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ELAMBRA WEST REZONING PROPOSAL: 48 CAMPBELL STREET, GERRINGONG, NEW SOUTH WALES

ABORIGINAL CULTURAL HERITAGE ASSESSMENT

FINAL REPORT

ALLEN PRICE AND SCARRATS PTY LTD

4 April 2022

DOCUMENT INFORMATION

Project:	Elambra West Rezoning Proposal: 48 Campbell Street, Gerringong, NSW
Services required:	ACHA
Client:	Allen Price & Scarratts
Prepared by:	Pauline Ramsey, Dominique Bezzina, Marika Low
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EXECUTIVE SUMMARY

This report has been prepared for Allen Price & Scarratts (the Proponent) and details the Aboriginal Cultural Heritage Assessment (ACHA) of land situated at 48 Campbell Street, Gerringong (Lot 2 DP1168922), New South Wales (NSW) [the study area], within the Kiama Local Government Area (LGA), and the Parish of Kiama in the County of Camden.

The study area is defined by the boundary of residential development to the north, an unnamed tributary of the Crooked River and residential development to the east, largely undeveloped pastoral land to the south and another unnamed tributary of the Crooked River and pastoral land to the west. The study area is in the suburb of Gerringong, located 7.5 kilometres from Kiama Central Business District.

This ACHA was undertaken to assess the archaeological potential for Aboriginal material as part of a Planning Proposal being prepared under Part 4 of the *Environmental Planning and Assessment Act 1979*, before the proposed rezoning and subsequent development of the study area. The ACHA has been undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (Department of Environment Climate Change and Water NSW 2010).

An archaeological survey covering the study area was undertaken in 2019 as part of the original Aboriginal Heritage Due Diligence Assessment (ACHDDA; Austral 2019) prepared for the project. Although no Aboriginal objects or sites were identified during the survey, two areas of moderate archaeological potential were identified in association with the alluvial terraces associated with the two unnamed tributaries of Crooked River, which are located within the western and eastern portions of the study area.

Archaeological test excavations were completed in the study area in November 2021 to test the different landforms and areas of very low, low and moderate archaeological potential. The primary landforms assessed include the alluvial terraces, slopes, crest and creekline/floodplain. An overview of the testing areas, number of test pits and number of artefacts recovered is provided in the table below.

Testing Area #	Landform	# Test pits	# Artefacts
TA1	Terrace and foot slopes associated to western tributary of Crooked River.	12	4
TA2	Slope connecting western terrace to central crest.	9	0
TA3	Top of central crest.	6	1
TA4	Top of Central crest, south of current homestead	2	0
TA5	Sloping ridgeline south of central crest	5, including one 1m^2 expansion	0
TA6	Slope connecting central crest to eastern tributary of Crooked River	6	0
TA7	Alluvial terrace above eastern tributary of Crooked River	12	0
Total		**53 including one 1m^2 expansion**	**5**

A total of 53 test pits were excavated resulting in the recovery of 5 stone artefacts. The depth of the deposits ranged from 40cm to 100cm. The test excavations confirmed that the upper 30-40cm of deposit across much of the study area is highly disturbed. This disturbance likely relates to the historical clearing of vegetation in the area, the use of the land for agricultural practices and the construction of buildings and associated infrastructure within the study area. A small number of artefacts, however, were recovered from below this level of disturbance from depths of between ~30-60cm.

The test excavation resulted in the recovery of a very low-density sub-surface assemblage consisting of 5 flaked stone artefacts. Artefacts occur mostly in association with testing area 1 (TA1) and test pit 9 (TP9). Artefacts were distributed between spit 3 to 6 (~30-60cm). The small assemblage is comprised of complete flakes and medial flake fragments manufactured from fine grained siliceous (FGS), volcanic material and indurated mudstone-tuff (IMTUFF). Based on the assemblage characteristics (i.e., absence of cores, retouched or utilised artefacts and lack of evidence of flaking debris) the site was not a focus of occupation or use. The small low-density artefact assemblage likely results from casual discard and is indicative of general background scatter.

The location of the artefacts in association with two different landforms (alluvial terrace and crest) separated by approximately 200 metres and their characterisation with different raw material compositions resulted in them being recorded as two separate sites including:

- 'Campbell Street Artefact 1' (AHIMS #52-5-1018)
- 'Campbell Street Artefact 2' (AHIMS #52-5-1019)

The site types found within the study area (i.e., Artefact sites) are well-represented in the region with numerous similar sites present. Such sites are indicative of sporadic Aboriginal use of the landscape surrounding Crooked River and its associated tributaries.

The Aboriginal sites identified during this ACHA are described, along with their significance in the table below:

Site name / AHIMS No.	Aboriginal cultural heritage values	Significance
Campbell Street Artefact 1 / (AHIMS #52-5-1018)	Campbell Street Artefact 1 is a low-density sub-surface artefact scatter comprised of four stone artefacts recovered from a depth of ~30-60cm. The artefacts include 3 complete flakes manufactured from FGS and a medial fragment of a flake manufactured from volcanic material. Rounding of the edge on three of the artefacts indicates post-depositional movement of artefacts likely associated with their context in an alluvial terrace. The results of the testing program indicate a sub-surface artefact density of 1.23 artefacts/m². The site type (low-density artefact scatter) and its contents (complete and broken flakes mostly of FGS and volcanic material) is well represented in the region. Based on its context, the site does not appear to represent in-situ occupation and is indicative of low-density background scatter. Overall, the site has limited potential to provide additional information about Aboriginal lifeways beyond general information regarding basic site type patterning associated with the broader landscape. The site has been assessed as not possessing historic, aesthetic, social or spiritual significance.	Low
Campbell Street Artefact 2 / (AHIMS #52-5-1019)	Campbell Street Artefact 2 consists of a single sub-surface isolated artefact in the form of a medial flake manufactured from IMTUFF recovered from a depth of ~40cm. The site type (isolated artefact) and its contents (a broken IMTUFF flake) is well represented in the region. The site is highly disturbed, is unlikely to be in-situ and is indicative of low-density background scatter. Overall, the site has limited potential to provide additional information about Aboriginal lifeways beyond general information regarding basic site type patterning associated with the broader landscape. The site has been assessed as not possessing historic, aesthetic, social or spiritual significance.	Low

ABORIGINAL COMMUNITY CONSULTATION

Consultation with Aboriginal stakeholders has been completed in accordance with the Consultation Requirements (DECCW 2010a). A summary of this process is included below.

Stage	Component	Commenced	Completed
Stage 1	Letters to agencies	20/08/2021	N/A
	Registration of stakeholders	31/08/2021	14/09/2021
Stage 2	Project information	17/092021 & 20/10/2021	N/A
Stage 3	Review of project methodology	17/09/2021 & 20/10/2021	15/10/2021
Stage 4	Review of ACHA by Aboriginal stakeholders	18/01/2022	15/02/2022

Further information on the consultation completed for the project can be found in Section 2 and Appendix A of this report.

RECOMMENDATIONS

The following recommendations are derived from the findings described in this ACHA. The recommendations have been developed after considering the archaeological context, environmental information, consultation with the local Aboriginal community, and the findings of the test excavation and the predicted impact of the planning proposal on archaeological resources.

It is recommended that:

1. Before any works occur, the Proponent apply to Heritage NSW for an Aboriginal Heritage Impact Permit (AHIP) to destroy 'Campbell Street Artefact 1' (AHIMS #52-5-1018) and 'Campbell Street Artefact 2' (AHIMS #52-5-1019). These sites are protected under the Section 90 of the *NSW National Parks and Wildlife Act 1974* (NPW Act). It is recommended that the following mitigation measures are implemented as part of the AHIP:
    1. All Aboriginal objects collected during the archaeological testing will be reburied onsite at a location to be determined by the Proponent in consultation with Aboriginal stakeholders for the Project.
2. No further assessment or works are required to be undertaken for the study area.
3. If human skeletal remains are encountered, all work must cease immediately and NSW Police must be contacted, they will then notify the Coroner's Office. Following this, if the remains are believed to be of Aboriginal origin, then the Aboriginal stakeholders and Heritage NSW must be notified. No work can continue until written notification has been obtained from Heritage NSW.
4. It is recommended that the Proponent continues to inform the Aboriginal stakeholders about the management of Aboriginal cultural heritage within the study area throughout the completion of the project. The consultation outlined as part of this ACHA is valid for six months and must be maintained by the proponent for it to remain continuous. If a gap of more than six months occurs, then the consultation will not be suitable to support an AHIP for the project.
5. A copy of this report should be forwarded to all Aboriginal stakeholder groups who have registered an interest in the project.

CONTENTS

FIGURES

TABLES

1 INTRODUCTION

Austral Archaeology Pty Ltd (Austral) has been commissioned by Allen Price & Scarratts (the Proponent) to undertake an Aboriginal Cultural Heritage Assessment (ACHA) for the property at Campbell Street, Gerringong, New South Wales (NSW) [the study area].

1.1 THE STUDY AREA

The study area consists of the eastern section of 48 Campbell Street, Gerringong, NSW (Lot 2 DP1168922), located approximately 7.5 kilometres from the township of Kiama, within the Kiama Local Government Area (LGA), and the Parish of Kiama in the County of Camden. It is also within the boundaries of the Illawarra Local Aboriginal Council (ILALC). It is bounded to the north by Lot 407 DP1156197, SP90596, Lot 301 DP1153752, the south end of Campbell Street, Lot 10 DP837894, Lot 2 DP1173543, Lot 1 DP1173543, Lot 205 DP1156196 and Lot 206 DP1156196.The study area is bounded to the east by Lot 206 DP 1180016, Lot 535 DP 1111492, Lot 534 DP1111492, as well as an unnamed tributary of the Crooked River. To the south is Lot 11 DP1045242 and to the west is a continuation of Lot 2 DP1168922 as well as another tributary of the Crooked River which runs on a north to south alignment. The location of the study area is shown in **Error! Reference source not found.**, Figure 1.2 and Figure 1.3.

1.2 PURPOSE OF THE ACHA

The ACHA was undertaken to assess the potential harm that may occur to Aboriginal cultural heritage values as part of a Planning Proposal under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), for the proposed rezoning of the study area.

The Proponent is seeking to amend the Kiama Local Environmental Plan 2011 (KLEP) to extend the Gerringong residential zone from Campbell Street to align with the southern boundary of 48 Campbell Street, (Lot 2 DP 1168922), Gerringong (the study area). The end result of this rezoning will be the creation of the Elambra West Urban Release Area. The proposed works include:

- The construction of principle roads, connecting to Campbell Street and Elambra Parade.
- The creation of a public reserve along the eastern border of the study area, as well as surrounding a mature fig tree positioned on the central crest.
- Future development of a residential subdivision within the R2 development area, which will involve ground works associated with, but not limited to, building construction, the installation of associated services and infrastructure and landscaping.

The proposed works will therefore involve ground disturbance associated with the construction of principle roads and earthworks associated with residential construction, landscaping and the installation of ancillary infrastructure (i.e., services and utilities) associated with the future development within the residential subdivision.

A preliminary concept design for the proposed works is provided in Appendix B. To allow for flexibility in the final design plans, however, for the purpose of this ACHA it is assumed that all land contained within the study area, other than the land contained within the area designated for public reserve, will be impacted by the proposed works.

1.3 ASSESSMENT OBJECTIVES

The scope of this ACHA is based on the legal requirements, guidelines and policies of the Heritage NSW, formerly the Office of Environment and Heritage (OEH), formerly, the Department of Environment, Climate Change and Water (DECCW), Department of Environment and Climate Change (DECC) and Department of Environment and Climate (DEC).

The guiding document for this assessment is the *Code of Practice for the Investigation of Aboriginal objects in NSW* (DECCW 2010b) [Code of Practice].

Information provided in this assessment includes, but is not limited to:

- A literarure review of available data, including previous studies or investigations undertaken within and adjacent to the study area.
- The results of archaeological test excavation and surveys.
- An assessment of archaeological significance and management recommendations.
- An assessment of harm posed to Aboriginal objects, places or values as part of the project.
- A description of practical measures that have been used to protect, conserve, avoid or mitigate harm to Aboriginal objects, places and values.
- Adequate documentation to accompany an Aboriginal Heritage Impact Permit (AHIP) application.

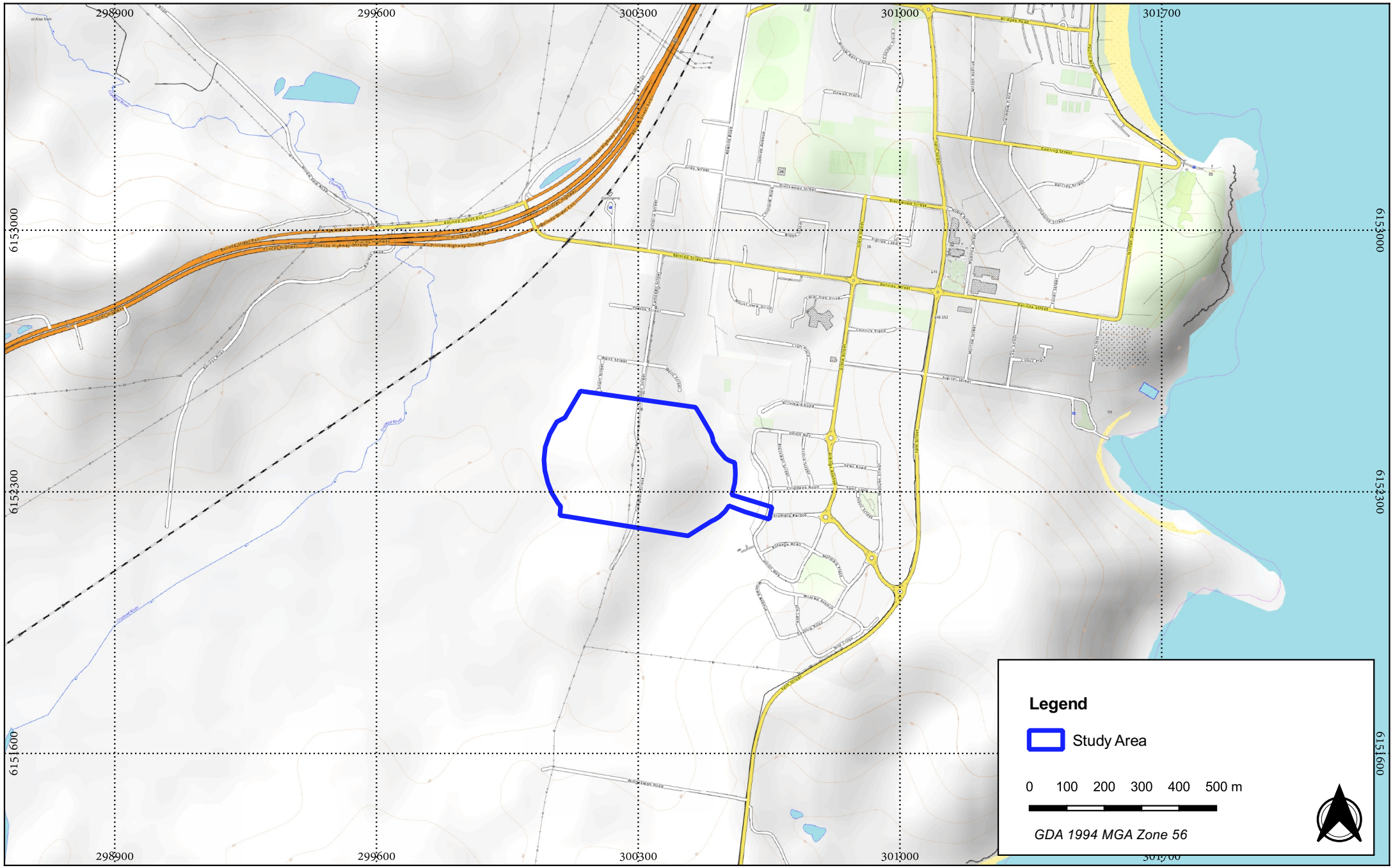

Figure 1.1 Location of the study area

21106 - Elambra West - ACHA

Source: NSW LPI Aerial, Austral (2019)

Drawn by: PR Date: 2021-09-16

AUSTRAL ARCHAEOLOGY

Figure 1.2 Detailed aerial of the study area

21106 - Elambra West - ACHA

Source: NSW LPI Aerial, Austral (2019)

Drawn by: PR Date: 2021-09-16

AUSTRAL ARCHAEOLOGY

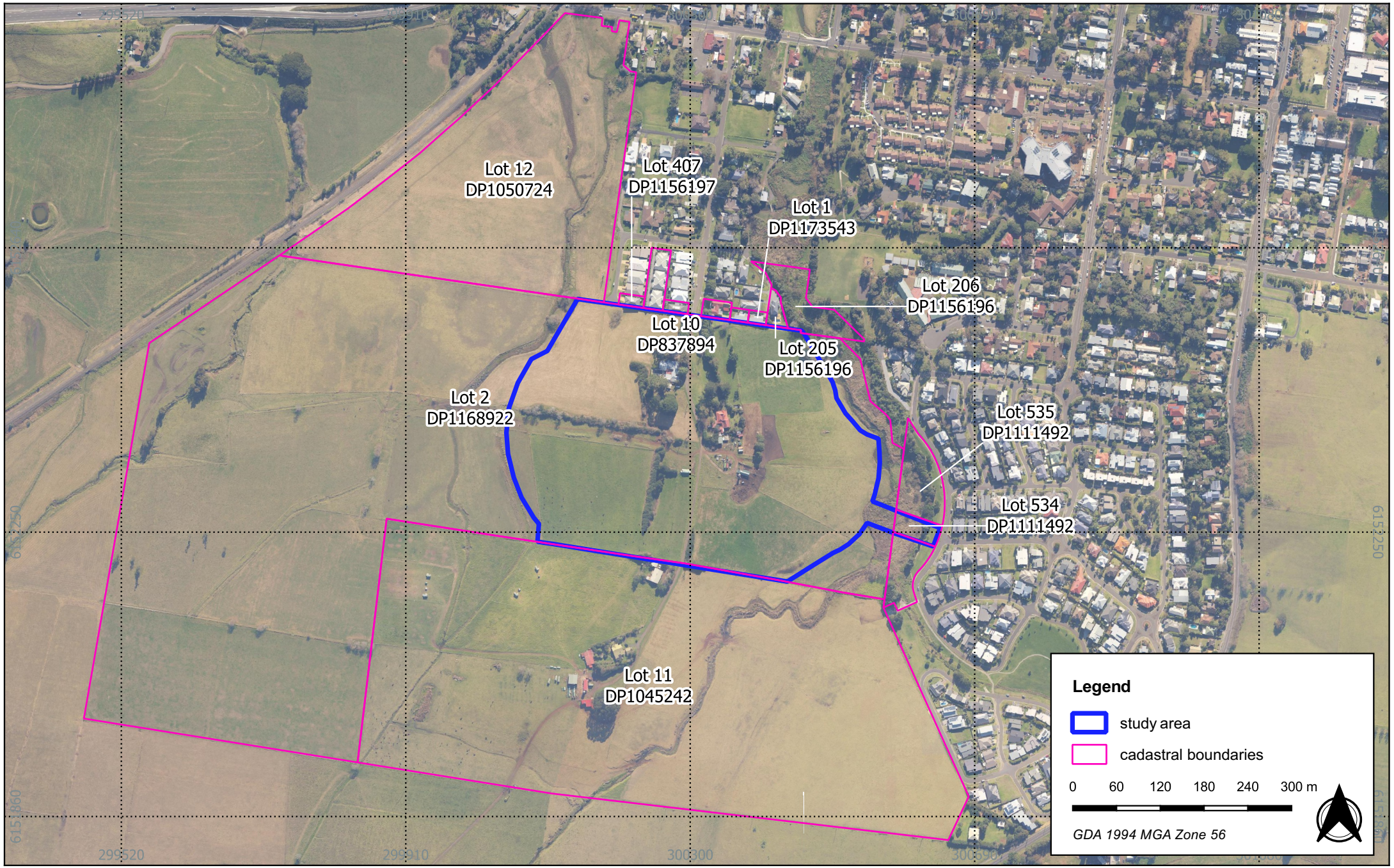

Figure 1.3 study area and surrounds in relation to cadastral boundaries

21106 - 48 Campbell Street, Gerringong, NSW - ACHA

Source: NSW LPI Aerial

Drawn by: ARH Date: 2021-10-15

AUSTRAL ARCHAEOLOGY

1.4 SUMMARY OF LEGISLATIVE PROCESS

Aboriginal archaeological and cultural heritage assessments in NSW are carried out under the auspices of a range of State and Federal Acts, Regulations and Guidelines. The Acts and Regulations allow for the management and protection of Aboriginal places and objects, and the Guidelines set out best practice for community consultation in accordance with the requirements of the Acts.

This section outlines the Australian acts and guidelines that are applicable or have the potential to be triggered with regards to the proposed development are detailed in **Error! Reference source not found.** to Table 1.4.

Table 1.1 Federal Acts

Federal Acts	Applicability and implications
Environment Protection and Biodiversity Conservation Act 1999	This act has not been triggered and so does not apply, as: • No sites listed on the National Heritage List (NHL) are present or in close proximity to the study area. • No sites listed on the Commonwealth Heritage List (CHL) are present or in close proximity to the study area.
Aboriginal and Torres Strait Islander Heritage Protection Amendment Act 1987	Applies, due to: • This Act provides blanket protection for Aboriginal heritage in circumstances where such protection is not available at the state level. This Act may also override state and territory provisions.

Table 1.2 State Acts

State Acts	Applicability and implications
National Parks and Wildlife Act 1974 (NPW Act 1974)	Applies, due to: • Section 86 – Prohibits both knowingly and unknowingly, causing harm or desecration to any Aboriginal object or place without either an AHIP or other suitable defence from the Act. • Section 87 – Allows for activities carried out under an AHIP or following due diligence to be a defence against the harm of an Aboriginal object. • Section 89A – Requires that the Heritage NSW must be notified of any Aboriginal objects discovered, within a reasonable time. • Section 90 – Requires an application for an AHIP in the case of destruction of a site through development or relocation.
NPW Regulation 2019	Applies, due to: • Section 57-58 – States minimum standards of due diligence to have been carried out • Section 60 – Requires Aboriginal community consultation process to be undertaken before applying for an AHIP. • Section 61 – Requires production of a cultural heritage assessment report to accompany AHIP applications.
The Environmental Planning and Assessment Act 1979 (EP&A Act 1979)	Applies, due to: • This project is being assessed under Part 4 of the EP&A Act 1979. • Sections 86, 87, 89A and 90 of the NP&W Act 1974 will apply. • The Part 5 Guidelines will not apply.
NSW Heritage Act 1977	There are no sites listed on the State Heritage Register associated with the study area, and therefore Section 57 of this act does not apply.

Table 1.3 State and local planning instruments

Planning Instruments	Applicability and implications
Local Environmental Plans (LEP)	The following LEP is applicable: • Kiama LEP 2011
Development Control Plans (DCP)	The following DCP is applicable: • Kiama DCP 2020

Table 1.4 Aboriginal community consultation guidelines

Guidelines	Applicability and implications
Consultation Requirements	• The development is to be conducted in accordance with Part 4 of the EP&A Act. • As the project is to be assessed under Part 6 of the NP&W Act, approvals under Section 90 of the NP&W Act 1974 as amended 2010 will be required, S89A of the Act will apply, and the Part 4 Guidelines will apply.

1.5 PROJECT TEAM AND QUALIFICATIONS

The personnel responsible for the preparation of this report are detailed in Table 1.5.

Table 1.5 Personnel involved in the preparation of this ACHA

Name	Qualifications	Title	Responsibilities
Doug Williams	B.A. (Hons.) Archaeology, Grad Dip Archaeology	Principal Archaeologist	Technical lead
Stephanie Moore	B.A. (Hons.), MA	Senior Archaeologist	Project manager
Pauline Ramsey	B.A. Anthropology and IDS	Archaeologist	Field work and reporting
Dominique Bezzina	B.A. Archaeology	Graduate Archaeologist	Background research
Marika Low	B.A. (Hons.) Archaeology, PhD (Archaeology)	Lithic Analyst	Lithic analysis and technical report
Adam Hansford	NA	GIS Officer	Mapping

1.6 ABBREVIATIONS

The following are common abbreviations that are used within this report:

ACHA	Aboriginal Cultural Heritage Assessment
ACHDDA	Aboriginal Cultural Heritage Due Diligence Assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
Austral	Austral Archaeology Pty Ltd
BP	Before Present
Burra Charter	Burra Charter: Australia ICOMOS Charter for Places of Cultural Significance 2013
CBD	Central Business District
CHL	Commonwealth Heritage List
DCP	Development Control Plan

DEC	NSW Department of Environment and Climate (former) Department of Environment and Conservation (former)
DECC	NSW Department of Environment and Climate Change
DECCW	NSW Department of Environment, Climate Change and Water (former)
EP&A Act	Environmental Planning and Assessment Act 1979
EPBC Act	Environmental Protection and Biodiversity Act 1999
EPI	Environmental Planning Instrument
ESD	Ecologically Sustainable Development
FGS	Fine Grained Siliceous
GSV	Ground Surface Visibility
Heritage Act	NSW Heritage Act 1977
ICOMOS	International Council on Monuments and Sites
IHO	Interim Heritage Order
IMTUFF	Indurated-mudstone-tuff
ILALC	Illawarra Local Aboriginal Land Council
JMCHM	Jo McDonald Cultural Heritage Management
KDCP	Kiama Development Control Plan 2020
KLEP	Kiama Local Environmental Plan 2011
KLSPS	Kiama Local Strategic Planning Statement
LEP	Local Environmental Plan
LGA	Local Government Area
NHL	National Heritage List
NPW Act	National Parks and Wildlife Act 1974
NSW	New South Wales
OEH	Office of Environment and Heritage (former)
PAD	Potential Archaeological Deposit
The Proponent	Allen Price & Scarratts Pty Ltd
PASA	Potential Archaeologically Sensitive Area
RAP	Registered Aboriginal Party
RNE	Register of the National Estate
Study Area	48 Campbell Street, Gerringong (Lot 2 DP1168922)
TA	Testing Area
TP	Test Pit
URA	Urban Release Area

Refer also to the document Heritage Terms and Abbreviations, published by the Heritage Office and available on the website: http://www.environment.nsw.gov.au/heritage/index.htm.

2 CONSULTATION PROCESS

This section outlines the consultation process that has been followed as part of the preparation of this ACHA.

2.1 INTRODUCTION

Stakeholder consultation for this project commenced in line with the Consultation Requirements (DECCW 2010a). Heritage NSW (2010a, p.iii) recognises that:

- Aboriginal people should have the right to maintain their culture.
- Aboriginal people should have the right to participate in matters that may affect their heritage directly.
- Aboriginal people are the primary determinants of the cultural significance of their heritage.

The Consultation Requirements outline a four-stage consultation process which includes:

- Stage 1 – Notification of the project proposal and registration of interest.
- Stage 2 – Presentation of information about the proposed project.
- Stage 3 – Gathering information about cultural significance.
- Stage 4 – Review of the draft cultural heritage assessment report.

Appendix A of this ACHA contains a consultation log and evidence of all correspondences that were sent and received as part of the consultation process.

2.2 STAGE 1: NOTIFICATION AND REGISTRATION OF INTEREST

The following section outlines the tasks that were undertaken as part of Stage 1 of the Consultation Requirements.

2.2.1 IDENTIFICATION OF RELEVANT ABORIGINAL STAKEHOLDERS

In accordance with the Consultation Requirements the following Agencies were notified as part of the project proposal on 20 August 2021:

- A response was received from Heritage NSW with a list of stakeholders who may have an interest in the proposed development on 23 August 2021.
- The ILALC responded that they had no names on 23 August 2021.
- The Greater Sydney Local Land Services replied that they had no list of stakeholders who may have an interest in the proposed development and to contact Heritage NSW on 20 August 2021.
- The Kiama City Council replied with a list of stakeholders who may have an interest in the proposed development on 31 August 2021.
- NTSCORP responded with a request to make direct contact with the representatives of the South Coast People, Isobel Brinnin and Sandy Chalmers, on 25 August 2021.

A copy of these letters and searches are included in Appendix A2 and A3 of this ACHA.

2.2.2 PUBLIC NOTICE

An advert was placed in the Shoalhaven and Nowra News, to run on 3rd September 2021, requesting the registration of cultural knowledge holders relevant to the project area. A copy of this advert is included in Appendix A4 of this ACHA.

2.2.3 INVITATION TO REGISTER

Letters were also written to the relevant agencies suggested in Section 4.1.2 of the Consultation Requirements (DECCW 2010a) on 31 August 2021 and a search was made of the Native Title Tribunal on the same day (Appendix A5).

As a result of the consultation procedure, the following groups shown in Table 2.1 registered as Aboriginal stakeholders with an interest in this project:

Table 2.1 Registered Aboriginal stakeholders

Organisation	Contact person
Tungai Tonghi	Troy Tungai
Thoorganura	John Carriage,
Woronora Plateau Gundangara Elders Council	Kayla Williamson,
ILALC	Donna Hiscox
Freeman and Marx Pty Ltd	Clive Freeman
Gerringong Housing Aboriginal Corporation	Gwenda Jarrett
Three Ducks Consulting	Leonard Wright
Warra Bingi Nunda Gurri	Nathanial Kennedy
Wodi Wodi Traditional Owner	James Davis

Copies of all correspondence relating to the registration of Aboriginal stakeholders are included in Appendices A5 and A6 of this report.

2.3 STAGE 2: PRESENTATION OF INFORMATION

All registered Aboriginal stakeholders were provided with information outlining the proposed works, including information relating to proposed impacts as well as the project's methodology on 17 September 2021.

Copies of all correspondence relating to the provision of project information to registered Aboriginal stakeholders are included in Appendices A7 and A8 of this report.

2.4 STAGE 3: GATHERING INFORMATION ABOUT CULTURAL SIGNIFICANCE

2.4.1 REVIEW OF DRAFT METHODOLOGY

On 17 September 2021, Austral provided each Aboriginal stakeholder with a copy of the project methodology. The methodology outlined the proposed assessment process that would be used in the completion of the project. Aboriginal stakeholders were provided with 28 days to review and provide feedback on the methodology.

- A notification to test was sent to Heritage NSW on 17 September 2021. A response was received on 11 October 2021. Clarification regarding testing areas as well as a request to diversify testing location to include areas of low archaeological potential was raised. A revised methodology was sent to Heritage NSW on 13 October 2021 and a confirmation response was received on the same day.
- A response from Gwenda Jarrett of the Gerringong Housing Aboriginal Corporation was received on 17 September 2021 to ask if Registered Aboriginal Parties could please be referred to as Traditional Owners.
- A confirmation of late registration by NTSCORP was received on 21 September 2021.
- Clive Freeman responded with a support for the methodology on 23 September 2021.
- Paul Knight of the ILALC responded on 13 October 2021 with his worries about fieldwork going ahead if all his comments had not been addressed, as well as to request the original ACHDDA for review. A reply was sent out on 14 October 2021 asking for the changes and feedback on the methodology, as well as providing the ACHDDA and the recent changes made for Heritage NSW.
- A list of concerns was sent by Paul Knight of the ILALC on 15 October 2021.These concerns broadly encapsulated the lack of background information provided with the methodology, if any attempts to alter the development had been made to avoid impacts

to Aboriginal sites and the greater testing of the area. A response was provided on 20 October 2021. A copy of the prior ACHDDA as well as our response to Heritage NSW was also sent to ILALC for review. No follow up correspondence was received.

In light of the request for additional information regarding Austral's initial methodology and the revision of the original methodology based on comments received from Heritage NSW and RAPs, a copy of the revised methodology was provided to all registered stakeholders on 20 October 2021 and fieldwork was postponed until the 1 November 2021 to allow time for RAPs to consider the revised methodology. No further responses were received during this period.

Copies of all correspondence relating to the draft methodology from Aboriginal stakeholders are included in Appendices A9 and A10 of this ACHA.

2.4.2 INFORMATION GATHERED DURING FIELDWORK

One comment about the nature of the area, as understood by Aboriginal people, was provided by Leeroy Boota (Gerringong Housing Aboriginal Corporation) during test excavations. Mr. Boota described Gerringong as a place of "in-between" – not quite within the Illawarra and not quite the Shoalhaven (Leeroy Boota, pers. comm.).

No other comments about the significance of the site were made by the RAPs during fieldwork.

2.5 STAGE 4: REVIEW OF DRAFT ACHA REPORT

The draft ACHA was provided to Aboriginal stakeholders on January 18, 2022, for their review and comment. Aboriginal stakeholders were given 28 days to review the ACHA and provide their responses in the finalisation of the ACHA (Appendix A11).

No responses were received towards the end of the Stage 4 ACHA report consultations.

3 LANDSCAPE CONTEXT

The following section defines the study area including its environmental and cultural context. This environmental context has been prepared in accordance with Requirement 2 of The Code (DECCW 2010c, pp.8–9).

3.1 ENVIRONMENTAL CONTEXT

The study area is defined by its place within the Southern Illawarra Coastal Plains region. The Southern Illawarra Coastal Plains region bound to the west by the Illawarra Escarpment and to the east by the Tasman Sea. The topography of the region is characterised by rolling hills made of basal slopes and littoral zones and valley floors associated with elevated topographies such as terraces and meadows. The local area surrounding the study area includes new residential areas to the east and the recent upgrades to the Princes Highway situated approximately 800 metres to the west. Further west of the highway are the spurs and ranges of the Cambewarra Range, a southern extension of the Illawarra Escarpment (Navin Officer 2010, p.27).

The study area itself is made up of large tracts of land which has been cleared for dairy farming and agricultural purposes. Crooked River, a 4th order stream, is situated approximately 2 kilometres to the south of the study area and drains in an east to west alignment. Two of its tributaries run adjacent to the eastern and western boundary of the study area.

This local region surrounding the study area is associated with several well documented locations of Aboriginal cultural significance. These locations include the Crooked River, the Little Mountain (also known as Dicky Wood's Meadow) battle ground located in Broughton village, Cullunghutti Mountain near Berry and numerous mature fig trees scattered throughout the local region. According to the Aboriginal community, Gerringong is a place of "in-between". Leeroy Boota, a stakeholder who participated in the fieldwork and a life-long resident of Gerringong, for example, described this ancestral landscape as not quite the Shoalhaven and not entirely the Illawarra (Leeroy Boota, pers. comm.). This town would have been the meeting place of several tribes for both community and social gatherings as well as for doing battle.

The following sections provide an overview of the key environmental factors which in the past would have influenced Aboriginal use and occupation of the landscape within which the study area is situated.

3.1.1 TOPOGRAPHY AND HYDROLOGY

The study area is positioned within the Southern Illawarra Coastal Plain and is characterised by undulating plains which dominate the region's landscape. The local area includes residential properties interspersed with large tracts of land which have been cleared for pastoral purposes. It is typically characterised by level to gently undulating land associated with riverbeds and banks as well as active floodplains (Hazelton 1992, p.68).

The eastern portion of the study area is placed squarely in the Kiama geological landscape. This erosional landform is characterised by rolling low hills with broad crests, long convex basal slopes and is characterised as an extensively cleared landscape with occasional stands of closed forests (Hazelton 1992, p.52).

The study area itself is dominated by a large central crest landform unit, which is part of an extending ridgeline which runs on a north to south alignment. This central landform is surrounded on either side by waning slopes which are situated above elevated terraces associated with two first order tributaries of the Crooked River. These tributaries run north to south on the eastern and western foot slopes. An outline of these landforms can be seen in Figure 3.1.

The study area is located within the Shoalhaven River catchment. The Crooked River, a 4th order creek, lies approximately 1.6 kilometres south-west of the study area (Figure 3.2). The river flows south-east from its source, Curry Mountain, into a coastal lagoon at Gerroa. According to the Blue Angle Creek Flood Study, the Crooked River is steep near the mountain source and is largely shallow throughout its main branch with its levels controlled by ocean tides (Evans and Peck Pty Ltd et al. 2005). In the past 100 years, flood levels rose between 25-30 m^3/s AHD. However, this estimate has at least tripled in recent years due to the intensive uses of the land particularly upstream (Evans and Peck Pty Ltd et al. 2005).

The elevated terrace within the study area and their proximity to gentle slopes and minor creeks would have made these landforms an ideal location for Aboriginal people to camp. The wider Shoalhaven landscape would have provided past Aboriginal groups with a rich resource base in addition to providing travelling corridors through the landscape (Attenbrow 2010). A small number of ethno-historical accounts describe the Crooked River Estuary at Gerroa as a focus of such occupation. An account written in 1893 during the extension of the railway line to Gerringong, for instance, notes the presence of Aboriginal people boating and fishing on the Crooked River (Bayley 1975, p.142). This unofficial encampment would have been in use between the 1830's to the beginning of the 20th century, although it is acknowledges that use of the resources of the Crooked River and its associated traditional activities would have continued until the present day (Navin Officer 2010, p.41).

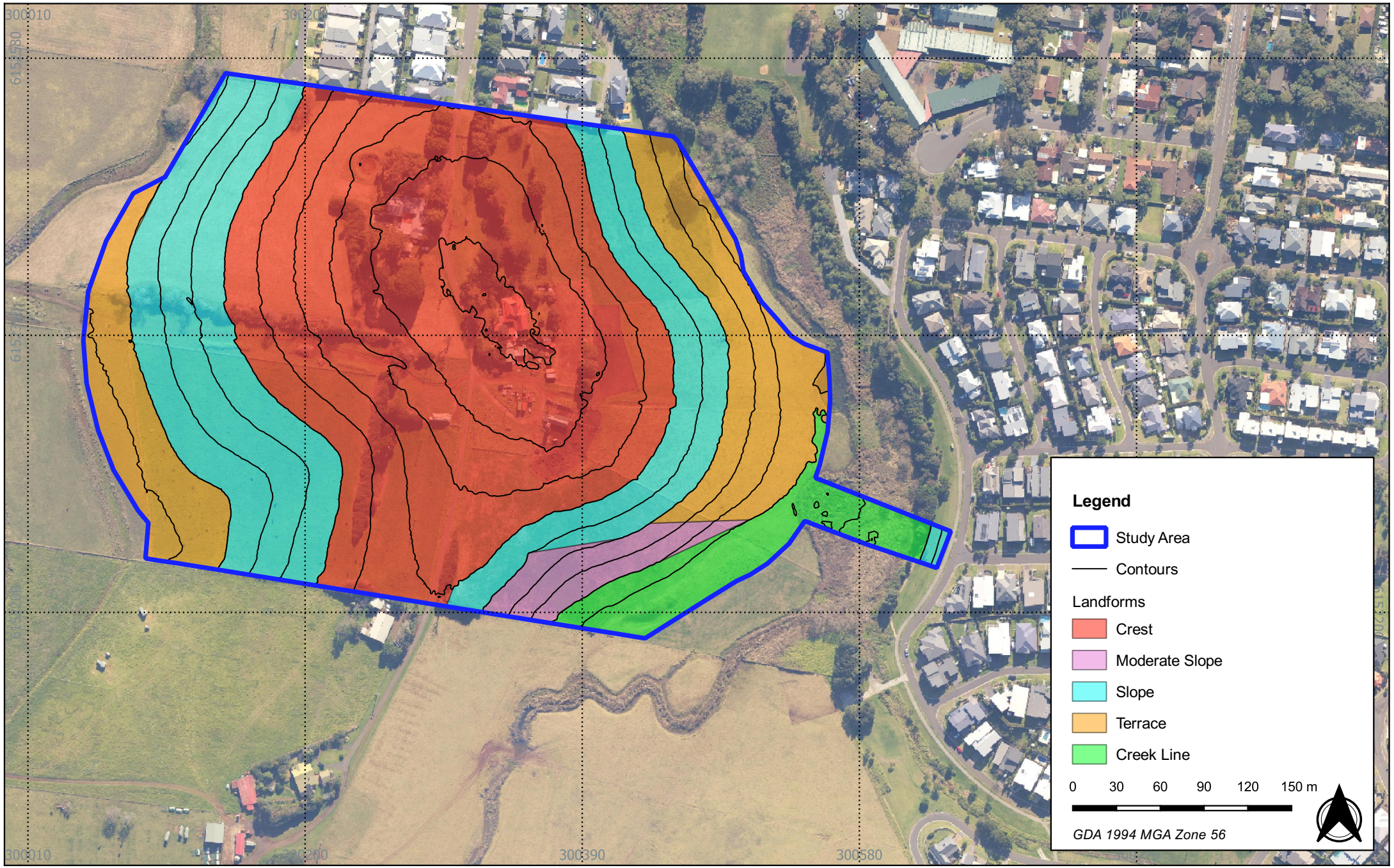

Figure 3.1 Landform units identified within the study area

21106 - 48 Campbell Street, Gerringong, NSW - ACHA

Source: NSW LPI Aerial

Drawn by: ARH Date: 2021-10-15

AUSTRAL ARCHAEOLOGY

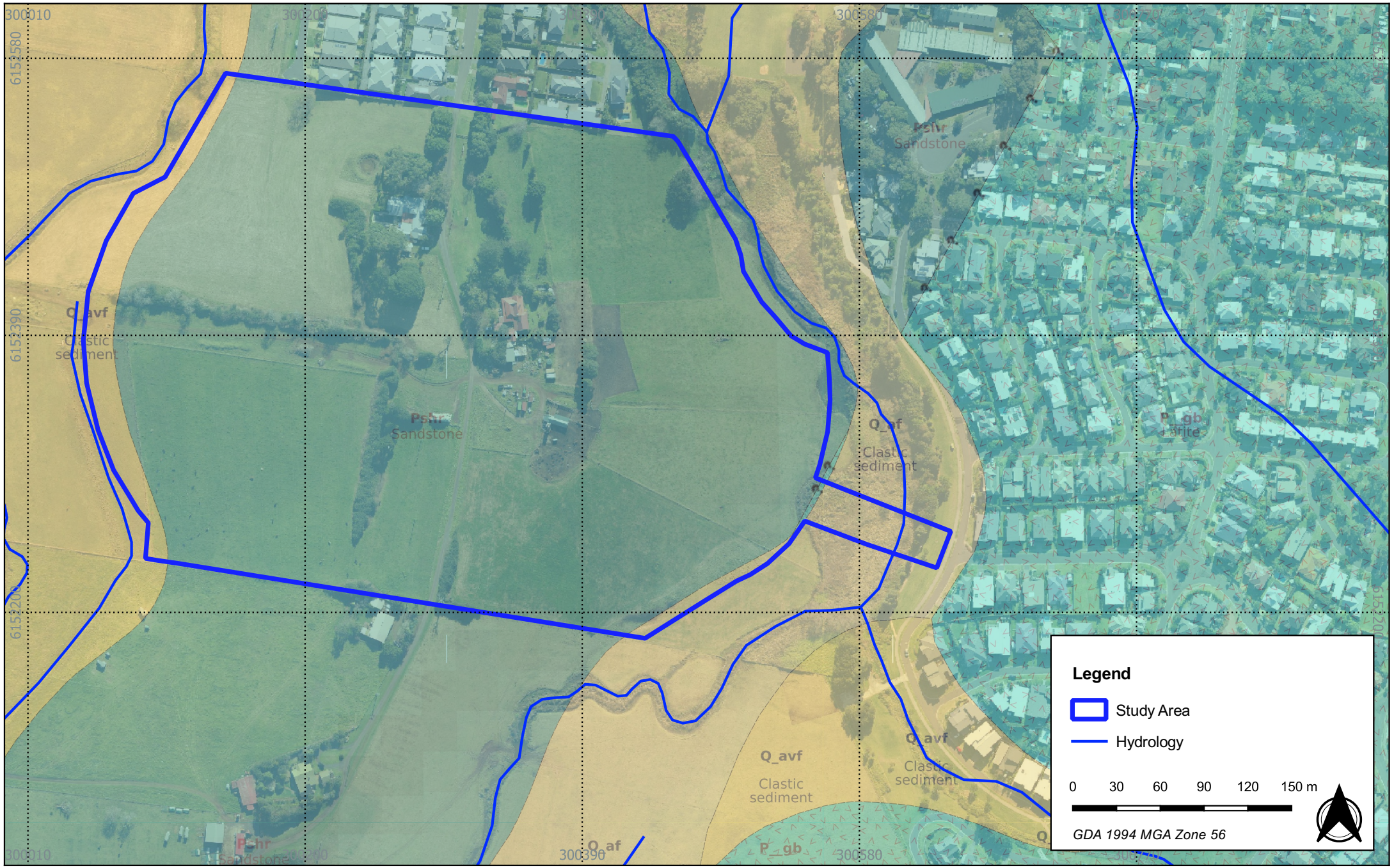

Figure 3.2 Geology and hydrology of the study area

21106 - 48 Campbell Street, Gerringong, NSW - ACHA

Source: NSW LPI Aerial, NSW Seamless Geology *Drawn by: ARH Date: 2021-10-15*

AUSTRAL ARCHAEOLOGY

3.1.2 GEOLOGY AND SOILS

The underlying geology of the study area is comprised of the Kiama and Shoalhaven Groups. The Kiama Group consists of the Blow Hole Latite Membrane; a mid-grey, latite trachyte tuff with pebbly bands of sandstone, siltstone and a conglomerate layer which is part of the Gerringong volcanics. This volcanic bedrock is a Permian deposit which can be up to 50 metres thick, and is responsible for the basal slope formations of the area (Hazelton 1992, p.52). The Shoalhaven Group is an alluvium layer derived from sandstone and shale overlying buried estuarine sediments. The alluvium is made up of gravel, sand, silt and clay and the subsoil is predominantly made of clay (Hazelton 1992, p.68). Based on these underlying geologies, a range of raw material types suitable for the manufacture of stone artefacts would have been available within the region including tuff, siltstone and volcanic materials. An outline of the geological units found in the study area can be seen in Figure 3.2.

The study area is located within the Kiama and Shoalhaven soil landscape types. The Shoalhaven soil landscape is present within the western portion of the study area and is characterised by moderately deep (between 0.5 and 1 metre) sediment profiles. It consists of Prairie soils which occur on levees, Red Earths and Yellow and Red Podzolic soils which occur on the terraces and alluvial soils and Gleyed Podzolic (potential Acid Sulphate) soils which occur on the floodplains. The Shoalhaven landscape is associated with level to undulating floodplains with less than 5 metres relief and 3% slope (Hazelton 1992, pp.68–69).

The Kiama soil landscape is present within the eastern half of the study area and is characterised by sediment profiles of greater than 1.5 metres in association with crests and upper slopes as well as prairie soils on the lower slopes. This soil landscape has a relief of between 40 to 60 metres and a slope of less than 20%. Crests are broad with long moderately inclined concave footslopes (Hazelton 1992, pp.52–53).

The two soil landscapes within the study area are therefore quite deep (i.e. between 1 to >1.5 metres). Deeper sediment profiles associated with these soil landscapes typically occur in low lying areas such as valleys and were formed anywhere between 20,000 to 30,000 years ago, while the more elevated terraces were most likely deposited around 29,000 years ago (Walker 1962). An increase in soil accumulation in these areas, caused by run-off and erosion following historical land clearing activities, however, could potentially obscure archaeological material within these older deposits (Navin Officer 2010, p.27).

Aboriginal archaeological site types that have been identified in association with these soil landscapes include artefact scatters, isolated finds and PADs typically found in association with basal slope landforms. Additional archaeologically sensitive landforms that occur within the region include watershed ridges, higher spurs and valley floor basins.

The soil landscapes identified within the study area are identified in Figure 3.3 and Table 3.1.

Table 3.1 Soil landscapes identified as being within study area

Soil landscape	Description
Kiama	**Ka1:** friable, brownish black, sandy clay loam topsoil with 10-20% subrounded, pebble inclusions and a pH of 4.5 to 6. **Ka2:** brown, weakly pedal, light clay, with no inclusions and a pH of 4.5. **Ka3:** dark red, weakly pedal, heavy clay with 2-10%, angular pebble inclusions and a pH of 4.5 to 5.5. **Ka4:** bright yellowish brown, moderately pedal, light medium clay, with no inclusions and a pH of 5 to 5.5.
Shoalhaven	**Sf1:** hard setting, brownish, black fine sandy loam topsoil, with no inclusions and a pH of 4. **Sf2:** brown, weakly pedal, light sandy clay loam with no inclusions and a pH of 4.5 to 5.5. **Sf3:** dull yellowish brown, massive sandy clay, with no inclusions and a pH of 5. **Sf4:** dull reddish brown, moderately pedal, light medium clay with no inclusions and a pH of 4.5 to 5.

Figure 3.3 Soils landscape of the study area

21106 - 48 Campbell Street, Gerringong, NSW - ACHA

Source: NSW LPI Aerial, NSW Soils Landscapes *Drawn by: ARH Date: 2021-10-15*

AUSTRAL ARCHAEOLOGY

3.1.3 CLIMATE AND VEGETATION

The study area falls within a warm temperate climate zone. Based on data from the Bureau of Meteorology, Gerringong receives an average annual rainfall of 1,264.8 millimetres, with July and December receiving the lowest averages at 2 millimetres, and the month of February receiving the highest average of rain at 408.6 millimetres. The mean annual temperature for Gerringong is 21.4°C, with the months of July experiencing the coldest temperatures at 16.2°C and the month of January experiencing 27°C at the highest (Bureau of Meteorology n.d.). These climactic conditions, result in a warm and temperate climate, suitable for prolonged occupation and the growth of a wide range of resources.

Land clearing activities have largely removed native vegetation that was present historically in the Gerringong region. Hazelton (1992), however, does outline the natural contents of the forests which preceded land clearing activities. The following species are listed: lillypilly (*Acmena smithii*), native quince (*Alectryon subcinereus*), brush bloodwood (*Baloghia lucida*), red-fruited olive plum (*Cassine australis*), brittlewood (*Claoxylon australe*), hairy clerodendrum (*Clerodendrum tomentosum*), murrogun (*Cryptocarya microneura*), giant stinging tree (*Dendrocnide excelsa*), black plum (*Diospyros australis*), sassafras (*Doryphora sassafras*), corkwood (*Duboisia myoporoides*), koda (*Ehretia acuminata*), bolwarra (*Eupomatia laurina*) (*Gerroaonly*), Moreton Bay fig(*Ficus macrophylla*), deciduous fig (*Ficus superba*), cabbage tree palm (*Livistona australis*), northern boobialla (*Myoporum acuminatum*), large mock olive (Notelaea longifolia), snow-wood (*Parachidendron pruinosum*), pittosporum (*Pittosporum spp.*), black apple (*Planchonella australis*), plum pine (*Polocarpus elatus*), yellowwood (*Sarcomelicope simplicifolia*),flintwood (*Scolopia braunii*), wilkiea (*Wilkiea huegeliana*), whalebone tree (*Streblus brunonianus*), bastard rosewood (*Synoum glandulosum*),buff hazelwood (*Symplocos thwaitesii*), scrub beefwood (*Stenocarpus salignus*), olivers sassafras (*Cinnamomum oliveri*), coast canthium (*Canthium coprosmoides*), bird lime tree (*Pisonia umbellifera*) (Hazelton 1992, p.52).

While completing the fieldwork in the study area, the climate was observed as highly variable: heavy rainfall was often followed by sunny days. Tall grasses grew in abundance across the cleared areas, with very tall reeds found in a swampy section on the eastern side of the study area. Pooling of water was evident after rainy days, especially at the base of the slopes on flatter ground. Neil Campbell, the owner of the property and long-time farmer, commented on the richness of the soil and the ease with which most plant species grew (Neil Campbell, pers. comm.).

3.1.4 LANDSCAPE RESOURCES

Prior to the removal of the natural vegetation, the ecological diversity of the area would have provided a wide range of resources for Aboriginal people. The soft, spongy bark of the Illawarra flame tree was used to make nets and fishing lines, sap from the red bloodwood trees were utilised to tan fishing nets and stain artefacts. Swamp oak bark provided material for canoe making and bark from the paperbark tree was used for bedding and blankets (Department of Environment and Conservation 2005). Many of the vegetation species found within the vicinity of the study area were crucial for Aboriginal people and were used for numerous purposes as well providing habitat for faunal resources (Attenbrow 2003).

The study area and its surrounds would have provided habitats for mammals including kangaroos, brush-tail possums, sugar gliders and common wombats, and the rivers and creeks nearby would provide access to additional faunal resources such as fish species, a range of water birds and a variety of lizards. These resources would have provided food for Aboriginal people travelling between the coastline and further inland along Shoalhaven River and its tributaries (Attenbrow 2003).

As well as being important food sources, animal products were also utilised for tool making and the production of ceremonial items. Examples include ‘bone points’, which would have functioned as awls or piercers, and tail sinews, which were used to make fastening cords. Animals such as brush-tailed possums were highly prized for their fur, used to make possum-skin cloaks (Attenbrow 2003).

Based on the underlying geologies associated with the study area and surrounding region, a range of raw material types suitable for the manufacture of stone artefacts would have been available within the region including, but not limited to tuff, siltstone and volcanic materials.

3.2 PAST LAND USE PRACTICES

The first European occupation within local region dates to the 1830s when 1,280 acres of land was granted to Alexander Berry in the Cambewarra and Nowra regions. The land associated with Berry's grant was known as 'Cambewarra Farm'. Berry was one of the first European landholders in the region and gave his name to the modern town of Berry, located approximately 13 kilometres west of the study area. Berry's grant formed a small part of his land holdings, which totalled to 57,000 acres (Biosis Pty Ltd 2017, p.17).

Historical and ongoing use of the study area for agricultural purposes, specifically cattle grazing has resulted in variable levels of disturbance across the study area. Activities associated with farming practices, such as the construction of vehicle tracks, fencing and associated infrastructure have resulted in modifications to the landscape and disturbance of the ground surface. Furthermore, the study area has been extensively cleared of vegetation relating to its use for farming and agriculture. Historical aerial imagery dating to 1970 and 1993 demonstrate that the study area and surrounding region had been extensively cleared by these dates (Figure 3.4 and Figure 3.5). The historical clearing of vegetation has likely resulted in an increase in erosion along the slopes and creek banks associated with the study area.

The main impacts within the study area, as summarised in Table 3.2 below, therefore, relate to past agricultural practices, extensive land clearance, animal grazing, construction of fences and the construction of dwellings and associated building/sheds within the property. These activities would have contributed to the removal of the original native vegetation and disturbance of soil profile within the study area. As such, much of the study area is considered as being associated with high levels of disturbance. Previous agricultural activities and land clearance of the study area, for instance, would have resulted in topsoil movement and/or potential loss of topsoil, which likely would have resulted in displacement of archaeological objects in such contexts.

Table 3.2 Summary of past land uses within the study area, and the potential impacts on archaeological resources

Past Land Uses	Potential Impacts on Archaeological Resources
Historical land clearance	Loss of native trees, shrubs and grasses and livestock grazing would lead to the potential loss of scarred trees, increased erosion and potential dispersal or disturbance of surface and subsurface artefacts across the predominantly sloping terrain of the study area.
Agriculture	Ploughing and harrowing as well as livestock movement and grazing would have exacerbated topsoil disturbance and erosion across the sloping terrain over much of the study area
Construction of dwellings/ buildings and associated infrastructure	Moderate to high levels of earth disturbance leading to the potential disturbance and dispersal of artefacts from their stratigraphic context.

Figure 3.4 **1970 Historical aerial of the local region showing the approximate location of the study area**

Figure 3.5 **1993 Historical aerial of the local region showing the approximate location of the study area**

4 ARCHAEOLOGICAL CONTEXT

The environmental context of the Southern Illawarra Coastal Plains region had a profound influence on the lives of the Aboriginal people who lived there. As hunters and gatherers, Aboriginal people were reliant on their surroundings to provide food. Their transitory lifestyle affected population size, social interactions and degree of mobility, which can be confirmed in the archaeological record.

The pre-European social context of the Illawarra region is one of small bands of Aboriginal people living a mobile hunting and gathering lifestyle. Bands frequently alternated amongst various groups, in a local model of group organisation referred to as “fusion and fission”. Groups of the Illawarra would band together for specific activities of a social nature, and then disband for different periods of time. Bands could have at their core, close family members who would often stick together through this process. Leadership of these bands was assigned to the most experienced elder of the group, most often a male member. Given this model, the boundary between local bands was flexible in nature, allowing for greater movement across the landscape. (Navin Officer 2010, p.30).

The social structure of pre-European groups was stratified with elders of clans holding decision-making capabilities. Subsistence activities were sexually dimorphic, and the spirituality of groups is detailed and explained through an oral tradition of Dreamtime. Material culture was sourced from a variety of materials such as bark, resin, shell, bone, and reeds. The hard stone material that was made into stone tools is the main element of this tool kit to remain in the archaeological record as the organic element has mainly decomposed.

The pre-European environment of the Illawarra region provided an extensive resource base associated with a multitude of water sources. These water sources include lakes (Lake Illawarra) and freshwater creeks (including the Crooked River). Habitats associated with these water systems supported a wide range of fish, birds, reptiles, and mammals. The pre-European Gerringong landscape would have been the setting for a variety of human activities. This human activity would have included camping, hunting, gathering, cooking, ceremonies, and other cultural activities associated with semi-permanent settlement sites in the region.

4.1 POPULATION AND CONTACT HISTORY

The Wodi Wodi people were the traditional owners of the area around Gerringong who spoke Dharawal. Population estimations at the time of contact are notoriously problematic as Aboriginal groups avoided the early settlers and were highly mobile. Another factor that complicates an accurate estimation is the effect of European diseases such as influenza and smallpox, which decimated Aboriginal populations soon after contact, and sometimes prior to initial contact in each region, with pathogens travelling via affected Aboriginal people in front of the first European incursions. However, records indicate that 11 people lived in an encampment on the Crooked River in 1834 and several others on the southern end of Werri Beach. These groups were members of the Gerringong Tribe, which resided mainly at Black Head. In 1836, the Gerringong Tribe was recorded as including 14 people, with this number having grown to 21 in 1837 (Navin Officer 2010, p.41).

Neighbouring Aboriginal groups to the Wodi Wodi include the Gundungurra, Darug, Dhurga, Awabakal and Wiradjuri people, and movement in neighbouring territories was permissible under certain circumstances. Favoured north to south travel routes included the current Princes Highway Route, Meryla Pass, and the Kangaroo River Route, while Bulli Pass, the Bong Route and the Cordeaux River were used for travel east to west (DEC 2005a:8). A close connection existed between the Illawarra Dharawal speakers and the Gameygal (Botany Bay) Dharawal speakers who traded together, shared ceremonies and intermarried (DEC 2005a:27). During the 1800s, Aboriginal people, including Illawarra Dharawal speakers, were known to have moved from the Tablelands down to Lake Illawarra, for both food gathering and inter-tribal activities (Organ & Doyle 1994:3-5; Sefton 1981:15).

The name “Illawarra” is derived from the Elouara word meaning high place near the sea. The region was probably one of the most densely populated parts of Australia with between 2 to 4 people present per square kilometre (Organ & Speechley 1997:1). After land grants were issued to settlers in the Illawarra from 1816, Aboriginal food supplies were compromised and land use was altered

through the introduction of European livestock, exotic plants and crops, tree-felling, hunting, the fencing off of lands and the enforcement of European rules about "trespassing" (Organ & Speechley 1997:11). All land grants fronted onto freshwater which would have had a detrimental impact on traditional Aboriginal land use (DEC 2005b:15). There is no record of large-scale armed resistance from the Aboriginal people of the Illawarra against the European settlers, but small-scale resistance including homicide, intimidation and the sabotage of European farms took place to drive off the Europeans. Further thefts occurred in attempts to obtain food once traditional hunting and plant collecting practices had been disrupted by farming (DEC 2005b:18).

The earliest recorded interaction between Europeans and Aboriginal people of the Shoalhaven occurred between local inhabitants and survivors of the "Sydney Cove" shipwreck of 1797. They had ventured from Gippsland, some 657 kilometres south of Gerringong. However, before being escorted to Port Jackson, the more exhausted survivors are thought to have perished at the hands of hostile local Aboriginal groups (Maunsell Australia & Navin Officer 2007, p.8).

The discovery of the region's rich supply of soft woods, specifically cedar trees, encouraged the official and illegal settlement of the Illawarra. The Shoalhaven River, approximately 18 kilometres south of Gerringong, was first sighted in 1797 by George Bass during his early navigations around the south-eastern coast of NSW. Exploration of the region followed shortly, in 1805 when government Surveyor James Meehan sailed the mouth of the Crookhaven and surveyed the Shoalhaven Valley (Peter Freeman Pty Ltd & JRC Planning Services 2003, p.17). During his travels, he noted the region's rich soft wood resource, which started the cedar getter period (Maunsell Australia & Navin Officer 2007, p.8). The first official shipment of cedar left Kiama harbour in 1811. By 1826, Kiama was supplying nine tenths of Sydney's cedar demand. The resource was in great demand, as it was essential for the furnishing of the colony (e.g. the building of door frames, doors, and buildings). The rich supply of cedar stretched from Jamberro Mountain to the coast. Gerringong's harbour began to play an increasingly important role in this economy as the business grew. By 1842, Kiama was the largest supplier of red cedar in all of Australia (Graham Mackie 2014, p.25).

During this time, early descriptions of Aboriginal people living in Kiama depict a picture of untamed bushland frequented by similarly untamed people. William Burliss, an early settler of Kiama writes in 1840:

> "*It would appear that then dense scrub which existed between Kiama and Gerringong was a great resort to them, having all the natural facilities of a romantic and hunting character."* (Organ 1993, p.268).

Continued expansion of European cedar cutters into the Shoalhaven, and increased settlement on the coast, resulted in pressures felt by the Aboriginal communities of the area. Occupation of the Illawarra by Aboriginal groups continued for the next two decades following the start of the Cedar getter period. Despite European appropriation of the land, some Aboriginal groups helped colonists explore the Illawarra to find good grazing or agricultural land (Peter Freeman Pty Ltd & JRC Planning Services 2003, p.16). Hostilities around the Shoalhaven River were not recorded more precisely at this time. However, the extent of the violence can be further hinted through a statement by Governor Macquarie in 1814, following growing unrest and similar reports as previously described. He states in a public notice:

> "*There being no reason to believe that the indulgence which has occasionally been granted to Masters and Owners of Vessels to resort to and bring Timber from Shoalhaven is subject to considerable abuse. Notice is hereby given that no permission to resort thither will be granted in future; and all persons are hereby prohibited from cutting down or removing timber from Shoalhaven after the present date on pain of prosecution…" (Sydney Gazette, 3 December 1814).*

Passing indications of push back by Aboriginal communities are found in early ethnohistorical accounts. As the Shoalhaven remained mostly unmonitored for most of its early settlement. Accounts such as those kept by Lieutenant William Breton during his southward's expeditions in 1834, which describe how three "natives persuaded a convict servant to accompany them in search of cedar…". The tail ends with the convict pushed over a cliff and his tongue removed (Breton

1835). Furthermore, in 1815, three cedar cutters were also found to have been murdered by Aboriginal people shortly after arriving in the Shoalhaven (Maunsell Australia & Navin Officer 2007, p.8).

Depictions of this period are painted by Mickey of Ulladulla, an Aboriginal artist who was a member of the Dharug Group. He lived between 1825 and 1891, his drawings use European tools such as pen and paper, to depict the traditional lifestyle of Aboriginal peoples in the Shoalhaven during his time (Peter Freeman Pty Ltd & JRC Planning Services 2003, p.16). Figure 4.1 showcases one of Mickey's pieces which illustrates kangaroos, an Echidna, Eucalyptus and a gathering of the Dharug groups among other things which made-up this local Aboriginal artist's life. The combination of traditional style drawings with the use of colonial instruments showcases the important cultural assimilation which was occurring during Mickey of Ulladulla's lifetime.

Figure 4.1 "Corroboree with Na" by Mickey of Ulladulla, painted in ca. 1885

The name Gerringong has had many translations in the past. The earliest being in 1899 when an Aboriginal man from the Shoalhaven named Buthring, wrote that "Oorajang" was the name of the Crooked River (Organ 1993, p.468). In Notebook 9 of Francis McCaffrey, a local Illawarra historian writing in the 1890's, Gerringong is translated as "the porpoise" as well as " A very fast walker" (Organ 1993, pp.477, 485). A more recent interpretation suggests the meaning is "fearful noises near beach". Despite these varying translations, Gerringong remains an important and frequented place for past and present Aboriginal people. Its ancient character requires further material descriptors to fully assess its significance.

Consultation with local Aboriginal representative Dick Henry, undertaken in during an archaeological survey at the mouth of the Crooked River in 1988, indicated that

> *"…the area is especially significant because Aborigines from the surrounding area are known to have congregated near the mouth of the Crooked River soon after European contact, when they were denied access to their traditional lands in the area around Berry."* (Colley 1988).

4.2 PREVIOUS ARCHAEOLOGICAL WORK

The material evidence of Aboriginal land-use has been compiled based upon a review of previous archaeological studies at a regional and local level, heritage database searches and field investigations.

4.2.1 REGIONAL ARCHAEOLOGICAL CONTEXT

Aboriginal occupation of the Illawarra region is currently known to extend back to at least the Pleistocene, with occupation at Bass Point, located approximately 18 kilometres south-east of the study area being dated to 18,000 years (Sefton 1980). Further afield, the Burrill Lake Shelter, located approximately 130 kilometres to the south of the study area has been dated to 20,000 years (AMBS Consulting 2006a, p.87).

Whilst most academic studies in the region have focused on coastal and sandstone formations, the Illawarra Coastal Plain has been subject to several regional assessments that have sought to combine the results of small consultancy-based assessments and additional research into regional level assessments of the known archaeological resource and estimated archaeological potential for the Illawarra Region. The major source of literature on the archaeological context of Gerringong lies in the investigations relating to the Illawarra Coastal Plains and the more recent Gerringong to Bomaderry Princes Highway Upgrade. A selection of regional studies of relevance to the study area are summarised below.

ABORIGINAL CULTURAL RESOURCES STUDY OF THE ILLAWARRA REGION

Sefton (1980) undertook an Aboriginal Cultural Resources Study of the Illawarra Region and identified the following categories of Aboriginal sites as being present within the region: archaeological deposits in caves, rock shelters and overhangs; midden deposits; open campsites; axe grinding grooves; water channels; scarred trees relating to the manufacture of canoe; shield or containers; quarries; burials; paintings; rock engravings; carved trees; ceremonial grounds; stone arrangements; and, natural sacred sites (Sefton 1980, pp.21–27).

Sefton (1980, pp.29–31) associated Aboriginal sites with the following environmental features:

- The zone from the coast to the upper reaches of estuaries was identified as having potential for middens, archaeological deposits, surface campsites and burials.
- Flat surfaces and overhangs where Hawkesbury sandstone and Shoalhaven group sandstone and conglomerates outcrop and/or overlay softer siltstones and shales were identified as having potential for engravings (on Hawkesbury sandstone), axe grinding grooves, water channels, shelters with archaeological deposit, art sites, surface campsites and stone arrangements.
- Alluvial plains and the well-drained hill slopes alongside them had potential for scarred trees, open sites, shelter sites and shelters with art.
- Areas of stone outcrops or exposures suitable for use in making stone tools may contain quarries and other archaeological sites.
- Prominent natural features of the landscape such as high mountain peaks, rock outcrops and lakes may also be culturally significant as natural sacred sites; such areas may not necessarily have associated archaeological deposit.

Sefton's initial model formed the basis for the later regional models formulated by others working in the region such as Mary Dallas Consulting Archaeologists (1995), AMBS (2006b, 2006a) and GML Heritage (2016).

GERRINGONG TO BOMADERRY PRINCES HIGHWAY UPGRADE

A predictive model for the region was developed during a preliminary survey undertaken as part of the Gerringong to Bomaderry Princes Highway Upgrade. This model was based on the results of previous studies completed in the development footprint as well as the broader region (Corkhill 1986, Donlan 1991, Kuskie & Navin Officer 1995, ERM Mitchell McCottery 1998, Paton 1992, Navin Officer 2000, Jo McDonald Cultural Heritage Management 1999, Navin Officer 2006). Based on a review of previous studies, it was determined that sub-surface testing programs within the Illawarra Coastal plains, in the Gerringong to Bomaderry region, have largely focussed on

investigating rock shelters or coastal sand dunes with less exploration of the sub-surface archaeological nature of other landform types.

According to the predictive model developed for this project, Aboriginal archaeological sites were considered likely to occur in varying densities and over a broad topographic range of landforms within the Illawarra Coastal Plains. Sites with longer-term occupational use or where food preparation and resource manufacture was undertaken were considered to likely result in higher densities of archaeological material at such sites. The likelihood of such sites occurring was considered dependent on certain topographic elements associated with a location, with the following predictions made:

- Preferred locations will be characterised by relatively level ground or areas with a low slope gradient (such as low-gradient basal slopes adjacent to the valley floor), lower valley elevation, terminal sections of major spurs and ridgelines, level ground on crests, spurs and ridgelines, foothills of alluvial terraces and sand dunes.
- Well drained and locally elevated landforms, such as elevated banks and margins of wetlands, rivers and creeks and low gradient crests and basal slopes within the coastal Plains represent additional landforms that were likely favoured for occupation due to their well-drained and elevated nature.
- Ridges and spurlines may contain sites associated with their use as travelling corridors, linking people to the resources of the coast, coastal plains and the Escarpment. Artefact densities are expected to be clustered more densely in association with large and more prominent ridgelines, as well as those closer to freshwater resources.
- Crests in association with saddles may have provided a good vantage point and/or additional travelling corridors between steeper hills and may therefore additionally provide evidence transitory use.
- Sheltered landforms protected from harsh environmental conditions were likely favoured.
- Sites are more likely to occur in proximity to a permanent freshwater resource.
- Sites are more likely to occur in locations bordering several ecotones, where a range of resources could have been accessed.
- Older sites will likely be in the form of stone artefacts and middens sites. Such sites are likely to occur in remnant or aggrading dunes, fossil beach ridges and shoreline features, alluvial terraces and fans, colluvial slope deposits as well as source bordering zones. These deposits can date anywhere between 6,000 and 5,000 years ago.
- While meadows and pastoral fields are often overlooked as areas of potential due to their intermittent or permanent flooding, ethnographic accounts by Dicky Woods indicate that such areas may preserve evidence relating to tribal battles and burials (Navin Officer 2010, p.54).

Based on the results of the subsurface testing program completed at several Potential Archaeological Deposits (PADs) for the project, the following predictions were added to the predictive model (Navin Officer 2010):

- Valley floor contexts with alluvium soils in proximity to lower order streams are likely to be associated with low density archaeological material.
- Well drained, elevated and/or low gradient landforms located in the valley floor alluvium soils as well as in proximity to a known or predicted wetland basin, are considered as being of high archaeological potential.
- Riparian corridors associated with higher order streams are considered as being of high archaeological potential.
- Ridges and spurline crests and adjacent slopes may contain evidence relating to their transitional use as potential travel routes (Navin Officer 2010, p.44).

PRINCES HIGHWAY UPGRADE FOXGROUND

Following the results of the Gerringong Upgrade testing program, a revised and more refined predictive model was developed for the proposed Princes Highway upgrades between Toolijoa Road, north of Foxground and Schofields Lane, south of Berry NSW.. This model found that the most effective method for identifying and assessing the archaeological resource of the Illawarra Coastal Plains was to use a combination of archaeological testing and the continuous development of predictive modelling. The following conclusions were reached based on the results of this study:

- The relatively sparse number of recorded Aboriginal sites in the Illawarra Coastal Plains is a result of the overall low ground surface visibility within the region rather than the lack of Aboriginal activity.
- Spurs, crest ridgelines, spurlines and other elevated landforms found within 200 meters of wetland basins are more likely to contain archaeological material. Such basins would include the Omega Flat basin which has well defined boundaries, with clear elevated margins in certain areas.
- Based on ethnographic evidence gathered, meadows may have occupied valley floors with no prior estuarine origin, or sensitivity to flooding. These areas, hold high scientific research potential. Investigations into these areas would greatly increase the Aboriginal archaeological literature of the area (Navin Officer 2012, p.54).
- Alluvial flats are considered to hold low archaeological potential. Sites found in this landform tend to be low-density scatters most likely explained by cold air drainage, dense vegetation cover and poorly drained ground, which made these areas less suitable for occupation.
- Valley floors, found on alluvium and located at greater distances from higher order riparian zones are unlikely to hold dense and rich archaeological deposits.
- Although riparian corridors associated with higher order streams were previously predicted to have high archaeological sensitivity, the results of the Gerringong Upgrade testing program did not support this statement. The archaeological potential of such areas must be determined on a case-by-case basis involving physical assessment (Navin Officer 2012, p.55).
- Most sites have been found near ecotones, where greater access to varied resources was possible (Navin Officer 2012, p.56).
- Artefact sites (including isolated artefacts or artefact scatters of varying densities) are the most likely site type within the region.
- The average artefact density of sites investigated as part of the Princes Highway Upgrade in the Illawarra Coastal Plains ranges from 2.5 to 10 artefacts per square metre with artefacts typically found at a depth of 400 millimetres. These sites are more likely present within landforms which have relatively level and elevated ground and close to freshwater and/or resource zones (Navin Officer 2012, p.57).

Table 4.1 outlines micro-topographic variables found to hold higher archaeological sensitivity and the landforms associated with these variables based on the results of this assessment.

Table 4.1 Summary of the micro-topographic traits with high archaeological potential (Navin Officer 2012, p.56)

Micro-topographic traits	Associated landform types
Low gradient slope, relatively level ground in proximity to a higher order stream (third order or above)	Low gradient basal slopes adjacent to the valley floor as well as the terminal section of a major spurs and ridgeline where they join or cross the valley floor.
Sheltered context.	Large mature fig trees.
Lack of surface rock exposure and gravel.	Banks of rivers and creeks.
Short distance to a freshwater source.	Foothill of alluvial terraces.

Micro-topographic traits	Associated landform types
Short distance from a resource area.	Elevated sand bodies outside of coastal barriers, dune systems, beach ridges, flats, infilled estuaries and source bordering zones.
Locally elevated area with well-draining surface.	Low gradient or level crests of spurs and ridgelines.

A limitation of this model is of course the restrictions of the area surveyed and tested. Only a sample of the landforms representative of the Illawarra Coastal Plains were assessed as part of the previous investigations into the Princes Highway upgrade (Navin Officer 2012, p.54).

4.2.2 HERITAGE DATABASE SEARCH

A search of the Heritage NSW Aboriginal Heritage Information Management System (AHIMS) database was undertaken on 6 September 2021 (Client Service ID 619998). A copy of the extensive search results is provided in Appendix C.

The results from the AHIMS search identified 62 previously recorded sites within a radius of approximately 5-kilometres, centred on the study area. Review of the AHIMS search results indicates that 3 of these sites are duplicates. An outline of these duplicates is found in Table 4.2. The search indicates that artefacts are the predominant site type with over 30% of known sites belonging to this category (Table 4.3 and Figure 4.2).

Table 4.2 Duplicate search results

Original (Site name / AHIMS #)	Duplicate (Site name / AHIMS #)
Elambra Isolated Find 1 / 52-5-0404	Elambra IF 1 / 52-5-0418
East Gerringong 1 (EG1) / 52-5-0416	East Gerringong 1 / 52-5-0411
Black Head; Gerringong; / 52-5-0132	Black Head; Gerringong; / 52-5-0101

Table 4.3 Summary of sites recorded within 5-kilometres of the study area

Site Type	Total	Percentage of total sites
Artefact	20	32.25%
PAD	17	27.41%
Artefact and shell	12	19.35%
Artefact and PAD	9	14.51%
Shell	2	3.22%
Burial	1	1.61%
Modified Tree	1	1.61%
Total	**62**	**100%**

A review of the AHIMS listings indicates that 2 isolated artefacts are found 400 metres from the study area. These are Elambra Isolated Find 1 (AHIMS #52-5-0404), located approximately 115 metres from the south-east corner of the study area, and Elambra Isolated Find 2 (AHIMS #52-5-0405) located approximately 360 metres from the south-west corner of the study area. Details of these two sites are provided in Table 4.4.

Within the wider search region, several clusters of Aboriginal cultural heritage sites are present in association costal context such as Werri Beach, Walker's Beach and Seven Mile Beach. A large proportion of the sites identified in the AHIMS search are associated with the Princes Highway with this cluster of sites being a result of the intensive archaeological investigations that have occurred in this area. There is a notable paucity of sites recorded to be present within the coastal plains portion of the search region between the coast and the Princes Highway (Figure 4.2). This is most likely the result of an archaeological bias, where a lack of development in this area has resulted in the lack of assessments and thus identification of sites in this area.

Table 4.4 Summary of sites recorded adjacent to the study area

Name	AHIMS No.	Type	Location
Elambra Isolated Find 1	52-5-0404	Artefact	Eroded edge of a dam
Elambra Isolated Find 2	52-5-0405	Artefact	Exposed animal track

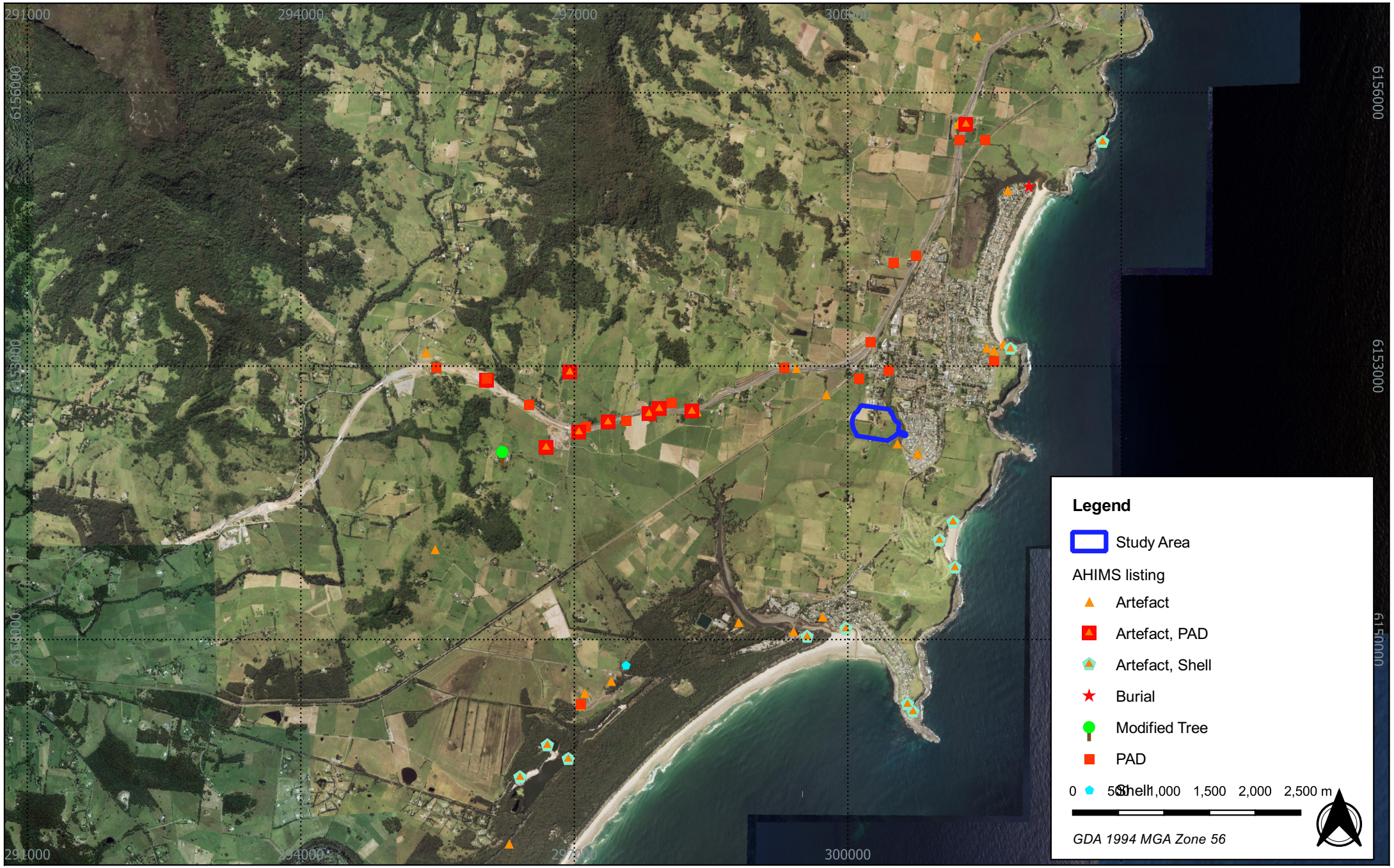

Figure 4.2 - AHIMS sites within 5 km of the study area

21106 - 48 Campbell Street, Gerringong, NSW - ACHA

Source: NSW LPI Aerial

Drawn by: ARH Date: 2021-10-18

AUSTRAL ARCHAEOLOGY

4.2.3 LOCAL ARCHAEOLOGICAL CONTEXT

Archaeological investigations of the southern Illawarra, and in particular Gerringong, have been conducted in response to the spread of urban development and state significant developments, with the major project being the upgrades to the Princes Highway in this area. The limited ethnographic accounts of early settlers and explorers were once considered the primary source for archaeological enquiry. However, with the recent developments within Gerringong and its environs, archaeological investigations have increased accordingly.

The major studies which have contributed to our understanding of the Illawarra Coastal Plains, and those with direct relevance to the study area, are outlined in Table 4.5. These reports have been selected based on their landform context, proximity and in particular, relationship to the Gerringong coastal plains and Crooked River. Reference is made to the main trends garnered from these investigations which serve to provide a broad framework in which to base the current study.

Table 4.5 Summary of past reports within the vicinity of the study area

Author	Date	Title and distance from the current study area	Type of assessment
Colley S.	1988	Archaeological survey for a proposed sand mining quarry. The sand mine is found approximately 3 kilometres south-west from the study area and 889 metres south of the entrance of the Crooked River.	Survey
Lance A.	1989	Archaeological study for a proposed sand mining quarry. The sand mine is found approximately 3 kilometres south-west from the study area and 889 metres south of the entrance of the Crooked River.	Survey and Testing (auger)
Paton R.	1992	Archaeological excavations for a proposed sand mining quarry. The sand mine is found approximately 3 kilometres south-west from the study area and 889 metres south of the entrance of the Crooked River.	Testing
Feary S.	1992	The Werri Beach Skeleton: A report on a burial from the South Coast of New South Wales. The site was found 1.2 kilometres north-east form the study area.	Excavations
Jo McDonald Cultural Heritage Management Pty Ltd (JMCHM)	1999	Aboriginal and European Heritage Assessment: The proposed Gerringong-Gerroa sewerage treatment plant and associated sewage pumping stations and pipeline routes, Gerringong and Gerroa, NSW. A section of the study crosses the central line of the study area.	Testing Excavation
Barber M.	2000	Archaeological re-assessment and survey of an extension to the Cleary Bros Sand Mine. The sand mine is found approximately 3 kilometres south-west from the study area and 889 metres south of the entrance of the Crooked River.	Survey
Navin Officer Heritage Consultants (Navin Heritage)	2000	A survey for Aboriginal archaeological material conducted on the Elambra Estate to assist in Master Plan and Development Control Plan spearheaded by the Kiama Council. The Elambra Estate is adjacent to the study area, 200 metres east.	Pedestrian survey
Barber M.	2002	Archaeological testing of an extension to the Cleary Bros Sand Mine in Gerroa. The sand mine is found approximately 3 kilometres south-west from the study area and 889 metres south of the entrance of the Crooked River.	Testing
Navin Officer	2002	Archaeological assessment of Lots 4 and 6 DP 541889 Belinda Street, East Gerringong, NSW. Studied area is 900 metres north-east from the study area.	Survey

Author	Date	Title and distance from the current study area	Type of assessment
Navin Officer	2004	Gerroa Sand Mine – Salvage of Aboriginal Artefacts. The sand mine is found approximately 3 kilometres south-west from the study area and 889 metres south of the entrance of the Crooked River.	Salvage
Navin Officer	2005	Aboriginal Cultural Heritage Review of a northern extension of the Cleary Bros sand mine. The sand mine is found approximately 3 kilometres south-west from the study area and 889 metres south of the entrance of the Crooked River.	Survey
Navin Officer	2006	Gerroa Sand Mine Extension: Archaeological Subsurface Testing Program. The sand mine is found approximately 3 kilometres south-west from the study area and 889 metres south of the entrance of the Crooked River.	Testing
Navin Officer	2010	Gerringong upgrade Prince Highway – Review of Environmental Factors – Appendix G – Cultural Heritage Assessment. The Princes Highway is 800 metres west of the study area.	Testing
Navin Officer	2010	Princes Highway Gerringong Upgrade: Mount Pleasant to Toolijooa Road – Aboriginal Archaeological Subsurface Testing and Collection Program. The route runs 3 kilometres west of the study area.	Testing
Navin Officer	2011	Princes Highway Gerringong Upgrade: Mount Pleasant to Toolijooa Road: Aboriginal Archaeological Subsurface Testing Program - Addendum Report – PASA31 (Site G2B A12). The Princes Highway is 800 metres west of the study area.	Testing
Navin Officer	2012	Foxground and Berry bypass Princes Highway upgrade – Volume 2 – Appendix J, Technical Paper: Aboriginal Heritage. The route runs 3 kilometres west of the study area.	Survey and Testing
Navin Officer	2012	Princes Highway Gerringong Upgrade: Additional Areas 1-19 and 49: Aboriginal Cultural Heritage Assessment. The Princes Highway is 800 metres west of the study area.	Testing
Biosis Pty Ltd	2019	Gerroa Sand Quarry modification: Archaeological report. The sand mine is found approximately 3 kilometres south-west from the study area and 889 metres south of the entrance of the Crooked River.	Survey

REPORT AND ASSESSMENT REGARDING HUMAN REMAINS IDENTIFIED IN WERRI BEACH (FEARY, 1992)

During the construction of a car park near Werri Beach, human remains were uncovered within a stockpile of sand. NSW Authorities and the Illawarra Local Aboriginal Land Council were notified of the incident and brought to consult on the situation. The remains were located adjacent to, and in a continuation of, the landform of the previously recorded artefact scatter 'Werri Beach Open Camp Site' (AHIMS #52-5-0216) [Feary 1992, p.1]. This site was located on a dune behind a rocky platform forming a part of the Gerringong headland (Dallas 1987).

After this initial discovery, sieving of the entire sand stockpile was undertaken using large machinery to transfer the sand onto the sieves. In total, 30 tonnes of sand was sieved (Feary 1992, p.7). From this excavation several human bone fragments were successfully identified including fragments of the upper jaw, sections of the palate, the mandibles, several of the teeth, 12 cranial fragments, 2 femur fragments, 2 tibia fragments and small pelvic fragments. Several stone artefacts were also recovered but not formally analysed as part of this assessment. Raw materials identified include silcrete, rhyolite and quartz, and artefacts include flakes, flaked pieces and backed blades.

Overall these stone artefacts are characteristics of a local, late Holocene assemblage (Feary 1992, p.8).

The recovered bone fragments indicate that a male in their late 30's was buried during the Late-Holocene at the site. This conclusion is mostly based on the lack of cavities or pipe stem wear on the teeth, as well as the environmental context of the dune which was most likely formed in the last 5,000 years (Feary 1992, p.8). The loss of much of the contextual evidence for this burial has resulted in the lack of further conclusions regarding this site (Feary 1992, p.10).

This report is of relevance to the current study as it contributes to the predictive model for the region.

AN ASSESSMENT OF THE EUROPEAN AND ABORIGINAL HERITAGE RELEVANT TO THE PROPOSED GERRINGONG TO GERROA SEWERAGE TREATMENT PLANT AND PIPELINE ROUTES (JMCHM, 1999)

The assessment was undertaken on a 50-hectare parcel of land located west of Gerroa and adjacent to the Crooked River, situated approximately 2.4 kilometres south of the current study area. The proposed pipeline route was also assessed, a portion of which bisects the current study area, intersecting the central crest landform. The treatment plant is located on a beach ridge associated with Seven Mile Beach and the Crooked River, which has been previously cleared of vegetation. This beach ridge is part of a barrier formation likely dating from the mid-Holocene period, between 6,000 to 7,000 years Before Present (BP) [JMCHM 1999, p.11].

From the known archaeological information at the time, it was predicted that the likelihood of locating Aboriginal sites was high, especially given the proximity of site 'Gerringong, Crooked River' (AHIMS #52-5-0206). The predictive model for the region, including the location of the assessment area, found that dune crests, elevated areas adjacent to resource zones, tops of headlands and ridge tops adjacent to marine or estuarine resources would most likely contain archaeological evidence. Shell middens were considered the most likely site type to be present (JMCHM 1999, p.31).

Based on this model, three areas were identified: low, moderate and high archaeological potential. Areas of low archaeological potential were restricted to low-lying areas which are subject to frequent flooding. This would have discouraged long-term occupation while also impacting preservation of any archaeological remains that may have occurred in such areas. Areas of moderate potential included those associated with elevated landforms with access to only a restricted range of resources discouraging any longer-term use of such areas. An assessment of high archaeological potential was reserved for landforms found overlooking water, in proximity to potentially rich resource zones, such as adjacent the coast (JMCHM 1999, p.34).

A total of 15 Aboriginal heritage sites were identified within the sewerage treatment plant portion of the assessment area, while no Aboriginal sites were identified along the pipeline route assessed in the study. A high level of previous disturbance was noted across the assessment area.

A summary of the sites identified during this assessment is provided in Table 4.6.

Table 4.6 Results of the Gerringong to Gerroa Sewerage Treatment Plant

Site name / AHIMS #	Landform	Site Feature	Extent	Contents
CR/BA-1	Eastern tip of the low peninsula between the Crooked River and Blue Angle Creek	Shell	15-20 metres by 1 metre	30 highly weathered and fragmented Pipi shells.
CR/BA-2	Southern bank of the Crooked River	Shell	50 metres^2, seen in section of up to 20 centimetres deep.	Pipi, mud oysters *Ostrea angasi*, whelk *Pyrazus ebeninus* and small whelk *Velacumantus australis*.

Site name / AHIMS #	Landform	Site Feature	Extent	Contents
CR/BA-3 / 52-5-0206	Top of a beach dune overlooking the Crooked River	Shell and artefact	375 metres^2	Pipi, mud oysters, rock oysters *Crassostrea commecialis*, mudwhelk, small whelk and cockle *Anadara Trapezia.* 15 stone artefacts including: eight flakes, two bipolar flakes, two bipolar split pebbles, one broken flake, one flake fragment and one core made of silcrete, quartz, basalt and chert.
CR/BA-4	North-western end of a dune that runs parallel to the Crooked River	Shell	200 metres^2	Pipi, mud oysters, whelk, small whelk.
CR/BA-5	West of the main dune, above the flood line	Shell and artefact	150 metres^2	An isolated red chert artefact with three small, broken mud oysters.
CR/BA-6	Behind the main dune above the flood line.	Shell and artefact	0.5 metres^2	Isolated quartz flaked piece with four small broken Pipi fragments.
CR/BA-7	Along a vehicle track	Shell and artefact	2 metres^2	Heavily disturbed site, by modern pebble imported fill. Consist of flaked dog cockle *Glycymeris flammeus*, pipi, whelk, mud oysters and two stone artefacts: a bifacially flaked pebble tool and a acid volcanic core.
CR/BA-8	Behind sand dune on stable, even ground.	Modified tree		Bangalay Eucalyptus *Eucalyptus botryoides*, measures 97 centimetres long and 15 centimetres wide. Facing north-east.
CR/BA-9	Behind sand dune on stable, even ground, 100 metres from Blue Angle Creek	Modified tree		Bangalay Eucalyptus *Eucalyptus botryoides*, measures 1.22 metres long, 28 centimetres wide and faces south-west.
CR/BA-10	Cleared dune, less than 100 metres from Blue Angle Creek.	Modified tree		Bangalay Eucalyptus *Eucalyptus botryoide*, measures 3 metres long and 5 centimetres wide and is north-west facing.
CR/BA-11	Adjacent to the highest dune in the studied area and CR/BA-3.	Modified tree		Bangalay Eucalyptus *Eucalyptus botryoide,* measures 62 centimetres long, 16 centimetres wide and is north-west facing.
CR/BA-12	Footslopes of the highest dune in the studied area.	Modified tree		Bangalay Eucalyptus *Eucalyptus botryoide*, measures 1.2 metres long, 35 centimetres wide and is north-west facing.

During this investigation it was found that isolated finds and shell middens presented little archaeological significance on their own. Sub-surface testing of such sites was considered necessary to assist in determining their full extent and significance. This work was not competed as part of this assessment. The identification of modified trees was deemed of high archaeological significance due to their general rarity within the region, as a result of the extensive land clearance that has occurred (JMCHM 1999, pp.50–54).

This report is of relevance to the current study as it contributes to the predictive model for the region.

A SURVEY FOR ABORIGINAL ARCHAEOLOGICAL MATERIAL CONDUCTED ON THE ELAMBRA ESTATE TO ASSIST IN MASTER PLAN AND DEVELOPMENT CONTROL PLAN SPEARHEADED BY THE KIAMA COUNCIL (NAVIN OFFICER, 2000)

An Aboriginal archaeological survey was completed to supplement information for the site master plan and Development Control Plan for land owned by the Kiama Council at Gerringong. This assessment encompassed 22 hectares of land known as the “Elambra Estate”. This property is situated approximately 200 metres east of the eastern boundary of the current study area. Archaeologically sensitive landforms were identified within the Elambra Estate including level areas on spurline crests and elevated and relatively level areas above drainage depressions (Navin Officer 2000, p.1).

Two isolated stone artefacts were identified as part of the survey of the Elambra Estate. These were ‘Elambra Isolated Find 1’ (AHIMS #52-5-0404) a volcanic flaked piece found on cleared land on the edge of a dam in proximity to one of the Crooked River tributaries running through the property. ‘Elambra Isolated Find 2’ (AHIMS #52-5-0405) consisted of a white quartz flake found on an eroded embankment adjacent to a stock animal track (Navin Officer Heritage Consultants 2000, p.10).

Based on these low-density findings, the proximity of minor tributaries of the Crooked River, as well as the previous land disturbances and the shallow nature of the soil it was concluded that the Elambra Estate had no further Aboriginal archaeological potential.

This report is of relevance to the current study as it contributes to the predictive model for the region.

ARCHAEOLOGICAL ASSESSMENT ON BELINDA STREET, EAST GERRINGONG, FOR A REZONING PROPOSAL (NAVIN OFFICER, 2002)

This archaeological assessment was conducted for the proposed rezoning of five hectares of land located between Belinda Street and Geering Street (Lot 4 and 6 DP 541889) in East Gerringong. The lots are located 400 metres from the coast and approximately 900 metres from the current study area. The assessment area consisted of a crest and the northern slopes of a ridgeline that forms part of the coastal headland of Gerringong. A survey of the lots was undertaken as part of the assessment resulting in the identification of one artefact site consisting of ‘East Gerringong 1’ (AHIMS #52-5-0416) and one potential archaeological deposit, ‘PAD 1’ (AHIMS# 52-5-0417) (Navin Officer 2002, p.1).

‘East Gerringong 1’ (AHIMS #52-5-0416) is a low-density artefact scatter made up of four artefacts, located on an exposed embankment adjacent to the fence line. The embankment is on the upper slopes of the headland’s basal slopes. A previous assessment in Werri Beach notes, that this area originally included a hind dune swamp (Dallas 1987). The site likely extends upslope outside of the development footprint and is likely associated with ‘Werri Beach Open Camp Site’ (AHIMS #52-5-0216). The artefacts recovered from the exposed and highly disturbed yellow-brown clay included: a fine grained volcanic scrapper, a volcanic flake, a volcanic core with 4 negative scars, and one rhyolite or chert scraper (Navin Officer 2002, p.10). This site was assessed as having low archaeological significance (Navin Officer 2002, p.17).

The registered site ‘PAD 1’ (AHIMS # 52-5-0417) was also identified within the relatively level crest and adjoining upper slope of a north facing spurline shoulder. The area identified measured 3,750 square metres. The favourable nature of the landform for camping was noted as the major contributing factor of the PAD. The area provides moderate potential for sub-surface archaeological deposits (Navin Officer 2002, p.11) and was thus assessed as having moderate archaeological significance (Navin Officer 2002, p.17).

This report is of relevance to the current study as it contributes to the predictive model for the region.

GERROA SAND MINE – VARIOUS REPORTS (COLLEY, 1988; LANCE 1989; PATON 1992; BARBER 2000, 2002; NAVIN OFFICER 2004)

This archaeological salvage program was undertaken within the Cleary Bros Sand Mine near Gerroa, approximately 3 kilometres south-west of the current study area, along Seven Mile Beach, and 889 metres south of the mouth of the Crooked River. This salvage was recommended following the results of a survey and subsequent archaeological testing of the proposed extension to the mining lease. This assessment builds on the results from previous investigations conducted as part of the Cleary Bros Sand Mine (Colley 1988, Lance 1989, Paton 1992, Huys 1997, Barber 2000, Barber 2002, Navin Officer 2005). Each of these assessments have been completed within the framework on an ongoing environmental assessment and management process following a ruling of the Land and Environment Court.

In response to the findings of Colley (1988), which indicated further archaeological investigation would be required in the proposed sand mine, Lance (1989) completed a study which found 'Brickies Pit' (AHIMS #52-5-0259); a shell midden with artefacts located at the mouth of the Crooked River. He further noted that shell material extended from this site to the mine. The most common shell type was Pipi (*Plebidonax)* and was generally found at a depth of 20 centimetres (Lance 1989). The significance of the site was concluded to be low, but this assessment was disputed shortly after its publication. More intensive investigations were recommended for the site and the proposed mine in 1992.

Paton, along with Wilfred Shawcross and students from the Australian National University, conducted detailed site mapping, auguring and additional hand excavations within the proposed mine as well as the adjacent sand dunes within Seven Mile Beach National Park (Paton 1992). The investigation resulted in the identification of a total of 41 middens, including 29 that were considered intact. Augurs identified 31 midden deposits out of the 2,000 holes. All of which were located outside the Seven Mile Beach National Park, with the majority on the crest of dunes inside the footprint of the mine. The lack of artefactual material in the National Park was found to be due to the lack of permanent water courses running through it, as well as the shorter dunes compared with those in the proposed development. Six areas of hand excavations were also conducted as part of this study. Consistently throughout these excavated areas, midden material was found within the first two spits, with more decomposed midden material at the fourth and sixth spit, with artefacts associated in majority with those deeper deposits. The assemblage showcased two cultural phases of Aboriginal occupation. The older artefacts found between spits four and six were indicative of the microblade stone tool technology, employed around 5,000 years ago. Artefacts located in the first two spits showed micro-blade technology, which was used in the late Holocene.

As part of this salvage program, Barber completed a survey which assessed the archaeological potential of mining areas 5D, 6D, 7D and 8D, as well as two of Paton's exclusion areas and the proposed extension (2000). Site CB2 (AHIMS #52-5-0415) was identified in the proposed extension area, behind the dune sequence of the Seven Mile Beach National Park. It comprised a quartzite core and scattered and fragmented Pipi (*Plebidonax)* shell. A testing program in the vicinity of this site was undertaken shortly after (Barber 2002). The program included the excavation of one 50 centimetre^2 test pit and 220 auger holes. 20 of the auger holes contained archaeological material, of which 11 had stone artefacts and 9 had shell midden material. The shell material recovered consisted almost entirely of Pipi (*Plebidonax)* specimens, found at depths of 10 and 30-centimetres. A total of 25 artefacts were recovered, which showcased a wide variety of stone material. Most of this assemblage was made of flakes, flaked pieces and cores, with one artefact showcasing extreme use wear. A large concentration of this assemblage was located on higher ground (Navin Officer 2004, p.4).

Due to the heavy levels of disturbance noted during this testing program, compared with the rest of the dune system, site CB2 (AHIMS #52-5-0415) was found to hold low archaeological significance. Salvage was recommended as part of the vegetation stripping process (Navin Officer 2004, p.4). This took place over two stages; stripping of the berm wall, followed by the extraction area. The berm wall, revealed to contain humic loamy sands, did not reveal any cultural material (Navin Officer 2004, p.10). The main extraction area on the other hand, revealed five artefacts: 1 silcrete utilised flake, 1 volcanic broken flake, 2 tuff flakes and 1 tuff core. The silcrete flake was

identified below the crest of a dune feature above a pebble layer of unknown origin. The three tuff artefacts were identified in the overburden pile. Some shell fragments were observed during the salvage, in larger concentrations towards the crest of the dune. All artefacts were recovered from the top 30 centimetres of soil (Navin Officer 2004, p.11).

These assessments are of relevance to the current study as they contribute to the predictive model for the region.

CLEARY BROS SAND MINE NORTHERN EXTENSION (NAVIN OFFICER, 2005, 2006)

This test excavation took place at the Cleary Bros Sand Mine near Gerroa, approximately 3 kilometres south-west of the study area, along Seven Mile Beach, and 889 metres south of the mouth of the Crooked River. This assessment builds on the results from previous investigations conducted as part of the Cleary Bros Sand Mine (Colley 1988, Lance 1989, Paton 1992, Huys 1997, Barber 2000, Barber 2002, Navin Officer 2005). In particular, Navin Officer produced an Aboriginal Heritage Review of the proposed northern extension for the mine, which found a need to conduct further archaeological investigations to determine the nature and significance of archaeological material within the area (Navin Officer 2005). The assessment investigated the entire application area, which included previously approved mining areas as well as the proposed extension area (Navin Officer 2006, p.1). During the investigation it was found that the north-eastern extension is found on beach barrier dune sequence on the northern end of Seven Mile Beach. The sand is thought to have been deposited by wave action between 7,000 and 3,000 years ago from the Shoalhaven Bight and the Shoalhaven River and Creek. The ridgeline has been stable for the last 3,000 years. While the southern section of the sand mine was found on an elevated dune crest overlooking a sandy flat adjacent to the expansive Foys Swamp (Navin Officer 2006, p.6).

51 auger test pits were excavated across all landscape features previously, identified including the low sandy flat, dune crest, cleared and grazed area, and the creek margin. 35 of the augur holes measured between 30 and 45 centimetres in diameter, and 16 measured 10 centimetres in diameter. The secondary test pits were excavated where a concentration of cultural material was encountered (Navin Officer 2006, p.11). All test pits were excavated at an average depth of between 100 to 165 centimetres (Navin Officer 2006, p.12). Two soil profiles were observed in the auger test pits: an aeolian soil profile and a swamp profile (Navin Officer 2006, p.14).

Shell material was recovered from 26 of the test pits, and 39 lithic artefacts were recovered from 5 test pits. A majority of the shell material recovered was fragmented Pipi (*Donax sp.*). Two pieces of Cabestana shell were also recovered. The average Minimum Number of Individuals (MNI) recovered was of 1.44 while the highest concentration was 25 (Navin Officer 2006, p.17).

The lithic assemblage was small and concentrated: 39 artefacts were recovered from 5 out of 51 test pits, 18 of which were complete flakes, 13 were broken flakes, 2 were flaked pieces and 2 were bipolar cores. 1 retouched flaked piece, 1 artefact with a pot lid, 1 broken redirection flake and 1 asymmetric backed artefact, most likely an attempted Bondi Point, were among the assemblage. The assemblage was made of 59% silcrete, 18% quartz, 10% chert, 5% sandstone, 5% chalcedony and 3% volcanic material. A majority of artefacts were recovered in the third and fourth spit, however all spits recovered some material (Navin Officer 2006, p.19).

The assessment concluded that this small assemblage made it difficult to make any reliable conclusions regarding the site formation, artefact taphonomy or its distribution. Similarly, the density of shell material seems to be overall low and its distribution sporadic. The previous conclusion by Paton which found greater midden concentrations on the crest of dunes is supported by these findings. However, the archaeological research potential at this site remains limited (Navin Officer 2006b, p.25).

This report is of relevance to the current study as it contributes to the predictive model for the region.

GERRINGONG UPGRADE REVIEW OF ENVIRONMENTAL FACTORS (NAVIN OFFICER, 2010)

This assessment of the Aboriginal heritage for the Roads and Transport Authority of NSW (RTA) Princes Highway upgrade between Gerringong and Bomaderry, encapsulated a study area surrounding 7.5 kilometres of proposed road alignment. This route included a central corridor which

proposed to pass through the current study area. In this corridor, 12 Aboriginal sites were identified during the survey. This included two surface scatters, one sub-surface scatter and nine PADs.

The likelihood of Aboriginal archaeological material was predicted using a model based on the current information available for the area. This included the results of previous investigations, which includes a preliminary Aboriginal and non-Aboriginal heritage assessment at the route option stage (Maunsell Australia & Navin Officer 2007) and a preliminary landscape review (Navin Officer 2007). It was noted that most test excavations had been conducted in rock shelters or sandy coastal deposits, and not in the coastal landforms of the region.

The assessment identified 12 Aboriginal heritage sites within or near the highway upgrade. These include two surface artefacts 'G2B A6' (AHIMS # 52-5-0569) and 'G2B A7' (AHIMS # 52-5-0570), one subsurface artefact deposit 'G2B A5' (AHIMS #52-5-0568) and nine PADs. It also noted the significance of 11 large mature fig trees to the traditional heritage of Aboriginal peoples. This was voiced on numerous occasions during the survey by stakeholders. Four primary reasons were given for this significance:

- The use of the tree's well-developed buttress as a shelter and weather break, making it an ideal camping spot.
- A reliable source of food, both for its fruit and the animals who took shelter within its branches.
- Mature fig trees are traditionally associated with birthing within women's lore.
- They are also associated with the traditional tale 'Yaroma' a nightmarish character from traditional tales (Navin Officer 2010, p.104).

Two of these large, mature fig trees are found along the banks of the Crooked River. For all identified trees, however, planting (whether by natural propagation or artificial planting), occurred after historical land clearing practices occurred. This was concluded based on the location of the trees, in close association with a homestead as well as the low and spread-out nature of their growth, indicative of relatively little competition often found in denser forests (Navin Officer 2010, p.105).

'G2B A5' (AHIMS #52-5-0568) was found by individuals Roger and Pauline Graham of the former Toolijoa Public Schoolhouse during excavations conducted in 1999 for the planting of a tree, fence pole digging, and creek side restoration works. They recovered a minimum of five artefacts on a basal slope adjacent to a now drained valley floor. The assemblage was recovered between 20 and 45 centimetres of soil. Furthermore, two ground edge hatches were also recovered at 20 centimetres. It was concluded that this site still held high archaeological potential (Navin Officer 2010, pp.90–91).

'G2B A6' (AHIMS #52-5-0569) was found in the exposed topsoil during fencing work on the north side of the Princes Highway. It consisted of an isolated complete chert flake. Other patches of exposure from the same work did not reveal any further archaeological material, this would indicate a low likelihood of a high density sub-surface artefact deposit within the area (Navin Officer 2010, p.92).

'G2B A7' (AHIMS #52-5-0570) consisted of three stone artefacts found on three separate disturbed exposures associated with a recent spoil heap on the eastern side of the Princes Highway. These were a fine grained silicious complete flake with use-wear along the margins and ridges on the dorsal side, a quartz broken flake, with possible backing along one margin, and finally a fine-grained silicious quartzite pebble incomplete manuport (Navin Officer 2010, p.93). This site is not rare or of particular significance, nor located on ground with relatively low levels of disturbance. As such it was concluded that 'G2B A7' (AHIMS #52-5-0570) demonstrates low levels of archaeological significance overall (Navin Officer 2010, p.148).

The nine PADs and their associated landform and sites are outlined in Table 4.7.

Table 4.7 PADs 'PASA 31 – 39' associated sensitive landforms and sites (Navin Officer 2010, pp.101–102)

PAD Name / AHIMS	Sensitive landform description	Associated Site
PASA 31	Crest and associated slopes of spurline.	NA
PASA 32	Banks, flats and adjacent slopes a third order unnamed creek.	NA
PASA 33	Banks, flats and adjacent slopes a third second unnamed creek, as well as elevated margin valley floor and associated basal slope.	NA
PASA 34	Crest associated with an elevated ridgeline.	G2B A6
PASA 35	Banks, flats and adjacent slopes of the fourth order Crooked River.	NA
PASA 36	Banks, flats and adjacent slopes a third order unnamed creek.	NA
PASA 37	Basal slopes adjacent to southern banks of the former Omega swamp basin, since drained.	NA
PASA 38	Ridgeline crest and basal slopes on the northern banks of the former Omega swamp basin.	G2B A7
PASA 39	Crest and upper slopes of a spurline.	NA

The full significance of these PADs would be determined following the systematic archaeological testing of each site.

This report is of relevance to the current study as it contributes to the predictive model for the region.

PRINCES HIGHWAY GERRINGONG UPGRADE: MOUNT PLEASANT TO TOOLIJOOA ROAD – ABORIGINAL ARCHAEOLOGICAL SUBSURFACE TESTING AND COLLECTION PROGRAM (NAVIN OFFICER, 2010)

This assessment is on the Princes Highway upgrade between Gerringong and Bomaderry, encapsulated a study area of 7.5 kilometres. A portion of this assessment ran approximately 800 metres west of the current study area. Testing excavations were undertaken between Mount Pleasant and Toolijooa Road Intersection, under the provisions outlined in the AHIP #3233 (Navin Officer 2010, p.1).

Based on the identified Potential Archaeologically Sensitive Areas (PASA's) from the previously discussed survey (Navin Officer 2010), a testing program was devised which included the mechanical excavation of 137 test pits within PASAs 32 to 39. This resulted in the recovery of 162 artefacts from 42 test pits and 5 PASAs. No artefacts were recovered from PASA 34, PASA 35 and PASA 36 (Navin Officer 2010, p.23).

PASA 32 (AHIMS #52-5-0571) and PASA 33 (AHIMS #52-5-0572) contained 14 artefacts from 11 test pits out of 36 dug, and at an average depth of 200 to 500 millimetres. Artefact density was on average 0.76 artefacts per metre^2 (Navin Officer 2010, p.24). The assemblage at this combined site, was composed of 6 flakes, 2 flaked pieces, 2 side and end scrappers, 2 bipolar flakes, 1 broken backed artefact and 1 redirecting flake (Navin Officer 2010, p.25).

PASA 37 (AHIMS #52-5-0575) recovered 42 artefacts from 8 test pits out of the 15 dug, and at an average depth of 300-400 millimetres. Artefact density was on average 5.72 artefacts per metre^2 (Navin Officer 2010, p.26). The assemblage is composed of 21 flakes, 6 asymmetric backed artefacts, 6 microblade fragments, 4 flaked pieces, 2 heat fragments, 1 axe rejuvenation flake, 1 redirected flake from microblade core, 1 shattered quartz crystal and 1 side retouched microblade fragment (Navin Officer 2010, p.29). The abundance of backing, microblades and axe flaking indicates this site is between 3,000 and 5,000 years old (Navin Officer 2010, p.27).

PASA 38 (AHIMS #52-5-0576) found 76 artefacts from 18 test pits out of the 44 dug, and at a depth of 300 and 400 millimetres on average. Artefact density was on average 3.36 per metre^2 (Navin Officer 2010, p.29). The assemblage of this site is composed of 44 flakes, 10 flaked pieces, 3 quartz crystals, 2 asymmetric backed artefacts, 2 heat fragments, 2 retouched flakes, 2 bipolar flakes, 2 microblades, 1 anvil fragment, 1 broken backed artefact, 1 hammerstone and anvil, 1

multiplatform core, 1 NDF, 1 notch, 1 redirected flake, 1 semi-discoidal core and 1 side scrapper (Navin Officer 2010, p.31).

PASA 39 (AHIMS #52-5-0577) identified 14 artefacts out of five test pits from the 10 dug, and at a depth of 400 to 600 millimetres. The average artefact density for this site was 2.8 per metre^2. The assemblage consisted of 11 flakes, 2 flaked pieces and 1 symmetric backed artefact (Navin Officer 2010, p.33).

This report is of relevance to the current study as it contributes to the predictive model for the region.

PRINCES HIGHWAY GERRINGONG UPGRADE: MOUNT PLEASANT TO TOOLIJOOA ROAD: ABORIGINAL ARCHAEOLOGICAL SUBSURFACE TESTING PROGRAM - ADDENDUM REPORT – PASA31 (SITE G2B A12) (NAVIN OFFICER 2011)

This addendum report presents the results of archaeological test excavations undertaken at testing location PASA 31 located at the southern end of the Gerringong Upgrade of the Princes Highway. A total of ten test pits were excavated resulting in the recovery of 16 artefacts from 5 test pits. The highest number of artefacts recovered from a single pit was 8. Artefact density ranged from 1 to 8 artefacts per square meter, with an average of 4 artefacts per square meter. The assemblage was dominated by complete and broken flakes (n=7, 44%). Two single platform cores were recovered as well as two retouched artefacts. Raw materials included chert (75%), quartzite (12.5%), chalcedony (6.2%) and silcrete (6.2%). The assemblage was subsequently recorded as site 'G2B A12'. The value of the site was assessed as being "limited by the remnant nature of the deposit, lack of vertical integrity and the low overall artefact incidence" (Navin Officer, 2011 p.1).

This report is of relevance to the current study as it contributes to the predictive model for the region.

FOXGROUND AND BERRY BYPASS PRINCES HIGHWAY UPGRADE: ABORIGINAL HERITAGE (NAVIN OFFICER, 2012)

This assessment was centred on 11.6 kilometres of the Princes Highway between Toolijoa Road, north of Foxground and Schofields Lane, south of Berry NSW. The studied area was the subject of both Aboriginal archaeological survey and testing within the framework of a proposed upgrade to the highway. The assessment follows the results of a Preliminary Aboriginal and non-Aboriginal Heritage Assessment (Maunsell Australia & Navin Officer 2007) as well as a preliminary landscape review (Navin Officer 2007) and outlines the results of a survey and testing program undertaken as part of this proposal (Maunsell Australia & Navin Officer 2007).

The field survey aimed to identify areas of potential archaeological deposits and sensitivity and sites as revealed on the ground surface. The predictive model developed as part of the Review of Environmental Factors and the testing results of the Gerringong Upgrade (Navin Officer 2010, Navin Officer 2010) was utilised to identify Potential Archaeologically Sensitive Areas (PASAs) within the Foxground upgrade. A total of 44 PASAs were identified using these reports, in consultation with registered Aboriginal parties (Navin Officer 2012, p.30). Out of these, 21 PASAs were selected for testing. This selection was based on the results of the Gerringong Upgrade testing program, as well as overlaps with impacted areas. PASA 12 and PASA 13, PASA 21 to PASA 24 and PASA 25 to PASA 27 were grouped together due to their continuing landforms (Navin Officer 2012, p.31). 18 of the 21 PASAs investigated were fond to contain a subsurface deposit. The location of these PASAs and their results is outlined in Table 4.8.

Table 4.8 Location and results of testing for all investigated PASAs (Navin Officer 2012, pp.63–65)

PASA	Landform	Testing Results
PASA 12	Not identified.	46 artefacts recovered, making it the densest site recorded.
PASA 13	Not identified.	2 artefacts recovered.
PASA 14	Not identified.	18 artefacts recovered.
PASA 15	Not identified.	4 artefacts recovered.

PASA	Landform	Testing Results
PASA 16	Not identified.	19 artefacts recovered.
PASA 18	Not identified.	2 artefacts recovered.
PASA 20	Crest and basal slopes of an elevated spurline associated with 5th order stream Broughton Creek.	40 artefacts recovered.
PASA 21	Broughton Creek's alluvial flats, including terraces.	1 artefact recovered.
PASA 22	Broughton Creek's alluvial flats and valley floor.	No artefacts recovered.
PASA 23	Broughton Creek's alluvial flats	13 artefacts recovered.
PASA 24	Broughton Creek's alluvial flats and valley floor.	14 artefacts recovered.
PASA 25	Crest and basal slope of a low spur adjacent to a valley floor and 5th order stream Broughton Creek.	15 artefacts recovered.
PASA 26	Broughton Creek's alluvial flats.	7 artefacts recovered.
PASA 27	Broughton Creek's alluvial flats and valley floor.	5 artefacts recovered.
PASA 28	Crest and upper slope of Toolijooa Ridge line.	8 artefacts recovered.
PASA 29	Crest and upper slopes of a spurline.	13 artefacts recovered.
PASA 40	Low banks, adjacent flats and slopes associated with an unnamed, 2nd order stream.	1 artefact recovered.
PASA 41	Low banks, adjacent flats and slopes associated with an unnamed, 2nd order stream.	Out of the 14 artefacts recovered, one possible glass artefact among other glass fragments was also identified. The location of this area of potential is consistent with a possible fringe camp location.
PASA 42	Crest and upper slopes of a spurline.	No artefacts recovered.
PASA 43	Alluvial flats of Connollys Creek, and associated valley floor.	10 artefacts recovered.
PASA 44	Valley floor of Broughton Creek with adjacent alluvial flats.	4 artefacts recovered.

The survey further identified one artefact scatter 'G2B A3' (AHIMS #52-5-0566), an isolated surface artefact 'G2B A38' (AHIMS #52-5-0656) associated with a PAD, and finally four places of Aboriginal cultural heritage significance. Three of which related to historical events or occupation and included one cultural landscape known as the Toolijooa Ridge Aboriginal Cultural Landscape. In addition two Aboriginal cultural heritage values were identified during consultation, 12 large, and old-growth fig trees as well as burials (Navin Officer 2012, p.60).

'G2B A3' (AHIMS #52-5-0566) consisted of four surface stone artefacts found in an exposed drainage ditch, on a low to moderately steep, north facing slope which forms the footslope of a descending spurline off Toolijooa Ridge. The artefact were exposed following mechanical ground disturbance (Navin Officer 2012, p.60). 'G2B A38' (AHIMS #52-5-0656) is an isolated find and PAD found on a crest of minor spur. It overlooks an unnamed tributary of the Crooked River. The find consists of fine-grained quartzite retouched flake. The PAD was measured at 100 by 80 metres in area, and thought to have moderate potential for archaeological sub-surface material, due to the moderate levels of disturbance found at the site (Navin Officer 2012, p.61).

The four Aboriginal heritage recordings were identified using oral tradition as well as ethno-historical documents (Navin Officer 2012, p.68). Toolijoa Ridge, approximately 4.5 kilometres

south-west from the study area, is a locally prominent ridgeline. In 1991, a local community questionnaire by Donlan, found that an old cattle trail running along the ridge and connecting the coast, follows an older Aboriginal trail which started in Foxground (Navin Officer 2012, p.44). This same questionnaire also identified, local artefact collection in association with a lost stone arrangement and bora ring on Toolijooa Hill, near the old trail. Contemporary Aboriginal groups, recognised the cultural significance of the crest and prominent slope during the survey (Navin Officer 2012, p.45).

In the same 1991 survey by Donlan, a local tradition amongst the Broughton Village community, found that Aboriginal people were known to have camped along the banks of Broughton Creek, approximately 10 kilometres south-west from the study area. This area known as Brookside, is locally famous for surface finds collected by the community. (Navin Officer 2012, p.37).

Little Mountain, also known as Dicky Wood's Meadow battle ground, is associated with site 'G2B A13', and found near the current Broughton village, approximately 5 kilometres south-west from the study area. This battle ground was recorded based on the oral testimony of a Shoalhaven Aborigine known as Buthring and written by Archibald Campbell in 1900. The man describes the area beside the creek on the eastern side of Broughton Creek as the area used for battle by generations of Aboriginal people (Navin Officer 2012, p.37). The descriptions provided here in this account, suggest that the battlefield would have been located within a natural clearing of the forest, most likely in a wetland or intermittent wetland basin. This site represent an area of high archaeological significance, both for its intangible cultural values but also for its potential to find burials (Navin Officer 2012, p.39).

Finally, the Aboriginal encampment at Berry, is known from ethnographic and historical sources to have occurred in two phases: the Boongaree encampment located in a meadow at the junction of the Broughton and Broughton Mill Creeks, and the temporary, seasonal encampment by Aboriginal crop pickers on the Broughton Mill Creek Flats (Navin Officer 2012, p.42).

A total of 298 test pits were excavated across all PASAs, all but one utilised a mechanical excavator (Navin Officer 2012, p.14). An average of less than 40% variation in spit depth was encountered due to the use of a mechanical excavator. The final depth of test pits which were mechanically excavated, were between one and three metres. An additional 200 millimetres was added to the width of the test pit to allow the bucket to reach these depths (Navin Officer 2012, p.15). Only one test pit was hand excavated: Pit #20 within PASA 20. The test pit measured 500 millimetres^2 (Navin Officer 2012, p.18).

The lithic assemblage recovered during this test excavation resulted in the identification of 236 artefacts, found in 18 of the 21 PASA's investigated. Overall, 58.1% were flakes, and 19.1% were flaked pieces. The remaining lithics are 5.9% the results of heat fracture, 3% of redirecting flakes, 2.1% have pot lids, 1.3% are multiplatform cores, 1.3% are retouched flake fragments, 0.8% are cores, 0.8% are hammerstones, 0.4% are asymmetric backed artefacts, 0.4% are possible bipolar cores, 0.4% are bipolar flakes, 0.4% are a burin spall, 0.4% are a core fragment, 0.4% are from an end scrapper, 0.4% are a fire cracked rock, 0.4% are a split cobble flake, 0.4% are a hammerstone and anvil, 0.4% are a microblade, 0.4% are a notch, 0.4% are a notched double side and end scrapper, 0.4% are retouched flakes, 0.4% are retouched flaked piece and 0.4% are ventral side scrappers. The assemblage was made of 71% chert, 27% quartz and less than 5% of volcanic stone silcrete, chalcedony, mudstone, quartzite, sandstone, glass, ochre and an unidentified sedimentary stone (Navin Officer 2012, pp.73–74).

It was concluded that the higher density sites recovered during this assessment tended to be found on elevated terraces and creek banks. Furthermore, the location of these richer assemblages also coincided with the location of major surliness and gentle basal slopes above valley floors. Lower-density sites were alternatively found within these valley floors, and alluvial flats. The inspected ridgeline crests and saddles tended to hold sparse and low-density sites.

This report is of relevance to the current study as it contributes to the predictive model for the region.

PRINCES HIGHWAY GERRINGONG UPGRADE: ADDITIONAL AREAS 1-19 AND 49: ABORIGINAL CULTURAL HERITAGE ASSESSMENT (NAVIN OFFICER, 2012)

This report presents the results from an ACHA conducted for additional areas to be impacted by the Princes Highway Gerringong Upgrade program. The ACHA was required as the existing AHIP area was too distant and/or based on assessment that did not cover the landform type within the additional areas. The ACHA involved a desktop review and additional survey of the new areas. A predictive model was developed based on the results of the Gerringong Upgrade and Foxground and Berry Bypass archaeological testing programs. The predictive model is summarised as follows (Navin Officer, 2012 p.28):

- Valley floors, alluvial flats, ridgeline crests and saddles are expected to be characterised by intermittent and low incidences of artefacts.
- A higher incidence of artefacts may occur in locally elevated terraces and creek banks within a valley floor context.
- Locally elevated and well-drained areas with a low gradient situated within 200 metres of known and predicted former wetland basins are associated with a high archaeological potential.
- Major spurlines and low gradient basal slopes are expected to be associated with higher artefact incidences and/or increased assemblage richness.
- The archaeological potential of ridge and spurline crests requires further investigation, particularly due to their potential association with past travel routes.
- The archaeological potential of riparian corridors associated with higher order streams required further investigation.

The additional survey resulted in the identification of three areas of PASA including:

- PASA 48: archaeologically sensitive due to the location of this basal slope at an intersection of a substantial drainage line and the margin of the former coastal plain wetlands, which are predicted to have been a focus of Aboriginal occupation.
- PASA 49: archaeologically sensitive due to the lack of comparative data for this landform (a locally elevated low rise situated between two drainage lines in a valley floor) combined with the areas expected archaeological potential based on the predictive model.
- PASA 50: archaeologically sensitive due to its association with an archaeologically sensitive landform type consisting of a locally elevated, low gradient slope adjacent to the floor of a coastal plain and margin of former wetlands, as suggested in the predictive modelling.

The assessment recommended test excavations be conducted within these areas of potential. This report is of relevance to the current study as it contributes to the predictive model for the region.

GERROA SAND QUARRY MODIFICATION: ARCHAEOLOGICAL REPORT (BIOSIS, 2019)

This report presents the results of an ACHA including archaeological survey undertaken for the proposed expansion of the Gerroa Sand Quarry. Based on a review of previous assessment undertaken in the region, the following predictive model was developed for the assessment area (Biosis, 2019 pp. 27-28):

- A high potential for flaked stone artefact scatters and isolated artefacts, shell middens, PADs and burials.
- A low potential for modified trees, axe grinding grooves, quarries, rockshelters with art and/or deposit, Aboriginal ceremony and dreaming sites, pre-contact sites and Aboriginal Places.

The archaeological survey resulted in the re-identification of four of the five previously recorded Aboriginal cultural heritage sites within the assessment area. No new sites were identified. The overall effectiveness of the survey, however, was considered to be low due to vegetation cover

resulting in low GSV and low levels of exposure. The assessment recommended test excavations be undertaken at the sites in order to assess the nature, extent and significance of Aboriginal heritage within the proposed impact area. As the sites were associated with shell midden material, an AHIP was required prior to testing.

This report is of relevance to the current study as it contributes to the predictive model for the region.

5 PREDICTIVE MODEL

Austral has used the information produced as part of the archaeological and environmental context sections to formulate a broad predictive model that identifies the type and character of Aboriginal cultural heritage sites that may be present within the study area.

The predictive model is based upon the analysis of the following key variables:

- Relationship between site types and their spatial distribution within the landscape.
- Site types, raw material types and site densities and their relationship to salient environmental features.
- Information in ethnohistorical sources that may indicate important natural resources or landscape features that may have been exploited.
- Potential chronological and spatial relationships between sites

A predictive model has been developed based on the consideration of the variables outlined above that indicates the likely site types that will be encountered during the archaeological survey and archaeological testing.

5.1 ANALYSIS OF KEY VARIABLES

The AHIMS search that has been completed for this project has identified similar trends in Aboriginal site types within the region. Commonly recorded site types in the wider region represent Artefacts (32.25%) and PADs (27.41%) with or without additional site features such as shell (Artefacts with Shell = 19.35%).

It should be noted that any analysis using AHIMS data will be prone to biases as it relates to sites that have been recorded over the past 40 years. During this time, varying methodologies have been used to identify sites and a large portion of the surrounding landscape may have been subject to limited or no assessment. Therefore, site distribution is likely to be reflective of survey methods and patterns and should not be considered a comprehensive list of all Aboriginal sites within a given region.

A summary of Aboriginal heritage sites within 5 kilometres of the study area is included in Table 5.1.

Table 5.1 Summary of sites recorded within a 5 kilometres radius of the study area

Site Type	Total	Percentage of total
Artefact	20	32.25%
PAD	17	27.41%
Artefact and shell	12	19.35%
Artefact and PAD	9	14.51%
Shell	2	3.22%
Burial	1	1.61%
Modified Tree	1	1.61%
Total	**62**	**100%**

5.2 PREDICTIVE STATEMENTS

Based on a review of the environmental and archaeological context of the local region, the following predictive model has been developed for the current study area.

- The relatively sparse number of recorded Aboriginal sites in the Illawarra Coastal Plains is a result of the overall low ground surface visibility within the region rather than the lack of Aboriginal activity.
- Artefact sites (including isolated artefacts or artefact scatters of varying densities) are the most likely site type within the region and the most likely to occur within the study area due to the proximity of the Crooked River and its minor tributaries. These sites may or may not be associated with PADs, depending on their landscape context and the intensity of occupation at locations.
- Locations where a longer duration of occupation occurred will be associated with a higher density of artefacts.
- Sites may occur in association with a broad range of landform types.
- Well-drained, elevated, flat and/or low gradient landforms located in proximity (i.e., within 200 metres) to a reliable water source are likely to have been the focus of past occupation. Such landforms may include elevated banks and margins of wetlands, rivers and creeks, flat/level areas associated with crests, spurs and ridgelines and low gradient basal slopes.
- Alluvial flats are considered to hold low archaeological potential. Sites found in this landform tend to be low-density scatters most likely explained by cold air drainage, dense vegetation cover and poorly drained ground, which made these areas less suitable for occupation.
- Disturbance including land clearance, building construction, farming, and limiting factors including grass coverage and areas of dense vegetation may impact visibility and the potential to identify artefacts. Some of these may also impact the integrity of surface and sub-surface deposits.
- Based on the soil landscapes associated with the study area and considering the results of previous testing programs within the local region, it is noted that although sediment profiles may be up to 1.5 metres deep, archaeological material will likely be restricted to the upper 40 cm of the deposits deposit.
- Based on the underlying geology associated with the study area and an assessment of raw materials present in previously excavated assemblages from the region, a variety of raw materials may be present in assemblages including, but not limited to, silcrete, volcanic material, fine grained siliceous (FGS), quartz, indurated-mudstone-tuff (IMTUFF), chert and sandstone.
- Assemblages will likely date to the mid-to-late Holocene.
- Fig trees are known to have been of significance to Aboriginal people in the past. Fig trees located in close association with modern homesteads on historically cleared land, however, were likely planted by Europeans after historical land clearing practices occurred and will therefore not necessarily relate to past Aboriginal use of that area.

6 FIELD METHODS

A site specific investigation methodology has been developed for the project that complies with the Requirements of the Code of Practice (DECCW 2010c).

6.1 SURVEY METHODOLOGY

The survey was conducted on 13 November 2019 by Alexander Beben (Director, Austral) and Pauline Ramsey (Archaeologist, Austral) with the assistance of Stacey Henry (Site Officer, ILALC).

6.1.1 SURVEY OBJECTIVES

The objectives of the survey were to:

- Complete a systematic survey that targets areas that have been identified as having the potential to contain Aboriginal heritage values.
- Identify and record Aboriginal archaeological sites visible on the ground surface and areas of PAD.

6.1.2 SAMPLING STRATEGY

The survey methodology was designed to optimise the investigation of areas where archaeological materials may be present and visible, as well as investigation of the broader archaeological potential of all landform elements present within the study area, which included:

- Crest
- Slopes
- Alluvial terraces
- Creekline/floodplain

The specific survey methodology developed for this assessment was guided by the survey requirements as set out in Requirement 5 to 10 of the Code of Practice (DECCW 2010c) and based upon consideration of the overall landform pattern within the study area, known landform elements (after Speight 2009) and the location of previously identified sites. The survey targeted portions of the study area which contained higher archaeological potential. This included the surrounding landforms not associated with the widespread disturbance found on the central crest. Specifically, the alluvial terraces above the tributaries surrounding the study area. Any areas of exposure, such as the central road or the dirt track running along the mid-western slope were also targeted as areas more likely to reveal Aboriginal archaeological material.

6.1.3 SURVEY METHODS

The archaeological survey consisted of pedestrian traverses completed by 3 team members. A key survey variable is ground visibility, which considers the amount of ground surface which is not covered by any vegetation; and exposure, which defines areas where dispersed surface soils and vegetative matter afford a clear assessment of the ground, were assessed across the study area and within each landform element. Overall survey coverage and calculated survey effectiveness was recorded. Note that the effectiveness of the field survey was largely dependent on the degree of ground surface visibility. Where surface visibility was restricted by dense vegetation cover, the potential for PADs was assessed, particularly in association with those landforms identified within the predictive model as more likely to contain Aboriginal archaeological sites. The potential of these areas and all landform elements within the study area was considered against available evidence of land disturbance.

Photographs were taken of all survey units and landforms as well as representative surface visibility, and where present, surface exposures, soil profiles and disturbances relevant to the interpretation of the stratigraphic conditions and archaeological potential within each survey unit.

6.2 TEST EXCAVATION METHODOLOGY

The test excavation was conducted between 1 November and 19 November 2021. On 5, 10, 11 and 12 November 2021 fieldwork was cancelled due to heavy rains. The testing was conducted by Pauline Ramsey (Archaeologist, Austral) and Isabelle Parnell (Archaeologist, Austral), with the assistance from Leeroy Boota and Elliot Stewart of Gerringong Housing Aboriginal Corporation.

The test excavation was completed in accordance with the notification and sampling strategy that was submitted to Heritage NSW on 13 October 2021, as well as in a response to Paul Knight of the ILALC on 15 October 2021 and then to all registered stakeholders on 20 October 2021. A copy of this notification is included in Appendix A.

6.2.1 TEST EXCAVATION OBJECTIVES

The objectives of the test excavation were to characterise the nature, extent and archaeological significance of Aboriginal objects associated with areas of previously recorded moderate potential. Another objective is to test the potential of all identified landforms within the study area.

6.2.2 TEST EXCAVATION METHODOLOGY

The test excavation programme was undertaken according to the prescribed methodology of Requirement 14 to 20 and 23 to 26 of the Code of Practice (DECCW 2010c). Specifically, Requirement 15b of the Code of Practice, stipulates that a sampling strategy must be developed for all test excavations which take place prior to work commencing (DECCW 2010c, p.25). In summary, test pits must be placed on a systematic grid designed to target both areas likely to contain PADs and the location of proposed impacts. Test pits must be located a minimum of 5 metres apart.

Each test pit was excavated following Requirement 16a of the Code of Practice using mattocks, shovels and trowels (DECCW 2010c, p.26). Sample units measured 500 millimetres^2, with the first test pit excavated in 50-millimetre spits to act as a geomorphologic example. The remaining test pits were excavated in 100-millimetre spits. Excavation was undertaken until the B-horizon was reached and then continued for another 100 millimetres to confirm that the following spit was culturally sterile. In each differing soil landscape, a test pit was dug to a 1 metre depth, in an attempt to reach the C Horizon. Most test pits do not reach the compact natural clay of the C Horizon, but instead for safety and time management reasons go one spit below the deepest find encountered, which is 600 millimetres.

Overall, 7 testing areas, spread over all landforms, were excavated, containing a total of 52 test pits. Of these test pits, 1 was expanded into a 1 metre^2 test pit, when a potential feature was encountered. An outline of the test pit distribution over the testing areas and landforms is outlined in Table 6.1 and spatially outlined in Figure 6.1.

Table 6.1 Number of test pits per Testing Area

Testing Area #	Landform	# of Test Pits	% of the landform
Testing Area 1	Terrace and foot slopes associated to western tributary of Crooked River.	12	0.01%
Testing Area 2	Slope connecting western terrace to central crest.	9	0.008%
Testing Area 3	Top of central crest.	6	0.001%
Testing Area 4	Top of Central crest, south of current homestead	2	0.0006%
Testing Area 5	Sloping ridgeline south of central crest	5, including one 1m^2 expansion	0.007%
Testing Area 6	Slope connecting central crest to eastern tributary of Crooked River	6	0.005%
Testing Area 7	Alluvial terrace above eastern tributary of Crooked River	12	0.01%

Figure 6.1 Proposed location of Test Pits within study area

21106 - 48 Campbell Street, Gerringong NSW

Source: NSW LPI Aerial

Drawn by: WA Date: 2021-12-17

AUSTRAL ARCHAEOLOGY

6.2.3 SIEVING

On site processing of excavated soils and artefact retrieval was undertaken via a combination of dry sieving through both a 5-millimetre and 3-millimetre nested sieve or solely through a 3-millimetre sieve, dependent on the nature of the material. Artefacts were collected from the sieves and placed in bags according to test pit provenance. Buckets containing material from the same spit were kept together and separate from other spits. All test pits were backfilled with the available material retrieved from the sieving location upon completion of the recording.

6.2.4 RECORDING

Detailed recording of all pits was undertaken, requiring the completion of an excavation recording form for each spit excavated. The form necessitated detailed descriptions of the soil profile, any evidence of disturbance and/or features, as well as depth of excavation and the number of artefacts and inclusions present. For each artefact a separate plastic bag was annotated with the project name, transect number, test pits number, spit number, date and recorder's initials.

Photographic recording occurred at the completion of each pit or when an archaeological feature was uncovered. A photographic record was taken of at least one wall section in each test pit. Together with a section drawing and stratigraphic photogrammetry from each pit, the photographs allowed for a detailed record of the strata present at the site.

6.2.5 ANALYSIS OF EXCAVATED MATERIAL

A lithic analysis was conducted by Marika Low (Lithics Specialist, Austral). The lithic analysis was aimed at primarily identifying the presence of culturally modified lithic material within the archaeological record, with a secondary goal of identifying material, tool types and any indicators of *in situ* reduction that informs depositional integrity. All artefacts recovered were taken to temporary storage at the Austral Archaeology office in Albion Park (NSW) and are to be reburied within the study area. Aboriginal stakeholders are to be consulted as to an appropriate area to relocate these artefacts. A new AHIMS site card for the location where the artefacts are to be relocated is to be created and lodged with the AHIMS registrar.

7 ARCHAEOLOGICAL RESULTS

The following section outlines the results of the archaeological investigations conducted within the study area.

7.1 ARCHAEOLOGICAL SURVEY RESULTS

An archaeological survey was undertaken on 13 November 2019 as part of the Aboriginal Cultural Heritage Due Diligence Assessment (ACHDDA) [Austral Archaeology Pty Ltd 2019] by Alexander Beben (Director, Austral), Pauline Ramsey (Archaeologist, Austral) and a representative from the TLALC.

7.1.1 VISIBILITY

In most archaeological reports and guidelines visibility refers to GSV, and is usually a percentage estimate of the ground surface that is visible and allowing for the detection of (usually stone) artefacts that may be present on the ground surface (DECCW 2010c). GSV within the proposed development area was very low, at less than 1% visibility. Drainages had particularly low visibility because of the presence of tall grasses and swamp reeds in and around these areas (Figure 7.1). This low percentage of visibility made it difficult to identify the presence of any surface artefacts.

7.1.2 EXPOSURE

Exposure refers to those parts of the surveyed landforms whose topsoil has visibly been removed due to naturally occurring erosion or man-made disturbances. Usually expressed as a percentage of the total land surface, it is a theory predicting the nature of geomorphological change (DECCW 2010c). Areas of exposure resulted in an increase in visibility to between 80 and 100% in some parts of the study area (e.g. Figure 7.8). These areas were centred around the extensive disturbance related to farming activities and the homesteads. These included the sides of the bitumen and dirt road along the central crest which connect the two Campbell houses, the cleared areas around the mature fig tree to the south of the main house, the circular dirt track in the work yard south of the red building and the dirt track along the western facing slope.

7.1.3 DISCUSSION OF RESULTS

The most significant disturbance in the study area is associated with the central crest landform. Here lies two homesteads, a work yard with multiple sheds that house large farming equipment, the cattle yards, and a level car park across the road from the main homestead. The central road along this landform is heavily utilised, as was observed during the survey in 2019 and then again during the testing in 2021. Residents of the homesteads, along with locals, use the private road to travel from Gerringong to Gerroa. It was also explained to us, that the relatively flat grassed area across the road form the main house is frequently used as a car park by various members of the community, including teachers at the nearby primary school.

Four landforms are present within the study area, these consist of the highly disturbed central crest, associated slopes along its eastern and western sides, sections of alluvial terraces at the footslopes and an alluvial floodplain on the eastern boundary, in association with the north to south aligned tributary of the Crooked River. At the time of undertaking the survey within the study area, the eastern portion of the study area was filled with tall reeds consisting of common reed (*Phragmites australis)*. Another tributary of the Crooked River is found adjacent to the western boundary of the study area. Only a small portion of the alluvial terrace sits within the study area, mostly associated with the footslopes either side of the crest. These areas were found to hold the most archaeological potential due to the results of the predictive model for the region. Despite the fact that no Aboriginal objects and/or sites were identified during the survey, these landforms are considered to be of moderate archaeological potential. The remainder of the study area is assessed as being of very low to low archaeological potential, based on the degree of disturbance on those areas.

A description of the survey results as they relate to the survey units and observed landforms within the study area can be seen in Table 7.1 and Table 7.2. Photos from the survey are provided in Figure 7.1 to Figure 7.9 while Figure 7.10 presents the results of the survey in terms of areas of archaeological potential.

Table 7.1 Survey coverage

Landform	Survey unit area (m²)	Visibility (%)	Exposure (%)	Effective coverage area (m²)	Effective coverage (%)
Crest	75,605	40	20	6,048.4	8
Slope	56,216	1	10	56.21	0.1
Terrace	8,886	1	0	0	0
Creekline/ Floodplain	2,513	1	0	0	0

Table 7.2 Landform summary

Landform	Landform area (m²)	Area effectively surveyed (m²)	% of landform effectively surveyed	No. sites	No. artefacts / features
Crest	75,605	6,048.4	8	0	0
Slope	56,216	56.21	0.1	0	0
Terrace	8,886	0	0	0	0
Creekline/ Floodplain	2,513	0	0	0	0

Figure 7.1 View towards the west of typical low GSV throughout the study area

Figure 7.2 View facing east of creek line and elevated terrace

Figure 7.3 View facing north of slope

Figure 7.4 View facing south west of floodplain and creek

Figure 7.5 View facing east of creek and terraces

Figure 7.6 View facing north of crest, southern fig tree disturbed areas

Figure 7.7 View facing west of dirt track, slope and floodplain from central crest

Figure 7.8 **View towards the north of disturbed cross section, showing one type of exposure**

Figure 7.9 **View towards the west of mature fig tree south of the main homestead**

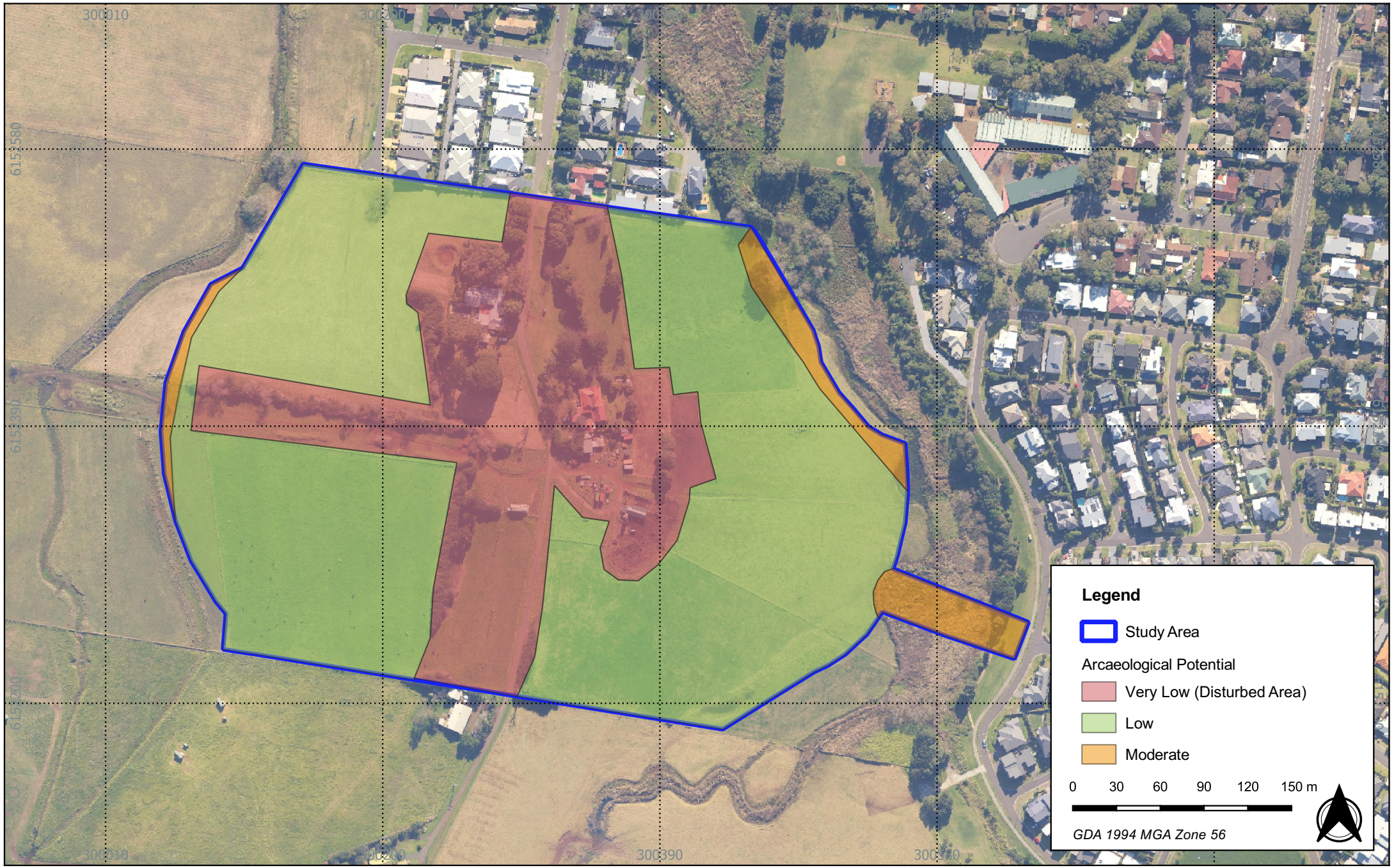

Figure 7.10 Survey results and assessed archaeological potential of the study area

21106 - 48 Campbell Street, Gerringong, NSW - ACHA

Source: NSW LPI Aerial

Drawn by: ARH Date: 2021-10-18

AUSTRAL ARCHAEOLOGY

7.2 TEST EXCAVATION RESULTS

Based upon the results of the archaeological survey conducted for the DD Austral recommended and completed archaeological test excavations within the study area, to test the different landforms and areas of very low, low and moderate archaeological potential. Archaeological testing was undertaken over 10 days between 1-4, 8-9 and 15-18 November 2021. This consisted of 7 archaeological testing locations as summarised in Table 7.3 below. The results from these areas are summarised within this section.

Table 7.3 Overview of Testing Areas

Testing Area #	Landform	# Test Pits	Excavated area (m^2)	Percentage of total landform (%)
TA1	Terrace and foot slopes associated to western tributary of Crooked River.	12	3	0.01
TA2	Slope connecting western terrace to central crest.	9	2.25	0.008
TA3	Top of central crest.	6	1.5	0.001
TA4	Top of Central crest, south of current homestead	2	0.5	0.0006
TA5	Sloping ridgeline south of central crest	5, including one $1m^2$ expansion	2	0.007
TA6	Slope connecting central crest to eastern tributary of Crooked River	6	1.5	0.005
TA7	Alluvial terrace above eastern tributary of Crooked River	12	3	0.01
Total		**53 including one $1m^2$ expansion**	**13.75**	**0.04**

7.2.1 TESTING AREA 1 (TA1)

TA1 consisted of a total of 12 test pits distributed approximately 10 metres apart on a single transect, covering the terrace and adjacent foot slopes associated with the western tributary of Crooked River and the area of moderate archaeological potential. Figure 7.20 shows the distribution of these test pits.

SOILS, DISTURBANCE AND FEATURES

Soils across TA1 were generally comprised of an A1 layer, transitioning into a A2 layer mottled with B Horizon layer. Test pits ranged from 40cm to 70cm in depth. Evidence of disturbance including a fragment of ceramic/porcelain, which was identified within the upper 30cm of the deposit. No archaeological features were identified. Excavation of test pits within TA1 ended when sterile B horizon was reached and/or when water table was reached in pits located close to creek.

A summary of soil characteristics across TA1 Test Pit 9 (TP9) is provided in Table 7.4 and Figure 7.11.

Table 7.4 Summary of soil characters within TA1 TP9

Soil Horizon	Soil Characteristics
A1 Horizon	**Depth:** 0-100 mm **Description:** Dark brown silty topsoil. Very humic. Gradual transition into underlying A2 horizon. Small grass roots present in upper 50 mm.
A2 Horizon/ B Horizon	**Depth:** 100-700 mm **Description:** Dark brown silty sediment with mottling of reddish orange clayey silt.

Figure 7.11 North section of test pit 09 showing typical soil profile within TA1

ARTEFACT ASSEMBLAGE

A small sub-surface assemblage consisting of 4 flaked stone artefacts was recovered from within TA1 from two artefact bearing test pit: TP9 (n=3) and TP11A (n=1). These artefacts were distributed between spits 3 to 6 (30-60 centimetres depth).

7.2.2 TESTING AREA 2 (TA2)

Testing within TA2 consisted of a total of 9 test pits distributed approximately 10 metres apart on a single transect covering the slope connecting the western terrace to the central crest, within an area of very low archaeological potential (due to very high disturbance levels). Figure 7.20 shows the distribution of these test pits.

SOILS, DISTURBANCE AND FEATURES

Soils across TA2 were generally comprised of an A1 layer, transitioning into a A2 layer and onto a B Horizon layer. Test pits ranged from 40cm to 100cm in depth. The transition between layers was often diffuse with mottling evident between layers. Evidence of disturbance including a fragment of ceramic/porcelain, and pieces of plastic and string were identified within the deposit. No archaeological features were identified. Excavation of test pits within TA2 ended when sterile B horizon was reached.

A summary of soil characteristics across TA2 TP1 is provided in Table 7.4 and Figure 7.11.

Table 7.5 Summary of soil characters within TA2 TP1

Soil Horizon	Soil Characteristics
A1 Horizon	**Depth:** 0-300 mm **Description:** Dark brown silty topsoil. Very humic and quite compact. Gradual transition into underlying A2 horizon associated with some mottling between the two layers. Small grass roots present in upper 50 mm. pH =7.
A2 Horizon	**Depth:** 300-600 mm **Description:** Fine grained loose reddish-brown silty clay. Clay content increasing with depth. Munsell = 10R 4/10. pH=3.

Soil Horizon	Soil Characteristics
B Horizon	**Depth:** 600 mm **Description:** High clay content. Compact.

Figure 7.12 North section of test pit 1 showing typical soil profile within TA2

ARTEFACT ASSEMBLAGE

No Aboriginal objects were recovered from test pits within TA2.

7.2.3 TESTING AREA 3

Testing within TA3 consisted of a total of 6 test pits distributed approximately 10 metres apart on a single transect covering the top of the central crest and an area of very low archaeological potential (due to very high disturbance levels). Figure 7.20 shows the distribution of these test pits.

SOILS, DISTURBANCE AND FEATURES

Soils across TA3 were generally comprised of a disturbed layer overlying a disturbed A1 layer, transitioning into a A2 layer and then onto a B Horizon layer. Test pits ranged from 50cm to 70cm in depth. Transitions between the natural layers were relatively diffuse with a relatively clear boundary between the top disturbance layer and the underlying A1 horizon. Evidence of disturbance within TA3 was relatively high including fragments of blue metal and plastic identified within the upper 30cm of the deposit. No archaeological features were identified. Excavation of test pits within TA3 ended when sterile B horizon was reached.

A summary of soil characteristics across TA3 TP4 is provided in Table 7.6 and Figure 7.13.

Table 7.6 Summary of soil characters within TA3 TP4

Soil Horizon	Soil Characteristics
Disturbance layer	**Depth:** 0-100 mm **Description:** Disturbed layer consisting of dark reddish-brown sediment with introduced material inclusions such as blue metal / slag relating to construction/demolition activities within the area. High context of grass roots (75%) within upper 50mm. Munsell = 2.5YR 5/4

Soil Horizon	Soil Characteristics
A1 Horizon	**Depth:** 100-200 mm **Description:** Dark reddish-brown fine silty clay. Small grass roots present. Inclusions of blue metal, plastic and carbon present (~10%). Munsell = 2.5 YR 4/8
A2 Horizon	**Depth:** 200-500 mm **Description:** Reddish-brown fine silty clay. Clay content increasing with depth. Sub-angular pebbles present. Munsell = 2.5 YR 5/8
B Horizon	**Depth:** 500 mm **Description:** Dark reddish-brown clay.

Figure 7.13 North section of test pit 4 showing typical soil profile within TA3

ARTEFACT ASSEMBLAGE

A single sub-surface artefact was recovered from TA3 from TP3 spit 4 below the layers of disturbance.

7.2.4 TESTING AREA 4

Testing within TA4 consisted of a total of 2 test pits distributed approximately 10 metres apart on a single transect covering the top of the central crest, south of the current homestead and in an area of very low archaeological potential (due to very high disturbance levels). Figure 7.20 shows the distribution of these test pits.

SOILS, DISTURBANCE AND FEATURES

Soils across TA4 were generally comprised of an A1 layer, transitioning into a A2 layer mottled with B Horizon layer. Test pits were 50cm in depth. A high level of disturbance was evident in both test pits with introduced materials including fragments of bitumen and construction material relating to the working shed and adjacent road present within the deposit. No archaeological features were identified. Excavation of test pits within TA4 ended when sterile B horizon was reached and/or based on a high degree of disturbance present.

A summary of soil characteristics across TA4 TP1 is provided in Table 7.4 and Figure 7.11.

Table 7.7 Summary of soil characters within TA4 TP1

Soil Horizon	Soil Characteristics
A1 Horizon	**Depth:** 0-300 mm **Description:** Dark brown silty topsoil mixed with angular gravel inclusions (~50%). Small grass roots present in upper 50 mm.
A2 Horizon	**Depth:** 300-450 mm **Description:** Reddish-brown silty clay with decreasing levels if angular gravel inclusions (<10%). Clay content increasing with depth.
B Horizon	**Depth:** 450-500 mm **Description:** Reddish-brown silty clay. Very compact and no inclusions.

Figure 7.14 North section of test pit 1 showing typical soil profile within TA4

ARTEFACT ASSEMBLAGE

No Aboriginal objects were recovered from test pits within TA4.

7.2.5 TESTING AREA 5

Testing within TA5 consisted of a total of 5 test pits (including one 1 m² expansion pit) distributed approximately 10 metres apart on a single transect covering the sloping ridgeline south of the central crest and in an area of very low archaeological potential (due to very high disturbance levels). Figure 7.20 shows the distribution of these test pits.

SOILS, DISTURBANCE AND FEATURES

Soils across TA5 were generally comprised of a disturbed A1 layer, transitioning into a disturbed A2 layer with gravel inclusions and then onto a B Horizon layer. Test pits ranged from 40cm to 60cm in depth. Evidence of disturbance including fragments of ceramic/porcelain, gravels, blue metal/ slag and burnt material and roots identified within the deposit. A potential feature was identified at a depth of ~45cm in TP2 consisting of an increased concentration of burnt material/roots. Expansion of this test pit to a 1 m² excavation pit, however, revealed the potential

feature to be associated with modern disturbance relating to smelting within the area. No additional features were noted. Excavation of test pits within TA5 ended when sterile B horizon was reached.

A summary of soil characteristics across TA5 TP2 is provided in Table 7.4 and Figure 7.11.

Table 7.8 Summary of soil characters within TA5 TP2

Soil Horizon	Soil Characteristics
A1 Horizon	**Depth:** 0-100 mm **Description:** Dark brown silty topsoil. Very humic. Gradual transition into underlying A2 horizon. Small grass roots present in upper 50 mm. pH = 7. Munsell = 2.5YR 6/1
A2 Horizon	**Depth:** 100-500 mm **Description:** Greyish-brown silty sediment with mottling of maroon clayey silt. Clay content increasing with depth. Small angular gravels, slag and carbon fragments present within deposit but concentrated at a depth of ~450 mm. pH = 7. Munsell = 2.5YR 5/6
B Horizon	**Depth:** 500-600 mm **Description:** Dark reddish-brown compact clay. pH = 7. Munsell = 7.5YR 6/8

Figure 7.15 North section of test pit 2 showing typical soil profile within TA5

ARTEFACT ASSEMBLAGE

No Aboriginal objects were recovered from test pits within TA5.

7.2.6 TESTING AREA 6

Testing within TA6 consisted of a total of 6 test pits distributed approximately 10 metres apart on a single transect covering the slope connecting the central crest to the eastern tributary of Crooked River within the area of low archaeological potential. Figure 7.20 shows the distribution of these test pits.

SOILS, DISTURBANCE AND FEATURES

Soils across TA6 were generally comprised of an A1 layer, transitioning into a A2 layer characterised by increasing clay content and compaction with depth, and then a compact B Horizon

layer. The transition between layers was diffuse. Test pits ranged from 60 centimetres to 70 centimetres in depth. Evidence of disturbance was limited to bioturbation within the upper 20 centimetres of the deposit. No archaeological features were identified. Excavation of test pits within TA6 ended when sterile B horizon was reached.

A summary of soil characteristics across TA6 TP3 is provided in Table 7.4 and Figure 7.11.

Table 7.9 Summary of soil characters within TA6 TP3

Soil Horizon	Soil Characteristics
A1 Horizon	**Depth:** 0-200 mm **Description:** Dark brown silty topsoil. Very humic with evidence of bioturbation. Gradual transition into underlying A2 horizon. Small grass roots present in upper 50 mm.
A2 Horizon	**Depth:** 200-500 mm **Description:** Dark brown silty sediment with increasing clay content and compaction with depth.
B Horizon	**Depth:** 500-700 mm **Description:** Dark reddish-brown silty clay. Minor sub-circular rock inclusions (<10%).

Figure 7.16 North section of test pit 3 showing typical soil profile within TA6

ARTEFACT ASSEMBLAGE

No Aboriginal objects were recovered from test pits within TA6.

7.2.7 TESTING AREA 7

Testing within TA7 consisted of a total of 12 test pits distributed approximately 10 metres apart on a single transect covering the alluvial terrace above the eastern tributary of Crooked River within an area of moderate archaeological potential. Figure 7.20 shows the distribution of these test pits.

SOILS, DISTURBANCE AND FEATURES

Soils across TA7 generally comprised of an A1 layer, gradually transitioning into a A2 layer which overlies a B Horizon layer. The transition between layers is diffuse and generally marked by an

increase in clay content. Test pits ranged from 50 centimetres to 70 centimetres in depth. No archaeological features were identified. Excavation of test pits within TA7 ended when sterile B horizon was reached and/or when water table was reached in pits located close to the creek.

A summary of soil characteristics across TA7 TP2 is provided in Table 7.4 and Figure 7.11.

Table 7.10 Summary of soil characters within TA7 TP2

Soil Horizon	Soil Characteristics
A1 Horizon	**Depth:** 0-100 mm **Description:** Dark brown silty topsoil. Very humic. Gradual transition into underlying A2 horizon. Small grass roots present in upper 50 mm.
A2 Horizon	**Depth:** 100-400 mm **Description:** Dark reddish-brown silty sediment. Clay content and compaction increasing with depth. No inclusions. High moisture content in sediment.
B Horizon	**Depth:** 400-700 mm **Description:** Dark reddish-brown compact silty clay. High moisture content in sediment.

Figure 7.17 North section of test pit 2 showing typical soil profile within TA7

ARTEFACT ASSEMBLAGE

No Aboriginal objects were recovered from test pits within TA7.

7.3 LITHICS ANALYSIS

This lithic analysis aims to provide details of the stone material identified during the test excavation using standard terminology for artefact analysis taken from Holdaway & Stern (2013) and McCarthy (1976). Detailed artefact analysis entailed recording several characteristics for each artefact. Stone artefact raw materials were examined through a hand lens (x10 magnification). Each artefact was recorded in database form, suitable for comparative analysis on a local and regional basis. The terminology used in the analysis is defined in Table 7.11.

Table 7.11 Terminology used in the identification of stone tools

Analytical Terms	Definition
Angular fragment / Debitage	A piece of debris exhibiting evidence of knapping but lacking key diagnostic traits (e.g. platform, termination, bulb of percussion)
Backing	Abrupt retouch normally found on one lateral margin of a tool and opposite the working edge.
Bladelet	A small (generally 8-12mm in width) example of a blade; a cutting or scraping tool that is prepared through retouch of an initial flake (blade blank) at least twice as long as it is wide.
Core	A nodule or block of siliceous rock from which sharp-edged slivers of stone are struck (generally with a hammerstone).
Cortex	The weathered outer layer of rock, differing in chemical and optical properties to the unweathered interior.
Distal flake	The termination end of a partial (broken) flake.
Dorsal surface	Outer surface of a flake (former surface of the core) characterised by cortex and/or negative concavities (flake scars) and ridges denoting prior removal of flakes.
Flake	A sliver of stone struck from a core exhibiting characteristic traits of force fracture.
Knapping	The process of fracturing flakes of stone from a core
Lateral margin	Left and right edges of a flake (platform oriented upward when viewing the ventral surface and distal end oriented upward for the dorsal surface).
Platform	Planar surface marking the location from which the flake was struck from the core.
Primary flake	Initial flake struck from a weathered cobble with a dorsal surface covered in cortex and lacking prior flake scars.
Proximal flake	The platform end of a partial (broken) flake.
Retouch	Alteration of the cutting edges of a flake or tool to refine sharpness, shape, angle or strength.
Termination	End of a flake opposite the platform denoting the place the force applied by the hammerstone exited the core.
Tertiary flake	Flake lacking dorsal or platform cortex indicating a high degree of prior reduction of the core from which it was knapped.
Ventral surface	Inner surface of a flake originally attached to a core exhibiting one or more traits of conchoidal fracture including a bulb of percussion, bulbar scar and ripple marks.

7.3.1 RESULTS OF THE ANALYSIS

The artefacts recovered during the test excavation program within the study area underwent a detailed lithics analysis by Marika Low (Lithics Specialist, Austral). A copy of the artefact catalogue is provided in Appendix D. The distribution of artefacts within the test pits is presented in Table 7.12.

The test excavation resulted in the recovery of a very low-density sub-surface assemblage consisting of 5 flaked stone artefacts. Artefacts occur mostly in association with Testing Area 1 (TA1) and Test Pit 9 (TP9). Artefacts were distributed between spit 3 to 6 (Table 7.12). The small assemblage is comprised of complete flakes and medial flake fragments which are representative of general debitage (Table 7.13).

Table 7.12 Distribution of artefacts within test pits

Testing Area	Test Pit	Spit	Count	%
TA1	TP9	5	1	20%
		6	2	40%
	TP11A	3	1	20%
TA3	TP3	4	1	20%
Total			**5**	**100%**

Table 7.13 Assemblage composition – artefact types

Artefact class	Count	%
Complete flake	3	60%
Medial flake	2	40%
Total	**5**	**100%**

The assemblage is dominated by fine grained silicious (FGS) raw material (n=3, 60%) with volcanic and indurated mudstone-tuff (IMTUFF) forming the remaining raw materials present (Table 7.14). Artefacts from TA1, TP9, spits 5 and 6 are of the same FGS material and likely result from the same discard event. Water-rolled cortex present on AFT#002 indicates that the FGS material was sourced from a fluvial context such as a riverbed (Table 7.14).

The condition of the artefacts was recorded (as either normal or rounded) to explore the possibility of post-deposition processes on assemblage formation. The results indicate that the FGS artefacts in TP9 have undergone some post-depositional modifications (Table 7.15). The edges of these artefacts are rounded and smoothed suggesting post-depositional movement/rolling of artefacts which has resulted in the dulling of their edges.

A photo of the artefacts recovered from the study area is presented in Figure 7.18 and Figure 7.19.

Table 7.14 Assemblage composition – raw materials

Raw material	Spits	Count	%
FGS	5, 6	3	60%
Volcanic	3	1	20%
IMTUFF	4	1	20%
Total		**5**	**100%**

Table 7.15 Artefact catalogue summary and condition

AFT#	Context	Class	Raw material	Cortex amount	Cortex type	Post-depositional processes
001	TA1, TP9, spit 5	Complete flake	FGS	0	NA	Rounded
002	TA1, TP9, spit 6	Complete flake	FGS	1-25%	Water-rolled	Rounded
003	TA1, TP9, spit 6	Complete flake	FGS	NA	NA	Rounded
004	TA1, TP11A, spit 3	Medial flake	Volcanic	0	NA	Normal
005	TA3, TP3, spit 4	Medial flake	IMTUFF	NA	NA	Normal

7.3.2 ASSEMBLAGE INTERPRETATION

Based on the assemblage characteristics (i.e., absence of cores, retouched or utilized artefacts and lack of evidence of flaking debris) the site was not a focus of occupation or use. The small low-density artefact assemblage likely results from casual discard and is indicative of general background scatter.

Figure 7.18 Ventral surface of artefacts

Figure 7.19 Dorsal surface of artefacts

7.4 IDENTIFIED ABORIGINAL SITES

An archaeological survey of the study area was completed on 13 November 2019 and archaeological test excavations were completed between 1 November 2021 and 18 November 2021. A total of 2 Aboriginal heritage sites were identified as part of the archaeological testing program. The sites identified as part of this investigation are outlined in Table 7.16.

Table 7.16 Test areas and identified sites

AHIMS No.	Site name	Feature(s)	Testing area	Landform
52-5-1018	Campbell Street Artefact 1	Artefact – sub-surface artefact scatter	TA1	Alluvial terrace and adjacent foot slopes
52-5-1019	Campbell Street Artefact 2	Artefact – sub-surface isolated artefact	TA3	Crest

CAMPBELL STREET ARTEFACT 1 (AHIMS #52-5-1018)

Site type	Artefact – sub-surface artefact scatter
Centroid	GDA 94 Zone 56 300004 m E and 6152369 m N
Site Extent	60 m X 20 m

Campbell Street Artefact 1 (AHIMS #52-5-1018) is situated in an alluvial terrace and adjacent foot slope associated with the western tributary of Crooked River within the study area. The site consists of a low-density sub-surface artefact scatter comprised of four stone artefacts which were recovered from within TA1, from two artefact bearing test pits including TP9 and TP11A. These artefacts were distributed between spit 3 and 6 (i.e. ~30-60cm depth). The small assemblage consists of three complete flakes manufactured from FGS material and a single medial flake fragment manufactured from volcanic material. The edges of the FGS artefacts are rounded and smoothed suggesting post-depositional movement/rolling of artefacts which has resulted in the dulling of their edges. Based on the assemblage characteristics (i.e., absence of cores, retouched or utilized artefacts and lack of evidence of flaking debris) the site was not a focus of occupation or use. The small low-density artefact assemblage likely results from casual discard and is indicative of general background scatter.

CAMPBELL STREET ARTEFACT 2 (AHIMS 52-5-1019)

Site type	Artefact – sub-surface isolated artefact
Centroid	GDA 94 Zone 56 300305 m E and 6152467 m N
Site Extent	1 m X 1 m

Campbell Street Artefact 2 (AHIMS #52-5-1019) is situated in association with the central crest within the study area. The site consists of a single sub-surface isolated artefact recovered from TA3 from TP3 spit 4 (i.e. ~40cm depth). The artefact consists of a medial fragment of a IMTUFF flake. The isolated artefact likely results from casual discard and is indicative of general background scatter.

Figure 7.20 Test excavation results of the study area

21106 - 48 Campbell Street, Gerringong NSW

Source: NSW LPI Aerial

Drawn by: ARH Date: 2022-03-15

AUSTRAL ARCHAEOLOGY

8 ANALYSIS AND DISCUSSION

The following section presents an analysis and discussion of the results of the archaeological investigation, with an emphasis on the archaeological testing program.

8.1 SITE INTEGRITY AND EXTENT

Based on the results of the testing program, 2 Aboriginal heritage sites are identified as occurring within the study area, despite the significant levels of disturbance that have occurred throughout the landscape relating to general clearing of vegetation, agricultural practices and the construction of buildings and associated infrastructure within the study area. The test excavations, for instance, confirmed that the upper 30-40cm of deposit across much of the study area is highly disturbed. Artefacts from the two sites were recovered from below this level of disturbance from depths of between ~30-60cm (Table 8.1). Evidence for natural post-depositional disturbance was also noted particularly in association with the areas in proximity to the drainage lines. Rounding on most artefacts associated with site 'Campbell Street Artefact 1' (AHIMS #52-5-1018), for example, indicates that post-depositional movement/rolling of artefacts has likely occurred resulting in the dulling of their edges. This is perhaps not surprising considering the location of the site within an alluvial terrace that is likely prone to flooding.

Nevertheless, the fact that the recovery of artefacts during the testing program was restricted to either one or two test pits within only two testing areas across the study area indicates a refined small extent for the site boundaries. Although both sites are likely the result of casual discard indicative of general background scatter, their location in association with two different landforms (alluvial terrace and crest) separated by approximately 200 metres and their characterisation with different raw material compositions resulted in them being recorded as two separate sites, the features of which are summarised Section 8.2 below.

Table 8.1 Analysis of artefacts per site by spit

Site / AHIMS No.	Spit Number							Total
	1	2	3	4	5	6	7	
Campbell Street Artefact 1 (AHIMS #52-5-1018)	-	-	1	-	1	2	-	4
Campbell Street Artefact 2 (AHIMS #52-5-1019)	-	-	-	1	-	-	-	1

8.2 THE ARTEACT ASSEMBLAGE

A summary of the assemblage characteristics for the two sites identified during the archaeological testing program is provided in Table 8.2 to Table 8.4 below.

Table 8.2 Analysis of raw material types per site

Site / AHIMS No.	Raw materials			Total
	FGS	Volcanic	IMTUFF	
Campbell Street Artefact 1 (AHIMS #52-5-1018)	3	1	-	4
Campbell Street Artefact 2 (AHIMS #52-5-1019)	-	-	1	1

Table 8.3 Artefact density per site

Site / AHIMS No.	Total artefacts	Total area (m^2)	Highest No. artefacts per pit	Artefact density (per m^2)
Campbell Street Artefact 1 (AHIMS #52-5-1018)	4	3.25	3	1.23
Campbell Street Artefact 2 (AHIMS #52-5-1019)	1	1.5	1	0.66

Table 8.4 Analysis of artefact type by site

Artefact Type	Artefact type		Total
	Complete flake	Medial flake	
Campbell Street Artefact 1 (AHIMS #52-5-1018)	3	1	4
Campbell Street Artefact 2 (AHIMS #52-5-1019)	-	1	1

8.3 ARCHAEOLOGICAL ANALYSIS

The archaeological investigation of the study area resulted in the identification of two sites, the types, and characteristics of which, are consistent with the predictive model developed for the project. Consistent with the predictive model, for instance, the following statements are made based on the results of the assessment:

- The two sites in the study area are of a form that is common in the region (i.e., Artefact sites) including a low-density sub-surface scatter (Campbell Street Artefact 1; AHIMS #52-5-1018) and a sub-surface isolated artefact (Campbell Street Artefact 2; AHIMS #52-5-1019).
- The artefact types (complete and broken flakes) and the raw materials used to manufacture them (i.e., FGS, volcanic and IMTUFF) at the two sites are typical of assemblages in the region.

The average artefact density associated with the two sites (

- Table 8.3) is comparable to other low-density sites assessed in the region as outlined in **Error! Reference source not found.**.
- Disturbance relating to land clearance, building construction, farming, and limiting factors including grass coverage and areas of dense vegetation has resulted in a low GSV across the study area and has impacted the integrity of the upper ~30-40 cm of deposit.
- Based on the assemblage characteristics (i.e., absence of cores, retouched or utilized artefacts and lack of evidence of flaking debris) the site was not a focus of occupation or use. The small low-density artefact assemblages likely result from casual discard and is indicative of general background scatter.

A reassessment of archaeological sensitivity is outlined in Figure 8.1.

Table 8.5 Average artefact density from comparable sites in the region

Site/s	Average artefact density	Reference
PASA 32 (AHIMS #52-5-0571) and PASA 33 (AHIMS #52-5-0572)	0.76 artefacts / metre2	Navin Officer 2010, p.25
PASA 37 (AHIMS #52-5-0575)	5.72 artefacts / metre2	Navin Officer 2010, p.26
PASA 38 (AHIMS #52-5-0576)	3.36 artefacts / metre2	Navin Officer 2010, p.29
PASA 39 (AHIMS #52-5-0577)	2.8 artefacts / metre2	Navin Officer 2010, p.33

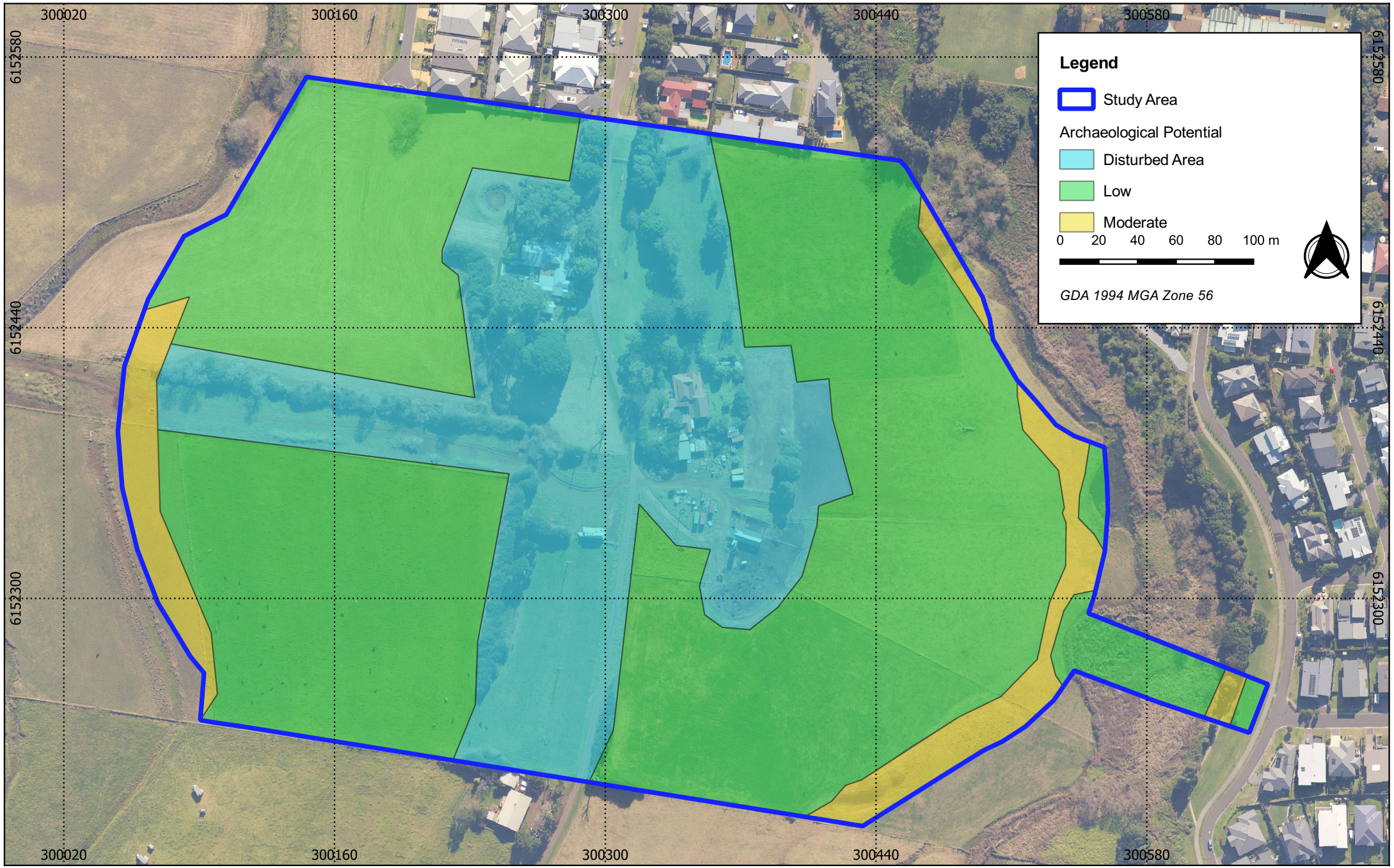

Figure 8.1 - Revised archaeological potential mapping

21106 - 48 Campbell Street, Gerringong NSW

Source: NSW LPI Aerial

Drawn by: ARH Date: 2022-03-15

AUSTRAL ARCHAEOLOGY

9 CULTURAL HEIRTAGE VALUES

An assessment of significance seeks to determine and establish the importance or value that a place, site or item may have to the community at large. The concept of cultural significance is intrinsically connected to the physical fabric of the item or place, its location, setting and relationship with other items in its surrounds. The assessment of cultural significance is ideally a holistic approach that draws upon the response these factors evoke from the community.

9.1 BASIS FOR THE ASSESSMENT

The significance values provided in the Australia ICOMOS *Charter for the Conservation of Places of Cultural Significance* (the Burra Charter) are considered to be the best practice heritage management guidelines in Australia (Australia ICOMOS 2013a). The Burra Charter defines cultural significance as:

> *"…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." (Australia ICOMOS 2013a, p.2)*

The Burra Charter significance values outlined in Table 9.1; these are frequently adopted by cultural heritage managers and government agencies as a framework for a more holistic assessment of significance.

Table 9.1 Definitions of Burra Charter significance values (Australia ICOMOS 2013b)

Value	Definition
Aesthetic	Refers to the sensory and perceptual experience of a place. That is how a person responds to visual and non-visual aspects such as sounds, smells and other factors having a strong impact on human thoughts, feelings and attitudes. Aesthetic qualities may include the concept of beauty and formal aesthetic ideals. Expressions of aesthetics are culturally influenced.
Historic	Refers to all aspects of history. For example, the history of aesthetics, art and architecture, science, spirituality and society. It therefore often underlies other values. A place may have historic value because it has influenced, or has been influenced by, an historic event, phase, movement or activity, person or group of people. It may be the site of an important event. For any place the significance will be greater where the evidence of the association or event survives at the place, or where the setting is substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of such change or absence of evidence.
Scientific	Refers to the information content of a place and its ability to reveal more about an aspect of the past through examination or investigation of the place, including the use of archaeological techniques. The relative scientific value of a place is likely to depend on the importance of the information or data involved, on its rarity, quality or representativeness, and its potential to contribute further important information about the place itself or a type or class of place or to address important research questions.
Social	Refers to the associations that a place has for a particular community or cultural group and the social or cultural meanings that it holds for them.
Spiritual	Refers to the intangible values and meanings embodied in or evoked by a place which give it importance in the spiritual identity, or the traditional knowledge, art and practices of a cultural group. Spiritual value may also be reflected in the intensity of aesthetic and emotional responses or community associations and be expressed through cultural practices and related places. The qualities of the place may inspire a strong and/or spontaneous emotional or metaphysical response in people, expanding their understanding of their place, purpose and obligations in the world, particularly in relation to the spiritual realm. The term spiritual value was recognised as a separate value in the Burra Charter, 1999. It is still included in the definition of social value in the Commonwealth and most state jurisdictions. Spiritual values may be interdependent on the social values and physical properties of a place.

In addition to the Burra Charter significance values, other criteria and guidelines have been formulated by other government agencies and bodies in NSW to assess the significance of heritage places in NSW. Of particular relevance to this assessment are the guidelines prepared by the Australian Heritage Council and the Department of the Environment, Water, Heritage and the Arts (DEWHA), and Heritage NSW (Australian Heritage Council & DEWHA 2009, DECCW 2010c, OEH 2011, NSW Heritage Office 2001).

The Guide (OEH 2011, p.10) states that the following criteria from the NSW Heritage Office (2001, p.9) should be considered:

- **Social value:** Does the subject area have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons?
- **Historic value:** Is the subject area important to the cultural or natural history of the local area and/or region and/or state?
- **Scientific value:** Does the subject area have potential to yield information that will contribute to an understanding of the cultural or natural history of the local area and/or region and/or state?
- **Aesthetic value:** Is the subject area important in demonstrating aesthetic characteristics in the local area and/or region and/or state?

OEH (2011, p.10) states that when considering the Burra Charter criteria, a grading system must be employed. Austral will use the following grading system to assess the cultural values of the study area and its constituent features. These are outlined in Table 9.2.

Table 9.2 Gradings used to assess the cultural values of the study area

Grading	Definition
Exceptional	The study area is considered to have rare or outstanding significance values against this criterion. The significance values are likely to be relevant at a state or national level.
High	The study area is considered to possess considerable significant values against this criterion. The significance values are likely to be very important at a local or state level.
Moderate	The study area is considered to have significance values against this criterion; these are likely to have limited heritage value but may contribute to broader significance values at a local or State level.
Little	The study area is considered to have little or no significance values against this criterion.

9.2 ASSESSMENT OF SIGNIFICANCE

The following section addresses the Burra Charter significance values with reference to the overall study area.

9.2.1 AESTHETIC SIGNIFICANCE VALUES

Aesthetic values refer to the sensory, scenic, architectural and creative aspects of the place. These values may be related to the landscape and are often closely associated with social and cultural values.

The study area has been heavily modified through the clearing of vegetation and its use for grazing and agricultural practices. The landscape of the study area is characterised by a central crest landform surrounded on either side by waning slopes which are situated above elevated terraces and a floodplain associated with 2 first order tributaries of the Crooked River. While an elevated landform (i.e. crest) exists within the study area, it does not form a prominent landform or focal point within the broader landscape that would have attracted intensive occupation. Much of the study area is characterised by lower lying landforms (i.e. footslopes, alluvial terraces, creekline/floodplain etc.) with no salient features or identifiable values that would represent any significant aesthetic values.

Based on this assessment, the study area is considered to have **low** aesthetic significance values.

9.2.2 HISTORIC SIGNIFICANCE VALUES

The assessment of historic values refers to associations with places associated with Aboriginal history. Historic values may not be limited to physical values but may relate to intangible elements that relate to memories, stories or experiences.

The study area has been extensively cleared of vegetation as a result of European land-use practices associated with grazing and agriculture. An historical aerial of the wider landscape covering the current study area and dating to 1970 demonstrates that extensive clearing had occurred by this time (Figure 3.4). The study area itself is not associated with any prominent historical figures and/or events.

Based on this assessment, the study area is considered to have **low** historic significance values.

9.2.3 SCIENTIFIC SIGNIFICANCE VALUES

Scientific significance generally relates to the ability of archaeological objects or sites to answer research questions that are important to the understanding of the past lifeways of Aboriginal people. Australia ICOMOS (2013b, p.5) suggests that to appreciate scientific value, that the following question is asked: "*Would further investigation of the place have the potential to reveal substantial new information and new understandings about people, places, processes or practices which are not available from other sources?*".

In addition to the above criteria, The Guide (OEH 2011, p.10) also suggests that consideration is given to the Australian Heritage Council and DEWHA (2009) criteria, which are particularly useful when considering scientific potential:

- **Research potential:** does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- **Representativeness:** how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- **Rarity:** is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- **Education potential:** does the subject area contain teaching sites or sites that might have teaching potential?

An assessment of the scientific significance of the Aboriginal sites located within the study area is outlined in Table 9.3

Table 9.3 Scientific significance of Aboriginal sites in the study area

Site name	AHIMS No.	Assessment of significance	Grading
Campbell Street Artefact 1	52-5-1018	The site consists of a low-density sub-surface artefact scatter comprised of four stone artefacts recovered from a depth of ~30-60cm. The artefacts include 3 complete flakes manufactured from FGS and a medial fragment of a flake manufactured from volcanic material. Rounding of the edge on three of the artefacts indicates post-depositional movement of artefacts likely associated with their context in an alluvial terrace. The results of the testing program indicate a surface artefact density of 1.23 artefacts/m². This site type and the patterning of raw materials and artefact types is common within the region. Based on its context, the site does not appear to represent in-situ occupation and is indicative of low-density background scatter.	Low
Campbell Street Artefact 2	52-5-1019	The site consists of a single sub-surface isolated artefact in the form of a medial flake manufactured from IMTUFF recovered from a depth of ~40cm. This site type and the patterning of raw materials and artefact types is common within the region. Based on its context, the site does not appear to represent in-situ occupation and is indicative of low-density background scatter.	Low

9.2.4 SOCIAL AND SPIRITUAL SIGNIFICANCE VALUES

As social and spiritual significance are interdependent, Austral has undertaken a combined assessment of these values. The Consultation Requirements specify that the social or cultural values of a place can only be identified through consultation with Aboriginal people.

The social and spiritual significance of the sites within the study area will be updated based on comments received during Stage 4 of the consultation process.

9.3 STATEMENT OF SIGNIFICANCE

Statements of significance for identified Aboriginal sites within the study area are presented in Table 9.4. The statements of significance have been formulated using the Burra Charter significance values and relevant NSW guidelines (DECCW 2010c, OEH 2011, Australia ICOMOS 2013a).

Table 9.4 Statements of significance for Aboriginal sites in the study area

Site name	Statement of significance
Campbell Street Artefact 1 (AHIMS #52-5-1018)	Campbell Street Artefact 1 is a low-density sub-surface artefact scatter consisting of four stone artefacts. The site type (low-density artefact scatter) and its contents (complete and broken flakes mostly of FGS and volcanic material) is well represented in the region. The site is highly disturbed and the sub-surface deposits are likely not to be in-situ. Overall, the site has limited potential to provide additional information about Aboriginal lifeways beyond general information regarding basic site type patterning associated with the broader landscape.
Campbell Street Artefact 2 (AHIMS ID 52-5-1019)	Campbell Street Artefact 2 is a sub-surface isolated artefact consisting of a broken IMTUFF medial flake recovered from a highly disturbed context. The site type (isolated artefact) and its contents (a broken IMTUFF flake) is well represented in the region. The site is highly disturbed and is likely not to be in-situ. Overall, the site has limited potential to provide additional information about Aboriginal lifeways beyond general information regarding basic site type patterning associated with the broader landscape.

Heritage NSW specifies the importance of considering cultural landscapes when determining and assessing Aboriginal cultural values. The principle behind this is that '*For Aboriginal people, the significance of individual features is derived from their inter-relatedness within the cultural landscape. This means features cannot be assessed in isolation and any assessment must consider the feature and its associations in a holistic manner"* (DECCW 2010d).

The results of the archaeological investigations undertaken as part of this ACHA indicate that the study area is highly disturbed due to previous land clearance, building construction and farming practices which have impacted the integrity of the upper ~30-40 cm of deposit. Despite this disturbance, a low density of sub-surface artefacts was recovered from depths of ~30-60 cm in two parts of the study area, including the alluvial terrace associated with the western tributary of Crooked River and the central crest landform. Based on the assemblage characteristics (i.e., absence of cores, retouched or utilized artefacts and lack of evidence of flaking debris) the study area was not a focus of occupation or use. The small low-density artefact assemblage recovered from the two sites within the study area is likely the result of casual discard and is indicative of general background scatter.

The site types found within the study area (i.e., Artefact sites) are well-represented in the region with numerous similar sites present. Such sites are indicative of sporadic Aboriginal use of the landscape surrounding Crooked River and its associated tributaries. Due to the low density of the assemblage, however, and the lack of distinctive and/or unique artefact types (retouched artefacts and cores), the archaeology associated with the study area is of limited scientific (archaeological) significance possessing limited potential to provide additional information about Aboriginal lifeways of the local area.

10 IMPACT ASSESSMENT

This section outlines, according to Heritage NSW guidelines, the potential harm that the proposed activity may have on identified Aboriginal objects and places within the study area (DECCW 2010c, OEH 2011).

10.1 LAND USE HISTORY

The study area is found within an area under constant artificial change. A summary of past land use practices within the study area is provided in Table 10.1 below.

Extensive clearing and use of the property for agricultural practices has occurred at least from the 1970s. During the time that the area was in used as pastoral land the ground would have been subject to ploughing and animal grazing. Moderate to high levels of disturbance relating to the clearing of native vegetation and the construction of dwellings and associated infrastructure will have impacted the original soil profile across much of the study area resulting in the loss of topsoil associated with crests and slopes. The test excavations confirmed, for instance, that the upper 30-40cm of deposit across much of the study area is highly disturbed as a result of this past land use history. Furthermore, evidence for natural post-depositional disturbance was also noted particularly in association with the areas in proximity to the drainage lines. Rounding on most artefacts associated with site 'Campbell Street Artefact 1' (AHIMS #52-5-1018), for example, indicates that post-depositional movement/rolling of artefacts has likely occurred resulting in the dulling of their edges. This is perhaps not surprising considering the location of the site within an alluvial terrace that is likely prone to flooding.

Despite the overall low GSV across the study area and the high level of disturbance, a small number of artefacts (n=5) were recovered from depths of between ~30-60cm. No artefactual material was recovered from below a depth of 60cm.

Their distribution in association with two different landforms (alluvial terrace and crest) separated by approximately 200 metres and their characterisation with different raw material compositions resulted in them being recorded as two separate sites including:

- 'Campbell Street Artefact 1' (AHIMS #52-5-1018), a low-density sub-surface scatter located in association with the western alluvial terrace; and
- 'Campbell Street Artefact 2' (AHIMS #52-5-1019), a sub-surface isolated artefact recovered from a disturbed context in association with the central crest.

Based on the context of both sites (i.e., their association with two highly disturbed landforms) the artefacts do not appear to represent in-situ occupation. Nevertheless, the artefacts are likely the result of casual discard indicative of general background scatter.

Table 10.1 Summary of past land use within the study area, and the potential impacts on archaeological resources

Past land uses	Potential impacts on archaeological resources
Historical land clearance	Loss of native trees, shrubs and grasses and livestock grazing would lead to the potential loss of scarred trees, increased erosion and potential dispersal or disturbance of surface and subsurface artefacts across the predominantly sloping terrain of the study area.
Agriculture	Ploughing and harrowing as well as livestock movement and grazing would have exacerbated topsoil disturbance and erosion across the sloping terrain over much of the study area
Construction of dwellings/ buildings and associated infrastructure	Moderate to high levels of earth disturbance leading to the potential disturbance and dispersal of artefacts from their stratigraphic context.

10.2 PROPOSED ACTIVITY AND JUSTIFICATION

The proposed activity involves the extension of the Gerringong residential zone to align with the southern boundary of 48 Campbell Street. The end result of this rezoning will be the creation of Elambra West Urban Release Area. The proposed works within the study area include:

- The construction of principle roads, connecting to Campbell Street and Elambra Parade.
- The creation of a public reserve along the eastern border of the study area, as well as surrounding a mature fig tree positioned on the central crest.
- Future development of a residential subdivision within the R2 development area, which will involve ground works associated with, but not limited to, building construction, the installation of associated services and infrastructure and landscaping.

The proposed works will therefore involve ground disturbance associated with the construction of principle roads and earthworks associated with residential construction, landscaping and the installation of ancillary infrastructure (i.e., services and utilities) associated with the future development within the residential subdivision.

The proposed activity (i.e. the extension of the Gerringong residential zone from Campbell Street to align with the southern boundary of the study area) is consistent with the Gerringong Charrette and the Kiama Local Strategic Planning Statement (KLSPS) 2020 as well as strategic outcomes identified in Illawarra – Shoalhaven Regional Plan and Illawarra Shoalhaven Urban Development Program Update. The outcome of this rezoning process will result in the creation of the Elambra West Urban Release Area (URA).

As outlined in the draft planning proposal (Allen Price & Scarratts 2020) this rezoning will facilitate an extension to the existing township of Gerringong in a south-westerly direction that will be carefully integrated with the existing surrounding urban area. The aim of the proposed activity is to implement part of the vision that was accepted by the community in the Gerringong Charrette to meet the future residential housing and associated recreation supply for this coastal village and to make efficient use of adjacent surrounding land that is not flood affected.

A preliminary concept design for the proposed works is provided in Appendix B. To allow for flexibility in the final design plans, however, for the purpose of this ACHA it is assumed that all land contained within the study area, other than the land contained within the area designated for public reserve, will be impacted by the proposed works.

10.3 ASSESING HARM

This section outlines the assessment process for addressing potential harm to Aboriginal objects and/or places within the study area, as outlined by Heritage NSW (OEH 2011, p.12).

10.3.1 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

An objective of the NPW Act, under Section 2A(1)(b)(i) is to conserve "*places, objects and features of significance to Aboriginal people*" through applying the principles of ecologically sustainable development (ESD) (Section 2A(2)). ESD is defined in Section 6(2) of the *Protection of the Environment Administration Act 1991* (NSW) as "…*the effective integration of social, economic and environmental considerations in decision-making processes".* ESD can be achieved with regards to Aboriginal cultural heritage, by applying principle of inter-generational equity, and the precautionary principle to the nature of the proposed activity, with the aim of achieving beneficial outcomes for both the development, and Aboriginal cultural heritage.

INTERGENERATIONAL EQUITY

The principle of intergenerational equity is where the present generation ensure the health, diversity and productivity of the environment for the benefit of future generations. The Department of Environment and Climate Change (DECC), now Heritage NSW, states that in terms of Aboriginal cultural 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.*" (DECC 2009, p.26).

The assessment of intergenerational equity and understanding of cumulative impacts should consider information about the integrity, rarity or representativeness of the Aboriginal objects and/or places that may be harmed and how they illustrate the occupation and use of the land by Aboriginal people across the locality (DECC 2009, p.26).

Where there is uncertainty over whether the principle of intergenerational equity can be followed, the precautionary principle should be applied.

PRECAUTIONARY PRINCIPLE

Heritage NSW defines the Precautionary Principle as "*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*" (DECC 2009, p.26).

The application of the precautionary principle should be guided through:

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

DECC (2009, p.26) states that the precautionary principle is relevant to the consideration of potential impacts to Aboriginal cultural heritage, where:

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

Where either of the above is likely, a precautionary approach should be taken and all effective measures implemented to prevent or reduce harm to Aboriginal cultural heritage values.

10.3.2 TYPES OF HARM

When considering the nature of harm to Aboriginal objects and/or places, it is necessary to quantify direct and indirect harm. The types of harm, as defined in the Guide (OEH 2011, p.12), and are summarised in Table 10.2. These definitions will be used to quantify the nature of harm to identified Aboriginal objects and/or places that have been identified as part of this assessment. The Code states that the degree of harm can be either total or partial (DECCW 2010b, p.21).

Table 10.2 Definition of types of harm

Type of harm	Definition
Direct harm	May occur as the result of any activity which disturbs the ground including, but not limited to, site preparation activities, installation of services and infrastructure, roadworks, excavating detention ponds and other drainage or flood mitigation measures, and changes in water flows affecting the value of a cultural site.
Indirect harm	May affect sites or features located immediately beyond, or within, the area of the proposed activity. Examples of indirect impacts include, but are not limited to, increased impact on art in a shelter site from increased visitation, destruction from increased erosion and changes in access to wild food resources.

10.4 IMPACT ASSESSMENT

This ACHA has included a programme of investigations that have characterised the nature, extent and significance of Aboriginal sites within the study area. A review of the Aboriginal site's locations in relation to the proposed that have been identified as part of this assessment indicates that:

- 'Campbell Street Artefact 1' (AHIMS #52-5-1018) is situated in an alluvial terrace and adjacent foot slope associated with the western tributary of Crooked River within the study area. The site will be impacted by future residential development within this area as would be facilitated by the rezoning of the study area.

- ‘Campbell Street Artefact 2’ (AHIMS #52-5-1019) is situated within the disturbed context of the central crest within the study area. The site will be impacted by future residential development and construction/maintenance of principle roads within this area as would be facilitated by the rezoning of the study area.

The proposed activity of rezoning the study area to facilitate residential development will inevitably result in large scale earthworks that will involve cut and fill activities to establish ground-levels that will result in wholesale disturbance to the landscape. Any soil profiles that remain following this process are likely to be displaced through the establishment of the principal roads, installation of services and the construction of the residential dwellings and associated structures, amenities and landscaping.

An evaluation of harm to the Aboriginal sites identified as part of the ACHA is summarised in Table 10.3. Details of the proposed activity and their relationship to identified Aboriginal sites is outlined in Figure 10.1.

Table 10.3 Assessment of harm to identified Aboriginal sites

Site name / AHIMS No.	Type of harm	Degree of harm	Consequence of harm
‘Campbell Street Artefact 1’ (AHIMS #52-5-1018)	Direct	Total	Total loss of value
‘Campbell Street Artefact 2’ (AHIMS #52-5-1019)	Direct	Total	Total loss of value

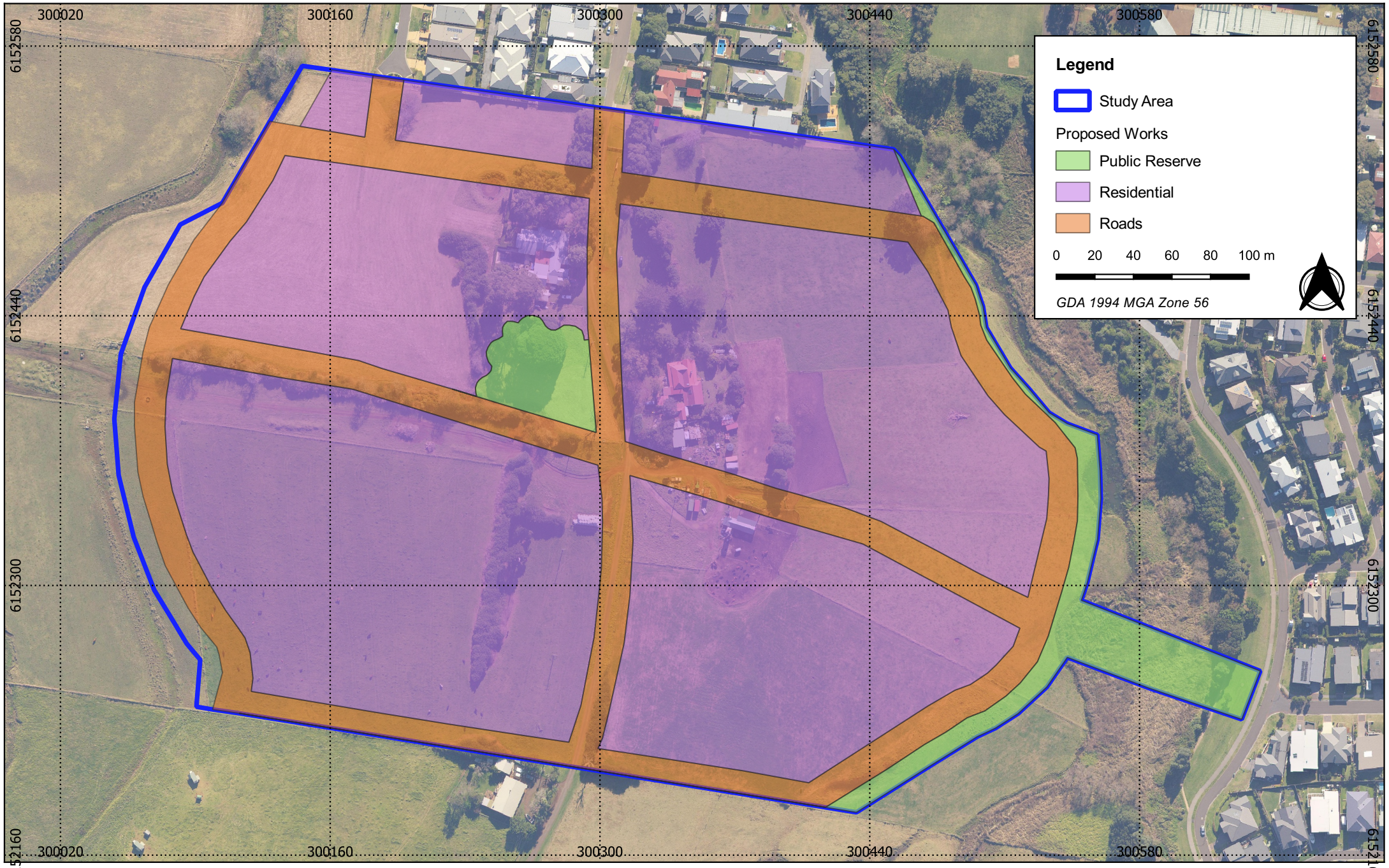

Figure 10.1 - Indicative plan of proposed works within the study area

21106 - 48 Campbell Street, Gerringong NSW

Source: NSW LPI Aerial

Drawn by: WA Date: 2021-12-17

AUSTRAL ARCHAEOLOGY

11 AVOIDING AND MINIMISING HARM

The Burra Charter, advocates a cautious approach to change: "*do as much as necessary to care for the place and to make it useable, but otherwise change it as little as possible so that its cultural significance is retained*" (Australia ICOMOS 2013a, p.1). Based on this principle, this section identifies the measures that have been taken to avoid harm and what conservation outcomes have been achieved through the preparation of this ACHA.

11.1 DEVELOPMENT OF PRACTICAL MEASURES TO AVOID HARM

This assessment has resulted in the recovery of a small low-density artefact assemblage recovered from the two Aboriginal heritage sites within the study area. The small assemblage is likely the result of casual discard and is indicative of general background scatter associated with sporadic Aboriginal use of the landscape surrounding Crooked River and its associated tributaries. The nature of the assemblage (low density, low diversity of artefact types and raw materials), combined with the high disturbance levels identified across the study area, has resulted in the identified sites possessing minimal scientific significance and this diminishes the cumulative impact of the proposed development.

Furthermore, the sub-surface testing program completed as part of this assessment has resulted in the collection of a small but representative sample of stone artefacts associated with the sites and the broader study area. The data catalogue produced from the analysis of this material, and provided in Appendix D, is therefore available for future reference and use. Despite its limited research value, the data nevertheless is important for contributing to current understandings of the past Aboriginal land use practices in the local region and provides support for the predictive model (see Section 8 for discussion).

11.2 APPLICATION OF PRINCIPLES OF ESD AND CUMULATIVE IMPACTS

The Guide to Reporting requires this ACHA to consider the effects of cumulative impacts under the principles of ESD. These principles are described in detail in Section 10.3.1. In essence, this requires the acknowledgement that while a single development might have a minimal impact, it forms part of a slow urbanisation process which results in the widespread loss of environmental and cultural resources.

The sites located within the study area that will be impacted by the proposed development are representative of a common site type (i.e. Artefacts sites including low density artefact scatters and isolated artefacts) in association with a range of landform types that are well represented across the region. The low density of these sites, the lack of diversity in artefact types and raw materials combined with the highly disturbed contexts within which they are situated means that their overall scientific/archaeological and educational value is assessed as being low.

Although all Aboriginal sites are of cultural significance to the Aboriginal community, the highly disturbed context associated with the sites within the study area and their similarity to a number of others in the greater region means that any harm to these sites will not result in significant harm to Aboriginal communities' connection to Country. The collection of a small but representative sample of artefacts during the testing program will be conserved for future reference. The cumulative impact of to the region's archaeological resource represented by the proposed development is thus considered minimal based on the number of comparable sites in the locality that are still present or likely to be conserved into the future.

11.3 STRATEGIES TO MINIMISE HARM

This assessment has identified Aboriginal sites that are consistent with the predictive model for the region. The sites have been assessed as being of low historic, aesthetic, social and scientific (archaeological) significance. Considering that the aim of the proposed activity is to implement part of the vision that was accepted by the community in the Gerringong Charrette to meet the future residential housing and associated recreation supply for this coastal village and to make efficient use of adjacent surrounding land that is not flood affected, avoidance as a strategy to minimise harm is therefore not reasonable.

The Aboriginal sites that will be impacted by the proposed works within the study area will require an application for an Aboriginal Heritage Impact Permit (AHIP) to destroy these sites, as the proposed development will impact it directly. For more details on this and other recommendations see Section 12.

12 RECOMMENDATIONS

The following recommendations are derived from the findings described in this ACHA. The recommendations have been developed after considering the archaeological context, environmental information, consultation with the local Aboriginal community, and the findings of the test excavation and the predicted impact of the planning proposal on archaeological resources.

It is recommended that:

1. Before any works occur, the Proponent apply to Heritage NSW for an Aboriginal Heritage Impact Permit (AHIP) to destroy 'Campbell Street Artefact 1' (AHIMS #52-5-1018) and 'Campbell Street Artefact 2' (AHIMS #Pending). These sites are protected under the Section 90 of the *NSW National Parks and Wildlife Act 1974* (NPW Act). It is recommended that the following mitigation measures are implemented as part of the AHIP:
    1. All Aboriginal objects collected during the archaeological testing will be reburied onsite at a location to be determined by the Proponent in consultation with Aboriginal stakeholders for the Project.
2. No further assessment or works are required to be undertaken for the study area.
3. If human skeletal remains are encountered, all work must cease immediately and NSW Police must be contacted, they will then notify the Coroner's Office. Following this, if the remains are believed to be of Aboriginal origin, then the Aboriginal stakeholders and Heritage NSW must be notified. No work can continue until written notification has been obtained from Heritage NSW.
4. It is recommended that the Proponent continues to inform the Aboriginal stakeholders about the management of Aboriginal cultural heritage within the study area throughout the completion of the project. The consultation outlined as part of this ACHA is valid for six months and must be maintained by the proponent for it to remain continuous. If a gap of more than six months occurs, then the consultation will not be suitable to support an AHIP for the project.
5. A copy of this report should be forwarded to all Aboriginal stakeholder groups who have registered an interest in the project.

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