YARRAMUNDI RESERVE.

ARCHAEOLOGICAL & CULTURAL HERITAGE ASSESSMENT.

FOR HAWKESBURY CITY COUNCIL.

George William Evans 1809 'View of part of Hawkesbury River at first fall and connection with Grose River, N.S. Wales 1809'. The view looking west depicts Yarramundi Reserve during the early 19th Century.

By Jim Wheeler.

AHMS

ARCHAEOLOGICAL & HERITAGE MANAGEMENT SOLUTIONS PTY LTD

349 Annandale Street
Annandale NSW 2038
T: 02 9555 4000
F: 02 9555 7005

E: info@arksolutions.com.au
ABN 45 088 058 388
ACN 088 058 388

CONTENTS

Contents 1
Abbreviations 6
1 Introduction 8
1.1 Preamble 8
1.2 Site identification 8
1.3 Reason for the current study 10
1.4 Statutory controls 10
1.4.1 Statutory protection 10
1.4.2 National Parks & Wildlife Act 1974 10
1.4.3 The Heritage Act 1977 (amended 1998) 12
1.4.4 Environmental Planning and Assessment Act 1979 13
1.4.5 Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Commonwealth) 14
1.4.6 Environmental Protection & Biodiversity Conservation Act 1999 (Commonwealth) 14
1.5 Project aims and objectives 15
1.5.1 Research 16
1.5.2 Community Consultation 16
1.5.3 Field survey 17
1.5.4 Significance Assessment 17
1.5.5 Management Opportunities with the local Aboriginal Community 17
1.5.6 Reporting 17
1.6 Report Outline 18
1.7 Authorship 19
1.8 Acknowledgements 19
2 Environmental context 20
2.1 Background 20
2.2 Landscape Characteristics 20

2.3 Soils and Geology 20

2.4 Vegetation 21

2.5 Landscape Modification 22

3 Aboriginal & European History 26

3.1 Preamble 26

3.2 The Traditional Owners 26

3.2.1 The Darug Language 26

3.2.2 Clans 27

3.2.3 Tribes 27

3.3 Lifestyle of the Traditional Owners 28

3.3.1 The Hawkesbury – Nepean 29

3.3.2 Resources of the Land 32

3.3.3 Use of Trees 33

3.3.4 Woodland & Grassland 33

3.3.5 Swamps and Lagoons 36

3.3.6 Plant Management 37

3.4 Exploration and First Contact 38

3.5 Early Settlement & Frontier Relations 42

3.6 Aboriginal Life on the Hawkesbury-Nepean 44

3.6.1 Intensified Settlement 44

3.6.2 Further Conflict & Institutionalisation 47

3.6.3 Assimilation & Population Decline 49

3.7 Site Specific History 50

3.7.1 Methodology 50

3.7.2 Early Settlement 51

3.7.3 Notification of the Reserve 54

3.7.4 Sand & Gravel Extraction (1924 – 1990's) 55

3.7.5 Yarramundi Reserve 61

4 Archaeological Context 63

4.1 Regional Aboriginal Archaeological Context 63

4.1.1 General Background 63
4.1.2 Early Occupation 64
4.1.3 Intensification during the Holocene Period 65
4.1.4 Regional Site Patterns 66
4.1.5 Stone Artefacts 69
4.2 AHIMS search results 70
4.3 Local Archaeological Context 72
4.3.1 Cranebrook Terrace 1974 - 2000 72
4.3.2 Jamisons Creek 1977 - 1984 73
4.3.3 Lapstone Creek Salvage - 1977 74
4.3.4 Shaws Creek KII – 1979 - 1980 74
4.3.5 Regentville RS1 – 1994-1999 75
4.3.6 Rouse Hill Infrastructure Development 75
4.3.7 Blighton, Pitt Town – 2005 77
4.3.8 Springwood Road, Yarramundi – 2002 78
4.3.9 Agnes Banks Survey – 1984 79
4.3.10 Boral Extraction, Yarramundi – 1983 79
4.4 Predictive Modeling 80
4.4.1 Site Types 80
4.4.2 Aboriginal Site Predictions 81
4.5 Historical Archaeological Predictions 81
5 Survey 83
5.1 Survey Details 83
5.2 Survey Methodology 83
5.3 Survey Coverage 83
5.4 Survey Results 84
5.4.1 General Observations 84
5.4.2 Individual Items 87
5.4.2.1 Item 1 & 2 – Aboriginal sites 87
5.4.2.2 Item 3 & 4 – 1937 railway and bins 88

5.4.2.3 Item 5 - 1943 building 89
5.4.2.4 Item 6 - Ashton's Falls 89
5.4.2.5 Item 7 - Mill Race 89
5.4.2.6 Item 8 - Archaeological Potential 89
5.5 Conclusions 90
6 Aboriginal Community Consultation 92
6.1 Development of Consultation 92
6.2 Outcomes of Consultation 94
7 Significance Assessment 95
7.1 Aboriginal Heritage Significance Assessment 95
7.1.1 Basis for significance assessment 95
7.1.2 Aboriginal Cultural Significance 95
7.1.3 Public Significance 96
7.1.4 Scientific Significance 96
7.2 Historical Heritage Significance 97
7.2.1 Principles and evaluation criteria 97
7.2.2 Evaluation 99
8 Impact Assessment 100
8.1 Proposed Development 100
8.2 Impact Assessment 100
9 Interpretation 102
9.1 Preamble 102
9.2 Themes 102
9.3 Interpretation Options 103
9.3.1 Aboriginal life on the River 103
9.3.2 Early Exploration of the River 105
9.3.3 River as a Resource 107
10 Recommendations 109
10.1 Basis for Recommendations 109

10.2 **Aboriginal Consultation 109**

10.3 **Archaeological management 110**

References 112

Appendix 1 – 117

Aboriginal Community Correspondence 117

ABBREVIATIONS

AHC	**Australian Heritage Council**
AHIA	**Aboriginal Heritage Impact Assessment**
AHIMS	**Aboriginal Heritage Information Management System**
CHL	**Commonwealth Heritage List**
DECC	**Dept of Environment & Climate Change**
DEH	**Department of Environment and Heritage**
DoP	**Department of Planning**
EA	**Environmental Assessment**
EIA	**Environment Impact Assessment**
EIS	**Environmental Impact Statement**
EP&A	**Environmental Planning and Assessment**
EPBC	**Environment Protection and Biodiversity Conservation**
GSV	**Ground surface visibility**
ICOMOS	**International Council on Monuments and Sites**
LALC	**Local Aboriginal Land Council**
LEP	**Local Environmental Plan**
LGA	**Local Government Area**
MGA	**Map Grid of Australia – unless otherwise specified all coordinates are in MGA**
NHL	**National Heritage List**
NNTT	**National Native Title Tribunal**
NPWS	**National Parks and Wildlife Service (now part of DECC)**
REF	**Review of Environmental Factors**
REP	**Regional Environment Plan**

RNE	**Register of the National Estate**
SHI	**State Heritage Inventory**
SHR	**State Heritage Register**
SOHI	**Statement of Heritage Impact**
S.90	**Section 90 of the National Parks & Wildlife Act 1974**
S.87	**Section 87 of the National Parks & Wildlife Act 1974**
S.140	**Section 140 of the NSW Heritage Act 1977**
S.60	**Section 60 of the NSW Heritage Act 1977**

1 INTRODUCTION

1.1 Preamble

Hawkesbury City Council engaged *Archaeological and Heritage Management Solutions* (AHMS) *Pty Ltd* to undertake an archaeological and cultural heritage assessment of Yarramundi Reserve, Yarramundi, NSW. The assessment was commissioned to document and assess the cultural values of the Reserve and provide management strategies in advance of proposed landscaping and visitor upgrade works proposed by the draft Plan of Management for the Reserve[1].

1.2 Site identification

The subject land is located at the confluence of the Grose and Nepean Rivers, which form the start of the Hawkesbury River (Figure 1).

The study area lies to the west of Agnes Banks, south of Grosewold and north of the small township of Yarramundi. The Reserve straddles both sides of the Nepean River, although most of the land is located on the western side of the river.

Yarramundi Reserve was transferred to the Crown in 2002 with Hawkesbury City Council appointed as the Reserve Trust Manager. The Reserve covers an area of 78 hectares and is comprised of a lineal parcel of land and water (including the river bed). It is located wholly within the riparian corridor and comprises a diverse landscape of natural river and flood channels, former quarried lagoons and back-waters, steep river banks and gently sloping foreshores.

The reserve comprises Crown land parcels Lot 1 DP 1040789 (formerly Lot 190 DP 803295), Lot 3 DP 393015 (formerly Lot 191 DP 803295), Lots 188 – 189 inclusive DP 803295, Lot 90 DP 786549, Lots 57 and 293 DP 751660, and Part Lot 28 DP 752021 within the Parishes of Ham Common, County of Cumberland and Parishes of Castlereagh and Nepean, County of Cook.

[1] *Landarc 2004*

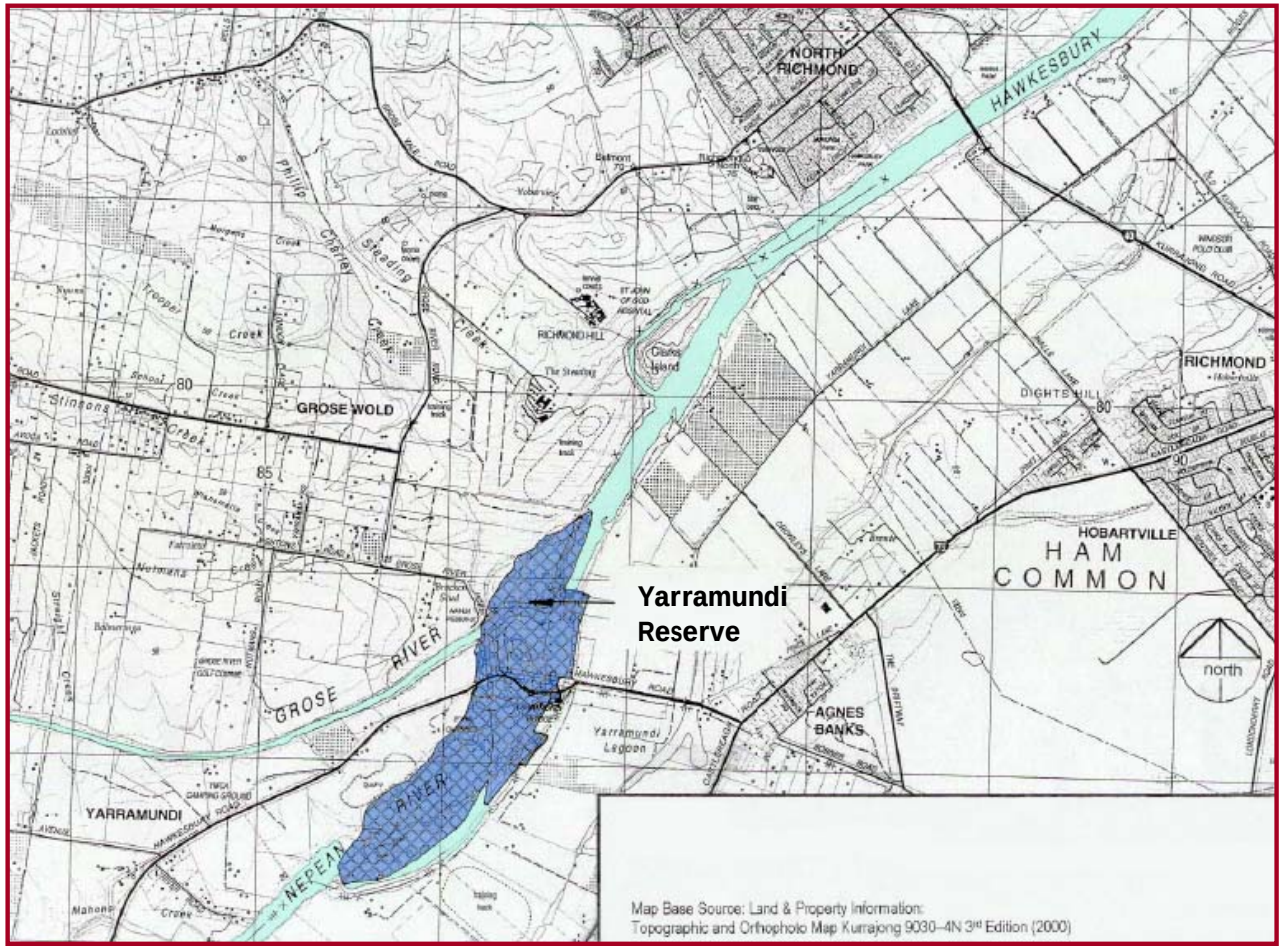

Figure 1. *Location Plan (Yarramundi Reserve is shaded dark blue).*

1.3 Reason for the current study

The purpose of the assessment is to develop procedures for management of Aboriginal and non-Indigenous archaeological sites and cultural heritage values within the Reserve. The assessment will augment Council's Plan of Management (POM) for the Reserve as a companion document specifically dealing with cultural heritage management.

The principal objectives are to identify known and potential threats to cultural heritage sites, objects and values within the Reserve, including landscaping and visitor facility upgrade and other works proposed by the POM (such as environmental re-generation, pedestrian trail construction and maintenance etc) and *ad hoc* impacts that may be associated with public use and access to the Reserve.

The assessment also aims to identify opportunities for future public interpretation and Aboriginal community involvement in managing the Reserve.

1.4 Statutory controls

1.4.1 Statutory protection

The *National Parks & Wildlife Act* (1974), the *NSW Heritage Act* (1977) and the *Environmental Planning and Assessment Act* (1979) provide the statutory tools for archaeological and cultural heritage management in New South Wales. The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* and the *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* also provide heritage protection at a Federal level. The implications of these statutes are outlined overleaf.

1.4.2 National Parks & Wildlife Act 1974

The provisions of the *NP & W Act (1974)* provide blanket protection for Aboriginal objects (material evidence of indigenous occupation) and Aboriginal places (areas of cultural significance to the Aboriginal community).

The following sections are particularly pertinent:

- Section 91 states that anyone who discovers an Aboriginal object is obliged to report the discovery to the DECC.
- Section 90 states that it is an offence to destroy, deface, damage or desecrate, or cause or permit the destruction, defacement, damage or desecration of, an Aboriginal object or Aboriginal place.
- Section 86 and 87 state that it is an offence to collect or disturb objects or excavate, or in any way disturb land for the purpose of discovering objects without a permit authorised by the Director-General DECC.
- Section 84 makes provision for protection of 'Aboriginal Places' or locations of special significance to Aboriginal culture.

In practical terms, the provisions of the Act require an archaeological assessment of any land where there is potential that Aboriginal sites or objects may be impacted by development. Aboriginal archaeological assessments are guided by the *NPWS Guidelines for Archaeological Survey and Reporting (1997)*. These guidelines require consultation with Aboriginal communities and relevant representative bodies such as Local Aboriginal Land Councils (LALCs) and Traditional Owner groups. This includes Aboriginal community participation in all archaeological survey and excavation work and consideration of the Aboriginal cultural significance of sites and places.

In accordance with *Section 90* of the *National Parks & Wildlife Act 1974*, all Aboriginal objects are protected and cannot be destroyed or disturbed without Consent under Section 90 of the *National Parks & Wildlife Act 1974* from DEC. Protection is provided irrespective of both the level of significance of the objects and issues of land tenure.

In 2004 DEC released *Interim Community Consultation Requirements for Applicants* that require a series of formal Aboriginal community consultation and notification procedures for sites that require applications under *Section 87* or *Section 90* of the *National Parks & Wildlife Act 1974*.

In summary, the following procedures are required:

1. Notification and Registration of Interests: The consultant must actively seek to identify stakeholder groups by:

(a) providing written notification to Local Aboriginal Land Council(s), Registrar of Aboriginal Owners, Native Title Services, Local Council(s), and DEC; and

(b) placing an advertisement in the local print media.

The closing date for registration of interest must allow at least 10 working days for groups to respond.

2. Preparation of the Assessment Methodology: The consultant must present and/or provide Registered Stakeholders with a proposed methodology for the assessment / testing methodology. The stakeholders must be allowed at least 21 days to review and provide feedback to the consultant.

3. Drafting, Review and Finalisation of the Assessment Report: Following completion of the survey a draft Aboriginal Heritage Impact Assessment (AHIA) report on the cultural and archaeological significance of the study area should be made available to all Registered Stakeholders and the Local Aboriginal Land Council for comment. After considering comments received, the consultant must then finalise the report and submit to DEC for consideration with their application.

1.4.3 The Heritage Act 1977 (amended 1998)

The *Heritage Act 1977* provides automatic statutory protection for 'relics'. The Act defines relics as:

> *'any deposit, object or material evidence relating to the settlement of the area that comprises NSW, not being an Aboriginal settlement, and which is 50 or more years old.'*

Sections 139 to *145* of the Act prevent the excavation or disturbance of land for the purpose of discovering, exposing or moving a relic, except by a qualified archaeologist to whom an excavation permit has been issued by the *Heritage*

Council of NSW. The protection is provided irrespective of either the level of significance of the objects or issues of land tenure.

In practical terms, the provisions of the Act require an archaeological assessment of any land where there is potential for historical archaeological relics to be disturbed by development. The required format of historical archaeological assessments is set out in the *Archaeological Assessment Guidelines (1996)*.

If the presence of significant relics is indicated by a site assessment, the NSW Heritage Office (delegated authority of the Heritage Council) generally requires archaeological test excavation of the site before development in order to:

- physically determine the nature, extent and significance of any such relics; and
- determine an appropriate strategy for their management during future development.

1.4.4 Environmental Planning and Assessment Act 1979

The *EP & A Act 1979* requires that environmental and heritage impacts are considered by consent authorities prior to granting development approvals. Under *Part IV* of the Act, specific approval from state agencies may be required in certain circumstances. This mechanism is known as an 'integrated development application' or IDA.

The DECC and NSW Heritage Office are approval bodies in the IDA process when a development will impact respectively on an Aboriginal object / place or an historical relic and thereby require Consent from DECC or NSW Heritage Office. In such circumstances, consent must be granted by DECC and/or NSW Heritage Office prior to a development being approved.

The provisions of the *EP & A Act 1979* are largely irrelevant to the current project as a development approval will not be required for the proposed works – Council is the proponent.

1.4.5 Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Commonwealth)

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* was enacted at a Federal level to preserve and protect areas (particularly sacred sites) and objects of particular significance to Aboriginal Australians from damage or desecration. Steps necessary for the protection of a threatened place are outlined in a gazetted *Ministerial Declaration (Sections 9 and 10).* This can include the prevention of development.

As well as providing protection to areas, it can also protect objects by *Declaration*, in particular Aboriginal skeletal remains (Section 12). Although this is a Federal Act, it can be invoked if a State is unwilling or unable to provide protection for such sites or objects.

There are no Aboriginal sites or places within the study area currently subject to a *Declaration*.

1.4.6 Environmental Protection & Biodiversity Conservation Act 1999 (Commonwealth)

The EPBC Act provides protection for natural and cultural heritage places at a Federal level. The Act established three heritage registers: World heritage, Commonwealth heritage and National heritage. World heritage items are those listed for outstanding international heritage values. National heritage items are assessed as having natural or cultural significance at a national level. The World and National lists may include items on private or State crown land. The Commonwealth list only includes items on land owned by the Commonwealth.

Items on the registers described above are protected under the terms of the EPBC Act. The Act requires approval before any action takes place which has, will have, or is likely to have, a significant impact on the heritage values of a listed place. Proposals for actions which could affect such values are rigorously assessed. The EPBC Act is administered by the Australian Heritage Council.

There are no items within the study area currently listed as items of National or World heritage.

1.5 Project aims and objectives

Specific aims of the study were as follows:

- Identify, record and assess Aboriginal and non-Aboriginal heritage sites and areas of potential archaeological deposit (PAD) within Yarramundi Reserve and determine their significance in consultation with relevant Aboriginal community organisations;
- Establish a register of Aboriginal Stakeholder Groups by following the first step of the Department of Environment and Climate Change (DECC) *Interim Community Consultation Requirements (2004);*
- Assess the impact of current and future recreational uses of the Reserve on identified heritage items and recognize potential opportunities and constraints for the improvement of facilities;
- Apply general principles & policies of heritage management to develop clear, concise management strategies to conserve the Reserve's heritage sites and mitigate current and future impacts on their heritage values; and
- Investigate opportunities for local Aboriginal involvement in a management role, including cross-cultural training, visitor management and interpretation of the Aboriginal heritage values of the Reserve.

The assessment was undertaken in accordance with the:

- Legislative requirements of the *NSW National Parks and Wildlife Act* (1974), *NSW Heritage Act (1977)* and relevant Federal legislation cited above;
- Procedures for Aboriginal heritage assessments and management outlined in the Aboriginal Cultural Heritage Standards and Guidelines Kit *(National Parks and Wildlife Service, 1997)*;
- Procedures for historical archaeological assessments outlined in the NSW Heritage Office Manual 1996; and

- Australia ICOMOS 'Burra' Charter for the conservation of culturally significant places and associated guidelines regarding significance assessment, conservation policy and processes.

The assessment required completion of the following tasks:

1.5.1 Research

- Review of previous archaeological investigations and studies carried out in the Yarramundi area;
- A search of the DECC *Aboriginal Heritage Information Management System* (AHIMS) in order to determine the type and distribution of Aboriginal sites that have been recorded in the vicinity of the study area;
- Preparation of a predictive model of the "archaeological potential" of the study area, including prediction of the potential for unrecorded Aboriginal sites to occur within the study area; and
- Review of existing heritage studies and historic source material (including maps, plans and texts showing and/or discussing past historical use of the site) to prepare a brief history of Yarramundi Reserve and to identify any evidence of past historical occupation and any other heritage values pertaining to the land.

1.5.2 Community Consultation

- Undertake the first stage of the Department of Environment and Climate Change (DECC) Interim Community Consultation Requirements (2004) to establish a register of Aboriginal Stakeholder Groups interested in future management of the Reserve. Groups who register their interest will then be consulted with about the project and will be asked to comment on the draft assessment report.
- Consult with the registered Aboriginal stakeholders to determine the cultural significance of the area; and
- Liaise with the Hawkesbury Historical Society to obtain any information about historic sites or values within the Reserve.

1.5.3 Field survey

- Record Aboriginal sites or Historical relics within the Reserve;
- Identify any areas that have archaeological potential based on the results of field survey, predictive modelling and previous investigations in the area;
- Assess the potential for buried sub-surface Aboriginal and/or historical archaeological deposits within the area; and
- Determine the degree to which previous development and landscape modification has disturbed original soils, and assess its implications for preservation of archaeological deposits.

1.5.4 Significance Assessment

- Assess the cultural significance of any historical archaeological relics or deposits with potential to contain relics; and
- Assess the scientific, public and Aboriginal (cultural) heritage significance of any Aboriginal sites, objects or places.

1.5.5 Management Opportunities with the local Aboriginal Community

- Undertake preliminary consultation with representatives of the Deerubbin Local Aboriginal Land Council, Darug Tribal Aboriginal Corporation and Darug Custodian Aboriginal Corporation and any other stakeholders identified by the notification procedures; and
- Discuss opportunities for local Aboriginal involvement with the management of Yarramundi Reserve. Each of the registered Stakeholders were asked to provide their written advice regarding cross-cultural training, visitor management and interpretation of Aboriginal heritage values of the Reserve.

1.5.6 Reporting

- Preparation of an assessment report for Hawkesbury City Council documenting the results of the study;

- Identify heritage constraints and opportunities for any Aboriginal or Historical heritage items or values within the study area;
- Recommend appropriate management of Aboriginal objects and/or historical archaeological relics, and mitigation of potential heritage impacts posed by proposed works, in accordance with the requirements of the *National Parks & Wildlife Act 1974* and *Heritage Act 1977;* and
- Prepare relevant DECC site cards and Heritage Inventory Forms for any Aboriginal or historical sites identified in the Reserve.

1.6 Report Outline

The remainder of the report is set out as follows:

- Description of the environmental context including the implications of landscape modifications caused by flooding and sand/gravel extraction (Section 2.0).
- A chronological site history that includes a review of the Aboriginal ethno-history for the region using early documentary records, a contact history and a review of historical occupation and use of the site using documentary records, maps, plans, illustrations and photographs (Section 3.0).
- Review of the local and regional archaeological context, including predictions regarding types of archaeological evidence that may be present in the development area (Section 4.0).
- Description of the archaeological field survey results (Section 5.0).
- Results of Aboriginal community consultation (Section 6.0).
- Assessment of the heritage significance of the study area (Section 7.0).
- Impact assessment (Section 8.0)
- A discussion of interpretation options, including themes and recommendations for implementation (Section 9.0)
- Management recommendations (Section 10.0).

1.7 Authorship

This report was written by archaeologist Jim Wheeler. Archaeologist Adam Paterson assisted with historical research. Archaeologists Lisa Campbell and Felicity Barry assisted with plans and graphics.

1.8 Acknowledgements

The authors acknowledge the assistance and valuable input provided by Steve Randall of the Deerubbin Local Aboriginal Land Council, Leanne Watson of the Darug Custodian Aboriginal Corporation, Gordon Workman of the Darug Tribal Aboriginal Corporation and Celestine Everingham representing Gordon Morton of Darug Aboriginal Cultural Heritage Assessments. We would also like to acknowledge the valuable assistance provided by John Bosque and Michelle Engelhard of Hawkesbury City Council.

2 ENVIRONMENTAL CONTEXT

2.1 Background

Archaeological assessment reports include information about the environmental context of study areas because of the important role environmental characteristics played in influencing the types of archaeological sites in any given area. Physical environments influenced both the type and availability of natural resources and the types of cultural activities that were carried out in the past. As a result, this also influenced the types of archaeological sites that may be found.

A determination of the former environmental context is essential to develop accurate models of cultural activity, site distribution patterns and the archaeological potential of any given area. The environmental setting of the study area is discussed below.

2.2 Landscape Characteristics

The Reserve lies within the active floodplain of the Hawkesbury – Nepean River, which is characterised by broad, relatively flat floodplains, meander scrolls, levees and wetlands. It is a highly dynamic environment that is constantly changing through the processes of alluvial deposition (gradual accretion and flood deposition) and channel scouring. The river channels, embankments, lagoons and islands are all affected by these on-going and at times dramatic changes. Historical evidence indicates large flood events have obliterated past river channels and created entirely new channel patterns and landscapes during the last 200 years.

2.3 Soils and Geology

The study area lies on the *Freeman's Reach* alluvial soil landscape, which comprises banks, beds and levees of the Hawkesbury-Nepean River. The parent material is alluvium deposited by the river system.

The soils are typically deep layered unconsolidated sediments (ie. sands and loams) deposited during floods. The river system has a sinuous, meandering character

flowing over and through its own deposited material of gravel, cobble, sand and soil.

Sediments within the southern portion of the reserve (upstream of Yarramundi Bridge) are typically fine-grained dark-brown and red-brown alluvial loams. This contrasts with the northern portion of the reserve (downstream of Yarramundi Bridge), which is influenced by the Grose River. Sediments of the Grose River are dominated by coarse-grained alluvial sand, gravel and cobbles. These materials have been deposited along the lower reach of the Grose River (adjacent to Navua Reserve), the western bars and beaches and throughout the northern flood channel.

The gravel and cobble deposits contain a wide variety of workable stone materials used by Aboriginal people for making stone implements. Numerous studies have identified the gravel bars of the Hawkesbury-Nepean System as important traditional stone sources, particularly for indurated mudstone / tuff cobbles[2].

2.4 Vegetation

Original vegetation within the study area was removed by flooding and quarrying. Current vegetation across the study area comprises a variety of re-growth communities.

During the first European expedition up the Hawkesbury River in 1789, Capt. John Hunter described the country around Richmond Hill (just north of the study area) as:

> *"…perfectly clear of any kind of under-wood; the trees upon it were all very tall, and stood very wide apart; the soil was also examined, and found [to be] very good.."*

More specific detail about the study area was provided on an 1891 Survey Plan, which described the study area as a large island of "sand and boulders" that was covered in pasture grass and timbered with "River Wattle and Oak".

[2] *Kohen 1986: 229*

2.5 Landscape Modification

The river channels, banks and islands within the study area have been modified through the effects of erosion, flood scouring, alluvial deposition, cultivation and quarrying. The effects of flood scouring and quarrying on the study area have been profound.

Removal of original vegetation during the 19th century exposed soils to erosion. During flooding events, soils on river banks were exposed and scoured away without the protection of tree and grass root systems. Further up river catchments, rain washed exposed surface soils into rivers causing a large amount of silt deposition further downstream. The archaeological implications are two-fold. In areas that have been scoured away by flooding, Aboriginal sites and objects have been removed. In areas that have been covered with silt deposited during flooding, original land-surfaces that may contain Aboriginal sites and objects have been covered.

In addition to the effects of flooding and erosion, the study area was substantially modified by gravel and sand extraction between 1927 and 1994. Boral Resources (formerly BMG Resources Ltd) removed large quantities of material from the study area and so doing formed the artificial lagoons, spoil heaps and islands that created Yarramundi Reserve in its current form we see today.

A Comparison of the current River configuration with early descriptions of the River illustrates the degree of modification the study area has undergone. Capt John Hunter was a member of the 1789 expedition up the Hawkesbury River and provided the following description of the study area and surrounds[3]:

> *"In the morning of the 6th, we examined the river, which, as I have before observed, was narrow and shoally; its bed was composed of loose round stones and sand….We here found the river to divide into two narrow branches, from one of which the stream came down with considerable velocity, and with a fall[4] over a range of stones which seemed to lye across its entrance: this was the fall which we had*

[3] *Hunter 1793: 6th July Diary Entry*

[4] *This probably refers to "Yarramundi Falls" or "Ashton's Falls"*

heard the night before from our situation on the side of Richmond-hill."

This early description of fast flowing narrow river channels with waterfalls contrasts with its current form, which could probably be described as broad, slow-moving and flat-bottomed (ie. devoid of any "falls").

The development of the study area during the late 19th century and the 20th century is shown in the following figures 2 – 5 and described below. Each figure has a 'best-fit' overlay of the current stream and lagoon configuration (shaded blue) overlain on the original plan or photo. This illustrates the degree to which the stream, banks and islands have been modified over the last 120 years.

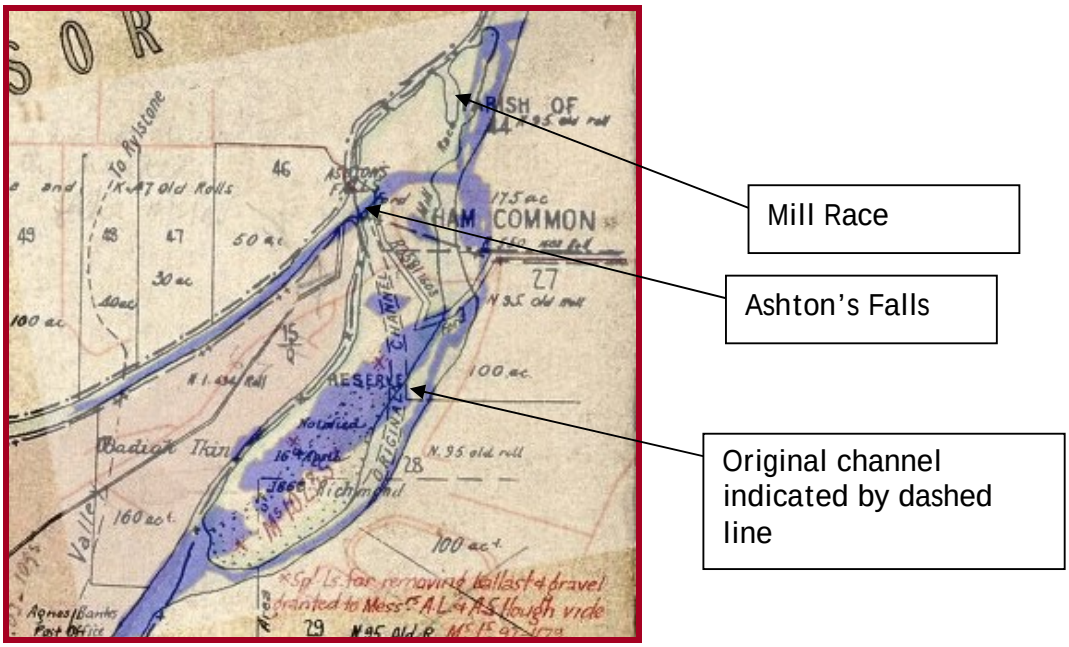

Figure 2. *1893 Parish Map showing Ashton's Falls (possibly the same as 'Yarramundi Falls'), the original river channel and a mill race. The current river channels (shaded blue) have a dramatically different configuration. (Source: Parish Map Preservation Project).*

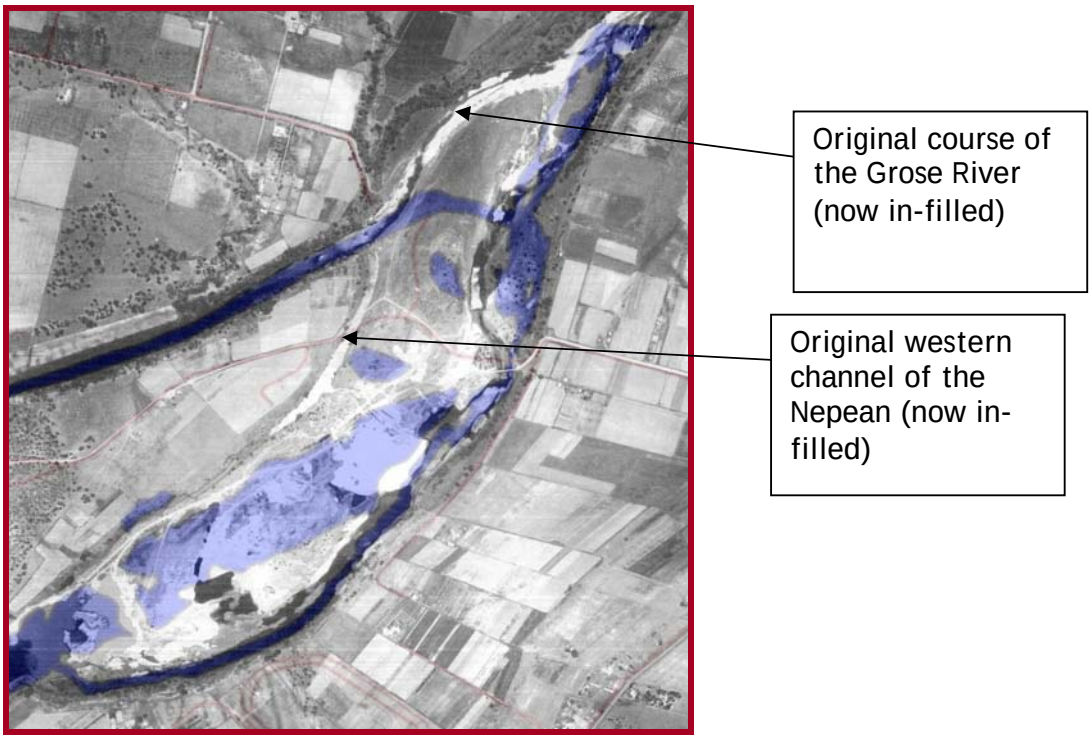

Figure 3. *1947 Aerial Photo showing original western channel of the Nepean (now in-filled) and the original course of the Grose River (now completely altered). (Source: Dept of Lands).*

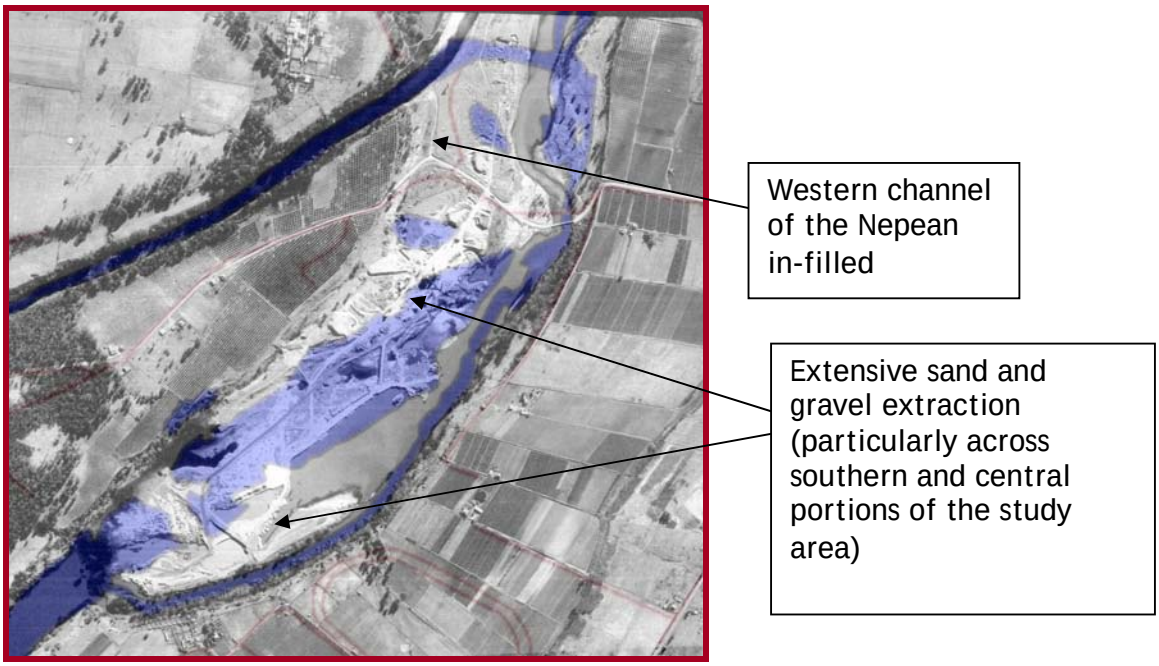

Figure 4. *1961 Aerial Photo showing extensive sand and gravel extraction underway and the western channel of the Nepean in-filled. (Source: Dept of Lands).*

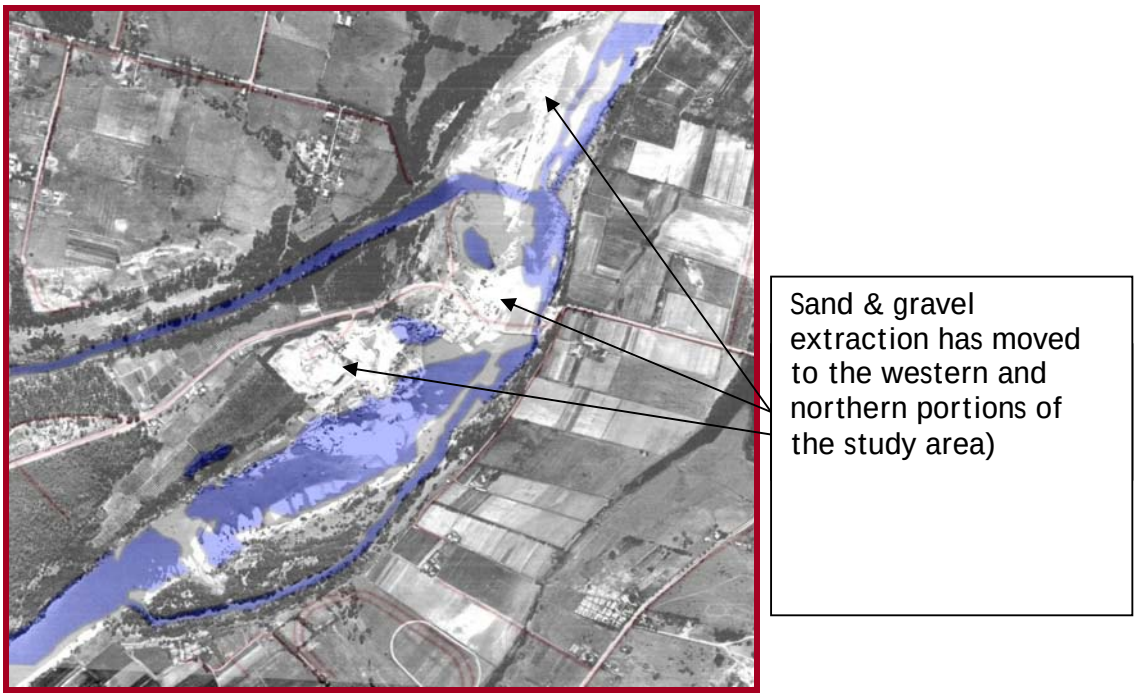

Figure 5. *1978 Aerial Photo showing sand and gravel extraction underway on western and northern portions of the study area. (Source: Dept of Lands). The study area is starting to resemble its current configuration (shaded blue).*

3 ABORIGINAL & EUROPEAN HISTORY

3.1 Preamble

This section presents a history of Aboriginal use and occupation of the study area based on documentary evidence and early ethnographic records. A summary of historical use and occupation of the study is also included for the purpose of assessing the historical heritage values of the Reserve and to identify any historical archaeological relics that may survive post-sand mining.

3.2 The Traditional Owners

The first people known to have an association with the study area were people of the *Darug* language group.

There is considerable ongoing debate about the nature, territory and range of the pre-contact Aboriginal language groups of the greater Sydney region. These debates have arisen largely because by the time colonial diarists, missionaries and proto-anthropologists began making detailed records of Aboriginal people in the late 19th Century, pre-European Aboriginal groups had been broken up and reconfigured by European settlement activity. Sydney region archaeologist and historian Val Attenbrow has cautioned:

> *'Any boundaries mapped today for (these) languages or dialects can only be indicative at best. This is not only because of an apparent lack of detail about such boundaries in the historical documents, but because boundaries between language groups are not always precise lines'.*[5]

3.2.1 The Darug Language

Darug was first described as a language (or dialectic group) by pioneer surveyor, anthropologist and linguist R H Mathews in the early 20th century. He described the extensive range of this language group as follows:

[5] *Attenbrow, 2002: 34-45*

> *'The Dharruk speaking people adjoined the Thurrawal on the north, extending along the coast to the Hawkesbury River, and inland to what are now Windsor, Penrith, Campbelltown and intervening towns'.*[6]

Since then, most historic and linguistic research has suggested that the *Darug* were principally an 'inland' group, associated with the Cumberland Plain and distinct from the Aborigines of Coastal Sydney.[7]

3.2.2 Clans

The *Darug* language group included a number of sub-groups often referred to as 'clans', based upon religious and/or totemic associations to country. The northern most clan of the *Darug* group were the *Buruberongal* who Governor Phillip noted to the northwest of Parramatta.[8] It is likely that the study area falls within the range of the Buruberongal people, who were associated with Yarramundi and nearby Richmond Hill.

3.2.3 Tribes

Tribe names were names of convenience given to Aboriginal groups witnessed by colonial observers. These groups were often clan groups at the time of first white settlement, but after the breakdown of traditional groupings (c1820s onwards) they tended to be aggregations of Aborigines from various clans who banded together 'to provide mutual protection and to maintain viable social and economic units'.[9]

These tribes were generally named after the area in which they lived (though they were occasionally named after a noted individual in a particular group). Tribes of the Hawkesbury, referred to in newspaper articles and other documents, included the *Hawkesbury River Tribe*, the *Windsor Blacks* and the *Branch Natives*, the *Caddie Tribe,* and the *Richmond Hill Tribe.*[10]

---

[6] *Mathews, 1901: 135*

[7] *Ross, 1990: 31-33*

[8] *Phillip in Hunter, 1793 [1968]: 514-523*

[9] *Kohen 1985; Ross 1988: 49*

[10] *Nichols, 2004: 4*

Despite significant changes following contact, these 'tribes' continued to adhere to certain rules governing social organisation and boundaries, as Dr John Dunsmore Lang, an early principal of the Sydney College and Hawkesbury chaplain, noted in the 1830s:

> *'The whole race is divided into tribes, more or less numerous, according to circumstances, and designated from the localities they inhabit; for although universally a wandering race, their wanderings are circumscribed by certain well defined limits, beyond which they seldom pass, except for purposes of war or festivity. In short every tribe has its own district, the boundaries of which are well known to the natives generally'.*[11]

3.3 Lifestyle of the Traditional Owners

By studying accounts of early British settlers, we can reconstruct aspects of traditional Aboriginal lifestyle and economy. Although such accounts are fragmentary and present a biased European view of Aboriginal culture, they provide an important insight about Aboriginal use and occupation of the land at Contact.

Early observers indicate that the subsistence and economy of Aboriginal groups depended largely on the environment in which they lived. While coastal groups exploited marine and estuarine resources, hinterland groups relied on freshwater and terrestrial animals and plants. A distinction between the two lifestyles is clearly made in early European accounts. During a trip along the Hawkesbury-Nepean during 1791, Watkin Tench wrote that hinterland people:

> *'depend but little on fish, as the river yields only mullets, and that their principal support is derived from small animals which they kill, and some roots (a species of wild yam chiefly) which they dig out of the earth'.*

In contrast, Collins wrote that for coastal people:

> *'Fish is their chief support…the woods, exclusive of the animals which they occasionally find in their neighbourhood, afford them but little sustenance; a few berries, the yam and fern root, the flowers of the*

[11] *Letter from John Lang in APB, 1839, Volume V: 140-142*

different Banksia, and at times some honey, make up the whole vegetable catalogue'

Although early observations have provided much useful information about Aboriginal society at contact, archaeological investigations have shown clear deficiencies. Archaeological excavations along the NSW coast have clearly shown that coastal people exploited a wide range of hinterland terrestrial resources, which sits in contradiction to early records that coastal people were almost exclusively 'fishers' and inland people were 'hunters'. The contradiction is probably accounted for by the visibility of fishing and gathering activities on and near the water as opposed to the relative invisibility of hunting and foraging activities in the hinterland.

Aboriginal groups living in the Hawkesbury sandstone region made extensive use of the natural rock overhangs and caverns that are characteristic of the area. George Barrington observed that *"Those who build bark huts are very few compared to the whole. Generally speaking, they prefer the ready made habitations they find in the rocks".*

Aboriginal people living on Cumberland Plain landforms (where sandstone overhangs were not available) utilised huts. Tench described how native huts were constructed by laying pieces of bark together in the form of an 'oven'. The end result consisted of a low shelter, which was opened at one end and sufficient to accommodate one person lying down[12]. Tench[13] goes on to conclude *"there is reason, however, to believe that they depend less on them* (huts) *for shelter than on the caverns with which the rocks abound".*

3.3.1 The Hawkesbury – Nepean

The Hawkesbury-Nepean river was called *Deerrubbin*, (or *Veeruben*), by Aborigines who occupied the area.[14] Within the Cumberland Plain, the river was a major resource for Aboriginal people. It was a source of finfish, shellfish, crustaceans, and birdlife. Its anabranch channels, creeks and swamps also supported aquatic and terrestrial food resources. Beyond the waterways, the banks and alluvial flats

[12] *Tench, W. 1996: 53*

[13] *Ibid*

[14] *Nichols, 2004: 4*

featured varied woodland and forest containing trees, shrubs and grasses that provided a range of usable products from canoe bark to traditional medicines, and habitat for food animals including possums, kangaroos and emus.

Fish and fishing were of major social and economic importance to Sydney Aboriginal people. Early colonial observer and diarist Watkin Tench wrote that:

> *'Fishing, indeed, seems to engross nearly all of their time, probably from its forming a chief part of their subsistence'.*[15]

The aforementioned Dr Lang, writing in the 1830s also noted:

> *'It is well known that these aborigines in no instance cultivate the soil, but subsist entirely by hunting and fishing, and on the wild roots they find in certain localities (especially the common fern), with occasionally a little wild honey; indigenous fruits being extremely rare'.*

The methods utilized by Aborigines to obtain fish on the Hawkesbury and its tributaries were many and varied, however the principle methods appear to have been line fishing, spearing and netting. Generally, the type of fishing was relatively strictly divided according to sex - Aboriginal women line fished the river and creeks from bark canoes; men speared fish from canoes and riverbanks. Netting was the most labour intensive and involved members of both sexes.

Bark canoes were used for travelling along the river and its tributaries, and as mobile fishing platforms. The craft used on the Hawkesbury were the same as those utilised on the coast.[16] Generally these craft were between 2.5 and 6 metres long, were made of bark, and were propelled by wooden paddles, between 0.6 and 0.9 metres long. Small fires were kept alight on clay beds in the centre of the canoes to provide light and warmth and to cook meals. Captain James Cook was one of the first to describe the fishing canoes of the Sydney Aborigines when he noted during the Endeavour's voyage of Discovery to Botany Bay:

> *'… Three canoes lay upon the bea(c)h the worst I think I ever saw, they were about 12 or 14 feet long made of one piece of bark of a*

[15] *Tench, 1979*

[16] *Tench cited in Atttenbrow, 2002: 87*

> *tree drawn or tied up at each end and the middle kept open by means of pieces of sticks by way of thwarts'.*[17]

The bark used to build such canoes in the Greater Sydney region was often sourced from the Grey or Saltwater Swamp She Oak (*Casuarina glauca*), Bangalay (*Eucalyptus Botroides*) and several species of stringybark (*Eucalyptus agglomerate* and *acmeniodies*). Canoe bark was removed from trees with stone axes, and later in the post-contact period, with metal axes. Plant fibres bound the canoes together at each end. As indicated by the comments of Cook, the bark canoes were serviceable but flimsy craft, and in order to keep them operational they were occasionally patched with the resin from grass trees (*Xanthorrhoea sp*.) and lined with Cabbage Tree Palm leaves (*Livistonia australis*).[18]

Canoes facilitated access to fishing locations that could not be reached from shore such as deep holes, drops offs, snags and weed beds, where fish were speared or line caught. Spearing involved the use of long, wooden spears with a pronged tip[19], while line fishing, generally the domain of women, utilised twine fishing line and baited shell or animal bone hooks.[20] Interestingly, catch rates on hook and line appear to have been improved by the prodigious use of 'ground baiting' or burleying. Lieutenant David Collins noted in his *Account of NSW* in 1798 that:

> *'While fishing, the women generally sing: and I have seen them in their canoes chewing muscles or cockles and spitting them into the water as bait'.*[21]

Along the Australian East Coast and adjacent rivers, fish were also caught in casting nets and traps. One method of net fishing (utilized to trap shoaling mullet) involved a 'drive' along shallow creeks where Aborigines advanced in line abreast

---

[17] *Cook, 1968 [1768-1771]; Curby, 1998: 3*

[18] *notes from the Australian Museum Exhibition 'Catching Sydney Harbour' – 'Building a Canoe'.*

[19] *multi pronged spears were called 'fizz gigs' by early colonists. The shafts of these spears were up to 6 metres long and made of the wood or the stems of flowering Xanthorroea grass trees. The prongs of fishing spears were barbed or pointed with stone, shell, hardwood, fish teeth, sharpened animal bone and stingray spines which were bound with two ply rope or plant fibre and coated in plant resin.*

[20] *the lines described were often made of Cabbage Tree Palm and Kurrajong bark, with lesser use of Hibiscus and Settlers Flax (Hibiscus heterophyllus & Gymnostachys anceps) Refer: Mudie, 1829: 238; Notes from the Australian Museum Exhibition 'Catching Sydney Harbour' – 'Making Fishing Line'.*

[21] *Collins, 1975 [1798]*

to a netted end point.[22] As with the fishing lines, these nets were likely made from plant fibres.

3.3.2 Resources of the Land

The land adjacent to the Hawkesbury- Nepean proved Aborigines with terrestrial animals and birds, plant foods and the various resources offered by the wide variety of plants, grasses, roots, fruits and flowers. Watkin Tench noted that when fish were not readily available:

> *'their principle support is derived from small animals which they kill and some roots which they dig out of the earth'.*[23]

The 'roots' described by Tench are generally believed to be yams which appear to have formed a significant component of the Aboriginal vegetable diet in the Hawkesbury-Nepean area. Capt Hunter recorded evidence of yam digging at the junction of the Grose and Nepean Rivers (ie. on or near the study area) in July 1789:

> *"On the banks here also we found yams and other roots, and had evident marks of the natives frequenting these parts in search of them for food. They have no doubt some method of preparing these roots, before they can eat them; for we found one kind which some of the company had seen the natives dig up; and with which being pleased, as it had much the appearance of horse-radish, and had a sweetish taste, and having swallowed a small quantity, it occasioned violent spasms, cramps in the bowels, and sickness at the stomach: it might probably be the casada root"*[24]

Yams are the bulbs found on a variety of creepers and vines. It appears that Aborigines on the Hawkesbury ate a range of these yams. Some, such as *Dioscorea transversa* could be eaten directly after being dug up, others such as *Dioscorea bulbifera* were poisonous and required detoxifying prior to use. Use of yam

[22] *Yeates, 1993a: 13*

[23] *Tench, 1793 [1979]: 121*

[24] *Hunter 1793: 6th July 1789 Diary Entry*

varieties appears to have related to seasonality with few of the species growing all year round.[25]

3.3.3 Use of Trees

Ethno-historical records indicate that the Aborigines of the Sydney region made use of a variety of tree species for such things as the sourcing of food products, production of canoes and the manufacture of tools and implements, as outlined below:

- Coastal timber was used for the manufacture of clubs and spears. Bark from select Eucalypts was used for the production of canoes and shields;
- Aboriginal women wove the bark fibres from the Hibiscus trees that grew along creek lines to produce fishing nets, which were cast over shoals of mullet. Other fibres produced fishing lines and twine;
- Babies were wrapped in soft tea-tree bark and slung in woven fibre bags;
- Saps and gums were used as adhesives; and
- Flowers, nectars, leaves and fruits were collected for processing as food, drinks and medicaments.

In addition to providing the raw materials needed to produce products that were utilised in everyday life, trees also provided access to the birds and animals that made use of them. Tree climbing allowed Aborigines to access a variety of foodstuffs including wild honey, possums, flying foxes (fruit bats), koalas and bird eggs (refer to figure 6).[26]

3.3.4 Woodland & Grassland

The more open areas along the Hawkesbury-Nepean were grazing areas for macropods and these formed an important part of the economy of the Hawkesbury Aborigines.

[25] *Ross, 1990: 37; Attenbrow, 2002: 78*

[26] *Collins, 1798 [1975]: 456; Phillip in Hunter, 1793 [1968]: 507*

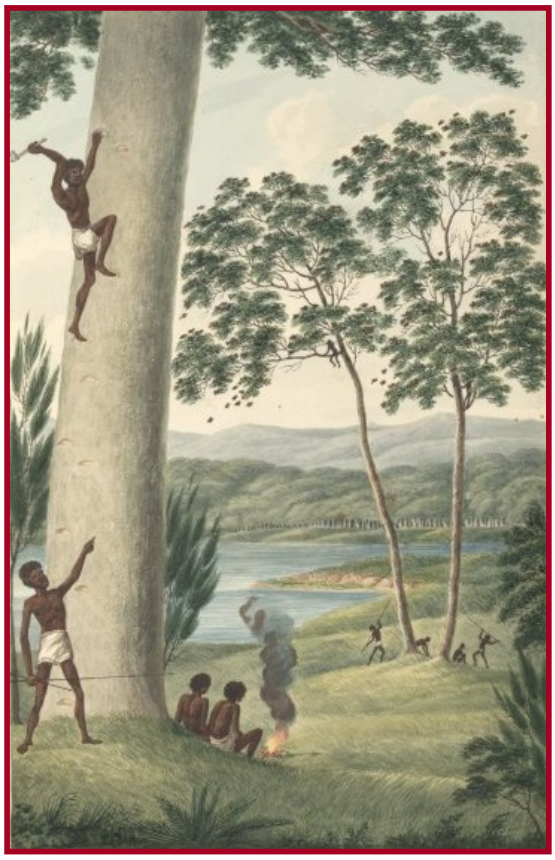

Figure 6. *Joseph Lycett c.1817 "Aborigines climbing a tree, with two Aborigines sitting by a fire, others spearing birds"* [27].

Surveyor, engineer, artillery officer and explorer Francis Barrallier recorded the Aboriginal method of catching kangaroos in Sydney's west in the very early 19th century. Barrallier's account highlights communal hunting and the use of fire (also refer to figure 7):

> *'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 tomohawks. When the circle is formed, each one of them holding a handful of lighted bark, they at a set signal set fire to the grass and bush in front of them. In proportion as the fire progresses they advance forward with their*

[27] *Lycett, J. 1830*

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 try to escape in various directions, and the native frightening them with their shouts throw spears at the one passing nearest them. By this means not one can escape'.[28]

Figure 7. *Joseph Lycett c.1817 – "Aborigines using fire to hunt kangaroos"*[29].

While the above method was suitable for wood and grassland, it was not suited to the more elevated, rockier land where a different method of catching macropods was utilised. Mrs Felton Matthews, wife of the famous 19th century surveyor, wrote about life on the Hawkesbury in her diary while journeying with her husband in 1833. On one occasion near the MacDonald River, she recorded Aboriginal wallaby hunting on rocky ground above the river:

'The lofty rocky ranges which border this river on either side I have frequently described, and there is nothing either to describe or relate during this journey: the dead unbroken silence which prevailed all around was extremely oppressive, and the voices of some natives

[28] *Barrallier, 1802 [1975]: 2-3*

[29] *Lycett, J. 1830*

> *which broke on the ear after some time, was really quite a relief: on nearer approach we found they were hunting wallabi or what they call wallabunging, a number of them assemble, and while some run along the tops and sides of the rocky heights shouting and screaming, drive down the poor little frightened inhabitants to the flats below where others attack them with their spears and dogs; we saw three of these little creatures hopping along with speed, followed by dogs and blacks at full cry - '.*[30]

The above passage describes the use of dingos as hunting dogs; however they were also food for Aborigines on occasion, as were other land animals including koalas, wombats, grubs and lizards.[31]

A practice noted by early European explorers of the Hawkesbury-Nepean, was the use of traps to ensnare animals. Collins made the following observations near Richmond Hill, just north of the study area:

> *"At the foot of Richmond Hill, I once found several places constructed expressly for the purpose of ensnaring animals or birds. These were wide enough at the entrance to admit a person without much difficulty; but tapering away gradually from the entrance to the end, and terminating in a small wickered grate. It was between forty and fifty feet in length; on each side the earth was thrown up; and the whole was constructed of weeds, rushes, and brambles: but so well secured, that an animal once within it could not possibly liberate itself. We supposed that the prey, be it beast or bird, was hunted and driven into this toil; and concluded, from finding one of them destroyed by fire, that they force it to the grated end, where it is soon killed by their spears. In one I saw a common rat, and in another the feathers of a quail"*[32].

3.3.5 Swamps and Lagoons

Resource rich swamps and lagoons, such as Yarramundi Lagoon located just east of the study area, were resource zones of great importance to the inland Aborigines. Within these small freshwater bodies were eels, fish and a variety of shellfish

[30] *Mathews in Havard, 1943c: 237*

[31] *Attenbrow, 2002: 71; Ross, 1990: 37*

[32] *Collins 1798: Appendix 4*

including freshwater mussels (*Velesunio ambiguus*, *Hyridella australis* and *Hyridella depressa*).

The swamps also harboured water rats, frogs, echidnas, as well as a variety of bird life including ducks. Birds in particular were targeted in a number of ways and were harvested by nets, spearing, ensnared in pit-traps and hand caught by stationary Aborigines using fish pieces as bait (refer to figure 8).[33]

Figure 8. *Joseph Lycett c.1817 "Aborigines Hunting Waterbirds"*[34].

3.3.6 Plant Management

Plant management practices that bear remarkable similarity to those reported in northern Australia were also conducted in the Sydney area. For instance, there is good evidence that Aborigines practiced fire-stick farming in and around Sydney.

When the first fleet arrived in Sydney, Captain John Hunter found an environment where:

33 Ross, 1990: 37; Attenbrow, 2002: 88

34 Lycett, J. 1830

> *"the trees stand very wide of one another, and have no underwood; in short the woods ... resemble a deer park, as much as if they had been intended for such a purpose"*

This is the classic result of Aboriginal firing of the landscape. Ethnographic evidence from Northern Australia suggests that the systematic burning of the landscape was carried out for a variety of reasons. 'Fire-stick farming' opened up access to land and created pockets of early succession vegetation that increased the amount of important plant foods. Early regrowth vegetation, particularly grasses, attracted animals, which in turn made them easier to hunt. Aboriginal firing of the landscape was an important tool in manipulating the environment to increase food sources.

Plant management was not just restricted to the manipulation of the environment though. Plant processing also figured prominently and enabled Aboriginal groups to broaden their range of food sources. Hunter provides an interesting account of trying to eat a poisonous yam (probably *Dioscorea bulbifera*) and getting violently sick. Hunter had seen Aborigines digging this same yam and concluded, *"They no doubt have some way of preparing these roots, before they can eat them".*

According to George Washington Walker's journal of 1836, the Illawarra Aborigines processed Xamias. Walker recorded that the Aborigines:

> *"either roast them, and pound them into a paste, steeping them in water to get rid of their acrid and hurtful properties, or get rid of these by longer period of steeping in water , so as to render them fit to be eaten in a raw state"*[35]

Such plant management and processing practices were an important part of the economies of Aboriginal groups.

3.4 Exploration and First Contact

The settlement of Sydney was established at Camp Cove in 1788. Due to the infertility of the soils on Sydney Harbour, fertile land at Rose Hill (Parramatta) was settled soon after to provide food for the fledgling settlement.

35 *Quoted in Organ, M. 1990: pp.208*

In the following year, 1789, considerable exploration of the Sydney region and the rivers and lands beyond was undertaken at the behest of the Colonial administration in an effort to find further suitable lands for settlement and agriculture, and resources such as timber, with which to construct the growing settlements.

The first recorded exploration party to explore the Hawkesbury-Nepean beyond its entrance and coastal estuaries was lead by Governor Phillip in 1789. Phillip's exploration party, which included Captains Hunter, Collins, and Johnson, and Surgeons White and Worgon, left Sydney on 6 June, walking from Manly to Pittwater where they met the boats that would take them on their journey inland. The story of the journey that ensued is detailed in John Hunter's journal and featured a detailed reconnaissance of the river, which fixed the latitude of Richmond Hill and identified the Grose River junction within the current study area (the upper limit of tidal influence and the area where the Hawkesbury becomes the Nepean River).[36]

During the journey, Phillip's party witnessed many Aborigines and recorded numerous signs of Aboriginal life and occupation including animal traps and bird decoys.[37] They also witnessed the signs of infectious disease in the form of smallpox, which had preceded them. Notable were the corpses of several Aborigines who had succumbed to the disease.

The expedition encountered the junction of the Grose and Nepean on July 6th (ie. the current study area), where the party found *"...too little water for the boats which we had with us to advance any farther, and the stream was very strong"*[38]. Capt. Hunter provides the first European description of the study area as the expedition party unsuccessfully attempted to continue beyond the tidal zone of the Hawkesbury and progress up the Nepean. According to Hunter the party *"found the river to divide into two narrow branches, from one of which the stream came down with considerable velocity, and with a fall over a range of stones which seemed to lye across its entrance".* This describes the junction of the Grose and Nepean Rivers at first contact.

[36] *Dash, 1990*

[37] *Hunter, 1793 [1968]*

[38] *Hunter 1793: July 6th 1789 Diary Entry*

Near the study area, Hunter also observed:

> *"evident marks of the vast torrents which must pour down from the mountains, after heavy rains. The low grounds, at such times, are entirely covered, and the trees with which they are overgrown, are laid down (with their tops pointing down the river,) as much as I ever saw a field of corn after a storm; and where any of these trees have been strong enough to resist in any degree the strength of the torrent, (for they are all less or more bent downwards) we saw in the clifts of the branches of such trees, vast quantities of large logs which had been hurried down by the force of the waters, and lodged from thirty to forty feet above the common level of the river; and at that height there were great quantities of grass, reeds, and such other weeds as are washed from the banks of the river, hanging to the branches"*[39]

This is good evidence that the Hawkesbury-Nepean was subject to significant flooding prior to European settlement and modification of the landscape.

Phillip undertook a second expedition[40] in April 1791. The purpose of this journey, which involved two Sydney Aborigines (*Colobee* and *Balladerry*), was to determine if the Hawkesbury and the Nepean were the same rivers. Capt. Watkin Tench documented the journey[41].

During the course of this venture, the party again encountered numerous Aborigines, who they conversed with via the translations of *Colobee* and *Balladerry* (refer to figure 9). One of the inland Aboriginal groups whom they encountered were the *Boorooberongal* clan whom the Aboriginal guides referred to as 'climbers of trees'. One of the clan demonstrated tree climbing to the exploration party, bolting up a tree by means of toeholds or notches that had been cut into the trunk. Relations between the party and the Aborigines encountered were cordial and three of the clan joined the group for a period - *Gomberee*, his son *Yellowmundee*[42], and grandson *Djimba*.

[39] *Hunter 1793: 6th July 1789 Diary Entry*

[40] *The exploration group numbered about 40*

[41] *Tench 1793 [1979]*

[42] *better known as Yarramundi*

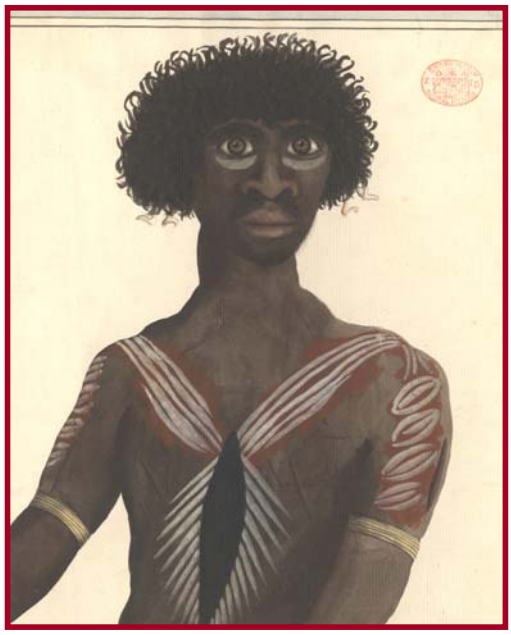

Figure 9. *Portrait of Balladerry (Museum of London)*

At the completion of his journey, Philip conveyed a letter to the Home Office, detailing his impression of the Hawkesbury and the potential benefit of its settlement:

> *'The high country which forms Broken Bay is lost as you proceed up the Hawkesbury, & the Banks of the River are then covered with Timber, the Soil a rich light Mould, & judging from what little I saw of the Country, I should suppose it good land to a very considerable Extent...*
>
> *On the Rivers we saw great Numbers of Wild Ducks and some black Swans; and on the Banks of the Hawkesbury, several Decoys made by the Natives for to catch quail...*
>
> *The great Advantages of so noble a River, when a Settlement can be made on its Banks, will be obvious to your Lordship'.*[43]

With Phillip's positive appraisal of the Hawkesbury, the stage was set for settlement and the opening up of the Hawkesbury region.

[43] *Phillip to Lord Sydney, HRNSW 1(2): 305*

3.5 Early Settlement & Frontier Relations

The first step in opening up the Hawkesbury-Nepean to settlers was a survey for marking out farms and this commenced almost immediately after the completion of Phillip's exploration. Surveyor General Augustas Alt carried out initial survey work[44] until 1791 when he was relieved and the task fell to botanist David Barton, who died in 1792 after accidentally shooting himself.

In 1793, Lieutenant -Governor Francis Grose received a dispatch from the Home Office granting approval for the assignment of allotments to settlers and authorising military and civil officers to have grants of land. By 1794, Alt had completed a map entitled *'A plan of the first farms on the Hawkesbury River'* which indicates that by this time settlement along the river and its tributaries had commenced, principally about Wilberforce Reach where 19 grants had been established at 'Pitt Town Bottoms'.[45]

Settlement thereafter occurred relatively rapidly, and despite the isolation, there were 1,100 settlers on the upper reaches and creeks of the Hawkesbury by 1799. By 1802, settlers who had arrived on the *Perseus* and *Coromandel* were settling near Portland and Sackville Reaches.[46]

The locking up of land through the formation of farms, reserves and riverside settlement served to block Aboriginal access to resources and disrupted traditional Aboriginal movements and lifestyle. European diseases and the ill treatment of Aborigines by some settlers had further negative impact on Hawkesbury Aborigines. Not surprisingly, the district Aborigines rallied against their misfortune and ill treatment and retaliated principally by burning and ransacking the crops of settlers and spearing the animals that were taking over the lands formally grazed by kangaroos.

Aboriginal attacks such as these inevitably lead to settler revenge attacks that started a cycle of violence characterised by attacks and counter attacks. Violence involving Aborigines probably occurred from the period of earliest white settlement in the mid 1790s, but it began to become prominent towards the end of the 18th

[44] *possibly with assistance from William Dawes*

[45] *Andrews, 1990: 71-72*

[46] *Powell, 1990: 43*

century. Probably the first recorded instance of Hawkesbury River racial violence occurred in 1794 when an Aboriginal boy, accused of being sent among white settlers as a spy was set upon:

> *'... the settlers tied his hands and feet together, and dragging him several times through a fire, threw him in the river and shot him'.*[47]

Not surprisingly, the local Aborigines retaliated; killing a Hawkesbury settler and a convict, before eight Aborigines were subsequently shot in revenge.[48]

Five years later, five white settlers[49] appeared before a court charged with the murder of two teenage Aboriginal boys in the Hawkesbury district. Though the men were found guilty after days of deliberation, they were later acquitted.[50] Governor Hunter made note of the event in 1800 when he reported:

> *'Two native boys have been most barbarously murdered by several of the settlers at the Hawkesbury River, not with standing orders have upon this subject been repeatedly given pointing out in what circumstances only they were warranted in punishing with severity'.*[51]

Governor Hunter himself acknowledged at the time that much of the blame for the early conflicts in the Hawkesbury lay with settlers, noting:

> *'Much of the hostile disposition which has occasionally appeared in these people has been too often provoked by the treatment which many of them have received from white inhabitants...'.*[52]

A striking example of the type of frontier violence typical of the 1790's occurred near the study area in 1795. Following violent government reprisals against the "the Wood Tribe (the Be-dia-gal)" for harassing settlers and stealing corn, Collins reported that:

---

[47] *Barrington: 136*

[48] *Bowd, 1982: 33*

[49] *Edward Powell, Simon Freebody, James Metcalfe, William Timm & William Butler*

[50] *HRA 1(1): 401-422; Nichols, 2004: 4-5*

[51] *Hunter to the Duke of Portland, HRNSW 4: 1*

[52] *Hunter to the Duke of Portland, HRNSW 4: 1-3*

> *"the natives attacked a farm nearly opposite Richmond Hill, belonging to one William Rowe, and put him and a very fine child to death, the wife, after receiving several wounds, crawled down the bank, and concealed herself among some reeds half immersed in the river …. In consequence of this horrid circumstance, another party of the corps was sent out; and while they were there the natives kept at a distance. This duty now became permanent; and the soldiers were distributed among the settlers for their protection; a protection, however, that many of them did not merit"*[53].

Despite the above incidents, the Hawkesbury was considered to be relatively peaceful at the turn of the century in 1800. While frontier violence raged about Parramatta[54], the Georges River and Prospect Hill, as *Pemulwey* and his followers conducted guerrilla attacks, Hunter's successor Governor Phillip Gidley King noted the following:

> *'The natives about Sydney and the Hawkesbury continued as domesticated as ever, and reprobated the conduct of the natives in the vicinity of Parramatta and Toongabbie, who were irritated by an active daring leader named "Pemulwye"'.*[55]

The relative peace in the region was not to last. As settlement intensified on the Hawkesbury in the opening years of the 19th century, so did local conflict.

3.6 Aboriginal Life on the Hawkesbury-Nepean

3.6.1 Intensified Settlement

The first major town settlement in the Hawkesbury district was called 'Green Hills' and existed under this name until Governor Lachlan Macquarie renamed it Windsor on the 6th December 1810. On this day he also named the four other "Macquarie Towns" of Castlereagh, Richmond, Pitt Town and Wilberforce. These towns were established by the Governor to act as 'food bowls' for the greater Sydney area and

[53] *Collins 1798: Chapt 98*

[54] *Botanist George Caley referred to the racial conflicts of the late 19th century as 'this sort of war' (refer: Caley in Kohen, 1985)*

[55] *Hunter to Lord Hobart, 1802, HRNSW 4: 867*

brought increased numbers of free settlers and convicts to the greater Hawkesbury region. As a consequence of the establishment of these towns, general riverside settlement and industry increased to service both the river settlers and the new townships.

The accelerated development of settlement and industry along the Hawkesbury Nepean likely contributed to the further breakdown of race relations which culminated in major instances of conflict along the River system in the early 19th Century.

We know that conflict was escalating in the Hawkesbury region in 1803 because in that year a petition signed by settlers at Portland Head was forwarded to Governor King requesting that settlers be allowed to shoot Aborigines found on their farms. This document turned out to be a forgery, and the forger was gaoled for several days.[56] Despite the fact that the letter was a forgery, disquiet in the vicinity of the study area bothered Governor King who sent for three local Aborigines to enquire as to the reason for their displeasure with the settlers of the area. King mentioned of the meeting:

> *'On questioning the cause of their disagreement with the new settlers, they very ingeniously answered that they did not like to be driven from the few places that were left on the banks of the river, where alone they could procure food; that they had gone down the river as the white man took possession of the banks; if they went across white men's grounds the settlers fired upon them and were angry'.*[57]

The Aborigines interviewed requested that they be given land to compensate them for their loss, at which point King assured the group that there would be no further settlement down the river.

In June 1804, probably not long after King's interview with local Aborigines, Magistrate Thomas Arndell received a dispatch from the Governor authorising a body of settlers to pursue Aborigines and further enquire as to why they had committed 'numerous outrages' at Portland Head. The group of settlers subsequently encountered a large group of Aborigines at an unknown location in

[56] *Nichols, 2004: 5*

[57] *HRA*, 5: 166

the mountains. Some of the Aborigines wore stolen settler's clothes and stolen corn was in evidence. The Aborigines justified their actions stating *'they wanted, and would have, corn…and whatever else the settlers had'* before throwing down spears in a defiant manner. The settlers then opened fire, though it is unknown how many Aborigines were wounded or killed.[58]

Not surprisingly, the conflicts continued and two weeks after the reporting of the above episode, the *Sydney Gazette* reported that:

> *'Further to our former accounts respecting the hostile hordes whose conduct of late has been worthy of attention, we have to add, that among the reaches about Portland Head their ravages have been felt with much greater severity than elsewhere…*
>
> *Last Friday … the farms of Crumby and Cuddie (sp) at the South Creek were totally stripped by a formidable body of natives supposed to be about 150 in number whom darted their spears at a labouring servant, who fortunately effected an escape without receiving a wound…*
>
> *The above persons have thrice been plundered in the space of a very few months and have now lost not only their crops but their whole flock of poultry, together with their bedding, wearing apparel, and every other movable'.*[59]

The Aboriginal raids are perhaps understandable given that the intensified settlement took away important resource-rich traditional lands. In an attempt to defuse the violence, Magistrate Arndell engaged with Richmond Hill Aboriginal chiefs *Yaramandy*[60] and *Yarogowhy*. The *Gazette* reported the communications between Arndell and the Richmond chiefs as follows:

> *'Two of the Richmond Hill chiefs, Yaragowhy and Yaramandy were sent for the day after the firing by Rev. Mr Marsden and Mr. Arndell,*

[58] *Sydney Gazette, 17 June 1804*

[59] *Sydney Gazette, 24 June 1804*

[60] *aka Yarramundi c. 1760 - 1818. The current study area is named after Yarramundi, chief of the Richmond Hill tribe. Yarramundi was the son of Gomberee, both of whom met Gov Phillip and Watkin Tench on their 1791 expedition up the Hawkesbury. Yarramundi was also the father of Maria Locke, who attended the Parramatta Native Institution. Many Darug descendents in the Sydney area trace their ancestry back to Yarramundi through Maria Locke.*

> *residentiary magistrate, who received them in a most friendly manner, and requested that they would exert themselves in putting a period to the mischiefs, at the same time loading them with gifts of food and raiment for themselves and their friendly countrymen'.*[61]

Despite Arndell's entreaties, Aboriginal hostilities about Portland Head again broke out in winter the following year (a time when displaced Aborigines were most vulnerable). Firesticks were thrown onto the farm of Henry Lamb and William Stubbs was robbed of his clothing and food reserves.[62]

3.6.2 Further Conflict & Institutionalisation

Governor Lachlan Macquarie came to Australia with instructions 'enjoining all our subjects to live in harmony with them (Aborigines)' and it was early in his administration that government and religious attempts to 'civilise' the natives commenced in earnest. Governor from 1810 to 1821, Macquarie pursued a policy of assimilation which aimed at encouraging Aborigines to abandon traditional culture and adopt European ways and encourage peaceful relations between Aborigines and whites. Central to Macquarie's vision were plans to provide land and farming equipment to select aborigines, and establish an Aboriginal School or Native Institution.[63]

The Native Institution, established at Parramatta in 1815 was to be the showpiece of Macquarie's plan. Interestingly, though Parramatta was chosen as the location for this school, it was not the only location considered. One Tree Point on the Parramatta River and Ebenezer, on the Hawkesbury were also viewed as potential school sites prior to the acceptance of Parramatta.

By 1816 however, after several years of intensified settlement, drought and renewed racial conflict (including major attacks at South Creek), Macquarie lost patience with the traditional owners, ordering three punitive expeditions against offending Aborigines and pursuing a policy of partial segregation. Macquarie justified his actions stating that over the course of three years, Aborigines had:

---

[61] *Sydney Gazette, 1 July 1804*

[62] *Bowd, 1982: 36*

[63] *Macquarie to Bathurst, August 20, 1814, HRA, 1(8): 372; Macquarie to Bathurst, October 8, 1814, HRA, I(8): 369*

> *'...committed most atrocious and wanton Barbarities murdering Men, Women, and Children, killing Cattle, and plundering grain and property of Settlers on Nepean, Grose, and Hawkesbury'.*[64]

As a consequence of the 'barbarities', Macquarie ordered that Aborigines were not to appear within one mile of established settlements with arms of any kind, and that not more than six unarmed natives were able to 'lurk' about farms. In addition, the Aborigines were instructed to desist with traditional tribal fights.[65]

In April 1816 with outbreaks of violence continuing in the Nepean-Hawkesbury districts, Macquarie broadened his objectives and directed three detachments of the 43rd regiment to the areas most 'infested and annoyed ' by Aborigines - the neighbourhoods of the Nepean (Cow Pastures), Hawkesbury and Grose. While most parties met no resistance and saw few Aborigines, the detachment under the direction of Captain Wallis, which was sent to the Appin and Airds districts, surprised a native encampment and 'meeting some resistance' killed 14 and took 5 prisoners to Liverpool.[66]

This violence took place at Appin, near where a number of Aborigines had been hiding out at a settler's farm. Amongst the dead were women and children. The men, who were hung from trees by the soldiers, included *Durelle*, believed to be a *Tharawal* tribesman and *Cannabayagal*, a *Gandangara* man. *Tharawal* men *Gogy, Bundle* and *Budburry* were all utilised as guides during the punitive expedition but, and perhaps not surprisingly, their employment resulted in the capture of no Aborigines and they all escaped before the final brutalities at Appin. After the massacre, a patrol of soldiers remained in the various districts to protect farms and round up any 'trouble-makers'.

The effect of the Macquarie's 1816 punitive expeditions against the Aborigines of the Hawkesbury-Nepean was almost immediate and put an end to organised Aboriginal resistance on the Cumberland Plain.[67]

---

[64] *HRA 1(9): 141*

[65] *HRA 1(9): 141*

[66] *Macquarie to Bathurst, 8th June, 1816, HRA, 1(9): 139-140*

[67] *Kohen, 1985*

3.6.3 Assimilation & Population Decline

Regional hostilities ended in 1816 and a new era of European-Aboriginal relations commenced. Devastated by dislocation and depopulation due to small pox, neglect and violence against them, and with reduced access to traditional food resources, Aboriginal groups became more dependant on Europeans to provide them with food clothing and shelter.[68]

While traditional lifestyles continued to some degree, particularly in the more remote areas of the greater Sydney district, many remnant bands of Aborigines began to congregate on the fringes of white settlement and on the estates of some larger landowners where they were afforded some autonomy and protection. The *South Creek Tribe* for example, often camped at *Mamre*, Charles Marsden's property near the junction of South and Eastern Creeks. A clan group of the *Tharawal*, the *Cubbitch-Barta,* resided on John Macarthur's property at Camden.[69]

While the white population of the Hawkesbury continued to grow, the Aboriginal population seriously declined, as the effects of violence, disease and dislocation became manifest. In 1827, Aboriginal returns associated with Government distribution of blankets and slop clothing reveal that 114 Aborigines were recorded at Portland Head in that year. The breakdown of the district tribes was as follows[70]:

Return of Aboriginal Natives at Portland Head - 1827		
Tribe	**Males, Females & Children**	**Total**
Mangaroo Tribe	9; 5; 4	18
Northeast Arm Tribe	8; 6; 8	22
Mullet Island Tribe	4; 5	9
First Branch Tribe	25; 22; 18	65
Total of All Tribes		114

[68] *Kohen, 1985*

[69] *Russell, 1914*

[70] *Table formatted from information in Banks, 1990: 100*

This was only eleven years after one punitive expedition into the Hawkesbury Valley had recorded *'...not less than 400 blacks'*.[71] By the 1850s, there were fewer local Aboriginal people still with Reverend T.C. Ewing, a regular visitor to the Hawkesbury and Pitt Town Parson noting, *'we see no blacks here now'*.[72]

While the Hawkesbury Aborigines were fewer in number, they had not disappeared, as some of the district settlers would have hoped. Some members of the Aboriginal community simply moved away, others obtained work on the properties of benevolent settlers and others congregated on fringe camps. One property within the broader study area that provided work and rations for Aborigines was the farm of the Hall Family at *Lilburndale* on the West Portland Road.[73] Within regards to the fringe camps, a number of informal communities consisting of traditional people and dislocated Aborigines from elsewhere, established themselves periodically at Richmond, Windsor and Sackville Reach.[74]

There are few references relating to the Aborigines of the Hawkesbury region until the 1880s. In 1881, it was recorded that 31 members of the Lower Portland Tribe had gathered at Windsor to receive the annual distribution of blankets on the Queen's birthday.[75] This number was significantly lower the figures reported for Portland Head in 1827. Interestingly there was no subdivision of the group into the various clan groupings recorded in the 1820s, which suggests both depopulation and a breakdown of traditional Aboriginal social groups.

3.7 Site Specific History

3.7.1 Methodology

Site-specific historical research undertaken for this study was based largely on secondary written material along with pictorial evidence, and early maps of the site and surrounding lands. A range of sources were consulted including, primary and secondary historical documents. Sources of primary historical documents were

[71] *cited in Brook, 1999: 14*

[72] *William Clarke Papers cited in Brook, 1999: 16*

[73] *Nichols, 2004: 5*

[74] *Brook, 1999: 14-15*

[75] *The Australian, 28 May 1881*

the Land Titles Office, Mitchell Library, State Archives NSW, and Hawkesbury Local Studies Library.

Due to time constraints, the research undertaken for this project was comprehensive, however it was not exhaustive. Further, more extensive research may provide additional information regarding the development of the subject site.

Historical research undertaken for this study identified five broad phases of European land use and occupation. These are:

- Exploration and Early Settlement (1789-1806);
- Consolidation of Farming Activities (1806-1868);
- Notification of the Reserve and early Gravel Extraction (1868 – 1924);
- Sand and Gravel Extraction (1924 – 1990's); and
- Yarramundi Reserve (1990's to Present)

3.7.2 Early Settlement

Information specific to the subject site that has been identified by this research is limited. The earliest plan showing the subject site and grants surrounding it dates to 1822, the only grant indicated in the vicinity of the subject site at this time is that of Obadiah Ikin (refer to Figure 10). The accuracy of the plan is questionable as accounts from the Sydney Gazette indicate that the land was no longer owned or occupied by Obadiah Ikin in 1822. The land was probably granted prior to 1806 which is the earliest account of Ikin occupying the 160 acres.

Ikin's Farm was granted prior to 1806. – Account from Sydney Gazette, December 28, 1806, pg2 column b.

> *Stolen or strayed from Ikin's farm at the Nepean, five goats the property of M. Kearns. If strayed the person returning them will be handsomely rewarded; and if Stolen, the sum of Twenty pounds will be paid to any person giving information that shall lead to conviction, by me,*

M. Kearns[76]

Two years later M. Kearns posted a notice in the Gazette advertising the land for let, this description suggests that the land had passed from Obadiah Ikin to M. Kearns.

> *To Let – Farm*
>
> *Known by the name of Kearns Retreat at Richmond Hill, or Nepean Point, containing 160 acres, 50 cleared with two miles square of pasture bounded by the rivers Nepean, Grose and Blue Mountains.*
>
> *M.Kearns, Pitt Row, Sydney*[77]

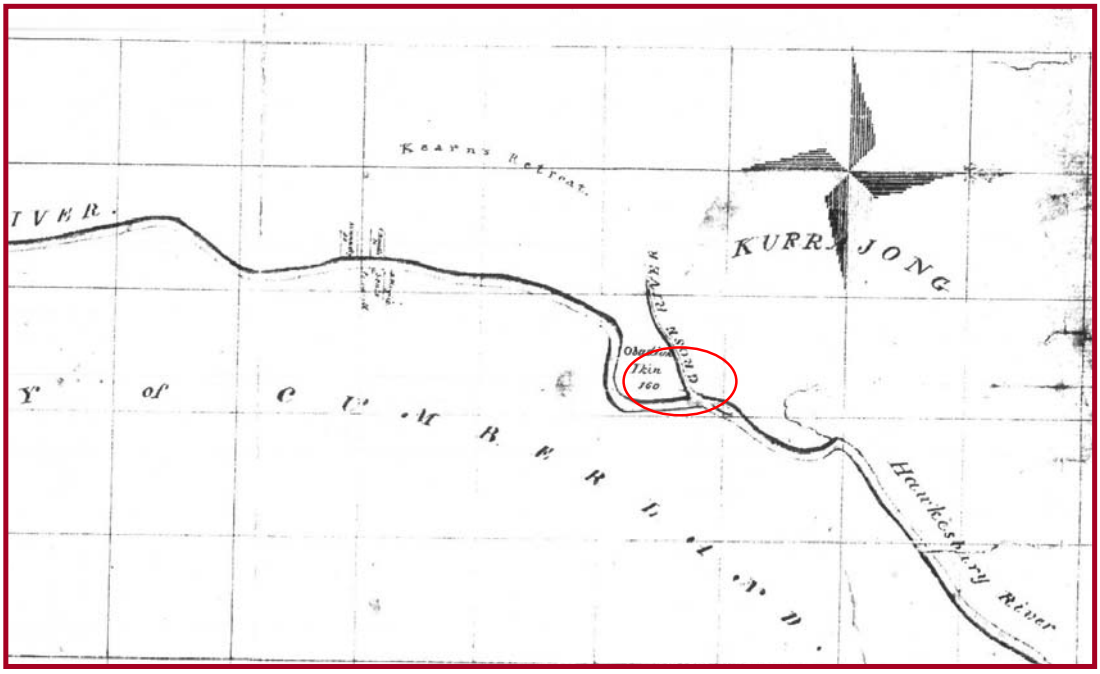

Figure 10. *Part of an anonymous sketch of the Nepean River from Grose River to Emu Plains, 1822 (AO Map 4411). The approximate location of the study area is circled.*

The settlers in the region faced many difficulties including drought, caterpillar plagues and "rust" which affected the wheat crops, however by far the most

[76] *Sydney Gazette, December 28, 1806: 2*

[77] *Sydney Gazette, December 25, 1808: 2*

destructive force of nature that the settlers had to contend with was the river itself. Phillip and his party had recognised signs that the river was prone to flooding during their early exploration of the region, their concerns were largely ignored by the British who chose to settle in the region. Following several years of drought a deluge of rain, caused the Hawkesbury to flood, with water level reaching 15.25 metres above average river level. This was to be the first of many flood events on the Hawkesbury during the Nineteenth Century.

The danger that the flooding posed to the settlers at the upper Hawkesbury was of concern to Governor Macquarie who following his arrival in NSW in 1809 identified the establishment of towns on high ground as a priority in this area. The sites of the towns for Richmond, and Windsor were largely based on the advice given to Macquarie by Andrew Thompson, who had arrived at the Hawkesbury as the Constable for the fledgling settlement

Within the years following their establishment the towns and the surrounding farm lands began to develop a permanency that had been lacking in earlier years. In 1813 Macquarie visited the region recording his movements and thoughts regarding the country through which he travelled. His entry for Saturday April 17th 1813 described a visit to the vicinity of the study area.

> *"Breakfasted at the confluence of the Grose & Nepean Rivers; crossed the latter on Horseback by an easy Ford close to our Breakfast Place, and ascended the mountain to the Summit, which we reached about Noon – the distance thither from where we crossed the Nepean being about Five miles".*[78]

Macquarie returned to the area later that year on Thursday 11th of November 1813. The following extract from is journal entry for this day, describes the state of the land in the area.

> *"Rode wt. Capt. Mitchell &c. &c. along the Banks of the Hawky. as far as the confluence of the Nepean & Grose Rivers; and was equally gratified wt. the fine appearance of the Crops in that part of the Country."*[79]

[78] *http://www.lib.mq.edu.au/digital/lema/1813/1813april.html*

[79] *http://www.lib.mq.edu.au/digital/lema/1813/1813nov.html*

3.7.3 Notification of the Reserve

Land encompassing the subject site was notified as a reserve on the 16th April 1868. A lease for the removal of ballast and gravel from the island was granted to Messers A.L. & A.S Hough. Exact dates of this lease have not been determined by historical research undertaken for this study however as it is not indicated on the 1903 parish map it must have been cancelled between 1893 and 1903. The extent and nature of this operation has not been identified by research undertaken for this study, however, the description of the material as "ballast", suggests that it may have been used in the construction of railways. It is possible that the material was used as ballast in river boats, although this is less likely, given the location of the site above the navigable reaches of the river. Ballast could have been loaded more easily in other parts of the river.

A mill race is also indicated on the 1893 Parish Map (Parish of Nepean County of Cook – refer to Figure 11). This race appears to have been partly silted up at this time indicating that it was no longer in use. No evidence if a mill on the subject site has been identified by research for this study, taking the direction of river flow and gradient into consideration the most likely location for a mill would be at the point that the race meets the former western channel of the Grose River.

The only mill within the general vicinity of the site identified by research undertaken for this study was located on the high ground between the Nepean River and Yarramundi Lagoon. The annotation adjacent to the mill is "Howell's Old Mill", along with "Chimney". Given its location on a terrace between the river and lagoon together with an annotation that says "chimney", it is considered most likely that this mill was a steam powered mill and was not associated with the mill race. George Howell did own a water mill at Richmond, between 1830-1841, and given the proximity of the mill race to the steam mill it is possible that the race was associated with Howell's water mill.[80]

80 Returns and Manufactories, mills, machinery, mines and quarries in the District of the Hawkesbury, AO NSW Loc. 4/7267 (compiled in Barkley and Nichols 1994)

Figure 11. *Part of 1893 Parish Map, Parish of Nepean, County of Cook (NSW Dept of Lands PMPP). Note the "Mill Race" indicated within the study area (marked by red arrow).*

3.7.4 Sand & Gravel Extraction (1924 – 1990's)

During the early 1900's there were two sources of sand and gravel for the Sydney market, dune sand from Mascot or Rosebery, and river sand from the Nepean. Following World War One, the demand for the higher quality river sand increased due to several public building contracts. The extension of the branch railway from Richmond to Kurrajong opened up an additional point of access/export for Nepean Sand at Richmond.[81]

A local resident, Mr W Percival obtained a mining lease over eighty five years, of part of the sand island at the Junction of the Grose and Nepean Rivers. This

[81] *Wilson 1985: 3*

location was three miles south of the proposed branch railway. Following the start of construction works on the railway, Mr Percival proceeded to float a company named the Nepean Sand & Gravel Company Limited. Two major share holders in the new company were James Hardie Ltd and Concrete Constructions Ltd.[82]

The initial plan for operations on the island consisted of an aerial ropeway from the island to the eastern bank of the Nepean River, where a company Railway would run the two and a half miles to the branch line. Early on, the board foresaw the problems associated with the flooding of the river, they therefore chose to locate most of their plant on the river bank adjacent to the branch line.[83]

In September 1924, Dorman Long & Co Ltd, concerned that there would not be enough supply of quality material for their Sydney Harbour Bridge Contract bought shares in the company.[84] Construction of the ropeway began in October 1924, and plans for construction of a crushing and screening plant on Mr Nowlands farm were presented to council. This area was to become known as "the Depot".[85]

Dr Bradfield, the engineer in charge of the construction of the Sydney Harbour Bridge visited the site in February 1925 to inspect the sand deposits, which were an immediate priority for the bridge construction. Finally, following testing of the aerial rope way, production on the island began in March 1925.[86] Initially extraction on the island was fairly simple and labour intensive, the overburden was removed with horse drawn scoops revealing the "clean sand" below, which was shovelled through screens into portable skips. The skips were horse drawn to a central point where they were emptied into a small elevated holding bin which fed the aerial ropeway buckets.[87] A horse drawn two foot gauge railway led from the ropeway to the Depot.

Within the first year of operations the Company made moves to increase production. In 1926, two Barber and Greene mechanical loaders were purchased - their introduction dramatically cut the workforce on the island while

[82] *Wilson 1985: 3*

[83] *Wilson 1985: 3*

[84] *Wilson 1985: 4*

[85] *Wilson 1985: 4*

[86] *Wilson 1985: 4-5*

[87] *Wilson 1985: 5*

simultaneously increasing production.[88] A new 3ft 6inch gauge railway was constructed towards the end of 1926. This railway could carry the new larger loading bins required for the two steam powered draglines that replaced the Barber Greene's in 1927.[89] The tracks on the island at this time were to an extent temporary, as they were moved around to service the points of extraction as needed.[90] The trucks were hauled by chain driven rail tractors, which could haul up to six skips.[91]

Increased production on the island affected the running of the rope line, which had not been up graded during these first years of operation. Meal breaks were staggered so that the line could operate continuously and with the introduction of the draglines a second shift working the rope line was required to raise the stockpiles produced by a single production shift.[92]

The ropeway was quickly replaced, and in 1927 a standard gauge railway was constructed between the Island and the Depot, following Yarramundi road until it crossed it at its junction with Crowleys Lane, from here it headed west towards the river where it turned and followed the river bank for a short distance (refer to Figure 12). Near to the island it cut down through the river bank, curving to the level of the Island, where it crossed the river on a timber trestle bridge, terminating at the existing bins, approximately 30 feet higher than the river level.[93] The sand and gravel were now separated on the island in the bins using a series of trammel screens to separate the sand and size grade the gravel. Two steam engines were bought to work the new rail line, *Big Emma* an 1104 locomotive and a less powerful F-Class nicknamed *Little Mary.* During times of peak production, both engines would operate on the line, with *Big Emma* taking the stone, and *Little Mary* the sand.[94]

[88] *Wilson 1985: 5*

[89] *Wilson 1985: 6*

[90] *Wilson 1985: 6*

[91] *Wilson 1985: 6*

[92] *Wilson 1985: 6*

[93] *Wilson 1985: 7*

[94] *Wilson 1985: 8-9*

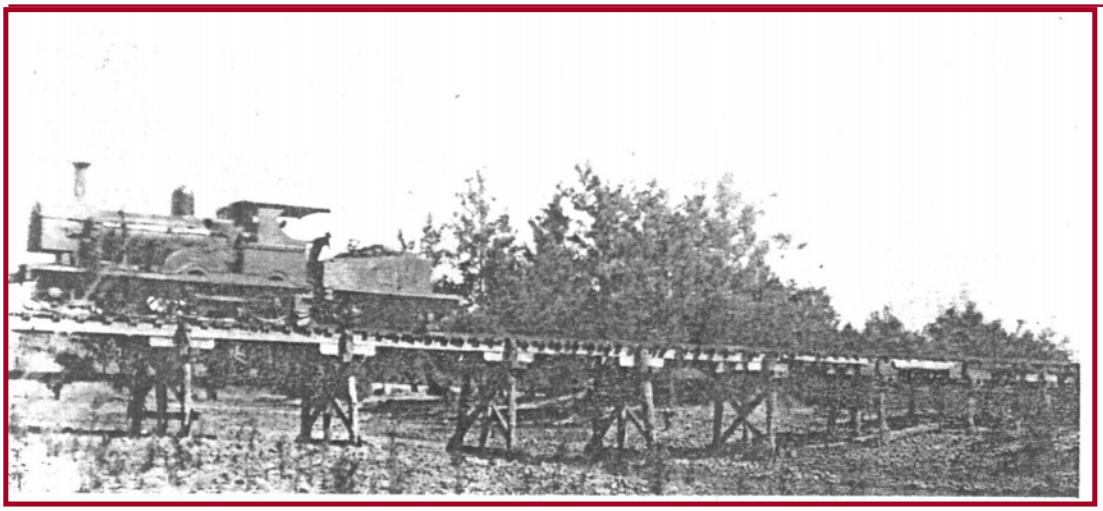

Figure 12. One of the company steam engines crossing the channel of the Nepean River c1936. The river was almost dry at the time the photograph was taken. (Wilson 1985: 12)

Growth continued during 1928 and 1929, largely on the back of orders for public works projects, such as the Sydney Harbour Bridge, the City Railway, Bunnerong power Station, and dams like Woronora and Cataract, as well as major road projects.[95] A steam navvy was purchased for use on stockpiles and overburden.

While the Great Depression affected the profits of the Nepean Sand And Gravel Co. they managed to diversify their market, by supplying small orders of less than a rail truck load, allowing them to maintain a profitable operation from 1929-31. Many of these clients were for private construction jobs in the city and inner suburbs. The sand and gravel were transported to Sydney via rail and delivered via lorries direct to the customers.[96]

By 1932 the company was struggling and reported its first loss in that year. Production was limited to Monday - Wednesday. At the prices going at that time, sand was not profitable, and while gravel production continued the sand was pumped back into the river. The draglines were modified so that they had a screen rather than a bucket, to allow the sand to pass through while still collecting gravel which was loaded directly into the rail mounted skips. Separating and grading bins operating on the island were no longer necessary and ceased operation in 1932.[97]

[95] *Wilson 1985: 9*

[96] *Wilson 1985: 11*

[97] *Wilson 1985: 13*

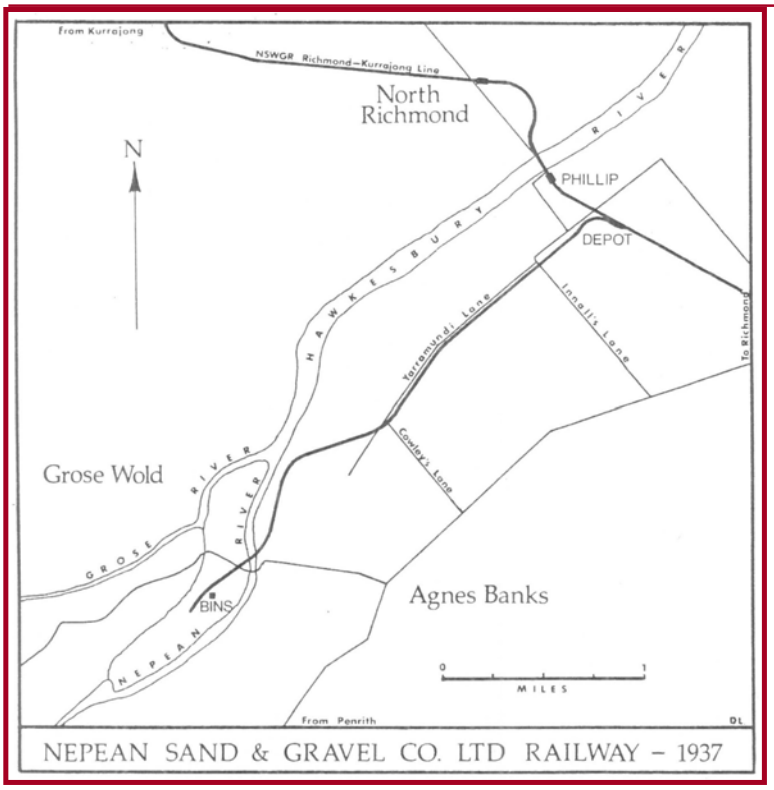

Figure 13. Map showing the location of the bins on the island, the railway linking the island to the depot in 1937 (Wilson 1985: 8).

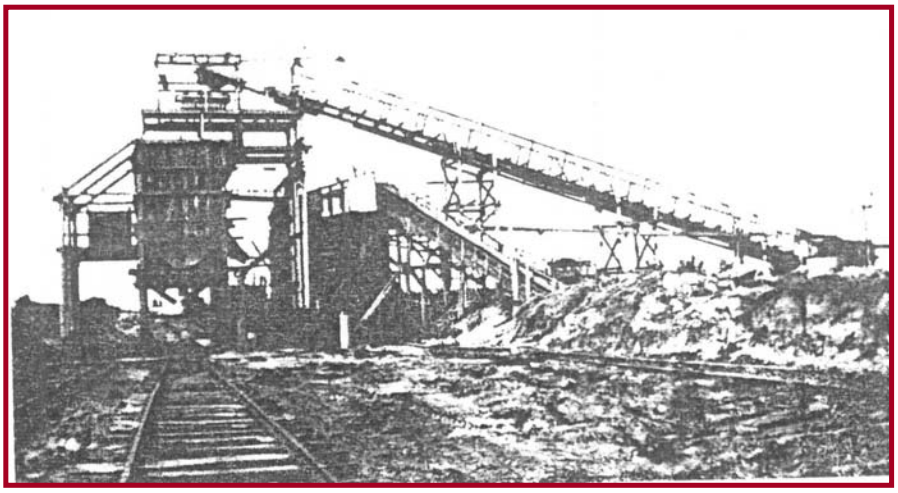

Figure 14. Island plant under construction in 1939. The original bins are the smaller structure to right of the larger new structure (Wilson 1985: 17).

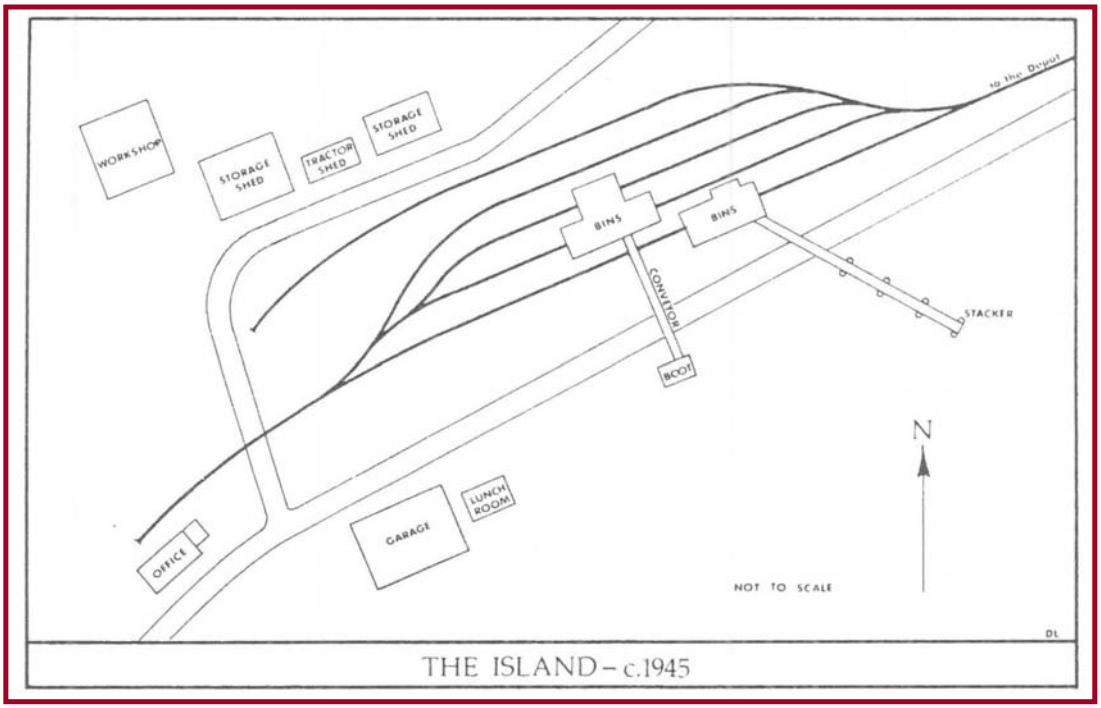

Figure 15. *Map showing buildings and plan on the island c.1945 (Wilson 1985: 19)*

In 1935 following several years of struggling to compete with government quarries for large public works programmes, seven private quarry owners entered into an agreement to tender for the State Metal Quarries and were successful.[98] Modernisation as a means to increase productivity was a priority for the co-operative however it was slow to eventuate. The introduction of lorries to the operation in 1937 was to have the most dramatic effect on operations at the Yarramundi Quarry. An additional set of holding bins were constructed on the island, and the plant at the Depot was closed down in March 1940. The railway was now limited to distribution of product, its internal role had been superseded by the lorries.[99]

[98] *Wilson 1985: 16*

[99] *Wilson 1985: 18*

During the early years of World War Two production declined, however following the fall of Singapore in 1942, the Garden Island Graving Dock was flagged as a priority, and many thousands of tons of material would be required for its construction. The company became a protected industry under manpower control.[100]

It was during the war period that the use of lorries for deliveries direct from the quarry began. While more expensive, lorries were better suited to the market developing at the time because they were able to deliver directly to the customers work site. [101]

Late in 1948 NSW Associated Blue Metal Quarries made a successful takeover bid, however the day to day running of the quarry and the plant on the island remained unchanged until the 1960's when a new sand classifying plant was built. A flood shortly after its completion washed away the entire infrastructure on the island except for the gravel bins constructed in 1939, which were partly undermined and later demolished. [102]

Comparison of a series of historical aerial photographs of the island (Figures 3, 4 and 5) indicate that workings in the second half of the twentieth century were undertaken across the area of the earlier plant. The bins and plant associated with the later operations also moved several times during this period. Operation of the quarry was continued by Blue Metal industries until the 1980's when operations were taken over by Boral Ltd who ceased extractive operations in 1989.[103]

3.7.5 Yarramundi Reserve

Boral Ltd were granted permissive occupancy of the crown land at the northern end of the island in 1987. The permissive occupancy was granted to allow removal of material and storage on the basis that the land was restored. In addition Boral agreed to return a portion of the land for creation of a public reserve. In 1994

[100] *Wilson 1985: 18*

[101] *Wilson 1985: 20*

[102] *Wilson 1985: 21*

[103] *Wilson 1985: 21*

following completion of restoration works by Boral Resources, the permissive occupancy was terminated.[104]

Hawkesbury City Council became the Trust Manager of Yarramundi Reserve in April 2002 when the Reserve was gazetted as Reserve 1003168 for the purpose of public recreation and environmental protection. Council commissioned restoration works (Weed control, bush regeneration and revegetation) within the reserve from November 2002 to present. After some initial landscaping works (car park, entry walls etc), the reserve was officially opened to the public in April 2007.

[104] *LandArc 2002: A2-5*

4 ARCHAEOLOGICAL CONTEXT

4.1 Regional Aboriginal Archaeological Context

For the purposes of determining settlement and site location patterns, archaeologists examine regional and local trends in the distribution of known sites in relation to environment and topography. This provides evidence about economic and social systems in the past and also assists archaeologists in predicting likely site types, site locations and the nature of the archaeological resource in any given area.

4.1.1 General Background

The archaeology of the Sydney region has been well documented through a large number of academic studies, regional management studies and impact assessment investigations over the past 30 years. More than 4,500 sites have been recorded and registered with the DECC *Aboriginal Heritage Information Management System* (AHIMS) for Sydney, reflecting both the wealth of archaeology in the region and the number of archaeological investigations undertaken. The Cumberland Plain is the most intensively investigated archaeological landscape in Australia.

The dominant site types in the Sydney region (in the 15 - 20 % frequency range) are rock shelters with midden deposit, rock shelters with art, rock art engravings and open artefact scatters[105]. Site types in the 5 - 15 % range include rock shelters with artefacts, grinding grooves and open middens[106]. The distribution, density and size of sites are largely dependent on environmental context. For instance, middens are found in close proximity to marine, estuarine and less often, freshwater bodies. Rock shelters are only found in areas of exposed sandstone escarpment and grinding grooves are found on areas of exposed flat bedded sandstone near a source of water.

[105] *Attenbrow 2002: 49*

[106] *ibid*

4.1.2 Early Occupation

Aboriginal occupation in the region dates back well into the Pleistocene period (ie. before 10,000 years ago). This evidence comes from radio carbon (C14) dates retrieved from excavated sites at Cranebrook Terrace (41,700 years before present [BP]), Shaw's Creek K2 (14,700 BP)[107] and George & Charles St Parramatta (c.25,000 – 30,000 BP)[108]. The dating of Cranebrook Terrace deposits have been revised[109] and the identification of stones from the terrace as artefacts has also been challenged[110], so at this time the George and Charles Street site is considered as the oldest reliable date for Aboriginal occupation in the Sydney region.

The early occupation sites dating to the late Pleistocene /early Holocene have been found in deep stratified rockshelter deposits and within alluvial deposits, particularly on the margins of large rivers such as the Hawkesbury-Nepean and Parramatta Rivers. Drawing on this evidence, McDonald has recently argued that early occupation of the Sydney basin was focused on these primary river systems and characterised by a high degree of 'residential mobility'[111] between small numbers of sites[112]. In our opinion it is unclear whether these patterns are real or biased by the exceptional preservation conditions found in deep alluvial deposits created by the large rivers. More work is required to test McDonald's model, specifically identifying and investigating landforms and deposits with potential to contain intact Pleistocene evidence, particularly those further away from the primary river systems.

[107] *Shaws Creek and Cranebrook Terrace are both located in the Penrith area*

[108] *As cited in Attenbrow 2002:18-19; Cranebrook Terrace [41 700 +3000/-2000 ANU-4016]; Shaw's Creek [14 700±250 Beta-12423]*

[109] *Stockton & Nanson 2004*

[110] *Attenbrow 2002: 20-21*

[111] *frequent movement between campsites*

[112] *McDonald 2005a*

4.1.3 Intensification during the Holocene Period

The vast majority of dated sites in the Sydney region are less than 5,000 years old (35 out of a total of 48 dated sites). It has been argued that this is a result of increased populations and 'intensification' of cultural activity during this period. The prevalence of sites dating to the last 5000 years may also be a result of the last significant rise in sea level, approximately 6000 years ago. The sea level rise would have submerged many of the older sites along the coastal fringe and forced Aboriginal groups westward to the current coastline.

In an attempt to better understand changes in use and occupation during the Holocene period, Val Attenbrow undertook a detailed study of the Upper Mangrove Creek catchment to the north of Sydney.[113] Attenbrow's study found significant changes in site patterning during the Holocene, notably, a gradual increase in habitation sites during the early Holocene followed by a dramatic increase after 2,000 BP. During the study, sites were classified as either *base camps* or *activity locations/transit camps* based on comparative millennial artefact accumulation rates.

Using these criteria Attenbrow found that:

- Very few base camps were established during the early Holocene. It was not until the 4th millennium B.P. that more base camps were established; at the same time as ground-edged implements were introduced into the assemblage;
- During the 3rd millennium BP base camps substantially increased with a reversal in the ratio of base camps to activity/transit camps; and
- During the last 2,000 years a dramatic increase in activity/transit camps occurred, but no new base camps were established - suggesting a dramatic increase in residential mobility.

Continually changing distribution patterns indicated a re-organisation of mobility patterns of occupation and use at frequent intervals, particularly during the last

[113] *Attenbrow 2003*

4,000 years. Although more detailed studies are required, particularly in regard to the classification of 'base camps', the Mangrove Creek investigations demonstrate at a broad level that:

- The number of occupation sites increased over time, particularly after 2000 BP; and
- shifts in site patterning indicate periodic re-organisation of residential mobility.

4.1.4 Regional Site Patterns

A study of the regional archaeology of the Cumberland Plain by Dr Jim Kohen made a number of findings about site location patterns in the Sydney area. The study demonstrated that proximity to water was an important factor in site patterning. Kohen found that 65 % of open artefact scatter sites were located within 100 metres of permanent fresh water[114]. Only 8 % of sites were found more than 500 metres away from permanent fresh water. In short, Kohen argued that open artefact scatters are larger, more complex and more densely clustered along permanent creek and river lines. Kohen's study also found that Silcrete (51 %) and Chert (34 %) are the most common raw materials used to manufacture stone artefacts[115]. Other raw materials include quartz, basalt and quartzite.

Although the patterns described above have been generally supported by subsequent investigations, Kohen's study was limited by a reliance on surface evidence. Extensive excavation across the Cumberland Plain has since shown that areas with no surface evidence often contain sub-surface deposits buried beneath current ground surfaces. This is a critical consideration in aggrading soil landscapes, such as those commonly found across the Cumberland Plain and Woronora Ramp. In a 1997 study of the Cumberland Plain, McDonald[116] found that:

- 17 out of 61 excavated sites had no surface artefacts prior to excavation;
- The ratio of recorded surface to excavated material was 1:25; and

[114] *Kohen 1986: 229-275*

[115] *Kohen 1986: 280-281*

[116] *McDonald 1997*

- None of the excavated sites could be properly characterised on the basis of surface evidence. In short, surface evidence (or the absence of surface evidence) does not necessarily indicate the potential, nature or density of sub-surface material.

The results of McDonald's study clearly highlight the limitations of surface survey in identifying archaeological deposits in this landscape. The study also shows the importance of test excavation in establishing the nature and density of archaeological material on the Cumberland Plain.

McDonald developed a predictive Aboriginal site location model based on previous archaeological studies across the Cumberland Plain and the results of archaeological survey and excavation across the Australian Defence Industries (ADI) site near St Marys. McDonald predicted that archaeological evidence is likely to occur across the entire landscape. Areas of archaeological potential were predicted wherever there has been limited prior surface disturbance[117]. It was predicted the size (density and complexity) of archaeological sites will vary according to permanence of water (stream order), landscape unit and proximity to stone sources as follows[118]:

- In the headwaters of upper tributaries (first order creeks) archaeological evidence will be sparse and represent little more than background scatter;
- In the middle reaches of minor tributaries (second order creeks), such as the tributary of Menangle Creek in the Noorumba Reserve, archaeological evidence will comprise sparse but focused activity (one-off camps, single event knapping etc);
- In the lower reaches of tributary creeks (third order), such as Menangle Creek, there will be evidence of more frequent occupation including repeated occupation by small groups, knapping floors and evidence of more concentrated activities;

[117] *Jo McDonald CHM 1997: 56*

[118] *Jo McDonald CHM 1997: 56-57*

- On major creeks (fifth order), such as the Georges and Nepean Rivers, archaeological evidence will reflect more permanent or repeated occupation. Sites will be complex and may be stratified;
- Creek junctions, such as the junction of Menangle Creek and the Nepean, may have been a particular focus of occupation;
- Ridge top locations between drainage lines will usually contain limited archaeological evidence although isolated knapping floors or other forms of one-off occupation may be present; and
- Sites in close proximity to an identified stone source will include stone artefacts with a range of size and cortex characteristics. The general size of artefacts and percentage of cortex will both decrease with distance from source.

Although the patterns described above may provide a useful general guide to site patterning and inferred cultural behaviour, there are always exceptions such as large waterholes or wetlands on upper tributaries that were important resource zones and attracted repeated and complex Aboriginal occupation. This point is illustrated by McDonald's recent work across the Rouse Hill Development Area (RHDA)[119] which found similarity in the composition of lithic assemblages across different landforms. Comparison of 'Marginal' sites (further away from permanent water) with those adjacent to Seconds Pond Creek (a 2nd order permanent water source) showed only subtle variations, such as slightly lower cortical lithics and higher frequencies of modified artefacts in marginal site assemblages. In short, although lithic assemblages decreased in scale and repetition further away from water, the composition of assemblages remained fairly consistent across the entire landscape.

McDonald concludes that classifying various landscape evidence according to site types (such as residential base camps, dinnertime camps etc) is not a useful framework for interpreting the archaeology of the Cumberland Plain.

[119] *McDonald 2005a*

4.1.5 Stone Artefacts

Aboriginal stone artefacts are an important source of archaeological information because stone is preserved for long periods of time whereas organic materials such as bone, shell, wood and plant fibres decay. Stone artefacts provide valuable information about technology, economy, cultural change through time and settlement patterning. Stone has also been used for 'relative' dating of sites where direct methods such as Carbon dating cannot be applied. A technological sequence for stone artefacts for the region was first described in the late 1940s by Fred McCarthy and has since been refined[120]. Known as the 'Eastern Regional Sequence' it was based on direct dating of excavated sequences. Some debate about the precise nature and significance of the technological changes described still continues[121], therefore the ERS should be regarded only as a general guide to technological change. The ERS phases are as follows:[122]

Capertian – is distinguished by large uniface pebble tools, core tools, horsehoof cores, scrapers and hammerstones. Backed artefacts are occasionally present. Generally dates to before 5,000 years before present (BP).

Early Bondaian – Aspects of the Capertian assemblage continue, but backed artefacts and ground-edged artefacts increase. Artefacts during this period were predominantly made from fine-grained silicious stone such as silcrete and tuff. Generally dated from 5,000 BP to 2,800 BP.

Middle Bondaian – Characterised by backed artefacts, particularly Bondi Points and ground-edged artefacts. Artefacts made from silicious materials, however quartz becomes more frequent. Generally dated from 2,800 BP to 1,600 BP.

Late Bondaian – characterised by bipolar technology, eloueras, ground-edged artefacts, and bone and shell artefacts. Bondi points are virtually absent and artefacts are predominantly made from Quartz. Generally dated from 1,600 BP to contact

---

[120] *The ERS is currently being re-examined by Hiscock & Attenbrow.*

[121] *Hiscock & Attenbrow 2002; Hiscock & Attenbrow 1988; Hiscock & Attenbrow 2005*

[122] *Based on Attenbrow 2002:152-159*

4.2 AHIMS search results

A search of the DECC Aboriginal Heritage Information Management System (AHIMS) for a five kilometre area surrounding the study area was undertaken to identify previously recorded sites in and around the study area (refer to Figure 3.1).

Two Aboriginal stone artefact scatter sites (AHIMS # 45-5-0444 & 45-5-0443) have been recorded within the study area. Both sites were identified by Brayshaw and Happ in 1983 during a survey for a sand and gravel extraction operation[123]. An overlay of the Brayshaw & Happ's site location plan on a current aerial photo of the site indicates both sites are now located within the large artificial lagoon created by the sand extraction operations. This strongly suggests both sites were destroyed by the extraction operations.

A total of 35 sites have been recorded within the search area, encompassing the following site types and frequencies:

- Open Camp (Artefact Scatter) - 22
- Axe Grinding Groove – 7
- Shelter with Art / Deposit – 5
- Rock Engraving – 1

An analysis of the search results provides an indication of local site patterning. The AHIMS search results show a predominance of open camp sites, which is typical of shale and alluvial landscapes of the Cumberland Plain. Some of the artefact scatter sites along the margins of the Hawkesbury-Nepean system are primary reduction or 'on source' sites due to their close proximity to flakable stone sources found in gravel and cobble deposits on the river beds and banks.

The other site types (rock shelter, axe grinding groove, engravings) are only found in areas of outcropping sandstone bedrock. There is no outcropping bedrock within Yarramundi Reserve, therefore there is not potential for these site types in the Reserve.

[123] *Brayshaw & Happ 1983*

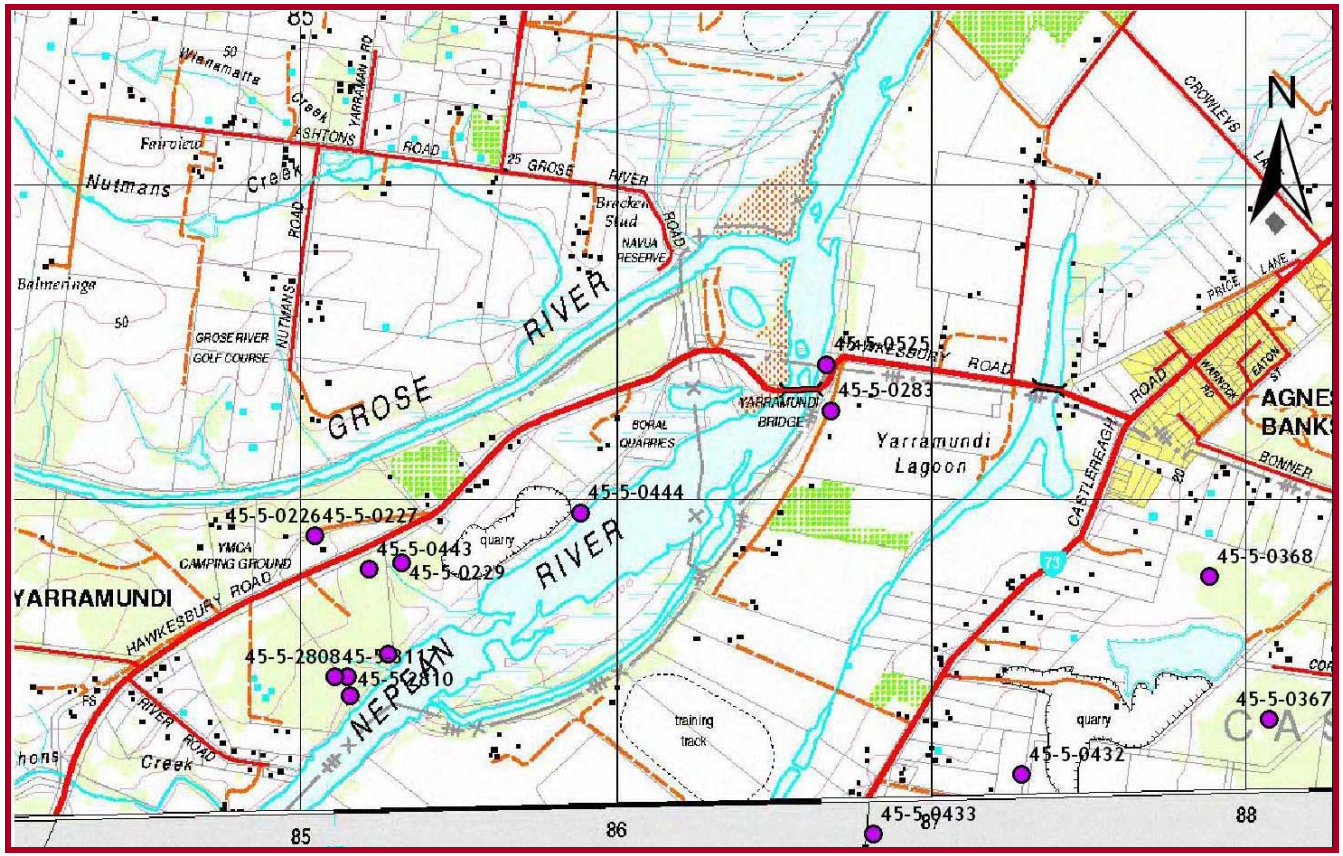

Figure 16. *Topographic map showing recorded sites within the search area on the DECC AHIMS register (Source: Topoview. Dept of Lands).*

4.3 Local Archaeological Context

A small number of archaeological studies have been undertaken near the study area. Archaeological investigations have been primarily surveys for development and environmental impact assessments. This section provides a review of studies in the local area as a means of determining site types and site distribution in the local area, and the nature of the archaeological resource.

4.3.1 Cranebrook Terrace 1974 - 2000

The quaternary alluvial deposits of the Cranebrook terrace formation, located on alluvial terraces of the Nepean River, south of the current study area, were the subject of an archaeological study undertaken by Stockton and Holland in 1974[124]. During an investigation of quarrying operations near the Nepean River where the Penrith Lakes complex is now located, Stockton and Holland reported the discovery of a range of 'choppers and steep-edged scrapers', including one chopper that was reportedly in-situ within the gravel unit. A radiocarbon date of approx 30,000 BP was obtained from a log found within the gravel unit from which the artefacts were found.

Subsequent geomorphological investigations of the Cranebrook terrace deposits by Nanson & Young[125] included a series of radiocarbon and thermoluminescence dates which indicated the terrace deposits dated to the period 40,000 – 45,000 BP. This suggested an even earlier date for the cultural material reported by Stockton and Holland. More recent geomorphological investigations by Nanson have significantly revised the earlier dating of terrace deposits; however, the unit that contained the cultural material reported by Stockton and Holland is now thought to date to the period 40,000 – 50,000 BP[126].

The Cranebrook terrace findings have been criticised on a number of fronts. Firstly, it has been argued that the cultural material identified by Stockton and Holland was not in-situ and may have derived from more recent units above the Pleistocene terrace. The recent significant revision of dating presented by Nanson also suggests

[124] *Stockton & Holland 1974*

[125] *Nanson et al 1987*

[126] *Stockton & Nanson 2004*

that more work needs to be done to confidently assess the age of the terrace deposits. Secondly, the identification of the stones as cultural artefacts has also been questioned[127]. However, in her textbook *Archaeology of the Dreamtime*, Josephine Flood reports personally examining the stones and concluding there are definite artefacts amongst the collection, including ovoid scrapers and choppers characteristic of the pre-Bondaian core-tool and scraper tradition[128].

In conclusion, although there are real concerns about the integrity of the artefacts and dating of the terrace deposits, on balance it is likely that at least some of the artefactual material derives from gravel deposits that date to the Pleistocene period. Therefore the Cranebrook Terrace deposits should be considered a regionally significant geo-archaeological unit. Similar deposits may have been present within the current study area prior to the extensive sand and gravel extraction during the 20th century.

4.3.2 Jamisons Creek 1977 - 1984

In the late 1970's and early 1980's Jim Kohen investigated an extensive artefact scatter site on a terrace of the Nepean River beside Jamisons Creek[129]. Jamisons Creek is located to the south of our study area on the western side of the Nepean River.

A surface collection of the Jamisons Creek site recovered almost 10,000 stone artefacts over an area of 775 square metres. All major categories of stone tools were found including stone axe heads, uniface pebble tools, elouera adze flakes, bondi points, geometric microliths, thumbnail discoid scrapers, bipolar cores, single and multiplatform cores and blade cores. Raw material types included chert, basalt, quartz from the Nepean gravels, quartzite, silcrete and siliceous wood. In addition to stone artefacts, post-contact artefacts were also found, including clay pipe bowl fragments and ceramics indicating that the site had been continuously used until at least the 1830s. Excavations at the site revealed a 1.5 metre deep deposit dating from 7,000 to 1,500 years BP. Unfortunately the site was heavily disturbed during the development of a sporting complex in 1984.

[127] *Mulvaney & Kamminga 1999, 138*

[128] *Flood 1995, 114*

[129] *Kohen 1984*

4.3.3 Lapstone Creek Salvage - 1977

In 1977 a salvage surface collection was carried out by Kohen at Lapstone Creek, between the railway line and the Great Western Highway, Emu Plains. The work was carried out prior to a housing development[130]. A large number of stone artefacts, including retouched implements, were recovered from the site. Ceramic pieces and broken glass, some with retouch, were also found dating to the period 1820-1840. Analyses of the assemblage indicated that the site had been continuously occupied for a long time period (estimated at around 24,000 years BP). The earliest industry was characterised by uniface pebble tools and scrapers made on cores and thick flakes. The Bondaian industry was not well represented in the assemblage (Backed artefacts were surprisingly rare). Eloueras, fabricators and edge-ground axes were also found and are thought to have extended into the contact period.

4.3.4 Shaws Creek KII – 1979 - 1980

In 1979-80, a team led by Jim Kohen and Eugene Stockton excavated a rockshelter called KII on the right bank of Shaws Creek. The site was located 700 metres upstream of the confluence of Shaws Creek and the Nepean River[131], on the western side of the river. The excavations recovered in excess of 25,000 pieces of worked stone and over 600 bone fragments. A series of 8 radiocarbon dates on charcoal samples indicated the site was occupied from c.13,000 BP.

The upper units of deposit contained a Bondaian assemblage with backed artefacts and fragments of ground-edged axes. The underlying earlier units lacked the forms and technology associated with Bondaian industry. These earlier deposits contained tools made on cores, pebbles and thick flakes with steep-angled retouch. The suite of evidence indicated the importance of sites located on resource intersection zones and the exceptional preservation conditions that are found in deep rockshelter sites.

[130] *Kohen, 1977*

[131] *Kohen et al 1981*

4.3.5 Regentville RS1 – 1994-1999

A series of archaeological investigations have been undertaken at a site called Regentville RS1, located approximately 4 kms south of Penrith between Mulgoa Creek and the Nepean River. The various investigations summarised below were undertaken in advance of an electricity sub-station development.

The initial archaeological survey, undertaken by Oakley & Koettig in 1994, identified the site RS1 and recommended test excavation[132]. Following the assessment, the site was subject to two phases of test excavation by Koettig & Hughes in 1995 and McDonald et al in 1996. Finally, the site was subject to salvage excavations undertaken by Craib & Bonhomme et al in 1999.

The initial test excavation found possible pre-bondaian occupation may have been present on the basis of heavily patinated artefacts 600 – 800 mm below ground surfaces[133]. The subsequent test excavations by McDonald et al found a low density of stone artefacts, none of which appeared to be pre-Bondaian in age. However, McDonald et al collected six samples of deposit in association with artefacts for thermoluminescence (TL) dating. The dates ranged from 3,000 – 12,000 BP, suggesting occupation may have extended back into the Pleistocene[134].

The discrepancy between dating and the technology was examined during the salvage excavation undertaken by Craib & Bonhomme et al[135]. They found that the stone artefacts were middle to late Bondaian and had been vertically displaced by natural processes such as bioturbation. This pushed the artefacts into older sediments, explaining McDonald's TL dates extending into the Pleistocene.

4.3.6 Rouse Hill Infrastructure Development

Jo McDonald Cultural Heritage Management and *Brayshaw McDonald* undertook a series of investigations associated with various stages of the Rouse Hill Infrastructure Development throughout the 1990's and most recently in 2005[136].

---

[132] *Oakley & Koettig 1994*

[133] *Koettig & Hughes 1995*

[134] *McDonald et al 1996*

[135] *Craib & Bonhomme 1999*

[136] *Jo McDonald CHM 2005, 2002 a & b, 1999; Brayshaw McDonald 1993 a, b & c*

The investigations covered a large area of urban release land in the vicinity of Kellyville and Rouse Hill. Although the development areas are located some 15 kilometres to the east of Yarramundi, the intensity and scale of the investigations give them relevance to understanding archaeological patterns across the Cumberland Plain. The intensity of study is reflected in the fact that a large proportion of the sites registered on the AHIMS were recorded as part of the ongoing Rouse Hill investigations. More than 1,800 square metres have been excavated during the project, yielding almost 68,000 stone artefacts.

Some key elements of McDonald's findings are presented in point-form below.

- Prior to excavation, many sites had little or no indication of artefacts on the ground surface – potential archaeological deposits should be identified on the basis of low levels of previous land use disturbance; and
- The percentage of indurated mudstone as a preferred raw material increased toward the northern end of the study area, while silcrete (mostly heat-treated) was predominant further south. There was an absence of obvious conservation strategies and identified local stone sources. This is problematic for explaining the variation in preferred stone types across the area.
- Most artefacts were small indicating people prepared and heat-treated stone near source and carried selected materials back to residential sites;
- McDonald's interpretation of the results of earlier excavation found that a range of functionally different site types were located in a range of differing environmental contexts, suggesting a complex relationship between site use, environment and resource distribution (particularly water sources). Subsequent investigations in the Second Ponds creek valley[137] modified this interpretation, suggesting that while lithic assemblages decreased in scale and repetition further away from water, the composition of assemblages remained fairly consistent across the entire landscape;
- Backed artefacts (commonly found across the landscape) were mostly made using asymmetric alternating flaking and considerable variation in their morphology suggests they were not standardised.

[137] *Jo McDonald CHM 2005*

- Functional analysis of the backed artefacts indicates they were multi-functional – used as spear barbs and as hand-held tools for plant / animal processing;
- Areas with sparse lithic scatter represent low levels of accumulated activity. Areas with > 20 lithics per square metre are likely to contain knapping concentrations.
- The presence of silicified tuff may indicate pre-Bondaian occupation.
- Fluvial deposits on a lower order tributary of Second Ponds Creek yielded a Pleistocene date. Although the date was not associated with cultural activity, it indicates significant changes in hydrology over time and suggests there is a potential for investigating Pleistocene occupation on lower-order drainage lines.

4.3.7 Blighton, Pitt Town – 2005

Archaeological and Heritage Management Solutions (AHMS) Pty Ltd undertook Aboriginal archaeological test excavation on a high terrace landform adjacent to the Hawkesbury River, just north of Pitt Town[138].

The primary aim of the investigation was to sample landforms present within the study area to determine whether Aboriginal sites and/or objects were likely to be present in subsurface deposits and gain an understanding of their nature, integrity and potential significance.

Transects were placed across various landforms, sampling the river bank, terrace slopes, floodplain, flood channel, the alluvial terrace capped with a sand levee and high ground on the northern edge of Lot 18. Twelve (12) 2 x 2 metre test trenches, situated at 60m intervals along transects, were excavated by a 7 tonne excavator equipped with a 1.2m wide batter bucket. The total depth of excavation varied from 40cm to 160cm below the surface.

The results of the investigation indicated that: (1) soil disturbance from agricultural land use practices was generally restricted to the upper levels of the soil profile; (ie. the top 20 to 30cm) (2) bioturbation varies in soils across the study

[138] *AHMS 2005*

area; (3) artefact density varies across landforms; (4) the elevated alluvial terrace and terrace slopes contain a deep, stratified stone assemblage with signs of spatial patterning and; (5) alluvial, rather than aeolian processes, were responsible for site formation and preservation on the sand terrace. Flooding of the Hawkesbury River was found to have had opposing effects on the archaeological deposits at Hall Street, depending on their distance from the river and elevation.

Aboriginal sites and deposits identified at Hall Street, Pitt Town were assessed as being highly significant to the Aboriginal community for their cultural heritage values. Aboriginal archaeological deposits were also assessed to have considerable public and scientific significance for their integrity, rarity and representative value. Intact portions of the alluvial terrace were considered regionally significant for their horizontal and vertical integrity, potential antiquity and potential to inform research questions about pre-Bondaian occupation in the greater Sydney region.

4.3.8 Springwood Road, Yarramundi – 2002

Jo McDonald CHM undertook an archaeological survey of Lots 1 & 2 [DP 871953] on the western bank of the Nepean River, immediately to the south of Yarramundi Reserve[139]. The survey was commissioned by Planning NSW in advance of proposed sale of the Lots for residential use.

Three artefact scatter sites were located during the survey, all on surface exposures approximately 100 metres from the Nepean River. Yarramundi 3 was located on a track and comprised more than 300 artefacts exposed across an 80m by 3m area. Yarramundi 4 was located across a 200m by 10m exposure on a track situated on a high terrace above a creekline. The artefacts were found among dense natural gravels (presumably alluvial in origin). Yarramundi 5 was located immediately north of their subject land on slopes above a steep section of riverbank and comprised one ground edged hatchet amongst a background scatter of silicified tuff and silcrete artefacts. They also noted a possible rockshelter that was overgrown with dense vegetation and could not be accessed.

Artefacts found at the three sites included a wide variety of raw material types (incl silcrete, silicified tuff, quartz, chert, petrified wood and quartzite), indicating

[139] *Jo McDonald CHM 2002*

an alluvial source (probably Nepean River gravels). A variety of tool types were observed, including an anvil/hammer stone, ground edged axe, debitage produced as a result of making flaked tools and retouch/usewear tools.

McDonald's report assessed undisturbed landforms as having good archaeological potential and recommended archaeological test excavation should be carried out in advance of development.

4.3.9 Agnes Banks Survey – 1984

Jim Kohen carried out an archaeological survey at Agnes Banks for proposed sand extraction[140]. The study area was located 2 kms east of the Nepean River on a Pleistocene sand sheet. Despite low survey visibility, Kohen identified 7 sites of varying density, with 'chert' the predominant raw material.

4.3.10 Boral Extraction, Yarramundi – 1983

In 1983 Gwenda Happ and Helen Brayshaw undertook a survey of the southern part of Yarramundi Reserve, described as Part Portion 67[141]. The survey was undertaken in advance of sand extraction.

As discussed earlier in Section 4.2, two artefact sites were identified during the survey – both are now located within a large lagoon created by the sand extraction operation. Therefore both sites were almost certainly destroyed during the extraction process[142].

Happ and Brayshaw describe the sites as follows[143]:

Site # 1 – An extensive scatter of flaked stone material approx 10m by 25m in area, disturbed by earthmoving activities associated with the gravel and sand extraction operations. The density of artefacts was estimated at 77 per square metre. The predominant material was chert, with a high percentage of waste flakes noted.

---

[140] *Kohen 1984*

[141] *Happ & Brayshaw 1983*

[142] *No Section 90 Consent is indicated on the AHIMS search results data for these sites. It is noted, however, that both sites were located just outside Brayshaw & Happ's study area.*

[143] *Happ & Brayshaw 1983: 7*

Site # 2 – Located further south of Site # 1, comprised a sparse scatter of artefacts that consisted largely of chert waste flakes.

The results of Brayshaw and Happ's investigation provide an indication of the likely nature and density of archaeological deposits that existed on the former banks and terraces of the Nepean River before they were removed during extraction operations.

4.4 Predictive Modeling

4.4.1 Site Types

Based upon information compiled within the *DECC AHIMS*, and background archaeological data reviewed above, the types of sites that may be expected to occur within the study area are as follows:

Open Artefact Scatter

Open artefact scatters occur almost anywhere that Aborigines travelled in the past. The cultural activity represented by these sites may be associated with hunting or gathering activities, domestic camps, or the manufacture and maintenance of stone tools.

The density of artefacts present in these scatters can vary dramatically and may relate to either transient or short stay camps, or base camps of long term and/or repeated occupation. These types of sites are commonly referred to as *'open campsites'*.

Stone Source

The beds, banks and terraces of the Nepean River were an important stone for stone for Aboriginal people who lived on the Cumberland Plain. A wide variety of workable stone sources were available in gravel bars and in the gravels and cobbles exposed in terraces and on scoured banks.

Isolated Find

Occur anywhere in the landscape and may represent the random loss, deliberate discard or abandonment of artefacts, or the remains of dispersed artefact scatters.

4.4.2 Aboriginal Site Predictions

The topography and distribution of natural resources near the study area indicates a potential for the site types described above. However, because virtually the entire site has been heavily disturbed by sand and gravel extraction over a period of more than 70 years, there is a very low potential for intact Aboriginal sites or objects in the Reserve. Although Aboriginal artefacts may be present within re-worked sediments and tailings left over from the extraction operations, they are highly unlikely to be in-situ or even near primary deposition.

Our analysis of a series of Parish Maps and aerial photographs (1943 – 1990's) indicates the only area with any potential for intact Aboriginal sites is the zone shaded brown (item 8) on Figure 17. All other parts of the Reserve have been heavily disturbed by the extraction industries.

Other site types that may normally be expected within alluvial landscapes, such as burials, scarred trees and middens, would have been similarly destroyed or completely re-worked by flooding and sand/gravel extraction.

The two Aboriginal sites previously recorded in the study area (AHIMS # 45-5-0444 & 45-5-0443) are located within a quarried-out lagoon and are almost certainly destroyed (refer to Figure 17).

4.5 Historical Archaeological Predictions

During documentary research, a range of sources were consulted, including the Land Titles Office, Mitchell Library, State Archives NSW and Hawkesbury Local Studies Library.

Historical maps, plans, images and ethnographic records that show or discuss occupation on and in the locality surrounding the study area were consulted to reconstruct the historical use of the study area. These sources were used to compile the site-specific history of the study area presented in Section 3.5 and to establish the presence of previously recorded historical archaeological or heritage resources within the study area.

This research has identified a number of historical items that would have existing within Yarramundi Reserve in the past. These items are shown on Figure 17, and

include a 1937 railway and bins associated with sand/gravel extraction (items 3 and 4), a small building shown on the 1943 aerial photograph of the site (item 5), 'Ashton's Falls' shown on early Parish Maps and referred to by John Hunter in the 1789 expedition up the Hawkesbury River (item 6) and a mill race shown on 19th century Parish Maps (item 7). The series of aerial photos from 1943 to the 1990's indicate sand/gravel extraction is likely to have destroyed or disturbed most, if not all, of these items.

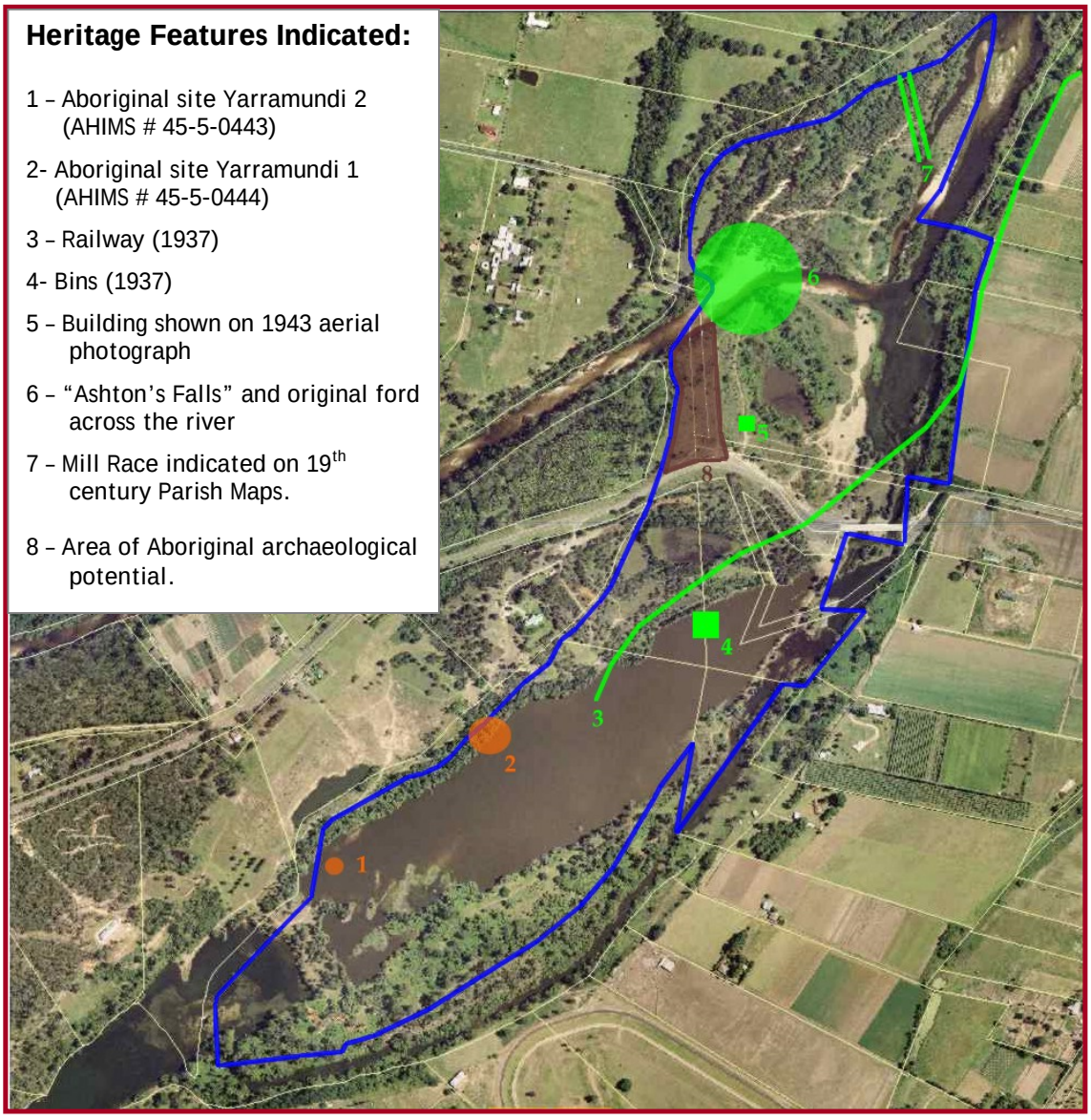

Figure 17. Heritage features indicated within Yarramundi Reserve.

5 SURVEY

5.1 Survey Details

An archaeological inspection of the site was carried out on 5th and 11th of September 2007 by archaeologist Jim Wheeler of AHMS and John Bosque of Hawkesbury City Council in partnership with Aboriginal community representatives Steve Randall (Deerubbin Local Aboriginal Land Council), Leanne Watson (Darug Custodian Aboriginal Corporation), Gordon Workman (Darug Tribal Aboriginal Corporation) and Celestine Everingham (Darug Aboriginal Cultural Heritage Assessments).

The objectives of the survey were to identify any Aboriginal and Non-Indigenous sites, objects or Potential Archaeological Deposits (PADs). The investigation also assessed the extent to which past land-uses have affected original landscapes and natural soil profiles. This information was used to assess the degree and extent of disturbance across the study area and the likely archaeological impact of proposed development.

5.2 Survey Methodology

The study area was traversed on foot, with the aim of locating and examining any areas of ground surface visibility. Areas of erosion and ground exposure were examined for archaeological evidence such as stone artefacts, charcoal and shell. Ground surfaces were also examined to determine the degree of soil disturbance, erosion and potential for archaeological deposits below current ground.

5.3 Survey Coverage

Survey coverage data is usually calculated to determine the effectiveness of surface survey. The calculation of effective coverage shows the effectiveness of the surface survey in detecting archaeological sites and accordingly, how much weight ought to be put on the results. As the Yarramundi Reserve study area has been almost entirely modified and disturbed by sand and gravel extraction, the calculation of effective coverage is largely meaningless because our research shows there is very little potential for any intact archaeological sites in the study area.

Accordingly, rather than undertaking systematic sampling of the study area as would be the case on unmodified landscapes, we adopted a targeted survey approach designed to specifically examine the heritage features indicated by our research shown on Figure 17. The purpose of this approach was to:

1. Confirm that the items have been disturbed / destroyed by sand and gravel extraction;

2. Identify whether any archaeological evidence of the features remain, and if so, assess their integrity and significance; and

3. Identify any portions of the study area that may contain un-modified land that has potential to contain intact archaeological sites.

The results of the survey are presented in the following sections, which include a general summary of results, followed by a description of the results of inspection at each of the heritage items indicated by our research on Figure 17.

5.4 Survey Results

5.4.1 General Observations

No Aboriginal sites or objects were identified within the study area. One small area with low potential for Aboriginal archaeological deposits was identified.

No intact historical sites were identified. Re-deposited fabric such as a piece of rail and large concrete blocks from a demolished structure were found during the survey.

Low ground surface visibility encountered during the survey indicates the investigation was generally ineffective in identifying whether or not surface archaeological sites and/or objects are present. Across more than 90 % of the study area thick grasses prevented the survey team from viewing the ground surface (refer to Figure 18). Soil exposures were limited to patches of sheet/rill erosion, tracks and paths.

Original vegetation has been cleared across the entire study area, with re-growth vegetation, grass and weeds dominating much of the Reserve.

Figure 18. Typical survey visibility encountered. Note the thick re-growth vegetation.

The site inspection confirmed the conclusions of our research – namely that the study area has been heavily modified by past flooding and more than 70 years of sand and gravel extraction. Artificial lagoons created by extraction operations are present where gently sloping river banks and a large island of sand and boulders once existed. This is perhaps best illustrated in Figure 19, which is a view looking east across a large artificial lagoon created by sand and gravel extraction. Historic aerial photos indicate the area now occupied by the lagoon was originally a large sand hill that separated two branches of the Nepean River. Figure 20 shows the landscape in the vicinity of the former western arm of the Nepean River, as can be seen this area has been radically modified and now comprises a hill consisting of tailings re-deposited during sand and gravel operations (Figure 21).

Figure 19. Looking east across a large artificial lagoon created by sand/gravel extraction. Before the extractive industries this area was a sand hill separating two branches of the Nepean River.

Figure 20. Looking north-west across an artificial hill created by deposition of mining tailings. This is the former location of the western branch of the Nepean River.

Figure 21. Ground comprising well-sorted river cobbles – these are screened tailings deposited during the sand extraction process. Deposition of these tailings has completely altered the landscape.

5.4.2 Individual Items

As part of the survey, we specifically targeted the heritage items indicated by our research on Figure 17. The purpose was to determine whether any evidence of the items can be seen on current ground surfaces, and to assess the potential for buried intact remains of each item.

5.4.2.1 Item 1 & 2 – Aboriginal sites

The Aboriginal sites Yarramundi 1 & Yarramundi 2 recorded by Happ and Brayshaw in 1983 are now located in the large artificial lagoon created by sand extraction. An overlay of Happ and Brayshaw's site location map on a current scaled aerial photo of the study area indicated that the sites were located within the current lagoon. During the survey we used a hand-held GPS unit to locate the site 'Yarramundi 1' using the northings and eastings (AGD 66 format) provided by Happ and Brayshaw. We were able to confirm that the site location is currently some 20 metres out into the lagoon. It is almost certain that both Yarramundi 1 and Yarramundi 2 were destroyed by sand and gravel extraction during the 1980's.

5.4.2.2 Item 3 & 4 – 1937 railway and bins

The 1937 railway and bins were substantial pieces of infrastructure during the mid 20th century sand and gravel quarrying operation at Yarramundi Reserve. The series of aerial photographs from 1943 – 1990's indicated intact evidence of earlier operations was unlikely to have survived subsequent intense extraction and periodic flooding. No intact evidence of the 1937 infrastructure was seen during the survey and the land that was associated with this earlier operation has been heavily re-worked by subsequent extraction. A small re-deposited section of rail (probably associated with the 1937 light rail system) was observed near its original alignment (see Figure 22). No other evidence of the rail system or bins was observed, however a range of industrial demolition debris (such as large broken concrete aggregate blocks) is scattered across the area to the south of Hawkesbury (Springwood) Road and north of the large lagoon. These relate to more recent industrial use of the land.

Figure 22. Small section of rail lying on current ground surface – this is probably a remnant of the 1937 light rail system. No intact remains were found.

5.4.2.3 Item 5 – 1943 building

Item 5 was a small building indicated on the 1943 aerial photograph. It was located adjacent to what is now a gravel carpark, recently constructed by Council. There is no evidence of the building now and no indications that sub-ground evidence may be present within the area.

5.4.2.4 Item 6 – Ashton's Falls

Ashton's Falls were first recorded by John Hunter during the 1789 expedition up the Hawkesbury River. They must have been a reasonably significant waterfall / cascade because they could be heard from the 1789 expedition camp on Richmond Hill, a few kilometres north of the study area. There is no evidence of the falls now, they were probably removed or gradually destroyed during sand and gravel extraction and flood scouring. This area was also the site of an early ford across the river. There is no physical evidence of the ford now, however, the roadway on the north-western side of the river adjacent to Navua Reserve preserves the original road alignment leading down to the former ford crossing.

5.4.2.5 Item 7 – Mill Race

During the survey we found no evidence of the mill race or buildings that may have been associated with the mill race. It is likely that subsequent sand/gravel extraction and flood deposition erased all evidence of the mill and race.

5.4.2.6 Item 8 – Archaeological Potential

Our research identified this area may have potential for intact Aboriginal archaeological deposits because the series of aerial photographs from 1943 to the 1990's do not indicate major sand/gravel extraction on this small piece of land.

During our inspection we observed this area retains what appears to be a fairly unmodified lower slope landform (it would have formed the east bank of the former western branch of the Nepean River), however the surface soils are heavily disturbed. It is unclear whether deeper soils are intact or not (refer to Figure 23). Therefore this area may have some archaeological potential.

Figure 23. Unmodified hill slope landform – may have some potential for buried Aboriginal archaeological deposits.

5.5 Conclusions

Drawing on the results of our research described in Chapter 4 and the results of survey described above, we make the following conclusion regarding archaeological sites and potential archaeological sites in the study area:

- With the exception of Item 8 (the area shaded brown on Figure 17), there is no potential for intact Aboriginal or historical archaeological sites or deposits within the Reserve;
- There is a low potential for deeply buried intact Aboriginal archaeological deposits within the areas shaded brown (ie. Item 8) on Figure 17. There is little to no potential for intact surface sites in this area; and
- There are re-deposited industrial demolition remnants within the Reserve, including broken concrete aggregate blocks and a small section of rail. There

is potential for re-deposited industrial demolition material and discarded plant components buried below current ground surfaces throughout the reserve.

6 ABORIGINAL COMMUNITY CONSULTATION

6.1 Development of Consultation

Consultation with the local Aboriginal community was undertaken in accordance with procedures set out in DECC's *Interim Community Consultation Requirements for Applicants 2005*. The following procedures were undertaken (a log of actions and correspondence regarding Aboriginal community consultation is presented in Table 6.1 overleaf):

Notification and Registration of Interests: stakeholder groups were identified by:

(a) providing written notification to Deerubbin Local Aboriginal Land Council (ILALC), Registrar of Aboriginal Owners, Native Title Services, Hawkesbury City Council and DECC Director of Operations;

(b) notifying the Darug Tribal Aboriginal Corporation and the Darug Custodian Aboriginal Corporation. These groups have previously registered their interest in Cultural heritage projects with Hawkesbury City Council; and

(c) placing an advertisement in the Hawkesbury Independent and Penrith Star - local print media.

Registration of interest allowed 10 working days for groups or individuals to respond. Groups that registered their interest are listed in Table 6.1.

Archaeological Survey: The Deerubbin Local Aboriginal Land Council, Darug Tribal Aboriginal Corporation and Darug Custodian Aboriginal Corporation confirmed their interest in the project and were invited to participate in a site survey. Darug Aboriginal Cultural Heritage Assessments expressed an interest in the project after the completion of the registration period and were also invited to participate in the survey. All four parties accepted our invitation and participated in the survey.

Drafting, Review and Finalisation of the AHIA Report: Copies of a draft version of this report was provided to the Deerubbin Local Aboriginal Land Council, Darug Tribal Aboriginal Corporation, Darug Custodian Aboriginal Corporation and Darug Aboriginal Cultural Heritage Assessments for review and comment. All correspondence received from the registered stakeholders has been included in

Appendix 1 of this report. No response has been forthcoming from the Deerubbin Local Aboriginal Land Council

TABLE 6.1 - Aboriginal Community Correspondence Log

Date	Action	Method
14/08/2007	Placement of Notification Advertisement in the *Hawkesbury Independent* and *Penrith Star* seeking expressions of interest from the Aboriginal community	Print Media
16/08/2007	Notification letters to Native Title Services, DECC Director of Operations, NSW Native Title Services, Deerubbin Local Aboriginal Land Council, Hawkesbury City Council and NSW Dept of Aboriginal Affairs	Express Post
21/08/2007	Deerubbin Local Aboriginal Land Council provided written confirmation of their interest in the project.	Post
28/08/2007	*Office of the Registrar Aboriginal Land Rights Act 1983* advised that there are no registered Aboriginal Owners for the subject land.	Email
03/09/2007	Invited Darug Tribal Aboriginal Corporation and Darug Custodian Aboriginal Corporation to express their interest in the project and participate in the survey.	Phone / email
5/09/07	Received an expression of interest from Darug Aboriginal Cultural Heritage Assessments – invited them to participate in the survey.	Phone
5/09/2007	Undertook survey with representatives of DTAC, DCAC and DACHA	Survey

9/09/2007	Undertook survey with Steve Randall of DLALC	Survey
09/10/2007	Draft copies of the report posted to DLALC, DTAC, DCAC and DACHA	Post
29/10/2007	Received feedback from DCAC	Fax
1/11/2007	Received Feedback from DTAC and DACHA	Fax

6.2 Outcomes of Consultation

At the time of finalising this report feedback has been received from DACHA, DCAC and DTAC, which has been included in Appendix 1 of this report. No response has been forthcoming from DLALC after 3 working weeks and despite follow-up phone calls to request a letter.

The outcomes that have emerged to date as a result of consultation with the Aboriginal community regarding cultural heritage values of the study area and management of Aboriginal heritage during development include the following:

1. DCAC, DACHA and DTAC support the recommendations made by AHMS;
2. DCAC, DACHA and DTAC have all noted the cultural importance of the Reserve, particularly its associations with Yarramundi and the Booruberongal clan;
3. The groups requested consultation about and involvement in, all stages of the Aboriginal heritage management process so that Aboriginal community views are considered in management outcomes;
4. DTAC have requested monitoring of all earthworks in the Reserve; and
5. DCAC have noted that an opportunity exists for signage within the reserve telling Aboriginal stories that relate to the reserve and of Aboriginal occupation in the area from a Darug perspective. DCAC would like to be consulted regarding any signage to be placed within the Reserve.

7 SIGNIFICANCE ASSESSMENT

7.1 Aboriginal Heritage Significance Assessment

7.1.1 Basis for significance assessment

Aboriginal sites are assessed in terms of three significance criteria: Archaeological (scientific), Cultural (Aboriginal) and Public Significance. These criteria recognise that Aboriginal sites are valuable in a number of ways. Namely:

- To the Aboriginal community as an aspect of their cultural heritage and as part of continuing traditions;
- To the broader community, for educational, historical and cultural enrichment values; and
- To the scientific community for potential research value.
- The guidelines outlined in the *NSW National Parks and Wildlife* publication *Aboriginal Cultural Heritage: Standards and Guidelines Kit* provide the basis and background for the following discussion regarding evaluation of site significance.

7.1.2 Aboriginal Cultural Significance

This area of assessment concerns the relationship and importance of sites to the Aboriginal community. Aspects of cultural significance include both people's traditional and contemporary links with a given site or landscape as well as an overall concern by Aboriginal people for sites and their continued protection.

Unmodified natural features in the landscape can signify sacred sites/places of significance. As such they are archaeologically invisible and can only be identified with the aid of Aboriginal interpretation. If such sites are known they may hold particular cultural significance to contemporary Aboriginal communities. Furthermore, sites of significance are not restricted to the period prior to contact with Europeans. Often events related to the Contact-period may be so important

to local Aboriginal communities that they have become significant. If these events relate to a specific place in the landscape, then that place may become sacred or highly significant to the local Aboriginal communities.

The cultural (Aboriginal) significance is a matter for the local Aboriginal community. Please refer to Appendix 1 for correspondence received from the registered Aboriginal stakeholders regarding the importance of the study area, their views with respect to the proposed development and their views regarding management of Aboriginal heritage in the Reserve.

7.1.3 Public Significance

This category concerns a site's potential to educate people about the past. It also relates to the heritage value of particular sites as being representative examples of past lifestyles, why they are important, and why they should be preserved.

At present, no Aboriginal sites or objects are known to exist within the study area (The sites identified by Happ & Brayshaw are likely to have been destroyed by sand and gravel extraction during the 1980's). If any intact Aboriginal sites are present within the Reserve (this is considered unlikely), such sites and objects are likely to have public significance as a demonstration of past Aboriginal life on the edge of the Nepean River.

Although there is very little potential for intact Aboriginal sites or objects within the Reserve, the Reserve does have less tangible public significance values because of its association with Yarramundi, an important Aboriginal figure in the early colony and a leader of the Buruberongal Clan. The Reserve also has important public significance relating to the detailed early European records about Aboriginal use and occupation of the area, such as those made by Hunter, Tench and Paterson. These associations have public significance and have potential to be used for public education and interpretation within the Reserve. Public interpretation of aspects of Aboriginal use and occupation of the area has the potential to enhance the cultural and educative values of the Reserve.

7.1.4 Scientific Significance

The objective of undertaking scientific significance assessment for a site is to determine its research potential in terms of contribution to knowledge about the

past. Criteria used to evaluate scientific potential include condition/integrity, representativeness and rarity.

At present, no Aboriginal sites or objects are known to be present within the study area. If they are present it is considered unlikely that they would have scientific significance given the degree of landscape and soil disturbance caused by past flooding and sand/gravel extraction. An assessment of scientific significance would be based on the results of archaeological excavation and would take into account the condition, integrity, representativeness and rarity of such finds. In short, the scientific significance would be based on archaeological research potential.

7.2 Historical Heritage Significance

Accurate assessment of the cultural significance of sites, places and items is an essential component of the NSW heritage assessment and planning process. A clear determination of a site's cultural significance allows informed planning decisions to be made, in addition to ensuring heritage values are maintained, enhanced, or at least minimally affected by development.

7.2.1 Principles and evaluation criteria

"Heritage significance" and "cultural significance" are terms used to describe an item's value or importance to our society. The Australian ICOMOS Burra Charter (1988) defines cultural significance as:

> *"Aesthetic, historic, scientific or social value for past, present or future generations"*

This value may be contained in the fabric of the item, its setting and relationship to other items, the response that the item stimulates in those who value it now, or the meaning of that item to contemporary society. By applying standard evaluation criteria assessments of significance can be made. These criteria are as follows:

Criterion (a) An item is important in the course or pattern of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (b) An item has strong or special associations with the life or works of a person, or group of persons, of importance in NSW' cultural or natural history (or the cultural or natural history of the local area);

Criterion (c) An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);

Criterion (d) An item has strong or special associations with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons;

Criterion (e) An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (f) An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (g) An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural and natural environments.

To an extent the archaeological significance of a site may be seen as directly linked to its scientific or research value. The deposits it contains may include cultural artefacts and structural remnants of buildings and other features made by previous occupants at various times in the past. Such deposits, if they are subject to well designed archaeological investigation, can provide important information about historic occupation of a site, its locality and the State. They can reveal new information about people's lives, society and past social conditions, and the material and technology that was available to people in different periods. Because of this, archaeological sites can have excellent research potential, and therefore high scientific significance.

In Australia this concept is commonly defined as a set of questions, originally proposed by Bickford and Sullivan in 1984[144], that are used as a means of assessing the significance of an archaeological site:

[144] *Bickford and Sullivan 1984:23-24*

- Can the site contribute knowledge that no other resource can?
- Can the resource contribute knowledge that no other site can?

Is this knowledge relevant to general questions about human history or other substantive questions relating to Australian history, or does it contribute to other major research questions?

7.2.2 Evaluation

This study identified demolition material (a piece of rail and broken concrete blocks) relating to the Reserve's 20th century industrial use as a sand and gravel extraction quarry. Although these items are considered historical archaeological relics (as defined by the NSW Heritage Act 1977), they have low archaeological significance because they are re-deposited.

None of the relics identified during survey are considered to have any potential to yield significant information relevant to current State Research themes if they were to be the subject of archaeological investigation. Accordingly, the relics are not considered to meet the guidelines for inclusion under any of the criteria described in Section 7.2.1 above.

8 IMPACT ASSESSMENT

8.1 Proposed Development

Landarc have prepared a Plan of Management (POM) for the Reserve on behalf of Hawkesbury City Council[145]. The POM includes details on proposed pedestrian trail construction, environmental re-generation, upgrade and enhancement of visitor facilities and ongoing maintenance. The proposed works are shown on Figure 24 overleaf.

Generally, the works are fairly minor and will be limited to shallow excavation works for proposed pathways and ground disturbance across limited discrete areas required for establishing seating, canoe launch, signage and tree / shrub planting etc.

8.2 Impact Assessment

Our assessment found that, with the exception of the area of potential archaeological deposit shaded brown on Figure 17, there is very-low to nil potential for any intact Aboriginal or historical archaeological sites within the Reserve. There are no specific works currently proposed in the area of sub-surface archaeological potential shaded brown on Figure 17 (NB: Landscape Master Plan for the area shaded in brown is "investigate options for providing a limited range of recreational facilities...eg composting toilet, shelter, picnic settings" – Council have indicated they are unlikely to proceed with these works in the area of archaeological potential).

Accordingly, unless works are proposed in the area shaded brown on Figure 17, the proposed Landscape Masterplan (Figure 24) should have no impact on intact archaeological sites, deposits or objects. Works and activities may affect re-deposited historical relics and/or Aboriginal objects that have been heavily disturbed by past sand and gravel extraction and flooding. These objects and relics have no integrity and very-low to nil archaeological research value.

[145] *Landarc 2004*

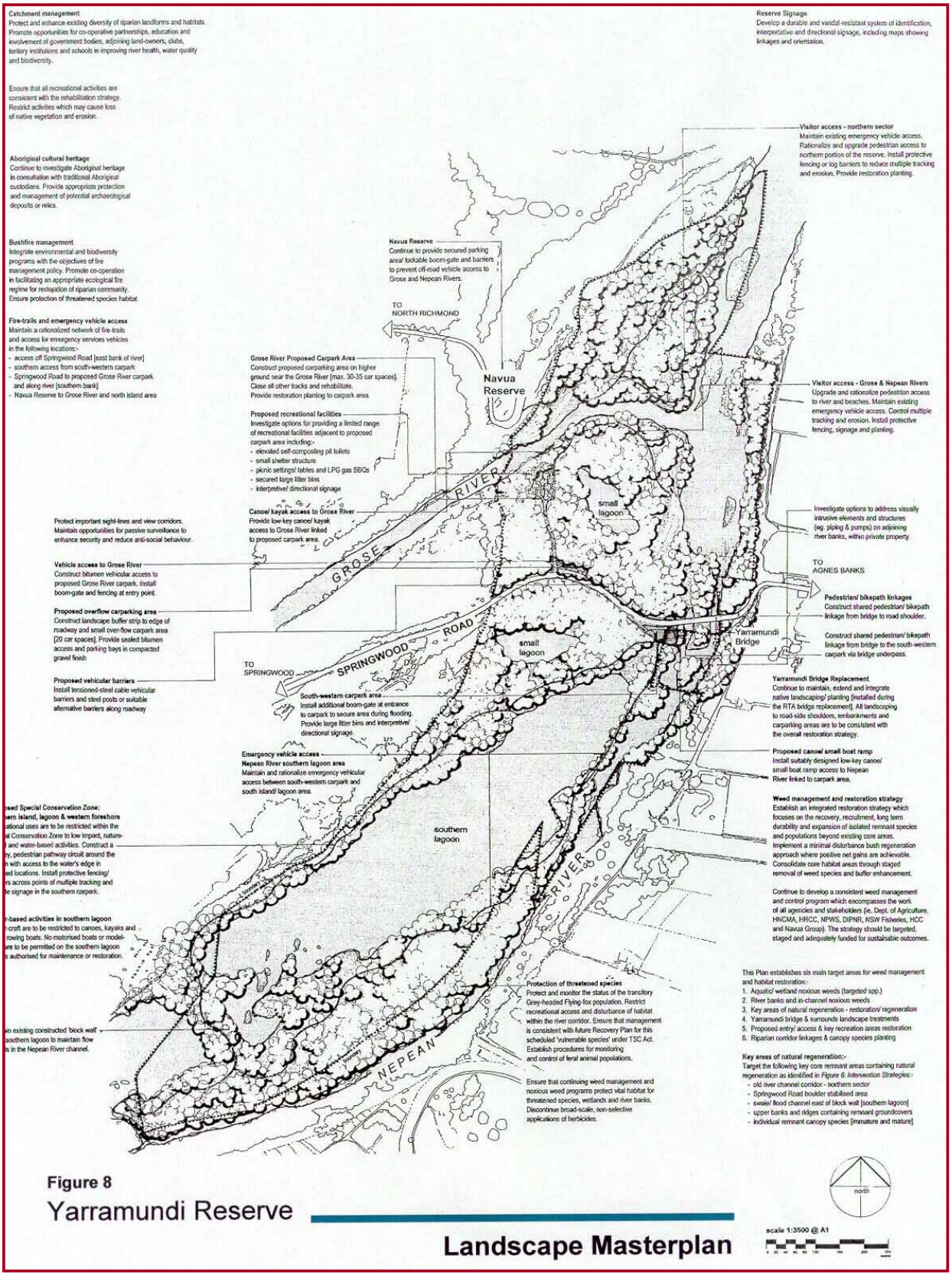

Figure 24. *Landscape Masterplan Prepared by Landarc 2004.*

9 INTERPRETATION

9.1 Preamble

Options for public interpretation of themes about human use and occupation of Yarramundi Reserve are presented below. The purpose of this section is to provide Council with options for incorporating important aspects of Aboriginal and European use and occupation of the River into the design of landscaping and artworks.

9.2 Themes

Our research has highlighted a number of themes associated with National and State level historical themes set out by the NSW Heritage Office. [146]

They are:

Australian Themes	NSW Themes
Tracing the natural evolution of Australia	Environment – Naturally Evolved
Peopling Australia	Aboriginal history & Aboriginal-European interactions
Developing local, regional & national economies	Agriculture Exploration Transport Events Environment – Cultural Landscape Technology Mining
Building settlements, towns & cities	Land tenure Utilities
Working	Labour
Developing Australia's cultural life	Leisure

[146] *http://www.heritage.nsw.gov.au/docs/themes.pdf*

9.3 Interpretation Options

From the site specific history more focused themes have been identified which may be explored through various interpretive options, some of which are outlined below. They are:

- Aboriginal life on the River;
- Early Exploration of the River; and
- River as a Resource.

9.3.1 Aboriginal life on the River

A combination of historical and archaeological information about Aboriginal use and occupation of the River and its foreshore indicates that the local environment supported many aspects of traditional Aboriginal life. The area was a favourable location for more permanent or repeated Aboriginal occupation due to a combination of environmental factors.

A diverse range of local environments provided a wide variety of food and material resources, particularly because the study area is near the interface between freshwater and saltwater on the Hawkesbury - Nepean river system. This meant that fresh drinking water, estuarine and riverine resources were all locally available. The hinterland provided an additional suite of terrestrial resources and the river bed and banks provided an important source of flakable stone materials. The broad and contrasting range of local resources allowed for sustained occupation and use of the area.

The flat topography and open "fire-stick" generated woodland described by John Hunter in 1789 was also conducive to Aboriginal occupation and transit through the area, assisted hunting and created a diverse suite of vegetation in different stages of succession – effectively broadening the subsistence and resource base. Members of the 1789 expedition, particularly John Hunter, make specific references to the Buruberongal people and individuals such as Yarramundi they encountered in the vicinity of Yarramundi Reserve. They also made specific reference to yam digging and 'wicker' traps on the river banks within the current Yarramundi Reserve. These

observations have public and cultural significance because they are early (first contact) detailed records directly associated with the Reserve.

The Landscape Masterplan and associated improvement of Yarramundi Reserve therefore offers an opportunity for Council to use the first contact records as a means to communicate aspects of *Buruberongal* life on the River. It also offers an opportunity, in consultation with the local Aboriginal community, to make these aspects of Aboriginal life accessible to the broader community.

Options may include incorporating quotations taken from the 1789 expedition in an interpretive display, such as a sign adjacent to a footpath or viewing area. The display could highlight the nature of Aboriginal use of the Reserve at first contact and the association of Yarramundi with the area. As an example, a suitable quotation may include the following extract from John Hunter's diary, recorded on the 6th July 1789 when the expedition reached the junction of the Grose and Nepean Rivers:

> *"On the banks here also we found yams and other roots, and had evident marks of the natives frequenting these parts in search of them for food. They have no doubt some method of preparing these roots, before they can eat them; for we found one kind which some of the company had seen the natives dig up; and with which being pleased, as it had much the appearance of horse-radish, and had a sweetish taste, and having swallowed a small quantity, it occasioned violent spasms, cramps in the bowels, and sickness at the stomach: it might probably be the casada root"*[147]

Such extracts might be accompanied by a suitable image such as an early drawing of the Buruberongal people or one of the Joseph Lycett paintings which illustrate aspects of Aboriginal life in the early 19th Century. An example is shown in Figure 24 overleaf.

Implementation of these options should be undertaken in consultation with the registered Aboriginal stakeholders and a suitably qualified archaeologist. This will ensure that interpretation is appropriate, culturally respectful and historically accurate.

[147] *Hunter 1793: 6th July 1789 Diary Entry*

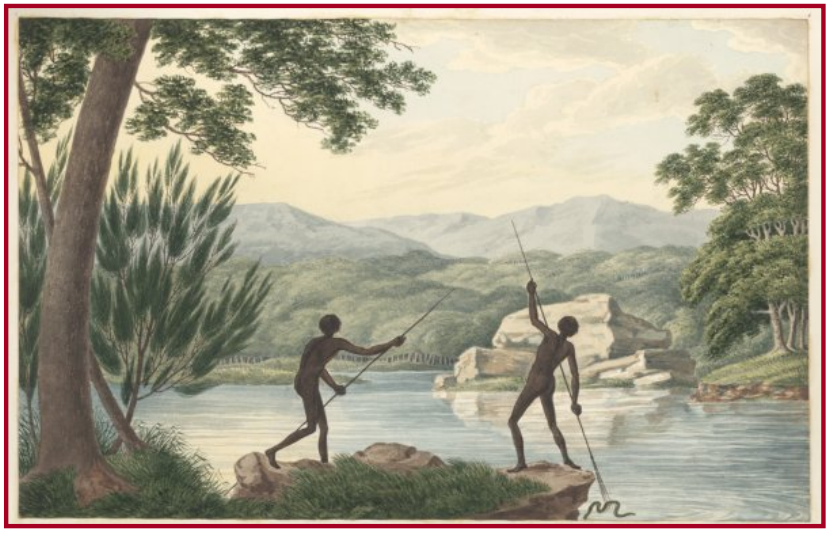

Figure 25. Joseph Lycett 1830 'Two Aborigines Spearing Eels"- a good illustration of Aboriginal life on the major river systems in the Sydney Basin.

9.3.2 Early Exploration of the River

The early exploration of the Hawkesbury-Nepean and the Grose Rivers is historically significant and has social and public significance values. As described in the historical summary presented in this report, there were a considerable number of early references that directly relate to the study area, particularly the diary records made by John Hunter in 1789 and those of Tench and Paterson during subsequent expeditions. The nature of the landscape, evidence of flooding, characteristics of the river and particular features such as 'Ashton's / Yarramundi Falls' are described by the early explorers and diarists.

Similar to the previous theme of Aboriginal life on the river, there is an opportunity to present some of this historical information in an interpretive display. The display could highlight the original nature of the River (comparing with the current character of the river) and the study area's associations with the early expeditions. A number of suitable quotations can be found in John Hunter's diary entries for the 6 – 7th July 1789 (some of which are included in the historical summary in this report). A good example is the following excerpt:

> *"evident marks of the vast torrents which must pour down from the mountains, after heavy rains. The low grounds, at such times, are entirely covered, and the trees with which they are overgrown, are laid down (with their tops pointing down the river,) as much as I ever saw a field of corn after a storm; and where any of these trees have been strong enough to resist in any degree the strength of the torrent, (for they are all less or more bent downwards) we saw in the clifts of the branches of such trees, vast quantities of large logs which had been hurried down by the force of the waters, and lodged from thirty to forty feet above the common level of the river; and at that height there were great quantities of grass, reeds, and such other weeds as are washed from the banks of the river, hanging to the branches"*[148]

The historical extract(s) might be accompanied by a suitable early depiction of the study area, such as the 1809 GW Evans view of the Grose River and Hawkesbury River confluence shown in Figure 26 below.

Figure 26. GW Evans 'View of part of the Hawkesbury River at 1st fall and connection with Grose River NS Wales 1809'. – This depicts the study area in the early 19th century.

[148] *Hunter 1793: 6th July 1789 Diary Entry*

Implementation of this interpretation option should be undertaken in consultation with a suitably qualified archaeologist or historian. This will ensure that interpretation is historically accurate.

9.3.3 River as a Resource

This is a theme that has been dominant since human occupation of the Sydney Basin. Before European settlement, the Hawkesbury-Nepean was an important Resource for Aboriginal people across the Cumberland Plain. It provided an important source of stone for making tools and attracted a rich and diverse suite of plant, animal and aquatic resources that made it a focus of Aboriginal occupation and use.

During the early colony, the River powered grain mills, provided drinking water, irrigation and a means of transport. These resources were critical to the survival and development of the early settlement by facilitating agriculture, settlement and transport of goods to markets.

During the Late 19th and 20th centuries, the focus shifted to the alluvial sand and gravel resources within the Reserve. Large extraction operations quarried almost the entire Reserve over a 70 year period and provided important materials used in construction of buildings, roads, bridges (including the Sydney Harbour Bridge) and rail.

Aspects of the River's resources and their use through time could form a valuable facet of public interpretation. There is an opportunity for Council to consider an interpretive display highlighting the use of resources over time. Photographs of the sand and gravel operations, including aerial photographs from the 1970s presented in this report, could be used to illustrate the scale and importance of the sand and gravel resource extraction within the Reserve.

Implementation of this interpretation option should be undertaken in consultation with a suitably qualified archaeologist or historian. This will ensure that interpretation is historically accurate.

Examples of two interpretive panels are shown overleaf in Figures 27 and 28 as an sample of the type of interpretive display that have been successfully used to communicate themes of human use and occupation.

Figure 27. A detailed interpretive panel from Old Windsor Hill archaeological site in England.

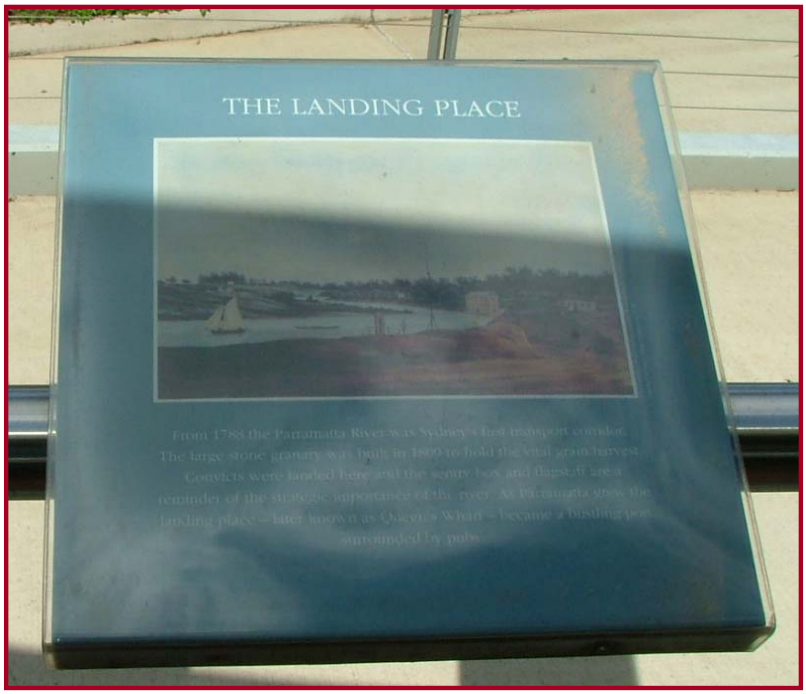

Figure 28. A less detailed interpretive panel at Charles Street Wharf on the Parramatta River, Sydney.

10 RECOMMENDATIONS

10.1 Basis for Recommendations

The following recommendations are based upon:

- Legal requirements of the *National Parks and Wildlife Act of 1974*;
- Legal requirements of the *Heritage Act 1977*;
- Results of the archaeological investigations documented in this report;
- Views and recommendations of the local Aboriginal community; and
- Analysis of the impact of development.

10.2 Aboriginal Consultation

It is recommended that:

1. Liaison established with the local Aboriginal community should be maintained by Council and consultation should be undertaken with the registered Aboriginal community stakeholders in relation to management and interpretation of Aboriginal cultural heritage;
2. The registered stakeholders should be specifically consulted about any proposals for interpretation of the Reserve's Aboriginal heritage, including any interpretive signage and/or information pamphlets;
3. A copy of this report should be forwarded to the registered Aboriginal stakeholders as follows:

   Deerubbin Local Aboriginal Land Council
   Attn: Steve Randall (Sites Officer)
   PO Box 3184
   MT DRUIT VILLAGE NSW 2770

   Darug Custodian Aboriginal Corporation
   Attn: Leanne Watson
   PO BOX 81
   Windsor, NSW, 2756

Darug Tribal Aboriginal Corporation
Attn: Gordon Workman
PO BOX 441
BLACKTOWN, NSW, 2148

Darug Aboriginal Cultural Heritage Assessments
Attn: Gordon Morton
90 Hermitage Road
KURRAJONG HILLS, NSW, 2758

10.3 Archaeological management

Recommendations for management of Aboriginal and non-indigenous heritage are set out below.

1. Any development that will or may impact Aboriginal sites or objects will require Section 90 Consent to Destroy from the Department of Environment & Climate Change (DECC). It is an offence to disturb, destroy or deface Aboriginal objects without prior consent from DECC;

2. Any development that will or may impact on an historical archaeological relic will require approval under Section 139/140 of the NSW Heritage Act 1977 or an exception under 139(4) of the NSW Heritage Act 1977;

3. This assessment found that development, works and activities associated with implementation of the Landscape Masterplan are highly unlikely to disturb any intact Aboriginal or historical archaeological sites except if such development is to occur in *Area 8*, shaded brown on Figure 17. Therefore, no further archaeological investigations are required in advance of the proposed works unless works are to occur in *Area 8*;

4. If any Aboriginal objects or sites are found during the course of development works or other activities in the Reserve, the work or activity should cease immediately. A suitably qualified archaeologist should be engaged to record the site or object and provide advice about appropriate management. In the first instance, the site or object should be avoided. If the site or object can not be avoided, a Section 90 Consent will be required from DECC before the work or activity can re-commence;

5. Council should apply to the NSW Heritage Office, Dept of Planning for an Exception (Type of Exception A and C) under Section 139(4) of the NSW Heritage Act. The application will require submission of an *Excavation Permit Exception Notification Form* along with 2 copies of the final version of this report and 2 copies of the Landscape Masterplan. The NSW Heritage Office address is as follows:

   NSW Heritage Office
   Dept of Planning
   Locked Bag 5020,
   Parramatta, NSW, 2124.

6. Council should consider the interpretation options provided in Section 9 of this report; and

7. Two copies of this report should be sent to the DECC Aboriginal Heritage Information Management System (AHIMS) Registrar. The DECC AHIMS address is:

   DECC AHIMS Aboriginal Sites Registry
   The Registrar
   PO BOX 1967,
   Hurstville, NSW 2220.

REFERENCES

AHMS (2005). *Blighton Pitt Town, Aboriginal Archaeological Test Excavation Report*. Prepared for Johnson Property Group.

Andrews, A. (1990). 'Early Surveys of the Hawkesbury' in Powell, J. & Banks, L (eds). *Hawkesbury River History: Governor Phillip, Exploration & Early Settlement.* Darug & Lower Hawkesbury Historical Society in association with Hawkesbury River Enterprises, Sydney. Pp: 71-84.

Attenbrow, V. (2002) Sydney's Aboriginal Past: Investigating the Archaeological and Historical Records. UNSW Press, Sydney.

Attenbrow, V. (2003) Habitation and Land Use Patterns in the Upper Mangrove Catchment, New South Wales Central Coast, Australia. Australian Archaeology Vol.57 pp. 20 – 31.

Banks, L. (1990). 'Developments Along the Lower Hawkesbury River: 1789-1889' in Powell, J. & Banks, L (eds). *Hawkesbury River History: Governor Phillip, Exploration & Early Settlement.* Darug & Lower Hawkesbury Historical Society in association with Hawkesbury River Enterprises, Sydney. Pp: 99-110.

Bickford & Sullivan (1984) "Assessing Research Significance of historic Sites", in Sullivan & Bowdler, 1984, *Site Surveys and Significance Assessment in Australian Archaeology.*

Bowd, D. (1984). *Macquarie Country: A History of the Hawkesbury*. Library of Australian History, Sydney.

Brayshaw McDonald (1993a) *Archaeological Survey of the Rouse Hill Infrastructure Project (Stage1) Works along Caddies, Smalls and Second Ponds Creeks, Rouse Hill, NSW*. Report to Rouse Hill Joint Venture Pty Ltd.

Brayshaw McDonald (1993b) *Additional Archaeological Survey in the Rouse Hill Development Area along Second Ponds Creek and Caddies Creek, Rouse Hill NSW*. Report to Landcom.

Brayshaw McDonald (1993c) *Additional Archaeological Survey of the Rouse Hill Infrastructure Project (Stage 1 Works) along Caddies and Second Ponds Creeks, Rouse Hill, NSW*. Report to Rouse Hill Pty Ltd.

Brook, J. (1999). *Shut Out From the World: The Hawkesbury Aborigines Mission & Reserve, 1889 – 1946.* Revised edition - Deerubbin Press, Berowra Heights.

Craib J.L, Bonhomme T, Mangold G.R. & Williams, S.S. (1999) *Archaeological Salvage Excavations at Site RS1, Regentville, Western Sydney.* Report prepared for Transgrid.

Collins, D. 1975 [1798]. *An Account of the English Colony in New South Wales. Volume 1.* A.H. & A. W. Reed in association with the Royal Australian Historical Society, Sydney.

Flood, J. (1995) *Archaeology of the Dreamtime:* Angus & Robertson, Sydney.

Happ, G. & Brayshaw, H. (1983) *An Archaeological Survey of a Proposed Soil Extraction Area from part Portion 67, County of Nepean, Yarramundi.* Prepared for P.S. Graham & Associates.

Havard, O. (1943). 'Mrs Felton Mathew's Journal' in *RAHS Journal & Proceedings*. 29(2): 88-128; 29(3): 162-195; 29(4): 217-244.

Hiscock, P. & Attenbrow V (1998) *Early Holocene Backed Artefacts from Australia.* Archaeology in Oceania 33(2).

Hiscock, P. & Attenbrow, V. (2002) Morphological and Reduction Continuums in Eastern Australia: Measurement and Implications at Capertee 3. Tempus 7, Anthropology Museum, University of Queensland.

HRA (Historical Records of Australia) (1914-1925). Vol 1, Series II, (Ed). Frank Watson. Library Committee of the Commonwealth Parliament, Sydney

HRNSW – Historical Records of NSW

Hunter, J. 1968 [1793]. *An Historical Account of the Transactions at Port Jackson and Norfolk Island…including the Journals of Governors Phillip and King, and of Lieutenant Ball.* Libraries Board of South Australia, Adelaide.

Koettig, M & Hughes, P. (1995) *Test Excavations at RS1 Regentville near Penrith on the Cumberland Plain, Sydney.* Report to Pacific Power.

Kohen, J. L. (1977) *A Surface Workshop at Lapstone Creek*. Unpublished Report.

Kohen, J. L (1981) *Excavations and Surface Collections at an Aboriginal Campsite of Jamison's Creek.* Report prepared for the NSW National Parks and Wildlife Service.

Kohen, J. L. (1984) *An Archaeological Survey within the Agnes Banks / Londonderry Area*. Report to Taylor Thomson Whitting Pty Ltd.

Kohen, J.L. (1986) *Prehistoric Settlement in the Western Cumberland Plain: Resources, Environment, Technology*. PhD Thesis, School of Earth Sciences, Macquarie University, Sydney.

LandArc (2002) *Draft plan of Management; Yarramundi Reserve*. Prepared for Hawkesbury City Council.

Lycett, J. (1830). *Drawings of the Natives and Scenery of Van Diemen's Land*.

Mathews, R. (1901). 'The Thurrawal Language (including Gundungarra and Dharrak languages, with vocabularies' in *Journal & Proceedings of the Royal Society of New South Wales.* 35:127-160.

McDonald. J, Mitchell. P & Rich .E (1996) *A Further Investigation of site RS1 at Regentville, Mulgoa Creek, Western Sydney.* Report to Environmental Services, Pacific Power.

McDonald, J. (1997*) Interim Heritage Management Report: ADI Site St Marys. Volume 1: Text*. Report to Lend Lease - ADI Joint Venture in Response to the Section 22 Committee Interim Report.

McDonald, J. (2002) *Archaeological Survey for Aboriginal Sites – Lots 1 & 2 DP871953, 269 and 305 Springwood Road, Yarramundi, NSW*. Report to Connacher Travers Environmental Consultants.

McDonald, J. (2005) *Archaeological Salvage Excavation of Eight Archaeological Landscapes in the Second Ponds Creek Valley, Rouse Hill Development Area, NSW.* Report to Rouse Hill Infrastructure Pty Ltd and Landcom.

Mulvaney, D.J. & Kamminga, J. (1999) *Prehistory of Australia.* Allen & Unwin, Sydney.

Nanson, G.C, Young, R.W. & Stockton, E.D. (1987) *Chronology and Palaeoenvironment of the Cranebrook Terrace containing artefacts more than 40,000 years old*. Archaeology in Oceania 22:72-78.

Nichols, M. (2004). *Pictorial History of the Hawkesbury*. Kingsclear Books, Alexandria.

NSW National Parks and Wildlife Service. (1997). *Aboriginal Cultural Heritage: Standards and Guidelines Kit*. Sydney.

Oakley, B. & Koettig, M. (1994) *Survey for archaeological sites along the route of the proposed 132kV transmission line related to the Power for Penrith project.* Report to Mitchell McCotter.

Organ, M. (1990) *Illawarra and South Coast Aborigines 1770-1850.* Aboriginal Education Unit, University of Wollongong. pp.158.

Powell, J. 1990. '*Early Hawkesbury River Settlement: Subsistence, Agriculture & Industries*' in Powell, J. & Banks, L (eds). Hawkesbury River History: Governor Phillip, Exploration & Early Settlement. Darug & Lower Hawkesbury Historical Society in association with Hawkesbury River Enterprises, Sydney. Pp: 43-70.

Ross, A. (1988) *Tribal and Linguistic Boundaries: A Reassessment of the Evidence* IN Aplin, G (ed.) Sydney Before Macquarie: A Difficult Infant. NSW University Press, Sydney.

Ross, A. (1990). *Aboriginal Life on the Lower Hawkesbury at the Time of European Settlement* in Powell, J. & Banks, L (eds). *Hawkesbury River History: Governor Phillip, Exploration & Early Settlement.* Darug & Lower Hawkesbury

Russell, W. 1914 (1991). *My Recollections by William Russell, 'Werriberrie': 1830-1914* Oaks Historical Society for the Wollondilly Heritage Centre.

Stockton, E.D. & Holland, W. (1974) *Cultural sites and their environment in the Blue Mountains.* Archaeology & Physical Anthropology in Oceania 9(I):36-65.

Stockton, E. & Nanson, G. (2004) *Cranebrook Terrace Re-visited*. Archaeology in Oceania 39:59-60.

Tench, W. (1996) [1793] *Watkin Tench 1788***.** Ed. Tim Flannery, The Text Publishing Company, Melbourne.

Wilson C, (1985), *Nepean Sand: The Railways of Yarramundi Falls*, The Light Railway Research Society of Australia.

APPENDIX 1 –

ABORIGINAL COMMUNITY CORRESPONDENCE

DARUG CUSTODIAN ABORIGINAL CORPORATION
PO BOX 81 WINDSOR 2756
PH: 45775181 FAX: 45775098 MOB: 0415770163
ABN: 81935722930
mulgokiwi@aol.com

28th October 2007.

Attention: Lisa Campbell.

SUBJECT: Draft Report- Yarramundi Reserve Heritage Assessment.

Dear Lisa,

The Darug Custodian Aboriginal participated in surveying Yarramundi Reserve with Jim Wheeler and other Darug groups. The area showed evidence of being disturbed by the previous mining activities.

This area is culturally significant to our group due to the recorded history of the area going back to colonisation, our family are direct descendants to Gomberee and Yellomundi, who the area was named after. We support signage for this area telling our history through the recorded stories of yellomundi and Gomberee as we are also from the boorooberongal clan, this is a great opportunity to tell our story.

The Draft report for this reserve is very informative and we are pleased that the Darug history has been included in a very thorough manner, it is very well written. I would like to add that the information included in this report is from settlers recordings and would like to add some information as well from a Darug point of view.

The Darug tribes and clans had very strict lores and protocols that had to be followed, in the settlers records all over Sydney there is always talk of dividing and breaking down the ways of the Darug, and this is correct to a certain degree. Within our organisation there are still many people who practice the old ways and they often talk of times sitting around the fire with old people speaking language and teaching the children, they often laugh about not letting any white people hear or see these things happening. Within the group our people have always known who there relations are ,where they lived and had moved to, further back than yellowmundi, so the clans have always and still do exist within the Darug. The settlers were just unaware of the strong connections and lores that have stayed in place to present time.

Our group are pleased with the consultation for this project and would also like to be consulted for the signage.

Regards
Leanne Watson

01/11/2007 11:06 0296728344 DTAC PAGE 01/01

DARUG TRIBAL ABORIGINAL CORPORATION

(Incorporating Darug Link Associating Inc.)
P.O BOX 441
BLACKTOWN NSW 2148
02 9672 8322 phone
02 9672 8344 fax only
ABN: 77 184 151 969

1st November 1, 2007

To Lisa Campbell

Archaeological & Heritage Management Solutions PTY LDT

Re: Draft Yarramundi Reserve Heritage Assessment

Although we found nothing while doing the walkover because of overgrowth of grass there are lots of artifacts still buried in Yarramundi Reserve. And if any work is to be done DTAC Wishers to be involved in the monitoring of all earth moving. And any work that will be done in YARRAMUNDI RESERVE there is a great history in this area.

With Thanks

Gordon Workman

Chairperson DTAC

0411240710

Darug Aboriginal Cultural Heritage Assessments

28 Calala Street, Mt Druitt 2770
ABN 51734106483

Gordon Morton
Ph: 9625 0005
Fax: 45 677421

Celestine Everingham
Ph/Fax: 4567 7421
Mob: 0432 528 896

1. 11. 07

Attention
Lisa Campbell
A H M S.

re Yarramundi Reserve

Gordon Morton & Celestine Everingham from DHCHA have read the report on the above site and agree with your recommendations for the management of Aboriginal Darug heritage. If works are planned in "Area 8" DHCHA wish to be consulted prior to any proposed works occurring.

Yours Sincerely,
C. Everingham
&
G. Morton