



Lower Hunter Lands Development Heritage Impact Assessment

Gwandalan

for Coal & Allied

October 2010

0111477_Gwandalan_Heritage

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Lower Hunter Lands Development

Heritage Impact Assessment
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Environmental Resources Management Australia Pty Ltd Quality System



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Coal & Allied

**Lower Hunter Lands
Development
*Heritage Impact
Assessment Gwandalan
Final***

October 2010

0111477_Gwandalan_Heritage

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CONTENTS

EXECUTIVE SUMMARY

1	INTRODUCTION	
1.1	PROJECT AND PLANNING CONTEXT	1
1.2	DESCRIPTION OF THE PROPOSAL	2
1.3	THE GWANDALAN SITE	2
1.4	METHODOLOGY	3
1.5	EXISTING HERITAGE STATUS	4
1.6	REPORT LIMITATIONS	4
1.7	REPORT STRUCTURE	4
1.8	AUTHORSHIP	5
2	DETAILS OF COMMUNITY CONSULTATION	
2.1	BACKGROUND – ABORIGINAL CONSULTATION	8
2.2	ABORIGINAL GROUPS CONSULTED	8
2.3	COMMUNITY MEETING	10
2.4	REQUIREMENTS FOR FUTURE ABORIGINAL CONSULTATION	10
3	ENVIRONMENTAL AND ABORIGINAL ARCHAEOLOGICAL CONTEXT	
3.1	ENVIRONMENTAL CONTEXT	11
3.1.1	PHYSICAL DESCRIPTION	11
3.1.2	GEOLOGY	11
3.1.3	TOPOGRAPHY AND LANDFORM	11
3.1.4	DRAINAGE	12
3.1.5	FLORA AND FAUNA	12
3.2	ABORIGINAL ARCHAEOLOGICAL CONTEXT	13
3.2.1	REGIONAL ABORIGINAL HERITAGE	13
3.2.2	LOCAL ABORIGINAL HERITAGE	17
3.2.3	DISCUSSION RELATING TO ABORIGINAL MIDDEN SITES	20
3.2.4	PREDICTIVE ABORIGINAL HERITAGE STATEMENT	20
3.2.5	SYNOPSIS OF ENVIRONMENTAL AND ABORIGINAL ARCHAEOLOGICAL BACKGROUND	21
4	HISTORICAL BACKGROUND OF GWANDALAN	
4.1	EARLY REGIONAL SETTLEMENT	23
4.2	HISTORICAL OVERVIEW OF THE GWANDALAN SITE	23
4.3	SYNOPSIS OF HISTORICAL BACKGROUND	24
5	GWANDALAN SITE SURVEY	

CONTENTS

5.1	<i>SURVEY METHODOLOGY</i>	26
5.1.1	<i>HISTORICAL ARCHAEOLOGY</i>	26
5.1.2	<i>ABORIGINAL HERITAGE</i>	26
5.1.3	<i>FIELDWORK CONSTRAINTS AND OPPORTUNITIES</i>	27
5.2	<i>SURVEY TRANSECTS</i>	27
5.3	<i>FIELD SURVEY RESULTS</i>	29
5.3.1	<i>HISTORICAL ARCHAEOLOGY</i>	29
5.3.2	<i>ABORIGINAL HERITAGE</i>	29
5.3.3	<i>MIDDEN SITE 45-7-0079</i>	29
5.3.4	<i>SHELL MIDDEN SITE "GWANDALAN 1"</i>	31
5.3.5	<i>SHELL MIDDEN SITE "GWANDALAN 2"</i>	31
5.3.6	<i>DISCUSSION - ARCHAEOLOGICAL POTENTIAL</i>	32
5.4	<i>SYNOPSIS OF FIELD SURVEY RESULTS</i>	34
6	<i>HERITAGE SIGNIFICANCE ASSESSMENT</i>	
6.1	<i>HISTORICAL HERITAGE ASSESSMENT</i>	36
6.1.1	<i>HISTORICAL ASSESSMENT CRITERIA</i>	36
6.1.2	<i>GWANDALAN SITE</i>	36
6.2	<i>ABORIGINAL HERITAGE ASSESSMENT</i>	37
6.2.1	<i>ABORIGINAL ASSESSMENT APPROACH</i>	37
6.2.2	<i>MIDDEN SITES 45-7-0079, GWANDALAN 1 AND GWANDALAN 2</i>	39
7	<i>PROPOSED CONCEPT PLANS</i>	
8	<i>ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)</i>	
8.1	<i>PREAMBLE TO ESD</i>	45
8.1.1	<i>AVOIDING OR REDUCING IMPACT TO ABORIGINAL SITES</i>	45
8.1.2	<i>PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT</i>	46
8.2	<i>PROPOSED CONSERVATION (AVOIDANCE) OF HERITAGE SITES</i>	47
8.3	<i>PROPOSED IMPACTS TO HERITAGE SITES</i>	47
8.3.1	<i>HISTORICAL HERITAGE</i>	47
8.3.2	<i>ABORIGINAL HERITAGE</i>	48
8.4	<i>SUMMARY OF HERITAGE IMPACTS</i>	49
8.5	<i>CUMULATIVE IMPACTS</i>	49
9	<i>STATUTORY CONTEXT</i>	
9.1	<i>NSW LEGISLATION</i>	51
9.1.1	<i>ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 (NSW)</i>	51
9.1.2	<i>NATIONAL PARKS AND WILDLIFE ACT 1974 (NSW)</i>	52
9.1.3	<i>HERITAGE ACT 1977 (NSW)</i>	52
9.2	<i>NSW PLANNING CONTROLS AND GUIDELINES</i>	53
9.3	<i>COMMONWEALTH LEGISLATION</i>	53
9.3.1	<i>ABORIGINAL AND TORRES STRAIT ISLANDER HERITAGE PROTECTION</i>	

CONTENTS

	<i>ACT 1984 (COMMONWEALTH)</i>	53
9.3.2	<i>ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 (COMMONWEALTH)</i>	54
10	<i>HERITAGE MITIGATION MEASURES</i>	
10.1	<i>HISTORICAL HERITAGE MITIGATION MEASURES</i>	55
10.2	<i>ABORIGINAL HERITAGE MITIGATION MEASURES</i>	55
10.2.1	<i>GENERAL ABORIGINAL HERITAGE MITIGATIONS</i>	55
10.2.2	<i>ABORIGINAL HERITAGE INTERPRETATION</i>	56
10.2.3	<i>AREA OF HIGH ARCHAEOLOGICAL POTENTIAL</i>	56
10.2.4	<i>AREA OF MODERATE ARCHAEOLOGICAL POTENTIAL</i>	57
10.2.5	<i>AREA OF LOW ARCHAEOLOGICAL POTENTIAL</i>	58
10.2.6	<i>CONSERVATION ZONES WITHIN THE DEVELOPMENT FOOTPRINT</i>	59
10.2.7	<i>PROTECTION OF THE CONSERVED ABORIGINAL MIDDEN SITE</i>	59
11	<i>CONCLUSION</i>	

LIST OF TABLES

TABLE 3.1	<i>LITERATURE REVIEW OF RELEVANT ARCHAEOLOGICAL REPORTS FROM THE AHIMS DATABASE</i>	14
TABLE 5.1	<i>DESCRIPTION OF TRANSECTS SURVEYED</i>	27
TABLE 5.2	<i>DEFINITIONS OF ARCHAEOLOGICAL POTENTIAL</i>	32
TABLE 8.1	<i>ABORIGINAL SITES IMPACTED BY THE PROPOSED DEVELOPMENT</i>	49
TABLE A.1	<i>CONSULTATION STAGE 1: ADVISORY REQUESTS</i>	A1
TABLE A.2	<i>CONSULTATION STAGE 1: ABORIGINAL GROUP REGISTRATIONS RECEIVED</i>	A2
TABLE A.3	<i>CONSULTATION STAGE 2: BRIEFING AND METHODOLOGY ADVICE SENT</i>	A2
TABLE A.4	<i>CONSULTATION STAGE 2: ABORIGINAL COMMENTS RECEIVED</i>	A3
TABLE B.1	<i>EFFECTIVE COVERAGE</i>	B1

LIST OF FIGURES

<i>FIGURE 1.1</i>	<i>GWANDALAN SITE IN ITS REGIONAL SETTING</i>	<i>6</i>
<i>FIGURE 1.2</i>	<i>GWANDALAN SITE IN ITS LOCAL SETTING</i>	<i>7</i>
<i>FIGURE 3.1</i>	<i>AHIMS SITES WITHIN THE LOCALITY OF GWANDALAN SITE</i>	<i>22</i>
<i>FIGURE 4.1</i>	<i>1914 WALLARAH PARISH MAPS. IMAGE SOURCE: DEPARTMENT OF LANDS, PARISH MAPS PRESERVATION PROJECT, IMAGE ID 10870001.</i>	<i>24</i>
<i>FIGURE 4.2</i>	<i>1954 AERIAL PHOTOGRAPH OF GWANDALAN</i>	<i>25</i>
<i>FIGURE 5.1</i>	<i>SURVEY TRANSECTS AND LANDFORMS</i>	<i>28</i>
<i>FIGURE 5.2</i>	<i>LOCATION OF ARCHAEOLOGICAL SITES AND AREAS OF ARCHAEOLOGICAL POTENTIAL</i>	<i>35</i>
<i>FIGURE 7.1</i>	<i>GWANDALAN STRUCTURE PLAN</i>	<i>43</i>
<i>ANNEX A</i>	<i>ABORIGINAL CONSULTATION LOG</i>	
<i>ANNEX B</i>	<i>EFFECTIVE COVERAGE TABLES</i>	
<i>ANNEX C</i>	<i>DISCUSSION PAPER - CONSERVATION OF ABORIGINAL MIDDEN SITES</i>	

EXECUTIVE SUMMARY

Environmental Resources Management Australia (ERM) was commissioned by Catylis Pty Ltd on behalf of Coal & Allied Industries Limited (Coal & Allied) to prepare a Heritage Impact Assessment (HIA) for lands at Gwandalan, which is subject to proposed development under Part 3A of the NSW *Environmental Planning and Assessment Act* (EP&A Act) 1979. The HIA considers the Aboriginal heritage and archaeology, historical archaeology and built heritage of the lands, the potential impacts of the proposed development on these and identifies an impact mitigation strategy.

The overall aim of this assessment was to ascertain whether there are any heritage values at the Gwandalan site that may be affected by the proposed development and provide relevant mitigation measures. A draft of this HIA was used during a community meeting in August 2007. The output of that meeting regarding the heritage issues has informed this report.

One Aboriginal shell midden has been previously recorded in the Gwandalan site along the foreshore. Archaeological survey has confirmed the extent and integrity of this midden site. The assessment of significance indicates that the site has high social value to the Aboriginal community. Two additional sites were identified one of which is within the Gwandalan site during the site survey; Gwandalan 1 and Gwandalan 2. Both of these sites have low archaeological significance and potential, and a high level of significance to the Aboriginal community.

This HIA identifies areas of high, moderate and low archaeological potential. Specific mitigation measures are recommended for these areas. General Aboriginal heritage mitigation measures are proposed, which should be provided in a simple 'Aboriginal Heritage Plan of Management' (PoM) for the development. It is also recommended that Aboriginal heritage interpretation options be explored by Coal & Allied. Detailed midden protection guidance has also been prepared (see *Annex C*).

Provided mitigation is followed, potential impacts of the proposed development on Aboriginal heritage can be satisfactorily avoided or managed.

No historic heritage sites or areas are located within the Gwandalan site. The implications and impact of development will not impact any historical heritage values of the Gwandalan site or the local region.

ABBREVIATIONS

AHIMS	Aboriginal Heritage Information Management System
ADTOAC	Awabakal Descendants Traditional Owners Aboriginal Corporation
ALALC	Awabakal Local Area Land Council
ATOAC	Awabakal Traditional Owners Aboriginal Corporation
AZP	Archaeological Zoning Plan
BURRA CHARTER	Australian best heritage practice reference that provides guidance for the conservation and management of places of cultural significance (cultural heritage places).
COAL & ALLIED	Coal & Allied Industries Limited
DECCW	Department of Environment, Climate Change and Water
DGEARS	Director General Environmental Assessment Requirements
DLALC	Darkinjung Local Aboriginal Land Council
ERM	Environmental Resources Management
ESD	Ecologically Sustainable Development
GTLAC	Guringai Tribal Link Aboriginal Corporation
LHRS	Lower Hunter Regional Strategy
MLALC	Mindaribba Local Area Land Council
PAD	Potential Archaeological Deposit
POM	Plan of Management
SHI	State Heritage Inventory
SHR	State Heritage Register
SOHI	Statement of Heritage Impact
RNE	Register of the National Estate

Environmental Resources Management Australia (ERM) was commissioned by Catylis Pty Ltd on behalf of Coal & Allied Industries Limited (Coal & Allied) to prepare a Heritage Impact Assessment (HIA) for lands at Gwandalan, which are subject to proposed development under Part 3A of the NSW *Environmental Planning and Assessment Act* (EP&A Act) 1979. The HIA considers the Aboriginal heritage and archaeology, historical archaeology and built heritage of the lands, the potential impacts on these of the proposed development and identifies an impact mitigation strategy.

This report builds upon a preliminary desktop review undertaken for the Gwandalan site in January 2007 (ERM 2007), and provides the results of a detailed site survey, comprehensive heritage values assessments, heritage impact analysis and Aboriginal consultation undertaken during June to August 2007, for the Gwandalan site (see *Figure 1.1* and *Figure 1.2*).

1.1 PROJECT AND PLANNING CONTEXT

Coal & Allied owns approximately 4,187 hectares of land in the Lower Hunter Region located within the four local government areas of Newcastle, Cessnock, Lake Macquarie, and Wyong (located in Northern Central Coast region). The sites are not required for future mining or other operational purposes.

Coal & Allied's Lower Hunter lands including Gwandalan are included in the Lower Hunter Regional Strategy (LHRS) for urban development and conservation. Coal & Allied is one of four major landowners within the region that are able to play a significant role in achieving the LHRS's environmental and conservation outcomes and sustainable growth.

The proposed Coal & Allied conservation lands are areas of high conservation value in the nominated green corridors that will be dedicated to the public. The conservation lands are similarly identified in the Lower Hunter Regional Conservation Plan prepared by the Department of Environment, Climate Change and Water (DECCW).

In August 2010 the Director General Environmental Assessment Requirements (DGEARs) were issued for the site. The requirements for heritage are:

"Heritage

(1) Provide an archaeological assessment and heritage impact statement in accordance with NSW Heritage Office guidelines. The statement should assess the impacts of the application on the area and any significant components of the site, including indigenous heritage.

(2) Provide an assessment in accordance with the draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005)."

1.2

DESCRIPTION OF THE PROPOSAL

It is proposed that the entire Coal & Allied owned Gwandalan site be rezoned/listed as a 'State Significant Site' (SSS) in Schedule 3 of State Environmental Planning Policy (Major Development). A draft Schedule 3 listing will be prepared with the Concept Plan Application.

The Concept Plan for a residential subdivision of the Gwandalan site will apply to the entire 268ha Gwandalan site. The key parameters for the proposed development of the site are as follows:

- Dedication of 205.75ha of conservation land to the New South Wales Government (NSWG) that is identified in the Lower Hunter Regional Strategy and Lower Hunter Regional Conservation Plan, comprising approximately 77% of the Gwandalan site.
- Maximum dwelling yield of 623 dwellings over 62.24ha.
- Indicative development staging. The number of lots and extent of staging for release areas will be largely dictated by the service infrastructure requirements as well as responding to market forces.
- The provision of associated infrastructure.
- Torrens title subdivision of the Gwandalan site. The Torrens title subdivision and boundary realignment of Coal & Allied land will enable land 205.75ha in area that is owned by Coal & Allied to be excised and dedicated to NSWG for conservation purposes.

The desired future character of the proposed concept plan will be included in Urban Design Guidelines. Urban Design Guidelines will be prepared to inform the Concept Plan in respect of urban form, built form, open space and landscape, access and movement and visual impact for the site.

It is proposed to dedicate land for conservation purposes as part of the Major Project Application via a Voluntary Planning Agreement (VPA) between Coal & Allied and the NSWG in accordance with s.93F of the EP&A Act.

1.3

THE GWANDALAN SITE

This report focuses on the Gwandalan site at Gwandalan, NSW. The location of the study area is provided at *Figure 1.1* and the Gwandalan site is shown in *Figure 1.2*.

The overall aim of this assessment was to ascertain whether there are any heritage values at the Gwandalan site that might be affected by the proposed development and if necessary provide relevant mitigation measures for impacts to any identified heritage values during any future development. To achieve these aims the following objectives were established:

- to undertake a preliminary background desk based review of potential heritage items within and adjacent to the Gwandalan site (ERM 2007);
- to identify and record all heritage objects and places within the Gwandalan site through field survey;
- to consult with the local Aboriginal community regarding the specific Aboriginal social value of the land and the Aboriginal heritage recommendations;
- to assess the significance of all heritage objects, sites, relics and places within the Gwandalan site in accordance with relevant NSW heritage guidelines;
- to assess the potential of the Gwandalan site to contain further heritage sites;
- to assess the impact of the proposed development on heritage values through a Statement of Heritage Impact (SoHI); and
- to prepare recommendations on the management and mitigation of potential impacts caused by development to any heritage values associated with the Gwandalan site.

ERM's approach to the preparation of the detailed site assessment was based on the following current best practice guidelines:

- NSW Heritage Office *Assessing Significance* Guideline;
- NSW Heritage Office *Statements of Heritage Impact* Guideline;
- Department of the Environment, Climate Change and Water (DECCW) *Draft Guideline for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*;
- The *Australia ICOMOS Burra Charter 1999* (Burra Charter);
- *Rio Tinto Cultural Heritage Management Guidelines for Australian Businesses*; and
- *Rio Tinto Cultural Heritage Management System Guidance for Australian Businesses*.

1.5

EXISTING HERITAGE STATUS

The preliminary background heritage assessment (ERM 2007) found that one Aboriginal shell midden had been previously recorded within the Gwandalan site under the NSW DECCW Aboriginal Heritage Information Management System (AHIMS) database within the Gwandalan site. The Gwandalan site also held a level of archaeological potential for further Aboriginal sites.

The preliminary background investigation included a search of the NSW Heritage Office State Heritage Register (SHR) and Inventory (SHI), the Wyong Environmental Plan (LEP), the Register of the National Estate (RNE) and the National Trust Register. It was found that no previously recorded historical heritage sites existed within the Gwandalan site.

1.6

REPORT LIMITATIONS

This report has not been limited in terms of research into and access to the Gwandalan site. The survey of the Gwandalan site was limited due to thick vegetation across a proportion of the Gwandalan site. However, it is considered that a sufficient representative sample of the Gwandalan site was surveyed to provide evidence of landforms, historical impacts, heritage sites and archaeological potential.

1.7

REPORT STRUCTURE

This report is structured as follows:

Chapter 2 outlines the Aboriginal community consultation undertaken for the Gwandalan site;

Chapter 3 provides the environmental and archaeological context of the Gwandalan site, including known and potential heritage sites within the Gwandalan site;

Chapter 4 provides an overview of the history of the study area;

Chapter 5 outlines the methodology and results of the field survey;

Chapter 6 assesses the significance of heritage sites located in the Gwandalan site;

Chapter 7 provides the proposed development structure plans;

Chapter 8 provides an overview of Environmental Sustainable Development and the conservation and impacts to heritage items in the Gwandalan site;

Chapter 9 outlines the legislative framework and statutory requirements;

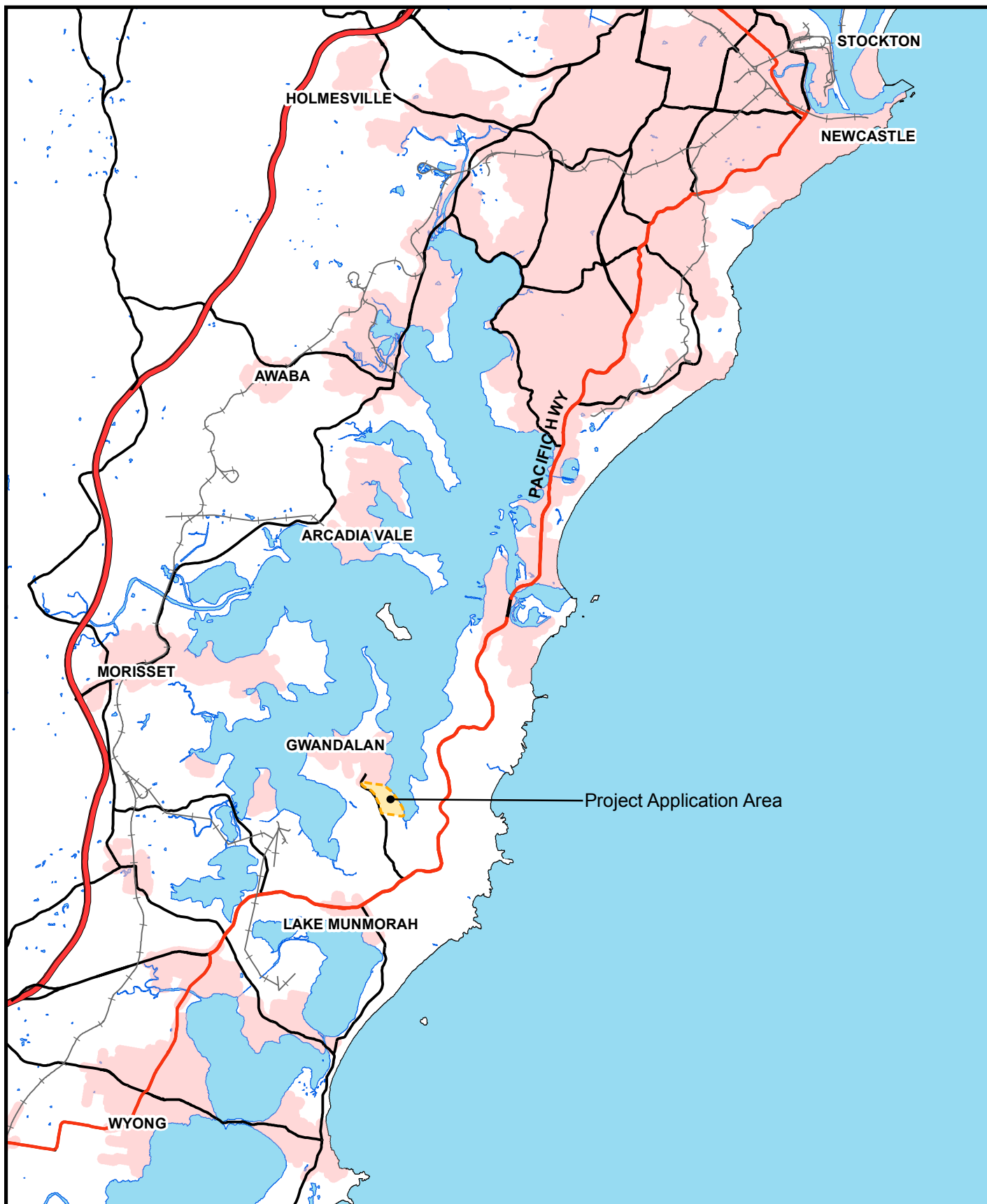
Chapter 10 provides heritage impact mitigation recommendations; and

Chapter 11 provides a conclusion outlining the findings of the HIA.


1.8

AUTHORSHIP

Dr Tim Owen (ERM Archaeologist) conducted the historical heritage field survey. Jenna Lamb (ERM Archaeologist) conducted the Aboriginal heritage field survey. Tim Owen and Jenna Lamb authored this report. Dr Diana Neuweyer (ERM Heritage Consultant) undertook the 2010 edits of the report. Shelley James (ERM Heritage Consultant) undertook a technical review of this report. Steve Laister (ERM Partner) undertook Quality Assurance (QA) review of this document.



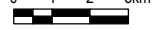
Legend

 Gwandalan Site

Client:	Catylis		
Project:	Lower Hunter Land Development - Gwandalan		
Drawing No:	0111477s_G_GIS001_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
Drawn by:	JF	Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to Scale Bar		



0 1 2 3km



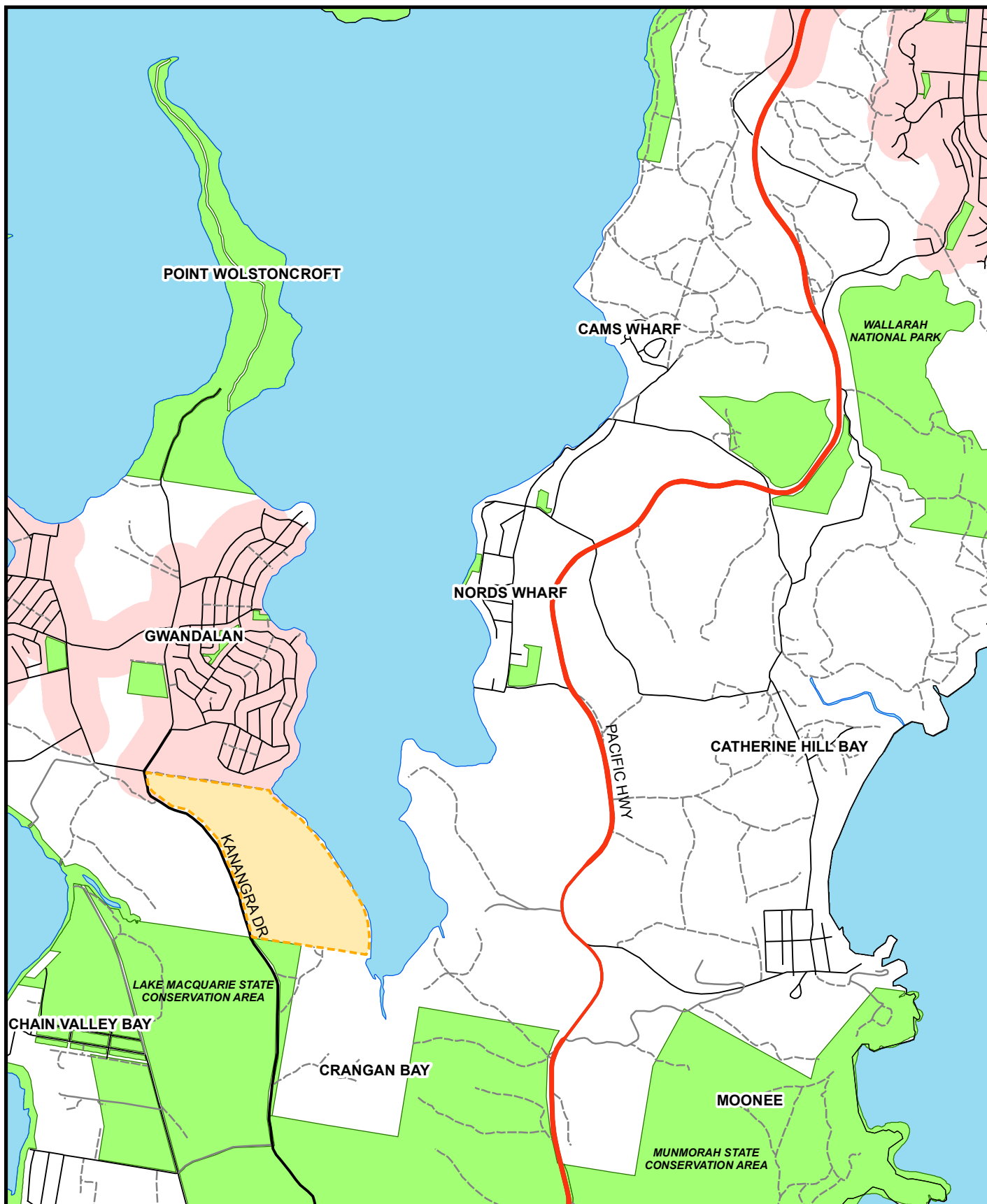
Maps and figures contained within this document may be based on third party data, may not be to scale and is intended for use as a guide only. ERM does not warrant the accuracy of any such maps or figures.

Figure 1.1
Gwandalan Site in its Regional Setting


Environmental Resources Management Australia Pty Ltd

Brisbane, Canberra, Hunter Valley, Melbourne, Perth,
Port Macquarie, Sydney





Legend

 Gwandalan Site

Client:	Catylis		
Project:	Lower Hunter Land Development - Gwandalan		
Drawing No:	0111477s_G_GIS002_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
Drawn by:	JF	Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to Scale Bar		



0 300 600 900m

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Figure 1.2

Gwandalan Site in its Local Setting

Environmental Resources Management Australia Pty Ltd

Brisbane, Canberra, Hunter Valley, Melbourne, Perth,
Port Macquarie, Sydney



2.1 BACKGROUND – ABORIGINAL CONSULTATION

Aboriginal consultation is required for any assessment of Aboriginal heritage. The Department of Environment, Climate Change and Water (DECCW) has released the '*Interim Community Consultation Requirements Guideline*' (2004) for Aboriginal consultation, and it forms a requirement of the DGEARs for this Part 3A application.

The interim guideline sets out a process for inviting Aboriginal groups to register interest as a party to consult (including local press advertisement), seeking responses on proposed assessment methodology, and seeking comment on proposed assessments and recommendations. The interim guideline requires proponents to allow ten working days for Aboriginal groups to respond to invitations to register, and then 21 days for registered Aboriginal parties to respond to a proposed assessment methodology. An additional ten days are allowed for groups to review a draft report and comment on the results and management recommendations made.

The Aboriginal community consultation for the project has been carried out in light of the DECCW guideline, taking into account the Part 3A requirements of the project. The Director General's Environmental Assessment Requirements (DGEARs) for the Gwandalan site state that the DECCW's guidelines should be adhered to and that consultation with the Local Aboriginal Land Council should be undertaken.

2.2 ABORIGINAL GROUPS CONSULTED

Letters requesting advice on Aboriginal organisations to consult, and any known heritage issues to be taken into consideration in the area, were emailed on 28 June 2007 to:

- the NSW DECCW;
- registrar, *Aboriginal Land Rights Act 1983* (NSW);
- Wyong Shire Council (WSC); and
- Darkinjung Local Aboriginal Land Council (DLALC).

In addition, a number of other Aboriginal stakeholder groups were already known to ERM for this area, and were also contacted on 28 June 2007:

- Guringai Tribal Link Aboriginal Corporation (GTLAC);
- Awabakal Traditional Owners Aboriginal Corporation (ATOAC); and
- Awabakal Descendants Traditional Owners Aboriginal Corporation (ADTOAC).
- A local press advertisement requesting Aboriginal individuals and groups interested in being consulted on this project to write to ERM was run in the Lake Macquarie News on 5 July 2007. No responses to this advertisement were received.
- WSC responded that they were unable to fulfil our request and directed us to DECCW.
- DECCW identified three Aboriginal parties to be contacted:
 - GTLAC;
 - Mur-Roo-Ma Inc.; and
 - Arthur C. Fletcher.

These parties were therefore contacted by ERM as to whether they wished to be consulted on this project. In addition, each party was asked to identify any further individuals or groups who would be interested in being consulted regarding this project. Four responses were initially received, from GTLAC, ATOAC, ADTOAC and DLALC. These parties were provided with a proposed assessment methodology (an example can be found in *Annex A*). Responses to this methodology were received from all parties, and each indicated their agreement with this methodology.

Further consultation was undertaken following the advice of DECCW on Aboriginal parties that may be interested in being contacted regarding the assessment (see above). A response was received from Arthur C. Fletcher (Wonnarua Sites Officer). Arthur indicated that he is of Wonnarua descent and requested to be involved in the project. Consultation with all of the other registered Aboriginal stakeholders and Coal & Allied resulted in a decision to invite Arthur to comment on the draft Aboriginal heritage assessment report but not involve him in the fieldwork because the Gwandalan site was not within his cultural boundary, as other stakeholders advised that the Wonnarua area does not cover the current Gwandalan site.

A search of the National Native Title Tribunal website undertaken on 28 June 2007 revealed no active claimant applications in the Wyong LGA. Native Title is extinguished in all land that is freehold or was freehold in the past. Therefore, freehold land in NSW cannot be claimed by Native Title applicants. As the Gwandalan site is freehold land, Native Title is extinguished, but such claims in the area are useful for identifying Traditional Owner groups, regardless of land tenure.

Fieldwork for the assessment was undertaken on 12-13 July 2007 and included a total of nine local Aboriginal community representatives: Tracey Howie, Trudy Smith and Dale Clouten from GTLAC; Kerrie Brauer, Dene Hawken and Jon Hawken from ATOAC; Shane Frost and James Frost from ADTOAC; and Craig Foresheaw from DLALC. These representatives were invited to comment on Aboriginal heritage issues in the field.

No further Aboriginal parties have so far been identified through the consultation process. Further details of the Aboriginal consultation undertaken for the Gwandalan site are provided in *Annex A*.

2.3 *COMMUNITY MEETING*

Between 27 and 30 August 2007 a series community meetings were held, for the purpose of community comment in relation to the proposed development. All Aboriginal stakeholder groups were represented at the meeting. This meeting was also used to provide the results of reporting to the Aboriginal groups and fine tune possible statements of commitment, with regard to Aboriginal heritage. During the meeting a process for the long term conservation of Aboriginal middens was devised between ERM and the Aboriginal stakeholder groups. This process is detailed in *Annex C*.

2.4 *REQUIREMENTS FOR FUTURE ABORIGINAL CONSULTATION*

It is recommended that copies of the draft final report are sent to the five registered Aboriginal parties, so that they may comment on its content and recommendations.

The comments of these parties should be appended to this report when received. Without this opportunity for comment this assessment remains incomplete. Although constraints are identified, the management options cannot be finalised without concluding consultation.

Future work relating to the Aboriginal archaeological mitigation, as stipulated in this report, should include consultation with the relevant Aboriginal stakeholders.

3.1 ENVIRONMENTAL CONTEXT

3.1.1 *Physical Description*

The Gwandalan site is located on the western foreshore of Crangan Bay immediately to the south of the township of Gwandalan on Lake Macquarie. It is a densely vegetated site and contains fire trail tracks, bike tracks and evidence of illegal dumping. No other infrastructure or services appear to occur across the Gwandalan site.

3.1.2 *Geology*

Lake Macquarie is situated on the north-eastern edge of the Sydney Basin, which extends over central-eastern NSW. Lake Macquarie's geology mainly consists of Triassic age Munmorah Conglomerates (Triassic Narrabeen Sandstones) in the south and west, and Permian Newcastle Coal Measures in the north. As the only region where these geological features interface, Lake Macquarie has an unusual and complex mix of soil types (NPWS 2005:7).

The Gwandalan site is composed of the Triassic Clifton Sub-group comprising Munmorah conglomerates (Nelson 1995:19-21). The Narrabeen Formation dominates the southern area of Lake Macquarie, particularly the south western, southern and south eastern shores of Lake Macquarie (Haglund 1986:5). The Gwandalan site is located on Doyalson soil types.

3.1.3 *Topography And Landform*

The Gwandalan site is located in the southern part of Lake Macquarie, the largest tidal lake in Australia. Prior to 10,000 years ago, Lake Macquarie existed only as a broad, shallow embayment. However, following the increase in sea levels in the early-mid Holocene, a marine sand barrier had been created at the Lake entrance by approximately 6,000 years ago, causing the formation of Lake Macquarie as a barrier estuary (NPWS 2005).

Speight (1990) describes categories of landform divisions, including ten morphological types of landform element units. For archaeological investigations the landscape is divided into standardised elements that can be used for comparative purposes and predictive modelling. Based on previous work in the study area, a number of landform units were identified within the Gwandalan site, being slopes, flats and open depressions (creeks).

The Gwandalan site is located on a gently sloping ridge that levels out to a flat along the lake edge. The original landform comprises predominantly sloping landform elements with minor first order drainage depressions and a swamp (Strangers Gully).

3.1.4 *Drainage*

The Gwandalan site generally slopes down to the south and drains into Lake Macquarie. Three small creek tributaries (first order – Strahler model) exist in the north of the Gwandalan site, and a system of small tributaries (first and second order) develops into a swampland (Strangers Gully) in the centre of the Gwandalan site. It should be noted that the Gwandalan site is located within the ‘Swansea-North Entrance Mine Subsidence District’. The surface typology and hydrology of the Gwandalan site may have been affected by subsidence caused by historical mining activities (Navin Officer 1995:5-6). It is therefore possible that the current drainage pattern differs from the original Holocene pattern.

3.1.5 *Flora And Fauna*

RPS undertook vegetation mapping in 2005 and additional more extensive mapping in 2007. It was found that the vegetation occurring at Gwandalan generally comprised Coastal Plains Scribbly Gum Woodland, Riparian Melaleuca Swamp Woodland, Coastal Wet Sand Cyperoid Heath and Coastal Foothills Spotted Gum Ironbark Forest.

Vegetation in the Gwandalan site is predominantly comprised of medium to heavy density Scribbly Gum Woodland and Swamp Woodland. Some parts of the Gwandalan site contain mature (old) trees.

RPS (2005) also notes a range of fauna species present or likely to be present in the Gwandalan site, which are predominantly comprised of birds, small mammals, frogs and reptiles. Reference should be made to RPS (2007) for the current full vegetation mapping of the Gwandalan site.

3.2

ABORIGINAL ARCHAEOLOGICAL CONTEXT

3.2.1

Regional Aboriginal Heritage

Prior to European settlement of the region, the Lake Macquarie area was inhabited by the Guringai and Awabakal people. Although information about the Aboriginal occupation of the Gwandalan area is somewhat limited, the abundance of food resources (particularly around the lake's foreshore) indicates that this region would have been 'attractive' to the groups living in the area (EJE 2005:15). By the start of the twentieth century only a small number of Aboriginal people remained in the area living on the outskirts of settlements including Cams Wharf. However, the community remained in the region and has since grown to be one of the most dynamic and largest in NSW (Turner and Blyton 1995:51-52).

A literature review of the NSW DECCW library was made (July 2007) to understand archaeological sites in the broader region. This review was targeted to those reports relevant to the study area. Key word searches were used to find reports for the locality in the Aboriginal Heritage Information Management System (AHIMS) Aboriginal Sites Database. *Table 3.1* lists reports which were reviewed and the locality with which they were concerned.

The general patterning of Aboriginal sites in the local area show a strong association with the lake edges, and little recorded in the immediate hinterland. This reflects Aboriginal focus on lake resources, predominantly shellfish. There is a general pattern in Australian archaeology of stone artefact sites concentrated along watercourses.

The network of watercourses and Strangers Gully swamp have some potential for associated artefacts, although there is an absence of site records in comparable contexts in the region. This may reflect lack of survey.

Table 3.1 *Literature Review of Relevant Archaeological Reports from the AHIMS Database*

Author of Report	Distance from Gwandalan site	Type of development/ report	Locality	Sites Recorded
Haglund (1986)	Includes the present Gwandalan site	Assessment report to LMCC	Lake Macquarie LGA	Discusses predictive model for likely site types and locations in Lake Macquarie area
Nelson (1995)	Includes the present Gwandalan site	Thesis for Master of letters University of New England	Lake Macquarie LGA	Discusses predictive model for midden sites in Lake Macquarie area
ERM (2007)	Approx. 1.5 km north	Aboriginal archaeological survey	North of Billabourie Road, Gwandalan	Extension of one previously recorded midden, including shell and stone artefacts, extending along the foreshore
Haglund (1985)	Approx. 2.5 km south east	Aboriginal archaeological survey for proposed coal reject emplacement and associated conveyor belts	Wallerah Colliery, Catherine Hill Bay	None
Griffiths (1992)	Approx 2 km west	Aboriginal archaeological survey for proposed water sports club and holiday cabins	West side of Kanangra Drive, Gwandalan	Shell midden comprising cockle (<i>A. trapezia</i>) shell found on Lake foreshore
Haglund (1987)	Approx. 2 km south east	Aboriginal archaeological survey for proposed coal reject emplacement and coal handling developments	Wallerah Colliery, between Pacific Highway and township of Catherine Hill Bay	None
Brayshaw (1989)	Approx. 3.5 km west	Aboriginal archaeological survey for proposed tourist resort	Area on fore-shore of Lake Macquarie, at Summer-land Point	Shell midden comprising <i>A. trapezia</i> , whelk (<i>Pyrazus ebeninus</i>) and abalone (<i>Haliotis ruber</i>) found on western bank of Bonny Boy Gully near Lake foreshore
Dallas (1986)	Includes sewage treatment works site approx. 3 km west	Aboriginal archaeological survey of proposed pipe-line	Between sewage treatment works sites at Gwand-alan and Mannering Park	Shell midden comprising <i>A. trapezia</i> found in roadway

Author of Report	Distance from Gwandalan site	Type of development/report	Locality	Sites Recorded
Dallas <i>et al</i> (1993)	Approx. 5 km north west	Aboriginal heritage assessment of proposed Morisset Peninsula Sewerage Scheme	Morisset peninsula, Lake Macquarie	12 shell middens comprising mainly <i>A. trapezia</i> , with some mud oyster (<i>O. angasi</i>), <i>P. ebeninus</i> , peri-winkle (<i>Bembicium sp.</i>), mud creeper (<i>Velacumantus australis</i>), scallop (<i>Notovola sp.</i>) and <i>Bittium sp.</i> found on foreshore flats, beaches, toes of hills, and hillslopes, with more concentrated middens adjacent to permanent creeks and where small freshwater creeks enter Lake. Chert artefact at one midden
Brayshaw (1988)	Approx. 3.5 km north east	Aboriginal archaeological survey for proposed Caves Beach Resort development	Caves Beach, Lake Macquarie	One midden, one shelter with PAD and one midden and burial site (relocated). Midden and burial site located on creek estuary and beach with associated rock platforms, included turban (<i>Ninella torquata</i>), <i>H. ruber</i> , <i>A. trapezia</i> , limpet (<i>Cellana tramoserica</i>), ducks-bill (<i>Scutus antipodes</i>), rock oyster (<i>Saccostrea commercialis</i>) and sea urchin (<i>Heliocidaris erythrogramma</i>), stone artefacts (including some backed artefacts) of chert, petrified wood, quartzite and basalt, and a fish hook file. Midden on Lakeshore included <i>A. trapezia</i> , <i>O. angasi</i> , <i>P. ebeninus</i> , <i>S. commercialis</i> and scallop, and stone artefacts of quartzite, chert and volcanic rock. Shelter with PAD consisted of conglomerate bedrock outcropping near creek
Dean-Jones (1988)	Approx. 4 km north	Aboriginal archaeological survey	Lot 37 Lambton Parade, Swansea Heads	Shell midden material found on property comprising <i>A. trapezia</i> , <i>P. ebeninus</i> , mussel and oyster shells, and stone artefacts made from Nobby's tuff

Author of Report	Distance from Gwandalan site	Type of development/report	Locality	Sites Recorded
Dyall (1975)	Approx. 3.5 km north	Aboriginal archaeological excavation	Swansea Heads, Lake Macquarie	Midden material including <i>A. trapezia</i> , <i>O. angasi</i> , <i>P. ebeninus</i> , <i>Nerita sp.</i> , fish bone, bone points, stone cobbles used for tools (including ground-edge axes and anvils), and human burials
Donlon (1991)	Approx. 3.5 km north	Skeletal remains identification of remains from the Swansea Channel burial ground	Swansea Heads, Lake Macquarie	Remains found indicated 21 individuals recovered, including 4 cremations, on beach in midden at Lake entrance
Resource Planning (1992)	Approx. 6 km west	Aboriginal archaeological survey for dredging and stabilisation of Windermere Creek	Windermere Creek, Lake Macquarie	Isolated tuff stone artefact found on cleared land. Small midden comprising <i>A. trapezia</i> found on swampy foreshore on bank of (eroding into) Windermere Creek near its junction with Lake Petite

3.2.2

Local Aboriginal Heritage

The environmental context outlined above has implications for Aboriginal heritage and archaeological deposits in the Gwandalan site. The basic geology of the Gwandalan site (the Narrabeen Formation) indicates that significant stratified archaeological deposits are not likely to be present. Further, no outcrops of suitable raw materials for Aboriginal stone artefact manufacture were evident within the Gwandalan site, therefore stone quarry sites are not expected to occur. The lack of suitable stone outcrops also indicates that shelter sites, stone engraving/art sites and axe grinding grooves will not occur.

Soils across the Gwandalan site (Doyalson soil types) have been associated with a high tendency for the occurrence of shell middens (Nelson 1995). These sites are likely to be found near to water sources such as creeks, the lake and swamp/marsh features. There is some potential for scarred or carved trees to occur in the Gwandalan site due to the maturity of the vegetation in some portions.

It can be stated that in general a pattern exists within the temperate zones of NSW that Aboriginal stone artefact sites are concentrated along watercourses. The watercourses flowing through the northern and central parts of the Gwandalan site have some potential for associated artefacts, although there is an absence of recorded sites in comparable regional contexts. This may reflect a lack of archaeological survey, rather than a lack of Aboriginal sites.

Table 3.2 *Aboriginal Archaeological Site Types (ERM 2004)*

Site types	Definition
Open sites [stone artefact scatters]	Open sites, also known as open campsites, are usually indicated by surface scatters of stone artefacts and sometimes fire blackened stones and charcoal. Where such sites are buried by sediment they may not be noticeable unless exposed by erosion or disturbed by modern activities. The term campsite is used as a convenient label which, in the case of open sites, does not necessarily imply that Aboriginal people actually camped on the sites; rather it indicates only that some type of activity was carried out there.
Middens	Middens consist of accumulations of shell that represent the exploitation and consumption of shellfish by Aboriginal people. Shell species may be marine, estuarine or freshwater depending on the environmental context and middens may also include other faunal remains, stone artefacts, hearths and charcoal.
Shelter sites	Sandstone shelters and overhangs were used by Aboriginal people to provide campsites sheltered from the rain and sun. The deposits in such sites are commonly very important because they often contain clearly stratified material in a good state of preservation.
Grinding grooves	Grooves resulting from the grinding of stone axes or other implements are found on flat areas of suitable sandstone. They are often located near waterholes or creek beds as water is necessary in the sharpening process. In areas where suitable outcrops of rock were not available, transportable pieces of sandstone were used.
Quarries	These are areas where stone was obtained for flaked artefacts or ground-edge artefacts, or where ochre was obtained for rock paintings, body decoration or decorating wooden artefacts.
Art sites	Aboriginal paintings, drawings and stencils are commonly to be found where suitable surfaces occur in sandstone shelters and overhangs. These sites are often referred to as rock shelters with painted art. Rock engravings, carvings or pecking are also to be found on sandstone surfaces both in the open and in shelters. These are referred to as rock engraving sites.
Scarred trees	Scarred trees bear the marks of bark and wood removal for utilisation as canoes, shields, boomerangs or containers. It is commonly very difficult to confidently distinguish between Aboriginal scars and natural scars or those made by Europeans.
Burial sites	Burials may be of isolated individuals, or they may form complex burial grounds.
Stone arrangements, carved trees and ceremonial grounds	These site types are often interrelated. Stone arrangements range from simple cairns or piles of rocks to more elaborate arrangements; patterns of stone laid out to form circles and other designs, or standing slabs of rock held upright by stones around the base. Carved trees are trees with intricate geometric or linear patterns or representations of animals carved into their trunks. Ceremonial grounds and graves were often marked by such trees. Bora grounds are a common type of ceremonial site and they are generally associated with initiation ceremonies. They comprise two circles, generally edged with low banks of earth but sometimes of stone, a short distance apart and connected by a path.

AHIMS Search

A search of the AHIMS Aboriginal Sites Database at DECCW within a 13 km x 14 km area centred around the Gwandalan, Nords Wharf and Catherine Hill Bay (CHB) sites was undertaken in July 2007. The extended search area provided additional context with regard to the location of known Aboriginal sites and provided further clarification as to previous archaeological work on a regional basis. It was also used for base line data for the concurrent ERM studies at CHB and Nords Wharf.

The search identified a total of 94 recorded Aboriginal sites – although some are noted as duplicate recordings (see *Figure 3.1*). The results comprise of 67 middens (two associated with quarries, two associated with stone artefact scatters and one associated with burials [at Swansea]), 14 stone artefact sites (13 stone artefact scatters and one isolated find), four scarred trees and three Potential Archaeological Deposits (PADs). Pulbah Island is identified as an Aboriginal place.

The AHIMS search across the south of Lake Macquarie shows that middens are the main Aboriginal site type recorded in the area. Estuarine middens comprising mostly cockle shells with some oyster and whelk are found in many parts of the Lake Macquarie shore.

Midden site, 45-7-0184, has been recorded along the foreshore near the Bowling Club in the township of Gwandalan, approximately 1 km north of the Gwandalan site. Site 45-7-0334 is also a midden, which has since been destroyed under Section 90 consent, and was positioned approximately 1km west of the Gwandalan site. Site 45-7-0178 comprises two scarred trees and a shell midden. These two latter sites are located approximately 1 km west of the Gwandalan site at Chain Valley Bay

A midden site has been recorded along the foreshore adjacent to the Gwandalan site (45-7-0079). The site card for this midden recorded that it extends approximately 20-30 m along the shore. The preliminary site investigation undertaken in January 2006 revealed that the site may be more extensive than this and indicated that it may also extend at least 15 metres inland. Initial observations suggest that the midden is one of the larger and more intact middens remaining around Lake Macquarie. As this midden site has been recorded in close proximity to the Gwandalan site, a survey was required to confirm the location and extent of the midden to determine if it may be affected by the proposed development.

3.2.3

Discussion Relating To Aboriginal Midden Sites

Given the propensity of shell material associated with Lake Macquarie it is very important to be able to differentiate between natural shell beds and shell deposits created by Aboriginal people. Discussion on the nature of undisturbed cultural shell deposits as opposed to natural shell deposits have been provided by Bowdler 1983; Coutts 1966; Gill 1951; Hughes and Sullivan 1974. A summary of this work suggests that:

- Aboriginal middens contain shells that are of edible species and sizes, whereas natural shell deposits contain shells of both edible and non-edible species and sizes;
- Aboriginal middens contain charcoal/burnt wood, blackened/burnt shells, bones from mammals used for food, and artefacts (including flaked stone, hearth stones, bone points or shell or bone fish hooks) in addition to shells, whereas natural shell deposits do not;
- Aboriginal middens do not contain marine lifeforms not used by Aboriginal people (eg. corals and tube worms), whereas natural shell deposits do;
- Aboriginal middens are unstratified or roughly stratified, whereas natural shell deposits are usually well stratified with sedimentary features of water laid deposits; and
- Aboriginal middens do not contain shell that has been worn during transport in the offshore/beach zone (or shell grit or rounded pebbles), whereas natural shell deposits do.

While there has been some misidentification of naturally occurring or dredge waste shell as midden in comparable contexts, many reliable midden records reflect the sensitivity of the Lake Macquarie shore for midden material.

3.2.4

Predictive Aboriginal Heritage Statement

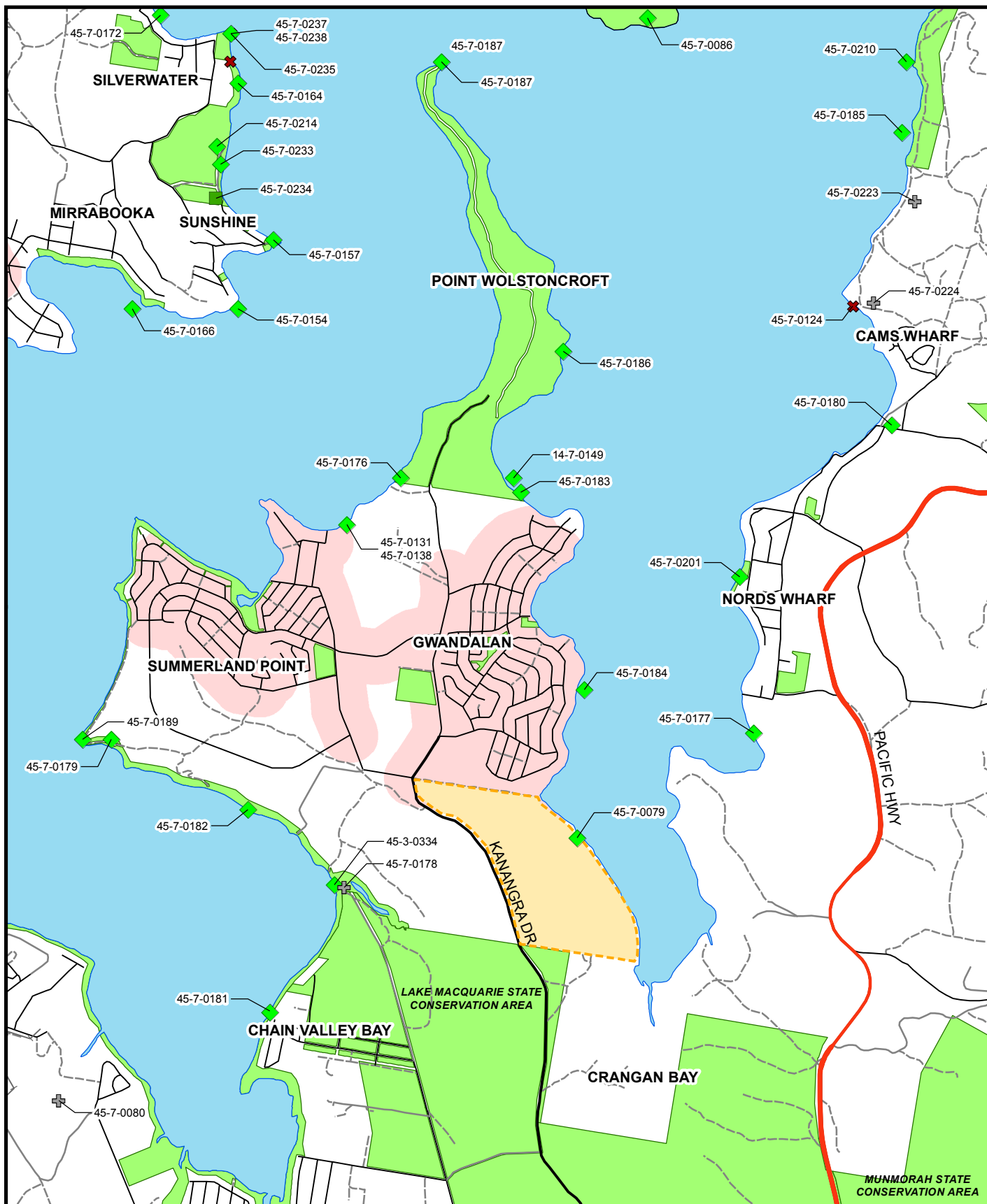
Based upon the environmental, regional and local archaeological patterns it is possible to provide a predictive statement for the occurrence of Aboriginal sites within the Gwandalan site.

Due to the undeveloped nature of the Gwandalan site, and general occurrence of Aboriginal sites across the region, intact Aboriginal sites could occur at any location within the Gwandalan site. However, there is a higher probability that Aboriginal sites were created near to the lake foreshore and on the lower lying portions of the Gwandalan site, associated with an accumulation of water, i.e. the creeks or swamps/marshes. Sites most likely to be found are midden sites and stone artefact scatters, although a range of site types are possible – see *Table 3.2*. These sites could be extensive covering several hundred metres, as they could represent long term Aboriginal subsistence adjacent to the lake's edge.

The background assessment of the Gwandalan site shows that the foreshore zone contains a previously recorded Aboriginal shell midden. This site is known to extend along the flat adjacent to Lake Macquarie, but there is a significant likelihood that it continues into the hinterland behind the foreshore and further along the foreshore than previously recorded.

It is predicted that shell middens and stone artefact sites (scatters and isolated finds) are the Aboriginal site types most likely to be found in the Gwandalan site. Stone artefacts are considered most likely to be found on ridges and flats adjacent to the small creeks and Strangers Gully swamp, while middens are most likely close to the foreshore. Scarred or carved trees may occur within the Gwandalan site.

It does not appear that the Gwandalan site has been associated with any historical activities and there is a low likelihood that any historical heritage or archaeology items will be discovered within its boundaries.



Legend

- Gwandalan Site
- ✕ Stone Artefact Scatter
- + Scarred Tree
- Potential Archaeological Deposit
- ◆ Midden

Client:	Catylis		
Project:	Lower Hunter Land Development - Gwandalan		
Drawing No:	0111477s_G_GIS003_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
Drawn by:	JF	Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to Scale Bar		



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Figure 3.1
AHIMS Sites within the Locality of Gwandalan Site

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4.1

EARLY REGIONAL SETTLEMENT

The establishment and growth of European settlement in the Hunter region is directly linked to the presence of coal. An 'abundance of coal' in the Lake Macquarie area was recorded in 1800 following Captain William Reid's journey to Newcastle to collect a small cargo of coal, where he mistakenly stopped at what is now known as Moon Island rather than Nobbys Island to collect the cargo (Barney 1999:1).

The earliest white settlers in the region were missionaries, led by Rev. Lancelot Threlkeld in the 1820s to the area named in honour of former NSW Governor Lachlan Macquarie. Threlkeld established several mission stations in the region along with the first coal mine, Ebenezer Colliery, at Coal Point on land granted in 1829 (Barney 1999:1).

The Hunter Valley was opened up to free settlement in 1820 following John Howe's discovery of an inland route from the Hawkesbury River to Patrick Plains. Extensive land grants were made along watercourses and farming for sheep and cattle commenced soon after (ERM 2006:5).

4.2

HISTORICAL OVERVIEW OF THE GWANDALAN SITE

The Gwandalan site is adjacent to the Lake Macquarie State Recreation Area, which includes the Pulbah Island and Moon Island Nature Reserves. The 2005 Plan of Management for these Nature Reserves notes that the area now known as Chain Valley Bay, which is located to the south west of the Gwandalan site, is thought to have been part of a 500 acre land grant made to Richard Cape in 1825 for cattle farming. This area was sought and obtained by John Moore in 1835 after Richard Cape left the colony temporarily (NPWS 2005: 24).

The Parish Maps of Wallarah for 1914, 1920, 1925 and 1932 all indicate that the Gwandalan site is located on land held by John Moore through this period (see *Figure 4.1*).

The preliminary desk-top review of the Gwandalan site indicates that no activity associated with historical settlement and expansion has occurred. The only indications of activity observed during the preliminary site investigation on the site are the fire trail tracks, minor trail bike tracks and evidence of illegal dumping.

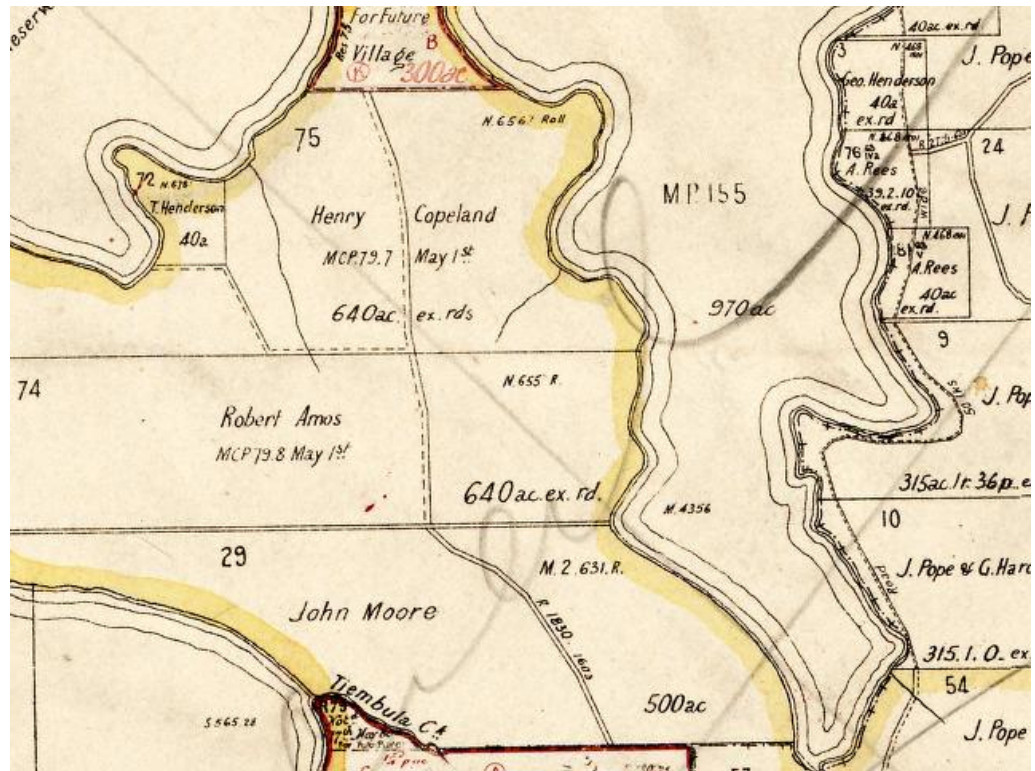


Figure 4.1 1914 Wallarah Parish Maps. Image Source: Department of Lands, Parish Maps Preservation project, Image ID 10870001.

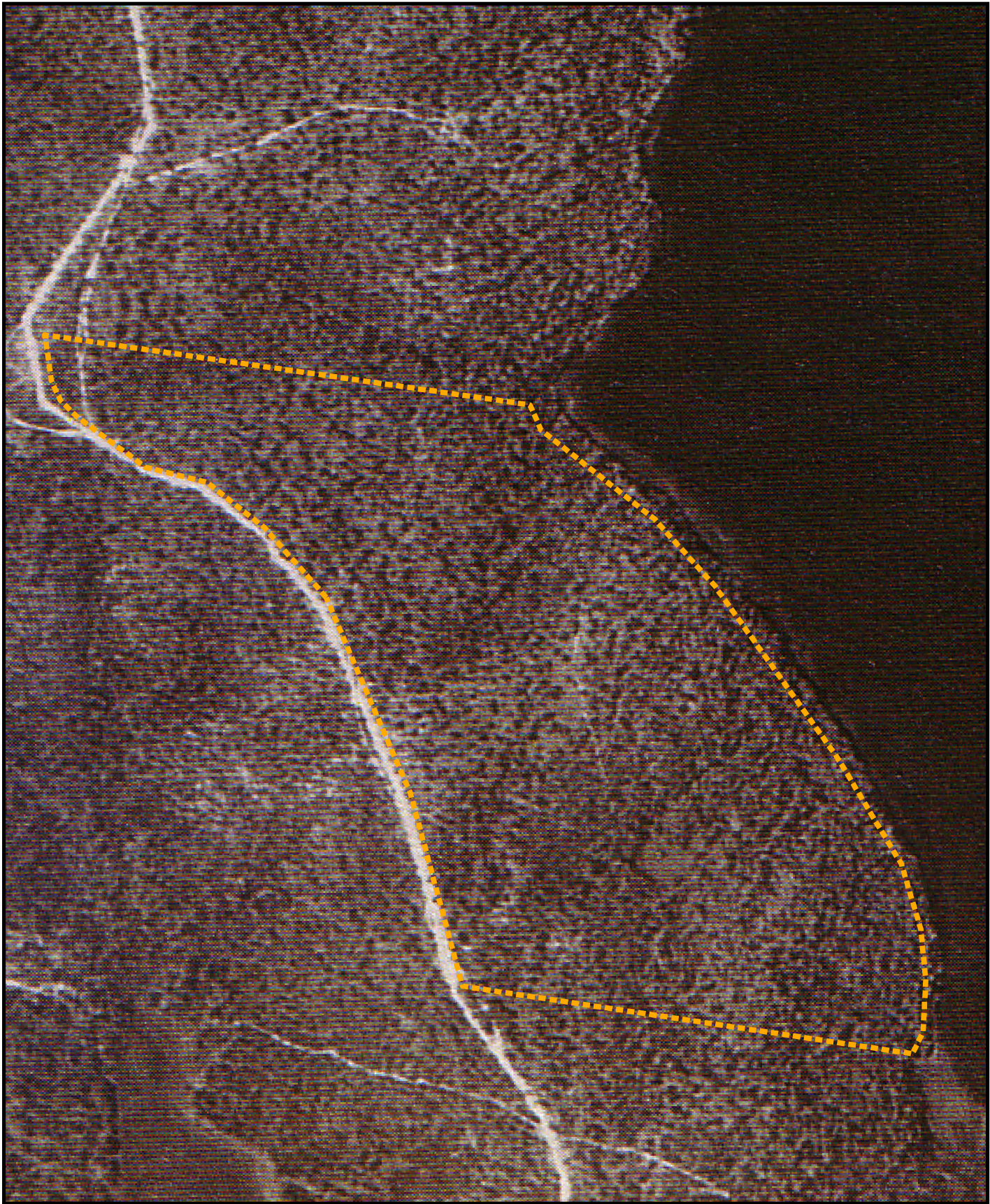
A review of historical aerial photograph from 1954 was undertaken to gain an understanding of historical activities within the Gwandalan site.

The 1954 aerial (Figure 4.2) clearly shows that the Gwandalan site is covered with dense vegetation across its extent. The main access road directly to the west of the Gwandalan site is clearly visible.

No historical features can be seen within the Gwandalan site suggesting that the area has not been subject to development by the mid-twentieth century.

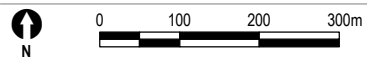
4.3 SYNOPSIS OF HISTORICAL BACKGROUND

Overall, it can be stated that the Gwandalan site has not been subject to historical development activities across its extent. Only have recent activities and public access has resulted in the creation of many walking tracks.



Legend
 Project Application Area

Client:	Catylis		
Project:	Lower Hunter Land Development - Gwandalan		
Drawing No:	0111477s_G_GIS004_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
Drawn by:	JF	Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to Scale Bar		



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Figure 4.2
1954 Aerial Photograph of Gwandalan

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 Port Macquarie, Sydney



5.1 SURVEY METHODOLOGY

The Gwandalan site was surveyed on foot by the study team and Aboriginal representatives on 12-13 July 2007. The survey aimed to inspect all zones within the Gwandalan site that contained tracks and paths, areas with soil exposures and zones with low vegetation. Transects were also walked through the dense bush around and through the centre of the Gwandalan site (see *Figure 5.1*).

The study team inspected all zones within the Gwandalan site that were readily accessible and a representative sample of zones with dense vegetation. When heritage sites were identified they were recorded by the survey team for content, GPS location and digitally photographed. Notes were made of soil conditions, evidence of disturbance and possible extent of sites. Specific methodologies are described below.

5.1.1 *Historical Archaeology*

The Gwandalan site was surveyed for historical archaeological sites concurrently with the Aboriginal survey. An inspection of all visible soil profiles was made, as well as an inspection of the landscape for former sites, such as house sites, evidence of landscape modification (associated with cultivation) and material culture, such as rubbish dumps.

5.1.2 *Aboriginal Heritage*

The ERM field survey team was accompanied by nine Aboriginal representatives (Tracey Howie, Trudy Smith and Dale Clouten from GTLAC, Kerrie Brauer, Dene Hawken and Jon Hawken from ATOAC, Shane Frost and James Frost from ADTOAC, and Craig Foresheaw from DLALC).

The survey was conducted according to the proposed draft methodology (see *Annex A*), as specified during the Aboriginal consultation. This focused on the identification of Aboriginal heritage values relating to archaeological sites. Field survey methods were adopted to pursue the discovery of new archaeological sites, ensure their accurate recording and provide sufficient background information to provide an assessment of cultural significance to the extent that surface survey allows. The field survey also aimed to determine the extent and intactness of the known midden site (45-7-0079) and to determine if it may be impacted by the proposed development.

As such each of the different landforms identified in the Gwandalan site were surveyed, namely slopes, flats and open depressions/creeks. Creek lines, mature trees, erosion scours and vehicle access tracks were all inspected. In order to ensure the highest likelihood of finding sites if present, survey focussed particularly on areas of visibility, water courses and trees.

5.1.3 *Fieldwork Constraints And Opportunities*

The survey was limited by the vegetation cover that was present over most of the Gwandalan site. Ground visibility was in general low, and it is estimated that less than 2% of the Gwandalan site was sampled during the survey (see *Annex B* for Effective Coverage Table). Erosion has occurred predominantly because of vehicle and walking tracks along with occasional patches of exposed ground resulting from water erosion.

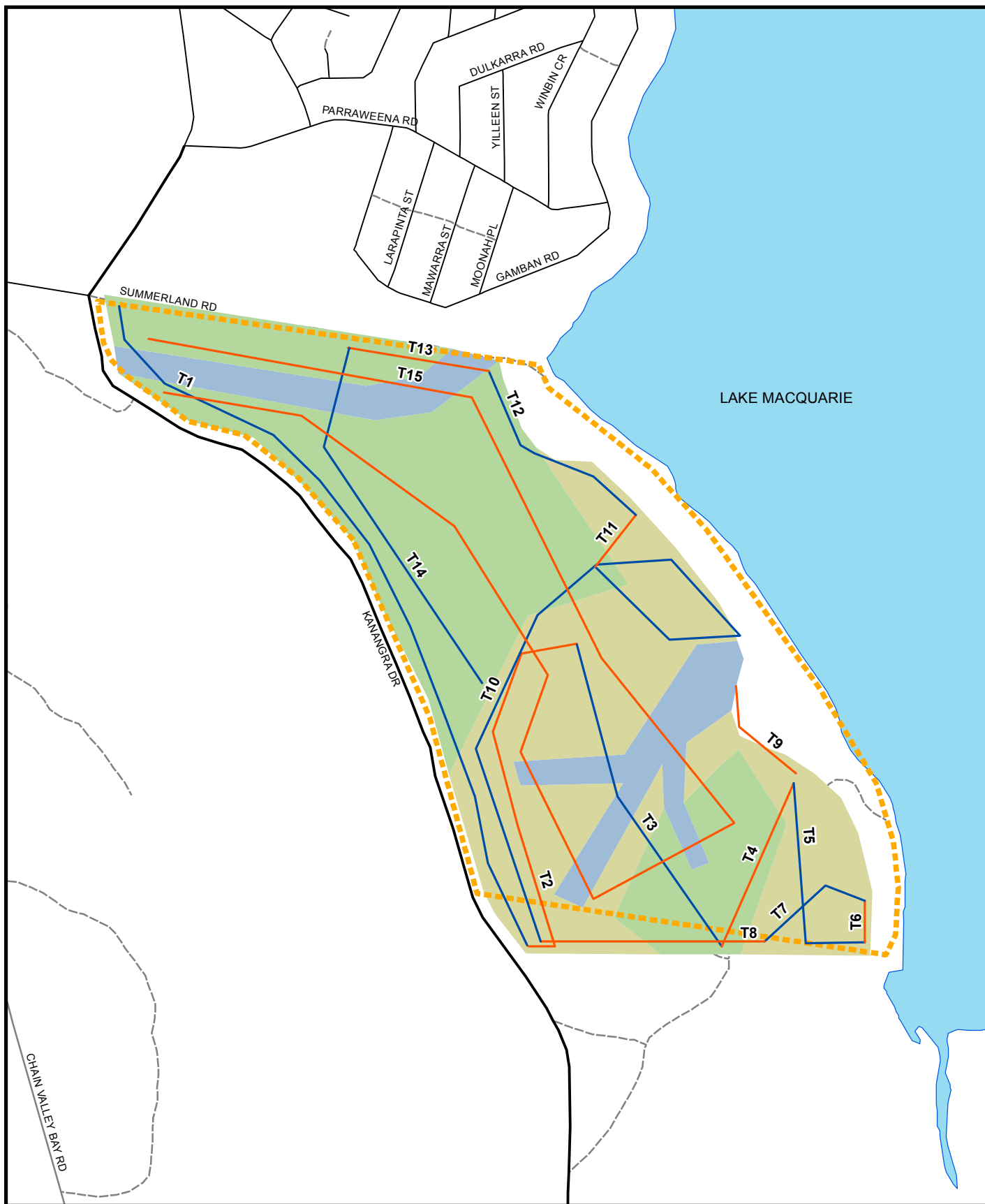
In light of these constraints, the survey focused particularly on areas of visible ground; however a sample of each of the landforms identified was surveyed (see below, and *Annex B*) to ensure that the full range of potential site locations was inspected.

5.2 *SURVEY TRANSECTS*

The survey of the Gwandalan site initially focused upon the tracks and paths within the main body of the Gwandalan site. This surveyed all possible paths with erosion and visibility. Next a representative sample of the densely vegetated zone was surveyed. These survey areas took in a number of landforms which defined the survey transect inspected. The transects and landforms are identified in *Table 5.1* and *Figure 5.1*, further details are provided in *Annex B*.

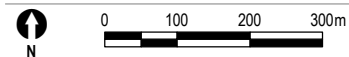
Table 5.1 *Description of Transects Surveyed*

Transect	Landforms	Description
T1	Slope	Vehicle track at western end of Gwandalan site
T2	Slope	Vehicle track from south western end into centre of Gwandalan site
T3	Slope, creeks	Track through centre of southern end of Gwandalan site
T4	Slope	Near foreshore, in south eastern part of Gwandalan site
T5	Flat	Near foreshore, in south eastern part of Gwandalan site
T6	Flat	Forested area in south eastern part of Gwandalan site
T7	Slope	Track from foreshore in south east part of Gwandalan site
T8	Slope	Forested area at southern end of Gwandalan site
T9	Slope, creek	Track to swamp, in middle of Gwandalan site
T10	Slopes	Tracks through middle of Gwandalan site and along foreshore to swamp
T11	Slope	Track to foreshore in middle of eastern end of Gwandalan site
T12	Flats, creek	Tracks through north eastern part of Gwandalan site
T13	Slopes, creeks	Track at northern end of Gwandalan site
T14	Slopes, creeks	Small track through middle of north west part of Gwandalan site
T15	Slopes, flats, creeks	Forested area throughout Gwandalan site



- Legend**
- Project Application Area
- Transects**
- T1
- T15
- Landform**
- Flat
- Slope
- Open Depression

Client:	Catylis		
Project:	Lower Hunter Land Development - Gwandalan		
Drawing No:	0111477s_G_GIS005_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
Drawn by:	JF	Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to Scale Bar		



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Figure 5.1
Survey Transects and Landforms

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5.3 *FIELD SURVEY RESULTS*

5.3.1 *Historical Archaeology*

The survey of the Gwandalan site did not reveal any evidence for any items of historical archaeological heritage. In general the Gwandalan site appears not to have been previously impacted by historical activities which could have created an archaeological record.

5.3.2 *Aboriginal Heritage*

Initial consultation with the local Aboriginal community indicated that Aboriginal heritage issues were associated with the potential for Aboriginal archaeological sites across the Gwandalan site. These sites included middens and stone artefact scatters.

The result of the survey confirmed that numerous exposures of Aboriginal shell midden 45-7-0079 were identified within the Gwandalan site and buffer zone (see *Figure 5.2*). These exposures were primarily associated with the foreshore, but two new midden sites were identified.

Apart from the tracks present throughout the Gwandalan site, detailed survey across the remainder of the area was limited because of dense vegetation cover. The Gwandalan site remains generally undisturbed and thus any Aboriginal sites located are unlikely to have been significantly impacted over the past 200 years.

The extent of the foreshores exposures and their location indicate that rather than separate Aboriginal midden sites, the material visible in the foreshore exposures forms a component of one large extensive midden complex. This complex extends along the entirety of the foreshore and includes the previously recorded Aboriginal site 45-7-0079. This site is therefore described further for clarification and archaeological purposes.

5.3.3 *Midden Site 45-7-0079*

Location

MGA: E 368526, N 6330977 (see *Figure 5.2*)

AMG: E 368422, N 6330787

History of Recordings of this Midden Site

One of the aims of the field survey was to determine the extent and intactness of the known midden site 45-7-0079 and ascertain whether the proposed development was likely to impact the site. The site had previously been recorded adjacent to the Lake foreshore.

This midden site was initially recorded in 1978 by Djekic and Happ. The site is noted to be located in gently sloping topography in a south west section of Crangan Bay, with no rock outcrops. The midden was recorded as being covered with a dense layer of grasses and some Casuarinas. The inland part of the area was noted to comprise numerous immature Eucalypt, Banksia and Acacia trees, with a thick undergrowth and grasses including *Xanthorrea*. The field survey confirmed that this vegetation does not appear to have changed in the intervening years.

The midden itself was noted to be located in a black soil deposit approximately 16 cm high, running intermittently for 20-30 m, and having been disturbed by undercutting in many places. It was said to comprise mostly *Anadara trapezia* (cockle shell), with some small whelks (*Pyrazus ebeninus*) and possible oyster (*Saccostrea glomerata*) fragments. Small charcoal fragments were visible, as were numerous small pebbles and quartz pieces, however no bone was visible. This is consistent with other Lake Macquarie middens.

2007 Survey Results

The current field survey confirmed shell exposures extending throughout the foreshore area, extending along the entire length of the Lake shore adjacent to the Gwandalan site. *Figure 5.2* provides a reference to the locations where midden material was observed. It must be noted that not all parts of the foreshore were traversed (see *Figure 5.1*), however as a result of the field survey it can be stated that the midden does not appear to extend into the Gwandalan site, but is likely to extend throughout the foreshore buffer area.

The Aboriginal evidence observed thus represents a 'complex' of midden material resulting from long term (probably several thousand years) occupation and use of the area. The long term occupation comprises a pattern of subsistence activities and artefact manufacture on this part of the Lake. Discussion with the Aboriginal representatives provided evidence for long term use of this area.

Midden Composition

Shell material in this midden comprised predominantly *A. trapezia* with occasional fragments of *Saccostrea glomerata* (oyster). This is consistent with other recorded Lake Macquarie middens. Greater numbers of oyster were seen in the southern area of the midden. An examination of exposures containing midden indicated that the midden material occurred in varying densities throughout the foreshore area. Stone artefacts were observed in more dense areas of the midden, which were less subject to modern disturbance.

5.3.4 *Shell Midden Site "Gwandalan 1"*

This site was recorded approximately 20 m east of Kanangra Drive in the south west part of the Gwandalan site. The site comprises a sparse scatter of *A. trapezia* (almost whole and fragmented) extending for approximately 55 m on a narrow, water-eroded vehicle track, with low integrity. The site is on a slight slope and the B-horizon clay is overlain by gravelly, sandy clay topsoil approximately 0.3 m deep. There is no environmental focus for the shell and no evidence of stone artefacts; however the nature of the shell (size, species, lack of shell grit or other water-borne material) is consistent with Lake Macquarie middens. Therefore, the site appears to represent sporadic use of the area, whereby shell was collected from the Lake and transported to this location before being consumed. Given the sparse nature of the surface evidence, the evidence of erosion and the shallow depth of topsoil, this site has low potential for subsurface archaeological deposit.

5.3.5 *Shell Midden Site "Gwandalan 2"*

This site appears to be located on one of the primary local roads proposed for the Gwandalan development (see *Figure 7.1*). This site consisted of a sparse scatter of *A. trapezia* shell on an eroded vehicle track to the north west of the Gwandalan site. The topsoil on this track is also a gravelly, sandy clay approximately 0.3 m deep, overlying B-horizon clay. The scatter is located on a flat and extends from approximately 15 m east of Kanangra Drive for approximately 50 m along the vehicle track. An isolated *A. trapezia* shell was found in a highly eroded part of the track, approximately 200 m from the rest of the scatter, and has undoubtedly been moved to this location through water action on the increasingly steep slope.

This disturbance and the sparse, scattered nature of the site, indicates that it has low integrity. There is no environmental focus for the shell and no evidence of stone artefacts, however the nature of the shell (size, species, lack of shell grit or other water-borne material) is consistent with Lake Macquarie middens. Therefore, the site appears to represent sporadic use of the area, whereby shell was collected from the lake and transported to this location before being consumed. Given the sparse nature of the surface evidence, the evidence of erosion and the shallow depth of topsoil, this site has low potential for subsurface archaeological deposit.

5.3.6 Discussion - Archaeological Potential

It is necessary to determine whether the Gwandalan site has further archaeological potential. Archaeological potential means the possibility of discovering further archaeological material and the likelihood that this material has not been disturbed. Definitions of archaeological potential are provided in Table 5.2.

Table 5.2 *Definitions of Archaeological Potential*

Rank	Definition	Example
No potential	Artefacts cannot occur in situ.	Reconstructed landscapes, hazardous landscape, developed areas.
Low potential	Artefacts are not normally found in comparable contexts but could occur in low densities making detection unlikely.	Landforms with no specific focus for use, i.e. with water sources or undifferentiated slopes.
Moderate potential	Artefacts are known to occur in comparable landforms in detectable densities (~1 artefact/m ²) and there is an unknown possibility for detection.	Landforms with an environmental focus which may have seen seasonal visitation.
High potential	Artefacts are consistently found in comparable landforms or similar environmental contexts and thus will certainly be found in any ground breaking works.	Landforms with known environmental focus encouraging repeat visitation to specific locale, i.e. margins of Lakes or near high order creeks.

High Archaeological Potential – Midden 45-7-0079

Site 45-7-0079 is an extensive midden that has been previously recorded outside the Gwandalan site (along the foreshore). The site has been confirmed to extend along the entire foreshore adjacent to the Gwandalan site, (see Figure 5.2). Shell was seen in varying densities across this area. This variable density of shell can be related to a number of factors:

1. the extent of current exposures providing a view of the midden material;
2. the variability in original accumulation of midden material, i.e. some zones within the site have more accumulated material; and
3. impacts caused by modern use of the foreshore area.

In areas of obvious erosion i.e. near vehicle tracks, the midden appeared more fragmented and dispersed. In less disturbed areas, such as near groups of trees, the midden was more intact and more densely distributed.

The area containing the midden is therefore considered to have high archaeological potential to contain further intact and undisturbed archaeological deposits (see *Figure 5.2*). Observations suggest that the midden is one of the larger and more intact middens remaining around Lake Macquarie. It is recommended that the extent of midden 45-7-0079 within the buffer zone should be avoided during development, as it is in the current concept plan (*Figure 7.1*).

Moderate Archaeological Potential

The area immediately behind (to the west of) the foreshore area where midden 45-7-0079 was observed in surface exposures is considered to have moderate archaeological potential to contain further intact and undisturbed archaeological deposits (see *Figure 5.2*). It is considered likely that archaeological material associated with midden 45-7-0079 will be present in this area, although it is unlikely to be as dense or extensive as in the area of high archaeological potential.

It is recommended that this area of moderate archaeological potential should be subject to appropriate mitigation prior to development. These mitigation measures are provided in *Chapter 10*.

Low Archaeological Potential

Sites Gwandalan 1 and Gwandalan 2 were not recorded as part of the midden site 45-7-0079 because they do not appear to represent a complex of continuous occupation of the area. Rather, these sites appear to represent sporadic use of the inland area for subsistence activities, whereby shell was collected from the lake and not immediately consumed in the foreshore area, but transported for a distance inland before being consumed. The sites therefore appear to represent occasional subsistence activities based on the lake's resources taking place in the inland landforms, and both have low archaeological potential and integrity.

A small, isolated fragment of oyster shell (*S. glomerata*) was noted beside one of the first order tributaries in the north of the Gwandalan site (see *Figure 5.2*). It is uncertain whether this was deposited by natural or cultural means, and whether it represents Aboriginal subsistence use of the location, and it has therefore not been recorded as a site.

Nevertheless, the surface evidence of sites in this area, and the evidence of previously recorded sites in the Lake Macquarie area, indicates that the entire Gwandalan site may contain subsurface evidence of Aboriginal subsistence and technological (stone artefact) use.

The surface evidence of midden along the foreshore, with isolated exposures further inland, suggests a pattern of occupation throughout the area which is common around Lake Macquarie. It is assumed that, given the proximity to the foreshore and the midden, the Gwandalan site would have been used for more sporadic Aboriginal occupation – possibly an inverse correlation with distance from the foreshore. It is therefore possible that sporadic Aboriginal sites could be located within the remainder of the Gwandalan site (outside of the areas with moderate and high archaeological potential). However, any sites in this area are likely to be small in size and extent. As such this area is considered to have a low archaeological potential.

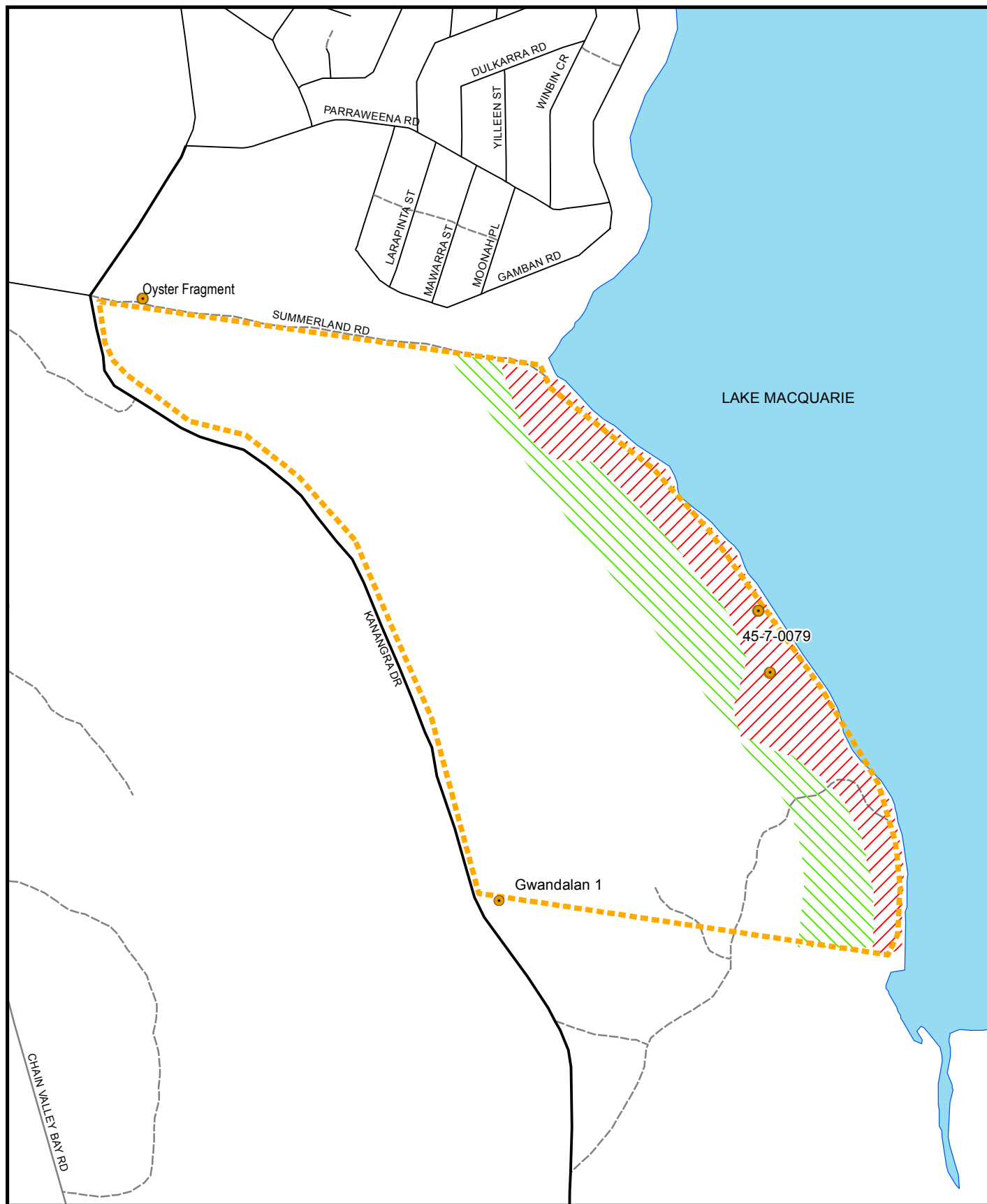
It is recommended that the areas where Gwandalan 1, Gwandalan 2 and the oyster fragment were located should be subject to appropriate mitigation prior to development. These mitigation measures are provided in *Chapter 10*.

5.4 SYNOPSIS OF FIELD SURVEY RESULTS

The field survey found that the Gwandalan site contains no items of historical heritage significance.

The survey confirmed the presence of Aboriginal midden site 45-7-0079 and defined its extent as outside of the Gwandalan site, hence it will be avoided during construction. Two other Aboriginal sites were located during the survey, one of which is outside of the Gwandalan site. Impacts arising from development should be mitigated within this area.

In summary, the Gwandalan site provides evidence for the pattern of Aboriginal occupation around the shores of Lake Macquarie, with more frequent evidence of occupation adjacent to the foreshore and more sporadic occupation as distance from the lake increased.



Legend

- Project Application Area
- Shell Observed
- /// Area of High Archaeological Potential
- /// Area of Moderate Archaeological Potential

Client:	Catylis		
Project:	Lower Hunter Land Development - Gwandalan		
Drawing No:	0111477s_G_GIS006_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
Drawn by:	JF	Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to Scale Bar		



0 100 200 300m

Maps and figures contained within this document may be based on third party data, may not be to scale and is intended for use as a guide only. ERM does not warrant the accuracy of any such maps or figures.

Figure 5.2

Location of Archaeological Sites and Area of Archaeological Potential

Environmental Resources Management Australia Pty Ltd

Brisbane, Canberra, Hunter Valley, Melbourne, Perth,
Port Macquarie, Sydney



6.1 HISTORICAL HERITAGE ASSESSMENT

6.1.1 *Historical Assessment Criteria*

The Burra Charter (*The Australia ICOMOS Charter for Places of Cultural Significance*) has set a standard for assessing heritage significance based on the aesthetic, historic, scientific and social values embodied in an item or place. In New South Wales the *Heritage Act 1977* has established seven criteria for the identification and assessment of heritage values. The NSW Heritage Office, Department of Planning, has developed a guideline to assessing heritage significance against the seven criteria in its publication *Assessing Heritage Significance*. 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 association with the life or works of a person, or group of persons, of importance in NSW’s cultural or natural history (or the cultural or natural history of the local area);

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

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

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

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

Criterion (g) – an item is important in demonstrating the principal characteristics of a class of NSW’s:

- cultural or natural places; and/or
- cultural or natural environments.

6.1.2 *Gwandalan site*

The historical background and Gwandalan site investigation have revealed that the Gwandalan site contains no historical heritage items or value at a local or State level, including historical archaeological potential. The Gwandalan site does not meet any of the above criteria at a State or local level.

Aboriginal Assessment Approach

Aboriginal heritage sites, objects and places hold value for communities in many different ways. The nature of those heritage values is an important consideration when deciding how to manage a heritage site, object or place and balance competing land-use options. The many heritage values are summed up in an assessment of “Cultural Significance”.

The primary guide to management of heritage places is the Australia ICOMOS Burra Charter 1999. The Burra Charter defines cultural significance as:

Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations.

Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.

Places may have a range of values for different individuals or groups.

This assessment has sought to identify Aboriginal heritage objects and sites within the Gwandalan site and obtain enough information to allow the values of those objects and sites to be determined.

Research and consultation with the Aboriginal community has also been conducted to determine whether any heritage value relates specifically to the Gwandalan site regardless of the archaeological evidence. While it is accepted that Aboriginal sites within the local Lake Macquarie region are of significance to Aboriginal people, this study sought to identify whether the Gwandalan site itself held specific values either in itself, or as part of a specific local area of particular significance.

Aboriginal heritage sites with archaeological evidence are of value to the Aboriginal community through the tangible connection that it represents with pre-European Aboriginal land use.

Scientific value is assessed according to the research potential of a site. Rarity and representativeness are also related concepts taken into account. Research potential or demonstrated research importance is considered according to the contribution that a heritage site can make to present understanding of human society and the human past. Those heritage site, objects or places of high scientific significance are those which provide an uncommon opportunity to inform us about the specific age of people in an area, or provide a rare glimpse of artistic endeavour or provide a rare chronological record of changing life through deep archaeological stratigraphy.

The comparative rarity of a site is a consideration in assessing scientific significance. A certain site type may be “one of a kind” in one region, but very common in another. Artefacts of a particular type may be common in one region, but outside the known distribution in another.

The integrity of a site is also a consideration in determining scientific significance. While disturbance of a topsoil deposit with artefacts does not entirely diminish research value, it may limit the types of questions that may be addressed. For example a heavily cultivated paddock may be unsuited to addressing research questions of small-scale site structure, but it may still be suitable for answering more general questions of implement distribution in a region and raw material logistics.

Research Questions

The capacity of a site to address research questions is predicated on a definition of what the key research issues are for a region. In the area of Lake Macquarie, the main archaeological research questions centre around the antiquity and content of middens, and to a lesser extent on stone artefact manufacturing technology and raw material sources.

The background literature review has shown that relatively few archaeological investigations have been conducted within the local and regional area. Most of the studies have been field surveys, where no consequential analysis or sub-surface investigation of Aboriginal sites has occurred. Some sites have been archaeologically investigated, but these have predominantly been related to Aboriginal burials.

The general absence of focused research in the Lake Macquarie area means that fundamental questions addressing Aboriginal land use, the chronology of the region, subsistence patterns and mechanisms for trade and exchange have not been explored. Archaeological questions should be asked on a local and regional basis. Suitable archaeological research questions focusing on the local Aboriginal archaeology, which could be addressed through investigations of the midden site within the Gwandalan site, include:

- What actual dates can be attributed to the use of the midden site? This can be determined through radio carbon dating of undisturbed deposits and by artefact typologies.
- What is the content of the midden? What species are represented? How do these change through time? Does any change represent a long term change in climate and thus subsistence base?
- What is the subsistence base of the region? Are shellfish sourced seasonally or year round? (It is possible to determine through oxygen 18 analysis of shell.) Do land based animal remains feature in midden content? What does this tell us about subsistence strategies in the region?

- What are the stone technologies present in the midden deposit? Do these extend back before the mid-late Holocene? Do they provide evidence for trade and exchange of resources?

Regional research questions include:

- How does this site compare to middens in and along other Lakes or the coast?
- What information does the midden provide in terms of Aboriginal demographic and economic values? How do these fit in with a regional framework? Is it possible to see patterns relating to shifting demographics or alterations to trade networks, such as the 'opening' or 'closure' of social structures?
- Does the intensive use of the site provide evidence for an increase in late Holocene population numbers as elsewhere in NSW?

6.2.2

Midden Sites 45-7-0079, Gwandalan 1 And Gwandalan 2

The extent of site 45-7-0079 conforms to the pattern of occupation expected in the Lake Macquarie area. This pattern displays more frequent occupation in close proximity to the Lake, seen in the Gwandalan site as extensive shell midden material from subsistence activity located within 75 m of the Lake (the area of high archaeological potential). More sporadic occupation with increasing distance from the Lake was anticipated, and identified in moderate archaeological potential immediately behind the foreshore, with low archaeological potential further up the slope (sparse shell midden material being identified at Gwandalan 1 and Gwandalan 2 approximately 750 m from the foreshore). Gwandalan 1 and Gwandalan 2 appear to represent sporadic use of the area, whereby shell was collected from the Lake and transported to these more distant locations before being consumed.

The midden site 45-7-0079 would appear to be representative within the local region. However, despite numerous midden sites being previously identified, it appears that only a few have been archaeologically investigated, and none have been dated through scientific means, such as radio carbon dating. Therefore the extensive midden adjacent to the Gwandalan site can be said to have a high scientific value because of the opportunities the site presents to further our understanding of Aboriginal culture, subsistence, economy, demography and society in the region. The integrity of the site has been diminished to a small extent by modern use of the area. However these activities are most likely not to have impacted sub-surface deposits, especially those deposits outside tracks.

Overall, site 45-7-0079 can be said to have high archaeological significance and high archaeological potential. It also has a high level of significance to the Aboriginal community.

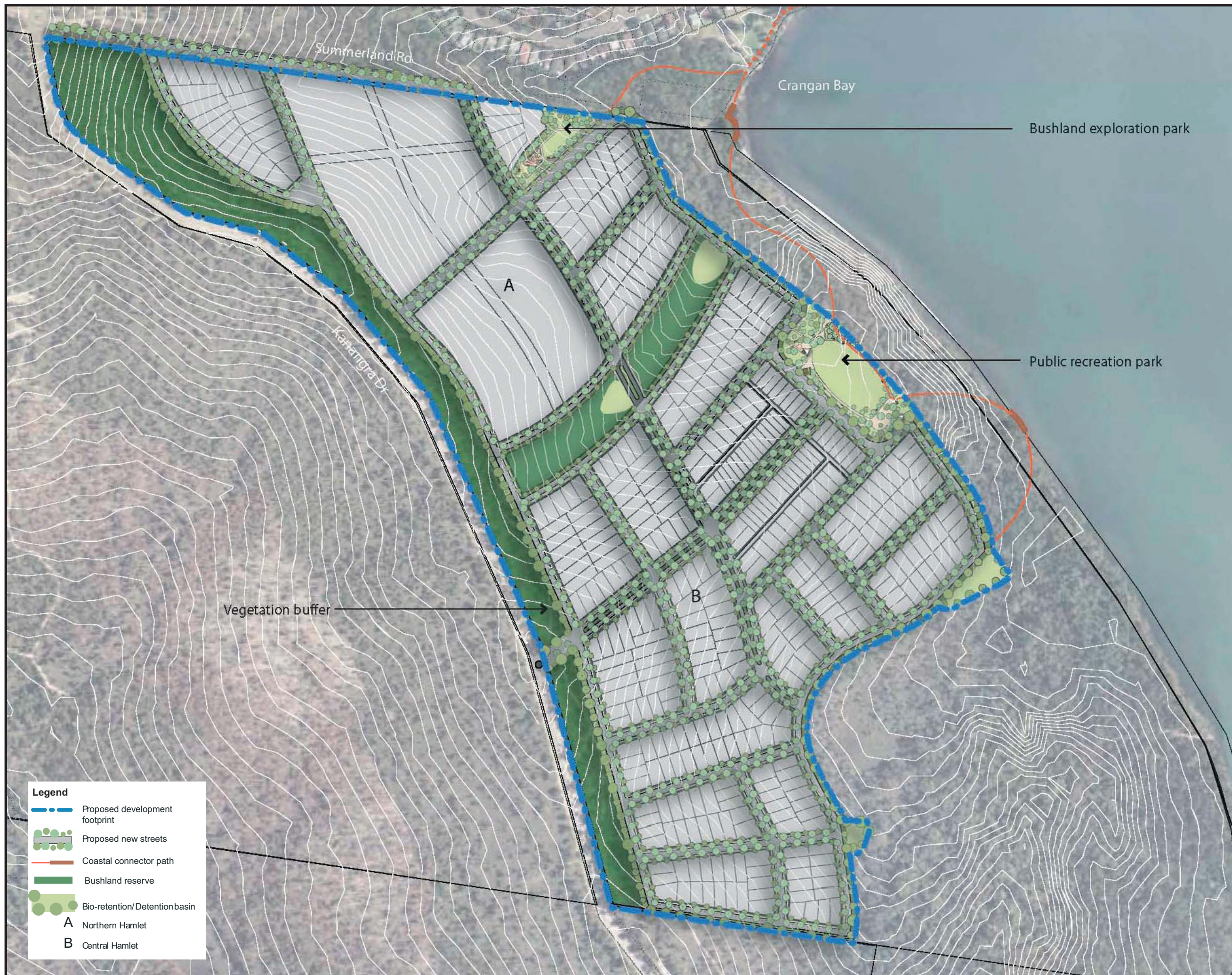
Gwandalan 1 and Gwandalan 2 can be said to have low archaeological significance and low archaeological potential. They have a high level of significance to the Aboriginal community.

The concept plan for the Gwandalan site is shown in *Figure 7.1*. Its development has benefited from an extensive multi-disciplinary approach including environmental surveys, the community meeting process and appropriate urban planning design.

If the concept plan is compared against *Figure 5.2*, it can be seen that the proposed development impacts Gwandalan 1 and Gwandalan 2, with primary roads proposed in these areas. The development will impact some of the area with moderate archaeological potential to contain midden 45-7-0079, where roads, residential lots and parks are proposed.

It should be noted that the original structure plan was altered to manage the extent of possible impacts to the previously recorded extent of the midden 45-7-0079 adjacent to the foreshore. This alteration saw the Gwandalan site set-back from the foreshore of Crangan Bay an additional 60 - 70 m to that originally proposed. The current concept plan moves the Gwandalan site further away from the Aboriginal midden, thus further reducing the impact on this heritage site.

The concept plan includes provision for parks as well as roads and individual residential lots. Some of the park space could be used as a conservation zone for representative portions of Aboriginal heritage sites.



- Legend**
- Proposed development footprint
 - Proposed new streets
 - Coastal connector path
 - Bushland reserve
 - Bio-retention/ Detention basin
 - A Northern Hamlet
 - B Central Hamlet

Figure 7.1
Gwandalan - Concept Plan

Client: Catylis
 Project: Lower Hunter Land Development - Gwandalan
 Drawing No: 0111477s_G_01_R0
 Date: 22/02/2010 Drawing size: A3
 Drawn by: GC Reviewed by: DN
 Scale: Refer to Scale Bar

0 50 100 150m

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8.1 PREAMBLE TO ESD

An objective of the NPW Act (1974) is the “*conservation of objects places and features ... of cultural value within the landscape, including ... places, objects and features of significance to Aboriginal people ...*” (s.2A(1(b)(i)).

The DECCW’s publication, *Operational Policy: Protecting Aboriginal Cultural Heritage* (2009), provides guidance to proponents with guidance in term of ESD. The following discussion provides an overview of ESD and its application to the current project.

8.1.1 Avoiding or Reducing Impact To Aboriginal Sites

“DECCW needs to balance the sometimes competing tensions between development activities and environment protection when we make decisions. Although the NPW Act gives a high level of protection to known Aboriginal objects, recent court decisions have reinforced that Part 6 gives the Director General (DG) express powers to consent to the damage, destruction or defacement of Aboriginal objects by development activities. The powers in Part 6 are not inconsistent with the objects of the Act or a requirement to give effect to ESD.” (DECCW 2009: Section 3.8)

The DECCW has three policies that provide guidance with respect to avoiding or reducing impact to Aboriginal sites:

Policy 20

Impacts to significant Aboriginal objects and places should always be avoided wherever possible. We [the DECCW] will promote the development (or amendment) of proposals to avoid impacts and therefore avoid the need for s.90 AHIPs.

Policy 21

Where impacts to Aboriginal objects and places cannot be avoided, we will require the proponent or AHIP applicant to develop (or amend) proposals so as to reduce the extent and severity of impacts to significant Aboriginal objects and places through the use of reasonable and feasible measures. Any measures proposed should be negotiated between the proponent or AHIP applicant and the Aboriginal community.

Policy 22

Once all avoidance, minimisation and mitigation options have been adequately explored, we may also consider the appropriateness of any proposed actions having potential Aboriginal cultural heritage benefit. Any actions proposed should be negotiated between the proponent or AHIP applicant and the Aboriginal community.

ESD has been defined in s.6 of the *Protection of the Environment Administration Act 1991*. This requires the integration of *economic* and *environmental* considerations (including cultural heritage) in the decision-making process. In regard to Aboriginal cultural heritage, ESD can be achieved by applying the principle of intergenerational equity and the precautionary principle. (DECCW 2009: 26)

Intergenerational Equity

“Intergenerational equity is the principle whereby the present generation should ensure the health, diversity and productivity of the environment for the benefit of future generations.

In terms of Aboriginal heritage, intergenerational equity can be considered in terms of the cumulative impacts to Aboriginal objects and places in a region. If few Aboriginal objects and places remain in a region (for example, because of impacts under previous AHIPs), fewer opportunities remain for future generations of Aboriginal people to enjoy the cultural benefits of those Aboriginal objects and places.

Information about the integrity, rarity or representativeness of the Aboriginal objects and places proposed to be impacted, and how they illustrate the occupation and use of land by Aboriginal people across the region, will be relevant to the consideration of intergenerational equity and the understanding of the cumulative impacts of a proposal.

Where there is uncertainty, the precautionary principle should also be followed.” (DECCW 2009:26)

The precautionary principle

“The precautionary principle states that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

In applying the precautionary principle, decisions should be guided by:

- a careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment
- an assessment of the risk-weighted consequences of various options.

The precautionary principle is relevant to DECCW's consideration of potential impacts to Aboriginal cultural heritage where:

- the proposal involves a risk of serious or irreversible damage to Aboriginal objects or places or to the value of those objects or places, and
- there is uncertainty about the Aboriginal cultural heritage values or scientific or archaeological values, including in relation to the integrity, rarity or representativeness of the Aboriginal objects or places proposed to be impacted.

Where this is the case, a precautionary approach should be taken and all cost-effective measures implemented to prevent or reduce damage to the objects/place." (DECCW 2009:26)

With respect to the above DECCW policy (Policy 20-22) and ESD the following sections detail specifications for conservation, potential impact, and possible reductions to impact on the identified Aboriginal sites and values.

8.2 *PROPOSED CONSERVATION (AVOIDANCE) OF HERITAGE SITES*

While a portion of the midden site at Gwandalan might be impacted, the cumulative effect of the Coal & Allied proposed conservation zones means that the majority of the midden (where it has been identified with high archaeological potential) will be conserved for perpetuity. The effect of the conservation zone is such that it will prevent future development which would impact further middens and Aboriginal sites along and adjacent to the coast.

If the regional impacts of the proposed conservation zones versus development are considered, it could be stated that the limited impacts to parts of one midden (with the conservation of most of that midden) are more than offset by the guaranteed conservation and preservation of other Aboriginal sites (known and unknown) within the Coal & Allied conservation lands. The cumulative conservation benefit resulting from the proposed conservation lands are considered to be of holistic long term benefit to the Aboriginal heritage values of the region.

8.3 *PROPOSED IMPACTS TO HERITAGE SITES*

8.3.1 *Historical Heritage*

The implications and impact of development will not impact any historical heritage values of the Gwandalan site or the local region. Therefore it is not necessary to prepare a Statement of Heritage Impact for the proposed development.

Chapter 7 (and *Figure 5.2* and *Figure 7.1*) presented the proposed development. This figure shows that development will impact an area with moderate archaeological potential to contain remains of the Aboriginal midden site 45-7-0177. The assessment of significance indicates that the site has high social value to the Aboriginal community, moderate archaeological potential and high scientific value. The site has been partially disturbed by recent activities in the area; however it is believed that a large proportion of the site remains fundamentally intact below the surface within the A2 soil horizon. The development will impact both Gwandalan 1 and Gwandalan 2. The assessment of significance indicates that these sites have high social value to the Aboriginal community, low archaeological potential and low scientific value. The site has been partially disturbed by recent activities in the area, but given the low archaeological potential it is unlikely to contain an extensive sub-surface component.

The concept plan (*Figure 7.1*) shows that a series of primary and local roads, streets with swales, and subdivision will cover most of the Gwandalan site. A green buffer is proposed adjacent to Kanangra Drive. A number of parks are located throughout the area, including along the foreshore area which has a high level of archaeological potential, and in the Strangers Gully swamp area.

Any works that result in ground breaking or disturbance in the area of moderate archaeological potential are likely to impact and disturb the midden site. Works in the vicinity of Gwandalan 1 and Gwandalan 2 will impact and disturb these sites. This includes any soil testing or sampling, such as geo-technical work. Top soil stripping in these areas prior to development will completely remove all deposits located within the Gwandalan site boundary, associated with midden site 45-7-0079, Gwandalan 1 and Gwandalan 2.

Development impacts to the area of moderate archaeological potential need to be mitigated prior to ground breaking or site works. Site works within the remainder of the Gwandalan site, which has low archaeological potential, require less stringent mitigation measures.

8.4

SUMMARY OF HERITAGE IMPACTS

A summary of the potential impacts on the heritage values of the Gwandalan site is provided in *Table 8.1* below. Mitigation requirements are presented in *Chapter 10*.

Table 8.1 *Aboriginal sites impacted by the proposed development*

Site	Scientific significance	Cultural significance	Affect of the impact	Archaeological mitigation required
Historical Heritage	None	N/A	None	No mitigation required
Area of High Archaeological Potential	High	High	None. All High Archaeological potential areas are located within conservation area.	No mitigation required
Area of Moderate Archaeological Potential	High	High	Disturbance to midden site	Devise methodology for sub surface testing and undertake sub-surface testing with the Aboriginal stakeholder groups
Area of Low Archaeological Potential (inc sites Gwandalan 1 and 2)	Low	High	Possible disturbance to some Aboriginal objects	Monitoring of soil disturbance by the Aboriginal stakeholder groups.

8.5

CUMULATIVE IMPACTS

The cumulative heritage impacts consider the proposed Coal & Allied development at Gwandalan along with the potential for separate development by the Rose Group within the local area. The NSW Heritage Office Local Government Heritage Guidelines (2002) include the need to consider the effect of new development on the total heritage resource of the local area.

The consideration of the Rose Group site potential for development has been undertaken based on the scope shown on the revised Concept Plan and supporting documents available through the Department of Planning website. These documents include Statements of Heritage Impact for Aboriginal and historic heritage values.

Neither proposal will affect historic heritage values. The Rose Group rezoning and potential for development will also not affect the identified Aboriginal sites. Therefore, the potential cumulative Aboriginal heritage impact of the Coal & Allied development and the Rose Group potential for development is no greater than the potential impacts of the Coal & Allied proposal.

This project is to be assessed and approved under Part 3A of the *Environmental Planning & Assessment Act 1979*. The Part 3A approval process involves strict requirements established by the Director General of NSW Planning to ensure all environmental factors are adequately considered and addressed.

Until the development is granted Part 3A approval the Gwandalan site and its heritage values remain protected and under the statutory control of the relevant State Acts.

Aboriginal cultural heritage in NSW is protected by the *National Parks and Wildlife Act 1974*. Historical heritage in NSW is protected under the *Heritage Act 1977*. These acts and their obligations are provided below. The obligations under these various acts have been used to devise relevant mitigation measures for the Gwandalan site, which are presented in *Chapter 10*.

9.1 NSW LEGISLATION

9.1.1 *Environmental Planning And Assessment Act 1979 (NSW)*

The *Environmental Planning and Assessment Act 1979* (EP&A Act) requires that environmental impacts are considered in land-use planning, including impacts on Aboriginal and historical heritage. Various planning instruments prepared under the Act identify permissible land use and development constraints.

The DECCW provides guidelines for Aboriginal heritage assessment, including those conducted under the EP&A Act 1979. Where Aboriginal heritage assessment is conducted under the Integrated Development Approval process, a more detailed set of NPWS guidelines applies.

Where a development is approved under Part 3A of the Act, further approvals under the National Parks & Wildlife Act 1974 are not required. In those instances management of heritage sites must follow the statement of commitments included in the Part 3A development approval.

The statement of commitments defines the environmental management and mitigation measures the proponent will undertake in respect of the site. The statement of commitments is made in accordance with *EP&A Act 1979*: Part 3A Division 2 Section 75F[6].

A Draft Statement of Commitments has been prepared as part of the Environmental Assessment. The draft Statement of Commitments defines the environmental management and mitigation measure the proponent proposes to undertake in respect of the site.

9.1.2

National Parks And Wildlife Act 1974 (NSW)

All Aboriginal objects within the state of NSW are protected under section 90 of the *National Parks and Wildlife Act 1974* (NPW Act).

Under section 5 of the Act, “Aboriginal Object” means any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.

Sites of traditional significance that do not necessarily contain archaeological materials may be gazetted as “Aboriginal places” and are protected under Section 84 of the Act. This protection applies to all sites, regardless of their significance or land tenure. Under section 90, a person who, without first obtaining the consent of the Director-General, knowingly destroys, defaces or damages, or knowingly causes or permits the destruction or defacement of or damage to, an Aboriginal object or Aboriginal place is guilty of an offence.

Amendments introduced by the *National Parks & Wildlife Amendment Act 2001* which strengthen the provisions of section 90 have yet to commence.

The DECCW is the statutory authority for the protection of Aboriginal objects and places within NSW, with the Director-General of that department the consent authority. Approvals under the NPW Act are not required where a development is approved under Part 3A of the *Environmental Planning and Assessment Act*.

9.1.3

Heritage Act 1977 (NSW)

The *Heritage Act 1977* protects the natural and cultural history of NSW with emphasis on non-Aboriginal cultural heritage. It provides automatic statutory protection to ‘relics’. The Act defines a ‘relic’ as:

Any deposit or material evidence relating to the settlement of the area that comprises NSW, not being an Aboriginal settlement, which is 50 or more years old.

Sections 139-145 of the Act prevent the excavation or disturbance of land known or likely to contain ‘relics’, except in accordance with an excavation permit issued by the Heritage Council of NSW (or in accordance with a gazetted exception under Section 139(4) of the Act).

While Aboriginal heritage sites and objects (“relics”) are protected principally by the *National Parks & Wildlife Act 1974*, if an Aboriginal site, object or place is of great significance it can be protected by a heritage order issued by the Minister on the advice of the Heritage Council.

Approvals under the Heritage Act are not required where a development is approved under Part 3A of the *Environmental Planning and Assessment Act*.

There are a range of planning controls and guidelines that outline issues to be considered in the management and protection of heritage at Gwandalan. These include:

- Hunter Regional Environmental Plan (REP) 1989 - Heritage;
- Wyong Local Environmental Plan (LEP) 1991; and
- Coastal Design Guidelines for NSW 2003.

The Hunter REP Heritage aims to conserve the environmental heritage of the Hunter Region. It lists 1300 heritage items that are divided in a number of categories; State, regional, local, areas requiring archaeological investigation, and heritage precincts or conservation areas. The Hunter REP Heritage also provides a framework for local government councils to develop, along with the assistance of the Department of Planning, appropriate means for conserving the heritage of their area.

The Wyong LEP 1991 includes a range of heritage protection provisions addressing both Aboriginal and European heritage sites, items and areas. The heritage objective of the LEP is to protect and conserve archaeological sites and places of Aboriginal, natural or European cultural significance. The LEP includes provisions to protect heritage in any redevelopment works.

The Coastal Design Guidelines for NSW 2003 provide a suite of guidelines aimed at shaping and enhancing the character of settlements along the coast of NSW. They focus primarily on the desirable urban design concepts for the coast including workable open space networks, integration within the existing environment, retention of key views and vistas and the scale, type and density of new development. In relation to heritage, the Guidelines promote the recognition, retention, integration and avoidance of impacts on Aboriginal and European heritage.

9.3

COMMONWEALTH LEGISLATION

9.3.1

Aboriginal And Torres Strait Islander Heritage Protection Act 1984 (Commonwealth)

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* protects areas and/or objects which are of significance to Aboriginal people and which are under threat of destruction. The Act can, in certain circumstances override State and Territory provisions, or it can be implemented in circumstances where State or Territory provisions are lacking or are not enforced. A significant area or object is defined as one that is of particular importance to Aboriginal people according to Aboriginal tradition. The Act must be invoked by or on behalf of an Aboriginal or Torres Strait Islander or organisation.

9.3.2

Environment Protection And Biodiversity Conservation Act 1999 (Commonwealth)

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides for the protection of matters of National Environmental significance and the environment generally on Commonwealth land. Impacts on the Aboriginal heritage must be considered as part of environmental impact assessment during land-use planning.

A referral was submitted by Coal & Allied to the Department of Environment Heritage Water and the Arts. The Minister for the Environment, Heritage, Water and the Arts has determined that this project is considered a controlled action. Further detail can be found in the RPS Ecology Environmental Assessment Report (2010).

This section contains provisions for the mitigation of impacts on the heritage values of the Gwandalan site resulting from the proposed development. Mitigation measures have been informed by consideration of the NSW Heritage Office and DECCW guidelines for historic and Aboriginal heritage impact assessments. They have also been informed by reference to the Coastal Design Guidelines as they relate to heritage.

The mitigation measures presented will be used to form the basis of a 'Statement of Commitments' as defined under the *EP&A Act 1979*: Part 3A Division 2 Section 75F[6].

10.1***HISTORICAL HERITAGE MITIGATION MEASURES***

The Gwandalan site does not have inherent historic heritage value nor does it contain items of historical heritage. The proposed development will not impact any known historic heritage items. Therefore the proponent is not required to undertake mitigation measures in relation to historical heritage before, during or after the proposed development.

10.2***ABORIGINAL HERITAGE MITIGATION MEASURES***

Recommendations for Aboriginal heritage mitigation are based upon archaeological patterning outlined in *Figure 5.2*. These recommendations are based upon the archaeological significance and archaeological potential of the areas as defined in *Table 8.1*.

10.2.1***General Aboriginal Heritage Mitigations***

The following general Aboriginal heritage mitigation measures are proposed. An 'Aboriginal Heritage Plan of Management' (PoM) written for the development. This PoM should be developed between Coal & Allied and the Aboriginal stakeholders and agreed upon before any site works commence. The PoM can cover these general points and make provision for other specific points below.

These measures are the responsibility of Coal & Allied (as developers):

- ensure appropriate stop work procedures are in place particularly for the excavation phase of works and all site contractors undergo a site induction that includes information about Aboriginal sites;
- in the unlikely event of discovery of skeletal material all works must cease in the immediate area, the police, relevant local Aboriginal community groups and a suitably experienced archaeologist or physical anthropologist contacted to assess the material before determining the correct management action; and
- ensure that on-site information about the heritage requirements is in place for the construction phase for the construction team.

10.2.2 *Aboriginal Heritage Interpretation*

Aboriginal heritage interpretation needs to be considered for the site. This interpretation could be developed in a number of ways, from signage, brochures, community involvement in the archaeological process and local schools education, through to on-going Aboriginal community education programs. Interpretation can also be considered in the context of the three southern sites (Gwandalan, Catherine Hill Bay and Nords Wharf).

The scope for interpretation should include explanation of local types of Aboriginal sites and their importance to local Aboriginal groups. Interpretation should be subject to involvement and agreement with the relevant local Aboriginal community groups (also see 10.2.5 below).

Interpretation of Aboriginal heritage is the responsibility of Coal & Allied.

10.2.3 *Area Of High Archaeological Potential*

This area of high archaeological potential is proposed as part of the conservation zone, are shown in *Figures 5.2 and 7.1*. If impacts from management of this zone are to occur to the archaeological deposits, then the following mitigation measures will be adopted.

The area of high archaeological potential be managed and treated as an “Aboriginal heritage conservation area” (conserving intact midden deposits for future generations). Any infrastructure and works planned for this zone (including but not limited to top soil stripping, new infrastructure services, vegetation removal, landscaping, installation of paths, play equipment, tables, BBQs and toilets etc) have the potential to directly impact the midden deposit. In order to allow relevant impacts within this area the following recommendations are made:

- no topsoil stripping be allowed;
- the existing topsoil be built up to create a protective layer above the midden. This layer of new topsoil can be landscaped and developed as required;
- if areas that cannot be built up with new topsoil require the installation of equipment etc then this equipment should not impact soil horizons i.e. it should be designed to sit on top of the current surface level; and
- follow the measures designed to manage impacts to Aboriginal midden sites – see below and *Annex C*.

Impacts to Aboriginal heritage are to be managed by the government authority in control of this zone following transfer of the Gwandalan conservation area to the NSW Government by Coal & Allied.

10.2.4 *Area Of Moderate Archaeological Potential*

Roads, residential lots and parks are proposed in this area, which is likely to contain sub-surface remains of midden which are associated with the extent of the midden 45-5-0079 on the foreshore.

The areas of moderate potential are PADs, and as such require their significance assessed to determine appropriate management and mitigation requires. To assess the significance sub-surface testing is required. A research design will be written prior to any archaeological works. This research design will be based upon the sampling strategy, defined below, and address the research questions which were posed in the Aboriginal heritage assessment (Section 6.2 of this report). The research design is to address potential archaeological works in all three archaeological zones.

It is recommended that the potential impact in the zone with moderate archaeological potential be mitigated by undertaking approximately 20 mechanical grader scrapes (2 m by 20 m) across the area. These grader scrapers are designed to identify areas with archaeological deposits. All site work will be monitored by a suitably qualified archaeologist.

Should more than a sparse scatter of shell or stone artefacts be found in any of the grader scrapes, manual excavation of a 1 m² pit will be undertaken in the area. If archaeological deposits are then found to be concentrated, it is proposed that the excavation pit be extended to 4 m² (expansion of 1-2 pits is recommended to obtain a representative sample). A maximum of 20 * 1 m² pits are considered suitable to sample a representative proportion of the midden material from Gwandalan.

Analysis and interpretation of all excavated material will be undertaken. Analysis should include radio-carbon dating of a suitable sample(s) to determine a relative chronology for the midden (and thus the local area). Reporting on the excavation could include Aboriginal community members input into the social assessment of material. In addition to a technical report, a plain English report should be produced for the Aboriginal community. This could be developed in the form of an educational document that can be used as part of site interpretation.

Comparison with concurrent archaeological work at Nords Wharf is recommended. All archaeological site works would necessitate the involvement of Aboriginal community stakeholders. Copies of all excavation works will be submitted to the local Aboriginal stakeholder groups for comment. Final reports will be lodged with the relevant DECCW office.

10.2.5 *Area Of Low Archaeological Potential*

Figure 5.2 shows the area with low archaeological significance and low archaeological potential. Roads, residential lots and parks are proposed in this area, which is unlikely to contain extensive sub-surface archaeological remains.

Sites Gwandalan 1 and Gwandalan 2 will be impacted by development in this area. The oyster fragment located in this area may also be indicative of a sparse sub-surface scatter of midden shell, which would also be impacted by development.

It is recommended that the Aboriginal stakeholders be invited to monitor topsoil stripping for the purposes of recovering cultural heritage material from the areas where Gwandalan 1, Gwandalan 2 and the oyster fragment were located. This work would not require the presence of an archaeologist. No further archaeological work is required within this area of low archaeological potential unless significant archaeological deposits were uncovered by topsoil stripping.

Repository for Cultural Material

The Aboriginal Heritage PoM, above, will include management recommendations for the storage and conservation of all Aboriginal materials excavated from the site. Measures will be agreed with the Aboriginal community prior to any site works. Storage solutions could include reburial at a nearby location, use of the material as a teaching collection or standard artefact repository with the Australian Museum.

10.2.6 *Conservation Zones Within The Development Footprint*

The concept plan (*Figure 7.1*) includes areas of public open space. Some of these are located within the areas of moderate archaeological potential. The opportunity exists for these parks to be treated as conservation zones, where intact top soil horizons are not impacted during site works. In order to avoid impacts to the archaeological deposits in these areas, a series of mitigation measures will be implemented.

All infrastructure and works planned for these zones (including but not limited to top soil stripping, new infrastructure services including sewerage and water, vegetation removal, landscaping, installation of paths, play equipment, tables, BBQs and toilets etc) have the potential to directly impact the midden deposit. In order to conserve Aboriginal objects in-situ the following recommendations will be followed:

- no topsoil stripping be allowed;
- the existing topsoil be built up to create a protective layer above the midden. This layer of new topsoil can be landscaped and developed as required;
- if areas that cannot be built up with new topsoil require the installation of equipment etc then this equipment should not impact soil horizons i.e. it should be designed to sit on top of the current surface level; and
- Aboriginal heritage interpretation (possibly information signs) within the parkland areas to inform locals and visitors about the significance and use of the local area to Aboriginal people. The interpretation should be written in collaboration with Aboriginal stakeholders and include details relating to any archaeological investigations undertaken within the Gwandalan site.

10.2.7 *Protection of the Conserved Aboriginal Midden Site*

Aboriginal midden material contained within the Gwandalan site, and also in the foreshore zones, which will revert to the NSW Government, should be conserved with the aim of zero impact. Consultation with all Aboriginal stakeholders during the meeting devised a draft paper for the conservation of middens. This paper is presented in *Annex C*.

CONCLUSION

This HIA has determined that the proposed development at Gwandalan has the potential to impact on the Aboriginal heritage values of the foreshore area. No impact on historic heritage values will occur.

Provided the mitigation measures outlined in this HIA are implemented by Coal & Allied, the potential impacts will be avoided or managed to an acceptable level.

In addition, the cumulative effect of the Coal & Allied proposed conservation zones means that the majority of the Aboriginal midden at Gwandalan will be conserved in perpetuity. Further, the effect of the conservation zone is that it will prevent future development which also contributes to the protection of Aboriginal sites along and adjacent to the coast in the local area.

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Annex A

Aboriginal Consultation Log

Table A.1 Consultation Stage 1: Advisory Requests

Date	Organisation/group/individual	Contact Name	Details
28-Jun-07	Lake Macquarie News newspaper	N/A	Ad to appear on Thursday 5 July 2007, given response date of 19 July 2007 Search of NNTT website of Wyong LGA shows 6 claimant applications, none of which are active. Two of these were for Darkinoong and were dismissed/withdrawn, one was for the Boongary Clan of the Taurai People which was discontinued, and three were for Jamie Roy Denniss and were dismissed/discontinued.
28-Jun-07	Native Title Services	N/A	Email requesting groups to consult. Letter received 4/07/07 identifying three Aboriginal parties who may be interested in being consulted: Guringai Tribal Link Aboriginal Corporation (who we're already consulting), Mur-Roo-Ma Inc. and Arthur C. Fletcher.
28-Jun-07	DECCW	Brendan Diacono	Email requesting groups to consult. Email received 29/06/07 specifying that no Aboriginal owners are known for the area.
28-Jun-07	Registrar of Aboriginal Owners	Megan Mebberson	Email requesting groups to consult. Email received 4/07/07 directing us to contact DECCW, which we have already done.
28-Jun-07	Wyong Shire Council	Chris Ferry	Phone call discussing project and checking whether a representative would be available for survey on 12-13 July. Email to this effect giving details, map and requesting groups to consult.
28-Jun-07	Darkinjung LALC	Roger Sentance	Phone call regarding project; left message. Email discussing project, giving map and asking whether a representative would be available for survey on 12-13 July; also requesting groups to consult.
28-Jun-07	Guringai Tribal Link Aboriginal Corporation	Tracey-lee Howie	Phone call regarding project; confirmed that they would be available for survey on 12-13 July.
28-Jun-07	Awabakal Traditional Owners Aboriginal Corporation	Kerrie Brauer	Email giving proposed survey details, map and requesting groups to consult.
28-Jun-07	Awabakal Descendents Traditional Owners Aboriginal Corporation	Shane Frost	Email discussing project, giving map and asking whether a representative would be available for survey on 12-13 July; also requesting groups to consult.
05-Jul-07	Mur-Roo-Ma Inc.	Anthony Anderson	Email discussing project, giving map and asking whether the Gwandalan sites are within their area of interest; also requesting groups to consult.
05-Jul-07	Wonn1 Contracting	Arthur C. Fletcher	Email discussing project, giving map and asking whether the Gwandalan sites are within his area of interest; also requesting groups to consult.

Table A.2 Consultation Stage 1: Aboriginal Group Registrations Received

Date	Organisation/group/individual	Contact Name	Details
28-Jun-07	Darkinjung LALC	Roger Sentance	Fax registering interest in being consulted for the project.
28-Jun-07	Awabakal Traditional Owners Aboriginal Corporation	Kerrie Brauer	Phone call, registering interest in being consulted.
28-Jun-07	Guringai Tribal Link Aboriginal Corporation	Tracey-lee Howie	Phone call registering interest.
29-Jun-07	Awabakal Descendents Traditional Owners Aboriginal Corporation	Shane Frost	Phone call and email registering interest.
16-Jul-07	Wonn1 Sites Officer	Arthur C. Fletcher	Fax registering interest.

Table A.3 Consultation Stage 2: Briefing and Methodology Advice Sent

Date	Organisation/group/individual	Contact Name	Details
29-Jun-07	Darkinjung LALC	Roger Sentance	Email of methodology and invitation to participate in fieldwork; survey date of 12-13 July 2007.
29-Jun-07	Awabakal Traditional Owners Aboriginal Corporation	Kerrie Brauer	Email of methodology and invitation to participate in fieldwork; survey date of 12-13 July 2007.
29-Jun-07	Guringai Tribal Link Aboriginal Corporation	Tracey-lee Howie	Email of methodology and invitation to participate in fieldwork; survey date of 12-13 July 2007.
29-Jun-07	Awabakal Descendents Traditional Owners Aboriginal Corporation	Shane Frost	Email of methodology and invitation to participate in fieldwork; survey date of 12-13 July 2007.

Table A.4 *Consultation Stage 2: Aboriginal Comments Received*

Date	Organisation/group/individual	Contact Name	Details
01-Jul-07	Awabakal Descendents Traditional Owners Aboriginal Corporation	Shane Frost	Email providing agreement with the methodology, offering fieldwork services and providing copies of insurance certificates.
02-Jul-07	Guringai Tribal Link Aboriginal Corporation	Tracey-lee Howie	Email and fax providing agreement with the methodology, offering fieldwork services and providing copies of insurance certificates.
02-Jul-07	Awabakal Traditional Owners Aboriginal Corporation	Kerrie Brauer	Email of letter providing agreement with the methodology, offering fieldwork services and providing copies of insurance certificates.
11-Jul-07	Darkinjung LALC	Roger Sentance	Phone call indicating agreement with the methodology and offering fieldwork services.



Jenna Lamb/ERMAU/ERM

29/06/2007 04:18 PM

To r.sentence@dlalc.org.au

cc

bcc

Subject Aboriginal Heritage Assessment: "Catylis" at Gwandalan

Dear Roger,

As we indicated in our email of 28 June 2007, Environmental Resources Management Australia (ERM) is undertaking an Aboriginal heritage assessment of an area proposed for future development at Gwandalan (please find attached a map of the study area). The study is being undertaken on behalf of Catylis/RTCA to assess development constraints and opportunities within the area.

This email provides Darkinjung Local Aboriginal Land Council with a proposed methodology for this heritage assessment. We would appreciate it if you could provide us with any written **feedback** on this methodology, by **Friday 6 July 2007** (by return email, or our fax number is 8584 8800).

We welcome your feedback on the method of assessing the Aboriginal heritage significance of the study area, and we understand that there are a number of methods that could be used in such an assessment. We would also welcome any information that you could provide us with concerning the cultural heritage values of the study area.

We propose to assess Aboriginal heritage of the study area through an archaeological **survey on Thursday 12 July-Friday 13 July 2007**. This survey will aim to locate any Aboriginal heritage sites that occur within the study area, and to assess their significance. The survey will be undertaken on foot and will cover all archaeologically sensitive landforms in the study area, focusing particularly on any soil exposures. Landform elements where we think sites may occur include:

- within 50 m of creeks;

- ridges, slopes and flats suitable for camping or travelling through the country; and

- in closest proximity to the shore of Lake Macquarie.

During the heritage assessment, we propose to:

- identify and record any Aboriginal heritage sites located during the survey;

- take GPS readings and mark site locations on a map;

- estimate the effective survey coverage of the study area;

- assess the impact of the proposed development on known Aboriginal heritage values;

- assess the scientific and Aboriginal significance of sites; and

- provide recommendations on how to manage and mitigate proposed development impacts on known Aboriginal heritage values.

When these tasks have been completed, ERM will provide a copy of the draft Aboriginal heritage assessment report to Darkinjung Local Aboriginal Land Council for comment

ERM would like to invite one representative from Darkinjung Local Aboriginal Land Council to participate in paid fieldwork for the Aboriginal heritage assessment field survey of the study area on **Thursday 12 July-Friday 13 July 2007**. Following current NSW DECC Aboriginal heritage consultation guidelines, your field representative should have skills or experience in one or more of the following:

field identification or survey techniques (including confirmation of physical ability to undertake fieldwork);

cultural knowledge of the study area and surrounds; and

ability to assist in communicating the results of the survey back to the stakeholder community for the assessment of cultural values and significance, and returning advice on their response to ERM (DEC Interim Community Consultation Requirements, January 2005, page 8).

In order to participate in the survey on **Thursday 12 July-Friday 13 July 2007**, Aboriginal representatives must be adequately insured, so please also provide your insurance status and copies of your certificate of currency for details concerning your public liability insurance. We would greatly appreciate it if you could respond to us in writing by Friday 6 July 2007 (by return email or by fax on 8584 8800) with this information, and also with the fieldwork rates of your representative. Our contact details are listed below in the email signature.

It is proposed that all field participants meet on **Thursday 12 and Friday 13 July 2007 at 8:00 am** at the **corner of Summerland Road and Kanangra Drive, Gwandalan**. Field participants should bring all food and water required for the day. Personal protective equipment required for the survey is **high visibility vests, safety shoes, long-sleeved shirt and trousers and sun/rain protection (hat, sunscreen and raincoat)**.

The Aboriginal heritage assessment will be conducted in collaboration with Aboriginal stakeholders over the course of the two days. The survey will target areas of land in the study area that are relatively undisturbed and where the ground surface is visible, including any mature trees, ridges, slopes, flats, and watercourses. ERM archaeologist Jenna Lamb will be undertaking the fieldwork for the Aboriginal heritage assessment with the Aboriginal stakeholders.

Payment for the participation of one representative in the fieldwork will be provided by the client, however invoices may be sent to ERM, at the following address:

Environmental Resources Management (Australia) Pty Ltd
Cultural Heritage Services
Attn: Jenna Lamb
Locked Bay 24
Broadway NSW 2007

In summary, we request, by **Friday 6 July 2007**:

Any feedback with regard to the proposed methodology

Any further knowledge with regard to Aboriginal heritage within the study area

Your representative's fieldwork rates

Certificates of currency for public liability insurance.

If you have any queries concerning the project, please feel free to contact me by return email or on the numbers listed below.

Many thanks,

Jenna Lamb
Archaeologist



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Jenna Lamb
Graduate Archaeologist
Environmental Resources Management Australia Pty Ltd
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ERM - Environmental Adviser of the year 2005 & 2006: Acquisitions Monthly

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Annex B

Effective Coverage Table

Table B.1 Effective Coverage

Transect	Landforms	Description	Approximate Area (m ²)	Approximate Area surveyed (m ²)	Visibility	Exposure	Effective coverage (m ²)	Sample fraction (%)	Number of sites
T1	Slope	Vehicle track at western end of Gwandalan site	54106	4510	1.0	1.0	4510	8.3	1 (Gwandalan 1)
T2	Slope	Vehicle track from south western end into centre of Gwandalan site	52096	4168	1.0	1.0	4168	8	0
T3	Slope, creeks	Track through centre of southern end of Gwandalan site	72611	218	1.0	1.0	218	0.3	0
T4	Slope	Near foreshore, in south eastern part of Gwandalan site	36942	1407	0.5	0.1	70	0.2	0
T5	Flat	Near foreshore, in south eastern part of Gwandalan site	5000	500	1.0	1.0	500	1	0
T6	Flat	Forested area in south eastern part of Gwandalan site	4369	87	0.3	0.01	0.3	0.05	0
T7	Slope	Track from foreshore in south east part of Gwandalan site	37844	1135	1.0	1.0	1135	3	0
T8	Slope	Forested area at southern end of Gwandalan site	32282	461	0.5	0.02	5	0.1	0
T9	Slope, creek	Track to swamp, in middle of Gwandalan site	29550	296	1.0	1.0	296	1	0
T10	Slopes	Tracks through middle of Gwandalan site and along foreshore to swamp	46948	2817	1.0	1.0	2817	6	1 (midden 45-7-0079)
T11	Slope	Track to foreshore in middle of eastern end of Gwandalan site	18600	372	1.0	0.9	413	2.2	1 (midden 45-7-0079)
T12	Flats, creek	Tracks through north eastern part of Gwandalan site	43593	872	1.0	0.9	785	1.8	0
T13	Slopes, creeks	Track at northern end of Gwandalan site	38500	1540	1.0	1.0	1540	40	1 (Gwandalan 2)
T14	Slopes, creeks	Small track through middle of north west part of Gwandalan site	86000	1075	0.5	0.5	269	0.3	0
T15	Slopes, flats, creeks	Forested area throughout Gwandalan site	381293	7626	0.5	0.05	191	0.5	0
Total			939734	27084			16917.3	1.8	3

Annex C

Discussion Paper -
Conservation Of Aboriginal
Midden Sites

C.1

CONSERVATION OF ABORIGINAL MIDDEN SITES

As this study has confirmed, Aboriginal midden sites are a common feature along the shore of Lake Macquarie. However, the cumulative impact caused by development and public use of the foreshore is starting to make these sites less common. Therefore proactive conservation of middens will preserve a representative sample of these fragile Aboriginal sites for future generations' education and enjoyment.

This discussion paper presents the outcomes of discussions held between the local Aboriginal stakeholders with regard to the immediate threats and possible conservation measures that can be used to preserve Aboriginal middens.

This paper can be used during the current approval process, local councils or by the Aboriginal groups to address the problems concerning the conservation of Aboriginal middens.

C.1.1

Location of Middens

Aboriginal middens are commonly found around the margins and within the hinterlands of Lake Macquarie. They have been formed because of an accumulation of shell and other materials (including charcoal, animal bones, stone debitage and tools) in a particular location, often over a long period of time (sometimes thousands of years).

Middens are viewed as culturally significant to the Aboriginal people in this region because of the tangible link they represent to their ancestors (see the Aboriginal social assessment in *Section 6.2.2*).

Middens created by Aboriginal people must be differentiated from natural accumulations of shell or shell bedding. *Section 3.2.3* provides guidance to differentiating between the two types of shell accumulation.

C.1.2

Statutory Protection

In NSW Aboriginal midden are afforded statutory protection as Aboriginal objects under the *National Parks and Wildlife Act 1974*. The dedication of Coal & Allied land to the NSW State government will afford long term future protection for all Aboriginal middens on Coal & Allied lands, outside of the proposed development areas.

Dedication of these lands to National Parks should provide for long term care and conservation of these Aboriginal sites.

C.1.3 *Objective for Conservation Mitigation*

The objectives for conserving Aboriginal middens are:

1. Long term preservation of the middens;
2. Aboriginal social appreciation of the midden; and
3. The ability to educate Aboriginal people and the general public (when appropriate) with regard to the midden's content, purpose and significance.

C.1.4 *Common Impacts to Midden Sites*

Middens are generally contained within topsoil profiles, where middens have become embedded into the A1 and A2 horizons. They have acted as a collection point for soil accumulation, where soil has built up around the margins of the midden. This means that if left alone the middens are generally stable and will not disintegrate. However, any impact to the structural integrity of the midden can lead to its sudden disintegration.

Common impacts that middens suffer include:

- wash from motor boats (leading to erosion of the banks);
- coastal erosion (land falling into the water);
- sheet wash erosion (rain washing deposits into the water);
- impacts from facilities being constructed (i.e. roads, new infrastructure services, seating areas, bbqs, play equipment etc);
- land use, including vehicle and human traffic crossing middens;
- impacts from landscaping (including installing signs); and
- public impacts either caused deliberately (i.e. vandalism of the site) or as a consequence of interest (i.e. walking onto the site to get a better view or taking a small piece of the midden).

C.1.5

Possible Mitigation Measures

Many of these impacts can be mitigated through public education or careful landscape modification to either move the impact or people away from the site or guide them past it appropriately. When devising mitigation measures the overall aim should be zero impact to the midden. However, this may not always be possible, and limited impacts may be acceptable if the overall aim of conservation is achieved.

Mitigation measures can include:

- zero impact walkways, which sit above the surface level;
- zero impact signage;
- placing a protective covering or layer above the midden i.e. a covering of soil, sand or a road above the midden so that impact are made to the new layer and not the midden;
- covering the upper surface in a geo-fabric to prevent impact;
- creation of a coastal barrier i.e. landscape change to prevent coastal erosion;
- screening of the midden using carefully placed vegetation or facilities to prevent the obviousness of the midden; and
- redesign of facilities around the midden, thus avoiding impacts.

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