GMIA.

The following Aboriginal organisations registered an interest in the project by 13 May 2015, which was the due date advised in the notification process:

1. Tharawal Local Aboriginal Land Council (LALC)
2. Cubbitch Barta Native Title Claimants Aboriginal Corporation (CBNTAC)
3. Peter Falk Aboriginal Consultancy
4. Darug Aboriginal Cultural Heritage Assessments
5. Darug Land Observations
6. Tocomwall
7. Kamilaroi- Yankuntjatjara Working Group
8. Walbunj
9. Murrumbul
10. Munyunga
11. Wingikara
12. Bilinga
13. Corroboree Aboriginal Corporation
14. Warragil
15. Gunyuu

4.1.1 Preliminary Cultural Values Mapping

This project provided an opportunity to incorporate an Aboriginal voice into initial discussions about the values of the study area with the aim of enriching the characterisation of the GMIA. To this end, a cultural values mapping workshop was held on 7 May 2015 at Narellan to discuss cultural places and values associated with the GMIA. Participants were selected on the basis of either:

- a long term residency in the area which could suggest they had historic interests in the study area, or
- claims for traditional descent specific to the study area which might mean that the participants could hold traditional cultural information.

From amongst those invited the following people agreed to participate: Glenda Chalker of CBNTAC, Abbi Whillock of Tharawal LALC, and Duncan Falk (Peter Falk Aboriginal Consultancy).

At the workshop participants were asked to annotate a large format (A0) aerial photograph of the study area with places of particular cultural interest or concern to them. The resulting map (see Figure 5) was a composite of places nominated by participants, although all places may not have been known to all participants.

The meeting identified six areas with specific cultural value to the Aboriginal community (Figure 5) which might not otherwise have been identified at this stage of the planning process:
1. Rocky Pond Creek massacre/burial – an area southwest of Appin, east of Douglas Park Drive near Cataract River was the site of an historical massacre. The site is also documented on the AHIMS database.

2. Hanging tree associated with (1) – an area east of (1) at which Aboriginal people were hanged in association with the massacre event.

3. Fishing and story place – a stretch of the Nepean River, east of Menangle near Birdseye corner, known to have good fish and eels, to have been extensively used by Aboriginal people in the recent past, and that continues to be used today. Within this stretch is an important Story Place\(^3\) that the informant did not want more precisely identified in a public document.

4. Historic building owned by BHP – a structure just north of Douglas Park, which is known to contain holes in the walls through which Aboriginal people were shot in the past.

5. Barrigal lagoon – a stretch of the Nepean River, west of Menangle Park, that was known to have good fish and eels, and to have been extensively used by Aboriginal people in the recent past (although participants commented that the lagoons depended on seasonal floods and there had been no significant flood events since the 1980s). Activities nearby also included meetings and dancing, along with day-to-day subsistence.

6. Canoe tree – a tree with large culturally created scar is known in the northern quadrant of (5).

In addition to the specific cultural locations listed above, a number of other areas were considered to have cultural importance arising from participants’ first-hand knowledge of a large number of rock shelter and open sites occurring within these areas. These areas included areas south of Gilead, the catchment of Elladale Creek, a small area north of Menangle and a small location near Bingara Gorge. The importance of the Nepean River was also identified with the riverbanks between Menangle and Douglas Park being highlighted. In the southern part of the study area participants commented that many sites occurred along the headwaters of the upper creeks at the interface with the relatively flat country where access to both the open hunting grounds and the sandstone shelters occurring along the creek lines was relatively easy. Participants also noted that a large area of land was owned by Tharawal LALC in the Appin region along the south-eastern border of the study area and as yet no decisions have been made as to its future use.

The Aboriginal cultural values layer that resulted from this exercise must be considered preliminary and more information may be revealed in subsequent stages of the project planning and consultation. However it has highlighted several areas of significance to the local community that were not identified through archaeological modelling and these should be considered in any future planning for the area.

\(^3\) Further enquiries should be directed to CBNTAC.
Figure 5. Map of cultural values including sites and places identified by Aboriginal people in the preliminary cultural mapping workshop.
4.2 Ethnographic Record

To assist in the development of cultural resource management (CRM), AHMS has initiated a mapping project to explore early historical texts and diaries to identify spatial locations where Aboriginal activities were observed. The AHMS project ‘Mapping Sydney’s Aboriginal Past’ provides a spatial understanding of Aboriginal activity around the temporal point of contact. It consists of an interactive map, a searchable database of site-specific ethnographic evidence, and a range of other tools which bring a spatial perspective to the primary sources. Further details of the program are provided in Appendix 3.

4.2.1 A Summary of Findings

Over thirty separate Aboriginal groups populated the wider Sydney area in 1788, each with their own country, practices, diets, dress, and dialects. We now know of these groups as ‘clans’ and each identified with broader cultural-linguistic groups known as ‘tribes’: Darug, Darkinjung, Gundungarra, Tharawal, Guringai (Coastal Darug), Eora (Coastal Darug) and Awabakal.

Each clan of thirty to fifty people lived within their own territory, occasionally converging with other clans to trade, hunt, fight, feast, arrange marriages, conduct ceremonies, resolve disputes, and share information. The database includes details of a gathering of three clans on their way to Camden to learn a new song (Backhouse, 1843), Burramattagal people venturing out to Manly to feast on a beached whale (Tench, 1793), and groups of hunters near Carabeely cooperating on a large-scale kangaroo hunt (Barrallier, 1802). There was often tension between neighbouring groups and the boundaries between territories were not lightly traversed (White, 1788). On an expedition north-west of Parramatta, Watkin Tench records that his guides Colebee (Gadigal) and Ballederry (Burramattagal) quickly found themselves in ‘country unknown’ and that they described those who lived there as ‘enemies’. When the party finally reached the Hawkesbury River, Tench (1791) surmised that ‘Our natives had evidently never seen this river before’.

The interactive map developed reveals a landscape criss-crossed with Aboriginal paths, many of which later became roads. Missionary James Backhouse was amazed by the speed and sophistication of communication between clans; on 23 October 1835 he encountered Aboriginal people in Richmond who knew of his brief visit to Wellington, over three hundred kilometres away: ‘Our persons, costume, and many other particulars, including our manner of communicating religious instruction, had been minutely described’ (Backhouse, 1843, p. 339).

The same paths that wove these communities together rapidly spread the small pox virus throughout the region in 1789. The devastating outbreak of small pox forced major reorganisation amongst clan groups. When William Bradley sailed into Sydney in May 1789, he recorded the ‘dreadful havoc’ that small pox had wrought amongst Aboriginal communities: ‘we did not see a Canoe or a Native the whole way coming up the Harbour & were told that scarce any had been seen lately except laying dead in & about their miserable habitations’ (Bradley, 1969). Traditional burial practices broke down and clans merged together as entire communities were taken by the virus (Hunter, 1793). Bodies were found in caves and by streams, around the harbour and all along ‘the path between Port Jackson & Broken Bay’ (Bradley, 1969). The impact of small pox continued to ripple across the country, reducing communities in the Hunter ‘from about 200, to 60’ (Backhouse, 1843, p. 401).

The primary sources offer only glimpses of the ceremonial life of these Aboriginal communities. Europeans recorded some Aboriginal customs, such as the avulsed teeth and ‘scarifications’ of certain initiated men, and the kangaroo teeth necklaces and the missing little finger joints of ‘mountaineer’ and coastal women. But, due to the secrecy surrounding ceremonial events, there are serious limitations to even the most richly described accounts like the ‘Yoo-long Erah-ba-diang’ initiation ceremonies Collins records at the head of Farm Cove and in the ‘middle harbour’ (Collins,
1798); the contests and dances conducted on ‘a clear spot between the town and the brickfield’ (Collins, 1798); and the operation performed by Yellomundee, a ‘caradyee’, on Colebee’s wound on the banks of the Hawkesbury (Tench, 1791).

Those clans that lived along the coast were saltwater people. They harvested shellfish from the shore; men fished from the shallows with long four-pronged spears, while the women fished in bark canoes using turban shell hooks and lines. The hunters’ toolkit included clubs, boomerangs, womeras, spears tipped with shell, and, of course, fire. At times they stayed for several months in the one area: Joseph Banks (1998) records finding ‘a small village consisting of about 6 or 8 houses’ on the south shore of Botany Bay in April 1770, and in December 1790, Watkin Tench describes a similar ‘little village (if five huts deserve the name)’ on the north side of the bay. Botany Bay was a focal point of Aboriginal activity; it has the highest density of plotted ethnographic sources in the Sydney area.

The inland clans fished for mullet and eels in rich lagoons, but much of their food came from yams dug out from the river banks and worms known as ‘cah-bro’ extracted from river driftwood. Colebee and Ballederry called these people the ‘climbers of trees’ after their practice of skilfully ascending gums in pursuit of animals, cutting footholds in the trunks with a stone axe. More hunting traps were plotted in the area from Parramatta to Richmond than any other part of Sydney. These included ‘bird decoys’ full of feathers, hollowed-out trees, and a tapering chute at the foot of Richmond Hill ‘between forty and fifty feet in length’, constructed of earth, weeds, rushes, and brambles (Collins, 1798).

Fire was a constant presence in early Sydney, from the ‘moving lights’ seen on the harbour at night (Banks, 1998:243) to lone trees burning on the Cumberland Plain, ‘the smoke issuing out of the top part as through a chimney’ (White, 1788). ‘In all the country thro’ which I have passed,’ wrote Arthur Phillip in May 1788, ‘I have seldom gone a quarter of a mile without seeing trees which appear to have been destroyed by fire’ (Phillip, 15 May 1788). The first Australians became known as the ‘fire-makers’ (Cox, 1815). They used fire to open paths and to clean country; to drive animals into the paths of hunters and then to cook the kill; to keep warm at night and to carry as a torch the next day; to treat wood, melt resin and crack stone for tools; to gather around and dance and share stories.

The interactive map gives us an insight into local burning regimes. On a hot dry day in September 1790, for example, David Collins observed Aboriginal people ‘burning the grass on the north shore opposite to Sydney, in order to catch rats and other animals’ (Hunter, 1793). Almost exactly twelve months later, on 31 August 1791, they were again ‘firing the country’ in the same place on a hot day ahead of heavy rains. While Collins regarded this to be another ‘remarkable coincidence’, it suggests a connection to the land and an understanding of the seasons which the settlers could not fathom. This dismissive approach proved devastating during the 1799 flood of the Hawkesbury. Settlers who ignored the flood warnings given by Aboriginal people were engulfed by a destructive torrent as the ‘river swell’d to more than fifty feet perpendicular height above its common level’ (Collins, 1798).

After contact, early Sydney remained, in the words of historian Grace Karskens, ‘an Eora town’ (Karskens, 2009:351). Crowds of Aboriginal people would flow through the settlement at Sydney Cove, eating in the yard of Government House, sharing a table with the Governor himself, or gathering at Bennelong’s hut. Large parties of convicts paid regular visits to an Aboriginal family in Woolloomooloo, ‘where they danced and sung with apparent good humour’ (Collins, 1798). A short-lived fish trade sprang up in Parramatta, with Aboriginal people selling fresh bream and mullet for bread and salted meat (Collins, 1798). Fierce warfare broke out on the Hawkesbury. And clans came ‘not less than one Hundred Miles’ to attend Governor Macquarie’s ‘Annual Meeting of the Natives’ at Parramatta. Each of these events makes up a single plotted marker in the ethnographic database. Combined they knit together a rich tapestry of Aboriginal activity around early Sydney.
4.2.2 The Study Area

The Traditional Owners of the Greater Macarthur area were reluctant to tell the new arrivals about their history and customs. What little we know comes from archaeology, later oral histories, and scraps of information recorded in early journals, such as those quoted above. Lieutenant David Collins (Organ, 1993, p. 134.) described ‘the men from the Cowpastures’ as ‘the most remarkable’ of those present at a large gathering in colonial Sydney: ‘They were rather short, stocky, strong and superbly built. The painting on their bodies, resembling some kinds of coats of mail, added even more to their martial attitude...’

From Barrallier’s account we learn that Aboriginal people in the study area harvested yams and other seasonal fruits and vegetables from river banks, caught eels, fish, and shellfish from creeks and lagoons, and hunted kangaroos, possums and waterbirds on the plains. As a meeting point between three cultural linguistic groups, we can also assume that the Darug, Dharawal and Gandangara people would have met to feast, conduct business and perform ceremonies. The Darug dialect closely resembled the Gandangara language, which allowed easy communication between tribes (Wrigley, 2001).

A search of AHMS’ ethnographic database reveals few historical interactions in the GMIA (Figure 6). Specifically, two were documented in the northern part of the GMIA, as follows.

Date: February 1804

Summary: Caley observes a lake full of eels known as Munangle.

Key words: Munangle; Menangle; eels

Location: 34° 5’56.58"S, 150°44’28.99"E (Accuracy: Within 2 km - 'Munangle', 'five miles south of Camden ford')

Source: Governor King to Mr. John Macarthur, 2 November 1805, Historical Records of Australia, Series 1, Volume 5, July 1804-August 1806, Governor's Despatches to and from England (Sydney: The Library Committee of the Commonwealth Parliament, 1915), 580.

Quotes: About five Miles from the Ford to the Southward is a Lake or Pond, named by the Natives Munangle. It is tolerable large and produces a quantity of Eels, but it is sometimes dry in long droughts.

Details: King is writing from Caley’s 1804 report, “A journey to ascertain the Limits or Boundaries of Vaccary Forest” (the Cowpastures).

Date: 7 November 1802 - 11 December 1802

Summary: Barrallier describes the fishing practices of Aboriginal people around the swamp 'Manhangle' and the use of fire when hunting kangaroos around 'Carabeely'. [10-11 December] Encounter at Menangle.

Key words: eels; fishing; hunting; fire; strategy; kangaroo; possum; spears; shouting; cooking

Location: 34° 6’48.39”S, 150°44’0.95”E (Accuracy: Within 2 km - swamp called Manhangle/Menangle on Barrallier’s route. Based on journals, sketch, and secondary analysis.)

Quote: On the 7th November, I went towards another swamp, called Manhangle by the natives,* S. 48° W., and a few miles distant from the first.[* In the swamps of Manhangle, Carabeely, and others, enormous eels, fishes, and various species of shells are found, which are sometimes used by the natives as food. They usually feed upon opossums and squirrels, which are abundant in that country, and also upon kangaroo-rat and kangaroo, but they can only catch this last one with the greatest trouble, and they are obliged to unite in great numbers to hunt it.]

When passing Carabeely,** we saw a kangaroo which we killed, and after half-an-hour’s walk we entered a valley where there was a herd of wild cattle. I counted 162 of them peaceably pasturing; they only perceived my party when it was at a short distance from them.[** When the natives assemble together to hunt the kangaroo, they form a circle which contains an area of 1 or 2 miles, according to the number of natives assembled. They usually stand about 30 paces apart, armed with spears and tomahawks. When the circle is formed, each one of them holding a handful of lighted hark, they at a given signal set fire to the grass and bush in front of them. In proportion as the fire progresses they advance forward with their spear in readiness, narrowing the circle and making as much noise as possible, with deafening shouts, until, through the fire closing in more and more, they are so close as to touch one another. The kangaroos, which are thus shut into that circle, burn their feet in jumping on every side to get away, and are compelled to retire within the circle until the fire attacks them. They then try to escape in various directions, and the natives frightening them with their shouts throw their spears at the one passing nearest to them. By this means not one can escape. They roast the product of their chase, without skinning nor even gutting the animals, and then divide it among themselves, after having cut each animal into pieces.]

... [10 December] I saw a native coming. Gogy went to welcome him, and after a short conversation, they came and sat by my side. I learnt from this native that Kelly had passed at Manhangle in the morning, accompanied by two men and one horse loaded with provisions, and that they had shot at them several times. He told me that himself and Wooglemay, whom I knew, were the only men in his party, the rest being women and children. They had been obliged to run away, and one bullet passed very near his shoulders. Having seen my camp, he had come to make his complaint to me.* When he had finished speaking, he took his net and gave me several swamp shells, which I liked very much. I gave him, in return, a joint of kangaroo, which he ate, and, picking up his axe and his net, he returned whence he had come.[* It is not of any advantage, but, on the contrary, it is very dangerous, to offer any insult to the natives. They avenge themselves of it sooner or later, and the first white man they meet without means of defence becomes their victim. They make use of the most cruel tortures on the one they can catch, whoever he might be, without troubling in the least about enquiring whether he belonged or not to the party who ill-treated them.]

... On the 11th December, thinking the waggon would very likely cross the river in the morning, I went with Gogy and two of my men to meet it. When I arrived at Manhangle I directed my march towards a fire I had caught sight of, and when I was thirty paces from it, the native pointed out to me a big wild dog lying in a bush.... Gogy told me that the fire I had reached by that time had been lighted by the native who had come to complain the day before. I saw several natives on the bank opposite Manhangle, who, recognising Gogy, called him. He went to them after giving his new axe to his wife. He told me he would come to meet me at Barhagal.

Details: Expedition by Francis Barrallier and four other men with the intent 'to explore the interior of the country and of trying to penetrate as far into the Blue Mountains as I should find it practicable', 6 November - 21 December 1802.

The mapping also shows that a number of tribal boundaries extend through the GMIA. The Greater Macarthur area sits at the intersection of three tribal boundaries. On the basis of reviews of the historical documents by Kohen (1993), Tindale (1974) and Capell (1970), the area of study encompasses three distinct cultural linguistic groups: the Darug, the Dharawal and the Gandangara.
people. The rich resources of the Nepean, Georges and Cataract rivers would have played a significant role in dividing the territories.

The ‘Muringong’ clan, whose territory included the northern portion of the study area, were Darug people (Kohen, 1993). Their land bordered to the east with the territory of the Tharawal people, who retain a strong presence in Campbelltown and Appin, and to the south-west with the Gandangara people, whose territory extended west into the mountains and south to Goulburn and Berrima.

The Greater Macarthur area is also currently home to a large contemporary Aboriginal community, most of whose pre-1788 ancestors were from outside of the Sydney area, but whose current sense of community and engagement with Aboriginal cultural heritage is often directed at their local area as well as places that they may identify in their traditional country. The Wollondilly Shire, which includes the study area, has a population of more than 1000 people identifying as either Aboriginal or Torres Strait Islander, representing 2.4% of the total community (Australian Bureau of Statistics, 2013), while 2,426 people identified as Aboriginal or Torres Strait Islander in Campbelltown at the 2011 Census, representing 3.5% of the total community. Through the *Aboriginal Land Rights Act 1983*, representation of much of this community in Aboriginal cultural heritage matters is through the system of LALCs. Aboriginal stakeholders considered to be important in the process of community consultation may be involved either as Traditional Owners or as Aboriginal people with a long term historical interest who have lived and worked in the area.
Figure 6. Map showing the location of ethnographic sites and boundaries within the GMIA.
4.3 Archaeological Context

As discussed in Section 2, the GMIA encompasses portions of the Cumberland and Sydney Cataract subregions of the Sydney Basin bioregion. The archaeology of the Sydney Basin has been well documented over the past 30 years (see Appendix 4) and 323 Aboriginal sites have been recorded and registered on the OEH Aboriginal Heritage Information Management System (AHIMS) within the GMIA. This reflects both the wealth of archaeology in the region and the number of archaeological investigations undertaken.

Archaeological context is established by examining local and regional trends in the distribution and character of known sites in relation to environment and topography. This, in turn, can indicate the occupational history of the area, trends in the nature and survivability of the archaeological record and the patterns of site distribution across the region.

A review of the history of archaeological investigation in the Sydney Basin, and regional patterning across the region is presented in Appendix 4. This section provides specific information on the investigations in the vicinity of the GMIA.

4.3.1 Local Context

A number of archaeological assessments have been undertaken within, and partially within, the GMIA. A spatial dataset by OEH indicates that at least 100 studies have taken place in the study area. The cumulative footprint of the study areas covers most of the GMIA (~100km², or approximately 62%; Figure 7). However, it should be noted that the dataset only shows the overall extent of the study areas, and does not represent the actual areas surveyed. Since the draft of this report was exhibited we have reviewed a number of additional reports and the sites identified in those studies have been considered in the re-worked predictive models (see Figure 7 and Figure 8).

In the north of the GMIA, the majority of previous archaeological assessments relate to proposed sand and gravel extraction sites at Mt Gilead and Menangle Park, and gas production wells at Mt Taurus. Between Menangle and Appin, archaeological assessments that have taken place have generally been in response to the proposed resource extraction activities, and relate to longwall mining applications, as well as supporting infrastructure such as gas and water pipelines within colliery areas. In the vicinity of Wilton, the assessments generally comprise linear studies for proposed rail (Maldon to Dumbarton rail route), road (Wilton Bypass), electricity (Wilton Substation 66kV Feeder Works) and gas infrastructure (Moomba to Sydney Ethane Pipeline). To the south and east, the Illawarra Prehistory Group has undertaken a series of archaeological surveys within the Sydney Cataract subregion, focussed on the Cordeaux and Woronora rivers, and the junction of the Cordeaux and Nepean rivers.

More recent studies not included in the OEH dataset have been undertaken in various parts of the GMIA in response to land rezoning proposals at Appin (Heritage Concepts Pty Ltd, 2007, Mary Dallas Consulting Archaeologists 2014), Menangle (Environmental Resources Management Australia (ERM), 2008; Jo McDonald Cultural Heritage Management Pty Ltd (JMCDCHM), 2010), Wilton (Kayandel Archaeological Services, 2014), and Mt Gilead (Campbelltown City Council, 2015) (refer to Appendix 4 for a summary of the findings). These assessments have been mapped separately by AHMS.
Figure 7. Map showing previous Aboriginal heritage assessments (not differentiated in terms of comprehensiveness) in the GMIA based on OEH AHIMS data as at 2016.
4.3.2 Summary

The following is a general summary of the information obtained from a review of select and key studies about archaeological site patterning across the GMIA Cumberland Plain and Sydney Cataract subregions (refer to Appendix 4).

Cumberland Plain Sub-region

- Archaeological investigation of the subregion has been fairly extensive, especially in areas developed for residential, mining and agricultural purposes (see Section 5.2.2). Investigations have included site surveys, excavation and salvage works. From these studies, numerous archaeological models have been developed.
- The models generally indicate that regardless of landform type, stream order proximity is the primary determiner of the scale and complexity of archaeological sites. The number of sites in a given area and sites with higher stone artefact densities (>100 artefacts per site) occur near high order streams and drainage lines, while less sites in a given area and lower densities of artefacts per site occur near low order streams/drainage lines.
- The excavations and stone artefact assemblages in proximity to higher order streams/drainage lines also show evidence of a variety of tool types and repeated occupation over time whereas the stone artefact assemblages in sites near low order drainage are less varied (as well as less in number) and appear to indicate more transient and casual occupation. The scale of occupation near high order drainage lines has been attributed to the greater number of resources in these areas.
- High densities of artefacts have been principally found on lower slopes, alluvial floodplains next to high order streams and on middle to upper ridges. Some of these high density sites show evidence of knapping (stone tool making) activities. However, low density artefact scatters have been found on the surface of all landforms including creek banks, creek terraces, flats, lower and upper slopes, elevated spurs, crests and ridge tops. These results are indicative of a ‘background scatter’ of occupation occurring across the region with sporadic areas of intensive or repeat usage.
- High density open artefact scatters occur along the major rivers and associated stream/drainage networks. This landform is subject to cyclical flooding which can result in archaeological material being buried by alluvial and colluvial deposits. This means that archaeological material is often not visible on the ground, but can be found in areas of sub-surface exposure, such as those caused by erosion.
- Regardless of landform, it has also been shown that elevation is a more important determining factor in the location of archaeological sites than aspect.
- Analysis indicates that local availability of raw materials is also a key factor in Aboriginal occupation and site distribution. Unfortunately, our understanding of the distribution of such sources in the GMIA is poorly understood.
- Following the trend of the archaeology of the Sydney Basin, the majority of sites in the subregion typologically dated to the mid- to late Holocene (<6,000 years BP). Some evidence suggests that earlier archaeological sites may, however, occur in rock shelter or sand dune deposits in key resource areas.

Sydney Cataract Sub-region

- Archaeological investigation of the Sydney Cataract sub-bioregion is limited. Few site surveys and excavations have been completed in the area due to limited development in the area. The majority of work in the area has been primarily focused in the Holsworthy Defence base to the east of the study area.
• Unlike the Cumberland Plain subregion, archaeological site patterning is not strictly related to stream order.
• Studies across this region have tended to focus on the individual characteristics of sites, rather than on site patterning across the area. This is because sites will tend to occur in the area in relation to sandstone formations rather than water sources or other variables. Patterning tends to not be as effective in relation to this due to the relatively random and isolated occurrence of shelter formations.
• The main site types across the subregion are shelters with deposits, rock art and grinding grooves.
• On the Hawkesbury sandstone formations along the river and its feeder creeks the most common site types were Aboriginal art and occupation sites. These were located within sandstone overhangs or shelters. Sheltered, painted art/occupation sites tend to occur more frequently above valley floors or below ridge tops. There appears a general preference for northerly or north-westerly aspects.
• The main site types across the subregion are shelters with deposits, rock art and grinding grooves.
• In other similar parts of the Sydney Basin, Attenbrow (2004) found that any overhang or rock shelter with reasonable head room, a level dry floor and a depth offering protection from extremes of sun, wind and rain could have been occupied by Aboriginal people in the past. Attenbrow (2004) also demonstrated that 70% of potential archaeological deposits (PAD) recorded within shelters are Aboriginal sites.
• Open artefact scatters are less common due to the lack of open flat areas in the steep sandstone country. However, these site types may still occur and are most likely to be situated on flat terraces adjacent to higher order streams (as in the Cumberland subregion).
• Axe grinding grooves are commonly found in creek beds, at the tops of valleys, above or along watercourses and also around rock pools or ridge tops near aquifers.
• Aboriginal burial sites may be located in rock shelter occupation deposits or within soft dry deposits such as sand bodies.

4.4 AHIMS Data

The AHIMS database is managed by OEH, and includes all spatial and compositional characteristics of all Aboriginal objects and sites previously recorded through academic and cultural resource management (see Appendix 5 for further explanation of site types).

In October 2016 OEH supplied updated AHIMS search data at the request of Department of Planning and Environment. This updated the information in the earlier version of this report. A total of 356 previously registered Aboriginal sites were identified within the GMIA. Approximately two thirds of these are open sites (226/63%), with artefactual material the most frequently recorded site feature, particularly within the shale-based Cumberland subregion (Figure 8). Approximately one third of the sites are rock shelters (130/37%), the majority of which are in the south of the GMIA, particularly within the Hawkesbury and Lucas Heights soil landscapes where suitable stone outcrops occur (Figure 8 see also Figure A2 in the Appendices). It should be noted that one additional closed site was identified in the general vicinity of west Appin which had location and site content restrictions. On average, the GMIA has approximately one recorded site per 0.45 square kilometres, although this is likely due to a lack of investigation across much of the study area.

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4 The predictive model in the draft Gap Analysis which went on public exhibition was based on AHIMS Data dated 24 March 2015 (AHIMS Searches #166835, #166836, #166837, #166838 and #166839) which included only 263 sites.
Sites are clearly clustered, most likely as a result of small-focussed development related CRM studies. They appear to be largely distributed along the margins of the Nepean and Georges rivers and their tributaries.

Table 6. Aboriginal sites summarised by site context and site feature\(^5\)

<table>
<thead>
<tr>
<th>Site Types</th>
<th>Site Count*</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undefined Art Site</td>
<td>69</td>
<td>12.02</td>
</tr>
<tr>
<td>Axe Grinding Groove</td>
<td>8</td>
<td>1.39</td>
</tr>
<tr>
<td>Rockshelter with Art</td>
<td>60</td>
<td>10.45</td>
</tr>
<tr>
<td>Rockshelter with Deposit</td>
<td>77</td>
<td>13.41</td>
</tr>
<tr>
<td>Rockshelter with Midden</td>
<td>1</td>
<td>0.17</td>
</tr>
<tr>
<td>Burial/s</td>
<td>1</td>
<td>0.17</td>
</tr>
<tr>
<td>Habitation Structure</td>
<td>17</td>
<td>2.96</td>
</tr>
<tr>
<td>Isolated Find</td>
<td>97</td>
<td>16.90</td>
</tr>
<tr>
<td>Midden</td>
<td>2</td>
<td>0.35</td>
</tr>
<tr>
<td>Moderate sized artefact scatter (&lt;50)</td>
<td>6</td>
<td>1.06</td>
</tr>
<tr>
<td>Small sized artefact scatter (&lt;10)</td>
<td>22</td>
<td>3.83</td>
</tr>
<tr>
<td>Potential Archaeological Deposit</td>
<td>124</td>
<td>21.6</td>
</tr>
<tr>
<td>Scarred Tree</td>
<td>16</td>
<td>2.79</td>
</tr>
<tr>
<td>Stone Arrangement</td>
<td>6</td>
<td>1.05</td>
</tr>
<tr>
<td>Undefined Artefact Site</td>
<td>68</td>
<td>11.85</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>574</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The factors that define the site distribution referred to in the subregional comparisons relate to whether a particular area has a sandstone or substrate. The Cumberland subregion is mostly shale and the Sydney Cataract mostly sandstone country, but these are by no means absolute distinctions, with a relatively broad transition area. There are a number of sites in the Cumberland subregion that are sandstone country sites (94 closed sites, mostly rock shelters with art) even though these generally occur in very low numbers across the majority of the subregion. Conversely, a number of open sites, predominantly artefact scatters or grinding grooves, were located in the Sydney Cataract subregion \((n=12)\). The subregional patterns outlined here are therefore less clear than would happen with selected sample areas in the centre of the two subregions or if the current mapping were refined to better reflect local intricacies of the geological transition.

As most of the sites registered in the AHIMS are found during investigations to inform development impact assessments, it should be noted that the distribution and significant numbers of previously documented sites within the Cumberland subregion almost certainly reflects some form of bias towards areas that have been subject to greater investigation due to proposed resource extraction activities. The inaccessibility of parts of the Sydney Cataract subregion within the GMIA is probably also a factor in the under-representation of previously documented sites in these areas.

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\(^5\) Some sites have multiple archaeological features, and hence the total presented is greater than the number of sites \((356)\) registered on the AHIMS database.
5 GAP ANALYSIS

This section provides a gap analysis of the Aboriginal and historical heritage for the GMIA. It includes sections that summarise what we know about the distribution of heritage items, sites and zones of potential sensitivity within the study area, highlights areas of high heritage risk, and areas where no investigation has previously occurred. This analysis is supported by the development on an archaeological predictive model, which serves to identify, locate and map where archaeological resources are likely to survive. Such models can apply to small single sites or large areas, and can be simple exercises or enhanced by the use of specially designed GIS based spatial models. The following section provides a summary of the predictive model created for the GMIA. Further details regarding the background, development, testing and limitations of the model is presented in Appendix 6.

5.1 Predictive Model

Archaeological predictive models identify, locate and map where archaeological resources are likely to survive. They can apply to small single sites or large areas, and can be simple exercises or enhanced by the use of specially designed GIS based spatial models.

This section provides a summary of the predictive model created for the GMIA. Further details regarding the background, development, testing and limitations of the model is presented in Appendix 6.

The final Aboriginal and historical archaeological models for the GMIA are shown in Figures 9 and 10. The predictive model for historic heritage is based on the likelihood of archaeological material occurring in the vicinity of built heritage and areas of known historic activity.

The final predictive model relating to Aboriginal heritage has been developed using a series of ‘environmental’ and ‘archaeological’ variables to predict the archaeological potential across the subject area. The outcomes of preliminary workshops with Aboriginal people also revealed some areas of high sensitivity that have been integrated into the model (see white bounded areas in Figure 9). Appendix 6 provides more detailed information on the specific variables that needed to be present to classify an archaeological probability ranking for any given area. Existing disturbance also played a role. In contrast, areas identified as of very low archaeological classification were considered areas that did not retain any of those variables. The model identifies that 76.4% of known sites are located in high or moderate zones, which in total make up about 55% of the study area (Table 7).

### Table 7. Percentage and area (km) of GMIA within each area of Aboriginal heritage potential

<table>
<thead>
<tr>
<th>Ranking</th>
<th># of sites</th>
<th>% of sites</th>
<th>Area (km²)</th>
<th>% of area</th>
<th>Ratio of % of sites to % of area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very low</td>
<td>37</td>
<td>10.4</td>
<td>32.8</td>
<td>20.6</td>
<td>1 : 2</td>
</tr>
<tr>
<td>Low</td>
<td>47</td>
<td>13.2</td>
<td>38.8</td>
<td>24.3</td>
<td>1 : 1.8</td>
</tr>
<tr>
<td>Moderate</td>
<td>132</td>
<td>37.1</td>
<td>58.3</td>
<td>36.5</td>
<td>1 : 1</td>
</tr>
<tr>
<td>High</td>
<td>140</td>
<td>39.3</td>
<td>29.7</td>
<td>18.6</td>
<td>1 : 0.5</td>
</tr>
<tr>
<td>(Total)</td>
<td>356</td>
<td>100.0</td>
<td>159.6</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Figure 8. Open and closed Aboriginal sites based on the AHIMS database.
Figure 9. Composite predictive model of Aboriginal archaeological sensitivity for the GMIA places identified through community workshops have been incorporated (outlined in white) The development and testing of this model is outlined in Appendix 6.
Figure 10. Composite predictive model of historical archaeological sensitivity for the GMIA (see RARDMS for higher resolution maps).
5.2 Summary of the Findings

The area formed part of the early agricultural expansion outside the immediate area of the early colony of Sydney. The majority of the better soils in the area were settled by Macarthur at Camden Farm (part of which lies within the study area) and large pastoral estates were also established throughout the Appin, Menangle and Douglas Park areas, at Mount Gilead, Glenlee, Glen Lorne, Beulah, and Meadowvale. The agricultural/pastoral mix of the area changed over the course of the 19th century but the rural nature was largely maintained until the post-WW2 period. Only two townships within the study area provided commercial and service hubs for this landscape - Appin and Menangle.

There are no listings on the WHL, NHL or CHL within the study area.

The SHR, LEP, RNE, SHI and National Trust listings for the study area reflect the rural environment. Many of the listings relate to large and small scale agricultural/pastoral establishments. Other items listed relate to transport, religious institutions and water and other infrastructure or services. However, in several cases the listings have been too narrowly defined delineating only extant structures and inadequately considering their place in the cultural landscape and/or their potential archaeology. This is particularly evident around Mt Gilead where only the immediate structures are protected and other historic features, their setting, views and potential archaeology are all inadequately protected by the listed areas (see item 10 in Figure 10).

Environmentally, the GMIA is dominated by the Cumberland Plain subregion and has several key waterways, including the Nepean, Cataract and Georges rivers. It has potential for significant cultural sites along these waterways, akin to those found elsewhere along Second Ponds Creek, Eastern Creek, South Creek and Kemps Creek. There is potential for rock shelters with art and or deposit and axe grinding grooves where exposed sandstone occurs along these waterways. To the south and east, the Sydney Cataract subregion is dominated by dissecting sandstone and has potential for rock shelters, engravings and grinding grooves.

The ethnographic database compiled by AHMS, notes several instances of early interactions between Aborigines and Europeans around Menangle and Menangle Park. This area was formerly a well-used series of swamps and waterways, and is likely to have formed a focus of activity and occupation in the past. It has remained largely unmodified since European arrival.

Known Aboriginal sites (recorded on AHIMS – see Figure 8) are clustered consistent with the limited compliance-based archaeological investigations that have occurred, but their distribution also suggests some other patterns. Specifically, the Cumberland Plain subregion, encompassing much of the study area, is dominated by surface and sub-surface artefactual material generally found within 200m of the larger river systems within the region. Distances of sites up to 500m away are documented, but remain relatively few. This part of the Cumberland Plain is well watered and has more sandstone outcrops that some other parts of the Cumberland Plain so a higher proportion of rock shelters and axe grinding grooves are likely. Along the eastern margins, within the Sydney Cataract subregion, rock shelters and other closed sites dominate, and they are located along creek lines where the sandstone geology has been incised to form suitable features.

Based on a review of heritage studies, and the archaeological predictive modelling (see Sections 5.1 and Figure 9), there is high potential for Aboriginal objects/site to occur along the banks of the Nepean, Cataract and Georges Rivers, and Allens, Elladale, Clemens, Cascade, Wallandoola creeks. The Georges River, Allens Creek, Elladale Creek and headwaters of the Cataract River (including Wallandoola Creek) reveal the highest potential for significant cultural material, primarily due to
frequent elevations along these corridors and a general absence of development. Recent excavations by AHMS along Georges River have demonstrated deeply stratified and old (>20ka) cultural materials on an elevated ridgeline at Moorebank, and it is considered more would be found along other parts of the river system. Conversely, large areas of the Nepean River are highly flood prone, and while Aboriginal people would have carried out activities along the river, thereby creating what archaeologists record as ‘sites’, there is a lower likelihood that such sites would be preserved due to the history of flooding the exception would be rock shelters high in the cliff-like banks of the Nepean where it cuts through sandstone bedrock to form gorges.

Aboriginal consultation has been undertaken and a cultural mapping exercise undertaken with a selection of stakeholders - six areas of cultural value were identified. These include subsistence activities and seasonal family gatherings along the lagoons and creeks around Menangle, a story place, and a massacre event southwest of Appin. A number of other areas of observed site abundance and diversity were also identified in other parts of the GMIA near Gilead, Menangle Park, Bingara Gorge and Elladale Creek. It is recommended that measures to protect the Aboriginal Story Place from future development be undertaken such as adding a caveat to the land title documents. It is also recommended that further historical research be undertaken in relation to the massacre site with a view to clarifying provenance and curtilage to enable long term protection and possibly interpretation of the site.

5.3 Key constraints

The following section highlights areas and issues that are likely to operate as constraints to future development. That is not to say that development would not be feasible, but rather that significant further investigation, mitigation measures and conservation are likely to be required. While the word ‘constraint’ is used here when considering development and housing yield, it is worth noting that this rich heritage and the number of surviving heritage buildings also provides rich opportunities to define and market the unique character and history of the area.

- The key constraint to development posed by the historical heritage is the presence of eight items on the SHR which are of State Heritage Significance. These include Glenlee, Sugarloaf Farm (Mt Huon), Beulah, the Menangle Rail Bridge, Menangle Railway Station, the Upper Canal System, Windmill Hill (North Farm), and Wilton Park. Development within the curtilages of these sites is restricted subject to review by the NSW Heritage Council. Camden Park Estate and Belgenny Farm is another State Heritage listed item that is immediately adjacent to the study area. Development adjacent to these items would also be subject to review should it be determined that view lines, significant corridors or extended curtilages and /or associated archaeological deposits were at risk.

- An additional heritage constraint compounded by uncertainty at this point is the identification of a number of locally listed items (LEP) that have been assessed in this study as potentially being of State heritage significance. These include Glen Lorne, Mount Gilead, Meadowvale, and St Mary’s Towers (Parkhall). Development within the curtilages of these sites may be restricted subject to review by the NSW Heritage Council, while development adjacent to these items may also be subject to review should it be determined that view lines, significant corridors or extended curtilages were at risk. Further heritage assessment would be required to determine the significance and curtilage boundaries of these potential SHR sites.

- In particular, the complex comprising Beulah, Meadowvale and Mt Gilead (items 12, 14 and 10, respectively, in Figure 10) is significant and imminently threatened. The removal of Meadowvale from LEP (2015) for unknown reasons despite its observed heritage significance raises the potential for development to not only impact the property but also to affect the rural setting of Beulah (currently owned by Sydney Living Museums). The current LEP listing for Mt Gilead did not include all extant heritage features and ignores its cultural landscape setting.

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• A number of local heritage items have been identified across the GMIA on the LEP, RNE and National Trust registers and, whilst numerous, they form less of a constraint to future development. Development within or in close proximity of these items may be permissible following approval and mitigation.

• From an historic archaeological perspective, the as yet undefined potential historic archaeological resource (subsurface archaeological deposits) also presents a significant constraint. Areas of this region were settled from an early period and the potential for as yet undiscovered early settlement sites, similar to the one recently excavated at Belgenny, is high. The history of the area is entwined with key historic figures (i.e., the Macarthur family) and it is possible that archaeological investigations may contribute further to an understanding of the activities of such figures and the significance of some listed sites. The cost and time impacts of piecemeal archaeological discovery and excavation are a potential constraint on effective development of the area. Once again this supports the value of a regional archaeological framework to guide and integrate further archaeological research in the GMIA.

• Based on a desktop review of listed heritage places and limited site inspections areas of high historic heritage conservation value have been identified and are shown in Figure 11.

• From an Aboriginal archaeological perspective, areas within 200m of any waterway are likely to contain extensive and/or significant cultural material. This is especially the case along the Nepean and Georges Rivers and Allens, Elladale, Clemens, Cascade, Wallandoola, and Ousedale creeks. It is likely that in some instances, these areas of archaeological importance may extend up to 500m from the creek edge.

• The east and southern margins (and many of the main creek corridors) of the GMIA are in geology and soil landscapes conducive to the presence of rock shelters, engravings and grinding grooves. These types of sites are often of scientific and cultural significance and, because of this, destruction via an AHIP may not be appropriate. Depending on the nature and significance of the site, they may require management if they become more accessible to the general public through the development. Conversely, the presence of such sites if managed and interpreted in open space areas can add to the amenity and enjoyment of residents.

• There are two sites that were identified as ‘burial’ or ‘restricted information’ situated in the Appin area.. Development in the vicinity of burial sites would be restricted and require adequate site protection measures to be in place.

• Several sites of cultural importance to Aboriginal people were identified through the preliminary cultural values workshop. These were located around Menangle and southwest of Appin. Further investigation of these sites would be necessary to refine their boundaries (see Section 4.1). Several of these such as the massacre site and the story place are likely to warrant long term protection.

• Riparian and swampy areas along the Nepean River in the vicinity of Menangle have been documented as being used extensively by Aboriginal people in the past. Few assessments have been undertaken in these areas (primarily desktop), with little evidence of cultural material to date. It is considered that these areas have high risk of significant material being present and may form a constraint to future development.

5.4 Areas where research has yet to occur

There are a number of gaps in both geographic coverage of past studies and in the information available for this gap analysis. Further work is needed in relation to the GMIA as indicated below.

This study reviewed the range of Aboriginal and historic heritage reports made available to the consultants by OEH, DPE and the two relevant councils - further information may emerge over time.
Both Wollondilly and Campbelltown LGAs have been subject to initial heritage studies and subsequent reviews. The detailed inventory sheets of items identified in the Wollondilly Heritage Study (Oehm 2006) remains unavailable. Both the Campbelltown and Wollondilly heritage studies establish and highlight local historic themes relevant to their respective LGAs. While they address the built heritage aspects, neither adequately address archaeological sensitivity. Some archaeological sites are noted in the Wollondilly LEP but none, specifically, in the Campbelltown LEP.

The archaeological assessment of the individual heritage places listed in the LEPs extends beyond the scope of the Gap Analysis. A more detailed field survey/analysis would be needed to determine accurate locations, significance and potential survival of archaeological remains that would be covered by the Heritage Act 1977. Any historic archaeological assessments undertaken in these LGAs have primarily been focussed on specific impacts and developments related to existing allotments/cadastral boundaries. On this selective basis the reports do not provide a broad regional picture of the archaeological potential of the study area.

The majority of studies have been focussed towards the north of the GMIA. Further, assessments carried out prior to 2010 may not conform to current guidelines.

Several parts of the study area have yet to undergo any Aboriginal heritage investigation, including along the Cataract River between Brooks Point and Douglas Park, and south and west of Appin. The periphery of the GMIA (i.e., around Maldon, the Dharawal State Recreation area, and near the Cordeaux River) do not appear to have been investigated. Several of these areas are predicted to contain extensive and/or significant cultural material.

Previous Aboriginal heritage assessments have had limited field investigation, such as focussing on a handful of gas wells within a much wider area, and for this reason most areas in the vicinity of the GMIA would require some level of re-investigation.

It is recommended that an integrated Aboriginal and historical archaeological strategy be developed for the GMIA – a Regional Archaeological Research Design and Management Strategy (RARDMS). This would serve as an holistic framework for future archaeological investigation in the region. The RARDMS is envisaged as in a similar manner and scale to the Parramatta Historical Archaeological Landscape Management Survey (PHALMS http://sydney.edu.au/arts/timemap/examples/PHALMS.shtml) combined with the Parramatta City Council Aboriginal Heritage layer. The RARDMS would provide a better understanding of areas where potential archaeology might be a constraint at a regional level, address archaeological issues for a broad scope approach to statutory requirements in relation to archaeology and therefore provide a greater degree of certainty in regard to development options. The RARDMS recommendations may range from in situ conservation of sites (excluding particular locations from development completely), to archaeological management and mitigation that may include formal excavation, monitoring, salvage or archaeological testing. The RARDMS may also define curtilages associated with potential sites.

The PHALMS project, which might provide the basis for the regional study approach, divided the Parramatta LGA into a number of archaeological management units (AMU) based on current cadastral boundaries. Each AMU’s historical background was outlined, the degree of disturbance identified and assessed by ground survey, and archaeological potential and significance assessed on this basis. Each AMU was then assigned management recommendations ranging from low potential/low significance – no further action required - to high potential/high significance, for which archaeological assessment of areas subject to disturbance through development should be undertaken.

Similarly the Parramatta City Council has an Aboriginal predictive model layer that is used to assist in a range of planning contexts. This proposal goes beyond these to include an more holistic overview of
the area covering both prehistory and history, and identifying the key research questions and directions for the GMIA to ensure that future archaeological investigations enhance our understanding and contribute to a regional heritage legacy.
Figure 11. Historic heritage areas recommended for permanent conservation (excluded from development impact and actively managed).
6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Report Summary

Based on the review undertaken it is clear that Aboriginal and historic heritage investigation in the GMIA to date has been limited in both geographic coverage and scope. Many of these studies have been for exploratory works (such as gas wells, or coal seams) and are therefore dominated by desktop research, with only minimal field investigation. Further, many reports are quite dated, and fail to conform to current guidelines. Where comprehensive investigations have occurred, both Aboriginal sites and, in some cases, historic sites, have been discovered and many have demonstrated archaeological potential. It is therefore likely that any future planning and development would need to incorporate heritage investigation from a very early stage.

The key areas of constraint are highlighted in Section 3. It is likely that extensive and/or significant Aboriginal sites would be prevalent along the large river systems and their riparian corridors throughout the GMIA. Based on modelling, key areas appear to be the Georges River and many of the tributaries of the Nepean River in the southern parts of the study area. In areas where the river banks are steepest and consist of sandstone gorges, Aboriginal sites are likely to cluster around the upper reaches of tributaries where sandstone shelters begin to form. The northern part of the study area appears to have been more heavily impacted by urban spread so Aboriginal sites may be less likely to have survived intact. It is generally more swampy and low-lying, such as around Menangle. It must be noted, however, that the Menangle area was used and occupied by Aboriginal people as observed by explorers at European contact and Aboriginal activity continues through particular families as indicated in the cultural values workshop. Areas of high potential to contain significant Aboriginal sites have been modelled and mapped (see Figure 9) and it has been shown that there is a high correlation between the model and recent survey results (see Figure 8). These areas shaded red (including several areas identified by the Aboriginal community as having high cultural significance) should be considered where possible for permanent conservation. A positive example of where this has happened recently is the Aboriginal rock shelters site in Lendlease’s Bingara Gorge development, now been incorporated into the LEP (Kayandel 2015).

Historic heritage studies and listing exercises have largely focussed on remaining historic structures and these have often been listed (or not) based solely on a consideration of extant structural remains without regard to their cultural landscape setting or associated archaeological deposits. Problems with the lack of comprehensiveness of the LEPs in the area pose potential risks to heritage outcomes, including lessening opportunities for archaeological investigation and adaptive re-use, and presenting uncertainty for developers.

Following a review of existing information plus some limited site visits to clarify issues around some of the historic places, areas of high conservation value have been identified (see Figure 11). These areas should be seen as minimum conservation areas for historic heritage in the GMIA and decisions to protect them made now to reduce uncertainty. This map should be read also in conjunction with the archaeological zoning map in the RARDMS that identifies a much larger area of archaeological potential that should be investigated before development. Subject to findings in future investigations, it is always possible that additional areas of state and local significance could be identified.

Notwithstanding the above constraints and limitations, there appear opportunities for development which may have minimal impact on cultural heritage values, especially in areas between Douglas...
Park and Menangle along the Nepean River; in the vicinity of Gilead; south and west of Appin, and surrounding Wilton.

6.2 Future Direction

Based on the analysis herein, further site specific assessment would be required to facilitate development of the area. While this report provides most of the background and a good foundation for the precincts, there is further need for Aboriginal consultation, and more detailed assessment with a focus on on-site investigation. This should at the very least include surface survey, but ideally sub-surface investigation of the extent of archaeological deposits, which are known to be widespread, significant and focussed on creek lines in this region. The development of a regional archaeological framework and research methodology would guide individual assessments, reduce duplication and ensure that the end results contribute in a meaningful way to our understanding of the Aboriginal heritage of the study area.

The archaeology of the GMIA is still relatively poorly understood, and on-site works are likely to be an essential pre-requisite of OEH’s prior to determining any AHIPs. It is considered likely that such permits would be required for parts of the GMIA prior to development. It is recommended that close liaison between DPE and OEH in the development of the RARDMS will help ensure that there is a clear understanding of the level of assessment that is required within the GMIA to allow re-zoning, and subsequent approvals. This is discussed further below.

This review suggests the majority of Aboriginal heritage is likely to be in close proximity to major water courses, and often within riparian corridors unlikely to be developed. Notable exceptions include areas identified as cultural values in the vicinity of Menangle and southwest of Appin. From an historical heritage perspective, listings are generally focussed around existing towns, and large rural properties and development through the Menangle, Wilton and Appin areas are likely to require consideration of this. Based on this review, it appears that areas west and south of Douglas Park and between Gilead and Appin have the least Aboriginal heritage issues. Conversely, areas in the vicinity of Menangle, Menangle Park, Appin and Wilton, are all likely to have far greater requirements to address Aboriginal and historic heritage.

It is recommended that prior to the wide-scale assessment of the GMIA, or any proposed re-zoning options that the following tasks are implemented to identify and manage significant heritage places:

1. Preparation of an integrated Aboriginal and historical regional archaeological research design and management strategy (RARDMS) to serve as an holistic framework for future archaeological investigation in the GMIA.
2. Further historical investigation of Appin, Wilton and Menangle is required to determine structures, places and areas of value, and any constraints that may be placed upon development in their vicinity. Based on the listings, each of these locations contains a number of historical items, information about which has been collected piecemeal with no dedicated study of the towns. A more structured and focussed study is required to provide a ‘town’ wide plan for any future development to ensure retention and management of structures or groups of structures of key heritage value. As an indication of lead time, it is considered that such investigations would take 3-4 months.
3. Further investigation should be conducted of areas of cultural value (identified through the preliminary Aboriginal cultural values workshop) through a combination of historical research, ongoing Aboriginal consultation and site investigation. This will help to further define the boundaries of these areas, and establish appropriate management strategies (estimated timeframe is 6-12 months).
4. Investigation of previously uninvestigated areas consistent with the proposed regional Aboriginal and archaeological RARDMS is recommended. These areas include those in the vicinity of Appin, west of Bingara Gorge, and south of Douglas Park.

6.3 Approval Process

6.3.1 Aboriginal Heritage

In relation to future large scale development of the GMIA, there are a number of legislative mechanisms and requirements that need to be considered. The most notable is the requirement for AHIPs to allow for the destruction of Aboriginal objects in accordance with the National Parks and Wildlife Act 1974 prior to development. Securing an AHIP is subject to the appropriate Aboriginal archaeological and cultural investigations with a specified consultation process. This can involve significant time frames that contribute to the time needed to re-zone and release priority growth areas.

AHIPs are generally obtained by the individual property developers following the precinct release. This may delay the on-selling of land, and introduces inefficiencies with OEH needing to assess multiple applications often for adjacent properties. This was a key issue raised in AHMS' review of the DPE processes in 2013 (AHMS, 2013b), and has yet to be adequately resolved. As part of the current project, AHMS has explored legislative and approval pathways relating to this issue.

The initial stages of this analysis indicates that there are five key issues that need to be considered with the existing AHIP process as required by OEH to assist in stream-lining development:

1. The amount of information that OEH requires to determine the extent of potential impacts to Aboriginal heritage, and whether the precinct-wide studies currently undertaken can achieve this.
2. The need for access to individually owned properties to carry out assessments to obtain an AHIP. In some cases the precincts can include several hundred individual landowners.
3. Currently OEH requires that landowners consent to AHIP applications although we note that there is no legislative or regulatory requirement that the landowner provide consent.
4. The AHIP is connected to the applicant not the land Therefore, unless DPE is undertaking the development, it would still result in administrative requirements and time-delays to change the AHIP holder when the land is passed on (it is also unclear how many applicants can be included on an AHIP). However, we note that the transfer of an AHIP from one landowner to another is not as difficult after the 2010 amendments to the legislation. Section 90R of the National Parks and Wildlife Act 1974 expressly provides for some AHIPs to run with the land.
5. OEH policy is, in general, not to grant an AHIP application until a formal development approval is obtained, although in some instances indicative layout plans have been considered adequate. The chances of such approval being granted at this early stage appears to be increased where provision is made for early identification of permanent protection zones comprised of areas of high potential/ high Aboriginal heritage conservation value.

Our initial investigation suggests that the applicant should work closely with OEH. This will ensure that OEH can clearly qualify and quantify what is required in the broader planning context, so that requirements are consistent with the legislation and regulations. Should our recommendation for a RARDMS be adopted and OEH endorse this approach then some of the requirements will be streamlined and timeframes reduced.
An alternative to applying for AHIPs is the declaration of parts or all of the works under Part 4, Division 4.1 (State Significant Development) or Part 5: Division 5.1 (State Significant Infrastructure or Critical State Significant Infrastructure) of the Environmental Planning and Assessment Act 1979. For State significant development and State significant infrastructure the provisions of the National Parks and Wildlife Act 1974 do not apply and there is no requirement for AHIPs. Dependent on the specific Secretary Environmental Assessment Requirements (SEARs) relating to the project, this may require less upfront archaeological field investigation but with subsequent stages of heritage investigation, salvage and interpretation as the project develops. The benefit of this process in terms of cultural heritage outcomes may be variable.

The declaration of an area as State Significant Infrastructure, or critical state infrastructure may be suitable for the necessary government infrastructure, which is often in similar locations and has been spatially constrained through the Structure Plans. Part 5.1 also removes the need for landowner consent, when the proponent is a public authority, which for infrastructure corridors, is often the NSW Government.

There are other options potentially requiring legislative or regulatory amendments. A few examples include:

- The development of heritage offsets, similar to the now well-established biodiversity certification, whereby priority growth areas are allowed large-scale destruction of Aboriginal heritage, as long as comparable areas of value are retained.

- The inclusion in primary legislation of the right to access private property for cultural heritage investigations.

- Modifications to the National Parks and Wildlife Regulations 2010 and/or OEH guidelines to revisit the requirements of an AHIP. Such changes may include:
  - the ability to have applicants added to the AHIP
  - the development of a staged AHIP, which provides over-arching approval for impact based on precinct wide studies, with subsequent work to refine any findings as the development progresses.

### 6.3.2 Approval Process for Historic Heritage

The process for historic heritage approvals is clear in relation to items on the SHR and local government LEPs. However, the provisions relating to archaeological heritage and undiscovered or unlisted heritage places of potential state and local significance is less well understood by developers. The current heritage system works on the general premise that local government wide heritage assessments will have been comprehensively completed for LGAs and that these, combined with the s170 Registers of government departments and statutory authorities, will give rise to comprehensive and robust heritage LEPs. This is meant not only to ensure adequate protection of the historic heritage of NSW, but also to reduce the unknowns for developers, landowners and managers. All such items require assessment and protection as a part of the development process. However, as outlined previously in this report, some examples within the GMIA raise questions about the comprehensiveness of the current LEPs.

The current council planning tools in relation to historical heritage do not adequately cover the potential for archaeological sites. Under the Heritage Act 1977 (NSW) protection extends to ‘certain relics (Division 9 clauses 136-146c). Section 19 provides that:
(1) A person must not disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit.

(2) A person must not disturb or excavate any land on which the person has discovered or exposed a relic except in accordance with an excavation permit.

Discovery of relics midway through a development can give rise to delays so it is prudent to understand the potential for archaeological relics and deposits in the early acquisition and assessment phases of a project. A relic is defined under the Act:

"relic“ means 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.

In order to assist developers to understand the likelihood of relics existing and to assist councils in determining development application conditions in relation to historical archaeology, it is strongly advised that preliminary archaeological zoning is prepared using current knowledge of the heritage resource of the area to categorise land according to its potential to contain archaeological relics and deposits. Such an archaeological zoning plan can be developed through a comprehensive study, or where available funds are limited, incrementally adopting a precautionary approach that can be more accurately defined as results begin emerging from project level investigations.

6.4 Recommendations

In relation to the efficient development of the GMIA and the adequate management of its Aboriginal and historic heritage resources, the following recommendations are made to adequately address cultural heritage concerns.

- Consultation with the Aboriginal community should be maintained and opportunities provided to build on the cultural values layer.
- Areas which have been identified by the Aboriginal community should form the focus of subsequent research to ensure they are managed appropriately in any future development context.
- Areas identified as having high archaeological sensitivity in Figure 9 should be considered for inclusion in permanent conservation areas.
- Areas identified as having high conservation value in Figure 11 should be set aside from development and permanently conserved. Further it is recommended that these areas be added to the LEP (with expanded curtilages where indicated) and that appropriate caveats on land title are created to ensure that future owners are aware of heritage interests.
- Further investigation of previous studies and databases, and the development of new assessments should be undertaken on individual locations or precincts when they are proposed for planning and development. This process could be streamlined through development of an integrated RARDMS.
- Tasks 1 through 4 identified in Section 6.2 should be implemented at least 6-12 months prior to the overall re-zoning program for the precincts.
- DPE contact the relevant State Government agencies to request data (S170 registers) to assist future planning and development. This data should be integrated into the project mapping during later phases of this project.
A regional cultural heritage framework should be developed to guide and optimise future investigations. Such an integrated RARDMS should, therefore, be completed for the development precincts covering both Aboriginal and historical archaeological heritage. This would serve as an holistic framework for future archaeological investigation in the GMIA. All future Aboriginal and historic heritage assessments in the area should be consistent with, and feed into that framework, maximising opportunities to create knowledge of value to the Aboriginal and broader community and facilitating more efficient assessment and management of the heritage resource.
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