Appendix 5

# Revised Aboriginal Cultural Heritage Assessment Report



umwelt



AUSTRAL ARCHAEOLOGY

# WATTLE CREEK BATTERY ENERGY STORAGE SYSTEM SSD-63345458

## ARTHURSLEIGH FARM 1001 CANYONLEIGH ROAD, BRAYTON & BIG HILL, NSW

ABORIGINAL CULTURAL HERITAGE ASSESSMENT

Prepared for Umwelt Pty Ltd on behalf of Spark Renewables Pty Ltd

5 February 2026

Final

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## ACKNOWLEDGEMENT OF COUNTRY

We respect and acknowledge the First Nations Peoples of the lands and waterways on which we live and work, their rich cultural heritage, and their deep connection to Country, and we acknowledge their Elders past and present.

## CULTURAL WARNING

Aboriginal and Torres Strait Islander readers are advised that this report may contain images or names of First Nations people who have passed away.

AUSTRAL
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# EXECUTIVE SUMMARY

This report has been prepared for Spark Renewables Pty Ltd (Spark) and details the results of an Aboriginal archaeological and cultural heritage assessment for the Wattle Creek Battery Energy Storage System (BESS) Project (the Project). The Project comprises a BESS with 350 MW capacity (AC or DC coupled) and project-related infrastructure. The Wattle Creek BESS is located at Arthursleigh Farm, Lot 3 DP1120270, Canyonleigh Road, Brayton and Big Hill NSW, 2579, New South Wales (NSW) [the Project Area], within the Upper Lachlan Local Government Area (LGA), the Parishes of Eden Forest and Uruingalla and the County of Argyle.

This Aboriginal Cultural Heritage Assessment (ACHA) was undertaken to assess the archaeological potential for Aboriginal material as part of the preparation of the Environmental Impact Statement (EIS) required for the assessment of the Project. The Project is a State Significant Development (SSD) under Part 4 of the *Environmental Planning and Assessment Act 1979*. This ACHA has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the Project. As required by the SEARs, the ACHA has been undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010), the *Guide to Investigating, assessing and Reporting on Aboriginal Cultural Heritage in NSW* (Office of Environment and Heritage 2011) and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (Department of Environment, Climate Change and Water NSW 2010a) [Consultation Requirements].

Austral completed an Archaeology Constraints Assessment in 2023, which included both Aboriginal and Non-Aboriginal cultural heritage advice (Austral Archaeology Pty Ltd 2023). An AHIMS search was completed as part of the constraints assessment, identifying 19 previously recorded Aboriginal heritage sites within the Project Area and an additional 4 outside of the Project Area but within 1 kilometre (km). The Constraints Assessment also identified that the Project Area was located within the South Eastern Highlands Bioregion, has 4 Mitchell soil types, has several tributaries and streams connected to the Wollondilly River, comprises undulating hills, slopes and river flats and consists of disturbances associated with agricultural practices. Due to the presence of cultural heritage, a review of reports in the area and the environmental conditions within the Project Area, it was determined that the Project Area had a moderate to high potential for Aboriginal archaeological sites.

As part of this ACHA, an initial search of the AHIMS database identified 67 previously recorded cultural heritage sites within a 20 km search radius of the Project Area. Of the identified 67 previously recorded cultural heritage sites, 19 are located within the Project Area; however, none are located within the development footprint. The majority of previously recorded cultural heritage sites included artefacts (both isolated and scatters), and combined artefact; PAD sites. In addition, the desktop evaluated the environmental factors of the Project Area, including the topography, hydrology and geology and evaluated this information with assessments undertaken nearby to determine the likelihood and potential cultural heritage likely to be identified. As a result of these investigations, the desktop assessment determined that if cultural heritage is present, it is likely to be artefactual, in elevated areas and near water sources.

Following the desktop assessment, a survey was undertaken to investigate the known cultural heritage and ground truth the predictive model. The archaeological survey was conducted between 22 and25 January 2024, and a supplementary survey was conducted on 10 April 2024. A total of 18 cultural heritage sites were identified during the survey, including 5 artefact scatters (one including a PAD), 12 isolated artefacts and one scarred tree. One of the previously recorded PADs was re-identified during the survey. As part of this assessment, areas of potential for cultural heritage were also determined, with testing to take place to confirm whether subsurface cultural material was present in areas of higher archaeological sensitivity.

A total of 79 test pits were excavated within the development footprint between 4 and 10 April 2024, 9 and 8 May 2024 and 24 June and 28 June 2024. The testing program resulted in 14 test pits having cultural heritage, with 25 Aboriginal stone artefacts recovered. Quartz is the dominant raw material within the excavated assemblage, accounting for 40% (n=10), followed by silcrete which accounts for 32% (n=8), and quartzite accounts for 24% (n=6), while chert only contributed 4% (n=1) of the excavated assemblage. The results also found that the typology broken/pieces (this category includes proximal, medial and distal fragments as well as flake pieces) account for a large portion of the assemblage (28%, n=7), followed by thumbnail scrapers (24%, n=6) and scrapers (20%, n=5). Less common artefact types include debitage (12%, n=3) flakes (8%, n=2), Bondi point (4%, n=1), and core(4%, n=1).

The investigation identified 30 new Aboriginal sites within the Project Area which were within or in close proximity to the Development Footprint. Twenty-seven of these sites have low significance, 2 have moderate significance and one has high significance. A detailed summary of the Aboriginal sites and their statements of significance is provided in Section 9.4.

The EIS was publicly exhibited from Friday, May 9, 2025, to Friday, June 6, 2025. Concurrently, the EIS was submitted to Heritage NSW for review. Following the conclusion of the public exhibition period and the subsequent review by Heritage NSW, this report has been revised to address all submissions received. The Volume 2 consultation Appendix associated with this report has also been updated to address the HNSW submission.

## ABORIGINAL COMMUNITY CONSULTATION

Consultation with Aboriginal stakeholders has been completed in accordance with the Consultation Requirements (Department of Environment, Climate Change and Water NSW 2010a). A summary of this process is included in the table below:

| Stage | Component | Commenced | Completed |
|---|---|---|---|
| Stage 1 | Letters to agencies | 10/11/2022 | N/A |
| | Registration of stakeholders | 3/07/2023 | 17/07/2023 |
| Stage 2 | Project information | 19/10/2023 | N/A |
| Stage 3 | Review of project methodology | 19/10/2023 | 03/11/2023 |
| | Project Update | 16/05/2024 | N/A |
| Stage 4 | Review of ACHA by Aboriginal stakeholders | 26/08/2024 | 23/09/2024 |
| Provision of Final | Provision Of Final ACHA | 25/11/2024 | N/A |
| | Additional Provision of Final ACHA | 14/03/2025 | N/A |
| | Project Update & Field work Engagement | 03/06/2025 | N/A |
| | Project Update & Field work Engagement | 11/11/2025 | N/A |

Further information on the consultation completed for the Project can be found in Section 2 of this report and Volume 2, Appendix A1.

### 2025 ADDITIONAL SURVEYS

In 2025, 2 additional surveys were conducted to address the 7 additional passing bays on Canyonleigh Road and changes to the development footprint of the BESS. The first, additional survey was conducted by Jordon Coltman (Archaeologist, Austral) with the assistance of an Aboriginal site officer from the Pejar Local Aboriginal Land Council (PLALC) in June 2025, and no additional Aboriginal sites were identified. The second survey was conducted in November 2025 by Zoe Bosevski and an Aboriginal site officer from PLALC and no additional Aboriginal sites were identified. All landforms that were assessed during these additional surveys had low potential for archaeological deposits. As such, the recommendations of this report remain unchanged.

### IMPACT ASSESSMENT

This ACHA has included a programme of investigation that has characterised the nature, extent and significance of Aboriginal sites within the Project Area. All disturbances associated with the conceptual project design would be contained within a development footprint The conceptual project layout includes common ancillary infrastructure with the Wattle Creek Solar Farm. To allow for the assessment of both projects separately, the development footprint has been separated into the relevant components, including the BESS disturbance area (all BESS-associated infrastructure) and the common ancillary infrastructure and transmission line.

The Project will impact a total of 9 identified Aboriginal sites within the development footprint (see table below). A total of 49 Aboriginal sites, comprising 19 that were previously recorded and listed on the Aboriginal Heritage Information Management System (AHIMS), and 30 new sites recorded during the investigation, are located within the Project Area but *outside* of the development footprint. These sites will not be impacted by the Project.

Activities that may harm Aboriginal cultural material include construction of the BESS, transmission line, the construction of the operation and maintenance facility - including a site office, operation and maintenance buildings, amenities, equipment sheds, storage, parking area, underground cables, new access tracks, upgrades to existing access tracks, minor upgrade to the existing access point from Canyonleigh Road, static water tanks, potential construction material areas such as borrow pits, rock crushing facilities, laydown areas and the use of heavy vehicles to transport equipment. An evaluation of the Aboriginal sites that will be impacted by the Development Footprint are summarised below with all other displayed in Section 10.5:

| Site name / AHIMS No. | Impact | Type of harm | Degree of harm | Consequence of harm |
|---|---|---|---|---|
| **Wattle Creek 3 / #52-4-0771** | Yes | Direct | Total | Total loss of value |
| **Wattle Creek 4 / #52-4-0774** | Yes | Direct | Total | Total loss of value |
| **Wattle Creek 9 / #52-4-0768** | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AFT 13 / #52-4-0807** | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AFT 14 / #52-4-0808** | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AFT 16 / #52-4-0811** | Yes | Direct | Total | Total loss of value |

| Site name / AHIMS No. | Impact | Type of harm | Degree of harm | Consequence of harm |
|---|---|---|---|---|
| **Wattle Creek AFT 17 / #52-4-0813** | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AS 6 / #52-4-0810** | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AS 7 / # 52-4-0812** | Yes | Direct | Total | Total loss of value |

## 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, the findings of the pedestrian survey and test excavations, and the predicted impact of the planning proposal on archaeological resources.

It is recommended that:

1. No further assessment of the development footprint is required. Sites located within the development footprint are listed in Table 11.1 and have been assessed as possessing low archaeological significance. Works may proceed with caution at this location. Aboriginal objects collected from this site during test excavations should be subject to the long-term management strategy developed in Recommendation 3 below.
2. Before any works occur, Spark Renewables should develop an Aboriginal Cultural Heritage Management Plan (ACHMP) to mitigate and manage impacts to all Aboriginal heritage sites within and directly adjacent to the Project Area. These sites are protected under Section 90 of the *NSW National Parks and Wildlife Act 1974*. The ACHMP should form part of the Project's construction environmental management plan (CEMP), and the conditions contained within it should apply to the construction, operational and decommissioning phases of the Project.
3. It is recommended that the ACHMP contains the following management and mitigation conditions:
    - A methodology for the community collection of isolated artefacts Wattle Creek 3 (AHIMS #52-4-0771), Wattle Creek 4 (AHIMS #52-4-0774) and Wattle Creek 9 (AHIMS # 52-4-0768) as they will be harmed by the Project.
    - A methodology for the construction of the exclusion zone for TME-OS2 (AHIMS #52-4-0134).
    - Allow harm to Wattle Creek AFT 13 (AHIMS # 52-4-0807) , Wattle Creek AFT 14 (AHIMS # 52-4-0808), Wattle Creek AFT 16 (AHIMS # 52-4-0811), Wattle Creek AFT 17 (AHIMS # 52-4-0813), Wattle Creek AS 6 (AHIMS # 52-4-0810), and Wattle Creek AS 7 (AHIMS # 52-4-0812).
    - A strategy for the long-term management of all Aboriginal objects collected during the community collection and test excavation program. The strategy should include provisions for reburial at a location nominated by Registered Aboriginal Parties adjacent to the development footprint. The strategy must be developed in consultation with Registered Aboriginal Parties.
    - Provisions for protecting Aboriginal heritage items within the Project Area but outside the development footprint.
    - Include protocols for managing the discovery of human remains and previously unidentified heritage items within and adjacent to the development footprint.

- Contain a contingency plan and reporting procedure if Aboriginal heritage items within or outside the development footprint are damaged.
- Include protocols for conducting further archaeological and heritage assessment in any disturbance areas where this assessment has not already been carried out.
- Ensuring any workers on-site receive suitable heritage inductions prior to carrying out any work on site.
- Maintain and manage reasonable access for Aboriginal stakeholders to heritage items on site.
- Provide for ongoing consultation with Aboriginal stakeholders in the conservation and management of Aboriginal cultural heritage on site.
- Contain a program to monitor and report on the effectiveness of these measures and any heritage impacts of the Project.

4. In the event that unexpected finds occur during any activity within the Project Area, all works in the vicinity must cease immediately. The find must be left in place and protected from any further harm. Depending on the nature of the find, the following processes must be followed:
    - If, while undertaking the activity, an Aboriginal object is identified, it is a legal requirement under Section 89A of the NPW Act to notify Heritage NSW, as soon as possible.
    - 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.
5. It is recommended that Spark Renewables continue to inform Aboriginal stakeholders about the management of Aboriginal cultural heritage within the Project Area throughout the life of the Project. The consultation outlined as part of this ACHA is valid for a period of 6 months and must be maintained after this by the Proponent for it to remain continuous and comply with Consultation Requirements (Department of Environment, Climate Change and Water NSW 2010a).
6. 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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# 1. INTRODUCTION

Austral Archaeology Pty Ltd (Austral) has been commissioned by Umwelt Pty Ltd, on behalf of Spark Renewables Pty Ltd (the Proponent) to prepare an Aboriginal Cultural Heritage Assessment (ACHA) for the Wattle Creek Battery Energy Storage System (BESS) Project (the Project) located on the property of Arthursleigh Farm, Lot 3 DP1120270, 1001 Canyonleigh Road, Brayton and Big Hill, New South Wales (NSW) [the Project Area]. The Project includes a standalone BESS with 350MW capacity and project-related infrastructure being developed under State Significant Development (SSD) 63345458.

## 1.1. THE PROJECT AREA

The Project Area consists of the entirety of Lot 3, DP1120270, located approximately 10 km from the township of Marulan, within the Upper Lachlan Local Government Area (LGA), the Parishes of Eden Forest and Uruingalla and the County of Argyle. It is also within the boundaries of the Pejar Local Aboriginal Council (PLALC). It is bounded on all sides by a mix of vegetation and farming land.

All proposed infrastructure associated with the Project would be contained within the proposed development footprint. The Project design includes common ancillary infrastructure areas (associated with the transmission line and access). These areas are also being proposed as part of the SSD-63344210 for the Wattle Creek Solar Farm within the same Project Area and are assessed separately.

Following the exhibition of the EIS and ACHA, the BESS SSD-63345458 disturbance area was amended. These additions required amendments to the disturbance area only (located within the original Project Area) and included:

- Alternate access road to the BESS from the north of the Project Area (this area was subject to survey during the preparation of the ACHA during the EIS phase).
- Seven passing bays were added to the length of Canyonleigh Road to facilitate the movement of vehicles during the construction phase. These areas required further survey and assessment. Details of the 7 additional passing bays are below:
  - Passing Bay: Adjacent to 20 Canyonleigh Road, Brayton, measuring approximately 130 metre (m) x 7 m.
  - Passing Bay: Adjacent to Lot 14, DP1123374, Brayton, measuring approximately 235 m x 4 m.
  - Passing Bay: Adjacent to Lot 14, DP1123374, Brayton, measuring approximately 260 m x 4 m.
  - Passing Bay: Adjacent to 362 Canyonleigh Road, Brayton, measuring approximately 260 m x 4 m.
  - Passing Bay: Adjacent to 586 Canyonleigh Road, Brayton, measuring approximately 245 m x 9 m.
  - Passing Bay: Adjacent to 882 Canyonleigh Road, Brayton, measuring approximately 110 m x 7 m.
  - Passing Bay: Adjacent to 882 Canyonleigh Road, Brayton, measuring approximately 130 m x 4.5m.

The location of the Project Area is shown in Figure 1.1 and Figure 1.2.

## 1.2. PURPOSE OF THE ACHA

The ACHA was undertaken to assess the potential harm that may occur to Aboriginal cultural heritage values as a result of the Project. As a State Significant Development, under the Planning Systems State Environment Planning Policy (SEPP), Spark Renewables must prepare an EIS that includes an ACHA and Statement of Heritage Impact (SoHI), as a requirement of the Secretary's Environmental Assessment Requirement (SEARS) SSD-63345458 (BESS) issued on 22 December 2023. This ACHA describes the potential impacts of the Project on Aboriginal cultural heritage (both archaeological and cultural) in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (Office of Environment and Heritage 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (the Code) [DECCW 2010].

## 1.3. ASSESSMENT OBJECTIVES

The scope of this ACHA report is based on the legal requirements, guidelines and policies of Heritage NSW, formerly the Office of Environment and Heritage (OEH), and prior to that, the Department of Environment, Climate Change and Water (DECCW), Department of Environment and Climate Change (DECC) and Department of Environment and Climate (DEC). Note that applicable documents have been published under the name of all these government departments.

The ACHA has been undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010), the *Guide to Investigating, assessing and Reporting on Aboriginal Cultural Heritage in NSW* (Office of Environment and Heritage 2011) and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (Department of Environment, Climate Change and Water NSW 2010a) [Consultation Requirements].

## 1.4. KEY PROJECT FEATURES

The Project includes the installation, operation, maintenance and decommissioning of a large-scale BESS, ancillary infrastructure and temporary facilities associated with the construction of the Project. The current Spark Renewables development design will have a capacity of up to approximately 350 MW (AC or DC coupled) and will have provision for up to four (4) hours of storage (1400 MWh).

The key components of the Project would include, but not limited to:

- Batteries – most likely a lithium-ion technology.
- Inverters – bi-directional inverters to convert DC current to AC current (when exporting electricity) and vice versa (when importing electricity).
- Transformers – skid-mounted transformers will be installed adjacent to each inverter to step up the voltage to the internal reticulation voltage of the plant.
- Substation and transmission connection – on-site collector substation and overhead powerlines to connect the BESS to the electricity transmission network via the Marulan Substation.
- A substation communication mast of up to 80 m in height is also included at the substation location.
- A research Test-Bed Facility – comprising a 2 hectare (ha) stand area, demountable buildings, security fencing, parking, 200 kVa power supply and 100 kVA dummy load (simulated electrical load for testing purposes).
- Electrical connections – a combination of underground cables and overhead powerlines connecting BESS facility to the on-site collector substation.

- Operations and maintenance (O&M) facility – including control rooms, O&M buildings, amenities, equipment sheds, storage, a hardstand and bench, and parking areas.
- Minor upgrades to the existing site access point from Canyonleigh Road and internal access roads.
- Temporary construction infrastructure – to facilitate construction and likely to include laydown and storage areas and site offices.
- Security fencing – to prevent unauthorised access to the Project infrastructure and guard high voltage or dangerous equipment.

The Conceptual Project layout represents a Development Footprint of ~80.68 ha, including transmission lines and associated ancillary infrastructure (i.e. BESS, substations, the operations and maintenance facility, and test bed).

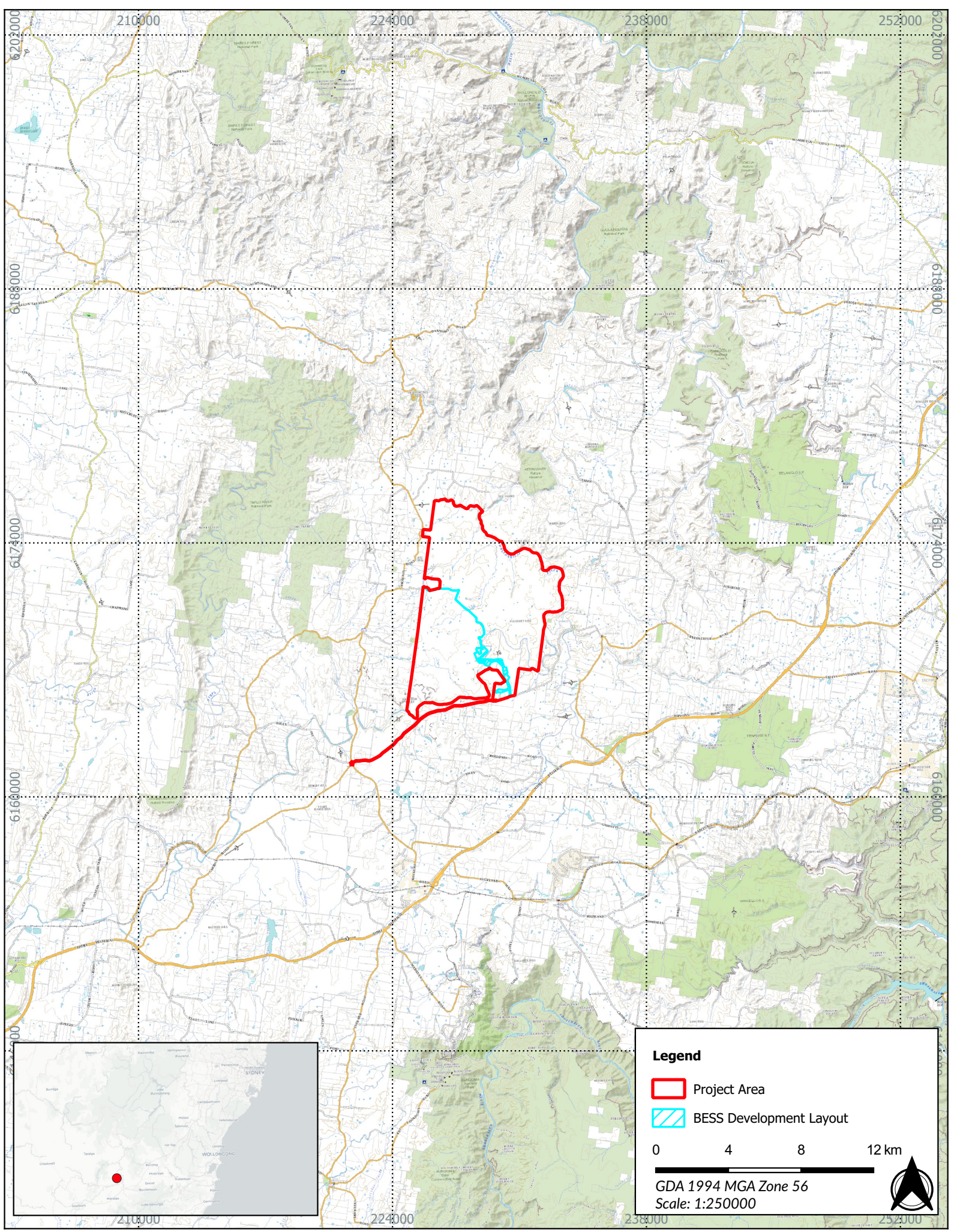



**Figure 1.1 - Location of the project area in a regional context**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Basemap, CartoDB Positron* *Drawn by: PB* *Date: 2026-01-30*

AUSTRAL ARCHAEOLOGY

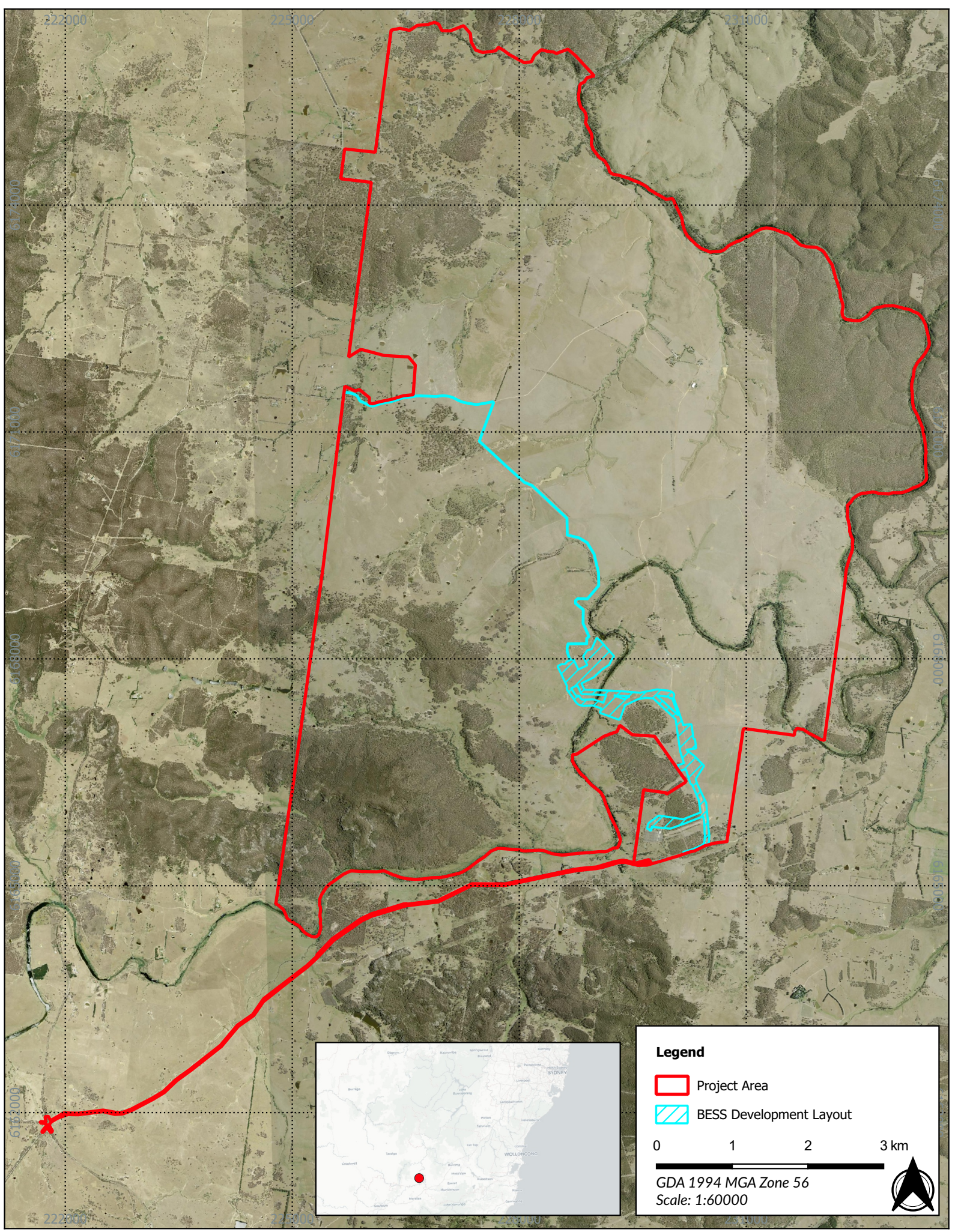



**Figure 1.2 - Detailed aeral imagery of the project area**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, CartoDB Positron* *Drawn by: FOT* *Date: 2026-01-30*

AUSTRAL ARCHAEOLOGY

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

- A literary review of available data, including previous studies/investigations from within and adjacent to the Project Area.
- The results of archaeological fieldwork including a pedestrian survey of the Project Area and archaeological test excavations.
- A description of the Aboriginal cultural heritage values identified as being within the Project Area and its significance.
- 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.
- Documentation of how the Consultation Requirements have been met (specifically Section 80C of the *National Parks and Wildlife Regulation 2009* [NPW Regulations]).
- The views of Aboriginal people regarding the likely impact of the Project on their cultural heritage, including evidence of their submissions and how these have been addressed.

## 1.5. 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 acts and guidelines that are applicable or have the potential to be triggered with regard to the proposed development and are detailed in **Table 1.1** to Table 1.4.

**Table 1.1 Federal acts.**

| Federal Acts | Applicability and Implications |
|---|---|
| *Environment Protection & Biodiversity Conservation Act 1999* | This Act has not been triggered in relation to Aboriginal Cultural Heritage and so does not apply to this assessment, on the basis that:<br>• No sites listed on the National Heritage List are present or in close proximity to the Project Area.<br>• No sites listed on the Commonwealth Heritage List are present or in close proximity to the Project Area.<br>This Act has been triggered in relation to impacts to biodiversity; however, this is not evaluated in this assessment. |
| *Aboriginal & Torres Strait Islander Heritage Protection Amendment Act 1987* | Applies.<br>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 legislation. |
| *Native Title Act 1993 (Cth)* | Applies:<br>This Act provides for the recognition by Australian law of Aboriginal people and their connection to land. This includes those that have a Native Title Determination on a piece of freehold land. Please note that this agreement does not apply to the Project Area, but is located in the general area:<br>• The Gundungurra Area Agreement |

**Table 1.2 State acts.**

| State Acts | Applicability and Implications |
|---|---|
| Environmental Planning and Assessment Act 1979 (EPA Act) | Applies to the wider project and governs the approval pathway required:<br>• The Project is being assessed as State Significant Development (SSD) under Part 4 of the EPA Act.<br>• This ACHA is required to support the Environmental Impact Statement for the Project. |
| *National Parks and Wildlife Act 1974* (NPW Act) | The Act is triggered by the potential presence of Aboriginal cultural material and offers the following protection:<br>• 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.<br>• 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.<br>• Section 89A – Requires that Heritage NSW must be notified of any Aboriginal objects discovered, within a reasonable time. |
| *National Parks and Wildlife Regulation 2019* (NPW Regulations) | The Regulation serves to support the implementation of the NPW Act in the following ways:<br>• Section 80A – States minimum standards for due diligence to have been carried out.<br>• Section 80C – Requires documented Aboriginal community consultation to be undertaken before applying for an AHIP. |
| *NSW Heritage Act 1977* | There are no sites listed on the State Heritage Inventory associated with the Project Area and therefore this Act does not apply. |

**Table 1.3 State and local planning instruments.**

| State Acts | Applicability and Implications |
|---|---|
| *Local Environmental Plan (LEP)* | The following LEP applies to the Project Area:<br>• Upper Lachlan LEP 2010<br>Aboriginal cultural material is discussed in Part 5, Section 10.0 of the LEP, which requires consent be granted for any works which may impact Aboriginal cultural material. |
| *Development Control Plan (DCP)* | The following DCP applies to the Project Area:<br>• Upper Lachlan DCP 2010<br>Aboriginal cultural material is discussed within section 4.4.2 of the Upper Lachlan DCP 2010. |

**Table 1.4 Aboriginal community consultation requirements.**

| State Acts | Applicability and Implications |
|---|---|
| Consultation Requirements | SSD consultation has been undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (Department of Environment, Climate Change and Water NSW 2010a). |

## 1.6. PROJECT TEAM AND QUALIFICATIONS

The following personnel have been involved in the preparation of this ACHA.

### AMANDA MARKHAM (BA Hons. PhD ANTHROPOLOGY, GRAD CERT. ARCH)

Amanda is the Principal Archaeologist/Team Leader West at Austral. She has 25 years' experience as both an anthropologist and archaeologist working on major infrastructure projects across NSW, Vic, the NT, SA and WA. Amanda specialises in Aboriginal anthropology and archaeology, with a focus on arid region archaeology and skeletal remains. She has conducted hundreds of heritage assessments under state and territory legislation, NSW Due Diligence Code, the NSW Code of Practice, the NT Sacred Sites Act, as well as the SA and WA Heritage Act, successfully obtaining AHIPs and Permits to Disturb/Impact.

### FELICITY SMOLENAERS (B. ARCH)

Felicity is a Graduate Archaeologist at Austral and has 4.5 years of experience in the completion of both Aboriginal and Historical projects. Felicity has experience in consultation and background research for Aboriginal Cultural Heritage Assessments (ACHA), Aboriginal Cultural Heritage Due Diligence Assessments (ACHDDA), Statements of Heritage Impact (SoHI) and Preliminary Historical Heritage Assessments (PHHA) in NSW and Cultural Heritage Management Plans (CHMP) in Victoria. Felicity also has experience in excavation, Aboriginal and historical surveys, sorting and cataloguing historical artefacts, and Aboriginal lithic analysis. Felicity has also been a member of the international archaeological team at Tell el Timai, Egypt.

### KARA OAKLEY-SMITH (Bachelor of Arts, ongoing)

Kara is a student archaeologist with 1 year of experience. Kara has successfully co-authored Aboriginal Cultural Heritage Assessments (ACHAs) in NSW. Kara has experience working successfully with teams on fieldwork projects in NSW, including excavations and surveys.

### CRYSTAL WOODING (B. ARCH, G.DIP ARCH)

Crystal is an archaeologist at Austral with two years of experience in the completion of both Aboriginal and Historical projects. Crystal has been involved with a number of projects across New South Wales and Victoria including working in remote isolated locations. Crystal has worked on large-scale government projects such as water infrastructure in NSW and NBN in Victoria. Crystal also has experience in preparing and writing Aboriginal Cultural Heritage Due Diligence Assessments (ACHDDA), Aboriginal Cultural Heritage Assessments (ACHA), Cultural Heritage Management Plans (CHMP) and Preliminary Historical Archaeological Assessments (PHAAs), and Historical Archaeological Assessments (HAAs).

Crystal has experience in excavation, Aboriginal and historical surveys, cataloguing and sorting historical artefacts, and Aboriginal lithic analysis. Crystal comes from an extensive background in customer service and brings many of those skills with her, including her ability to communicate and work efficiently with people of all ages and backgrounds.

### NICOLE MONK (B. ARCH, G.DIP ARCH)

Nicole is a senior archaeologist at Austral and has 4 years' experience in the completion of both Aboriginal and historical heritage projects. Since joining Austral, Nicole has worked on numerous infrastructure projects in NSW, ACT and Vic. She has completed research, consultation and reporting for Aboriginal Heritage Due Diligence, Aboriginal Cultural Heritage Assessment, Cultural Heritage Management Plans and Historical Heritage Assessments.

Nicole has contributed to reports completed in accordance with the *NSW National Parks and Wildlife Act 1974* and its associated guidelines. This includes ensuring that consultation and reporting comply with the *Code of Practice* for the investigation of Aboriginal objects in NSW and *Aboriginal consultation requirements for Proponents 2010*. Nicole has also worked within the *Victorian Aboriginal Heritage Act* 2006 and the *Aboriginal Heritage Regulations 2018* for Victorian consultation and reporting.

Nicole has worked with both state and local governments on several projects in both historical and Aboriginal heritage and has experience in the assessment of Aboriginal and non-Aboriginal heritage. Through the completion of these projects, Nicole has developed strong relationships with Aboriginal stakeholders, clients, Heritage NSW and First Peoples-State Relations.

### FINN OTLEY (MSc GEOSPATIAL SCIENCE)

Finn is a graduate GIS technician at Austral, with a Master's degree in Geospatial Science and 3 years prior experience as an engineer in the land and groundwater contamination industry. He has worked in several engineering and risk management firms. Finn's studies at RMIT focused on the utilisation of remote sensing technology to explore the fire history of remote island regions, but now his professional focus has shifted towards providing support to Aboriginal heritage and historical heritage assessments through mapping.

Finn specialises in the use of GIS technologies and the procurement of spatial data in order to create clear and informative mapping information products. These information products convey relevant background and post-fieldwork information to stakeholders associated with various heritage reports in both NSW and VIC, in compliance with the relevant authorities' requirements.

Finn has contributed mapping outputs to a number of Aboriginal heritage and historical heritage reports in both NSW and VIC. This includes Aboriginal Cultural Heritage Assessments (ACHAs), Aboriginal Heritage Impact Permits (AHIPs), Aboriginal Cultural Heritage Due Diligence Assessments (ACHDDAs), Preliminary Historical Archaeological Assessments (PHAAs), and Historical Archaeological Assessments (HAAs).

Amanda has reviewed this report for quality assurance and technical adequacy and had input into the management recommendations.

## 1.7. HERITAGE NSW SUBMISSION

Following submission of this final ACHA to Heritage NSW, Heritage NSW provided 29 comments that had to be explained and/or incorporated into this report. As such, Table 1.5 details the provided comments and Austral's response to them, including reference to updated sections.

**Table 1.5 Responses to Heritage NSW comments**

| **Heritage** NSW Comment | Austral's Response |
|---|---|
| *Aboriginal Community Consultation* | |
| 1. Please update Section 2 of the ACHAR to provide an accurate and complete outline of the Aboriginal community consultation undertaken for the project including explanations for when stages were re-undertaken due to admin errors and/or due to the Project being placed on hold and/or due to changes in project design which necessitated updates to the report and additional Stage 4 reviews. Specifically, please provide the following:<br>a. Explanation for why Stage 1 agency letters were sent on 10 November 2022 and then again (but only to some agencies) on 22 June 2023.<br>b. Explanation for why the Stage 1 invitations to register were sent to Aboriginal stakeholders on the 3 July 2023 but the Stage 1 Advert was only published a year later on 17 July 2024.<br>c. Explanation for why the Stage2/3 consultation letter was sent to RAPs on 19 October 2023 and then again on 15 July 2024 and 31 July 2024 approximately 9 months later.<br>d. Noting that Step 4.1.6 of the *Aboriginal cultural heritage consultation requirements for Proponents* (Department of Environment, Climate Change and Water NSW 2010a) requires that the Proponent provide a list of the Aboriginal persons who have registered an interest in the project to Heritage NSW and the LALC within 28 days of the closing date for registration, please provide explanation for why this step was completed on 15 July 2024 only a couple of days after the Stage 1 newspaper advert was published and despite the Stage 1 registration period ending ~12-months prior on 17 July 2023. | 1a. An additional email was sent to Heritage NSW on 22 June 2023 as part of Stage 1.1, as no response had been received to the earlier correspondence. Although this is a gap of more than 6 months in consultation, this is stage 1 of the consultation process, and no RAPs had registered to the project at this time, and as such, no update could be sent to provide continuous consultation. Not all agencies were contacted as they had previously provided information. This has been addressed in Section 2.2.1.<br>b. The Stage 1.3 advertisement was issued more than a year after the registration of RAPs due to an administrative error. This has been addressed in Section 2.2.3.<br>c. Stages 2/3 were sent on two separate occasions, approximately 9 months later, due to administration errors. However, between these send-outs for Stages 2/3, fieldwork communication with all RAP groups had been done within 6 months, including the groups who were originally missed in the first version of Stage 2/3. This is addressed in Section 2.4.<br>d. The notification of RAPs to Heritage NSW and the PLALC as part of Stage 1.4 of the consultation process was sent only a few days following the newspaper advert being published. This was due to the administrative error that identified that the public notice had not been sent. If any Aboriginal individuals or groups registered interest from the newspaper advert, then Stage 1.4 would have been resent. This has been addressed in Section 2.2.4. |

| **Heritage** NSW Comment | Austral's Response |
|---|---|
| 2. Heritage NSW requires that consultation with RAPs is continuous. Under our guidelines, breaks in consultation of over six months may not constitute continuous consultation. If an unexpected break of greater than six months has occurred, the applicant may be required to restart the consultation process. With this in mind, please address the following:<br>a. The consultation log indicates that the Stage 2/3 consultation letter was sent to RAPs on 19 October 2023 and then again on 15 July 2024. Please provide further explanation for this and confirm whether consultation was maintained during that ~9-month gap.<br>b. The last date of consultation with RAPs recorded in the ACHAR was August 2024 (i.e. Stage 4 review of the draft ACHAR). Please confirm whether consultation with RAPs remains active for the project (i.e. no gaps of over 6 months) and if so, update the ACHAR to include an outlined of this including evidence of all additional consultation that has been undertaken (e.g. Project update letters etc.) to ensure continuous consultation. | 2a. Stages 2/3 were issued on two separate occasions, approximately nine months apart, due to an administrative oversight. However, in the period between these send-outs, fieldwork communications with all RAP groups occurred within six months, including those who were not included in the initial Stage 2/3 distribution. This is addressed in Section 2.4.<br>b. Further consultation has occurred following the Final ACHA going to RAPs on 25 November 2024. The final ACHA was edited and resent to RAPs on 14 March 2025, which has now been included in the consultation log in Appendix A. In addition to updates to the report, consultation was also undertaken in relation to fieldwork carried out in June and November 2025, with Aboriginal stakeholders involved in the process, including discussions regarding the passing bays and the revised development footprint. This update is included in Section 7.3. |
| 3. The consultation documentation provided in Appendix A is incomplete. Please provide:<br>a. Evidence that the Stage 2/3 Project letter dated 18 October 2023 was provided to Kazan, Burra Burra Aboriginal Corporation and Pejar LALC.<br>b. Evidence that the additional consultation letter dated 16 May was provided to Burra Burra Aboriginal Corporation.<br>c. Any additional consultation completed with RAPs to ensure continuous consultation (e.g. project update letters) as required to address the matters outlined in Comment 2 above. | 3a. An administration error during the original Stage 2 and 3 send out did not include 3 groups. This was rectified in the resending of Stage 2 and 3.<br>b. This has been included in the updated Volume 2.<br>c. The second final ACHA send out has been added to the volume 2 appendix for this report. |
| 4. Appendix A7 contains an email dated 20 October 2023 from Diana Astin of Girragirra Murun requesting to register as a RAP for the project. Please clarify the outcome of this and whether or not this group has been included as a RAP for the project. | 4. As Diana Astin of Girragirra Murun registered after 31 March 2023, she was a late registration. Due to an administration error Girragirra Murun was not added to the contact list of RAPs. When this was identified the project information, methodology and ACHA were forwarded to Girragirra Murun. |

| **Heritage** NSW Comment | Austral's Response |
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| 5. The ACHAR (including Executive Summary and Section 2), consultation log provided in Appendix A1 and consultation documentation provided in Appendices A2-A9 contains many errors and discrepancies, particularly regarding dates/years recorded against different consultation stages. Please complete a thorough review of all consultation records and ensure that the information presented is accurate and complete. Examples of the errors/discrepancies that require correction and/or clarification include but are not limited to the following:<br>-The Aboriginal community consultation overview in the Executive summary states that the Stage 4 review commenced on 26/08/2023 and ended on 23/09/2024. There are many similar references to incorrect years within the consultation log.<br>- Section 2.2.3 of the ACHAR states that the Stage 1 Public notice advert was placed in Goulburn Post on 12 July 2024. However, the advert provided in Appendix A4 is dated to 17 July 2024.<br>- The consultation log provided in Appendix A1 indicates that Agency notifications were sent on 10 November 2022. In contrast the Agency letters and emails provided in Appendix A2 are dated 11 October 2022. | 5. Due to an administrative error, the original excel spread sheet dates were formatted into the American month day year dating system. They have now all been converted to the standard day month year system.<br>- The Executive summary has been updated to include the correct the dates.<br>- Section 2.2.3 amended to note correct date of 17 July 2024.<br>- Date discrepancy fixed in the consultation log in Appendix A1. |
| *Assessment of Aboriginal cultural heritage* | |
| 6. Section 6.2.1 of the ACHAR indicates that test excavations were completed within areas assessed to be of high and moderate potential within the proposed disturbance footprint, however, it is unclear how these areas have been identified and defined. We note that the survey results presented in Section 7.1, for example, do not consider or discuss the potential for archaeological deposits within each survey unit. To address this, please update the ACHAR to include explanation around how areas of high and moderate archaeological potential were identified/defined and how it was assessed that the remaining areas within the proposed disturbance area were of low potential. Archaeological sensitivity mapping may help to address this. | 6. Austral has clarified how areas of low, moderate and high archaeological potential areas were identified within the development footprint within Section 6.2.1. Additionally, Section 7.1 now contains a discussion of the potential for the Survey Units and a map, Figure 7.58, has been added. |

| **Heritage** NSW Comment | Austral's Response |
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| 7. Please update the site description provided in Section 7.5 to include:<br>a. Details of how site extents/boundaries have been determined as per Requirements 6 and 7 of the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (Code of Practice; DECCW 2010). This should include consideration of the potential for the site to extend beyond the recorded site extent, particularly in instances where low visibility may have affected the identification of surface artefacts and/or where a site was identified during testing and the potential for additional sub-surface artefacts remains in the surrounding unexcavated areas.<br>b. A clear outline of whether the artefact component of the site represents a surface and/or sub-surface expression.<br>c. An assessment/consideration of the potential for sites and/or landforms identified and assessed during the survey to contain archaeological deposits. | 7a. Sites within this section have been updated to include how site extents were established.<br>b. Whether the sites are surface or sub-surface artefacts has been clarified.<br>c. An assessment of potential has been included for sites within this section. |
| 8. Please update Section 7.5 to include additional mapping showing the location of each site and its recorded boundary, noting that maps should be at a scale that is appropriate to the site and its relationship to other sites, important features, the disturbance footprint/s and the project boundary and that multiple maps may be required to effectively convey this information. | 8. Figure 7.58 has been added to show the extent of sites identified during the survey. Site extents have been added to the maps of individual testing areas in Section 7.4, and Figure 10.1. |
| 9. Section 6.1.1 of the ACHAR states that one of the objectives of the survey was to "*re-identify previously recorded Aboriginal archaeological site (AHIMS #52-4-0237*)" (Pg.76) however, there is no discussion of this site in the survey results presented in Section 7.1. Please update the ACHAR to include clarification regarding whether the site was re-identified during the survey and provide the results of any additional recording/assessment relating to site condition etc. | 9. Based on a review of the tracks and notes from the survey that had been reformed, there is no mention of an effort being made to identify the site. This objective has been removed from section 6.11. |

| **Heritage** NSW Comment | Austral's Response |
|---|---|
| 10. Figure 7.35(Results of the test excavations) shows a number of test pits that were excavated within an area situated to the north of Area 6 and Area 2. The figure indicates that artefacts were recovered from this area, however, the results of the testing within this area have not been discussed in the ACHAR and it is unclear whether the area has been registered as a site on Aboriginal Heritage Information Management System (AHIMS) consistent with artefacts having been recovered. We note that, while the area may now be outside of the proposed disturbance footprint, the results of assessment in this area must still be documented within the ACHAR consistent with the requirements for investigations undertaken under the Code of Practice. Please update the ACHAR to meet this requirement, confirm whether the area has been registered as a site on AHIMS and ensure that the significance and impact assessments are updated accordingly. | 10. Figure 7.35 (now Figure 7.59) has been updated to include a label for this area. This has also been done for Testing Area 3 and Testing Area 5, which are associated with the Wattle Creek Solar Farm ACHA (separate project). Their results have been included in Section 7.4 |
| 11. Figure 7.52 shows a series of eight (8) test pits that were excavated outside of the proposed BESS development corridor within 'Testing Area 6'. According to the figure three (3) sub-surface artefacts were recovered from test pits in this area. The ACHAR, however, does not include discussion of these test pits (i.e. they are not included in the 40 test pits noted as being excavated to inform the ACHAR) and it is unclear how these artefacts have been interpreted and recorded. Please clarify this discrepancy and confirm whether these artefacts are captured within the extent of any Aboriginal site/s recorded within Area 6 or whether they have been registered as a new site. As with our previous comment, the ACHAR must be updated to include these results and meet the requirements of the Code of Practice. | 11. This discrepancy has been fixed as part of addressing Comment 20 b. and c. Please refer to that comment for how this was addressed. |

| **Heritage** NSW Comment | Austral's Response |
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| 12. Figure 4.1 indicates that AHIMS #52-4-0778 is situated within proximity to the potential disturbance footprint for Transmission Line Option 2. The site card for AHIMS #52-40778 indicates that the site represents a potential archaeological deposit (PAD) measuring approximately 100m by 50m recorded by Austral on 6 February 2024. From the scale of the mapping, it is unclear whether the site has the potential to extend into the development corridor and there is no information or discussion of the site presented within the ACHAR. To address this:<br>a. Please update the ACHAR to include an outline of all sites and areas of PAD identified during the assessment for the current project.<br>b. Please confirm how it has been determined that AHIMS #52-4-0778 does not have the potential to extend into the proposed development footprint. Where there is potential for the site to extend into the proposed development footprint, test excavations will likely be required to investigate this. | a. Section 7.1.3 of the ACHA has been updated to outline the details of AHIMS 52-4-0778 and how it was determined not to be a valid site.<br><br>b. AHIMS 52-4-0778 was registered due to an administrative error, due to a misinterpretation of fieldwork notes and a change of project manager. This site card has been updated to "Not a Site" on AHIMS to reflect this on 21 November 2025. |
| 13. Section 9.1 refers to "the lone high-density artefact scatter, Wattle Creek 6 (AHIMS #52-4-0776) recorded during the field survey" (pg.152) however there is not discussion of this site in the survey results presented in Section 7.5 (Identified Aboriginal sites) or in the site analysis presented in Section 8 (analysis and discussion). As per our previous comments, the ACHAR must be updated | 13. During the addition of Wattle Creek 6 (AHIMS #52-4-0776) into the ACHA it was identified that a number of sites identified during the survey have not been included in Section 7.5 and Section 8. For completeness all sites that have been identified during the survey have been added to the relevant sections.<br>It was also identified that Section 9.1 was located in the incorrect location and has been moved to become Section 8.4. |
| 14. Figure 11.1 indicates the Wattle Creek 9 (AHIMS #52-4-0768) is situated within the proposed BESS disturbance footprint, however, no information regarding the original recording/identification of the site has been included in the ACHAR. Please update ACHA to address this. | 14. This was updated as part of addressing Heritage NSW comment 13. |

| **Heritage** NSW Comment | Austral's Response |
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| 15. The site description for Wattle Creek 18 (AHIMS #52-4-0805) provided in Section 7.5 indicated that artefact was identified eroding out of an exposure at the base of a stringy bark tree. We note that where an artefact is identified out of the ground surface this is generally indicative of an original sub-surface context. With this in mind, please clarify whether Wattle Creek (AHIMS #52-4-0805) is considered to have PAD. Where this is the case and the site is proposed to be impacted, please clarify whether the site has been or will be subject to testing. Where the site is not proposed to be impact additional testing would not be required, however the AHIMS site card must be updated to include 'PAD as a feature to ensure appropriate assessment and management of the site in the future. Where the site has the potential to be impacted, and has not been subject to test excavation, this will likely be required. | 15. The site description for Wattle Creek 18 (AHIMS #52-4-0805) has been updated on page 191 to make it clearer that the site did not have a PAD associated with it. |
| 16. Please clarify why Aboriginal site 'TME-OS2 with PAD' (AHIMS #52-4-0134) was not subject to test excavation. According to the site card, the site consists of an artefact scatter with PAD, however there are no details as to the extent of the PAD and whether there is potential for the site to extend into the proposed development footprint of Transmission Line Option 2 and/or the road access associated with the Solar Development Footprint. Where adequate justification cannot be provided, additional test excavation will likely be required to address this. | 16. The site description for TME-OS2 with PAD (AHIMS # 52-4-0134) in section 7.1.11 and 7.6 has been updated to reflect the investigation of the site's location. The cultural material of the site was unable to be relocated, and no evidence of a PAD in this area was identified where exposure was present. The site card has been updated to reflect the new extent.<br>The proposed design of the BESS has been altered and therefore, TME-OS2 with PAD (AHIMS # 52-4-0134) will no longer be directly impacted and therefore does not require test excavation. |
| 17. Please confirm whether the AHIMS site cards for sites that were identified during test excavations have been prepared to clearly identify the sub-surface context of the artefacts and include 'PAD' as a site feature where there is potential for additional sub-surface artefacts to be present within adjacent unexcavated areas. | 17. All site cards have been checked and updated to specify if they are subsurface deposits or have the potential to contain subsurface deposits. Those that do not have subsurface potential have been updated to specify that they are surface artefacts. |
| 18. Aboriginal sites AHIMS #52-4-0805 and AHIMS #52-4-0806 are registered on AHIMS in the exact same location (see Figure 11-1). Please confirm whether the correct co-ordinates have been used when registering both sites. Where an error in registration has occurred, please ensure the ACHAR and AHIMS records are updated to correct this, noting that the impact assessment will also likely require updating based on corrected locations. | 18. Upon review, AHIMS # 52-4-0805 was registered with the incorrect location on AHIMS. The site card for AHIMS # 52-4-0805 was updated on 26 November 2025 and approved by AHIMS on the same date. The relevant mapping has also been updated to accurately display the location of AHIMS # 52-4-0805. |

| **Heritage** NSW Comment | Austral's Response |
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| 19. Additional discussion is required to support the reassessment of the entire disturbance footprint as being of 'low archaeological sensitivity' as presented in Figure 9.1. This reassessment is inconsistent with the results presented in the ACHAR which have confirmed the presence of Aboriginal objects across the disturbance footprint. | 19. Figure 9.1 (now Figure 8.1) has been updated to better reflect the results of the ACHA. |
| 20. Please update the ACHAR to provide clarification regarding the following discrepancies:<br>a. Section 7.5 indicates that a total of 9 new Aboriginal sites were identified during the survey completed as part of the ACHAR, however, the landform survey data presented in Table 7.2 indicates that the total number of sites within the landforms surveyed is only 6.<br>b. Section 7.4.1 of the ACHAR states that a total of 17 artefacts were recovered during test program in contrast , data presented in Table 8.1 indicates that a total of 15 artefacts were recovered during testing.<br>c. Section 7.4.1 of the ACHAR states that 40 test pits were excavated resulting in 17 Aboriginal objects being recovered from 8 of the test pits. In contrast, the EIS states that a total of 79 test pits were excavated resulting in 25 stone artefacts being recovered from 13 test pits (pg.7).<br>d. Section 11 states that *"following the desktop, survey and excavation investigation a total of 48 sites were identified within the Project Area"*. however, only 33 sites are considered in the impact assessment. Further Table 9.3 presents the scientific significance assessment for only 47 Aboriginal sites located within the Project area.<br>e. Figure 4.1 (AHIMS Sites within and adjacent to the Project Area) is missing from the ACHA. | 20a. Section 7.1 now refers to 18 sites identified during the survey, and Table 7.2 accurately reflects this total.<br>b. The discrepancies between section 7.4.1. and section 8 (which includes table 8.1) have been fixed and all artefacts identified during test excavation and survey have been added with clear wording to indicate when the text is referring to subsurface artefacts, surface artefacts or both.<br>c. Section 7.4.1 had been updated to include all test pits that were dug as part of the testing program in the Project Area.<br>d. The discrepancies between section 11, the impact assessment and table 9.3 have been addressed as part of addressing comment 21 and 23.<br>e. Figure 4.1 has been added. |
| *Significance Assessment* | |
| 21. Please update the significance assessment to include all sites within the defined Project Area assessed in the ACHAR regardless of whether they are within the proposed development footprint or not. The label for Table 9.3 indicated that the significance assessment includes all sites within the Project area, however this does not appear to be the case. | 21. The significance assessment has been updated to include all sites in the Project Area. |
| *Proposed works* | |

| **Heritage** NSW Comment | Austral's Response |
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| 22. We note that the proposed transmission line corridors (option A and option B) have been included in the current SSD application for the BESS and have also been included in the SSD application for solar farm being assessed under SSD-63344210. Please confirm whether the proposed transmission line works are to be undertaken the current SSD, the Solar SSD or both and update the ACHAR to provide clarification regarding the staging of works and the interaction with the related SSD project for the solar farm. | 22. The transmission line options are no longer proposed. A revised single transmission alignment has been confirmed. The transmission line and associated access and ancillary infrastructure is noted as 'common ancillary infrastructure' in both the Project and the Proposed Wattle Creek Solar Farm Project. These areas are assessed under both projects to allow both projects to be developed independently, however the common ancillary infrastructure will only be built under one approval. |
| *Impact Assessment* | |
| 23. Please update the impact assessment presented in Section 11 to include all Aboriginal sites identified within the Project Area for completeness. Noting that the current project is directly related to the standalone BESS being assessed under SSD-63345458, Heritage NSW also requests that impact assessment presented in Section 11 be updated to consider the cumulative impact of both projects by clearly articulating which Aboriginal sites are within the proposed disturbance area of the Solar Farm (current SSD), which are located within the proposed disturbance area of the standalone BESS (SSD-63345458), which sites are within the transmission line options (differentiating between the option A or option B alignments) and which sites are located outside of all disturbance areas. This is requested to ensure consistency in the proposed approach to managing Aboriginal sites within the shared Project Area and to ensure that those sites identified for avoidance in the current SSD can be avoided by both projects. | 23. All sites that have been identified in the Project Area have been added to the impact assessment. |

| **Heritage** NSW Comment | Austral's Response |
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| 24. Please confirm whether the current impact assessment and disturbance footprint boundary relates to the most recent design revision. Specifically, we note the following discrepancies that require clarification:<br>a. The Environmental Impact Statement (EIS) states that eight (8) Aboriginal sites will be impacted by the project (pg.127) in contrast the ACHAR which states that nine (9) Aboriginal sites will be impacted. We note that there are also differences in the sites identified as being impacted between the EIS and ACHAR (e.g. compare Table 6.27 in the EIS with Table 11.1 in the ACHAR).<br>b. The impact assessment presented in Table 11.1 of the ACHAR indicates that Wattle Creek 17 (AHIMS #52-4-0806) and Wattle Creek 18 (AHIMS #52-4-0805) will be subject to total direct harm as a result of the project. In contrast, Figure 11.1 of the ACHAR places both of these sites outside of the proposed disturbance corridor, indicating that avoidance should be possible.<br>c. Figure 11.1 indicates that Wattle Creek 9 (AHIMS #52-4-0768) is situated within the proposed BESS disturbance footprint, however, the site has not been considering in the impact assessment presented in the ACHAR.<br>d. Figure 11.1 indicates that Wattle Creek AFT 14 (AHIMS #52-4-0808) is situated within the disturbance footprint for Transmission Line Option 1 and therefore has the potential to be impacted by the project, however, the site has not been considered in the impact assessment. | a. The ACHA identifies the correct number of sites (n=9) that will be impacted.<br>b. The impact assessment has been updated accurately to portray that Wattle Creek 17 (AHIMS #52-4-0806) and Wattle Creek 18 (AHIMS #52-4-0805) will not be harmed by the proposed works of the BESS.<br>c. The impact assessment has been updated accurately to portray that Wattle Creek 9 (AHIMS #52-4-0768) will be harmed by the proposed works of the BESS.<br>d. The impact assessment has been updated accurately to portray that Wattle Creek AFT 14 (AHIMS #52-4-0808) will be harmed by the proposed works of the BESS. |
| 25. Based on Figure 11.1 a number of Aboriginal sites appear to be located within or very close to the proposed disturbance footprint for the project and it is unclear whether these sites have the potential to be impacted. To address this please:<br>a. Provide updated or additional figures at an appropriate scale to clearly show the location of Aboriginal sites in relation to the Project area and proposed disturbance footprints. The boundary and extent of Aboriginal sites with artefact scatters and/or PADs must clearly be illustrated.<br>b. Clarify the distance between the boundaries of the following Aboriginal sites to the proposed disturbance area and confirm whether there is potential for them to extend into the disturbance footprint and be impacted by the project: AHIMS #52-4-0134 and AHIMS #52-4-0778. | 25a. Figure 11.1, now Figure 10.1, has been updated to show the footprint of sites that have an area greater then 1 by 1 m which are represented by a point due to their small size.<br>b. Clarity regarding AHIMS #52-4-0778 boundary is addressed as part of Comment 12. AHIMS #52-4-0134 is now being considered to be impacted and the extent added to Figure 11.1, now Figure 10.1. |

| **Heritage** NSW Comment | Austral's Response |
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| 26. Section 1.4 of the ACHAR indicates that the project includes minor upgrades to the existing site access point from Canyonleigh Road and internal access roads. Please clarify whether these proposed update works will result in ground disturbance (e.g. road widening etc.) and if so, whether the potential for impacts to Aboriginal cultural heritage objects and values has been considered and assessed in relation to these works/locations. Please note that the impact assessment must also consider any road upgrade works that may be required along any transport routes (e.g. upgrades to accommodate 'over size, over mass vehicle' [OSOM] transporting components to the project area). | 26. The proposed passing bays along Canyonleigh Road were surveyed in July 2025. The results of this additional survey are presented in Section 7.3. Maps have been updated to include these impacts along with a survey to address changes to the development footprint. |
| *Management measures* | |
| 27. We note that Section 12.3 indicates that a community salvage program is recommended to mitigate harm to sites proposed for impact and states that this will occur at "six artefact sites and 3 artefact scatter sites", however, no information is provided in relation to which sites these are. Please update Section 12 to include a table which clearly identifies the site-specific management measures proposed for all Aboriginal sites within the Project Area including those to be avoided, those to be subject to community collection and those to be subject to unmitigated harm. | 27. Section 12.3 (now Section 11.3) has been updated to include a table identifying the management measures for each of the sites. |
| 28. Please clarify whether any Aboriginal sites located within proximity to the disturbance footprint require protective fencing during construction to ensure their protection/avoidance. | 28. Disturbance associated with the Project will be contained within the Development Footprint. Most sites are located with or some distance from the disturbance footprint. The only site located in close proximity to the Development Footprint TME-OS2 with PAD (AHIMS # 52-4-0134) which is recommended to have exclusion fencing. |
| 29. Figure 2.8 in the EIS includes an 'Aboriginal heritage avoidance area', however, there is no information provided in the EIS regarding how this area has been defined and what it means in terms of management. Furthermore, there is no mention of an 'Aboriginal heritage avoidance area' within the ACHAR provided in support of the EIS. Please clarify this discrepancy and provide additional information regarding the proposed 'Aboriginal heritage avoidance area' mentioned in Figure 2.8 of the EIS. | 29. Figure 2.8 provides a broad overview of the potential constraints identified on site to inform project planning. The area referenced was identified as a sensitive landform during the assessment which would require test excavation, due to access to this area being difficult, this area was identified as being a constraint for development due to archaeology. |

## 1.8. ABBREVIATIONS

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

| | |
|---|---|
| AC | Alternating Current |
| ACHA | Aboriginal Cultural Heritage Assessment |
| ACHMP | Aboriginal Cultural Heritage Management Plan |
| ACHDDA | Aboriginal Cultural Heritage Due Diligence Assessment |
| AHIMS | Aboriginal Heritage Information Management System |
| AHIP | Aboriginal Heritage Impact Permit |
| Austral | Austral Archaeology Pty Ltd |
| BESS | Battery Energy Storage System |
| Burra Charter | *Burra Charter: Australia ICOMOS Charter for Places of Cultural Significance 2013* |
| CEMP | Construction Environmental Management Plan |
| Cth | Commonwealth |
| DC | Direct Current |
| DCP | Development Control Plan |
| EIS | Environment Impact Statement |
| EPA Act | *Environmental Planning and Assessment Act 1979* |
| EMM | *EMM Consulting Pty Ltd* |
| GSV | Ground Surface Visibility |
| ICOMOS | International Council on Monuments and Sites |
| IMSTC | Indurated mudstone, silicified tuff, chert |
| LEP | Local Environmental Plan |
| LGA | Local Government Area |
| MW | Megawatt |
| NEM | National Electricity Market |
| NPW Act | *National Parks and Wildlife Act 1974* |
| NPW Regulation | *National Parks and Wildlife Regulation 2009* |
| NSW | New South Wales |
| OzArk | Environment & Heritage Management Pty Ltd |
| PAD | Potential Archaeological Deposit |
| PLALC | Pejar Local Aboriginal Land Council |
| Premise | Premise Pty Ltd |
| Project Area | 1001 Canyonleigh Road, Brayton & Big Hill NSW - Lot 3 DP1120270 |
| Proponent, the | Spark Renewables Pty Ltd |

| | |
|---|---|
| AC | Alternating Current |
| PV | Photovoltaic |
| REZ | Renewable Energy Zone |
| SEAR | Secretary's Environmental Assessment Requirements |
| SEPP | State Environment Planning Policy |
| Spark | Spark Renewables Pty Ltd |
| SU | Survey Unit |
| Umwelt | Umwelt (Australia) Pty Ltd |

# 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 the Project commenced in line with the Consultation Requirements (Department of Environment, Climate Change and Water NSW 2010a). Heritage NSW recognises that (Department of Environment, Climate Change and Water NSW 2010a:iii):

- 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.

A copy of the consultation log and evidence of all correspondences that were sent and received as part of the consultation process is included in Volume 2, Appendix A of this ACHA.

## 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, Austral notified the bodies and organisations listed in Section 4.1.2 (Department of Environment, Climate Change and Water NSW 2010a:10) with the following responses:

- Heritage NSW – responded with a list of stakeholders who may have an interest in the proposed development.
- PLALC did not respond.
- Office of the Registrar, *Aboriginal Land Rights Act 1983* – Did not respond to the email and therefore did not provide a list.
- National Native Title Tribunal – responded that Gundungurra LALC may have an interest in the proposed development.
- Native Title Services Corporation Limited did not respond.
- The Upper Lachlan Shire Council did not respond with a list of stakeholders who may have an interest in the proposed development.

During Stage 1.1, the project approach and wording were still being finalised between Austral and Spark Renewables, which extended the following stages. It was also identified that Heritage NSW had not responded to the earlier correspondence, and a follow-up email was sent once this was identified, although this fell outside the recommended 6 month timeframe. At that time, no stakeholder list had been provided, and no Aboriginal stakeholder groups had registered for the Project, so there were no groups to update during the interval.

A copy of these letters, searches and responses are included in Volume 2, Appendix A.2 of this ACHA.

### 2.2.2. INVITATION TO REGISTER

Letters were written to the Aboriginal stakeholders identified through notifying the various agencies suggested in Section 4.1.2 of the Consultation Requirements (Department of Environment, Climate Change and Water NSW 2010a:10). Aboriginal stakeholders were provided with a 14-day period to register an interest in the project.

In response to the stage 1.2 component of the consultation, one stakeholder group requested that their details not be provided. As a result, they have been included under the pseudonym 'anonymous 1'.

Girra Murun requested to register for the project as a stakeholder on the 24 October 2023. Due to an administrative error the request form Girra Murun was not identified and actioned until late January 2026. On 10 February 2026, Girra Murun was formally registered.

A copy of outgoing letters and responses is included in Volume 2, Appendix A.3 of this ACHA.

As a result of the consultation procedure, the groups shown in Table 2.1 registered as Aboriginal stakeholders with an interest in this project. It should be noted that the Yankuntjara/Kamilaroi Working Group originally registered for the project but formally withdrew their registration on 17 June 2024. This correspondence is contained in Appendix A.

**Table 2.1 List of Registered Aboriginal stakeholders.**

| Organisation | Contact Person |
|---|---|
| Sonione Wakabut Rogers | Sonione Wakabut Rogers |
| Wingarra Wilay Aboriginal | Ray Moon |
| Anonymous 1 | Anonymous 1 |
| Kazan | Kazan |
| Yurwang Gundana | Merekai Bell |
| Burra Burra Aboriginal Corporation | Graham Maranda |
| Thomas Dahlstrom | Thomas Dahlstrom |
| Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corp | Tyronne Bell |
| PLALC | Delise Freeman |
| Girra Murun | Diana Astin |

### 2.2.3. PUBLIC NOTICE

Due to an administrative error, the Stage 1.3 advertisement was not sent to the newspaper following the Stage 1.2 period. As a result, it was placed in the *Goulburn Post* and ran on 12 July 2024. This public notice

requested the registration of individuals or organisations who hold cultural knowledge relevant to the Project Area. Although there was an error, no registration occurred as a result of this notification.

A copy of this advert is included in Volume 2, Appendix A.4 of this ACHA.

#### 2.2.4. SUBMISSION OF RECORDED STAKEHOLDERS

In accordance with Section 4.1.6 of the Consultation Requirements (Department of Environment, Climate Change and Water NSW 2010a:11), Austral provided details of all registered Aboriginal stakeholders to Heritage NSW and PLALC on 15 July 2024. An additional list of stakeholders was sent on 10 February 2026 due to formulation of a late registration.

A copy of this letter is included in Volume 2, Appendix A.5 of this ACHA.

## 2.3. STAGE 2: PRESENTATION OF INFORMATION

All registered Aboriginal stakeholders were provided with information outlining the Project, including information relating to potential impacts as well as the survey methodology, on 19 October 2023 and again on 15 July 2024 due to an administrative error occurring in the original email. Project Information was sent to Girra Murun on the 10 February 2026 due to late registration and administrative error.

Copies of all correspondence relating to the provision of project information are included in Volume 2, Appendix A.6 of this report.

## 2.4. STAGE 3: GATHERING INFORMATION ABOUT CULTURAL SIGNIFICANCE

This section details information relating to cultural significance provided by Aboriginal stakeholders through the formalised process of Stage 3 of the Consultation Requirements and any additional information which may have been provided during fieldwork.

#### 2.4.1. REVIEW OF PROJECT METHODOLOGY

Austral provided each Aboriginal stakeholder with a copy of the methodology on 19 October 2023 and again on 15 July 2024 due to an administrative error occurring in the original email. The methodology outlined the proposed assessment process that would be used in the completion of the ACHA. Aboriginal stakeholders were provided with 28 days to review and provide feedback on the methodology.

No comments from Aboriginal stakeholders were received at this stage of consultation.

The methodology was sent to Girra Murun on the 10 February 2026 due to late registration and administrative error.

Copies of all correspondence relating to the draft methodology are included in Appendix A.7, Volume 2 of this ACHA.

#### 2.4.2. INFORMATION GATHERED DURING FIELDWORK

No cultural information was provided by Aboriginal stakeholders during the fieldwork component of this Project.

## 2.5. STAGE 4: REVIEW OF DRAFT ACHA

The draft ACHA was provided to Aboriginal stakeholders on 26 August 2024 for their review and comment. Aboriginal stakeholders were given 28 days to review the ACHA.

There were 3 responses received from stakeholders for Stage 4 and the responses were as follows:

- *"Thank you for the update I will take a look."* Sonione Wakabut Rogers, 26 August 2024.
- *"It may take up to 5 working days to respond."* An automated response from Thunderstone Aboriginal Cultural and Land Management Services Aboriginal Corporation, 26 August 2024.
- Anonymous Party 1 provided comments on 24 September 2024. A summary of Anonymous Party 1's comments is provided in **Table 2.2**.

**Table 2.2 Summary of comments received from Anonymous Party 1 during Stage 4 of the Consultation Requirements**

| Comment | Response |
|---|---|
| "We request the author review the document with consideration to readily available records such as those contained in resources such as Arthursleigh by Chrissy Fletcher (2002) and What the Settlers Saw by Jennifer Lamb (2019)" | Addressed in Section 4.1. |
| "The subject site has high significance, including intangible elements and the Wollondilly River. Wollondilly does not mean 'Wundjigaribay' - this is incorrect." | References to the Wollondilly River, meaning 'Wundjigaribay' have been removed. |
| "Our family has maintained a connection to the subject site (to the present day) and the statement "Although there are no known Aboriginal individuals associated with the Project Area" is incorrect." | This statement has been removed. |
| Edits to 3.2. PAST LAND USE PRACTICES | Addressed in Section 3.2. |
| Edits to 4.1. POPULATION AND CONTACT HISTORY | Addressed in Section 4.1. |
| "Artefacts located during the fieldwork are precious and specific and need to be returned to the site post development, treated with the respect they deserve. Burra Burra Aboriginal Corporation and Anonymous Party 1 would welcome the opportunity to be involved in any further Aboriginal involvement regarding the subject site, and request to be involved in ensuring the artefacts are treated appropriately and returned to Country. Based on what is known of the development to date, returning the artefacts to Country would seem appropriate." | Addressed in Section 13. |

| Comment | Response |
|---|---|
| "The site proposed for the Wattle Creek Solar Farm [including the BESS] was likely utilised as an important hunting ground and location for sourcing a variety of food. Fresh water was plentiful." | Addressed in Section 4.1. |

No other responses were received.

The methodology was sent to Girra Murun on the 10 February 2026 due to late registration and administrative error.

Copies of all correspondence relating to the review of the draft ACHA are included in Appendix A10, Volume 2 of this report.

## 2.6. PROVISION OF FINAL ACHA

To comply with Section 4.4.5 of the Consultation Requirements (Department of Environment, Climate Change and Water NSW 2010a:14), a copy of the final ACHA is to be provided to all registered Aboriginal stakeholders and PLALC following its completion on the 25 November 2024. Due to updates being made to the body of the ACHA the updated report was distributed to the Aboriginal stakeholders on the 14 March 2025 as no major changes were made to the wording of the report or the recommendations.

The ACHA was revised in late 2025 early 2026, to address a request for further information from HNSW and to capture changes to the proposed project. Though some of these changes resulted in additions to the body of the ACHA; this content provides further context and information to address HNSW's submission only and there were no new sites identified during survey associated with the revised development footprint.

Modification to the recommendations was required for clarification of the required mitigation measures and readability only. The additional previously recorded sites noted for collection are located in close proximity to the existing farm access track that will be used for emergency access for the Project. These sites have been previously communicated to the RAPs for collection associated with the Wattle Creek Solar Farm Project as consultation was undertaken with the RAPs across both projects concurrently.

The ACHA has been issued to the Aboriginal stakeholders upon finalisation of this version.

## 2.7. ADDITIONAL CONSULTATION

Due to the extended period of time between the completion of field work and the distribution Stage 4, a project update was sent to the registered Aboriginal stakeholders on 16 May 2024 to ensure that the consultation remained current. No responses were received from these updates. Evidence for this can be seen in Appendix A9, Volume 2 of this report.

Additional consultation was conducted in the field during surveys in 2025 of the 7 passing bays and the altered development footprint. These surveys took place on 3 June 2025 and 11 November 2025. No comment was made during these surveys.

# 3. LANDSCAPE CONTEXT

The following section defines the Project Area and it's environmental and cultural context.

## 3.1. ENVIRONMENTAL CONTEXT

The following section discusses the Project Area in relation to its landscape, environmental and Aboriginal landscape resources. This environmental context has been prepared in accordance with Requirement 2 of The Code (Department of Environment, Climate Change and Water NSW 2010b:8–9).

The Project Area is located in the South Eastern Highlands bioregion. This temperate region is defined by the plateaus and ranges of the Great Dividing Range that are below the Australian Alps. It contains several headwaters for major rivers within south-eastern Australia, including the Murray, Murrumbidgee, Lachlan, Shoalhaven and Snowy rivers (Sahukar et al. 2003:203–209). The Project Area is located in the Bungonia sub-region, an area characterised by fine-grained Palaeozoic sedimentary and meta-sedimentary rocks. There are pockets of acid volcanics and limestone as well as sedimentary and sand deposits along rivers (Sahukar et al. 2003:209). Additionally, the Project Area is close to the boundary of the Burragorang sub-region, part of the Sydney Basin bioregion (Sahukar et al. 2003:193). Due to this, there may be some characteristics of this sub-region within the Project Area.

The following sections give an overview of the key environmental factors that in the past would have influenced Aboriginal use and occupation of the landscape of which the Project Area is a part. These factors are informed by our limited knowledge of early contact history between the first European settlers and local Aboriginal groups as well as more recent academic and development-pushed archaeological studies.

### 3.1.1. TOPOGRAPHY AND HYDROLOGY

There are several ridgelines and valleys in the Project Area, with the major topographical features being Pleasant Hill, Mount Pleasant, and the Wollondilly River. As such the Project Area comprises undulating hills, slopes, and terraces with narrow river flats. The areas of highest elevation are in the western portion of the Project Area, reaching an approximate elevation of 650 m above sea level. Slopes within the Project Area are mainly moderate with occasional spurs and terraces. Ridge lines are mainly flat, forming terraces or plateaus.

The landform units identified within the Project Area are identified in Figure 3.1.

The Project Area is situated adjacent to the Wollondilly River within the Hawkesbury-Nepean catchment. The Hawkesbury-Nepean catchment is the largest coastal catchment in NSW, over 70 % of the catchment consists of mountainous terrain with approximately 10% flat terrain (Hawkesbury-Nepean Catchment Management Authority 2008). The Wollondilly River, a 6$^{th}$ order stream, runs along portions of the northern, eastern and southern boundaries of the Project Area as well as through the Project Area. The Project Area has several other creeks and minor tributaries oriented both south-west and north-east, these waterways include Dead Mans Creek and Wattle Creek to the north, Island Creek to the south-east and Sandy Creek running through the Project Area. Given the location and accessibility to numerous freshwater sources, the Project Area is ideally situated for occupation. There are also a number of unnamed first, second and 3$^{rd}$ order streams also within the Project Area that feed directly into the Wollondilly River. A number of these streams have been dammed for agricultural purposes and are fed by intermittent springs.

The hydrological systems identified within and in the locality of the Project Area are identified in Figure 3.2.

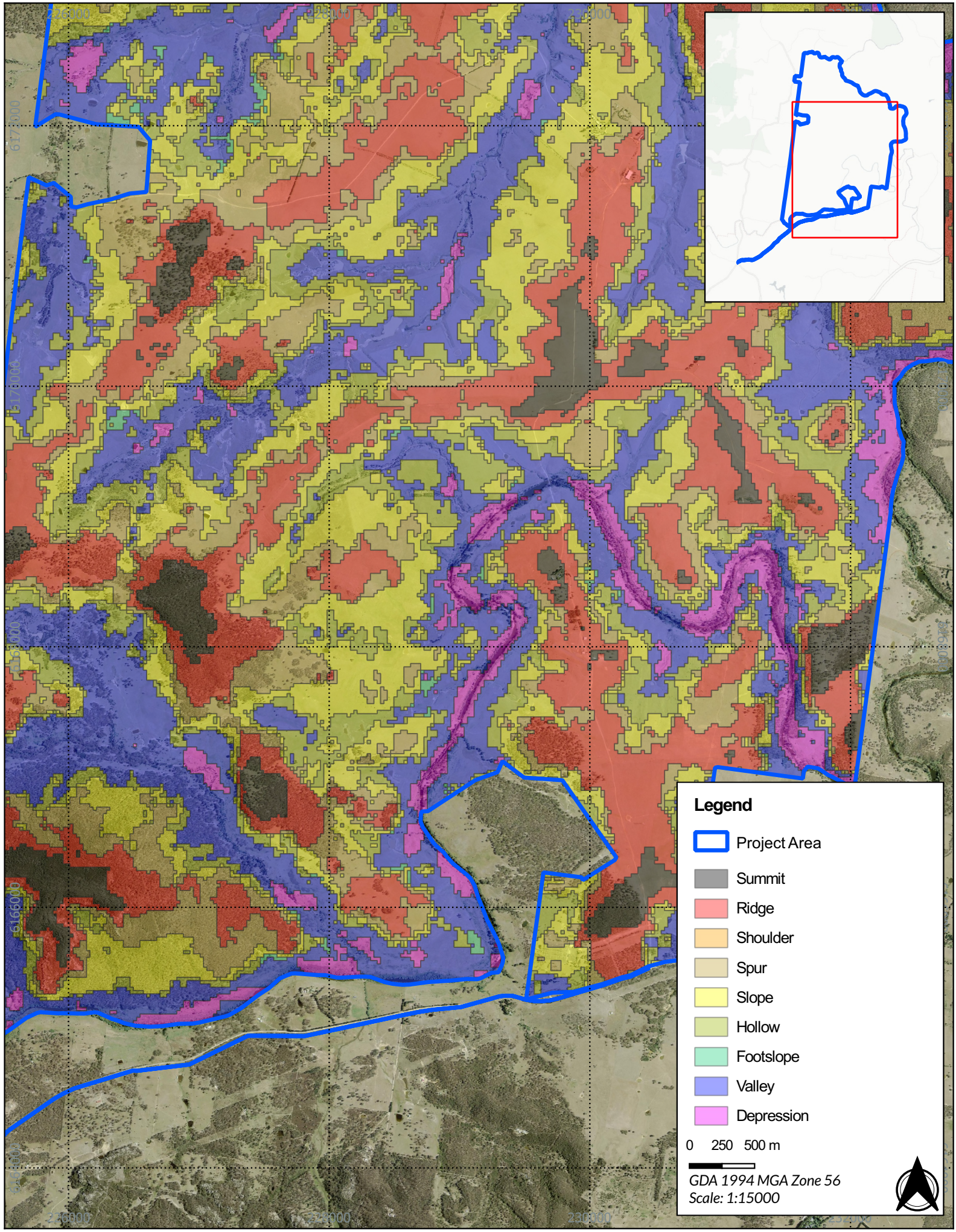



**Figure 3.1 - Landform units identified within the project area**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, CartoDB Positron, Geoscience Australia DEM*

*Drawn by: FOT Date: 2025-10-20*

AUSTRAL ARCHAEOLOGY

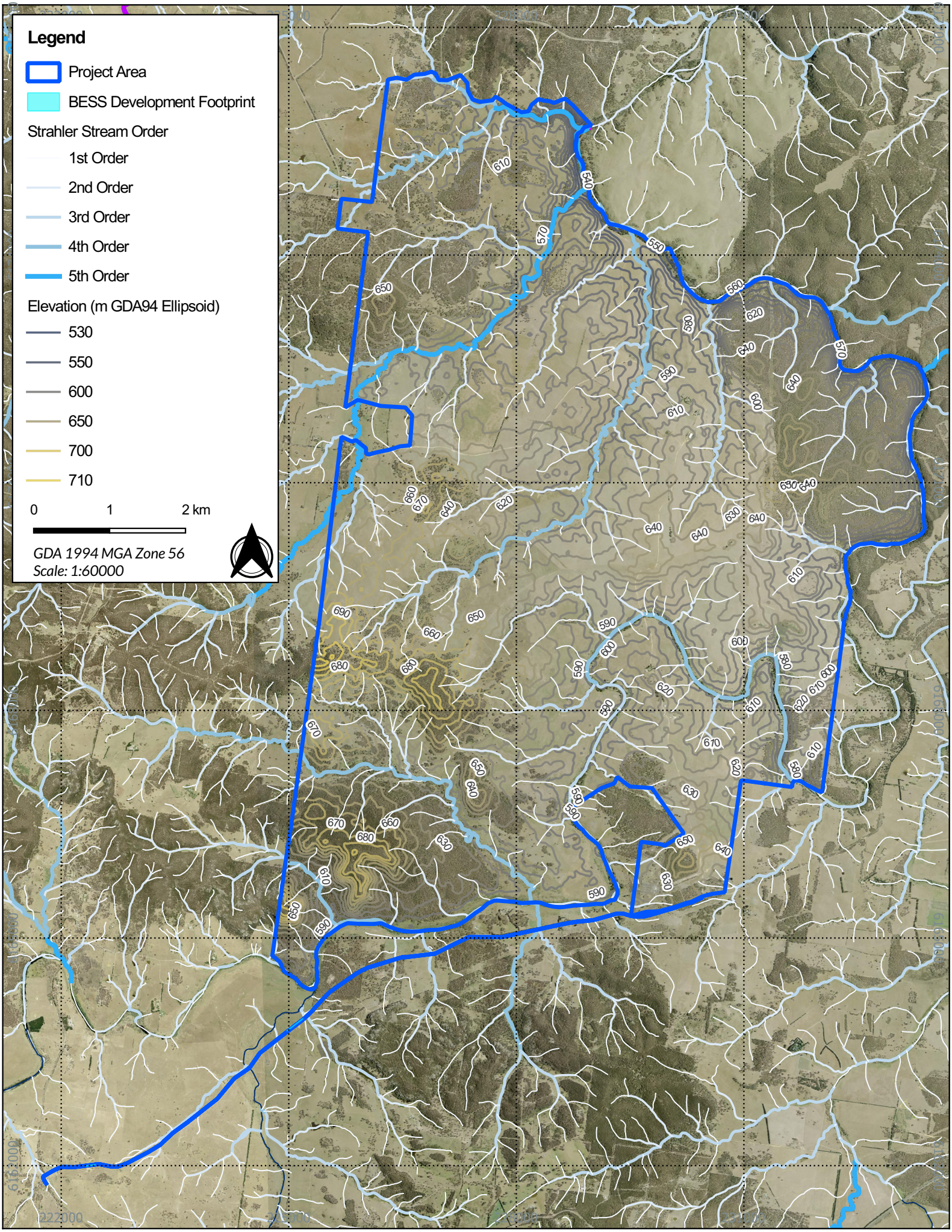



**Figure 3.2 - Hydrology and topography of the project area**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, NSW LGA Hydroline, Geoscience Australia DEM*

*Drawn by: FOT Date: 2025-10-20*

AUSTRAL ARCHAEOLOGY

### 3.1.2. GEOLOGY AND SOILS

The Project Area is located within the Lachlan fold belt. The Lachlan fold belt is characterised by sandstones and shales with areas of volcanic rock, limestone and granite (Sahukar et al. 2003:203–204). The main geological units identified within the Project Area are Arthursleigh Tonalite and Residual Deposits, which are found through the central portion of the Project Area. Other significant geological units in the Project area include the Abercrombie Formation in the eastern parts, and the Kerillon Tuff Member and Kerrawarra Dacite Member in the western portions of the Project Area. In the south-west corner of the Project Area are Tallong Conglomerate, and Colluvial talus deposits (Colquhoun et al. 2019). The Project Area also contains a variety of other geological units which include:

- Alluvium
- Barrallier Ignimbrite
- Berry Siltstone
- Bindook Group – rhyolite
- Bungonia group
- Colluvium
- Jaorimin Ignimbrite
- Johnniefields Granodiorite
- Kerrawarra Dacite Member, sandstone facies
- Pleasant Hill Granite
- Southern Highlands Volcanics
- Ungrouped Cenozoic sedimentary unit

Most of the geology within the Project Area is of the Devonian age, with alluvial and residual deposits developing during the Quaternary period. The Project Area contains a number of small outcrops of sandstone, siltstone, granite and volcanic bedrock. Some geological groups also contain quartz and siliceous deposits (Colquhoun et al. 2019). These geological attributes of the Project Area may have provided areas suitable for shelter, art, quarries and grinding as well as material for lithic production. The geological units within the Project Area are shown in Figure 3.3.

The Project Area mainly contains Kurosols and Sodosols soil with a small area of Dermosols soil in the eastern portion of the Project Area. Kurosols have an abrupt textural B horizon that is also very acidic (CSIRO 2016:74). Sodosols also have a distinct B horizon but are not as acidic as Kurosols (CSIRO 2016:98). Dermosols have a very weak textual B horizon (CSIRO 2016:41). Mitchell's landscapes provided further descriptions of the soils within the Project Area. The Project Area is mostly located on the Wollondilly – Bindook Tablelands and Gorges, which contain thin soil profiles over steep slopes and outcrops. This landscape also had grey and yellow texture contrast soils located on flats and mild slopes (Mitchell 2002, pp. 132-133). In the south-eastern portion of the Project Area, the landscape is classified as Bungonia Tableland and Gorge which contains red-brown clays that are well-structured and can contain alkaline pH where there is limestone. Over sedimentary rocks are red and red-yellow texture contrasting soil profiles (Mitchell 2002, p. 132). There is a pocket of Robertson Basalt landscape in the south-eastern area of the Project Area. This area contains loams and clay loams that are red and red-brown (Mitchell 2002, p. 118). The soil landscapes identified within the Project Area are shown in Figure 3.4.

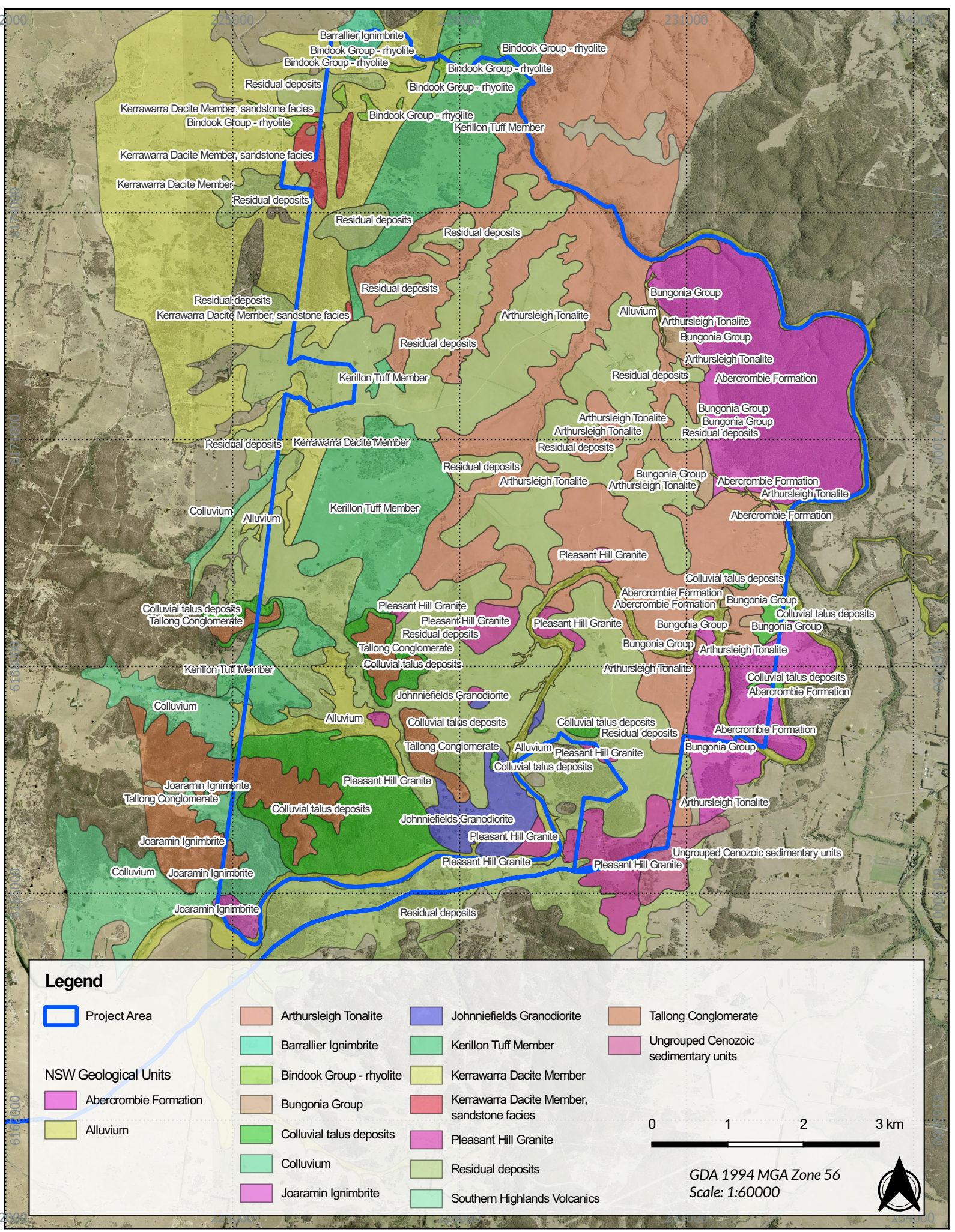



**Figure 3.3 - Geology of the project area**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, NSW Seamless Geology* *Drawn by: FOT Date: 2025-10-20*

AUSTRAL ARCHAEOLOGY

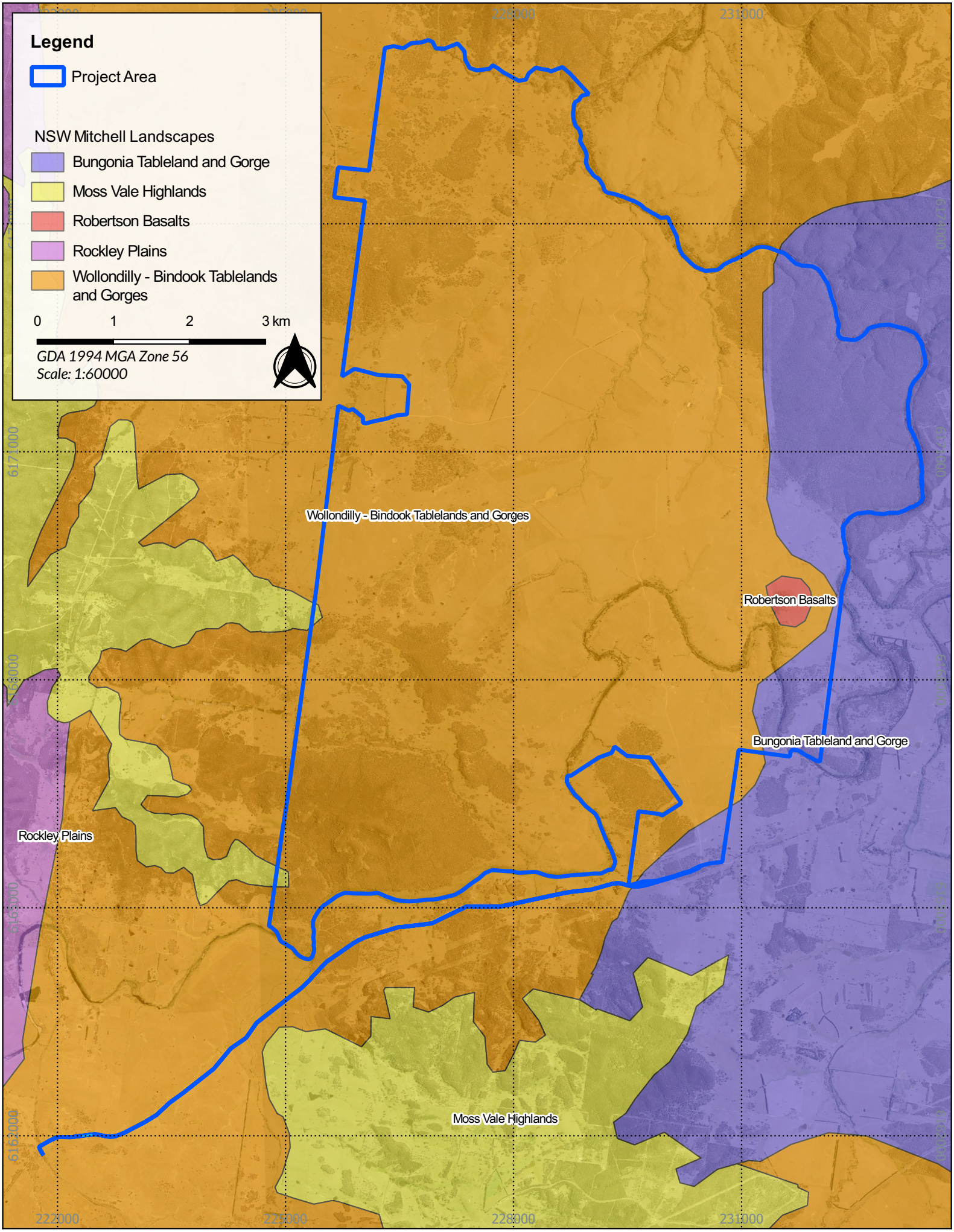



**Figure 3.4 - Mitchell Landscapes identified within the project area and surrounding landscape**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, Mitchell Landscapes v3.1* *Drawn by: FOT Date: 2025-10-20*

AUSTRAL ARCHAEOLOGY

### 3.1.3. CLIMATE AND VEGETATION

The climate of the south-eastern Highlands is generally temperate. The nearest weather station to the Project Area is the Goulburn Airport (Station # 070330) located 35 kms to the south-west of the Project Area. The mean maximum temperature was recorded as 19.8°Celsius while the mean minimum temperature was 6.1°Celsius (Bureau of Meteorology 2025). The winter months experience multiple days below 0°Celsius, which may be accompanied by frost and occasional snow. Rainfall has been recorded at Brayton (Station # 070143) since 1959 and is 9.5 km to the west of the Project Area. The mean annual rainfall is 698.9 millimetres (mm), indicating water would be entering the local catchment and contributing to the flow of streams and rivers (Bureau of Meteorology 2025). The combination of mild temperatures, and reasonable annual rainfall would suggest that the southern-eastern Highlands make a suitable area for human occupation for much of the year, but with winter months experiencing temperatures below 0°Celcius and seeing people don animal skin clothing such as that observed by Wilson in 1798 and recorded by Jervis (1973:2).

The Bungonia subregion is described as containing forest and woodland. These are mainly formed from Mottled gum, broadleaf peppermint, white gum, red stringybark and black ash. These forests would contain an understory formed from black she-oak (*Casuarina litoralis*). There are communities of snow gum and snow grass located in areas that experience lower temperatures compared to the surrounding landscape (Sahukar et al. 2003:209). With the Project Area specifically located in the Wollondilly – Bindook Tablelands and Gorges Mitchell landscape, the vegetation is described as being open forests and woodlands containing communities of forest red gum (*Eucalyptus tereticornis*), yellow box (*E. melliodora*), grey box (*E. molucanna*), and white box (*E albens*). Smaller tree species present are black wattle (*Acacia mearnsii)*, Parramatta wattle (*A. parramattensis*), and black she-oak. There are numerous shrubs, grasses, and bracken (*Pteridium esculentum*) that form the ground cover of the landscape (Mitchell 2002, pp. 132-133).

### 3.1.4. LANDSCAPE RESOURCES

The sedimentary geology and fertile soils of the region, along with the presence of readily available water and the wetlands provide a diverse range of landscape resources to be utilised. The unique ecological communities of the south-eastern Highlands, while today quite fragmented, support a diverse range of flora and fauna as it would have done in the past. Flora not only provided a food source in the form of seeds, fruits, vegetables and tubers but other materials as well (Australian Museum Business Services 2012:14–15). Fibrous from plants could be used for clothing and ornamentation. Bark and wood from trees were used to create weapons, tools and shelter (Australian Museum Business Services 2012:16–17).

Many animal species were also present in the region. Kangaroos and possums were not only a food source but also provided furs and pelts that were used to make clothing. Notable possum skins were used for protection from the colder weather of winter. Sinew and hair from animals were also used to make thread and bone tools, such as needles (Australian Museum Business Services 2012:15). Animal teeth and bone were also used for ornamentation in necklaces, belts, and other head ornaments (Australian Museum Business Services 2012, p. 16). Along with lithics, shells were used to scrape hides before drying (Australian Museum Business Services 2012:15). Other fauna resources within the area included birds that would be hunted, and their eggs collected. Bird feathers were used as ornamentation. In the rivers and larger streams, there was a variety of fish, mussels, and eels that were caught for food (Australian Museum Business Services 2012, p. 14). Some communities of the regions would travel south in the summer to participate in the gathering of Bogong moths, a significant practice for many Aboriginal groups in south-east Australia.

Ochre and clay were often used as ornamentation on the skin and in the hair (Australian Museum Business Services 2012, p. 16). Other inorganic resources were lithic deposits that provided material for tools such as axes chisels and knives (Australian Museum Business Services 2012, p. 18).

The Project Area itself was likely to have been utilised as an area for hunting due to its ability to provide a variety of food sources and the accessibility of fresh water.

## 3.2. PAST LAND USE PRACTICES

The establishment of the colony of New South Wales soon saw the nearby agricultural land exhausted and as a result, a series of tracks began to form from Sydney into the outer regions (Schofield 2000:2). European exploration of the Southern Highlands began in the 18th century when James Wilson, a former convict, reached the grasslands in 1798 and noted the presence of Aboriginal people. A second expedition took place, but it was ultimately decided that exploration should cease due to concerns about uncontrolled settlement expansion and cattle security in the region (Jervis 1973:1,2; Mount Gibraltar Landcare and Bushcare 2007:39). Exploration of the Goulburn region was mainly conducted from 1815 into the 1820s (Lester Firth Associates Pty Ltd 1983, p. 18).

Agriculture within the region began in the late 1810s with early land grants seeing the first establishment of stock stations. In the early years, cattle were mainly grazed in the regions with wool becoming the main industry in the 1830s. Hannibal Hawkins Macarthur, who was granted the land that the Project Area is located within in 1819, utilised the accumulated land for sheep farming, grazing and the production of wool (Fletcher 2002). The growth of the wool industry during this time led to the founding of a number of towns including Goulburn (Lester Firth Associates Pty Ltd 1983, p. 21). There is evidence that one of the main travel and stock routes from Sydney to Goulburn passed through the Project Area with the Eden Forest parish map depicting the Old Sydney Road passing north of the Wollondilly River. In the late nineteenth century, wheat became another industry within the region along with the addition of gold fields being proclaimed. The Project Area, though still functioning as a farm holding, was proclaimed as a part of the Argyle Camden and King Gold Field in 1881 (*New South Wales Government Gazette*, 19 November 1881 p. 6148; Map of Eden Park parish, County of Argyle; Map of Uruingalla Parish, County of Argyle). There is, however, no evidence that the Project Area contained any mining activity.

In 1912 the Project Area ("Arthursleigh" Farm), was advertised as being suitable for fattening lambs. Described as "fattening, heavy carrying and thoroughly sound" and "well improved" the Project Area would have been heavily cleared with cultivated pastures and a high number of sheep (The Yass Courier, 22 April 1912, p.2). The 1961 aerial of the Project Area shows the extent of the clearing and evidence of historic and/or contemporary ploughing. In these aerials, there is also extensive erosion along streamlines. There are several dwellings, large sheds, extensive fencing and an internal track network throughout the Project Area (Figure 3.5). There is little change in the Project Area between 1961 to 1997, apart from the addition of powerlines running through the southern portion of the Project Area and the addition of the new outbuildings (Figure 3.6).

Over the past 100 years, the Project Area has been subject to prolonged disturbance associated with agricultural activities including extensive clearing, ploughing, the construction of dams, and pasture improvements. These are likely to have impacted archaeological materials on the surface and in the top 200-300 mm of soil. Most notably, ploughing has been recognised as affecting archaeological deposits by displacing them horizontally and vertically in the soil profiles. Both clearing and grazing activities also impact archaeological deposits, as they reduce the ground cover, making it easier for cultural deposits to be exposed due to soil deflations. Clearing also removes mature trees from the regions, having a direct impact on the survivability of culturally modified trees.

Though the presence of hoofed animals does have some impact on surface deposits, the impact is highly dependent on other variables, such as ground cover, topography and the density in which stock is grazed. The erosion identified in the Project Area is severe in some places and has the potential impact of exposing subsurface cultural sites. The other forms of disturbance that have been identified in the Project Area, such as outbuildings and roads, would have a high impact on surface and subsurface archaeological deposits in a defined area.

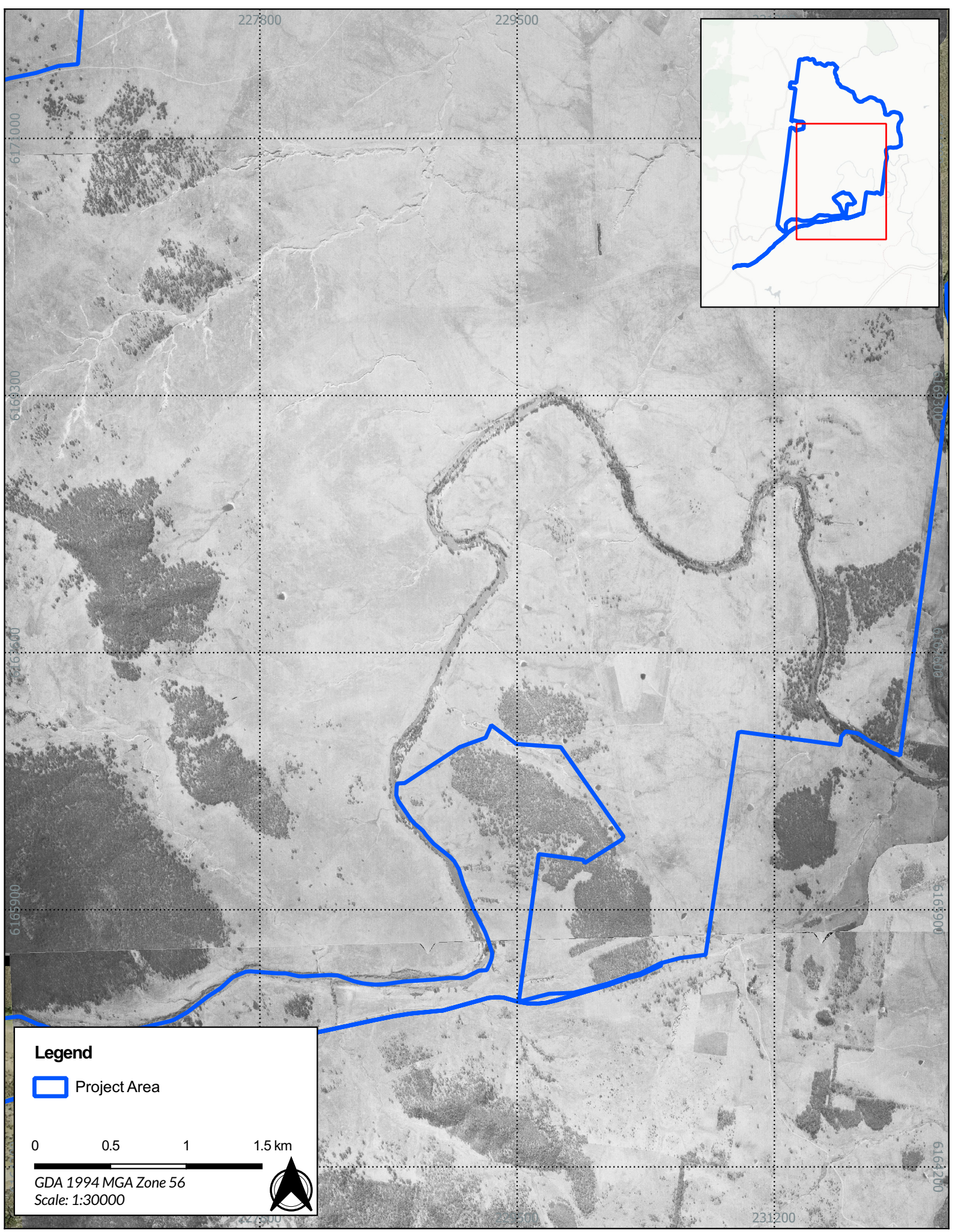



**Figure 3.5 - 1961 Historical aerial of the project area**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, CartoDB Positron, NSW Spatial Services*

*Drawn by: FOT Date: 2025-10-20*

AUSTRAL ARCHAEOLOGY

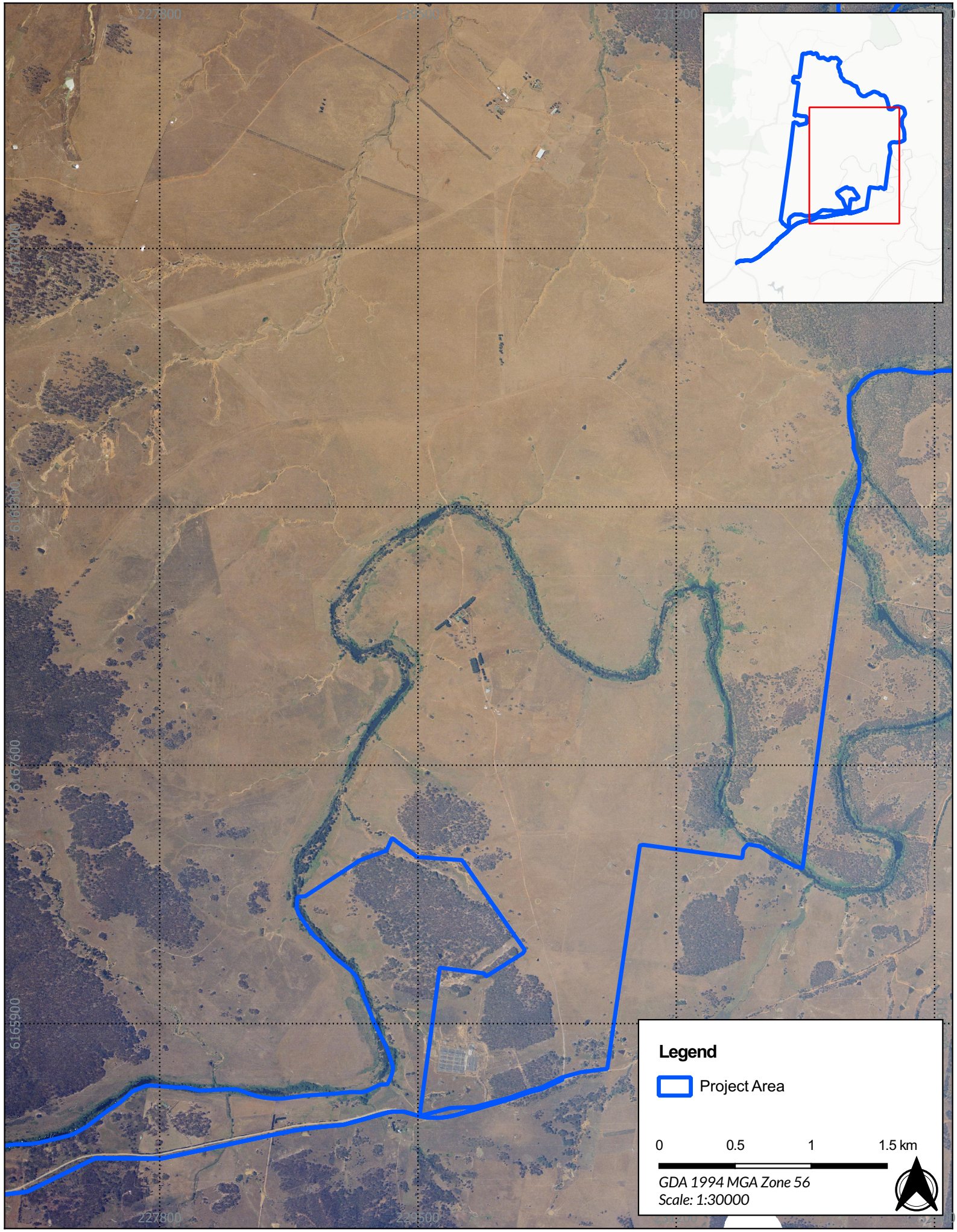



**Figure 3.6 - 1997 Historical aerial of the project area**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, CartoDB Positron, NSW Spatial Services*

*Drawn by: FOT Date: 2025-10-20*

AUSTRAL ARCHAEOLOGY

# 4. ARCHAEOLOGICAL CONTEXT

The range of environments and landscapes within the South Eastern Highlands 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.

## 4.1. POPULATION AND CONTACT HISTORY

The Southern Highlands region is part of the land traditionally occupied by the Gundungurra people (also referred to as Gandangara by Tindale), whose land encompasses most of the land surrounding the Cox, Nattai, Nepean, Wingecarribee and Wollondilly rivers (Organ 1990:x1). The name Wingecarribee itself is derived from the name Wundjigaribay, meaning "white waratah" (Northern Illawarra Aboriginal Collective Inc. 2008:2). The people occupying the Wingecarribee region were a sub-tribe of the Gundungurra, speaking Midthung and creating distinctive tree carvings to commemorate the deceased (Northern Illawarra Aboriginal Collective Inc. 2008:2). The study area was likely an important hunting ground for the Gundungurra people and would have sourced a variety of food. As the Traditional lands of the Gundungurra people were developed into pastoral properties, tense and violent relations developed between the Gundungurra people and pastoralists (Lamb 2019). There is often misinformation spread regarding the Gundungurra people (Lamb 2019).

The earliest evidence of Aboriginal occupation of the wider region dates to 21,000 years before present. This evidence came from carbon dated from Birrigai rock shelter, in the Alps south of Goulburn. Most of the dates for the region are between 3,000 and 5,000 years which area form open campsites and rock shelters.

Prior to the arrival of European explorers, the Gundungurra also inhabited the Blue Mountains region with the Burra Burra and Darug tribes (Gundungurra Tribal Council n.d.). Despite the region having rich volcanic soils supporting a large variety of plants and animal species, such as kangaroos, wild ducks and lyre-birds (Jervis 1973:1), Gundungurra people moved around the area including the Burragorang Valley and Mount Gibraltar, following the seasonal availability of different food resources (Flood 1973:11; Mount Gibraltar Landcare and Bushcare 2007:30). They would undertake their gathering moving in small groups, and meet with members of other groups through social arrangements (Mount Gibraltar Landcare and Bushcare 2007:30).

Rich (1988) collected ethnographic accounts that suggest that Bowral, within the lands of the Gundungurra people, was also used by the Wodi Wodi people as a route across the Illawarra escarpment. The Gundungurra people are said to have fought with the Hartley, Illawarra and Shoalhaven tribes, although they also had friendly relationships with these groups (Bowern 2018:61).

The earliest known account of contact between the Aboriginal people of the Southern Highlands is recorded in the journal of Wilson (1798) and relayed by Jervis (1973). It refers to the Aboriginal people wearing ankle-length animal skins and Wilson capturing an Aboriginal girl with the intent to "learn something" from her (Jervis 1973:1,2). While the arrival of European explorers in the Southern Highlands devastated the Aboriginal population of the region due to starvation, conflict and disease, many artefacts and sites have been located which reflect the activities of the Gundungurra. Paintings, drawings, stencils, axe-grinding grooves, rock shelters, open campsites, scar trees, flakes and tooled items have been identified in the Southern Highlands, which depict how Aboriginal people were using the land prior to settlement.

Some of the stone artefacts found in the region have been determined to consist of raw materials not found in the local area, suggesting migration and possible trade relationships (Mount Gibraltar Landcare and Bushcare 2007:30, 31).

Early contact also introduced some diseases that greatly affected the Aboriginal populations. Several epidemics occurred, including smallpox in 1789 and influenza from 1846 to 1847, where some of the main illnesses that were recorded as well as measles. This coincided with confrontations between the Aboriginal communities and European settlers. Despite there being a claim that the was very little to no conflict in the Goulbourn region, archival evidence depicts some tensions in the 1820s. Troops were sent in 1826 by Governor Darling to address rising tensions and conflict between stockmen and the Aboriginal community. It should be noted that these stories of alleged acts of cannibalism of which the above tension and conflict refer to can be misleading, in her book Greenwich Park, Lorna Parr recounts the events of this discourse and draws on the accounts of Charles Throsby and several witnesses to establish a more accurate timeline of the events that took place (Parr 2005).Alongside this, several unverified massacre sites such as Narambulla Creek and Eastgrove have remained in the oral history of the local Aboriginal community.

Many Aboriginal peoples worked for European settlers. They were mostly paid in food and clothing to provide services such as hunting, stripping bark, and other labour-based tasks. Many were also hired as stockmen to break horses, carry messages, shear and droving. Some worked as linemen for the electrical commission or as guides and trackers.

In 1875 several reserves were established across the Southern Tablelands. Reserves were mainly located at Boorowa, Brungle, Cootamundra and Yass, however, there are none recorded in the Goulburn region. Many Aboriginal families also began to move into towns and integrate into the European community. In the 1950s and 60s Aboriginal communities began to be moved, sometimes forcibly, out of the reserves as part of the government's policy of assimilation.

Within the Project Area specifically, the land belonged to the Burra Burra people of the Gundungurra Nation. When Hannibal Hawkins Macarthur took possession of the land that is now known as Arthursleigh, it was described by early settlers as being well-managed and quite likely to have been firestick farmed, a traditional method used by the Burra Burra people. Before the colonial settlement of the Project Area, Charles Throsby, a surgeon and explorer, was the first to settle in the Illawarra region (Parsons 1967). Throsby later explored the region with a party led by a local guide Cookoogong, who was the Burra Burra chief, and described the area near Tirranna as being picturesque and extensive (Lamb 2019)). Throsby was also known to refer to the Aboriginal place names when writing of his travels (Lamb 2019). Gundungurra Chief Werriberri (Billy Russell) records the region that the Gundungurra Nation encompassed as being bounded by Yass, Bathurst, Camden and the South Coast (Fletcher 2002). Furthermore, while the conflict was observed, Russell explains that the sub-tribes of the Gundungurra Nation never fought against each other, with the conflict only against those men of other tribes with sub-tribes banding together when a battle would take place (Fletcher 2002:21). Others note that Weereewaa (Lake George) is the furthest frontier of many Aboriginal groups in the region, including sub-tribes of the Gundungurra Nation (Jackson-Nakano 2001; Smith 1992).

## 4.2. PREVIOUS ARCHAEOLOGICAL WORK

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

### 4.2.1. REGIONAL ARCHAEOLOGICAL CONTEXT

#### WINGECARRIBEE RIVER PROPOSED MANAGEMENT PROJECT: ARCHAEOLOGICAL SURVEY FOR ABORIGINAL SITES BY RICH 1988.

Rich (1988) was commissioned to conduct an archaeological survey of Aboriginal and historical archaeological sites with regard to the Wingecarribee River and proposed modifications to the Shoalhaven Water Supply Scheme, approximately 95 km south of the Project Area. The survey was performed on foot along the Wingecarribee River from Wingecarribee Swamp (Reservoir) to Black Springs Creek, passing along the south-eastern border of Sutherland Park and covering an area of 25 km by 200 m (Rich 1988:1–3). The survey identified 6 historic sites, 12 Aboriginal sites, 6 isolated finds, one shelter with PAD and one potential open site. The details of the Aboriginal archaeology identified by the survey are presented in Table 4.1.

**Table 4.1 Aboriginal archaeology identified by Rich (1988)**

| Site Name | Site Type | Landform | Size | Features |
|---|---|---|---|---|
| WR 1 | Open Site | Dry flat adjacent to a small billabong | 5 $m^2$ | 4 artefacts and one fragment of emu shell. Materials were milky quartz, brown silcrete, grey chert, and pink silcrete. One artefact had cortex on a single surface, and 2 had wear/retouch. One core, one scraper, 2 flakes. |
| WR 2 | Open Site | Dry spur atop sandstone outcrop above the river | 200 $m^2$ | Maximum artefact density of one per $m^2$, 5 artefacts identified, one of red silcrete and 4 of milky quartz. One artefact had cortex on a single surface, and 2 had wear or retouch. All flakes or flaked pieces. |
| WR 3 | Open Site | Wide flat above river | 380 $m^2$ | 15 artefacts in one area, 22 in the other. Materials in the first area include light brown indurated mudstone, milky quartz, glassy quartz, grey silcrete and cream silcrete. 3 artefacts had cortex, 5 had wear or retouch. The second area featured milky quartz, grey silcrete, sugar quartz, yellow indurated mudstone, crystalline quartz and rose quartz. Two artefacts had cortex, 2 had wear or retouch. Types were flakes, cores and chips. |

| Site Name | Site Type | Landform | Size | Features |
|---|---|---|---|---|
| WR 4 | Shelter Site | Under the upslope of upturned sandstone block | 2 $m^2$ | The shelter is only 970 mm in height. Contained one red silcrete flake and one milky quartz flake. |
| WR 5 | Shelter Site | Under sandstone ledge on slope | 6 $m^2$ | The shelter is 1 m in height. Contained two milky quartz flakes. |
| WR 6 | Open Site | Narrow saddle above river loop | 1 $km^2$ | One black chert flake, one white silcrete flake, 2 amorphous white silcrete flaked pieces. Low density of one artefact per 250 $m^2$. |
| WR 7 | Open Site | Wide flat spur above river | 600 $m^2$ | One amorphous milky quartz flaked piece, one milky quartz flake, one grey silcrete flake one light brown indurated mudstone flake. Low density of one artefact per 150 $m^2$. |
| WR 8 | Scarred Tree | Atop a long ridge above river | 2.33 m tree circumference | Two scars on tall forest scribbly gum tree. Scars lack indications of surveyors' markings, deemed to be from Aboriginal presence. |
| WR 9 | Open Site | Knoll / spur | 100 $m^2$ | 5 flakes of milky quartz, white chert, rose sugar quarts and grey silcrete. Low density of one artefact in 20 $m^2$. |
| WR 10 | Open Site | Spur | 500 $m^2$ | One white silcrete scraper with wear/retouch. One white silcrete amorphous flaked piece. The site was recently destroyed by a subdivision. |
| WR 11 | Open Site | Rise on riverbank | 500 $m^2$ | 32 artefacts were identified, consisting of various colours of silcrete, quartz and mudstone with the majority being either flakes or flaked pieces, many with wear/retouch. |
| WR 12 | Natural Mythological Site | Waterhole at junction of Wingecarribee and Wollondilly Rivers | N/A | Site associated with a myth reported by Mathews (1908) describing how Gurangatch, a part reptile part fish being, would at times camp in the waterhole. When Mirragan the tiger cat tried to catch Gurangatch, he escaped by forming the Wollondilly River. |
| WR PAD | Shelter with PAD | Under sandstone outcrop below ridge | 3 $m^2$ | Shelter 2.2 m in height, friable rock not suitable for art. Dry compact orange-brown sandy-clay deposit more than 150 mm deep. |

| Site Name | Site Type | Landform | Size | Features |
|---|---|---|---|---|
| WR POS | Potential Open Site | Levee bank | N/A | Levee banks are noted to potentially contain archaeology. Specific levy bank was noted as higher and drier than others and such would have been a suitable camping spot. |
| IF 1 | Isolated Find | Low rise above river | N/A | One grey silcrete flake. |
| IF 2 | Isolated Find | Exposure on wide flat | N/A | One amorphous milky quartz flaked piece. |
| IF 3 | Isolated Find | Exposure in fill material above river | N/A | One milky quartz bipolar flake. |
| IF 4 | Isolated Find | Exposure below confluence of gullies | N/A | One yellow silcrete flake. |
| IF 5 | Isolated Find | Exposure above river | N/A | One milky quartz bipolar flake. |
| IF 6 | Isolated Find | Slope above river | N/A | Grey silcrete flake. |

The visibility and exposure of potential sites were overall quite low due to grassed vegetation. The soils encountered at sites of Aboriginal archaeology include grey brown soils, orange clay, various colours of sand clay and loamy sandy clay, various colours of sand, alluvial deposits and similar (Rich 1988:9,47-57).

Rich (1988) makes several general statements on Aboriginal archaeological sites based on the survey results. These can be summarised as follows:

- The most common site type encountered was an open site.
- Most sites were located on sandstone geology.
- Most sites were located more than 20 m from the river and more than 5 m above the river.
- The isolated finds closer to the river suggest the utilisation of the land without intense occupation.
- The open sites highlight areas selectively occupied further from the river.
- The presence of trees appears to correlate to occupations as trees were an important resource.
- The occupation pattern of sites away from the river contrasts the findings of Koettig (1981a) which suggest occupation most commonly occurred in close proximity to water courses.
- The site occupation pattern in the region is similar to the site occupation pattern observed in Canberra.

### HODDLES CROSSING TO ALPINE: ARCHAEOLOGICAL SURVEY OF THE PROPOSED F5 EXTENSION BY Koettig, 1981

Koettig (1981) was commissioned to complete an archaeological survey to assess the route of the proposed F5 extension, a 34 km long Project Area 100 to 200 m wide that covered the landscapes from Alpine in the north to Exeter in the south with Mittagong and Berrima to the east.

The study aimed to assess the potential impacts the proposed road extension would have on Aboriginal archaeological sites and make recommendations for managing these impacts. The report notes that at the time of this study, there were limited investigations that had been undertaken in the area, however, a

search of the National Parks and Wildlife Register (now AHIMS database) found 21 previously recorded sites within 30 km either side of the survey route. These sites were categorised as three grinding grooves, three carved trees with burial mounds, three open sites, 11 shelters with art, and one shelter without art. The shelter sites are noted to occur in the sandstone landscape to the north, and the art is described as depicting anthropomorphic and zoomorphic forms in red and white pigment and charcoal (Koettig 1981a:1–3).

The study identified 24 previously unrecorded sites along the 34 km survey group. These sites comprised 3 grinding grooves, 2 scarred trees, 10 open sites, one open site with quarry, 2 open sites with scarred trees, 4 shelters with deposit and 2 shelters with deposit and art. Twenty of these sites are noted as being within the northern 20 km of the survey route. Sites located at the southern end of the survey are described as scattered, while sites 9 to 24 are described as clustering into 4 distinct groups. The sites identified by this study are summarized in Table 4.2.

**Table 4.2 Sites identified by Koettig (1981)**

| Site Name | AHIMS ID | Group | Classification | Landforms | Features |
|---|---|---|---|---|---|
| HCA 1(a) & (b) | 52-4-30 | - | Grinding Grooves | Creek with sandstone boulders | One defined groove and 2 weathered grooves. |
| HCA 2 | 52-4-33 | - | Scarred Tree | Paddock | Rectangular scar of 1.2 by 0.6 m. |
| HCA 3 (a) & (b) | 52-4-31 | - | Grinding Grooves | Shallow depression in head of creek tributary | 24 grooves in part (a), 9 grooves in part (b). |
| HCA 4 | 52-4-32 | - | Open Site | Small knoll near riverbank | 30 by 20 mm red silcrete flake, small grey silcrete flake, several small quartz flakes. |
| HCA 5 | 52-1-48 | - | Grinding Grooves | Slope above drain which feeds into creek | Two grooves on 700 by 500 mm isolated block of sandstone. |
| HCA 6 | 52-1-49 | - | Open Site | Creek bank | Two white chert cores and raw materials of smoky quartz, quartzite, grey chert, red chert, and red silcrete in Area A. Large silcrete core in Area B. |
| HCA 7 | 52-1-50 | - | Open Site | Slope of small ridge above creek | Several artefact scatters. One backed blade, multiple flakes and multiple cores. Raw materials present were quartz, white chert, grey and white silcrete. Protected sandy area created by rock overhang noted as a potential sleeping place. |
| HCA 8 | 52-1-51 | - | Scarred Tree | Saddle leading below rocks | Ovate scar of 1.14 by 0.42 m, with axe marks at upper end. |
| HCA 9 | 52-1-52 | 1 | Open Site | Flat area between two watercourses | 100 by 50 m scatter of varying density. Isolated artefacts up to 20 m from main scatter. One chert backed blade (25 mm) and one river pebble (140 by 90 by 40 mm) with 10-mm wide |

| Site Name | AHIMS ID | Group | Classification | Landforms | Features |
|---|---|---|---|---|---|
| | | | | | grinding. Artefacts made of quartz, red and white silcrete, grey and white chert, possible red chalcedony. |
| HCA 10 | 52-1-53 | 1 | Open Site | Cleared ridge parallel to creek | Artefact scatter, one quartz backed blade (20 by 10 mm), other artefacts consisted of flakes and cores made of quartz, grey chert, grey and white silcrete. |
| HCA 11 | 52-1-54 | 1 | Open Site | Wide flat beside creek | One black chert flake and one grinding groove within cave shelter (9 by 3 by 1.6 m). |
| HCA 12 | 52-1-55 | 1 | Open Site | - | - |
| HCA 13 | 52-1-56 | 1 | Shelter with Art | Outcrop above slope to creek. | Sandstone shelter of 9 by 3 by 1.6 m. Compact deposit of 40 to 200 mm depth, level with dripline. One black chert artefact. European graffiti in shelter. |
| HCA 14 and HCA 14A | 52-1-57 | 2 | Open Site and Quarry | Slope on creek tributary within gully<br><br>End of low ridge in gully | Silcrete eroding out of gully identified as quarry. Seven flakes of red, white and grey silcrete, 2 more flakes and one core nearby. Ten flakes, 11 flake fragments, 2 chips and one core were found adjacent to 14A. Nearby was a grey silcrete core and 4 small quartz flakes. |
| HCA 15 | 52-1-58 | 2 | Open Site | Wide flat | 4 silcrete flakes, one with a modified margin. |
| HCA 16 | 52-1-58 | 2 | Open Site and Scarred Trees | End of low ridge leading to creek junction | Site covers area of 130 by 100 m. Areas of dense chips and flakes, up to 20 artefacts per $m^2$ with some pieces as small as 1 mm. Quartz, grey chert, grey and white silcrete noted as materials. Small block of sandstone with elongate grooves approximately 100 mm long. 7 scarred trees of 3 types, present. Axe marks on all trees, unclear if Aboriginal or European in origin. |
| HCA 17 | 52-1-60 | 2 | Open Site | Sandy ridge leading to creek | Flakes of quartz, chert and silcrete noted within an 80 m area. |
| HCA 18 | 52-1-61 | 3 | Shelter | Large round sandstone exposure | Cavity of 9 by 2 m with height varying between 1.5 m at the front and 500 mm at the back. No surface artefacts were |

| Site Name | AHIMS ID | Group | Classification | Landforms | Features |
|---|---|---|---|---|---|
| | | | | | located, deposit within shelter was excavated. |
| HCA 19 | 52-1-62 | 3 | Shelter and Open Site | Flat abutting sandstone cliff | Deposit estimated to be 3.5 m in width and between 500 to 600 mm deep. Five flakes were identified, comprised of dark grey chert, banded chert, quartz and basalt. |
| HCA 20 | 52-1-63 | 3 | Shelter with Art | Sandstone outcrop with dripline, flat and slope to creek. | Shallow cavern in sandstone outcrop of 5 by 3.5 by 2 m. Remnants of charcoal drawings on 3.5 m of the wall. Deposit is estimated to be 200 mm deep in the shelter and deeper across the flat for 7.3 m. One grey silcrete flake was located in the dripline. |
| HCA 21 | 52-1-64 | 3 | Shelter with Art | Sandstone wall outcrop of 18 to 20 m. | Sheltered area of 4 by 1.5 m. Aboriginal drawings extend over 1.4 by 0.34 m. One image depicts an eel and another figure. Another eel of 13 by 250 mm was 350 mm away, along with smudged charcoal lines. European graffiti is located above the second eel. Shelter deposit extends 5 m beyond wall base, is compact, and more than 200 mm deep. Five flakes and one core of grey silcrete, banded chert, and dark grey chert were recorded. |
| HCA 22 | 52-1-65 | 4 | Open Site | Elevated flat between 2 watercourses. | 50 by 20 m artefact scatter of flakes up to 30 mm in length. Artefacts comprised of quartz, grey silcrete, and grey and black chert. |
| HCA 23 | 52-1-66 | 4 | Open Site and Scarred Trees | Southern bank of Sheepwash Creek, nose of wide ridge, top of ridge. | Artefacts dispersed over 440 m concentrated in 2 areas. Wide range of artefact types and materials, including flakes (between <1 and 30 mm) scrapers, backed blades and an axe fragment, made of various coloured silcretes, grey, black and white chert, fine grained siliceous material, basalt, and blue fine-grained material. Five scarred trees, one eucalypt, one peppermint, and 3 stringy barks, were also located, with scars up to 380 mm wide. |

| Site Name | AHIMS ID | Group | Classification | Landforms | Features |
|---|---|---|---|---|---|
| HCA 24 | 52-1-67 | 4 | Open site | Elevated flat at junction of 2 water courses. | Artefacts in density of 5 per $m^2$ found within scour. Chert, silcrete and quartz flakes were located, as well as a 10 mm quartz crescentic microlith. |
| HCA 25 | 52-1-68 | - | No information was provided regarding this site | No information was provided regarding the site | No information was provided regarding the site |

As a result of the survey, sites HCA 14 and HCA 14A were subject to testing. Three pits of 500 by 300 mm were opened 20 m apart, named A, B and C. Square A was open to a depth of 300 mm and contained no artefacts.

Square B was opened to 200 mm and contained 5 flakes of between 10 and 46 mm, with one being made of grey chert. Square C was opened to 300 mm and contained 12 flakes, 15 pieces of debitage and one core, all made of silcrete and between 2 and 17 mm. This material is in addition to the material observed in the survey (Koettig 1981a:30–32).

Site HCA 18 was also excavated to determine the presence of subsurface deposits. A pit of 500 square mm was opened to a depth of 540 mm where excavation ceased due to the 500 by 500 mm pit being too small to continue further. The deposit was noted to continue for an additional 220 mm down to bedrock. Most artefacts were retrieved from between 330 and 460 mm deep. A total of 117 artefacts were removed from the pit, meaning the average density for the site is 468 artefacts per square m. Of the artefacts recovered, there were 13 worked pieces, including seven scrapers and 6 backed blades (three incomplete), as well as three bipolar cores. The remaining artefacts are considered waste materials of between 8 and 37 mm in length. Raw materials included in the assemblage were grey, yellow and red silcrete, yellow, grey and dark grey chert, quartz, and possibly some chalcedony (Koettig 1981a:34–36).

The survey was able to provide a broader insight into Aboriginal site distribution within the districts of Mittagong and Moss Vale. Based on the observations of sites during the survey the following general statements were made regarding Aboriginal sites in the Southern Highlands (Koettig 1981a:45,46):

- Several sites contained evidence of backed blade and microlith technology.
- Open sites (artefact scatters and isolated artefacts) are the most common site type.
- Nearly all open sites occur on Wianamatta Shales or the intersection of Wianamatta Shales and Hawkesbury Sandstone.
- Open sites typically occur in these settings:
  - Along banks of watercourses.
  - On small, elevated areas near the junction of watercourses.
  - On level parts of low spurs and ridges above watercourses.
  - On flats adjacent to watercourses.
  - One site was located on a level area atop a medium slope on an expanse of sandstone.
- It is concluded that almost any level area near a watercourse will contain evidence of Aboriginal occupation.
- Shelter sites were confined to exposures of Hawkesbury Sandstone within the shale area.

- There are likely to be more shelter sites beyond the area of the survey.
- It can be expected that the majority of shelter sites near watercourses will contain evidence of Aboriginal occupation.
- All grinding grooves identified were on sandstone within shale lithology.
- The presence of scarred trees can be linked to a lack of European vegetation clearing.

### HIGHLANDS SOURCE PROJECT SUBSURFACE TESTING AND SALVAGE AT ABORIGINAL SITES BETWEEN GOULBURN AND WINGECARRIBEE RESERVOIR, NSW NAVIN OFFICER 2012a.

Navin Officer (2012a) was commissioned by GHD on behalf of the Goulburn Mulwaree Council to conduct subsurface testing and subsequently an archaeological salvage on a series of previously identified archaeological sites. The Highlands Source Project on which the study was based covered a length of 81 km, extending from Wingecarribee Shire to Goulburn Shire, passing through an area roughly 4 km south of the Project Area.

The artefact collection, subsurface testing, salvage excavation and soil stripping identified over 2,000 artefacts which are documented according to which activity they were recovered. The results of the surface artefact collection completed for artefact scatters and isolated finds are outlined in Table 4.3.

**Table 4.3 Summary of surface artefact collection by Navin Officer (2012)**

| Landform | Collection Sites | Number of Salvage Units | Total Salvage Area ($m^2$) | Number of Artefacts |
|---|---|---|---|---|
| Spur crest bordering tributary of Jaorimin Creek | HSP17 | 17 | 2.2 | 70 |
| Spur crest and basal slopes | HSP5 | 35 | 20 | 174 |
| Spur crest | HSP20 | 2 | 0.2 | 3 |
| Spur | HSP31 | 1 | IF | 1 |
| Ridge crest | HSP23, HSP24 | 15 | 3.7 | 34 |
| Saddle | HSP8 | 8 | 6.7 | 8 |
| Mid slope | HSP12, HSP18, HSP29 | 25 | 1.2 | 69 |
| Creek margin / basal slopes | HSP25, HSP26 | 43 | 37.5 | 117 |
| Basal slopes | HSP30 | 3 | 1.2 | 4 |
| Creek margin | HSP15 | 7 | 0.2 | 34 |
| Alluvial terrace/basal slopes | HSP PAD8 | 1 | 0.4 | 2 |
| Total | | 157 | 73.3 | 516 |

The test excavations were performed using a 450 mm auger at 20 m intervals along a transect dictated by a pipeline easement. The results of the text excavation procedure are outlined below in Table 4.4.

**Table 4.4 Summary of subsurface testing results by Navin Officer (2012)**

| Test Site | Landform | Number of Auger Test Pits | Depth (mm) | Number of Artefact Bearing Test Pits | Number of Artefacts |
|---|---|---|---|---|---|
| HSP5 | Spur crest and basal slopes | 26 | 380-450 | 12 | 17 |
| HSP7 | Spur crest | 23 | 350-500 | 2 | 2 |
| HSP8 | Saddle | 9 | 280-550 | 1 | 1 |
| HSP15 | Creek margin | 3 | 190-500 | 1 | 7 |
| HSP16 | Alluvial terrace | 3 | 650-850 | 2 | 5 |
| HSP17 | Spur crest/creek tributary | 5 | 300-450 | 2 | 8 |
| HSP20 | Spur crest | 5 | 700-110 | 6 | 33 |
| HSP23 | Ridge crest | 18 | 200-450 | 4 | 10 |
| HSP25 | Creek margin / basal slopes | 14 | 220-500 | 9 | 33 |
| HSP26 | Creek margin / basal slopes | 7 | 400-860 | 1 | 1 |
| HSP PAD1 | Spur crest | 6 | 600-850 | 3 | 10 |
| HSP PAD2 | Terminal spur crest | 11 | 350-850 | 0 | 0 |
| HSP PAD3 | Creek margin | 3 | 550-720 | 0 | 0 |
| HSP PAD5 | Spur crest | 6 | 280-560 | 4 | 79 |
| HSP PAD6 | Basal slopes | 7 | 300-720 | 2 | 3 |
| HSP PAD7 | Spur crest | 10 | 280-420 | 4 | 31 |
| HSP PAD8 | Alluvial terrace / basal slopes | 7 | 250-500 | 2 | 2 |
| Total | | **163** | - | **55** | **242** |

The auger testing recovered 225 artefacts, with most artefacts being retrieved from spits 1 and 2. The highest density of artefacts occurred at HSP PAD5 with 79 artefacts being recovered. The soils encountered during testing ranged in colour and were generally sandy, silty or loamy towards the top of the profile, grading downwards into sands, clays and gravels. The results of the test augers were used to inform which areas should be salvaged. Areas that contained an artefact density above 25-30 $m^2$ were discussed in the field to determine if salvage would be appropriate. The salvage was conducted in 500 $mm^2$ pits with 100 mm spits, except for areas that were found to be too rocky to excavate by hand, in which case the 450 mm auger was used (Navin Officer 2012a:15). The results of the subsequent salvage are outlined in Table 4.5.

**Table 4.5 Summary of subsurface salvage results by Navin Officer (2012)**

| Site Name | Number of Salvage Pits | Number of Artefact Bearing Pits | Number of Artefacts | Spit Containing Most Artefacts |
|---|---|---|---|---|
| HSP20 | 43 | 43 | 376 | 1 |
| HSP25 | 24 | 24 | 907 | 1 |
| HSP PAD5 | 9 | 9 | 205 | 2 |
| HSP PAD7 | 11 (7 Auger) | 5 | 30 | 1 |
| Total | **87** | **81** | **1518** | - |

Archaeological sites noted in previous investigations to have a high density of artefacts present were subject to soil stripping procedures. Six of the 7 sites that were soil-stripped produced a total of 328 artefacts. HSP12 produced one artefact, HSP17 produced 2 artefacts, HSP20 produced 173 artefacts, HSP23 produced 0 artefacts, HSP25 produced 145 artefacts, HSP26 produced 3 artefacts and HSP PAD5 produced 4 artefacts.

Lithics analysis of the 2601 artefacts retrieved from the different procedures categorised them into 63 distinct types made of 16 different raw materials. 49.25% of the artefacts were classified as flakes, and 34.14% as flaked pieces. The artefact assemblage has been analysed to be 52% quartz, 34% silcrete, 7% weathered fine grained stone and 4% chert. This assemblage is noted to have a high density of richness, although 75% of the assemblage has been determined to be fragmented or broken. The combined results of the procedures undertaken allowed Navin Officer (2012a) to make the following predictive statements in regard to the Aboriginal archaeology of the Southern Highlands region (Navin Officer 2012a:vi):

- Artefacts located at sites within the Southern Highlands are dominated by chert and fine-grained sedimentary raw materials.
- Artefacts are most commonly located on the margins of creeks and spur crests directly overlooking reliable sources of water.
- Landforms in a valley floor context, such as alluvial terraces and basal slopes, tend to contain lower numbers of artefacts.
- Sites of higher artefact numbers and larger areal extent are mostly located on spur crests.
- Artefact density and assemblage size have a strong positive correlation (r2 = 0.901), meaning sites with large assemblages also generally have the densest assemblages.
- Most subsurface artefacts occur at a depth of 200 mm or shallower and most sites do not appear to have undergone substantial bioturbation.
- Artefacts on a surface, even in relatively high numbers, are not a reliable indication of the presence of archaeological deposits in the subsurface.

### HUME COAL PROJECT – ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT - EMM CONSULTING 2017

EMM Consulting (EMM) was commissioned by Hume Coal Pty Ltd to conduct an Aboriginal Cultural Heritage Assessment as part of development approval for an underground coal mine in the Southern Coalfield of NSW. (EMM Consulting 2017).

The methodology for the survey involved an area of 124 square km within the proposed impact area for the Hume Coal Project and the Berrima Rail Project.

The pedestrian survey involved between 7 and 10 people surveying a corridor of 20 to 50 m working to identify exposures within the thickly grassed area and inspecting any mature trees and outcropping sandstone in the path or impact zone. Areas of exposure created by ploughing, vehicle tracks, cattle tracks, eroded scalds and stream banks were targeted as they provided good visibility (EMM Consulting 2017:65).

The survey resulted in the recording of 177 sites across the 2 project areas, 2 sites outside of both project areas and the relocation of 2 previously recorded sites, AHIMS #52-4-0098 and #52-4-0097. The findings of this survey were then used to inform the test excavation methodology. A survey of the underground mine area was also conducted to identify any Aboriginal sites which may be vulnerable to subsidence impacts. The survey inspected scarps, cliffs and outcropping sandstone associated with stream channels to identify any potential shelters, carvings, rock pools and grinding grooves.

The survey found rock shelters with PADs to be the most commonly occurring site type at 30.4% of the sites encountered, followed by isolated finds at 21.5%. Sites were found to occur most commonly in scarps, followed by hill spurs and crests. Of the sites containing stone artefacts, silcrete and quartz were observed to be the dominant raw material types. (EMM Consulting 2017, p. 90-94)

The test excavation program comprised 160 pits of 500 mm x 500 mm, in linear transects, with 10 transects within the Coal Project Area and 6 in the Rail Project Area. The excavations retrieved a total of 281 artefacts, giving the project's areas an average density of 7 artefacts per $m^2$, with most artefacts being found in footslope landforms. Most artefacts were found in Spit 1 and 2 within the upper soil layer, which was described as mixed from ploughing and bioturbation, and as such lacked stratigraphically intact deposits. Forty-five percent of the artefacts were retrieved from the transect adjacent to Oldbury Creek. The artefacts retrieved by the test excavation were dominated by silcrete, and flaked pieces / broken flakes as the artefact type (EMM Consulting 2017, p.135-137)

The results of the survey and test excavations led to the formulation of predictive statements regarding Aboriginal archaeology in the area and the concentrations of artefacts around perennial streams compared to ephemeral streams. It was suggested that (EMM Consulting 2017, p.93):

- It is statistically more likely for sites to occur near ephemeral streams due to their higher presence in the landscape compared to perennial streams.
- Perennial streams were less prevalent within the survey area and had lower surface visibility, meaning it was less likely for sites to be found here.
- Level to gently inclined land which is suitably elevated within 150 m of ephemeral streams is likely to contain low density subsurface deposits with an average density of 2.7 artefacts per $m^2$ at maximum.
- Level to gently inclined land which is suitably elevated within 200 m of perennial streams and prominent hill crests are likely to contain medium-density subsurface deposits with an average density of 14 artefacts per $m^2$ at maximum.

### 4.2.2. HERITAGE DATABASE SEARCH

An initial search of the Heritage NSW AHIMS database was undertaken on 14 September 2022, with an updated search completed on 28 March 2024, following the survey (Client Service ID 717346, 877778). A third search was completed on 11 February 2025 (Client Service ID 974048) and a fourth on 29 January 2026 (Client Service ID 1086711) to ensure compliance. As a result of the third search occurring after the survey and test excavation, sites that were recorded during the current assessments have also been included. The results from the AHIMS search (Client Service ID 974048 and 1086711) identified 105 previously recorded sites within a 20 km radius of the greater Project Area.

The search indicates that sites containing only artefacts are the predominant site type with over 72.38% (n=76) of known sites belonging to this category, followed by artefact; PAD sites (15.24%, n=16) and PAD sites (10.48%, n=11). A single modified tree was also identified and accounted for 1.9% of known sites (Table 4.6 and Figure 4.1).

The vast majority of sites are located in association with waterways, with many being located on the slopes above the rivers and creeks. The modified tree is located in remnant woodland that is also located above the river but has more association with an ephemeral creek line.

For this purpose in Figure 4.1, Table 4.6 and Table 4.7, it is assumed, that the correct coordinate system has been registered for each site.

**Table 4.6 Summary of sites recorded within a 20 km radius of the Project Area.**

| Feature Type | Total | % |
|---|---|---|
| Artefact | 76 | 74.75 |
| Artefact, PAD | 16 | 15.15 |
| PAD | 11 | 9.09 |
| Modified Tree | 2 | 1.01 |
| TOTAL | **105** | **100%** |

There are several historical sites known to be located within and adjacent to the Area, these sites are discussed in more detail in a separate historical archaeological report. However, several searches were conducted to identify if any of these known sites have been registered, these included:

- A search of the Australian Heritage Database identified no national historical heritage within or adjacent to the Project Area.
- A search of the NSW Stage Heritage Inventory identified no state historical heritage within or adjacent to the Project Area.
- A search of the Upper Lachlan LEP 2010 identified no local historical heritage within or adjacent to the Project Area.

Table 4.7 identifies the previously recorded sites that have been identified in and adjacent to the Project Area. This list does not include the sites that were located during the survey or test excavation for this assessment.

**Table 4.7 Summary of sites recorded within the greater Project Area and adjacent.**

| Name | AHIMS No. | Type | Location Landform | Cadastral Boundary |
|---|---|---|---|---|
| 1 Arthursleigh; Arthursleigh; | 52-4-0085 | Artefact | Hill Slopes | Lot 100 DP778396 |
| BH1 (Canyon Leigh) | 52-4-0229 | Artefact | Hill Slope/drainage | Lot 2 DP1120270 |
| BH10 (Canyon Leigh) | 52-4-0236 | Artefact | Undulating hills | Lot 2 DP1120270 |
| BH11 (Canyon Leigh) | 52-4-0237 | Artefact | River terrace | Lot 3 DP1120270 |
| BH12 (Canyon Leigh) | 52-4-0238 | Artefact | Creek/drainage bank | Lot 3 DP1120270 |

| Name | AHIMS No. | Type | Location Landform | Cadastral Boundary |
|---|---|---|---|---|
| BH13 (Canyon Leigh) | 52-4-0239 | Artefact | Ridgeline – crest/dip | Lot 3 DP1120270 |
| BH14 (Canyon Leigh) | 52-4-0240 | Artefact | Hill Slope | Lot 3 DP1120270 |
| BH15 (Canyon Leigh) | 52-4-0244 | Artefact | Rolling hills - plain | Lot 3 DP1120270 |
| BH16 (Canyon Leigh) | 52-4-0241 | Artefact | Creek/drainage bank | Lot 2 DP1237771 |
| BH2 (Canyon Leigh) | 52-4-0228 | Artefact | Hill Slope/drainage | Lot 1 DP1120270 |
| BH3 (Canyon Leigh) | 52-4-0230 | Artefact | Medium hill crest | Lot 2 DP1120270 |
| BH4 (Canyon Leigh) | 52-4-0231 | Artefact | Creek/drainage bank | Lot 2 DP1120270 |
| BH5 (Canyon Leigh) | 52-4-0232 | Artefact | Creek/drainage bank | Lot 2 DP1120270 |
| BH6 (Canyon Leigh) | 45-4-1031 | Artefact | Hill slopes | Lot 2 DP1120270 |
| BH7 (Canyon Leigh) | 52-4-0233 | Artefact | Hill Slopes | Lot 2 DP1120270 |
| BH8 (Canyon Leigh) | 52-4-0234 | Artefact | Undulating hilly | Lot 2 DP1120270 |
| BH9 (Canyon Leigh) | 52-4-0235 | Artefact | Undulating hilly | Lot 2 DP1120270 |
| KA4a | 52-4-0335 | Artefact, PAD | Shoulder | Lot 3 DP1120270 |
| KA6a | 52-4-0337 | Artefact | Flat | Lot 3 DP1120270 |
| KA5a | 52-4-0336 | Artefact, PAD | Flat | Lot 3 DP1120270 |
| KA7 | 52-4-0338 | Artefact, PAD | Valley | Lot 3 DP1120270 |
| KA8 | 52-4-0339 | Artefact, PAD | Flat | Lot 1 DP225509 |
| KPAD-3 | 52-4-0348 | PAD | Footslope | Lot 3 DP1120270 |
| KPAD-4 | 52-4-0349 | PAD | Valley | Lot 3 DP1120270 |
| KPAD-5 | 52-4-0350 | PAD | Valley | Lot 3 DP1120270 |
| KPAD-6 | 52-4-0351 | PAD | Valley | Lot 3 DP1120270 |
| MGPS10 | 52-4-0306 | Artefact, PAD | Flat | Lot 2 DP1120270 |
| MGPS11 | 52-4-0307 | Artefact | Flat | Lot 2 DP1120270 |
| MGPS12 | 52-4-0308 | Artefact, PAD | Flat | Lot 2 DP1120270 |
| MGPS5 | 48-4-0119 | Artefact | Valley flat | Lot 3 DP1120270 |
| MGPS6 | 48-4-0120 | Artefact | Valley flat | Lot 2 DP1120270 |
| MGPS7 | 52-4-0303 | Artefact, PAD | Flat | Lot 2 DP1120270 |
| MGPS8 | 52-4-0304 | Artefact | Flat | Lot 2 DP1120270 |
| MGPS9 | 52-4-0305 | Artefact, PAD | Shoulder | Lot 2 DP1120270 |

| Name | AHIMS No. | Type | Location Landform | Cadastral Boundary |
|---|---|---|---|---|
| TME-OS2 with PAD | 52-4-0134 | Artefact, PAD | Plain | Lot 3 DP1120270 |
| TME-OS3 with PAD | 52-4-0133 | PAD | Creek bank – elevated terrace | Lot 3 DP1120270 |
| TME-OS4 | 52-4-0132 | Artefact | Creek bank – elevated terrace | Lot 3 DP1120270 |
| TME-OS5 | 52-4-0131 | Artefact | Creek bank – elevated terrace | Lot 3 DP1120270 |

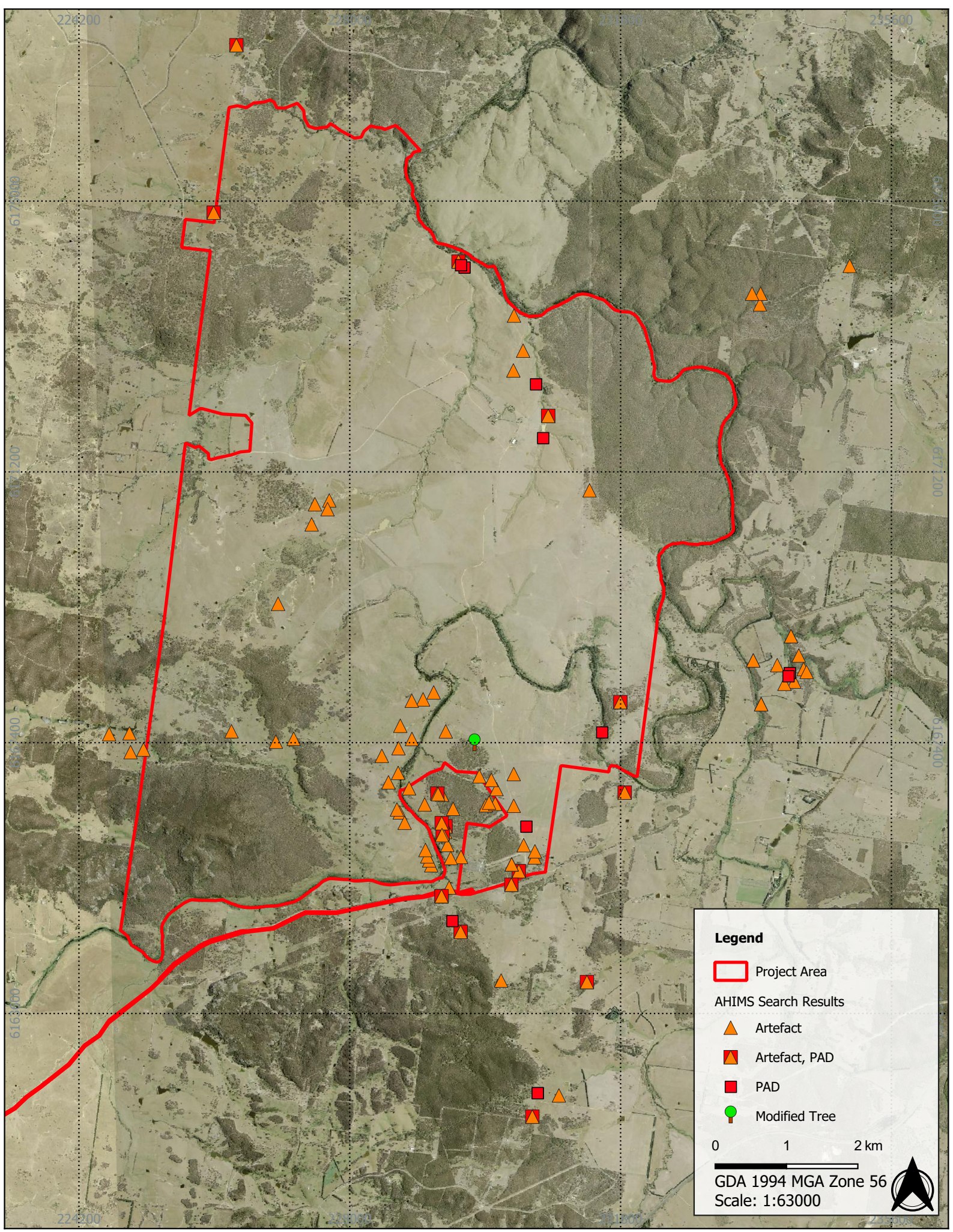



**Figure 4.1 - AHIMS sites within and ajdacent to the project area**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial*

Drawn by: PB Date: 2026-01-30

AUSTRAL ARCHAEOLOGY

### 4.2.3. LOCAL ARCHAEOLOGICAL CONTEXT

Archaeological investigations of the South Eastern Highlands have been conducted in response to the spread of urban development as well as within the framework of academic enquiries. The limited ethnographic accounts of early settlers and explorers were once considered the primary source for archaeological enquiry. However, with the recent spread of urban development within the South Eastern Highlands environs, archaeological investigations have increased accordingly.

Several studies have been completed in the region, as such, this section presents a synopsis of selected archaeological investigations of direct relevance to the Project Area. These reports have been selected based on their landform context, proximity and in particular, relationship to the landform and locality. The reports that have been reviewed are detailed in Table 4.8 and their location in relation to the Project Area is provided in Figure 4.2.

**Table 4.8 Reports selected for review as part of local archaeological context**

| Author | Date | Relevance to Project Area | Type of assessment |
|---|---|---|---|
| Kinhill Engineers Pty Ltd | 1996 | An Archaeological Assessment of the Proposed Jadinbrunbi Equestrian Centre, RMB Tugalong Road, Canyonleigh, NSW— located 12 km east of the Project Area | Archaeological Survey |
| OzArk Environment & Heritage Management Pty Ltd | 2005 | Indigenous and Non-Indigenous Heritage Study: Proposed Transmission Line from Taralga to Marulan, NSW- OzArk undertook an ACHA for the proposed construction of a transmission line corridor parts of their assessment were located adjacent to the Project Area. | Archaeological Survey |
| Umwelt | 2005 | Aboriginal Archaeological Assessment for the proposed Lynwood Quarry, Marulan — Located 12 km south-west of the Project Area. | Archaeological Survey |
| Biosis | 2008 | Cultural Heritage Assessment of the Proposed Marulan Gas Turbine Facilities, NSW—Biosis undertook an ACHA for a proposed gas turbine facility, with parts located in the south-western portion of the current Project Area. | Archaeological Survey |
| Navin Officer | 2012 | Kerrawary Power Station Project, Big Hill, NSW —An ACHA was undertaken before the development of Kerrawary Power Station and Pipeline, with parts located within the current Project Area. | Test Excavation |
| Umwelt | 2015 | Lynwood Quarry Project – this is a summary of the salvage program and reports that Umwelt undertook between 2007 and 2014 taken from the Lynwood Quarry Extraction Area Modification 2015 report. This site is located approximately 11.5 km south of the current Project Area. | Salvage |
| Umwelt | 2015 | Lynwood Quarry Extraction Area Modification -ACHAA is located approximately 11.5 km south of the current Project Area. | Test Excavation |
| NGH Pty Ltd | 2021 | Aboriginal Due Diligence Assessment – Arthursleigh Farm – Brayton and Big Hill NSW—Completed a Due Diligence within the same Project Area. | Due Diligence |
| Premise | 2022 | Marulan Solar Farm— Completed an ACHA located 12.5 km west of the current Project Area. | Test Excavation |
| Austral | 2023 | Cultural Heritage Advice for Scoping Report for 22492 — Wattle Creek Energy Hub completed a scoping report within the same Project Area as the current Project Area. | Scoping Report |

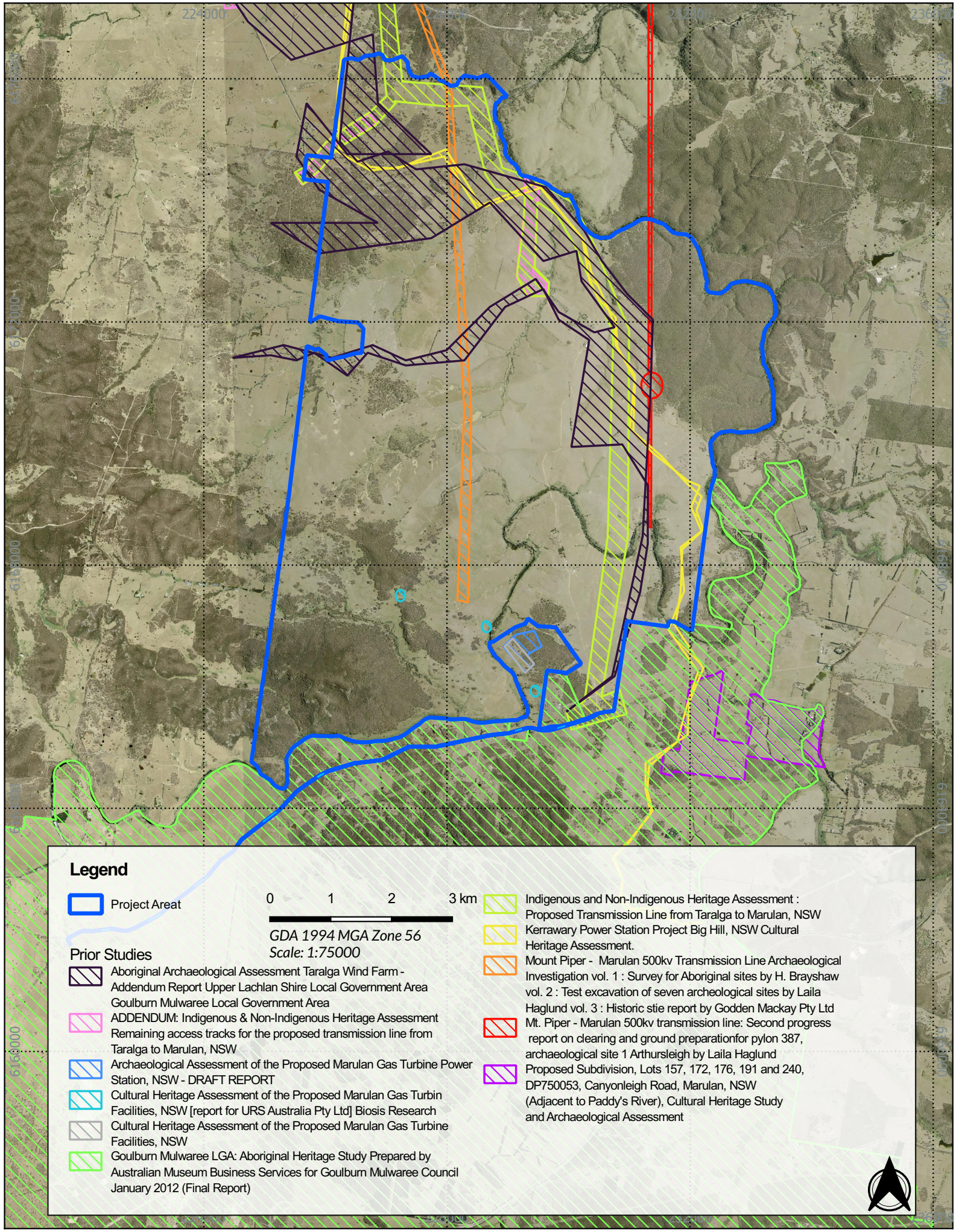



**Figure 4.2 - Location of studies undertaken within 2 kilometres of the project area**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, AHIMS*

*Drawn by: FOT Date: 2025-10-20*

AUSTRAL ARCHAEOLOGY

### ABORIGINAL ARCHAEOLOGICAL ASSESSMENT FOR PROPOSED LYNWOOD QUARRY, MARULAN BY UMWELT, 2005

Umwelt prepared an Aboriginal Archaeological Assessment for the proposed Lynwood Quarry, located approximately 12 km, south-west of the current Project Area. The report details the assessment and survey that were undertaken as part of the report.

The assessment identified that the Project Area consisted of ridges, saddles, crests and a valley and was located mostly within the Bindook Porphyry geographic formation, however, the Marulan Granite, Porphyritic Adamellite, Andesite, Adamellite Dyke, Adamellite sills, Siliceous Dyke, Sand and Lockyersleigh Adamellite geological features were also present.

The survey component of the assessment included 5 transects and identified 52 unrecorded sites, 50 within and 2 outside the boundary of the Project Area. Of the 50 sites, 29 were artefact scatters (2 or more artefacts), 12 were isolated finds, 7 were scarred trees and 2 were stone arrangements [Table 4.9] (Umwelt 2005:5.5). Note that the report did not have include the site's AHIMS registration numbers.

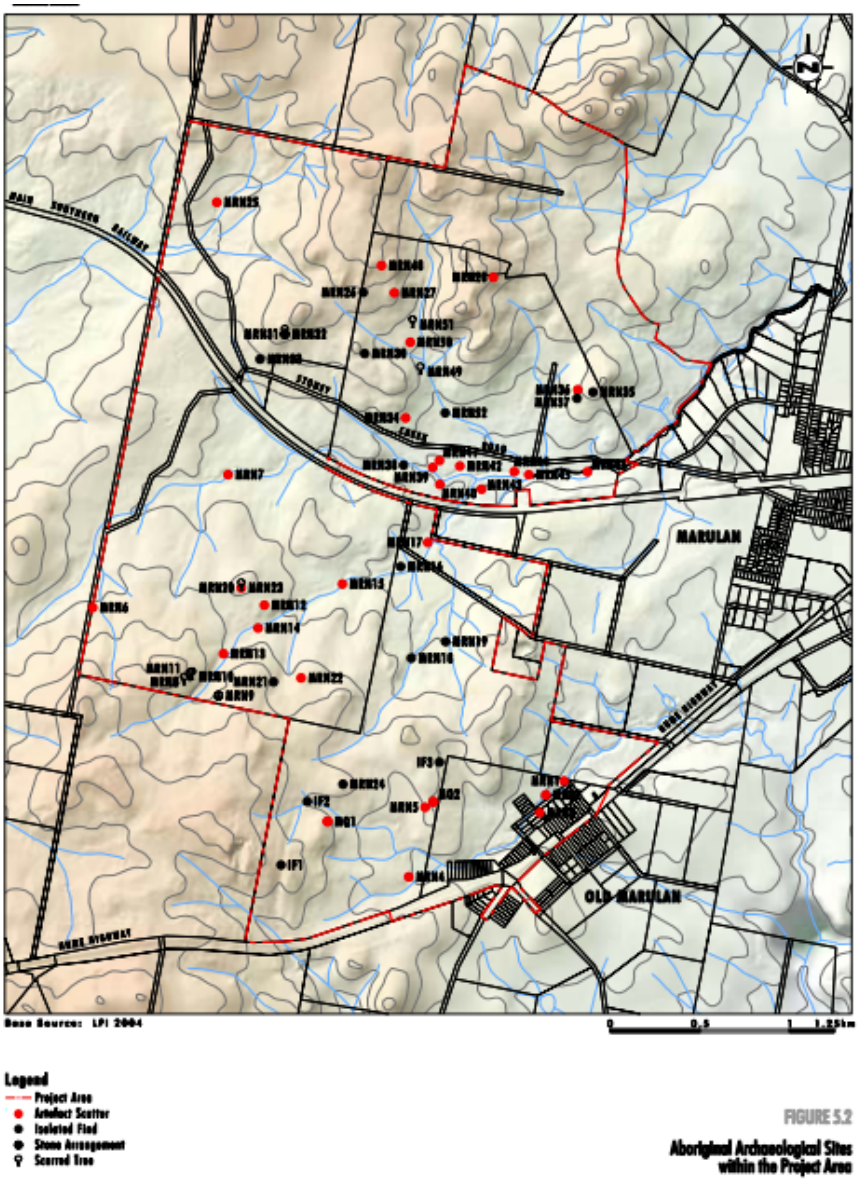



**Figure 4.3 Aboriginal Archaeological Sites within the Project Area (Umwelt 2005:5.6)**

**Table 4.9 Sites identified as part of the assessment by Umwelt, 2005**

| Name of site | Details | Name of site | Details |
|---|---|---|---|
| Stone Arrangement | | | |
| MR9 | A stone arrangement with parallel alignment of stones. The southern line measures 13.8 m long and the northern line measures 8.7 m, with a distance of 2.6 m between the lines. Possibly a 'stone circle' (Umwelt 2005:5.6) | MRN32 | 'A squarish arrangement of stones on a crest', possibly a 'women's business site' or historical (Umwelt 2005:5.6). Located adjacent to MRN31. |

| Name of site | Details | Name of site | Details |
|---|---|---|---|
| Scarred Tree | | | |
| MRN8, MRN10, MRN11 | Stringybark tree varieties located on a crest, within 'skeletal soil', all were in good health (Umwelt 2005:5.8). Located within 20m of each other. All scars are coolamon/shield like in shape (Umwelt 2005:5.7). | MRN23 | Western scribbly gum located on a crest. The bark was likely removed for the production of a coolamon (Umwelt 2005:5.8). |
| MRN31 | Stringybark tree located on a crest. The bark was likely removed for the production of a coolamon (Umwelt 2005:5.8). | MRN49 | Stringybark tree located on a midslope. The tree is dead and in fair condition. Suggested to be removed for the manufacture of a shelter (Umwelt 2005:5.8). |
| MRN51 | A stringybark tree located on a low spur crest. Suggested to be removed for the manufacture of a shelter (Umwelt 2005:5.9). | | |
| Artefact Scatter | | | |
| MRN1 - | 3 quartz flakes located on northern bank of Marulan Creek. | MRN2 | 6 quartz flakes located on a tributary of Marulan Creek. |
| MRN3- | 7 quartz flakes and a banded chert flake located on the south bank of Marulan Creek. | MRN4 | 6 quartz flakes located between 2 tributaries on the end of low spur. |
| MRN5 | Reidentified site MQ2 (AHIMS #51-6-0060). 6 grey chert flakes, located on low saddle. | MRN6 | 3 quartz flakes, located on lower slope of a ridge. |
| MRN7 | 4 white quartz flakes, 1 brown chert flake, located within Jaorimin Creek's channel. | MRN12 | 2 chert flakes, located on a crest. |
| MRN13 | 20 artefacts spread along both banks of Jaorimin Creek. Material included quartz, chert, porphyry. Included flakes, broken backed blade, 2 grindstone fragments and a ground axe | MRN14 | 6 quartz flakes and one chert flake. Located 300m downstream from MRN13. |

| Name of site | Details | Name of site | Details |
|---|---|---|---|
| MRN15 | 2 quartz flakes manufactured from a pebble of bipolar, located on a large erosion scour | MRN20 | 2 pieces of grinding fragment, located on a crest |
| MRN22 | 7 chert and 3 quartz flakes and a small grey chert core, located at head of minor tributary of Jaorimin Creek | MRN25 | 10 chert and quartz flakes. Located on lower slope/footslope. |
| MRN27 | 150+ quartz, quartzite, silcrete and chert, plus 3 volcanic broken river pebbles over an area of 100mx50m on a south-easterly facing upper, mid and lower slope | MRN28 | Consists of one chert and 2 quartz flakes located on a crest over an area of 75mx25/50m. |
| MRN34 | 30+ flakes, broken flakes and flaked pieces from quartz, silcrete and chert. The site is located on south-east facing lower slope/footslope. A bifacially backed geometric microlith was identified within | MRN36 | 3 quartz flakes, located on a south facing upper slope |
| MRN39 | 3 quartz flakes. Located on a footslope. | MRN40 | 25 quartz, silcrete and chert flakes and broken flakes. Located on large erosion on footslope. |
| MRN41 | 23 quartz, silcrete and chert flakes located on footslope | MRN42 | 10 quartz, silcrete and chert flakes and a porphyry core. Located on the top of B clay horizon. |
| MRN43/MRNH7 | 2 clay pits recorded as historical. 10 quartz and chert flakes mixed with glass and metal. Located on the footslope. | MRN44 | 6 quartz flakes, washed into erosion gully |
| MRN45 | Consists of 3 quartz flakes located on spoil. | MRN46 | One quartz flake steeply retouched and a grey chert flake which is adze-like, located on sheet erosion. |
| MRN48 | 2 chert flakes, located on a spoil on a crest. | MRN50 | 6 quartz flakes located on a low spur crest between 2 eroded ephemeral tributaries. |
| Isolated Find | | | |
| MRN16 | Isolated quartz fragment, located on the eroded bank of the creek. | MRN18 | Quartz pebble core, located on eroded bank of a tributary. |
| MRN19 | Quartz flake located on eroded bank of a tributary. | MRN21 | Single chert flake located on a midslope above a tributary. |

| Name of site | Details | Name of site | Details |
|---|---|---|---|
| MRN24 | Quartz pebble, bipolar core located on the crest above Marulan Creek. | MRN26 | Consists of a chert flake located on a crest. |
| MRN30 | An unmodified cobble (manuport) located on a crest. | MRN33 | A chert flake located at the foot of a spur with minor sheet erosion. |
| MRN35 | Isolated chert flake located on exposure of upper slope. | MRN37 | Broken river cobble, of unknown raw material. Recorded as a manuport and located on the midslope of a spur. |
| MRN38 | Isolated chert flake, located on footslope. | MRN52 | Chert flake located on northern side of Jarmin Creek. |
| IF1, IF2, IF3 | Unable to be relocated at the time of survey. | | |

Figure 4.3 and Table 4.9 show that a majority of the sites are located within proximity to either Jaorimin Creek and its tributaries or on elevated topographical features, such as spur crests (77.5%) and adjoining slopes (20.5%). The remainder of the sites were identified on slope or saddle landforms. In addition to these findings, Umwelt also determined that where deep sands had undergone weathering on porphyry, there was a larger concentration of archaeological material.

The investigation recovered a total of 5,217 artefacts across 37 sites. A total of 526 surface artefacts were collected from 13 of the 37 sites, with 4,691 subsurface artefacts identified at 34 of the 37 sites during the testing and salvage program. Of the three sites with over 500 artefacts included MRN73 (761 artefacts, gentle lower slope above Marulan Creek, MRN27 (1314 artefacts, spur crest and adjoining slope to Jaorimin Creek) and MRN54 (1392 artefacts, spur crest and adjoining slope down to Jaorimin Creek). The overall subsurface artefact densities were much higher in MRN27 (32.85/m2), than MRN54 (0.4/m2) and MRN73 (0.05/m2).

Umwelt's investigation suggested that most sites were located close to watercourses, and generally contained less than 10 artefacts, with assemblages dominated by quartz and silcrete. Flakes, broken flakes, and flaked pieces were the most common artefact types recorded within the surface assemblage during the survey. Additionally, Umwelt found that low density sites of surface artefacts also had low numbers of subsurface artefacts, with the exception of MRN25, where the number of subsurface artefacts was much higher than those recorded on the surface.

Following the field assessment, Umwelt interpreted the site distribution pattern, determining that:

- Low density artefact scatters would likely be present throughout the Project Area with higher density scatters along main creek channels and areas where deep sand was present.
- The larger sites within both the surface surveys and test program were found to be located on spur crests and their adjoining short, low gradient slope down to a watercourse.
- The high proportion of isolated finds and small artefact scatters suggests a general low density background scatter of artefacts that most likely reflects transient use of the landscape rather than periods of occupation and/or camping with just a few locations targeted for camping.

Overall, there were 54 known sites at the conclusion of the assessment, with 14 of those likely to be impacted by the proposed works.

## PROPOSED TRANSMISSION LINE FROM TARALGA TO MARULAN BY OZARK ENVIRONMENT & HERITAGE MANAGEMENT PTY LTD, 2005

OzArk Environment & Heritage Management Pty Ltd (2005) [OzArk] was commissioned to undertake an Aboriginal and Historical assessment for the proposed construction of a transmission line connecting the proposed Taralga wind farm to the Marulan Switching station.

Predictive modelling showed that through the concept of stream ordering the following predictions about the site were made:

- The area surrounding 1st order streams and headwaters is most likely to contain evidence of sporadic occupation and may consist of little more than a background scatter of artefactual material;
- In the vicinity of 2nd order creeks, archaeological evidence may be sparse, but may indicate focussed activity (one-off campsites and knapping events);
- In the lower reaches of the tributary creek (3rd order), archaeological evidence will be more frequent and intense, indicating more permanent or repeated occupation by small groups and may show evidence of concentrated activities;
- On major creek lines and rivers (4th order) more permanent and repeated occupation may be evident by a more diverse stone tool assemblage indicating a greater range of lithic activities. Sites in this location may be stratified;
- Creek junctions may provide a popular location for occupation and the size of the confluence (in terms of stream ranking nodes) may influence the size of the site;
- Ridgetop locations between drainage lines are likely to contain limited archaeological evidence.

The most likely sites to be encountered were identified as:

- Scarred trees (frequently close to creeks and rivers but also found further afield);
- Open sites, close to permanent/temporary water;
- Isolated finds may occur anywhere, especially within disturbed locations near water sources on red soil or in areas close to ephemeral water.
- Carved trees (unlikely)
- Rock shelters (unlikely because very little of the easement traversed landform in which shelter sites are likely to occur).

A survey of the Project Area was undertaken which resulted in 9 archaeological sites to be identified, 5 were open sites with PADs, 2 were open sites, 1 isolated artefact and 1 scarred tree.

These were all located within landscapes close to permanent water (OzArk Environment & Heritage Management Pty Ltd 2005).

Below is a summary of the identified sites:

- TME-IF 1 – an isolated chert flake, possibly transported by human agency or by erosion.
- TME-OS1 with PAD – over 100 artefacts were recorded within this site, materials included silcrete, chert, greywacke, hornfel/rhyolite, quartz and tuff. Artefacts included flakes, cores, broken lakes and debitage.
- TME-ST1 – scarred tree located within TME-OS1 with PAD, most likely a Red Stringybark (*E. macrorhyncha*) and is approximately 25m in height.

- TME-OS2 with PAD – The presence of artefacts within tree roots suggests the potential for subsurface finds. Artefacts included flakes, broken flakes and a grinding dish made from materials including silcrete, quartz and hornfel.
- TME-OS3 with PAD – Open campsite with potential archaeological deposit located on an unmanned drainage line feeding the Wollondilly River on the University of Sydney's property 'Arthursleigh' (OzArk Environment & Heritage Management Pty Ltd 2005). Ploughing has acted as a mechanism for artefact detection and dispersal, it us considered that there is potential for subsurface deposits. It is concluded that the extent of this site is difficult to assess without subsurface testing. Artefacts identified within this site include flakes, broken flakes and cores made of silcrete, quartz and tuff.
- TME-OS4 –Open campsite located on an unmanned drainage line feeding the Wollondilly River on the University of Sydney's property 'Arthursleigh'. Disturbances to this site include overgrazing, land clearing and soil erosion.
- TME-OS5 – Located in an unlikely camping spot, on a very thin, sloping spur edge adjacent to the Wollondilly River on the University of Sydney's property 'Arthursleigh' (OzArk Environment & Heritage Management Pty Ltd 2005). Disturbances to the site include land clearing, overgrazing and soil erosion. The artefacts present include cores, flakes and broken flakes with material types being silcrete and quartz.
- TME-OS6 – Open campsite with potential archaeological deposit. The land has been disturbed and altered by land clearing, wombat and rabbit burrows and overgrazing but is unlikely to be ploughed. Over 50 artefacts were identified with exposures associated with erosion and soil loss (OzArk Environment & Heritage Management Pty Ltd 2005). Within the site with PAD *in situ*, subsurface archaeological features were observed eroding from the wall of a gully into a creek (OzArk Environment & Heritage Management Pty Ltd 2005). The artefacts present include flakes, broken flakes, microliths, and cores with materials such as silcrete, tuff, FGS, Quartzite, chert, quartz and hornfels being used.
- TME-OS7 with PAD – PAD situated in a saddle near the headwaters of a north-flowing, eroded drainage line. Due to erosion the soil A horizon is very thin, and where there was soil loss, artefacts were observed. The landscape has been disturbed by land clearing, possible but limited ploughing, and detailed recording of artefacts was not undertaken as it falls outside of the Project Area.

In light of these findings, the Proponent was provided recommendations to follow so that the impact could be avoided. Throughout the project, the Proponent had also altered the impacts of the development to ensure the conservation of heritage sites.

### AN ARCHAEOLOGICAL ASSESSMENT OF THE PROPOSED JADINBRUNB EQUESTRIAN CENTRE, RMB 255 TUGALONG ROAD, CANYONLEIGH, NSW BY Kinhill Engineers Pty Ltd, 1996

Kinhill Engineers Pty Ltd completed an archaeological assessment, including a survey, for a proposed Equestrian Centre in Jadinbrunbi. Undertaken as a staged approach, this assessment was completed as part of the Stage 1 works situated on a slightly undulating to moderately dissected plain that has been formed on Ordovician metasedimentary rocks and is close to the Wollondilly River and Pivets Creek.

The desktop assessment included an AHIMS search which evaluated an 8 km radius of the Project Area. The low results from this search, one artefact scatter and a site containing 70 grinding grooves, were attributed to the low number of archaeological assessments that had been undertaken in the region rather than a lack of cultural heritage.

The survey was undertaken over 3 days in April 1996 and identified 36 archaeological sites, including:

- J1, J2, J3, J4 - 4 surface artefact scatters
- J5 - 1 rock shelter with art
- J6 - 1 rock shelter with occupation deposits
- 30 isolated artefacts

A summary of the sites is listed below:

- Site J1 consisted of 57 artefacts, 45 quartz, 9 silcrete and 3 others with 4 cores, 28 flakes and 26 flaked pieces. The site was located on the southern side of an unnamed creek on a low, broad north-west trending dune.
- Site J2 included 4 quartz and 2 silcrete artefacts, with 4 flakes and 2 flaked pieces. This site was identified on the north side of an unnamed creek on a bedrock bench.
- Site J3 contained 5 quartz and 2 silcrete artefacts, with 4 flake and 3 flaked pieced. The site was located on the western side of a north to south draining tributary on a gently sloping ridge.
- Site J4 consisted of 6 quartz and 6 silcrete artefacts with 3 cores, 6 flakes and 3 flaked pieces recorded. This site was located on the south-east side of an unnamed creek on a low interfluve.
- Site J5 is a rock shelter with art with 3 panels of art, an indeterminate red ochre infilled figure with charcoal markings, indeterminate charcoal markings and an indeterminate linear charcoal figure. The rock shelter is located on a low scarp that has formed from an outcrop of sandstone.
- Site J6 is a rock shelter with a PAD with a sandy deposit of more than 1 m and an isolated quartz flake. The rock shelter is located on the northern end of a low scarp and faces west.

Overall, there were 113 artefacts, including 7 cores, 68 flakes and 38 flaked pieces, with raw material of quartz (n=87) silcrete (n=25) and other [mudstone (n=2), porphyritic volcanic(n=1) and quartzite (n=1)] (n=4).

The results of the survey determined that quartz was the dominant raw material which was associated with the large number of quartz present in the wider area. This quartz had limited workings whereas the less popular silcrete had a higher number of manufacturing processes and was more likely to have been less utilised due to the 10 km distance to the closest quarry.

### MARULAN GAS TURBINE FACILITIES ENVIRONMENTAL ASSESSMENT APPENDIX G CULTURAL HERITAGE ASSESSMENT BY BIOSIS PTY LTD, 2008

Biosis Pty Ltd (2008) was commissioned to undertake a Cultural Heritage Assessment of the proposed Marulan Gas Turbine Facilities, NSW. The 2 proposed gas facilities and associated infrastructure envelopes /corridors near the town of Marulan in the NSW Southern Highlands.

A predictive model was formulated using the results of AHIMS searches, the location and types of Aboriginal sites identified and previous archaeological work. The following predictions are what was suggested for the Project Area:

- Open campsites (artefact scatters) are likely to be the most common site types in the Project Area;
- Artefact scatters are the most common site type and are likely to occur on level, well-drained ground adjacent to sources of freshwater and wetlands;
- Isolated finds are likely to occur anywhere in the landscape;
- Scarred trees are likely to occur in all topographies where old growth trees survive, either as isolated trees or as part of remnant or continuous forest;

- Burial sites may occur in landforms characterised by a relatively deep profile of soft sediments such as sand and alluvium.

The site survey resulted in 10 Aboriginal sites being recorded. It was noted that a major limitation of this survey was the lack of visibility and exposure throughout a majority of the Marulan Soil Landscape (Biosis Pty Ltd 2008). This can be attributed to the thick pasture grass cover that occurs across much of the Project Area.

A summary of the sites identified is below:

- BH1 – Consisting of an isolated quartz artefact situated at the base of an existing overhead powerline, resulting in the site being heavily disturbed and exposed.
- BH2 – Comprised of one quartz flake and one silcrete flake located on excavated mounds on man-made drainage systems, adjacent to existing electricity sub-station. Much of the area along the drainage has been disturbed by the construction of the mounds and the dam.
- BH3 – Small scatter of stone artefacts, 3 quartz flakes and a quartzite core, which have been exposed along a farm vehicle. Although there is disturbance from the vehicle track, this site is relatively undisturbed.
- BH4 – An isolated stone artefact, a primary flake that has been removed from the outside of a large smooth quartz pebble, identified in close proximity to a major drainage line that runs into the nearby Wollondilly River. The section of the farm track it was identified on was moderately eroded into the underlying alluvial deposits.
- BH5 – Identified on the same farm vehicle track, the site comprises a silcrete core and core trimming flake. This portion of the vehicle track is eroded in small patches.
- BH6 – This stone artefact scatter is located along the far vehicle track and gateway on the upper slope of a moderate hill. A total of 8 artefacts were identified, comprising of cores, formal tools and flakes. This site has been exposed and disturbed due to the continuous use of the vehicle track.
- BH7 – This site is comprised of a singular quartz flake, located on the spoil of a wombat hole at the base of a tree, as a result of the wombat burrow the area is exposed and has been disturbed.
- BH8 – Was identified on the spoil from a number of wombat burrows amongst remnant vegetation and consists of two broken quartz flakes and one retouched quartz tool. Due to the wombat burrows, this site was heavily disturbed.
- BH9 – Located 60m from BH8, likely that cultural material is related. This site was also found on the spoil from wombat burrows and consists of a quartzite core and a quartzite broken flake.
- BH10 – Consists of one broken fragment of silcrete located on the top of a moderate rise, overlooking the Wollondilly River.

The report findings identified that the survey coincided with the predictive modelling formulated from previous archaeological investigations in the area, particularly the expectation that many of the sites would be identified on specific landforms.

### KERRAWARY POWER STATION PROJECT, BIG HILL, NSW BY NAVIN OFFICER, 2012

Navin Officer (2012) was commissioned by Parsons Brinckerhoff on behalf of Origin Energy to undertake an ACHA for the Kerrawary Power Station Project, adjacent to the Project Area's southern boundary. The proposed project comprised up to 8 open-cycle gas turbines and associated infrastructure including approximately 30 km of underground gas pipeline.

During an AHIMS search, it was identified that 2 sites had been recorded within the Project Area: 2 Kerrawary Trig, and BA5 (Bannaby Substation). A predictive model of the location was created to identify any areas of high archaeological sensitivity, it was concluded that artefact scatter sites:

- Are most likely to occur within locally elevated and well-drained fine sediment contexts;
- Are likely to be exposed within fine sediment terrace embankments situated above, or away from, the high energy fluvial zones;
- May have been situated away from valley floor contexts due to the discomfort of cold air valley drainage;
- Are more likely to be recorded on elevated level ground within the topographic transition between the sedimentary flood plain and the bedrock slopes;
- Frequently occur along descending spurs and elevated ground adjacent to large alluvial cobble and gravel deposits (presumably used as procurement sites for rock suitable for flaking).

During the field investigation, 25 Aboriginal artefacts were recorded within the Project Area. The finds consisted of:

- One Isolated find;
- Three artefact scatters;
- Fifteen PADs with associated artefact scatters; and
- Six PADs with no associated artefacts.

Below is a summary of artefacts found within each site:

- KA1 and PAD – Artefact and PAD: 4 silcrete flakes, 2 quartz flakes, 1 quartzite pebble fragment, 2 flaked pieces
- KA2 and PAD – Isolated Find and PAD: 1 chert flake, 4 quartzite flakes, 1 quartz flake, 3 silcrete flakes, 1 fine-grained volcanic flake, 2 silcrete flaked pieces.
- KA3 and PAD – Aboriginal artefact scatter and PAD: 1 chert flake, 4 quartzite flakes, 1 quartz flake, 3 silcrete flakes, 1 fine-grained volcanic flake, 2 silcrete flaked pieces.
- KA4 – Aboriginal artefact scatter and PAD: 1 silcrete flaked piece, 1 silcrete flake, 6 quartz flake, 2 quartz flaked pieces.
- KA5 and PAD – Aboriginal artefact scatter and PAD: 1 quartz flaked piece, 2 silcrete flakes.
- KA6 – Aboriginal artefact scatter: 1 silcrete flake, and 1 quartzite core.
- KA7 and PAD – Aboriginal artefact scatter and PAD: 1 quartzite core, 2 quartz flakes, 1 quartz core fragment, 2 silcrete flakes, 1 metamorphic core, 1 volcanic ground-edge hatchet, 1 silcrete flaked piece and 1 silcrete blade.
- KA8 and PAD – Aboriginal artefact scatter and PAD: 1 silcrete flake, 1 chert flake, 2 quartz flakes
- KA9 and PAD – Aboriginal artefact scatter and PAD: 3 silcrete flakes, 2 chert flakes, 2 quartz flakes, 1 silcrete flaked piece, 1 rhyolite core fragment, 1 fine-grained volcanic flake.
- KA10 – Aboriginal Artefact scatter: 2 chert flakes, 1 quartz flake, hammerstone fragment, 1 silcrete flake, 2 volcanic flakes
- KA11 and PAD – Aboriginal Artefact scatter: 1 chert flake, 1 silcrete flake, 1 quartz flaked piece, 3 quartz flakes.
- KA12 – Isolated find: 1 silcrete core
- KA13 and PAD – Aboriginal artefact scatter and PAD: 1 tuff flake, 1 quartzite flake, 2 silcrete core, 7 silcrete flake, 5 quartz flake, 1 rhyolite flake

- KA14 and PAD – Aboriginal artefact scatter and PAD: 2 quartz cores, 3 quartz flakes, 2 silcrete flakes, 1 volcanic hammerstone, 1 quartzite flake, 1 tuff core fragment
- KA15 and PAD: Aboriginal artefact scatter and PAD: 5 silcrete flake, 1 quartz flake, 1 silcrete flaked piece
- KA16 and PAD – Aboriginal artefact scatter and PAD: 1 chert flake, 1 mudstone flake, 1 quartz core, 2 quartz flake
- KA17 and PAD – Aboriginal artefact scatter and PAD: 2 quartz flakes, 1 fine-grained volcanic backed artefact, 3 quartz core and 1 jasper core.
- KA18 and PAD – Aboriginal artefact scatter and PAD: 1 silcrete flake, 2 fine-grained volcanic flake, 1 quartz core, 3 quartz flakes and 3 silcrete flakes.
- KA19 – Aboriginal artefact scatter: 3 quartzite flakes

It was identified that sites recorded on the site survey were more frequently recorded on low gradient spur crests, ridge crests, alluvial flats, and locally elevated basal slopes and creek margins.

### LYNWOOD QUARRY PROJECT, BY UMWELT 2015.

Umwelt (2007-2014) was commissioned by Holcim to undertake a subsurface testing and salvage program of Aboriginal sites within the Lynwood Quarry Approved Project Area. A total of 5,217 artefacts were recovered from 37 sites. A total of 526 surface artefacts were collected from 13 of the 37 sites while 4,691 subsurface artefacts were collected from 34 of the 37 sites (Table 4.10 and Table 4.11).

**Table 4.10 Surface collection (Umwelt 2015)**

| Site Name | Artefacts No. | Landform |
|---|---|---|
| JSC | 111 | Low Spur Crest |
| MRN27 | 369 | Low Spur Crest |
| MRN26 | >10 | Spur Crests |
| MRN28 | >10 | Spur Crests |
| MRN64 | >10 | Spur Crests |
| MRN77 | >10 | Spur Crests |
| MRN33 | >10 | Spur Slopes |
| MRN35 | >10 | Spur Slopes |
| MRN36 | >10 | Spur Slopes |
| MRN78 | >10 | Spur Slopes |
| MRN25 | >10 | Spur Crest and Slope |
| MRN62 | >10 | Ridge Crest |
| MRN5 | >10 | Saddle |

**Table 4.11 Subsurface collections (Umwelt 2015)**

| Site Name | Artefacts No. |
|---|---|
| MRN26, MRN28, MRN33, MRN36, MRN48, MRN53, MRN57, MRN59, MRN60, MRN61, MRN63, MRN65, MRN66, MRN67, MRN70, MRN71, MRN72, MRN78 and MRN81 | All had less than 10 Artefacts |
| MRN15, MRN55, MRN56, MRN58, MRN62, MRN64 and MRN68 | Between 10 to 20 artefacts |
| MRN79 and MRN80 | Between 20 to 50 artefacts |
| JCS, MRN25 and MRN69 | Between 200 to 500 artefacts |
| MRN73 | 761 |
| MRN27 | 1314 |
| MRN54 | 1392 |

Ten of the salvage sites contained both surface and subsurface artefacts including JCS, MRN25, MRN26, MRN27, MRN28, MRN33, MRN36, MRN62, MRN64 and MRN78.

Umwelt (2015) indicated that surface artefacts were a good indicator of the subsurface artefact potential of the Project Area. Umwelt (2015) also identified through their testing that landforms that include high points on ridge and spur crests, ridge crests and midslopes had very low numbers of subsurface artefacts.

The surface assemblage was dominated by broken flakes (51.3%), flakes (20.2%) and flake pieces (12.7%), while the subsurface assemblage was also dominated by broken flakes (57.6%), flakes (18.2%) and flaked pieces (11.7%). The presence of cores was low, with the collected cores exhausted or very close to exhausted, retouched artefacts were present in 21 of the 37 sites indicating that re-sharpening of flakes was common in the Project Area. Steep retouch was the most common type of retouch while backed artefacts including Bondi points, backed blades and geometric microliths were only located within the surface assemblage and not common (Umwelt 2015).

Quartz artefacts dominated the surface assemblage (50.5%), followed by silcrete (31.5%), with the remaining 18% made up of quartzite, chert, chalcedony, dolerite, basalt, petrified wood, hornfels, ignimbrite and aplite. The subsurface assemblage was dominated by silcrete (59.8%) and quartz (22.5%) with the remaining 18% made up of quartzite, chert, chalcedony, dolerite, petrified wood, hornfels, ignimbrite and aplite (Umwelt 2015)

Umwelt concluded that most sites contained less than 10 artefacts, sites located close to water sources tended to have higher artefact numbers, quartz and silcrete were the most common raw material types, broken flakes, flakes, and flaked pieces were the dominant artefact type and sites with low numbers of surface artefacts generally also had low numbers of subsurface artefacts with (Umwelt 2015),

### LYNWOOD QUARRY EXTRACTION AREA MODIFICATION 2015

Umwelt (2015) was commissioned by Holcim to undertake an ACHA, which included both a survey and test excavation as part of an EA for the Modification Project. The Modification Project sought to gain approval to extend the quarry to the adjacent land parcel (Umwelt 2015).

As part of the assessment, the environmental context of the Project Area was described as consisting of a series of low spurs interspersed by gentle slopes with several 1st and 2nd order ephemeral tributaries of Lockyersleigh Creek. It is situated in the Sydney Basin, with surface geology comprised mostly of granites and adamellite intrusions, and is within Lockyersleigh Granite and Bindook Porphyry Complex Soil landscapes (Umwelt 2015).

The survey covered approximately 891,350 m². GSV was recorded as generally poor due to thick grass with areas of better GSV along tracks and other exposures. A total of 19 new sites and 4 previously recorded sites were identified during the survey (Table 4.12).

**Table 4.12 Sites identified during the survey (Umwelt 2015).**

| Site Name / AHIMS # | Site Type | Description | Landform |
|---|---|---|---|
| LA32 / 51-6-0387 | Artefact | This site was previously recorded by Saunder (2005) and is a quartz flake. | Lower slope |
| LA33 / 51-6-0388 | Artefact | This site was previously recorded by Saunder (2005) and is a quartzite flake. | Basal slope |
| LKIF1 | Artefact | A broken quartz flake. | Lower slope of a creek bank |
| LKIF2 | Artefact | Small quartz core | Lower slope |
| LKIF3 | Artefact | Quartz retouched flake | Mid-slope |
| LA31 / 51-6-0386 | Low density Artefact Scatter/PAD | This site was previously recorded by Saunder (2005) as a low-density artefact scatter. However, during the new survey, it was identified as containing a PAD. Artefacts recorded included 9 flakes, 1 flaked piece, 2 broken flakes, and 4 cores. Raw materials included silcrete, quartz, quartzite and chert. | Slope, footslope and creek bank |

| Site Name / AHIMS # | Site Type | Description | Landform |
|---|---|---|---|
| MRN25 / 51-6-0266 | Artefact Scatter and PAD | This site was recorded in 2004 and was recorded as having 10 flakes of chert and quartz. During reinspection in 2015 a chert flake, 2 broken quartz flakes, a silcrete flake and a bipolar quartzite flake were identified. | low spur crest and slope, |
| LKAS1 | Artefact Scatter and PAD | 4 broken flakes, 2 retouched flakes, 4 flakes and 4 cores manufactured from silcrete, quartz, dolerite and chert. The PAD was assessed as an area that would be suitable for subsurface testing | Slope wash on the edge of a spur crest |
| LKAS2 | Artefact Scatter | A quartz flake, a quartz broken flake and a quartz bipolar flake. | Lower Slope |
| LKAS3 | Artefact Scatter | The site contained four artefacts including a quartz retouched flake, a quartz flake, a quartz broken flake and a dolerite flake. | A dam wall within a scour |
| LKAS4 | Artefact Scatter | Two quartz cores. | Lower Slope |
| LKAS5 | Artefact Scatter | The site contained one broken dolerite flake and one silcrete flake. | Small Scour |
| LKAS6 | Artefact Scatter | A broken silcrete flake and a granite grindstone. | Upper section of a lower slope |
| PAD2 | PAD | Classified as PAD because it retained a relatively deep and undisturbed A2 soil horizon, was of low gradient and suitable for camping, was in an area with an expansive view to the east, west, and south, and was close to a very distinctive landmark in the form of several balancing granite tors. | Rocky Spur Crest |
| PAD4 | PAD | The archaeological assessment identified the area as a PAD due to its deep and undisturbed A2 soil horizon, negligible gradient, suitability for summer camp (too cold in winter), panoramic 360-degree view, association with LKST2, and privacy provided by surrounding granite tors. | Rocky Spur Crest |
| PAD5 | PAD | The area was classified as PAD due to its low gradient, proximity to a spring-fed creek, presence of ponds with Typha sp., a starchy carbohydrate source and the preservation of a deep and undisturbed A2 soil horizon. | Lower Spur Slope |
| PAD6 | PAD | The area was assessed as PAD as sites are often located in this landscape context, it appeared relatively undisturbed and retained a relatively deep (20 centim) A2 soil horizon. | Lower slope |

| Site Name / AHIMS # | Site Type | Description | Landform |
|---|---|---|---|
| LKST1 | Scarred Tree | A brittle gum (*E. mannifera*) approximately 200 years in age. The scar is a large ovoid shape. L.172cm, W.72cm. | Spur Crest |
| LKST2 | Scarred Tree | A brittle gum (*E. mannifera*) and is approximately 250 to 300 years in age. The scare is elliptical in shape. L.46cm, W.10cm | Upper Slope |

### MARULAN SOLAR FARM BY PREMISE 2022

Premise Australia Pty Ltd (Premise) and OzArk were commissioned by Terrain Solar Pty Ltd to undertake an ACHA, which included both a survey and test excavation, for an SSD Solar farm and BESS project, approximately 12.5 km west of the current Project Area. The investigation for the ACHA included an area of 1,400 ha, with 375.5 ha of this area for the proposed footprint of the works.

As part of the assessment, the environmental conditions of the site included disturbed but undulating landscape and several named and unnamed waterways, with the most prominent, consisting of 4$^{th}$ order streams the most (Lockyersleigh. Osborns and Narambulla creeks). It is situated in the Sydney Basin, with surface geology comprised mostly of granites and adamellite intrusions and is within the Garland Soil and Blakey Creek Soil landscapes.

As part of Premise and OzArk's assessment, a predictive model was developed and included:

- There is low to moderate potential for stone artefacts to be identified due to the topography, with waterways having a higher potential.
- Silcrete and quartz are the dominant raw materials used for artefact manufacture and flakes, broken flakes and flaked pieces were the dominant typology, with cores and retouched flakes also present but in lower densities and stone axes and hammerstones considered to be rare.
- Isolated artefacts may be identified anywhere, with their presence likely to be identified in disturbed contexts.
- Artefact scatters will most likely occur on level or low-level gradient context, along crests or ridgelines and spurs, and elevated areas that are close to watercourses or wetlands. If identified, they are likely to be low density.
- Scarred trees are unlikely to be present within the Project Area due to the lack of native and remnant vegetation.
- Stone quarries may be present if rock cropping is available. They have previously been identified adjacent to the Project Area (LA17 [AHIMS #51-6-0372]).
- Low to moderate levels of disturbances suggest that if cultural heritage is identified it is likely to be *in-situ*.
- Aboriginal sites are likely to occur in low to moderate densities.
- The Project Area is unlikely to have been a location for long-term occupation.
- Burials are unlikely to occur due to the lack of elevated sandy contexts associated with rivers and/or creeks.
- Bora/Ceremonial sites are unlikely to be present due to the rarity of the site type.

Following the survey, 7 sites were identified, with 5 previously recorded and 1 new site (Narambulla Creek IF-1 (AHIMS #51-6-0908]). These sites include:

- Artefact Scatter - LA9 (AHIMS #51-6-0364)
- Artefact Scatter - Name not identified in the report (AHIMS #51-6-0373)
- Artefact Scatter - Name not identified in the report (AHIMS #51-6-0374)
- Artefact Scatter - Name not identified in the report (AHIMS #51-6-0375)
- Artefact Scatter - HSP13 (AHIMS #51-6-0376)
- Artefact– Narambulla Creek IF-1 (AHIMS #51-6-0908). Consisted of a singular quartz artefact in a disturbed context (farm track) on a mid-slope with a suggestion that it was located *ex-situ*.
- Stone Quarry – LA17 (AHIMS #51-6-0372) [outside the Project Area]

Of these 7 sites, 1 was located outside the Project Area and would not be further assessed.

After the survey, a testing programme commenced, with 6 locations tested, 72 (0.5x0.5m) test pits excavated, and 203 Aboriginal objects recorded. Of the 6 testing locations, there was only one that did not identify any artefacts, with the highest density at Location 5, in the south-western corner of the Project Area.

Of the total number of test pits excavated, only 19 had cultural material with artefacts mostly identified in the topsoil and sandy loam layer, often at a maximum depth of 150 mm. These artefacts included 106 flakes, 5 retouched flakes, 78 flaked pieces and 14 cores with the raw material, listed by frequency, consisting of:

- Indurated mudstone, silicified tuff, chert (IMSTC)
- Silcrete
- Quartz
- Quartzite

The results were outlined in a table, which was presented in the report, shown in Table 4.13 (Premise Pty Ltd 2022:53–54).

**Table 4.13 Premise table showing the test excavation results**

| Location | Features | No. Artefacts Recorded | Context | Landform |
|---|---|---|---|---|
| 1 | Silcrete and quartz flakes and flaked pieces | 4 | Square 8<br>Spit 2 | Elevated bench overlooking the confluence of Narambulla and Osborns creeks. No previous site recorded at this location. Western side of Narambulla Creek. |
| 2 | IMSTC and Quartzite flake | 2 | Square 7<br>Spit 2<br>Square 11<br>Spit 2 | Large, elevated landform associated with Narambulla Creek. No previous site recorded at this location. |

| Location | Features | No. Artefacts Recorded | Context | Landform |
|---|---|---|---|---|
| 3 | IMSTC flake | 1 | Square 5<br>Spit 1 | Level elevated landform associated with Narambulla Creek. No previous site recorded at this location. Eastern side of Narambulla Creek. |
| 4 | Quartz flaked piece and IMSTC, quartz and Silcrete flakes | 11 | Squares 1.2.8.9.10<br>Spits 1-3 | Previously recorded (HSP13, AHIMS #51-6-0736, artefact scatter). Located on a flat bench within a spur overlooking Narambulla Creek. Eastern side of Narambulla Creek. |
| 5 | Quartz, Silcrete and IMSTC cores.<br>Quartz, IMSTC, Quartzite, silcrete and glass flaked pieces<br>Quartz, IMSTC. Quartzite, Silcrete flakes | 14<br>78<br>111 | Squares 1-11<br>Spits 1-5 | Previously recorded site (LA0, AHIMS #51-6-0364, artefact scatter) Located on a flat bench overlooking Narambulla Creek/ Near historical ruins (a location often selected for the same reasons as Aboriginal occupation). Western side of Narambulla Creek. |
| 6 | None | 0 | None | Level landform associated with the tributaries to Lockyersleigh Creek. On the eastern boundary of the Project Area close to the Lynwood Quarry. |

After the programme, 3 sites (Locations 1-3) were registered as new sites (Location 1-Osborns Creek OS-1 [AHIMS #Unknown], Location 2-Narambulla Creek OS-1 [AHIMS #Unknown] and Location 3-Lockyersleigh Creek [AHIMS #Unknown]) and 2 (Locations 4-5) were regarded as extensions of AHIMS #51-6-0376 (Location 4) and AHIMS #51-6-0364 (Location 5).

### ABORIGINAL DUE DILIGENCE ASSESSMENT— ARTHURSLEIGH FARM – BRAYTON FARM AND BIG HILL IN NSW BY NGH, 2021

NGH was commissioned by The University of Sydney to complete a Due Diligence Assessment for Aboriginal cultural heritage at Arthursleigh Farm (Lot 3 DP1120270). The assessment included an AHIMS search on 27 April 2021, which investigated a 20 km radius search that centred on the Project Area with 98 Aboriginal sites with 19 sites recorded within the Project Area, and a further 4 sites located within 100 m of the boundary of the Project Area.

The Due Diligence assessment evaluated the environmental factors of the Project Area. As part of this assessment, the background identified that the Wollondilly River and 3 associated perennial tributaries intersected the Project Area, the geology was associated with the South East Highlands bioregion, there a 9 soil types within the Project Area; Barralier, Bindook Road, Durran Durra, Gibraltar Rocks, Jaqua, Larkin, Marulan, Tarrawarra and Wollondilly River; and disturbances are associated with past agricultural activities.

The assessment predicted that:

- Stone artefacts and isolated scatter— had a high potential of occurring within low to moderate densities.
- PADs— have a high potential to occur within the side slopes, terraces and flats of undulating open landscapes associated with perennial drainage lines.
- Grinding Grooves— has moderate potential to occur where sandstone outcrops are present.
- Modified Trees — moderate potential to occur where remnant mature native trees are present.
- Art sites — Low potential to occur in ridgeline areas where favourable stone panels are present and protected from natural elements, however, may be impacted by natural erosion.

Although a site inspection was not undertaken, NGH determined that the Project Area has moderate to high potential and as a result, further investigations are required.

### CULTURAL HERITAGE ADVICE FOR SCOPING REPORT FOR 22492 — WATTLE CREEK ENERGY HUB SCOPING REPORT BY AUSTRAL, 2023

Austral was commissioned by Umwelt to complete a desktop scoping report for both Aboriginal and non-Aboriginal cultural heritage within the Project Area (Lot 3 DP1120270). As part of this assessment, an AHIMS search was conducted on 25 August 2023. This search identified that there were 68 sites within a 10 km search area, centred on the Project Area. Of these 68 sites, 19 sites were recorded within the Project Area, and an additional 4 were located within 100 m of the project boundary. The search results also showed that artefacts were the most common site feature, forming 88.24% (n=60) of the record with PADs the only other site type and forming 33.82% (n=23) of the record.

The scoping report also evaluated the environmental components of the Project Area, including ethnographic history, soils, hydrology, geology, landforms and disturbance. The information identified that there were 4 soil types, including Bunguno Tableland and Gorge, the Moss Vale Highlands, Robertsons Basalts and Wollondilly-Bindook Tablelands and Gorges is located close to a 6$^{th}$ order stream, the Wollondilly River and has several minor tributaries, in within the South Eastern Highlands Bioregion, has undulating hills, slopes and some river flats and has had historic land clearing and associated activity disturbances.

As a result of these findings, the desktop assessment concluded with the recommendation that additional assessments would be required as the Project Area was determined to have moderate to high potential for Aboriginal cultural heritage and that a Historical Heritage Assessment and Statement of Heritage Impact also be completed.

# 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 Project 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.
- Raw site types, raw material types and site densities and their relationship to salient environmental features.
- Information in ethnohistorical sources 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 indicate the lively site types that will be encountered during the archaeological survey and archaeological testing.

## 5.1. ANALYSIS OF KEY VARIABLES

An analysis of the initial 2022 AHIMS search (Client Service ID 717346) completed for this Project has identified several trends in Aboriginal site types within the region. These are discussed in the sections below. Commonly recorded site types in the wider region represent artefact (70.59%), artefact, PAD (17.65%), PAD (10.59%) and modified tree (1.17%). Please note that the above and below-mentioned analysis results from the AHIMS used to inform the predictive model excludes sites recorded during the survey and test excavation stages of this assessment.

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 20 km of the greater Project Area is included in Table 5.1.

**Table 5.1 Summary of sites recorded within a 20 km radius of the greater Project Area**

| Feature Type | Total | % |
|---|---|---|
| Artefact | 60 | 70.59 |
| Artefact; PAD | 15 | 17.65 |
| PAD | 9 | 10.59 |
| Modified Tree (carved or scarred) | 1 | 1.17 |
| TOTAL | **85** | **100%** |

### 5.1.1. SOIL LANDSCAPE

The majority of previously identified features within 20 km of the Project Area have been recorded within the Wollondilly - Bindook Tablelands and Gorges soil type (65%, n=65),

followed by the Bungonia Tableland and Gorge soil type (34%, n=34). Only a single artefact feature has been recorded within the Moss Vale Highlands soil type.

Artefact feature type is the only feature type identified across all three soil types, while PADs were identified within the Wollondilly - Bindook Tablelands and Gorges and Bungonia Tableland and Gorge soil type. A single modified tree was identified within the Wollondilly - Bindook Tablelands and Gorges soil type [Figure 5.1 and Figure 5.2].

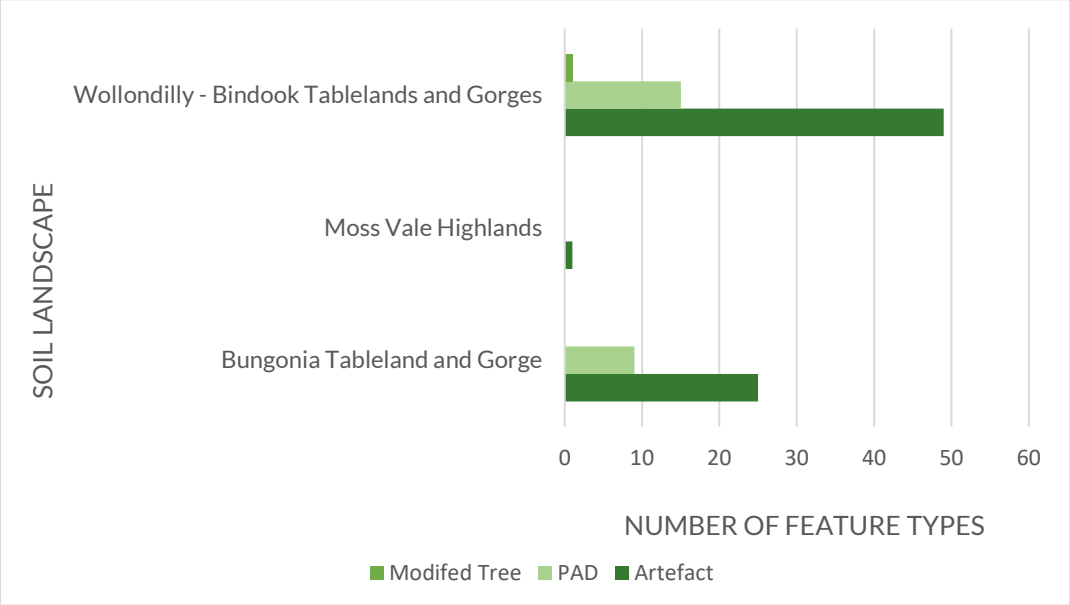



**Figure 5.1 Recorded feature type distribution by soil landscape.**

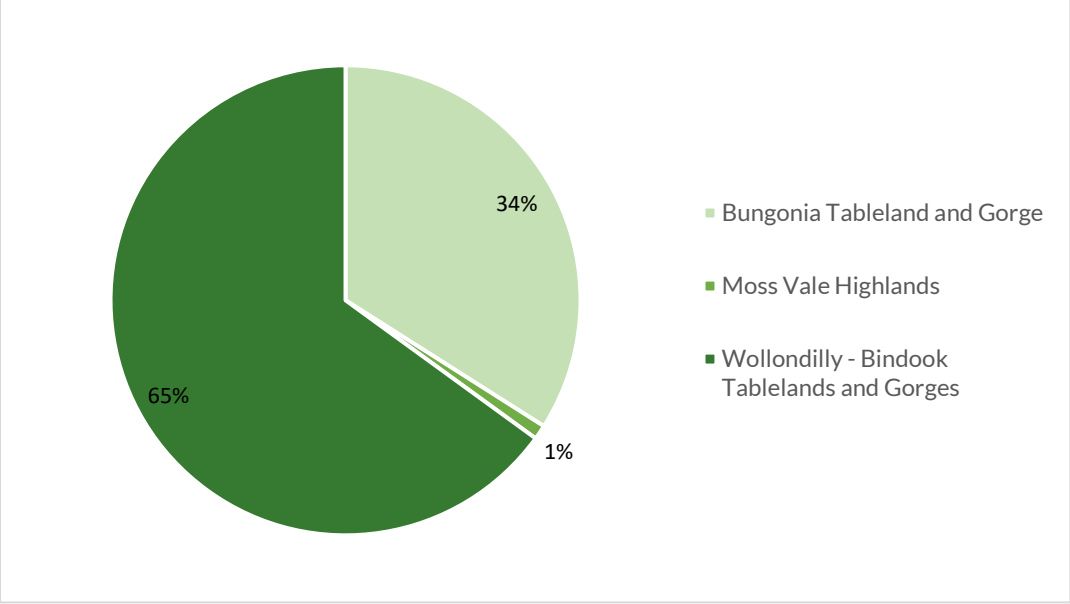



**Figure 5.2 Frequency of recorded feature type by soil landscape.**

### 5.1.2. GEOLOGY

Geological units determine the availability of raw lithic materials for artefact manufacture. As such, these contexts dictate the type, composition, and distribution of sites within a given landscape. The Project Area contains a variety of geological units with the majority of feature types identified within 20 km of the Project Area recorded within the Residual Deposits geological unit (38%, n=38), these included artefact (71.06%, n=27), PADs (26.31%, n=10) and a modified tree (2.63%, n=1). Eleven (11%) feature types were identified within the Ungrouped Cenozoic sedimentary geological units, which included artefacts (81.81%, n=9) and PADs (18.19%, n=2). Both Abercrombie Formation and Pleasant Hill Granite contained the same 10 features: artefact (80%, n=8 ea.) and PAD (20%, n=2 ea.). Feature types identified within the Arthursleigh Tonalite geological unit include artefacts (44.44%, n=4) and PADs (55.56%, n=5). Alluvium and Colluvial talus deposits geological units each contain the same 4 feature types which include 3 (75%) artefacts and a PAD (25%). Four (100%) artefact feature types were identified within the Johnniefields Granodiorite geological unit. Colluvium and Kerillon Tuff Member geological units each contained 3 artefact feature types. The Kerrawarra Dacite Member, sandstone facies contained a PAD and an artefact feature type. Berry Siltstone and Tallong Conglomerate each contained a single artefact feature type (Figure 5.3 and Figure 5.4).

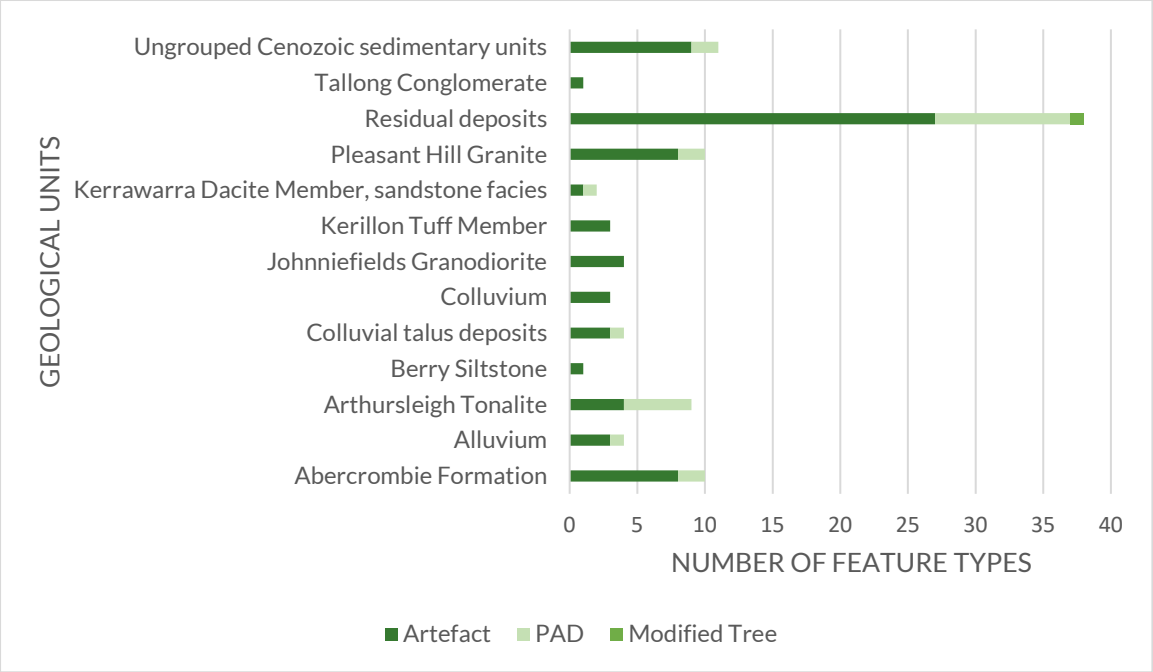



**Figure 5.3 Recorded feature types and distribution by geological unit**

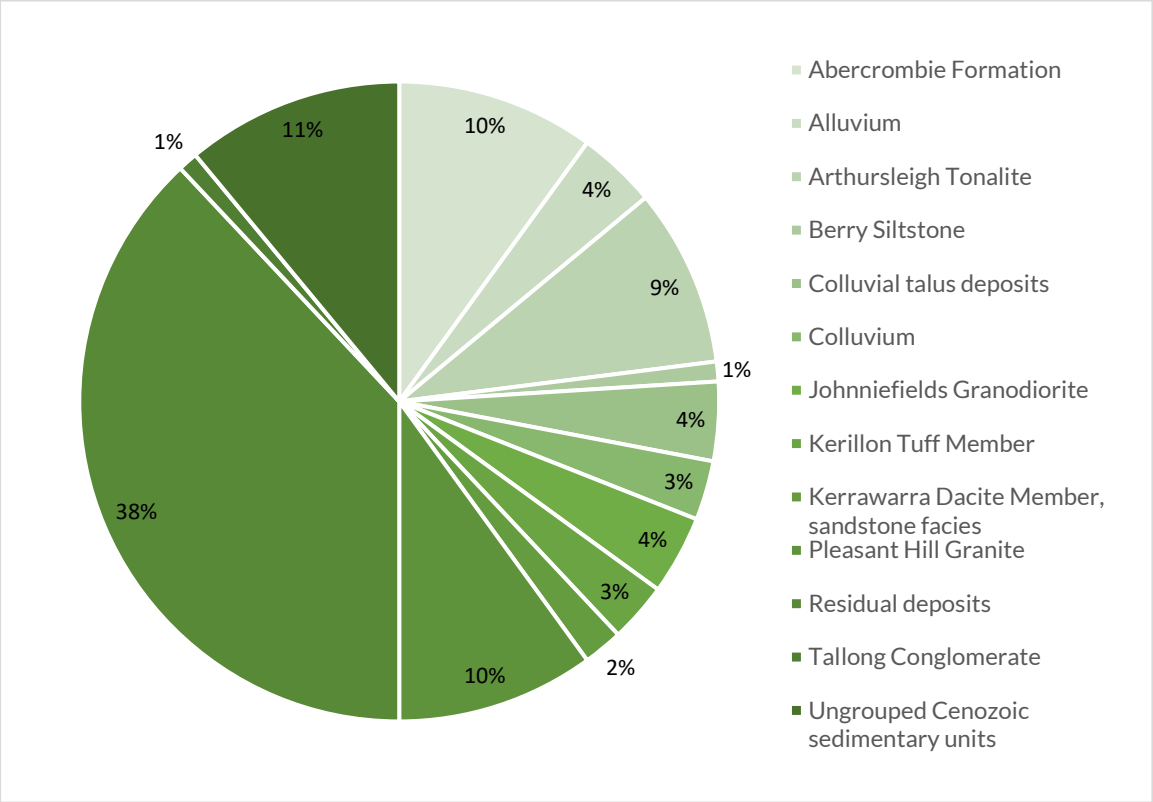



**Figure 5.4 Frequency of recorded feature types by geological unit**

### 5.1.3. HYDROLOGY

Proximity to water is a significant determinant of site location. This is due to the abundance of reliable natural resources and watercourses present for both areas of occupation and travel routes. *The Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Department of Environment, Climate Change and Water NSW 2010d) states that the archaeological sensitivity of an area increases within 200 m of a watercourse. Within the 20 km buffer zone, 100% (n=100) of the identified feature types were recorded within 200 m of a watercourse confirming the statement made in *The Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Department of Environment, Climate Change and Water NSW 2010d) [Figure 5.5].

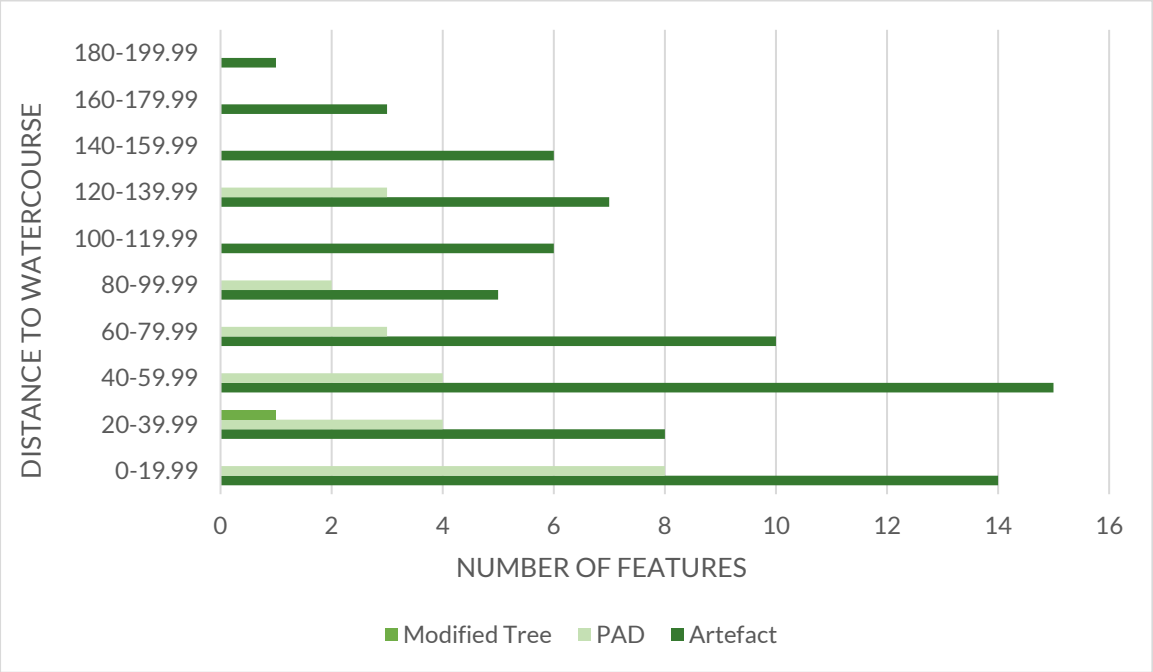
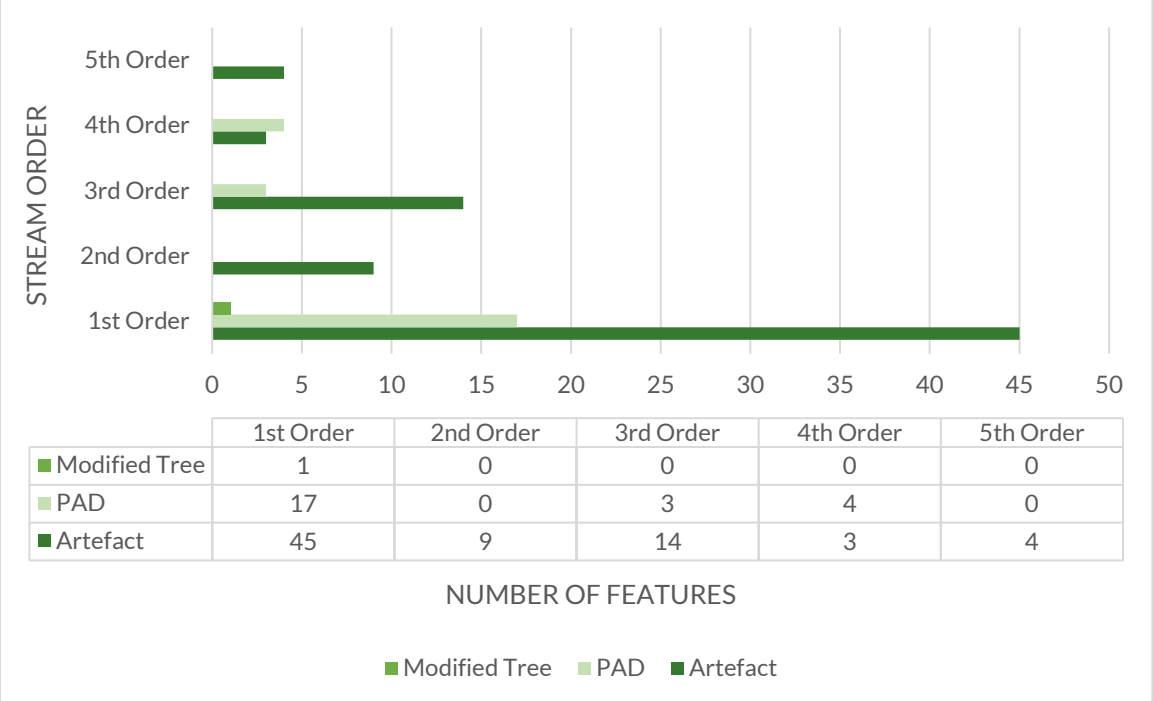



**Figure 5.5 Number of feature types by distance to a watercourse**

Further investigation showed that the highest number of recorded features (63%, n=63) are associated with 1st order streams followed by 3rd order streams (17%, n=17). Nine (9%) recorded features are associated with 2nd order streams, while 7 (7%) recorded features are associated with 4th order streams. Five (5%) of the recorded features were associated with 5th order streams. Whilst artefact feature types are associated across all stream orders the majority (60%, n=45) are associated with 1st order streams. PADs (70.84%, n=17) and modified trees (100%, n=1) are also more commonly associated with 1st order streams (Figure 5.6).




| | 1st Order | 2nd Order | 3rd Order | 4th Order | 5th Order |
|---|---|---|---|---|---|
| Modified Tree | 1 | 0 | 0 | 0 | 0 |
| PAD | 17 | 0 | 3 | 4 | 0 |
| Artefact | 45 | 9 | 14 | 3 | 4 |

**Figure 5.6 Number of feature types in relation to stream order**

### 5.1.4. TOPOGRAPHY

An analysis of the distribution of local sites in comparison to terrain has been undertaken using a spatial tool that classifies landforms using a range of parameters including slope, elevation and form (Jasiewicz and Stepinski 2013; Stepinski and Jasiewicz 2011). An overview of the landform classifications used by the algorithm is detailed in Figure 5.7.

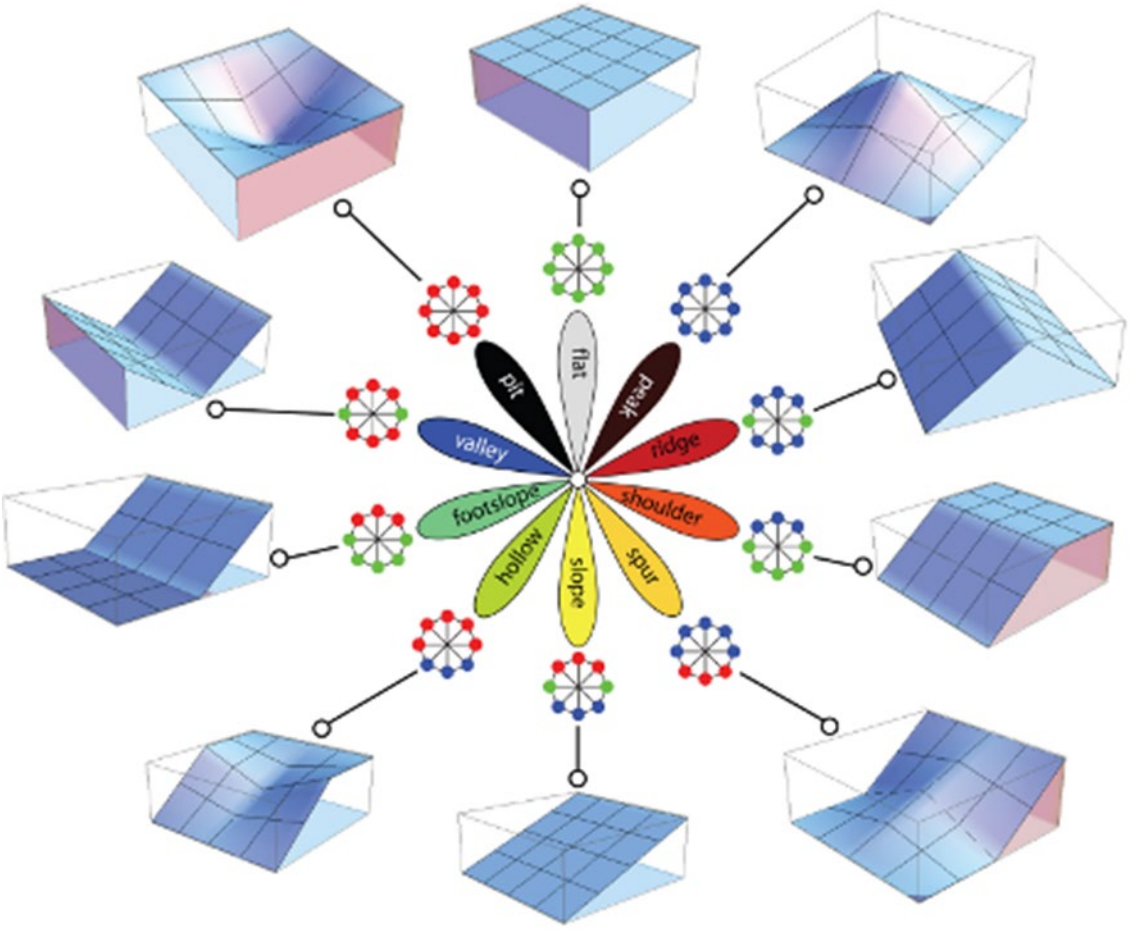



**Figure 5.7 Examples of landform definitions by geomorphons**

Based on these landform definitions, the majority of recorded features within the 20 km buffer zone are within a flat landform (64%, n=64), followed by footslope (18%, n=18), shoulder (8%, n=8), valley (7%, n=7), ridge (2%, n=2) and slope (1%, n=1). Artefacts (68%, n=51), PADs (50%, n=12) and modified trees (100%, n=1) features were more likely to be identified in a flat landform. However, artefact feature types were identified across all identified landforms in various degrees (Figure 5.8). PADs were also recorded in footslope (20.83%, n=5), ridge (4.17%, n=1), shoulder (8.34%, n=2) and valley (16.66%, n=4) landforms (Figure 5.8).

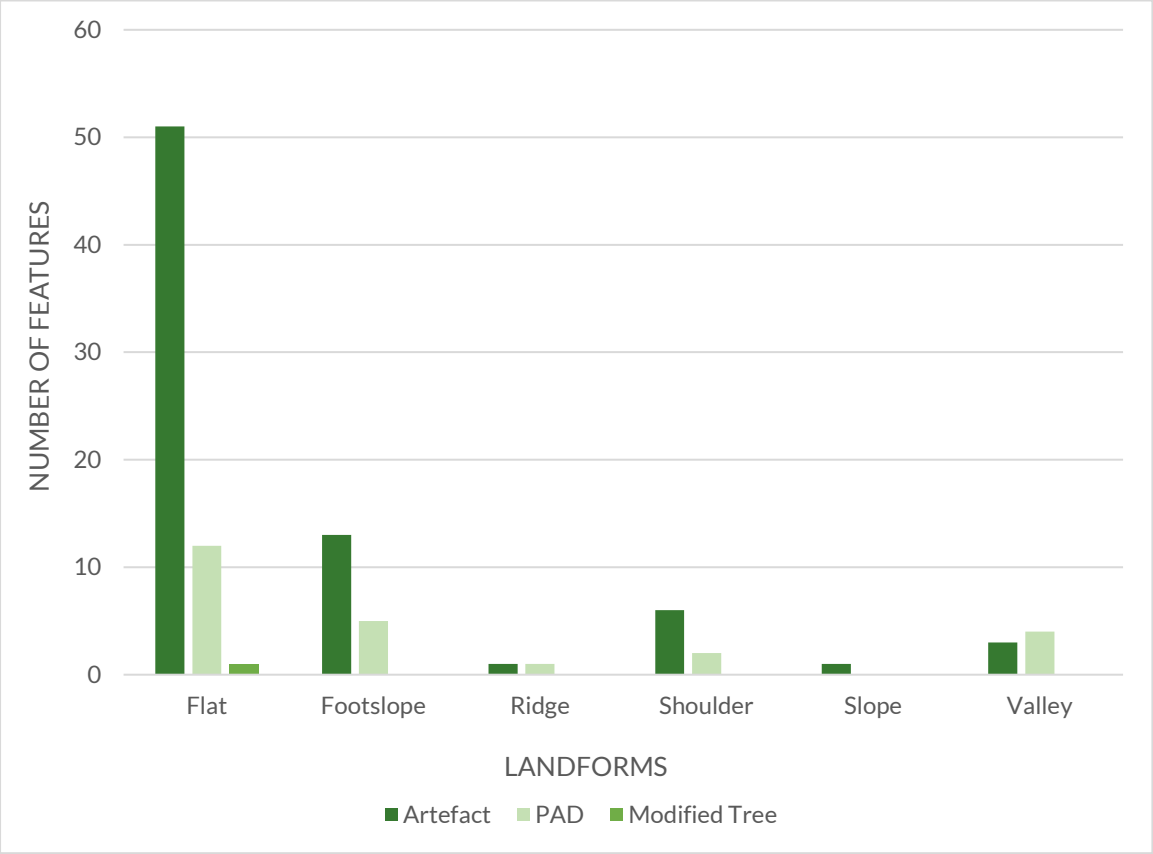



**Figure 5.8 Number of feature types by landform**

### 5.1.5. ANALYSIS OF THE KNOWN SITES IN THE LOCALITY

To provide a detailed breakdown of the anticipated density and composition of lithic assemblages, Austral has undertaken an analysis of sites in proximity to the Project Area. No excavation data was available for analysis, for this reason, a convenience sample was formulated from the available AHIMS data. A total of 26 sites were identified from 2 survey programs, the proposed transmission line from Taralga to Marulan, NSW, conducted by OzArk (2005) and the Kerrawary power station project, Big Hill, NSW, conducted by Navin Officer (2012). These sites are summarised in Table 5.2 and Table 5.3.

**Table 5.2 Composition of local lithic assemblages (OzArk, 2005)**

| Site name | Site type | Number of Artefacts |
|---|---|---|
| TME-IF 1 | Isolated | 1 |
| TME-OS1 | Scatter & PAD | <100 / 13 Recorded |
| TME-OS2 | Scatter & PAD | 13 |
| TME-OS3 | Scatter & PAD | 9 |
| TME-OS5 | Scatter | 5 |
| TME-OS6 | Scatter | <50 / 30 Recorded |

**Table 5.3 Composition of local lithic assemblages (Navin Officer, 2012)**

| Site name | Site type | Number of Artefacts |
|---|---|---|
| KA1 | Scatter & PAD | 8 |
| KA2 | Isolated & PAD | 1 |
| KA3 | Scatter & PAD | 12 |
| KA4 | Scatter & PAD | 20 / 11 Recorded |
| KA5 | Scatter & PAD | 3 |
| KA6 | Scatter | 2 |
| KA7 | Scatter & PAD | <50 / 10 Recorded |
| KA8 | Scatter & PAD | 4 |
| KA9 | Scatter & PAD | 10 |
| KA10 | Scatter | 7 |
| KA11 | Scatter & PAD | 6 |
| KA12 | Isolated | 1 |
| KA13 | Scatter & PAD | 30 / 17 Recorded |
| KA14 | Scatter & PAD | 20 / 10 Recorded |
| KA15 | Scatter & PAD | 7 |
| KA16 | Scatter & PAD | 5 |
| KA17 | Scatter & PAD | 7 |
| KA18 | Scatter & PAD | 30 / 10 Recorded |
| KA19 | Scatter | 3 |

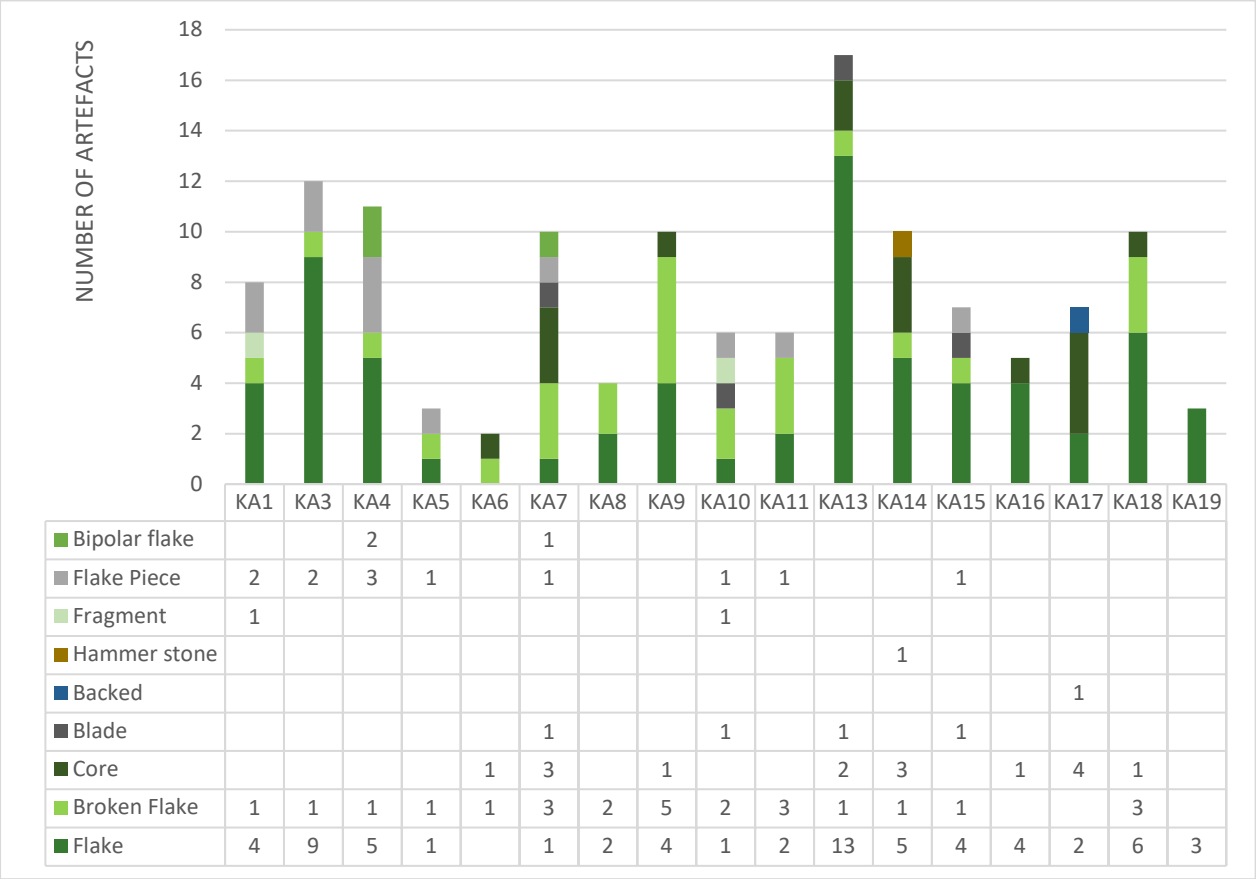
Broken flakes were the most common artefact identified across all sites recorded by OzArk (2005) [n=32], followed by flakes (n=24). Cores (n=8) were identified in 4 of the 5 sites recorded while microliths were less common with a total of three identified across two sites. A single grinding dish, Bondi point and piece of debitage were identified in three separate sites (Table 5.4).

**Table 5.4 Artefact types by site from the OzArk assemblage**

| Artefact Type | Site Name | | | | | Total |
|---|---|---|---|---|---|---|
| | TME-OS1 | TME-OS2 | TME-OS3 | TME-OS5 | TME-OS6 | |
| Flake | 3 | 6 | 1 | 1 | 13 | 24 |
| Broken Flake | 4 | 4 | 6 | 3 | 15 | 32 |
| Core | 4 | - | 2 | 1 | 1 | 8 |
| Bondi Point | 1 | - | - | - | - | 1 |
| Debitage | 1 | - | - | - | - | 1 |

| Artefact Type | Site Name | | | | | Total |
|---|---|---|---|---|---|---|
| | TME-OS1 | TME-OS2 | TME-OS3 | TME-OS5 | TME-OS6 | |
| Microlith | - | 2 | - | - | 1 | 3 |
| Grinding Dish | - | 1 | - | - | - | 1 |

Flakes, three of which were bipolar, were the most common artefact identified across all sites recorded by Navin Officer (2012) [n=69) with KA6 being the only site with no recorded flakes. Broken flakes, 2 of which are fragments, (n=28) are the next most common artefact type with 15 of the 17 recorded artefact sites containing broken flakes. Eight of the recorded 17 artefact sites contain cores in varying numbers. Flake pieces were identified in 8 of the recorded sites, while only a total of 4 blades were identified in 4 separate sites. A single backed artefact and hammer stone were also recorded in 2 separate sites (Figure 5.9).




| | KA1 | KA3 | KA4 | KA5 | KA6 | KA7 | KA8 | KA9 | KA10 | KA11 | KA13 | KA14 | KA15 | KA16 | KA17 | KA18 | KA19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bipolar flake | | | 2 | | | 1 | | | | | | | | | | | |
| Flake Piece | 2 | 2 | 3 | 1 | | 1 | | | 1 | 1 | | | 1 | | | | |
| Fragment | 1 | | | | | | | | 1 | | | | | | | | |
| Hammer stone | | | | | | | | | | | | 1 | | | | | |
| Backed | | | | | | | | | | | | | | | 1 | | |
| Blade | | | | | | 1 | | | 1 | | 1 | | 1 | | | | |
| Core | | | | | 1 | 3 | | 1 | | | 2 | 3 | | 1 | 4 | 1 | |
| Broken Flake | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 5 | 2 | 3 | 1 | 1 | 1 | | | 3 | |
| Flake | 4 | 9 | 5 | 1 | | 1 | 2 | 4 | 1 | 2 | 13 | 5 | 4 | 4 | 2 | 6 | 3 |

**Figure 5.9 Artefact types from the Navin Officer assemblage**

Flakes and broken flakes were the most common artefact type across both assemblages, cores were also well represented across both assemblages. However, when it comes to specialist tools the assemblages differ, with the OzArk assemblage containing a Bondi point, microliths and a grinding dish, and the Navin Officer's assemblage containing, a backed artefact, hammerstone and bipolar flakes. The Navin Officer's assemblage contains blades whilst the OzArk assemblage does not (Figure 5.10).

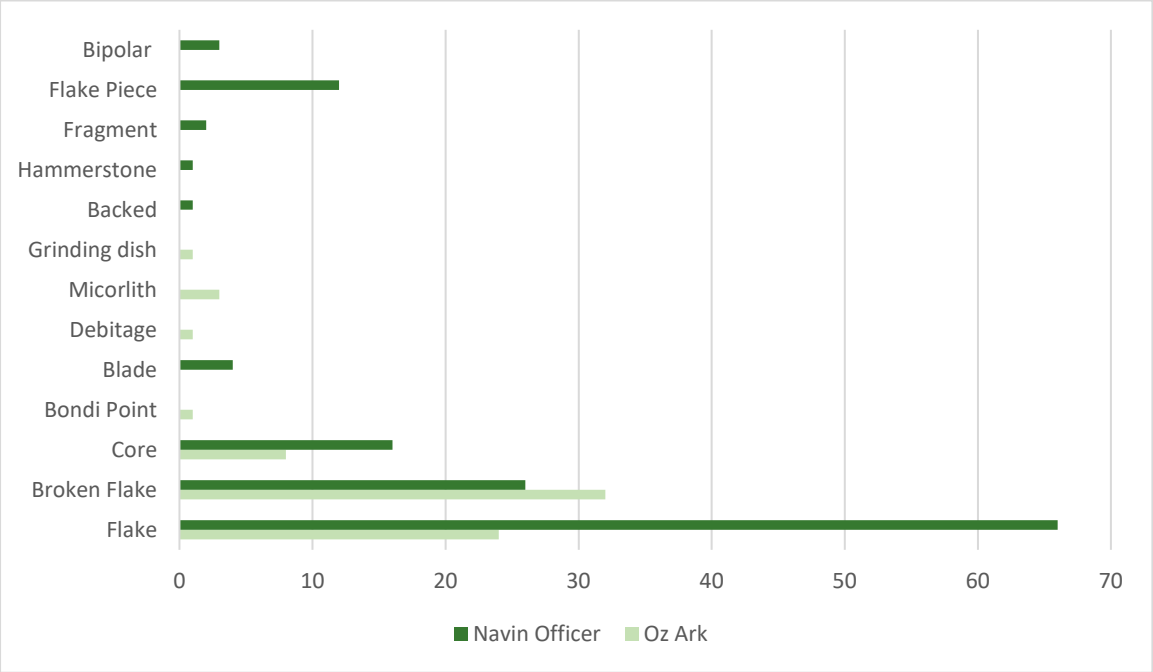


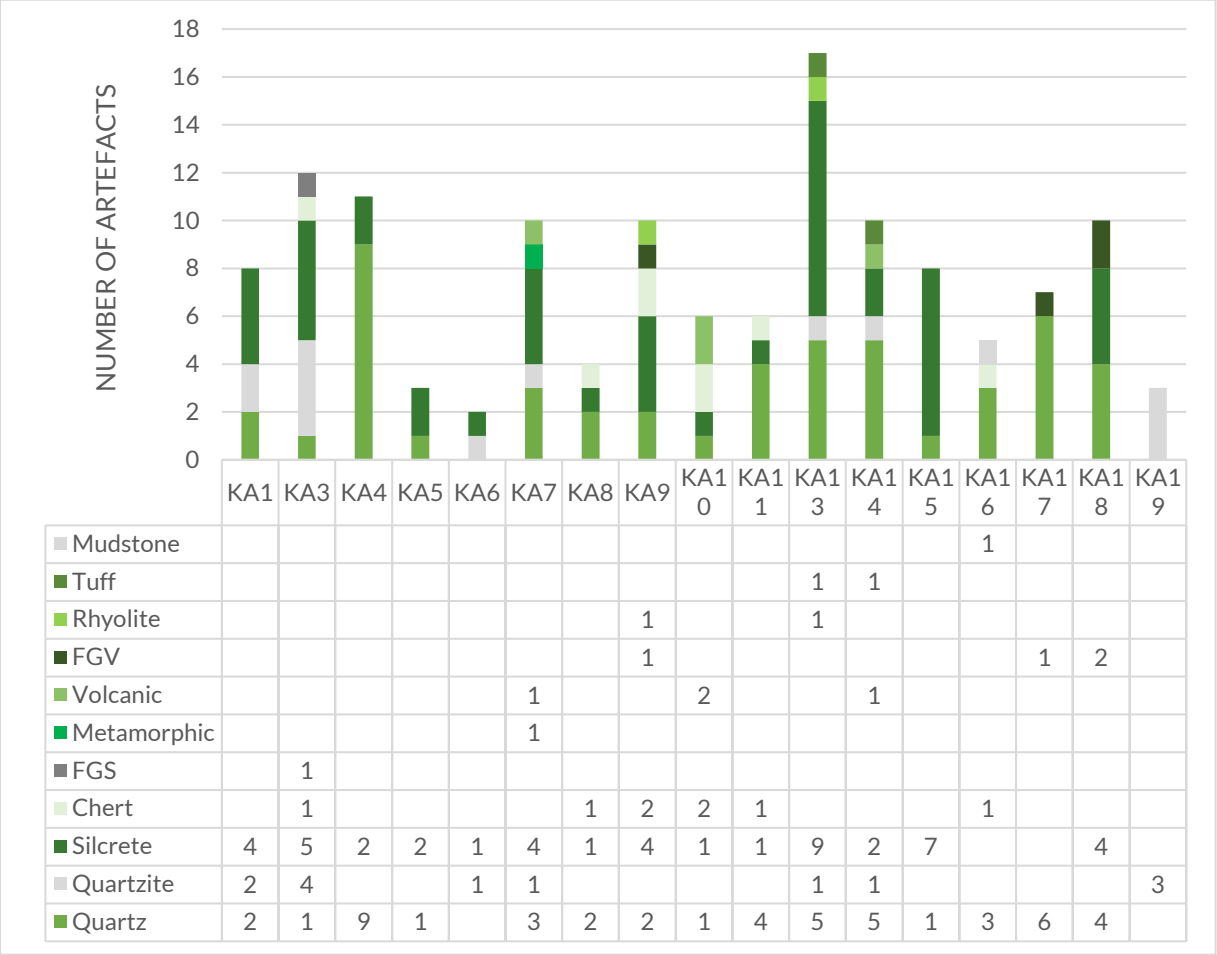

**Figure 5.10 Artefact types combined OzArk and Navin Officer assemblages**

The most common raw material type in the OzArk assemblage is silcrete (n=27), followed closely by quartz (n=25). Five recorded artefacts were made on chert, while FGS, greywacke and hornfels were represented by 3 artefacts each. The least common raw material in the OzArk assemblage was rhyolite with a single artefact recorded comprising this material (Table 5.5).

**Table 5.5 Raw material types from the OzArk assemblage**

| Raw Material | Site Name | | | | | Total |
|---|---|---|---|---|---|---|
| | TME-OS1 | TME-OS2 | TME-OS3 | TME-OS5 | TME-OS6 | |
| Quartz | - | 6 | 2 | 2 | 15 | 25 |
| Quartzite | - | - | - | - | 1 | 1 |
| Silcrete | 5 | 6 | 6 | 3 | 7 | 27 |
| Chert | 4 | - | - | - | 1 | 5 |
| FGS | - | - | - | - | 3 | 3 |
| Rhyolite | 1 | - | - | - | - | 1 |
| Tuff | - | - | 1 | - | 1 | 2 |
| Greywacke | 3 | - | - | - | - | 3 |
| Hornfels | - | 1 | - | - | 2 | 3 |

The most common raw materials in the Navin Office assemblage are quartz (n=49) and silcrete (n=17), followed by quartzite (n=13). Eight artefacts were made on chert, while both volcanic and FGV were each represented by 4 artefacts. The assemblage also contained 2 rhyolite and 2 tuff artefacts and 1 artefact each of FGS, metamorphic and mudstone (Figure 5.11).




| | KA1 | KA3 | KA4 | KA5 | KA6 | KA7 | KA8 | KA9 | KA10 | KA11 | KA13 | KA14 | KA15 | KA16 | KA17 | KA18 | KA19 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mudstone | | | | | | | | | | | | | | 1 | | | |
| Tuff | | | | | | | | | | | 1 | 1 | | | | | |
| Rhyolite | | | | | | | | 1 | | | 1 | | | | | | |
| FGV | | | | | | | | 1 | | | | | | | 1 | 2 | |
| Volcanic | | | | | | 1 | | | 2 | | | 1 | | | | | |
| Metamorphic | | | | | | 1 | | | | | | | | | | | |
| FGS | | 1 | | | | | | | | | | | | | | | |
| Chert | | 1 | | | | | 1 | 2 | 2 | 1 | | | | 1 | | | |
| Silcrete | 4 | 5 | 2 | 2 | 1 | 4 | 1 | 4 | 1 | 1 | 9 | 2 | 7 | | | 4 | |
| Quartzite | 2 | 4 | | | 1 | 1 | | | | | 1 | 1 | | | | | 3 |
| Quartz | 2 | 1 | 9 | 1 | | 3 | 2 | 2 | 1 | 4 | 5 | 5 | 1 | 3 | 6 | 4 | |

**Figure 5.11 Raw material types from Navin Officer assemblage**

Quartz and silcrete are the dominant raw material types across both assemblages. Both assemblages also have quartzite, chert, FGS, rhyolite and tuff artefacts in common, however, these raw material types are limited in the assemblages. Both assemblages contain raw materials that the other does not, such as hornfels and greywacke within the OzArk assemblage is not present in the Navin assemblage, as volcanic, metamorphic, mudstone and FGV within the Navin assemblage are not present within the OzArk assemblage (Figure 5.12).

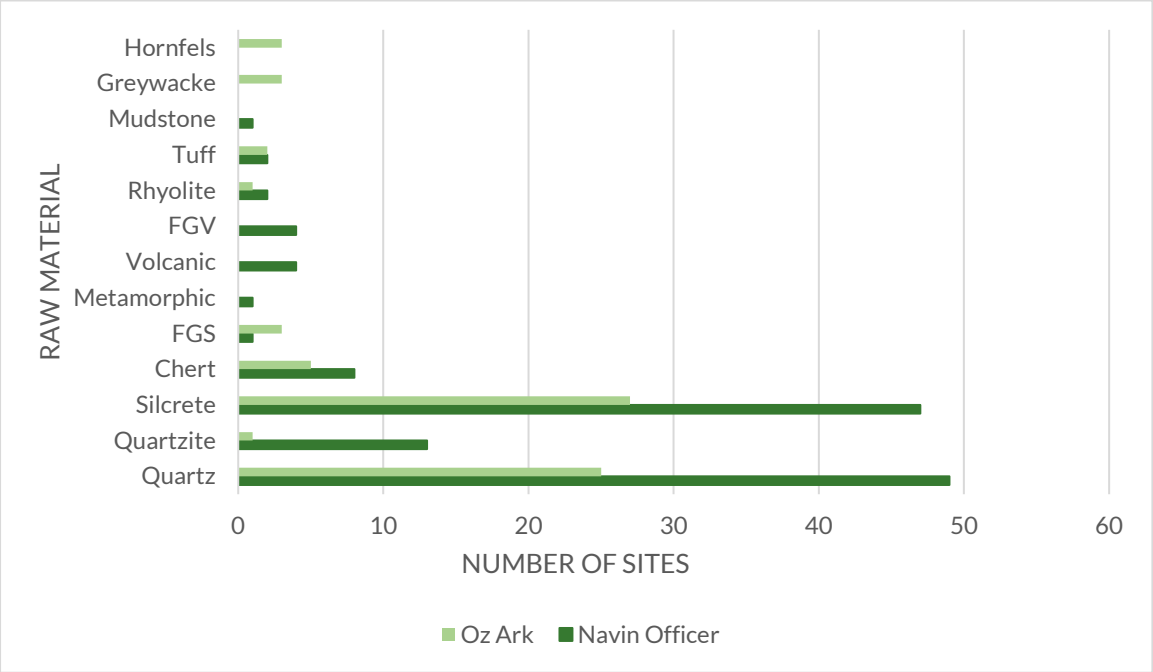



**Figure 5.12 Raw material types from locally excavated assemblages**

## 5.2. PREDICTIVE STATEMENTS

Based on the analysis presented in Section 5.1, the following predictive statements can be made:

- Isolated artefacts and artefact scatters (70.59%) are the most common site types in the region. Artefact and PAD sites also occur but less frequently (17.65%).
- PADs (not associated with other site types) and modified trees also occur, but far less frequently in areas with residual soils and remnant old growth forest.
- All recorded sites within a 20 km search radius of the Project Area are located within 200 m of a stream. Sites are commonly located adjacent to 1st and 3rd order streams (63% and 17%, respectively).
- Whilst sites may be located in a variety of landform contexts, most sites, (64%), specifically artefact and PAD sites, are located within "flat" (68%) or "footslope" 18%) landform units.
- Sites in the region most commonly occur in the Wollondilly – Bindook Tablelands and Gorges soil landscape (65%). Approximately one-third of sites occur in the Bungonia Tableland and Gorge soil type (34%).
- All regionally common site types are associated with residual deposits. Both artefact sites and PADs occur in Ungrouped Cenozoic sedimentary units, the Abercrombie formation, Pleasant Hill Granite and Arthursleigh Tonalite.
- Quartz and silcrete are the most common raw materials in the region, with quartzite, chert, FGS, rhyolite and tuff appearing in lower quantities. These are likely to be sourced from locally-present alluvial cobbles and quartz outcrops.
- Broken flakes and flakes are the dominant artefact type in the region. Cores and formal tools are found in low numbers in lithics assemblages.

When this information is considered in tandem with the results of other archaeological investigations in the local area (refer Section 4.2.3), the following general predictive statements can be made:

- Isolated artefacts may occur anywhere within the landscape.
- Areas of high fluvial activity, such as those associated with the banks and lower terraces of the Wollondilly River, are likely to have low archaeological potential.
- Artefact and PAD sites are more likely to occur within 50 m of 1st order streams and headwaters, especially on landforms such as low gradient spur crests, alluvial flats, locally elevated basal slopes and creek margins not subject to high fluvial activity.
- Higher density artefact scatters (<50), PADs and more intense areas of occupation may be found on elevated flats, footslopes, and low gradient spur crests above creek lines in areas of fine-grained sediments not subject to high fluvial activity.
- Ridgetop locations and steep slopes between drainage lines are likely to possess very low archaeological potential.
- Sites generally occur within 200 m of water sources, particularly near creek junctions. Junctions between higher order-streams on suitable landforms may be associated with higher lithic densities.
- Lithics assemblages are likely to be dominated by quartz and silcrete, with lower numbers of quartzite and chert present.
- In areas where alluvial cobbles and quartz outcrops are present, lithic assemblages will contain higher percentages of cortex. Silcrete, chert and other artefacts sourced from non-local materials will exhibit tertiary reduction and little cortex.

# 6. FIELD METHODS

A site-specific investigation methodology has been developed for the project that complies with the Requirements of the Code of Practice (Department of Environment, Climate Change and Water NSW 2010b).

## 6.1. SURVEY METHODOLOGY

The survey was conducted between 22-25 January 2024 by Dr Amanda Markham (Principal Archaeologist/Team Leader West, Austral) with assistance from Felicity Smolenaers (Graduate Archaeologist, Austral), Ashleigh Croker (Pejar LALC), Chris McCalister (Pejar LALC), Sonione Rogers (Sonione), Byamee Williams (Sonione), Darnell Coe (Sonione) and Daniel Leahy (Spark). A supplementary survey in Survey Area 9 was conducted on 10 April 2024 by Dr Amanda Markham (Principal Archaeologist/Team Leader West, Austral) with assistance from Madeleine Firth (Archaeologist, Austral), Ashleigh Croker (Pejar LALC), Chris McCalister (Pejar LALC).

### 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 target areas of moderate and higher archaeological sensitivity where materials may be present and visible, as well as undertake sample surveys of the broader archaeological potential of all landform elements present within the Project Area, which included:

- Undisturbed creek and river flats.
- Elevated flats and crests near the junction of permanent and semi-permanent water courses.
- Undulating hills and slopes possess residual, colluvial, and alluvial soils.
- Sandstone escarpments and ridgelines where grinding grooves and rock shelters may be present.
- Areas of native woodland where culturally modified (scar) trees may be present.

The specific survey methodology developed for this assessment was guided by the survey requirements as set out in Requirements 5 to 10 of the Code of Practice (Department of Environment, Climate Change and Water NSW 2010b) and based upon consideration of the overall landform pattern within the Project Area, known landform elements (after Speight 2009) and the location of the previously identified sites. The Project Area was divided into 9 survey units, and the survey targeted sensitive landforms within this area subject to impacts from the proposed works, as well as those identified in the predictive model set out in Section 5 as possessing moderate or high archaeological potential. Areas within 50 m of water courses and within 100 m of the Wollondilly River were initially surveyed but were later excluded from the development footprint. The exceptions to this comprise:

- An access track across the Wollondilly River is located in Survey Unit 2 and Survey Unit 5, which will be used during the construction and maintenance of the Project.

- The main property access track located in Survey Unit 8 (north-western extent of the Project Area) that crosses two branches of the semi-permanent Sandy Creek.
- A section of Canyonleigh Road outside the property where shoulder widening for the Project will be required.

Both main access tracks were surveyed in the field and are included in the results in Section 7. The survey units within the Project Area are shown in Figure 6.1.

Additional surveys were conducted in June and November of 2025 to address design changes to the development footprint and the addition of 8 passing bays located along Canyonleigh Road. The results of these surveys are included in Section 7.

### 6.1.3. SURVEY METHODS

The archaeological survey consisted of pedestrian traverses completed by 6 team members, while the supplementary survey conducted on 10 April 2024 comprised 4 team members. A key survey variable is ground visibility, which considers the amount of ground surface that 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 Project Area and within each landform element. Overall survey coverage and calculated survey effectiveness were recorded. Note that the effectiveness of the field survey was largely dependent on the degree of ground surface visibility (GSV). 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 Project 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.

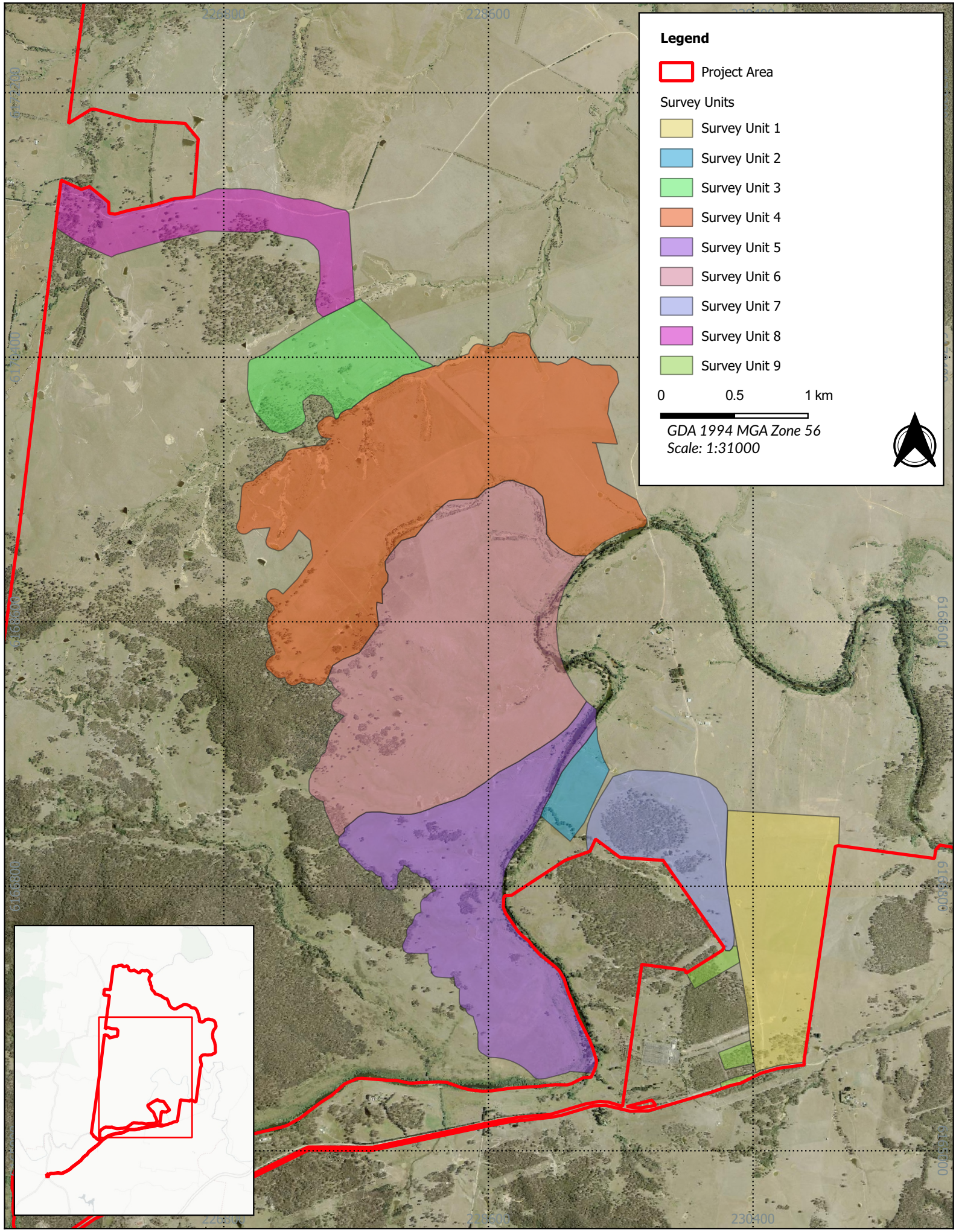



**Figure 6.1 - Survey units within the project area**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, CartoDB Positron* *Drawn by: PB* *Date: 2026-01-30*

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## 6.2. TEST EXCAVATION METHODOLOGY

The test excavation was conducted across three separate field visits due to poor weather conditions halting work. The first excavation took place between 4 April 2024 and 10 April 2024 by Dr Amanda Markham (Principal archaeologist and team leader, Austral) with assistance from Madelaine Firth (Archaeologist, Austral), Zoe Bosevski (Graduate Archaeologist, Austral), Ashleigh Croker (Pejar LALC), Chris McCalister (Pejar LALC), Sonione Rogers (Sonione), Mark Connors (Sonione) and Lachlan Coe (Sonione).

The second excavation took place between 29 April 2024 and 8 May 2024 with Dr Amanda Markham (Principal Archaeologist and team leader, Austral) with assistance from Madelaine Firth (Archaeologist, Austral), Zoe Bosevski (Graduate Archaeologist, Austral), Crystal Wooding (Archaeologist, Austral), Zoe Mavrogenes (student Archaeologist, Austral), Daniel Leahy (Spark), Delise Freeman (Pejar LALC), Ashleigh Croker (Pejar LALC), Chris McCalister (Pejar LALC), Sonione Rogers (Sonione), and Jermaine Williams (Sonione).

The third and final excavation took place between 24 June 2024 and 28 June 2024 with Crystal Wooding (Archaeologist, Austral), Zoe Bosevski (Graduate Archaeologist, Austral), Jordon Coltman (Graduate Archaeologist, Austral), Ashleigh Croker (Pejar LALC), Aryssa McAlister (Pejar LALC), Rodney Seymour (Pejar LALC), Lawrance Seymour (Pejar LALC), Chris McCalister (Pejar LALC), Sonione Rogers (Sonione), and Jermine Williams (Sonione).

The test excavations were completed in accordance with the notification and sampling strategy that was initially submitted to Heritage NSW on 21 March 2024. A copy of this notification is included in Volume 2.

### 6.2.1. TEST EXCAVATION OBJECTIVES

Test excavation areas were selected on a systematic assessment of archaeological potential derived from the results of:

- Previous archaeological studies undertaken in the Goulburn and Marulan regions, especially Fuller (1989), Brayshaw & Dallas (1993) and OzArk (2005).
- AHIMS site patterning within a 20 km radius
- The predictive model developed in Section 5.2.
- The results of the January 2023 survey.
- The project disturbance footprint.

Together, these datasets enabled a structured identification of zones of *high*, *moderate*, and *low* archaeological potential within the Solar Development Footprint.

Following previous archaeological investigations, the predictive model and the survey results, areas of high archaeological potential were identified by the presence of elevated flats or terraces, or by the presence of surface artefacts located within 200 m of the Wollondilly River, its tributaries and other watercourses. These criteria reflect regional AHIMS patterning showing that 100% of sites recorded within 20 km occur within 200 m of watercourses, and that 64% of previously recorded sites occur on flat landforms.

Moderate archaeological potential was assigned to elevated flats or terraces located between the intersections of tributaries to the Wollondilly River, including areas within SU5 and SU6. Surface artefacts were not necessarily present within these locations; however, the landform characteristics suggested

potential campsites for Aboriginal people based upon previous regional models of occupation and site patterning (Fuller 1989; Brayshaw & Dallas, 1993; McDonald 1997; OzArk 2005).

Areas of low archaeological potential were excluded from testing based on the following criteria:

- Areas of steep slope were unsuitable for habitation.
- Areas of moderate to steep slopes that had been subject to extensive agricultural disturbance, such as clearing, discing, ripping and tilling. A large portion of the study area has been subject to these agricultural activities; for example, Figure 3.5 shows the extent of natural vegetation clearing in 1961. The impact of this, as noted by previous archaeological investigations, is that the A horizon of soils has been significantly eroded or disturbed (OzArk 2005, p.17).
- Erosional landforms with limited soil accumulation (including active watercourse banks); eroded or truncated soil profiles on slopes
- Areas on ridgelines with the absence of raw materials suitable for lithic manufacture.
- Locations beyond 200 m of watercourses where unsuitable landform, or disturbance, and AHIMS site patterning suggested low potential for Aboriginal sites to occur on steep slopes, ridges, and crests.

Test pits were placed in areas of high and moderate potential to determine the presence, density, and vertical distribution of subsurface artefacts. The rationale for each test location is now explicitly linked to the potential classification described above.

The boundaries of high and moderate potential areas were defined using watercourse buffers, landform classification (flat, terrace, footslope), surface artefact presence, and disturbance mapping. This approach is consistent with Requirements 3, 6 and 7 of the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW.

### 6.2.2. TEST EXCAVATION METHODOLOGY

The test excavation programme was undertaken according to the prescribed methodology of Requirements 14 to 20 and 23 to 26 of the Code of Practice (Department of Environment, Climate Change and Water NSW 2010b). 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 (Department of Environment, Climate Change and Water NSW 2010b: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 m apart.

Each test pit was excavated following Requirement 16a of the Code of Practice using mattocks, shovels and trowels (Department of Environment, Climate Change and Water NSW 2010b:26). Sample units measured 500 $mm^2$, with the first test pit excavated in 50-mm spits to act as a geomorphologic example and the remaining test pits were excavated in 100-mm spits. Excavation was undertaken until the B-horizon was reached and then continued for another 100 mm to confirm that the following spit was culturally sterile. In general, the decision to stop excavating was made, when the top of the C horizon; when a higher percentage of clay was evident or when coffee rock was encountered. The location of the test pits within the Project Area is shown in Figure 6.3.

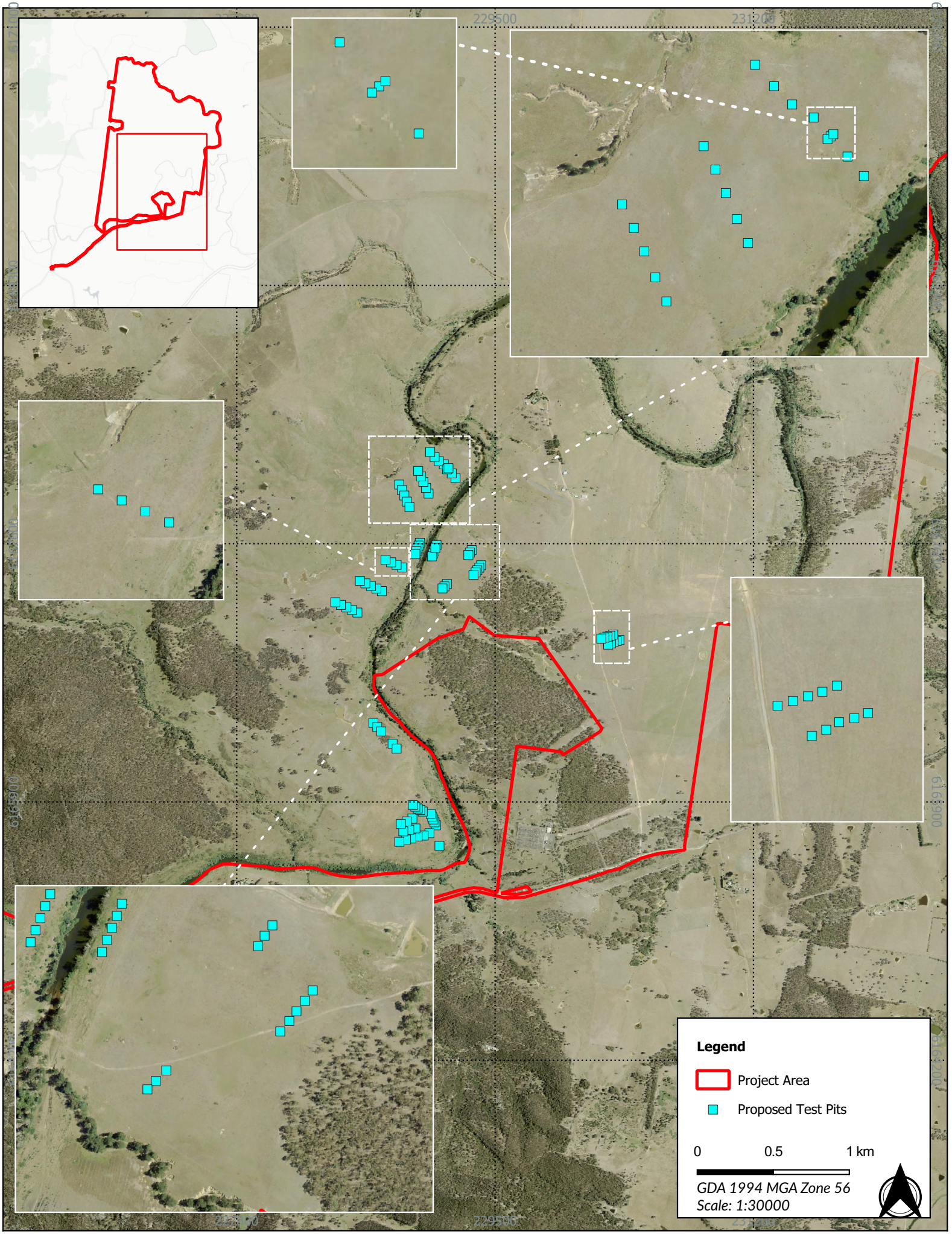



**Figure 6.2 - Location of test pits within the project area**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, CartoDB Positron*

*Drawn by: PB Date: 2026-01-30*

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### 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-mm and 3-mm nested sieve or solely through a 3-mm 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 the 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 Dr Amanda Markham, Principal Archaeologist (Austral). The lithics 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 inform depositional integrity. All of the artefacts recovered were taken to temporary storage at the Austral Archaeology office in Yallah (NSW) and are to be reburied within the Project 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 development footprint. Due to the large size, proposed works and terrain, the development footprint was divided into 8 survey units, which focused on landforms. Following a general summary of the conditions observed during the field survey in Section 7.1 below, the results of the field survey in each survey unit are presented separately in sections 7.1.3 to 7.1.11.

## 7.1. ARCHAEOLOGICAL SURVEY RESULTS

### 7.1.1. VISIBILITY

In most archaeological reports and guidelines, visibility refers to Ground Surface Visibility (GSV) and is usually a percentage estimate of the ground surface that is visible and allows for the detection of (usually stone) artefacts that may be present on the ground surface (Department of Environment, Climate Change and Water NSW 2010b). GSV within the Project Area was generally very low, averaging 0% to 10% due to extensive vegetation coverage. In approximately 80% of the Project Area, GSV was 0%. Higher GSV between 0%-10% was observed in areas of relict natural woodland. Very small portions of the Project Area are associated with minor water courses and water erosion had a high GSV of between 50% to 100%.

### 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 (Department of Environment, Climate Change and Water NSW 2010b). Exposures across the Project Area averaged around 5%-10%. Larger exposures within the Project Area comprised those associated with access tracks, earthworks around dams, levy banks and swales, as well as some areas of water erosion on slopes and in minor gullies. Other exposures were observed:

- Around the base of trees.
- Around wombat and rabbit burrows.
- At animal scours, dust baths and pads.
- Along fence lines and near gates.

### 7.1.3. SURVEY UNIT 1

Survey unit 1 (SU1) is located in the Project Area's south-eastern portion. SU1 comprises an undulating hill landform with a moderate north-west to south-east slope scoured with minor drainage lines leading into an unnamed watercourse. The watercourse joins the Wollondilly River approximately 1.6 km to the north-east, outside of the development footprint. Several dams are also present within SU1.

GSV within SU1 was generally low, ranging from 5%-10%, whilst exposures averaged 5% and were associated with water erosion, the base of trees and some rabbit and wombat burrows (Figure 7.1, Figure 7.2, Figure 7.3, Figure 7.5 and Figure 7.6). The dominant vegetation in SU1 consisted of open dry sclerophyll woodland on the mid and lower slopes nearer to the southern boundary of the development footprint, dense pasture grasses, serrated tussock, blackberries, and annual summer weeds such as Scotch Thistle, St John's Wort and sorrel. The northern portion of SU1 on the mid-slopes around the dams was completely covered in vegetation, resulting in 0% visibility except for the dam walls. The most significant existing disturbances in SU1 were from historic clearing of vegetation for grazing, high voltage

electricity power lines, fencing and access tracks, water erosion, animal burrows and pads (Figure 7.2, Figure 7.4 and Figure 7.6).



**Figure 7.1 Visibility in SU1, lower slope, view north-west.**



**Figure 7.2** Low visibility and disturbances in SU1, view north-east.



**Figure 7.3** Exposures from water erosion in the southern portion of SU1, view west.



**Figure 7.4** **Disturbance from an animal pad in SU1, view north.**



**Figure 7.5** **Low visibility on mid-slope in northern part of SU1, view north.**



**Figure 7.6** **Exposure from animal scours around the base of a box thorn tree in SU1, view north-east.**

The survey team conducted a total of 17 transects within SU1, inspecting the hill, crest, slope, and gully landforms within the unit, and targeting areas of exposure for Aboriginal cultural heritage material. A total of 4 new Aboriginal heritage sites were identified within SU1; Wattle Creek 3 (AHMS #52-4-0771) and Wattle Creek 4 (AHIMS # 52-4-0774). Wattle Creek 1 (AHIMS #52-4-0772), and Wattle Creek 2 (AHIMS #52-4-0773) were originally within SU 1, however, due to a change in the development footprint, they are now located outside of the survey unit and the development footprint.

Based on the landform characteristics and disturbances from agriculture within SU1, following the survey and testing, the unit was assessed as having low archaeological potential. The unit is dominated by moderate slopes, rolling hills, and hill crests with some areas of gentle slope in the southern portion near Canyonleigh Road. Erosion gullies were present in the far south-eastern corner of SU1, associated with an unnamed 1st order watercourse. Much of the area surveyed in SU1 was later excised from the proposed development, including the 1st order watercourse and erosion gullies in the south-east. One area of SU1, a ridge crest, was selected for testing. The results of the testing are described in section 7.4.1.

It should be noted that Wattle Creek PAD1 (AHIMS 52-4-0778) is located adjacent to SU1. This PAD was incorrectly registered on AHIMS following a misinterpretation of field notes and a change of project manager. This site card was updated to 'not a site' once this error was identified.

### 7.1.4. SURVEY UNIT 2

Survey Unit 2 (SU2) is located in the southern portion of the development footprint. SU2 comprises a river terrace and riverbank landform with lower moderate slopes running north-south adjacent to the Wollondilly River.

GSV within SU2 was generally low, ranging from 5%-10%, whilst exposures averaged 5% and were associated with water and gully erosion, and wombat burrows (Figure 7.7, Figure 7.8 and Figure 7.10). The dominant vegetation in SU2 consisted of dense Eucalypt, Casuarina and Acacia trees on the riverbank and river terrace in the western portion of SU2, this was accompanied by dense serrated tussock and blackberry bushes. The western portion of SU2 on the lower slopes also had very low GSV with scattered blackberry bushes and serrated tussock. The most significant existing disturbances in SU2 were from the instillation of a concrete spillway and associated earthworks on each side and the historic clearing of vegetation for grazing, fencing and access tracks, water erosion, and animal burrows, particularly in the western portion of SU2 (Figure 7.7, Figure 7.9, Figure 7.10, Figure 7.11 and Figure 7.12).



**Figure 7.7** Disturbance and exposure from wombat burrows in SU2, view east.



**Figure 7.8** Exposures from water erosion in the eastern portion of SU2.



**Figure 7.9** Low visibility on low-slope in the eastern portion of SU2.



**Figure 7.10** Disturbance from access track on river terrace and riverbank in SU2, view west.



**Figure 7.11 Low visibility and access on the riverbank from blackberry bushes in SU2, view north-east.**



**Figure 7.12 Concrete spillway and associated earthworks in SU2, view north-west.**

The survey team conducted a total of 5 transects within SU2, inspecting the riverbank, river terrace, and slope landforms within the unit, and targeting areas of exposure for Aboriginal cultural heritage material. No Aboriginal heritage sites were identified within SU2.

### 7.1.5. SURVEY UNIT 3

Survey unit 3 (SU3) is located in the north-western portion of the development footprint. SU3 comprises an undulating hill landform in a gully with a moderate to steep slope on a crest and gentle east to west slopes along the unnamed watercourse.

GSV within SU3 was generally low, ranging from 0%-60%, with the highest visibility in the cleared stock run only (Figure 7.13, Figure 7.14 and Figure 7.18). Exposures averaged 5%-10% and were associated with water erosion, the base of trees and some pig digging (Figure 7.13, Figure 7.15, Figure 7.16 and Figure 7.19). The dominant vegetation in SU3 consisted of open dry sclerophyll woodland along the north side of the gully that is associated with an unnamed watercourse, nearer to SU3's northern boundary. The remainder of SU3 consists of scattered eucalypt and acacia trees, grasses, annuals, and low shrubs. The most significant existing disturbances in SU3 were from the historic clearing of vegetation for stock movement, earthworks for the water levy and dam, fencing and access tracks, water erosion, animal burrowing and digging (Figure 7.13, Figure 7.14, Figure 7.19and Figure 7.20). Other portions of SU3 had been subject to widescale rotary tilling and extensive replanting of native tube stock.



**Figure 7.13 Disturbance and exposures from pigs in SU3, view west.**



**Figure 7.14** Exposure from water erosion on gully terrace in the eastern portion of SU3, view east.



**Figure 7.15** Exposure from water erosion on gully terrace in SU3, view south.



**Figure 7.16** Exposure under tree on the creek terrace in SU3, view west.



**Figure 7.17** Low visibility on the gully terrace in the eastern portion of SU3.



**Figure 7.18** Low visibility on the riverbank in SU3, view southwest.



**Figure 7.19** Exposures from water erosion in SU3.



**Figure 7.20 Exposure from stock paths in a stock corridor in SU3, view north-east.**

The survey team conducted a total of 2 transects within SU3, inspecting the hill, crest, slope and gully landforms within the unit, and targeting areas of exposure for Aboriginal cultural heritage material. A single new Aboriginal heritage site was originally identified within SU3; Wattle Creek 11 (AHIMS #52-4-0766), however, due to changes in the development footprint this site is now located outside the development footprint. This is discussed in detail in Section 7.5.5 below.

### 7.1.6. SURVEY UNIT 4

Survey unit 4 (SU4) is located in the central portion of the development footprint. SU4 comprises an undulating hill and crest landform with moderate to gentle south-west/north-east slopes scoured with minor drainage lines leading into unnamed watercourses. The drainage lines on the south of the SU lead from an unnamed watercourse into the Wollondilly River approximately 2 km away.

GSV within SU4 was generally low, ranging from 0%-5%, whilst exposures averaged 5% and were associated with water erosion channels and scours below dams (Figure 7.21, Figure 7.22, Figure 7.23 and Figure 7.24). The dominant vegetation in SU4 consisted of open dry and dense pasture grasses, serrated tussock and annual summer weeds such as Scotch Thistle, and sorrel. The northern portion of SU4 also consisted of replanted Acacias and Eucalypts; small numbers of these were present in the southern portion also. The most significant existing disturbances in SU4 were from tilling, levy banks, fencing and access tracks, water erosion and animal pads (Figure 7.23, Figure 7.24, Figure 7.26 and Figure 7.27). Other portions of SU3 had been subject to widescale rotary tilling and extensive replanting of native tube stock.



**Figure 7.21** Low GSV mid crest in SU4, view north-west.



**Figure 7.22** Low GSV with dense thistle and scrub cover in SU4, view north.



**Figure 7.23 Exposures from erosion gullies in SU4.**



**Figure 7.24 Exposure in erosion gully below levy bank in SU4.**



**Figure 7.25** Rocky outcrop mid slope on a crest in SU4, view northeast.



**Figure 7.26** Soil profile and erosion in a gully of SU4.



**Figure 7.27 Top of a crest with stock pad disturbance in SU4, view north-west.**

The survey team conducted a total of (9) transects within SU4, inspecting the hill, crest, and slope landforms within the unit, and targeting areas of exposure for Aboriginal cultural heritage material. A total of 1 new Aboriginal heritage site was identified within SU4; Wattle Creek 8 (AHIMS #52-4-0777), however, due to changes in the development footprint this site is now located outside the development footprint. This is discussed in detail in Section 7.5.5 below.

### 7.1.7. SURVEY UNIT 5

Survey unit 5 (SU5) is located in the southern portion of the development footprint. SU5 comprises an undulating hill and elevated flat landform with gentle east-west and west-east slopes towards the Wollondilly River. Several dams are also present within SU5.

GSV within SU5 was generally low, ranging from 5%-15%, whilst exposures averaged 5%-10% and were associated with water erosion, access tracks, scrapes near earth levies and some animal pads (Figure 7.28, Figure 7.30, Figure 7.31 and Figure 7.32). The dominant vegetation in SU5 consisted open grass cover with serrated tussock, and blackberries. Clusters of acacia and eucalypt woodland are scattered along the eastern boundary of SU5 on the river bench approximately 200 m from the Wollondilly River. The most significant existing disturbances in SU5 were from historic clearing of vegetation for grazing, fencing and access tracks, water erosion, levee banks and animal pads (Figure 7.29, Figure 7.30 and Figure 7.31).



**Figure 7.28** Low GSV in the southern portion of SU5, view north-west.



**Figure 7.29** Exposure from an animal pad in SU5, view north.



**Figure 7.30** Exposure and disturbance associated with levy bank construction in SU5, view west.



**Figure 7.31** Slope erosion exposure and disturbance in SU5, view west.



**Figure 7.32 Exposure on the rise in the western portion of SU5, view south.**

The survey team conducted a total of 8 transects within SU5, inspecting the hill, crest, slope and flat landforms within the unit, and targeting areas of exposure for Aboriginal cultural heritage material. No Aboriginal heritage sites were identified within the portion of SU5 that falls within the development footprint.

### 7.1.8. SURVEY UNIT 6

Survey unit 6 (SU6) is located in the central portion of the development footprint. SU6 comprises an undulating hill and crest landform with a moderate to gentle north-west/south-east slope scoured with minor drainage lines leading into the Wollondilly River. Several dams are also present within SU6.

GSV within SU6 was generally low, ranging from 0%-10%, whilst exposures averaged 5% and were associated with animal pads, access tracks, levies, the base of trees and burrows (Figure 7.33, Figure 7.34 and Figure 7.35). The dominant vegetation in SU6 consisted of open dense pasture grasses, serrated tussocks, reeds, and annual summer weeds. The most significant existing disturbances in SU6 were from fencing and access tracks, levy banks, dams, and animal burrows and pads (Figure 7.35, Figure 7.36 and Figure 7.37).



**Figure 7.33** Low GSV in SU6, view north-east.



**Figure 7.34** Low GSV on hill crest in SU6, view south-west.



**Figure 7.35** Exposure on an elevated flat in SU6, view west.



**Figure 7.36** Exposure and disturbance from an animal pad in SU6.



**Figure 7.37 Exposure around the base of Box Thorn from animals in SU6.**

The survey team conducted a total of 2 transects within SU6, inspecting the hill, crest, and slope landforms within the unit, and targeting areas of exposure for Aboriginal cultural heritage material. No Aboriginal heritage sites were identified within the portion of SU6 that falls within the development footprint.

### 7.1.9. SURVEY UNIT 7

Survey unit 7 (SU7) is located in the south-eastern portion of the development footprint. SU7 comprises an undulating hill crest landform with moderate to gentle east-west slopes scoured with minor drainage/gully lines leading into an unnamed watercourse. The watercourse joins the Wollondilly River approximately 880 m to the north-west, inside of the Project Area. Several dams are also present within SU7.

GSV within SU7 was generally low, ranging from 0%-10%, whilst exposures averaged 0%-10% and were associated with water erosion, the base of trees, fences, animal pads, and wombat burrows (Figure 7.38, Figure 7.39, Figure 7.40 and Figure 7.41). The dominant vegetation in SU7 consisted of open dry sclerophyll woodland, pasture grasses, serrated tussock, and annual summer weeds. The most significant existing disturbances in SU7 were from historic clearing of vegetation, fencing, water erosion, and wombat burrows (Figure 7.42, Figure 7.43 and Figure 7.44).



**Figure 7.38** Visibility top of a small rise of SU7, view west.



**Figure 7.39** Low GSV in open woodland of SU7.



**Figure 7.40** Exposure under a tree above gully in SU7, view north.



**Figure 7.41** Exposure from water and erosion in SU7, view south-west.



**Figure 7.42 Exposure and disturbance from dam at gully end in SU7, view north.**



**Figure 7.43 Exposure from animal pads in SU7, view west.**



**Figure 7.44 Disturbance and exposure from wombat burrowing in SU7.**

The survey team conducted a total of (4) transects within SU7, inspecting the hill, crest, slope and flat landforms within the unit, and targeting areas of exposure for Aboriginal cultural heritage material. A total of 3 new Aboriginal heritage sites were identified within SU7; Wattle Creek 10 (AHIMS #52-4-0767), Wattle Creek 15 (AHIMS #52-4-0780) and Wattle Creek 16 (AHIMS #52-4-0779), however, these sites are now located outside of the development footprint. These are discussed in detail in Section 7.5.5 below.

### 7.1.10. SURVEY UNIT 8

Survey unit 8 (SU8) is located in the northern portion of the development footprint. SU8 comprises undulating hills and flat landforms with moderate to gentle north/south slopes on either side of the access track into the property. Several dams are also present within SU8.

GSV within SU8 was generally low, ranging from 0%-10%, whilst exposures ranged from 10%-20% and were associated with access tracks, and the base of trees (Figure 7.45, Figure 7.46, Figure 7.47 and Figure 7.48). The dominant vegetation in SU8 consisted of moderate to dense pasture grasses, serrated tussock and scattered eucalypts. The most significant existing disturbances in SU8 were from historic clearing of vegetation for access tracks, dams, bore infrastructure, fencing, a bridge, and animal pads (Figure 7.47, Figure 7.48, Figure 7.49, Figure 7.50 and Figure 7.51).



**Figure 7.45** No GSV on flat along the gully of SU8, view south-south-east.



**Figure 7.46** Exposure from water and erosion in SU8, view south.



**Figure 7.47** Exposure and disturbance from an animal pad in SU8, view west.



**Figure 7.48** Exposure and disturbance from access track in SU8, view north.



**Figure 7.49** Disturbance from bore infrastructure and turkey nests in SU8, view north.



**Figure 7.50** Valley depression with dam along access track in SU8, view west.



**Figure 7.51 Wooden post bridge in SU8.**

The survey team conducted a total of 2 transects within SU8, slope and flat landforms within the unit, and targeting areas of exposure for Aboriginal cultural heritage material. A total of 2 new Aboriginal heritage sites were identified within SU8; Wattle Creek 5 (AHIMS #52-4-0075) and Wattle Creek 6 (AHIMS #52-4-0776), however, these sites are now located outside of the development footprint. These are discussed in detail in Section 7.5.5 below.

### 7.1.11. SURVEY UNIT 9

Survey unit 9 (SU9) comprises two rectangular areas measuring approximately 300 m by 150 m located in the southern portion of the development footprint, and one 400 m by 10 m corridor that extends beyond the property boundary south-west along Canyonleigh Road. SU9 comprises an undulating hill landform with a moderate north-west to south-east slope scoured with minor drainage lines and gullies. One dam is also present within SU9.

GSV within SU9 was generally low to moderate, ranging from 5%-40%, whilst exposures averaged 5%. Exposures were associated with road shoulders, around access tracks, water erosion, scours around the base of trees and rabbit and wombat burrows (Figure 7.52, Figure 7.53, Figure 7.54 and Figure 7.55). The dominant vegetation in SU9 consisted of open dry sclerophyll woodland on the mid slopes nearer to the Project Area's western boundary, pasture grasses, serrated tussock and annual weeds such as Scotch Thistle, St John's Wort and sorrel. The most significant existing disturbances in SU9 were from the historic clearing of vegetation for grazing, fencing and access tracks, Canyonleigh Road water erosion and animal burrows and pads (Figure 7.53, Figure 7.54 and Figure 7.55).



**Figure 7.52 Typical GSV and vegetation in SU9, view south.**



**Figure 7.53 Visibility, slope and exposures around an erosion gully in SU9, view south-west.**



**Figure 7.54 Exposures on the road shoulder in SU9, view south.**



**Figure 7.55 Disturbances from table drain, GSV and exposures on road shoulder in SU9, view east.**

The survey team conducted a total of 4 transects within SU9, on the mid and lower-slope landforms within the unit, targeting areas of exposure for Aboriginal cultural heritage material. Two new Aboriginal heritage sites comprising isolated quartz artefacts were identified within SU9; Wattle Creek 17 (AHIMs #52-4-0806) and Wattle Creek 18 (AHIMS #52-4-0805). SU9 also contained TME-OS2 with PAD (AHIMS # 52-4-0134), however no cultural material was identified in association with the location of TME-OS2

with PAD (AHIMS # 52-4-0134). The extent of the site covered a portion of Canyonleigh Road; however the exposure identified along the road indicated there was no subsurface potential present within the road reserve. These are discussed in detail in Section 7.5.5 below.

## 7.2. DISCUSSION OF RESULTS

A description of these results, as they relate to the survey units and observed landforms within the Project Area can be seen in Table 7.1, Table 7.2 and Figure 7.56 and Figure 7.58.

**Table 7.1 Survey coverage**

| Survey unit | Landform | Survey unit area ($m^2$) | Visibility (%) | Exposure (%) | Effective coverage area ($m^2$) | Effective coverage (%) |
|---|---|---|---|---|---|---|
| 1 | Undulating hill | 211,104 | 10 | 5 | 1,055 | 0.5 |
| 2 | River terrace | 102,912 | 10 | 5 | 514 | 0.5 |
| 3 | Undulating Hill | 150,430 | 60 | 10 | 9,025 | 6 |
| 4 | Undulating Hill | 1,228,026 | 10 | 5 | 6,140 | 0.5 |
| | Crest | 746,291 | 10 | 5 | 3,731 | 0.5 |
| 5 | Undulating hill | 714,652 | 15 | 10 | 10,719 | 1.5 |
| | elevated flat | 608,777 | 15 | 10 | 9,131 | 1.5 |
| 6 | Undulating hill | 2,103,311 | 10 | 5 | 10,516.6 | 0.5 |
| | Crest | 0 | 0 | 0 | 0 | 0 |
| 7 | Undulating hill | 146,216 | 10 | 10 | 1,462 | 1 |
| | Crest | 62,664 | 10 | 10 | 626 | 1 |
| 8 | Undulating Hill | 55,781 | 10 | 10 | 558 | 1 |
| | Flat | 3,934 | 10 | 10 | 39 | 1 |
| 9 | Undulating hill | 85,473 | 40 | 5 | 1,709 | 2 |

**Table 7.2 Landform summary**

| Landform | Landform area ($m^2$) | Area effectively surveyed ($m^2$) | % of landform effectively surveyed | No. Sites | No. artefacts / features |
|---|---|---|---|---|---|
| Undulating hill | 5,931,333 | 41,185 | 0.69 | 12 | 12 |
| River terrace | 169,034 | 514 | 0.3 | 0 | 0 |
| Elevated flat | 919,611 | 9,131 | 1 | 4 | 4 |
| Crest | 1,525,645 | 4,357 | 0.28 | 2 | 2 |
| Flat | 138,646 | 39 | 0.03 | 0 | 0 |

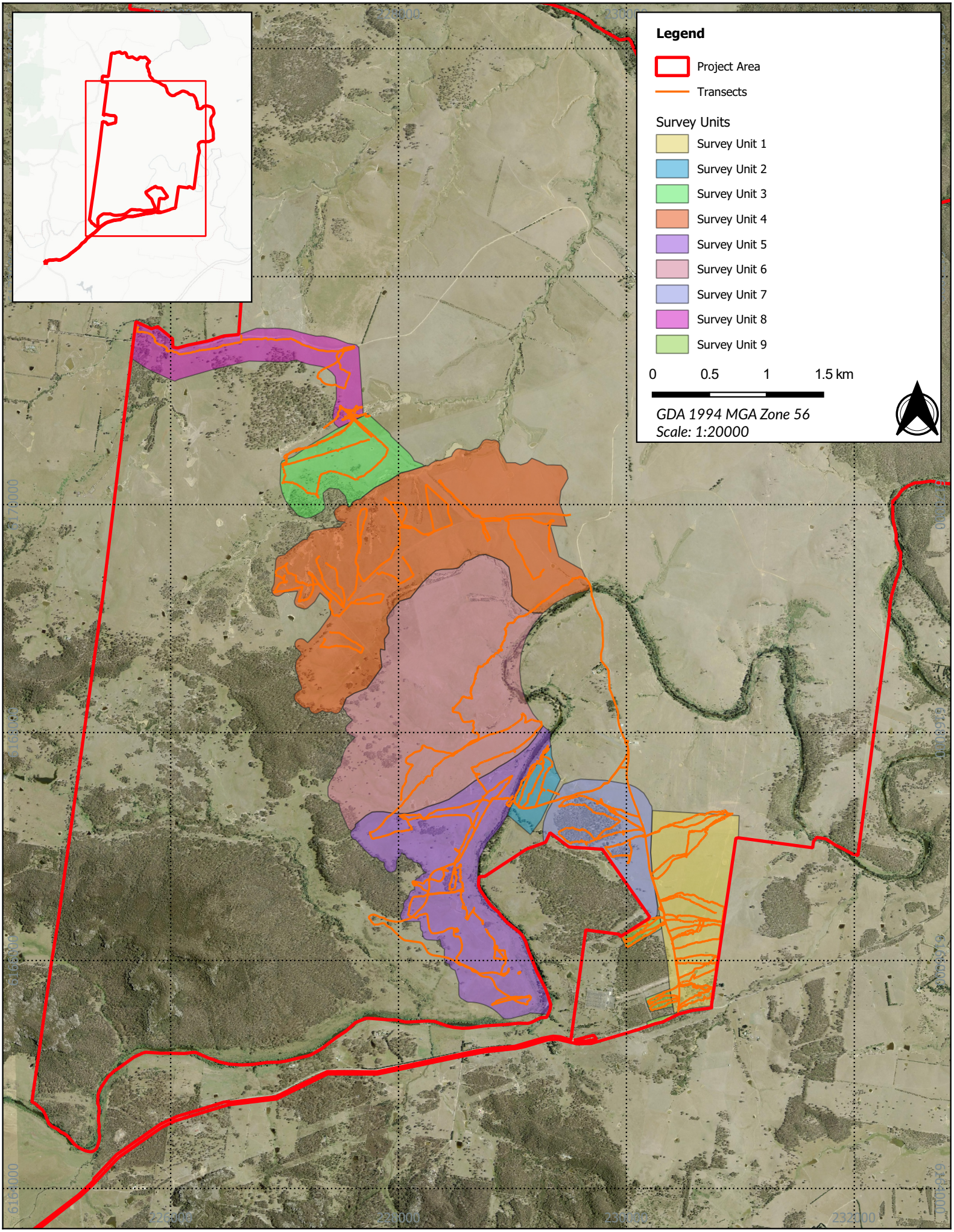



**Figure 7.56 - Survey unit transects**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, CartoDB Positron*

*Drawn by: PB Date: 2026-01-30*

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## 7.3. ADDITIONAL 2025 SURVEYS

### 7.3.1. 8 ADDITIONAL PASSING BAYS ON CANYONLEIGH ROAD

On 3 June 2025, 8 additional passing bays were required to be incorporated into the development footprint of the BESS. As these areas were not originally surveyed, an additional survey was conducted by Jordon Coltman (Austral Archaeologist) with the assistance of an Aboriginal site officer from the PLALC.

All of the proposed 8 additional passing bays are situated within a low-lying flood plain and are significantly disturbed from imported material and the construction of the roads and associated infrastructure (e.g. culverts). GSV across these passing bays was low (less than 5%), however, the PLALC site officer agreed that all landforms had a low potential for subsurface archaeological deposits. This was primarily due to the absence of ideal landforms for Aboriginal occupation in accumulation with the high level of disturbance. As a result of this assessment for the 8 additional passing bays, the recommendations of this report remain unchanged.

### 7.3.2. DEVELOPMENT FOOTPRINT UPDATES.

On 11 November 2025, an archaeological survey was conducted of an alteration to the development footprint that was not covered by the original 2024 surveys. This area is located 200 m north of SU 9 and connects SU1 with the existing power station. The additional survey was conducted by Zoe Bosevski (Austral Archaeologist) with the assistance of an Aboriginal site officer from the PLALC.

The survey began at the main track adjacent to the proposed alternate transmission line. The survey proceeded to cover the length of the proposed alternate transmission line heading west towards the current power station. Visibility and exposure were both low, visibility 10% and exposure 50%, limited to areas at the base of trees. Raw material, including quartz, was identified, but was not artefactual. Leaf litter and fallen trees were the main source of low GSV. The entire transmission line route is situated on a south-facing slope, not indicative of a PAD. Once the survey reached the shoulder landform adjacent to the power station, it was noted that the landform was modified, with modern fill materials noted. The survey also re-identified AHIMS site Wattle Creek 3 (#52-4-0771), located adjacent to the main track into the property. No additional sites or areas of potential were identified.

The results of the additional survey are displayed in Figure 7.57 and Figure 7.58.

## 7.4. TEST EXCAVATION RESULTS

Based upon the results of the archaeological survey, Austral completed archaeological test excavations within the Development footprint within areas of moderate archaeological potential. This consisted of 7 archaeological testing locations over 4 main landforms, including a crest, elevated flats, lower slopes, and spurs. The results from these areas are summarised within this section and the test pits, their arrangement, and artefact distribution are summarised within the following section. The results of the test excavation are shown in Figure 7.59.

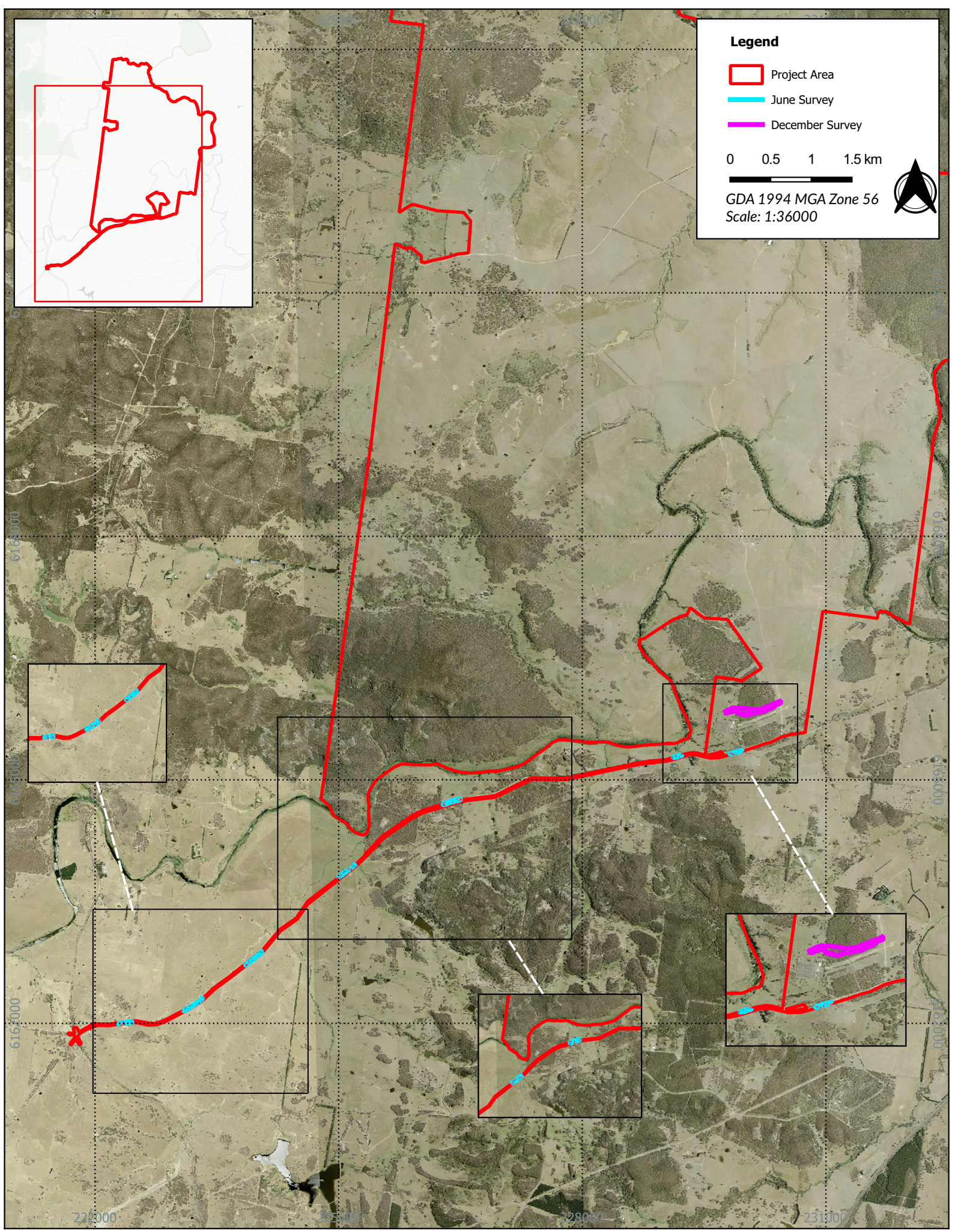



**Figure 7.58 - Additional Survey Transects**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, CartoDB Positron* *Drawn by: PB* *Date: 2026-01-30*

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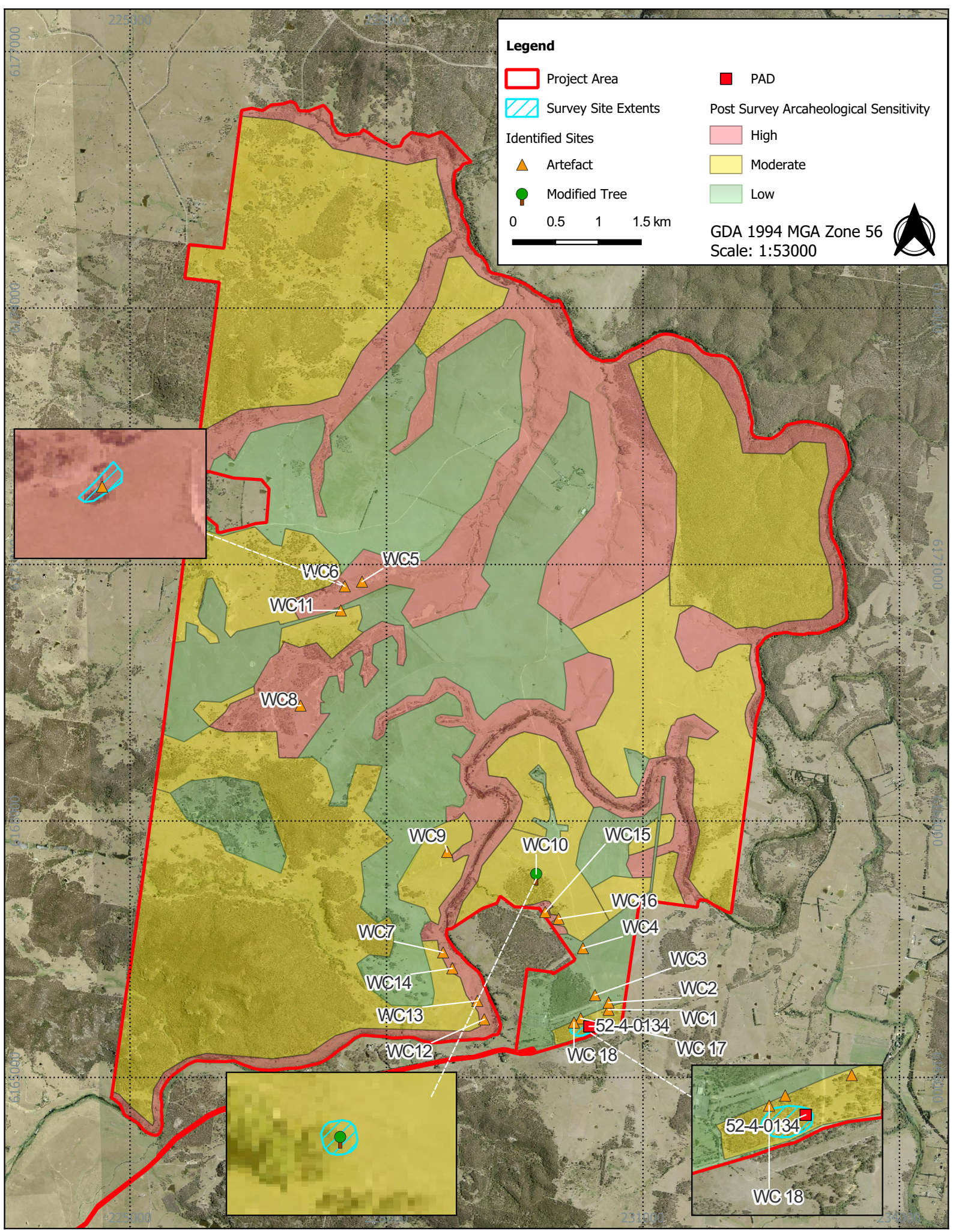



**Figure 7.59 - Results of the archaeological survey**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial*

*Drawn by: PB Date: 2026-01-30*

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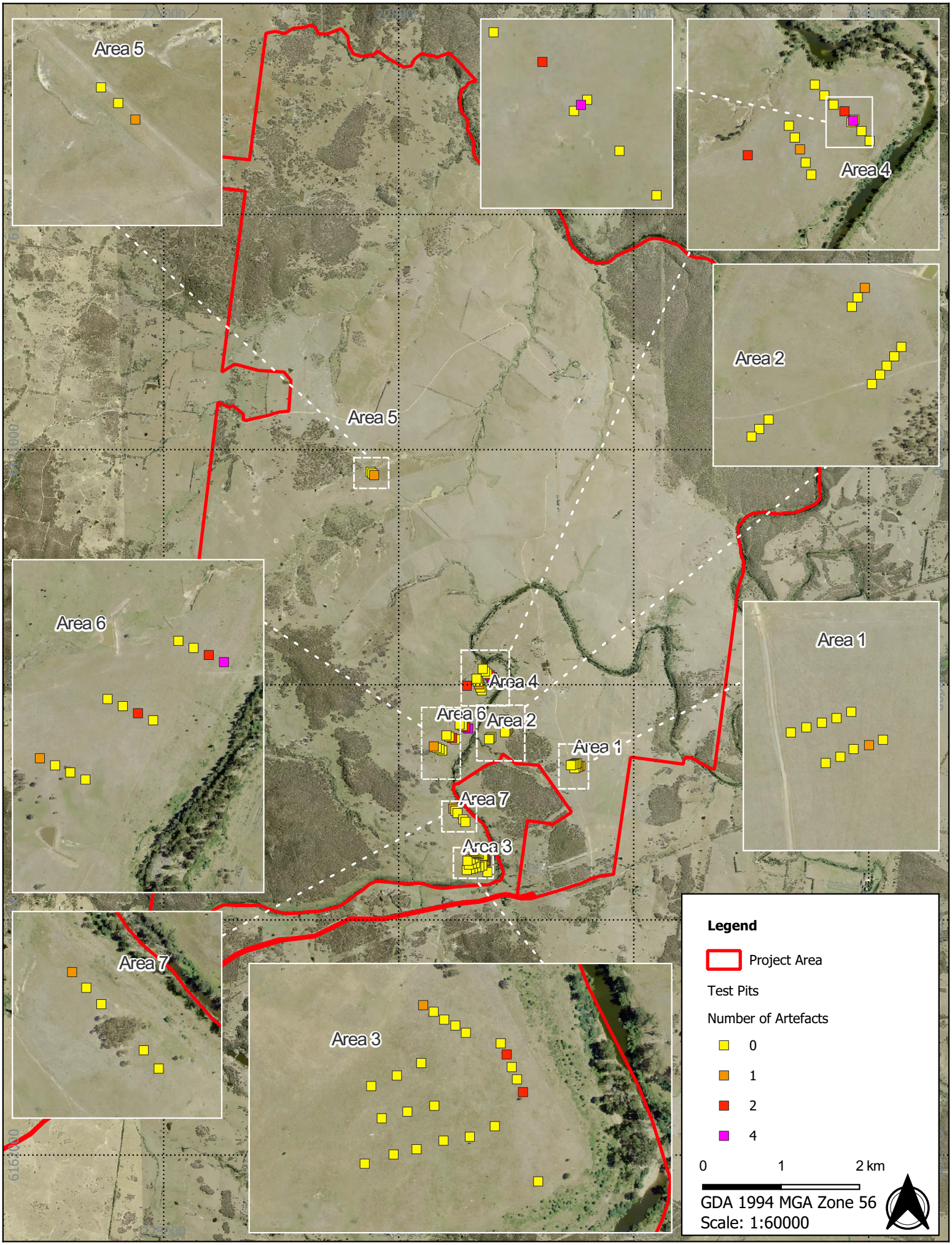



**Figure 7.37 - Results of the test excavations**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial* *Drawn by: PB Date: 2026-01-30*

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### 7.4.1. TESTING AREA 1

Testing within Area 1 consisted of 10 test pits distributed over 2 transects, A and B. These 2 transects were separated by approximately 50 m, with the test pits on each transect separated by 20 m. Figure 7.64 shows the distribution of these test pits.

#### LANDFORM

Testing area 1's landform consisted of a ridge crest that ran east to west. Transect A focused on the northern portion of the ridge crest and Transect B focused on a terrace on the northern side of the ridge, below Transect A.

Figure 7.60, Figure 7.61 and Figure 7.62 display the landforms within Testing Area 1.



**Figure 7.60 North facing view north across Testing Area 1.**



**Figure 7.61** East facing view along transect A, Testing Area 1.



**Figure 7.62** West facing view along transect B, Testing Area 1.

## SOILS, DISTURBANCE AND FEATURES

Soils across Area 1 were generally comprised of a homogenous A horizon, which had either a very defused transition between the A1 and A2 Horizons. In the shallower pits of transect B, there was no A2 Horizon present. The transition between the A and B horizons was clear in most test pits. The A horizon consisted of the dark reddish brown clayey loamy sand with colour the only difference present between the A1 and A2 Horizon, where they were present. The B horizon was generally a compact reddish-brown clay. There was evidence of bioturbation with pit 1 transect A containing an ant's nest.

A summary of soil characteristics across Testing Area A is provided in Table 7.3 and Figure 7.63.

**Table 7.3 Summary of soil characters within Testing Area 1**

| Soil Horizon | Soil Characteristics |
|---|---|
| A1 Horizon | Depth: 0-150 mm<br>Munsell: 5YR2.5/2<br>PH: 6<br>Description: Dark reddish-brown, compact, clayey loamy sand layer, containing grass roots. A diffuse transition occurs between 60 to 150 mm into Horizon A2. |
| A2 Horizon (where present) | Depth: 100-300 mm<br>Munsell: 10YR3/4<br>PH: 6<br>Description: Dark yellowish brown, compact, clayey loamy sand layer, containing grass roots and <5% quartz gravel. Clear transition with B-Horizon. |
| B Horizon | 200 - 390 mm<br>Munsell: 5YR4/4<br>PH: 6.5 - 7<br>Description: Reddish brown, compact clay. |




**Figure 7.63 North section of test pit 2, Testing Area 1**

## ARTEFACT ASSEMBLAGE

A single quartz distal fragment was recovered from Transect A, test pit 2, spit 2, making up 4% of the total assemblage for the testing program.

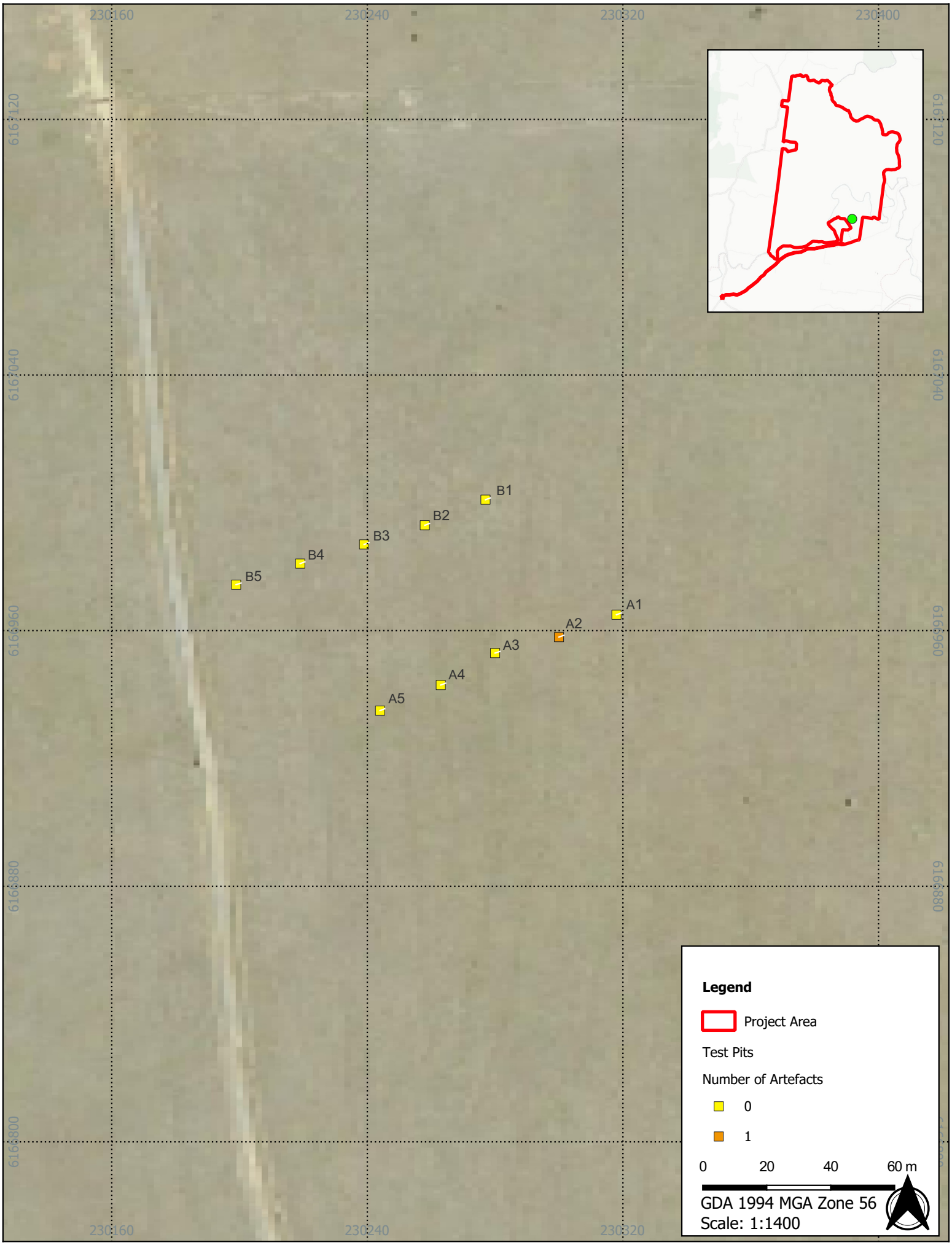



**Figure 7.64 - Location of test pits and artefact distribution within Testing Area 1.**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, CartoDB Positron* *Drawn by: PB Date: 2026-01-30*

AUSTRAL ARCHAEOLOGY

### 7.4.2. TESTING AREA 2

Testing within Area 2 consisted of 3 transects, A, B and C which were spaced approximately 100 m apart. Within these 3 transects, there were 11 test pits distributed 20 m apart, with Transect A consisting of 5 test pits and both Transect B and C consisting of 3 test pits each. Figure 7.68 shows the distribution of these test pits.

#### LANDFORM

Testing Area 2 was located south-east of the Wollondilly River and consisted of a spur crest landform, with 2 spurs that followed a south and west direction. The transects for this landform were spaced from the crest of the spurs (Transect A and B) down to the elevated terrace (Transect C), adjoining the spur with the river flood plain.

Figure 7.65 and Figure 7.66 contain representative images of the landform within Testing Area 2.



**Figure 7.65 West facing view of the landform associated with Testing Area 2.**



**Figure 7.66 North facing view of the landform within Testing Area 2.**

## SOILS, DISTURBANCE AND FEATURES

Soils across Area 2 were generally comprised of a homogenous A horizon layer, which had a clear to diffuse transition between the A1 and A2 horizons. In the shallower pits of transect B, there was no A2 horizon present. The transition from A horizon to B horizon was clear in most test pits.

The A horizon consisted of the dark reddish brown clayey loamy sand with colour the only difference present between the A1 and A2 Horizon where they were present. The B horizon varied between transects A, B and C with pink mottled clay in transects A and B and a yellowish brown compact sandy clay in transect C.

A summary of soil characteristics across Testing Area 2 is provided in Table 7.4, Table 7.5, Figure 7.67 and Figure 7.68

**Table 7.4 Summary of soil characters within Transect A and B, Testing Area 2**

| Soil Horizon | Soil Characteristics |
|---|---|
| A1 Horizon | Depth: 0-110 mm<br>Munsell: 7.5YR 4/3<br>PH: 6<br>Description: Brown, friable silty soil, with ~5% rootlets, and <1% minor gravel inclusions. A clear transition to the A2 Horizon around 110 mm. |
| A2 Horizon | Depth: 110-230 mm<br>Munsell: 7.5YR 7/4<br>PH: 5.5<br>Description: Pink friable to plastic silty clayey soil. Rootlets ~1% with rootlets and minor gravel. Gradual transition to B Horizon. |

| Soil Horizon | Soil Characteristics |
|---|---|
| B Horizon | 230- 250 mm<br>Munsell: 7.5YTR 7/4<br>PH: 5.5<br>Description: Pink plastic mottled clay, similar characteristics to A2 Horizon. |




**Figure 7.67** North section of test pit 4 showing soil profile in Transect A.

**Table 7.5** Summary of soil characters within Transect C, Testing Area 2

| Soil Horizon | Soil Characteristics |
|---|---|
| A1 Horizon | Depth: 0-190 mm<br>Munsell: 10YR 3/4<br>PH: 6<br>Description: Dark yellowish brown soft loamy sand with gravel and grass root inclusions. A diffuse transition occurs between 190 and 200 mm into Horizon B. |
| B Horizon | 190- 355 mm<br>Munsell: 10YR 5/4<br>PH: 6<br>Description: Yellowish brown compact sandy clay. |




**Figure 7.68 The north section of Test Pit 1, Transect C.**

## ARTEFACT ASSEMBLAGE

A single red silcrete proximal fragment was recovered from Transect B, test pit 3, spit 2, making up 4% of the total assemblage for the testing program.

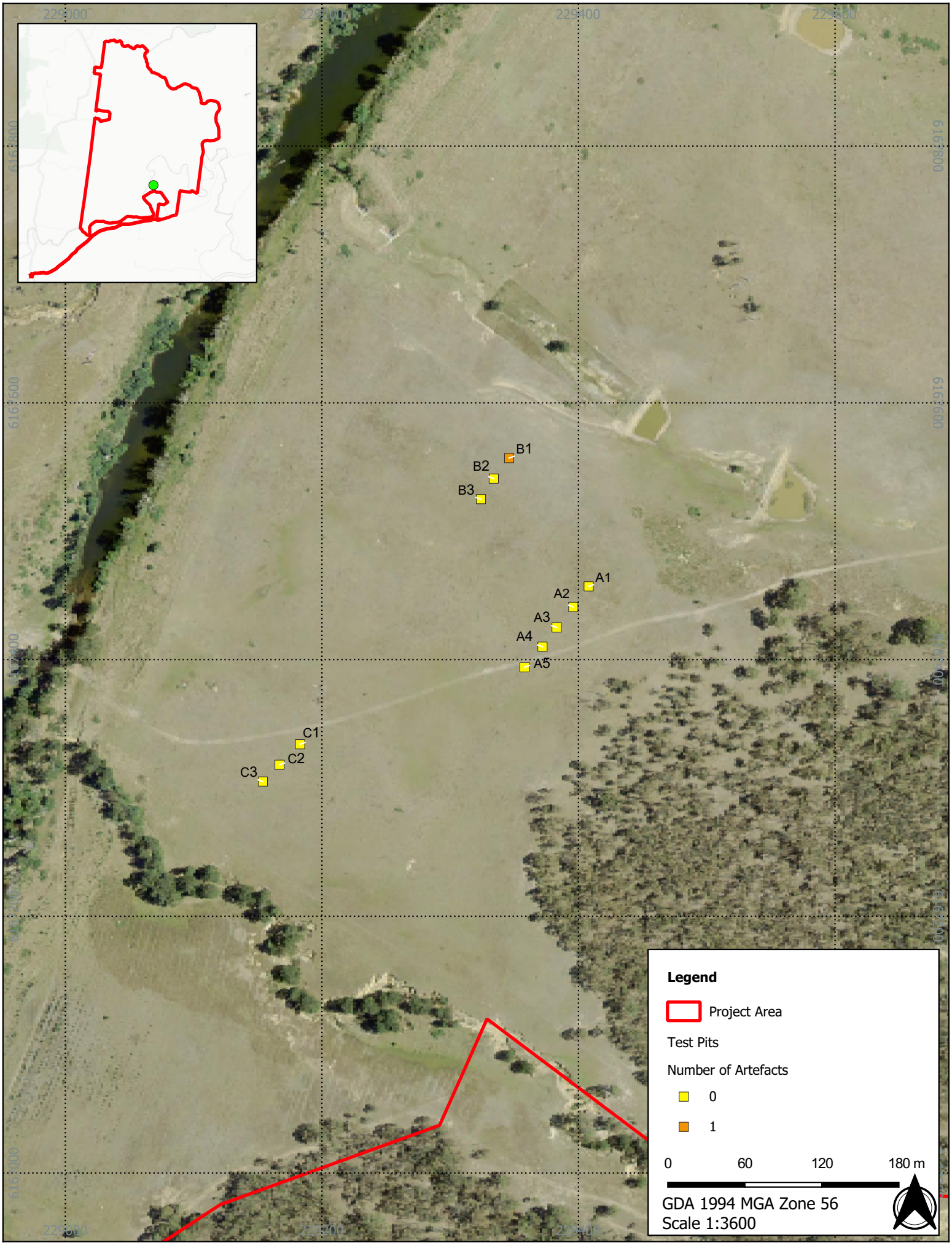



**Figure 7.69 - Location of test pits and artefact distribution within Testing Area 2**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial*

*Drawn by: PB Date: 2026-01-30*

AUSTRAL ARCHAEOLOGY

### 7.4.3. TESTING AREA 3

Testing within Area 3 consisted of 6 transects, A to F, with each transect having pits separated by 20 m. Within the 6 transects, there were 23 test pits, with Transect A having 5 test pits, Transect B having 1 test pit, Transect C having 6 test pits, Transect D having 3 test pits, Transect E having 3 test pits and Transect F having 5 test pits. Figure 7.71 shows the distribution of these test pits.

#### LANDFORM

Testing Area 3 included the testing of 3 landforms within close proximity to the Wollondilly River. The Wollondilly River located to both the east and south of the testing area. Transect A was located within a footslope, while a single test pit from both Transect C and D was located within a hollow. The remaining 5 test pits from Transect C and the remaining 2 test pits from Transect D were located within a valley landform. Transect B, Transect E and Transect F were located solely within a valley landform.

#### SOILS, DISTURBANCE AND FEATURES

Soils across Area 3 were generally composed of a fine-grained friable sandy silt A1 horizon layer, which had a clear but defused transition into a fine-grained friable sandy clayey silt A2 horizon layer which overlayed a mottled clay B horizon layer that contained minor pebbles/river stones.

A summary of soil characteristics across Area 3 is provided in Table 7.6 and Figure 7.70.

**Table 7.6 Summary of soil characters within Testing Area 3**

| Soil Horizon | Soil Characteristics |
|---|---|
| A1 Horizon | Depth: 0-250 mm<br>Munsell: 7.5YR 3/4 – 7.5YR 4/4<br>PH: 5<br>Description: Fine grain friable sandy silt- grassroot inclusions 1%, clear but diffused transition to horizon A2 |
| A2 Horizon | Depth: 250-450 mm<br>Munsell: 7.5YR 5/4 – 7.5YR 6/6<br>PH: 5<br>Description: Fine grain friable sandy clayey silt – grassroot inclusions 1%, diffused transition to base |
| B Horizon | 450 mm<br>Munsell: 7.5YR 6/6 - mottled with 10YR 5/8<br>PH: 5<br>Description: Clay - minor pebbles/river stone inclusions |




**Figure 7.70 North section of test pit 3 showing soil profile within testing area 3.**

## ARTEFACT ASSEMBLAGE

A total of 3 artefacts were recovered from testing area 3, accounting for 12% of the total assemblage for the testing program. All 3 artefacts were recovered from transect A with a single silcrete scraper recovered from test pit 1, spit 8, a quartz flake recovered from test pit 4 spit 3 and silcrete debitage recovered from test pit 4 spit 5.

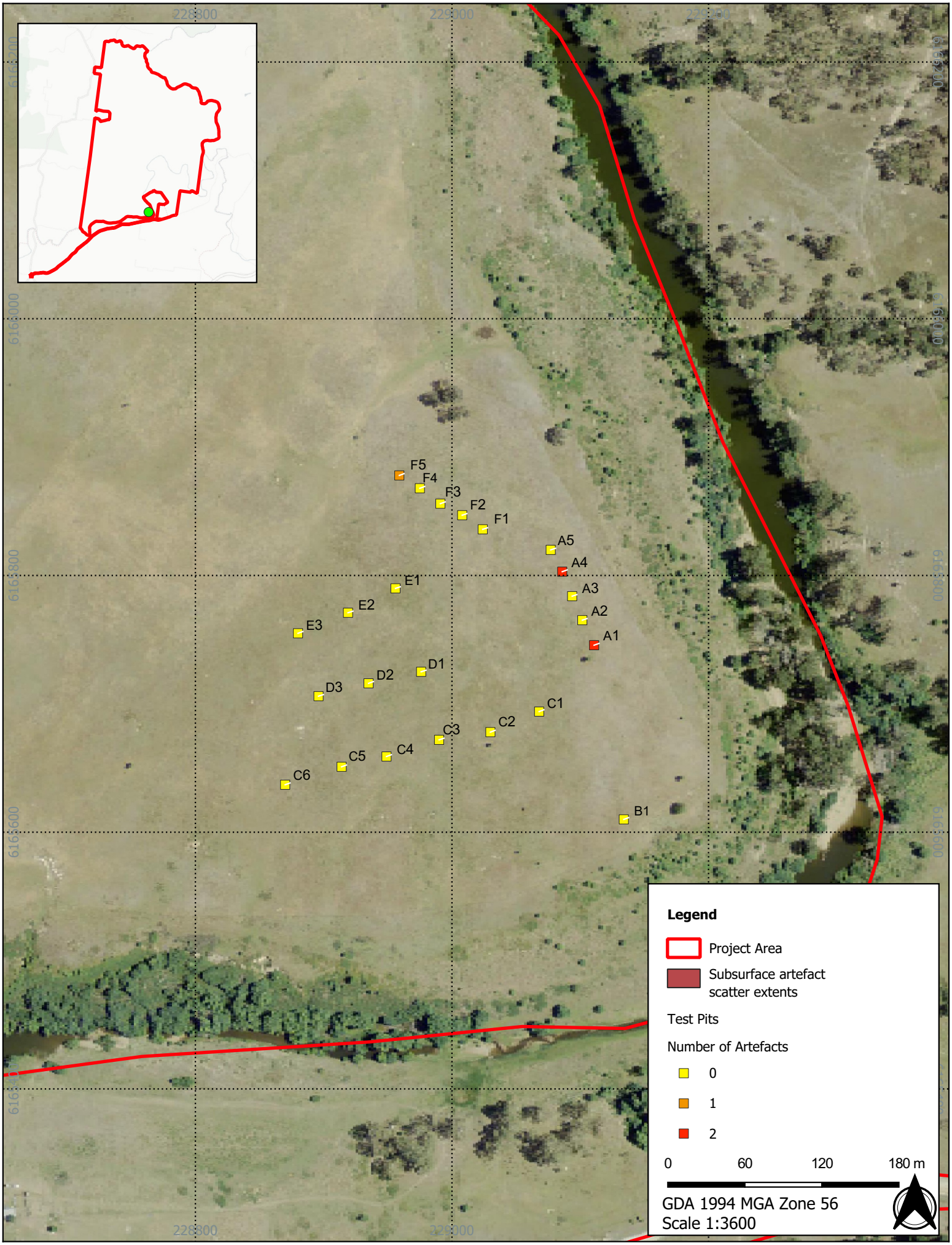



**Figure 7.71 - Location of test pits and artefact distribution within Testing Area 3**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial*

*Drawn by: PB Date: 2026-01-30*

AUSTRAL ARCHAEOLOGY

### 7.4.4. TESTING AREA 4

Testing within Area 4 consisted of transects, A, B and C which were spaced approximately 150 to 200 m apart. Transects run in a south-east/north-west line with test pit 1 located closest to the Wollondilly River. A total of 15 test pits were excavated. Transect A comprised of 7 test pits with a further 2 test pits excavated as an extension of test pit 3. Transect B comprised of 5 test pits while transect C comprised of a single test pit. Testing in this area was conducted under extremely wet conditions. Figure 7.75 shows the distribution of these pits.

#### LANDFORM

Testing Area 4 was located adjacent to the Wollondilly River and consisted of undulating hills, crest, hollows and slopes. Transects run in a south-east/north-west line with test pit 1 located closest to the Wollondilly River. Transect A was located on a small hill crest and valley landform. Transect B was located within two landforms, hollows and valleys, test pit 1 and test pit 4 were located within hollows while test pits 2, 3 and 5 were located within a valley landform. Transect C was located within a slope landform.

Figure 7.72 and Figure 7.73 contain representee images of the landforms within Testing Area 4.



**Figure 7.72 West facing view of the elevated flat associated with Testing Area 4.**



**Figure 7.73 East facing view of the flat with the Wollondilly River in the background.**

## SOILS, DISTURBANCE AND FEATURES

Soils across Area 4 were generally comprised of a fine-grain friable sandy silt layer, transitioning into a fine-grained clayey sandy silty layer that overlayed a clay layer. All test pits contained gravel/river pebbles ranging in size and consistency throughout. Testing in this area was conducted under extremely wet conditions, the wet conditions would affect both the pH levels and Munsell colour recorded.

A summary of soil characteristics across Area 4 is provided in Table 7.7 and Figure 7.74.

**Table 7.7 Summary of soil characters within Area 4**

| Soil Horizon | Soil Characteristics |
|---|---|
| A1 Horizon | Depth: 0-200 mm<br>Munsell: 5YR 3/2 – 5YR 4/3<br>PH: 6<br>Description: Fine grain friable sandy silt, grassroot inclusions 1%, Gravel/river pebbles throughout. Diffused transition into A2 between 120-150 mm |
| A2 Horizon | Depth: 120/150-320 mm<br>Munsell: 5YR 4/3 - 5YR 5/4<br>PH: 7<br>Description: Fine grain friable semi plastic clayey sandy silt, grassroot inclusions 1%, Gravel/river pebbles throughout. Diffused transition into B horizon. |
| B Horizon | 320 – 400 mm<br>Munsell: 7.5YR 5/4 – 10YR 7/6<br>PH: 7.5<br>Description: Clay- minor gravel/river pebbles |




**Figure 7.74 North section of test pit 2, Transect A, showing soil profile within Testing Area 4**

## ARTEFACT ASSEMBLAGE

A total of 9 artefacts were recovered from testing area 4 accounting for 52.94% of the total assemblage for across all the testing program. Four of the 9 artefacts were recovered from transect A, test pit 3, including a quartzite scraper and a quartzite distal fragment recovered from spit 3, a quartzite thumbnail scraper and a quartzite medial fragment from spit 4. A further 2 artefacts were recovered from Transect A, test pit 4, a quartzite thumbnail scraper and a quartz flake, both recovered from spit 3. A single red silcrete scraper was recovered from transect B, test pit 3, spit 1. Transect C contained 2 artefacts, a quartz scraper recovered from spit 1 and a piece of red silcrete debitage recovered from spit 3.

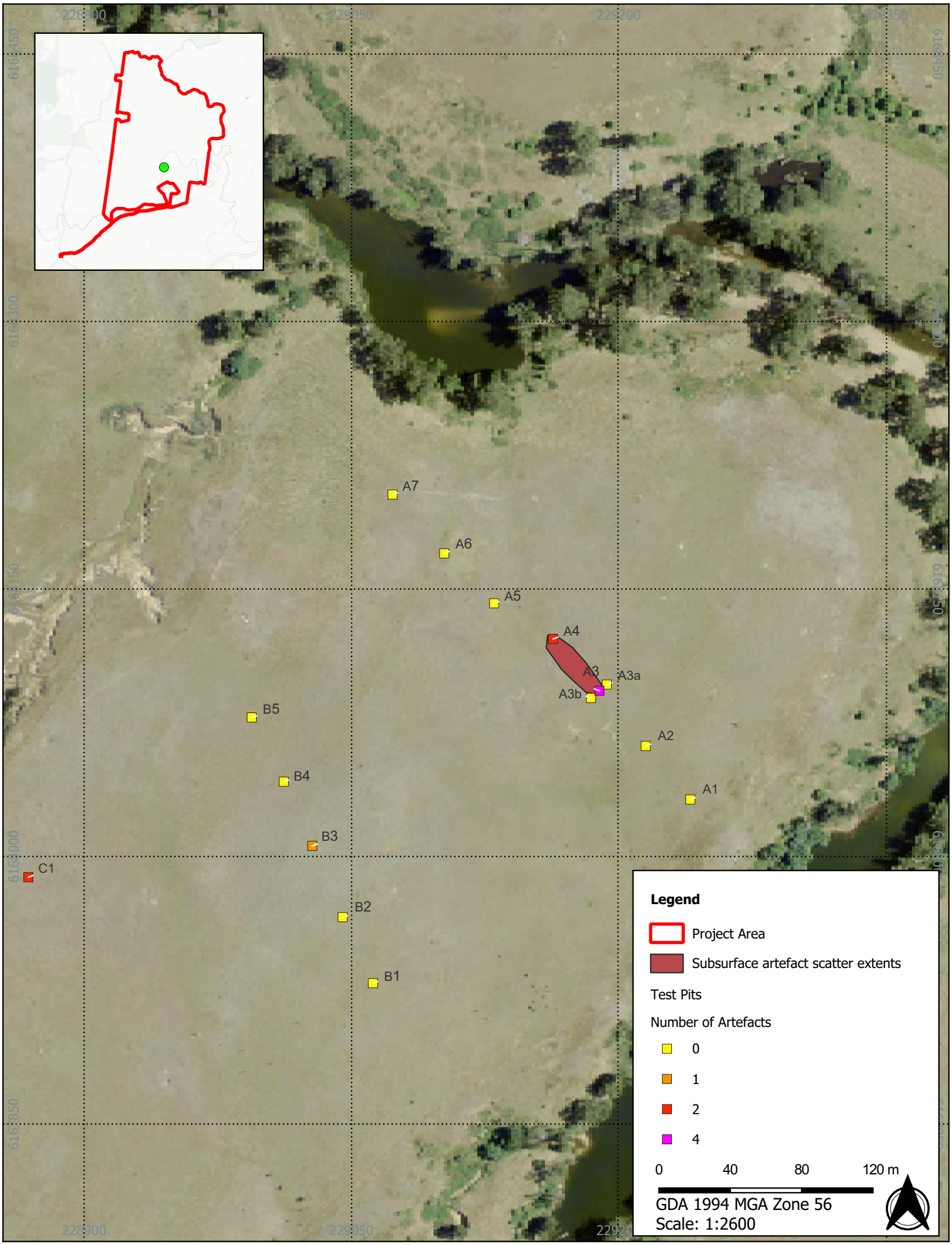



**Figure 7.75- Location of test pits and artefact distribution within Testing Area 4.**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, CartoDB Positron* *Drawn by: PB Date: 2026-01-30*

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### 7.4.5. TESTING AREA 5

Testing within Area 5 consisted of a single transect which runs south-east/north-west and contains 3 test pits spaced approximately 30 m apart. Testing Area 5 is the furthest testing location from the Wollondilly River but is within close proximity to Island Creek which is a tributary of Wollondilly River. Figure 7.77 shows the distribution of these test pits.

#### LANDFORM

Testing Area 5 is located across two landforms. Test pit 1 is located within a slope landform while test pits 2 and 3 are located within a hollow landform.

#### SOILS, DISTURBANCE AND FEATURES

Soils across Area 5 were generally comprised of a friable silty clayey loam layer, transitioning into a clayey sandy silty layer that overlayed a clay layer. All test pits contained mudstone gravel ranging in size and consistency throughout. Testing in this area was conducted under extremely wet conditions, the wet conditions would affect both the pH levels and Munsell colour recorded

A summary of soil characteristics across Area 4 is provided in Table 7.8 and Figure 7.76.

**Table 7.8 Summary of soil characters within Area 5**

| Soil Horizon | Soil Characteristics |
|---|---|
| A1 Horizon | Depth: 0-450 mm<br>Munsell: 7.5YR 4/3 – 7.5YR 6/2<br>PH: 7<br>Description: silty clayey loam, friable compaction, grassroots and rock inclusions |
| B Horizon | 200-450 mm<br>Munsell: 7.5YR 6/6 - mottled with 7.5YR 8/2<br>PH: 7<br>Description: Sandy silt with Clay at base – 10% subangular mudstone inclusions |




**Figure 7.76 North section of test pit 3, Transect A, showing soil profile within Testing Area 5.**

## ARTEFACT ASSEMBLAGE

A single yellow chert core with 9 negative flake scars was recovered from Transect A, test pit 3, spit 2, making up 4% of the total assemblage for the tested area.

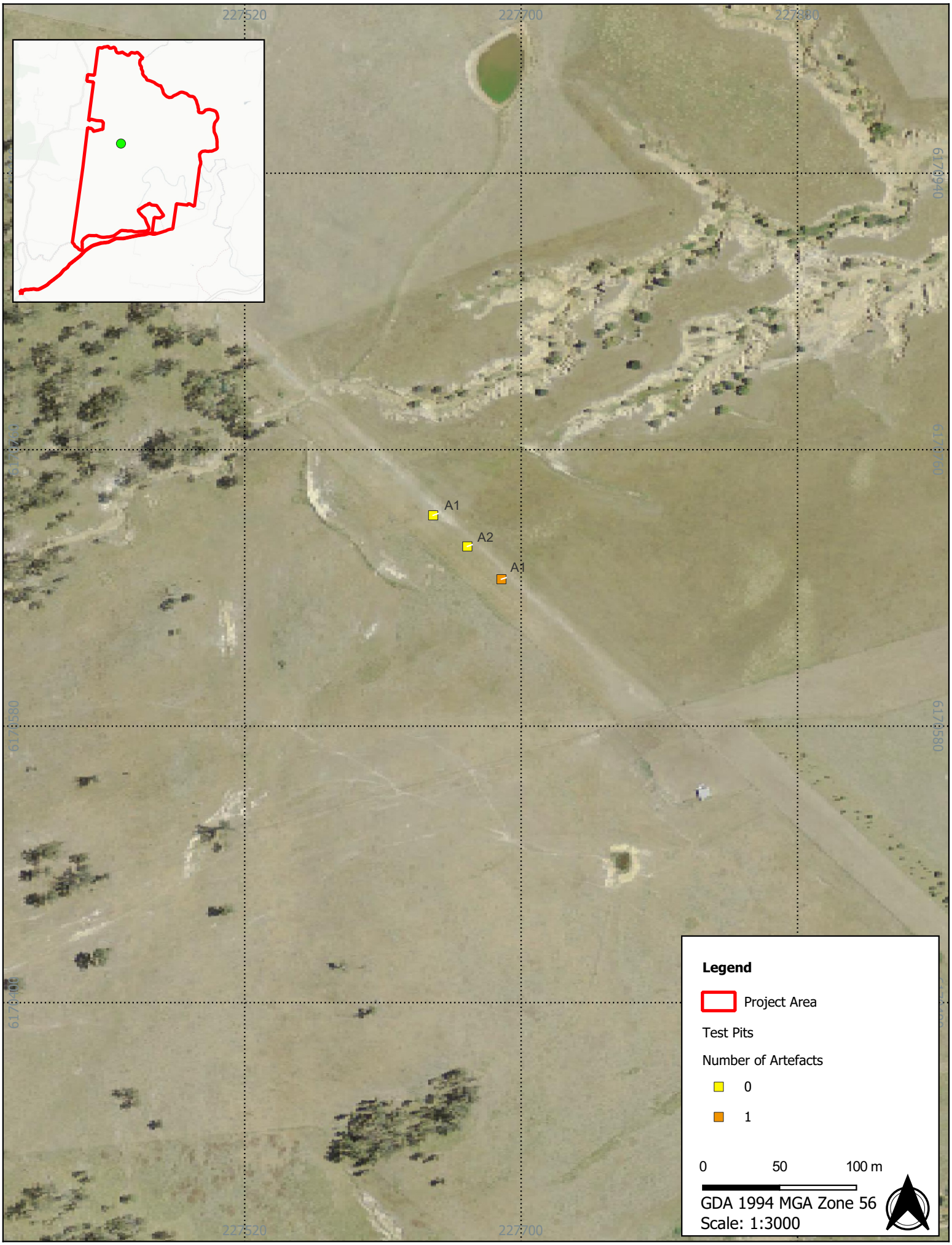



**Figure 7.77 - Location of test pits and artefact distribution within Testing Area 5.**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial, CartoDB Positron* *Drawn by: PB Date: 2026-01-30*

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### 7.4.6. TESTING AREA 6

Testing within Area 6 consisted of transects, A, B and C which were spaced approximately 200 m apart. Transects run in a north-west/south-east line with test pit 4 in each transect located closest to the Wollondilly River. A total of 16 test pits were excavated testing Area 6. Testing was conducted under wet conditions. Figure 7.81 shows the distribution of these test pits.

#### LANDFORM

Testing Area 6 was located adjacent to the Wollondilly River and consisted of slopes, hollows, spurs and valley landforms. Transect A test pits 1, 2 and 3 are located within a hollow landform while test pit 4 is within a valley landform. The pits of transect B are distributed along the slope land form and Transect C located on slope and spur.

Figure 7.78 and Figure 7.79 contain representative images of landforms within Testing Area 6.



**Figure 7.78 West facing view at the base of the slope in testing Area 6.**



**Figure 7.79 West-facing view of testing Area 6.**

## SOILS, DISTURBANCE AND FEATURES

Soils across Area 6 were generally comprised of a friable silty topsoil layer, with a diffused transition into a firm silty clayey sandy layer that overlayed a clay base. Grassroots were a minimal but common inclusion, while rocks, gavel and river pebbles inclusions increased with depth.

Testing in this area was conducted under extremely wet conditions, the wet conditions would affect both the pH levels and Munsell colour recorded.

A summary of soil characteristics across Area 6 is provided in Table 7.9 and Figure 7.80.

**Table 7.9 Summary of soil characters within Area 6**

| Soil Horizon | Soil Characteristics |
|---|---|
| A1 Horizon | Depth: 0-100 mm<br>Munsell: 2.5YR 4/2 – 2.5YR 3/1<br>PH: 6<br>Description: silty, friable compaction topsoil, grassroots 1% and rock 1% inclusions. Diffused transition to A2 |
| A2 Horizon | Depth: 100-600 mm<br>Munsell: 2.5YR 5/6 – 5YR 6/6<br>PH: 6<br>Description: silty, clayey sand, firm compaction, grassroots 1% and rock 3-5% inclusions. Gradual transition to B horizon |
| B Horizon | 600 mm<br>Munsell: 2YR 7/8<br>Description: Sandy clay with plastic clay at base, rock 3-5% inclusions |




**Figure 7.80 North section of test pit 2, Transect C, showing soil profile within Testing Area 6.**

## ARTEFACT ASSEMBLAGE

A total of 9 artefacts were recovered from testing area 6. Three of the 9 artefacts were recovered from transect B, test pit 3, spit 1, including a silcrete scraper, a quartz thumbnail scraper and a quartz Bondi point. A further 4 artefacts were recovered from Transect A, test pit 4, a piece of quartz debitage was recovered from spit 1, 2 quartz thumbnail scrapers were recovered from spit 3 and a proximal fragment was recovered from spit 5. A singular artefact, a quartz flake piece was retrieved from transect C, test pit 1, spit 1.

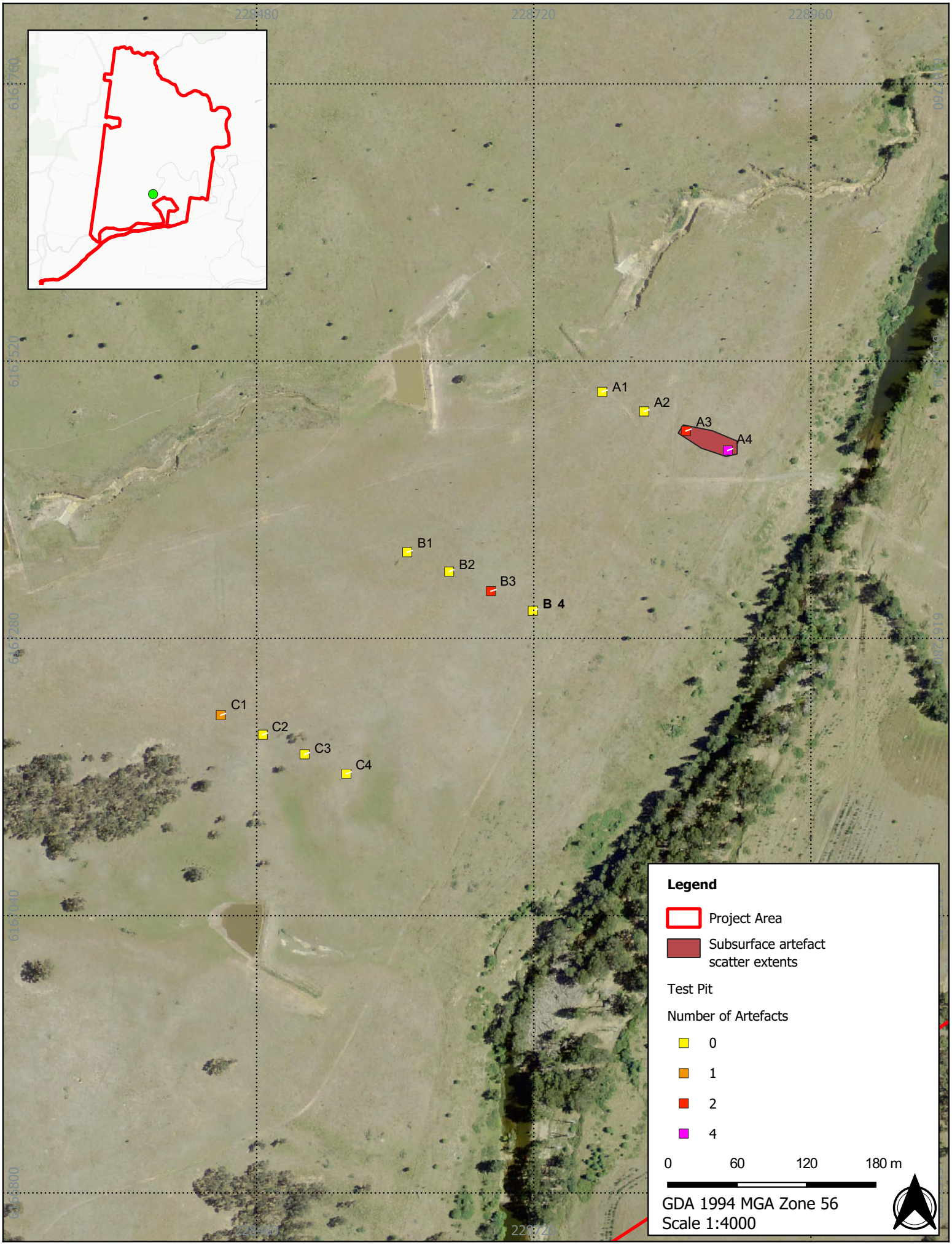



**Figure 7.81 - Location of test pits and artefact distribution within Testing Area 6**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial*

*Drawn by: PB Date: 2026-01-30*

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### 7.4.7. TESTING AREA 7

Testing within Area 7 consisted of a single transect containing 5 test pits. The transect ran from south-east/ north-west parallel with the Wollondilly River. Testing was conducted under wet conditions. Figure 7.84 shows the distribution of these test pits.

#### LANDFORM

Testing Area 7 was located adjacent to the Wollondilly River and consisted of a raised alluvial flat terminating in an eastward-slope directly adjacent to the Wollondilly River (Figure 7.82).



**Figure 7.82 North-facing view of elevated flat in Test Area 7**

#### SOILS, DISTURBANCE AND FEATURES

Soils across Area 6 were generally comprised of a friable sandy silty loam layer, transitioning into a compact silty sandy pebbly layer that overlayed a clay base layer.

Testing in this area was conducted under extremely wet conditions, which would affect both the pH levels and Munsell colour recorded.

A summary of soil characteristics across Area 4 is provided in Table 7.10 and Figure 7.83.

**Table 7.10 Summary of soil characters within Area 7**

| Soil Horizon | Soil Characteristics |
|---|---|
| A1 Horizon | Depth: 0-400 mm<br>Munsell: 2.5YR 5/4 – 7.5YR 5/4<br>PH: 7<br>Description: friable sandy silty loam, grassroot inclusions <1%, Gravel/river pebbles throughout. Clear transition into B horizon |
| B Horizon | 400 mm<br>Munsell: 5YR 4/3 – 2.5YR 5/6<br>PH: 7<br>Description: Compact silty sandy pebbly soil with a clay base |



**Figure 7.83 North section of test pit 1, Transect A, showing soil profile within Testing Area 7**

## ARTEFACT ASSEMBLAGE

A single quartz flake piece was recovered from Transect A, test pit 5, spit 1, making up 4% of the total assemblage for the tested area.

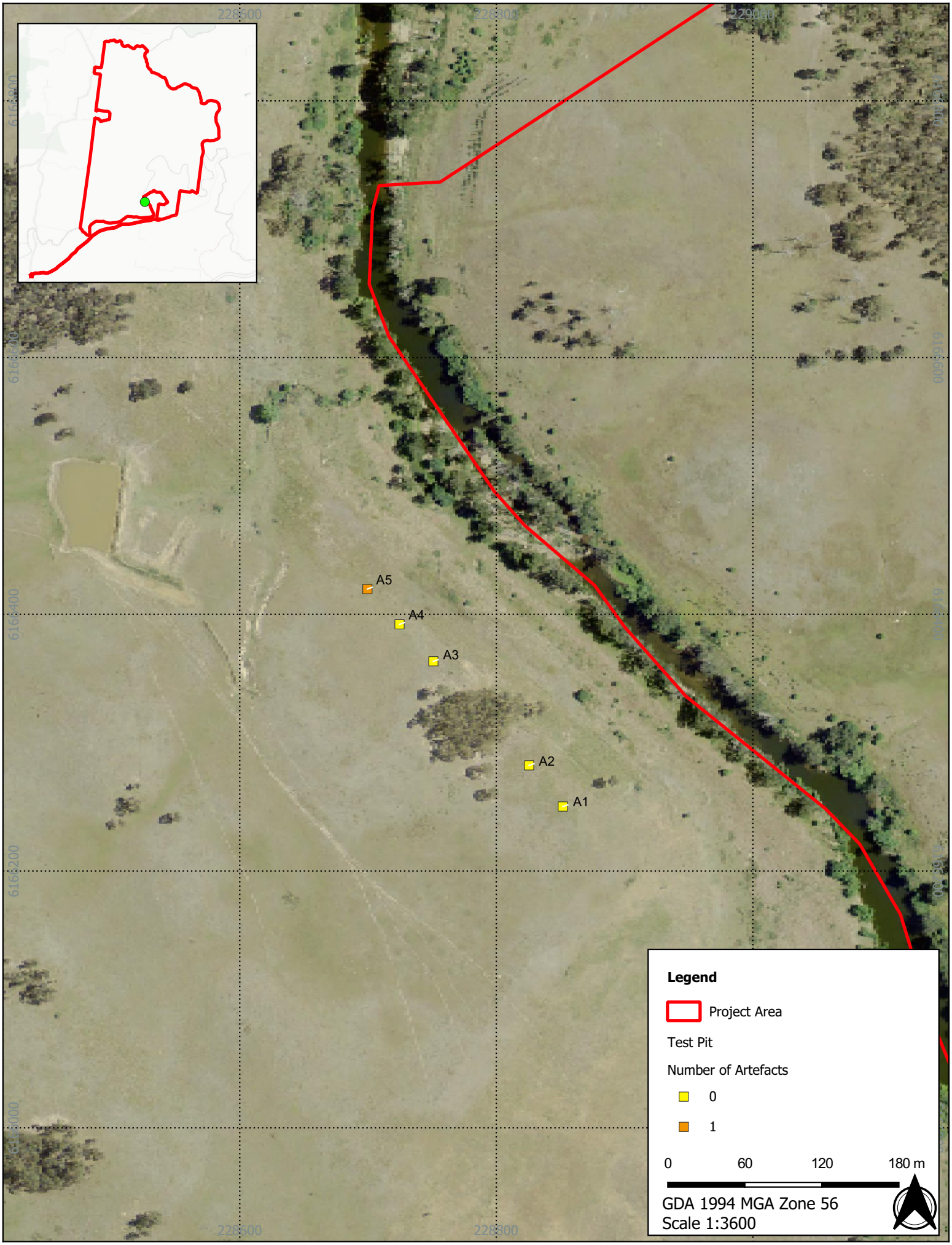



**Figure 7.84 - Location of test pits and artefact distribution within Testing Area 7**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial*

*Drawn by: PB Date: 2026-01-30*

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## 7.5. 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 (x 10 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. |

### 7.5.1. RESULTS OF THE ANALYSIS

The artefacts recovered during the test excavation program within the development footprint underwent a detailed lithics analysis by Dr Amanda Markham (Archaeologist, Austral). The distribution of artefacts within the test pits is presented in Table 7.12.

Results are presented first in terms of the excavated assemblage as a whole looking at:

- The distribution and extent of artefacts including spatially between test pits and vertically between spits.
- The average artefact density of each test pit per square m and the overall average artefact density per square m of the total area excavated.
- Assemblage composition including raw material type, cortex type and amount and artefact classification.

A total of 79 test pits were excavated within the Project Area. A total of 25 Aboriginal stone artefacts were recovered from 14 of the 79 test pits. The distribution of artefacts within the testing area, transects and test pits is presented in Table 7.12 and Table 7.13.

The largest number of artefacts was recovered from testing area 4 and testing area 6, each with a total of 9 artefacts which accounts for 36% each of the total assemblage. Testing areas 1, 2, 5 and 7 each contained a single artefact which accounts for 4 % each of the total assemblage (Table 7.12).

The largest number of artefacts recovered from a single test pit was 4, and they were recovered from testing area 4, transect A, test pit 3 (4A3) testing area 6, transect A test pit 4 (6A4) and testing area 6, transect B test pit 3 (6B3). Testing area 3, transect A test pit 4 (3A4), testing area 4, transect A, test pit 4 (TA4), testing area 4, transect C, test pit 1 (4C1), testing area 6, transect A, test pit 3 (6A3) contained 2 artefacts. Testing area 1, transect A, test pit 2 (1A2), testing area 2, transect B, test pit 3 (2B3), testing area 3, transect A, test pit 1 (3A1), testing area 4, transect B, test pit 1 (4B1) testing area 5, transect A, test pit 3 (5A3), testing area 6, transect C, test pit 1 (6C1) and testing area 7, transect A, test pit 5 (7A5) each contained a single artefact (Table 7.12).

**Table 7.12 Distribution of artefacts within test areas and transects**

| Testing Area | Transect | Pit Number. | Number of artefacts | Total No. artefacts per testing area | Percentage of the total assemblage |
|---|---|---|---|---|---|
| 1 | A | 2 | 1 | 1 | 4 |
| 2 | B | 3 | 1 | 1 | 4 |
| 3 | A | 1 | 1 | 3 | 12 |
| | | 4 | 2 | | |
| 4 | A | 3 | 4 | 9 | 36 |
| | | 4 | 2 | | |
| | B | 3 | 1 | | |
| | C | 1 | 2 | | |
| 5 | A | 3 | 1 | 1 | 4 |
| 6 | A | 4 | 4 | 9 | 36 |
| | B | 3 | 4 | | |

| Testing Area | Transect | Pit Number. | Number of artefacts | Total No. artefacts per testing area | Percentage of the total assemblage |
|---|---|---|---|---|---|
| | C | 1 | 1 | | |
| 7 | A | 5 | 1 | 1 | 4 |
| **Total** | | **14** | **25** | | **100** |

The majority of artefacts were recovered from spit 3 (32%, n=8), followed by spit 1 (0.28%, n=7). Four artefacts were identified in spit 2 (16%) and 2 artefacts were recovered from both spit 4 and 5 (8% ea.). A single artefact was recovered from spit 5 (4%) [Table 7.13]. No artefacts were recovered from spit 6 and or spit 7.

**Table 7.13 Distribution of artefacts within test pits**

| Testing area, Transact, Test Pit | Spit Number | | | | | | Total | Percentage of the total assemblage (%) |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 8 | | |
| 1A2 | - | 1 | - | - | - | - | 1 | 4 |
| 2B3 | - | 1 | - | - | - | - | 1 | 4 |
| 3A1 | - | - | - | - | - | 1 | 1 | 4 |
| 3A4 | - | - | 1 | - | 1 | - | 2 | 8 |
| 4A3 | - | - | 2 | 2 | - | - | 4 | 16 |
| 4A4 | - | - | 2 | - | - | - | 2 | 8 |
| 4B3 | 1 | - | - | - | - | - | 1 | 4 |
| 4C1 | 1 | - | 1 | - | - | - | 2 | 8 |
| 5A3 | - | 1 | - | - | - | - | 1 | 4 |
| 6A4 | 1 | - | 2 | - | 1 | - | 4 | 16 |
| 6B3 | 3 | 1 | - | - | - | - | 4 | 16 |
| 6C1 | 1 | - | - | - | - | - | 1 | 4 |
| 7A5 | 1 | - | - | - | - | - | 1 | 4 |
| **Total** | **7** | **4** | **8** | **2** | **2** | **1** | **25** | **100** |

### 7.5.2. ARTEFACT DENSITY

The overall average artefact density of the total tested area is 1.27 artefacts per m squared (Table 7.14). Testing area 6 had the largest average artefact density with 3 artefacts per $m^2$ while testing area 4 had an average artefact density of 2.4 artefacts per $m^2$.

**Table 7.14 Artefact density of the tested area**

| Test Area | Number of Artefacts | Total Area Tested m2 | Average Artefact Density ($m^2$) |
|---|---|---|---|
| 1 | 1 | 2.5 | 0.4 |
| 2 | 1 | 2.75 | 0.36 |
| 3 | 3 | 5.75 | 0.52 |
| 4 | 9 | 3.75 | 2.4 |
| 5 | 1 | 0.75 | 1.3 |
| 6 | 9 | 3 | 3 |
| 7 | 1 | 1.25 | 0.8 |
| Total | 25 | 19.75 | 1.27 |

### 7.5.3. RAW MATERIALS

Quartz is the dominant raw material within the excavated assemblage, accounting for 40% (n=10), followed by silcrete which accounts for 32% (n=8), while quartzite accounts for 24% (n=6) of the excavated assemblage. There was only one piece of chert (4%) identified with in the assemblage (Table 7.15).

**Table 7.15 Raw materials of the excavated assemblage by test pit.**

| Test Pit | Raw Material | | | | Total |
|---|---|---|---|---|---|
| | Chert | Quartz | Quartzite | Silcrete | |
| 1A2 | - | 1 | - | - | **1** |
| 2B3 | - | - | - | 1 | **1** |
| 3A1 | - | - | - | 1 | **1** |
| 3A4 | - | 1 | - | 1 | **2** |
| 4A3 | - | - | 4 | - | **4** |
| 4A4 | - | 1 | 1 | - | **2** |

| Test Pit | Raw Material | | | | Total |
|---|---|---|---|---|---|
| | Chert | Quartz | Quartzite | Silcrete | |
| 4B3 | - | - | - | 1 | **1** |
| 4C1 | - | 1 | - | 1 | **2** |
| 5A3 | 1 | - | - | - | **1** |
| 6A4 | - | 3 | 1 | - | **4** |
| 6B3 | - | 2 | - | 2 | **4** |
| 6C1 | - | - | - | 1 | **1** |
| 7A5 | - | 1 | - | - | **1** |
| **Total** | **1** | **10** | **6** | **8** | **25** |

### 7.5.4. ARTEFACT TYPES

Broken/pieces (this category includes proximal, medial and distal fragments as well as flake pieces) and thumbnail scrapers account for a large portion of the assemblage (28%, n=7 each), followed by scrapers (24%, n=6). Less common artefact types include debitage (8%, n=2), Bondi point (4%, n=1), cores (4%, n=1), and flakes (4%, n=1), [Table 7.16].

**Table 7.16 Artefact type by test pit**

| Test Pit | Artefact Type | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Bondi Point | Core | Debitage | Flake | Scraper | Thumbnail Scraper | Broken /Pieces | |
| 1A2 | - | - | - | - | - | - | 1 | **1** |
| 2B3 | - | - | - | - | - | - | 1 | **1** |
| 3A1 | - | - | - | - | 1 | - | - | **1** |
| 3A4 | - | - | 1 | 1 | - | - | - | **2** |
| 4A3 | - | - | - | - | 1 | 1 | 2 | **4** |
| 4A4 | - | - | - | 1 | - | 1 | - | **2** |
| 4B3 | - | - | - | - | 1 | - | - | **1** |
| 4C1 | - | - | 1 | - | 1 | - | - | **2** |

| Test Pit | Artefact Type | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Bondi Point | Core | Debitage | Flake | Scraper | Thumbnail Scraper | Broken /Pieces | |
| 5A3 | - | 1 | - | - | - | - | - | **1** |
| 6A4 | - | - | 1 | - | - | 2 | 1 | **4** |
| 6B3 | 1 | - | - | - | 1 | 1 | 1 | **4** |
| 6C1 | - | - | - | - | - | 1 | - | **1** |
| 7A5 | - | - | - | - | - | - | 1 | **1** |
| **Total** | **1** | **1** | **3** | **2** | **5** | **6** | **7** | **25** |

The majority of artefacts within the excavated assemblage were made of quartz (40%, n=10). These include one Bondi point and scraper, 2 flakes, 3 thumbnail scrapers and 3 broken/pieces. Silcrete (32%, n=8) was also a common raw material type within the excavated assemblage with one thumbnail scrapper, 2 broken/pieces, 3 scrapers, and 2 single pieces of debitage. Quartzite (24%, n=6) was less common but still represented within the excavated assemblage with one scraper, 2 thumbnail scrapers, 2 broken/pieces and one piece of debitage. The chert artefact that was identified was a core [Table 7.17].

**Table 7.17 Artefact type by raw material**

| Artefact Type | Raw Material | | | | Total |
|---|---|---|---|---|---|
| | Chert | Quartz | Quartzite | Silcrete | |
| Bondi Point | - | 1 | - | - | **1** |
| Core | 1 | - | - | - | **1** |
| Debitage | - | - | 1 | 2 | **3** |
| Flake | - | 2 | - | - | **2** |
| Scraper | - | 1 | 1 | 3 | **5** |
| Thumbnail Scraper | - | 3 | 2 | 1 | **6** |
| Broken/Piece | - | 3 | 2 | 2 | **7** |
| **Total** | **1** | **10** | **6** | **8** | **25** |

Following the size class code used in Dibden (2010, p. 18) to explore the variation in artefact size, all collected artefacts from the assemblage were assigned to a size class based on their maximum dimensions. The results demonstrate that artefacts measuring between 10 – 19.99 mm (size class 2) are dominant, representing 60% (n=15) of the assemblage (Table 7.18).

**Table 7.18 Artefact size class based on maximum length**

| Size Class | Dimensions | Count | % |
|---|---|---|---|
| 1 | 5-9.9 mm | 4 | 16 |
| 2 | 10 – 19.99mm | 15 | 60 |
| 3 | 20 – 29.99 mm | 6 | 24 |

### 7.5.5. CORTEX

An artefact's stage and degree of reduction can be determined by examining the quantity and kind of preserved cortex, which can also reveal information about the probable source of specific raw materials. The presence of cortex, for example, may suggest that the flake from which a tool was formed was among the earliest to have been removed from the core, even though this is based on the assumption that removal of the cortex constitutes the initial stage of core reduction or tool manufacturing (Andrefsky Jr 1998:103; Bousman 2005:209). Similarly, the lack of cortical artefacts in an assemblage can suggest that the core's initial reduction was done somewhere else.

More than half (56%, n=14) of the recovered artefacts contained cortex in the form of either primary or weathered. The majority of quartz artefacts (80%, n=8) retained some form of cortex. Four (50%) of the 8 recovered silcrete artefacts retained cortex. Only 2 (33.33%) of the 6 quartzite artefacts retained any cortex and none of the recovered chert artefacts retained any cortex (100%, n=1) [Table 7.19].

**Table 7.19 Cortex type and percentage per artefact by raw material**

| Raw Material | Cortex Type and artefact count | | | |
|---|---|---|---|---|
| | Primary | Percentage of Cortex (%) | Weathered | Percentage of Cortex (%) |
| Silcrete | 2 | 25, 50 | 2 | 5, 50 |
| Quartz | 1 | 50 | 7 | 10, 25, 25, 40, 50, 50, 80 |
| Quartzite | 1 | 25 | 1 | 25 |

## 7.6. IDENTIFIED ABORIGINAL SITES

The archaeological survey was completed between 22 and 25 January 2024, and a supplementary survey was conducted on 10 April 2024 and 3 June 2025. Archaeological test excavations were completed between 4 and 10 April 2024, 29 April and 8 May 2024 and 24 and 28 June 2024.

A total of 18 new sites were identified as part of the archaeological survey and a further 12 sites were identified during the testing program. There for a total of 30 new sites were identified within the Project Area. An additional 1 site from the previously 19 recorded sites were revisited during the original survey. The sites identified as part of this investigation are outlined in Table 7.20.

**Table 7.20 Survey units and testing areas and identified sites**

| AHIMS No. | Site name | Feature(s) | Testing area / Survey Unit | Landform |
|---|---|---|---|---|
| 52-4-0772 | Wattle Creek 1 | Low Density Artefact Scatter* | SU1 | Mid to Low Slope |
| 52-4-0773 | Wattle Creek 2 | Isolated Artefact* | SU1 | Mid to Low Slope |
| 52-4-0771 | Wattle Creek 3 | Isolated Artefact | SU1 | Mid to Low Slope |
| 52-4-0774 | Wattle Creek 4 | Isolated Artefact | SU1 | Crest/Upper Slope |
| 52-4-0775 | Wattle Creek 5 | Isolated Artefact* | SU8 | Open Plain |
| 52-4-0776 | Wattle Creek 6 | High Density Artefact Scatter, PAD* | SU8 | Lower Slope of a Terrace |
| 52-4-0769 | Wattle Creek 7 | Low Density Artefact Scatter* | SU5 | Crest |
| 52-4-0777 | Wattle Creek 8 | Low Density Artefact Scatter* | SU4 | Mid-Slope |
| 52-4-0768 | Wattle Creek 9 | Isolated Artefact | SU6 | Mid-Slope |
| 54-4-0767 | Wattle Creek 10 | Scared Tree* | SU7 | Hill Slope |
| 52-4-0766 | Wattle Creek 11 | Isolated Artefact | SU3 | Slope |
| 52-4-0770 | Wattle Creek 12 | Isolated Artefact* | SU5 | Elevated flat |
| 52-4-0782 | Wattle Creek 13 | Low Density Artefact Scatter* | SU5 | Elevated flat |
| 52-4-0781 | Wattle Creek 14 | Isolated Artefact* | SU5 | Elevated flat |
| 52-4-0780 | Wattle Creek 15 | Isolated Artefact* | SU7 | Elevated flat |
| 52-4-0779 | Wattle Creek 16 | Isolated Artefact* | SU7 | Slope |
| 52-4-0806 | Wattle Creek 17 | Isolated Artefact | SU9 | Slope |
| 52-4-0805 | Wattle Creek 18 | Isolated Artefact | SU9 | Slope |
| 52-4-0807 | Wattle Creek AFT 13 | Isolated Artefact | Testing Area 1 | Ridge |
| 52-4-0808 | Wattle Creek AFT 14 | Isolated Artefact | Testing Area 2 | Slope |
| 52-4-0818 | Wattle Creek AFT 15 | Isolated Artefact | Testing Area 3 | Footslope |

| AHIMS No. | Site name | Feature(s) | Testing area / Survey Unit | Landform |
|---|---|---|---|---|
| 52-4-0811 | Wattle Creek AFT 16 | Isolated Artefact | Testing Area 4 | Footslope |
| 52-4-0813 | Wattle Creek AFT 17 | Isolated Artefact | Testing Area 5 | Elevated flat |
| 52-4-0816 | Wattle Creek AFT 18 | Isolated Artefact | Testing Area 6 | Slope |
| 52-4-0817 | Wattle Creek AFT 19 | Isolated Artefact | Testing Area 7 | Slope |
| 52-4-0809 | Wattle Creek AS 5 | Isolated Artefact | Testing Area 3 | Slope |
| 52-4-0810 | Wattle Creek AS 6 | Low Density Artefact Scatter | Testing Area 4 | Valley & Hollow |
| 52-4-0812 | Wattle Creek AS 7 | Low Density Artefact Scatter | Testing Area 4 | Slope |
| 52-4-0814 | Wattle Creek AS 8 | Low Density Artefact Scatter, PAD | Testing Area 6 | Slope |
| 52-4-0815 | Wattle Creek AS 9 | Low Density Artefact Scatter | Testing Area 6 | Elevated flat |
| 52-4-0134 | TME-OS2 with PAD | Low Density Artefact Scatter, PAD | SU9 | Slope |

*These sites were originally within the development associated with these survey units, however, due to refinements made by Spark Renewables to the conceptual project layout, the sites are no longer within the development footprint.

*WATTLE CREEK 1 (AHIMS #52-4-0772)*

| | |
|---|---|
| Site type | Low Density Artefact Scatter |
| Centroid | GDA 94 Zone 56 230593 m E and 6165789 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 1 (AHIMS #52-4-0772) is situated in a mid to low slope within the Project Area (outside the development footprint). The site is located approximately 135 m east of the main dirt track/driveway of Arthursleigh Farm, 220 m north of Canyonleigh Road and 84 m south of Wattle Creek 3 (AHIMS #52-4-0771). The site consists of 7 red silcrete artefacts in the form of 3 cores, 3 flakes and a piece of debitage.

This site was originally within SU1, however, it now lies approximately 20 m east of the survey unit due to a change in the development footprint.

The site is located on a mid-slope in an area that has been previously cleared of vegetation and subject to disturbances from cattle, powerline installation and water erosion. Due to historical clearing and powerline infrastructure, there is a low potential for the site to extend beyond the observed boundary, or to have a subsurface component. The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.85 contains a representative image indicating the cultural material identified within Wattle Creek AS (AHIMS #52-4-0772).



**Figure 7.85 Wattle Creek 1 (AHIMS #52-4-0772).**

*WATTLE CREEK 2 (AHIMS #52-4-0773)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 230597 m E and 6165874 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 2 (AHIMS #52-4-0773) is situated in a mid to low slope within the Project Area (and outside the development footprint). The site is located approximately 145 m east of the main dirt track/driveway of Arthursleigh Farm, 300 m north of Canyonleigh Road and 84 m south of Wattle Creek 1 (AHIMS #52-4-0772).

The site consists of a single grey/red silcrete core scraper measuring 27 mm long, 17.5 mm wide and 6.7 mm thick with 60% cortex retained and 3 negative flake scars. This artefact was located on earthworks adjacent to a dam.

This site was originally within SU1, however, it now lies approximately 30 m east of the survey unit due to a change in the development footprint.

This artefact was located on earthworks adjacent to a dam and is not in-situ. There is no potential for the site boundary to extend beyond that observed during the survey. The boundary was determined by measurement with a range pole and a pedestrian search of the area by a survey team of 4 members.

Figure 7.86 contains a representative image indicating the cultural material identified within Wattle Creek 2 (AHIMS #52-4-0773).




**Figure 7.86 Silcrete core scraper of Wattle Creek 2 (AHIMS #52-4-0773)**

*WATTLE CREEK 3 (AHIMS #52-4-0771)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 230439 m E and 6165960 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 3 (AHIMS #52-4-0771) is situated on a mid to low slope within the Project Area (within the development footprint). The site is located on the main dirt track/driveway of Arthursleigh Farm, approximately 415 m north of Canyonleigh Road and 184 m north of Wattle Creek 2 (AHIMS #52-4-0773). The site consists of a quartzite river cobble ground edged mortar with pitting on one end measuring 90 mm long, 60 mm wide and 50 mm thick. This site is not in-situ and is located on the side of the main dirt track/driveway of Arthursleigh Farm.

This artefact was located on the main Arthursleigh access road and is not in-situ. There is no potential for the site boundary to extend beyond that observed during the survey. The boundary was determined by measurement with a range pole and a pedestrian search of the area by a survey team of 4 members.

Figure 7.87 contains a representative image indicating the cultural material identified within Wattle Creek AFT 3 (AHIMS #52-4-0771).




**Figure 7.87 Quartzite river cobble ground edged mortar of Wattle Creek 3 (AHIMS #52-4-0771)**

*WATTLE CREEK 4 (AHIMS #52-4-0774)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 230296 m E and 6166511 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 4 (AHIMS #52-4-0774) is situated on a crest/upper slope within the Project Area (within the development footprint). The site is located on the main dirt track/driveway of Arthursleigh Farm, approximately 982 m north of Canyonleigh Road and 572 m north of Wattle Creek 3 (AHIMS #52-4-0771). The site consists of a ground edge quartzite river cobble fragment, a possible hand axe measuring 54.1 mm long, 20.7 mm wide and 15.9 mm thick. The artefact was not in-site and was located on the side of the main dirt track/driveway of Arthursleigh Farm.

This artefact was located on the main Arthursleigh access road and is not in-situ. There is no potential for the site boundary to extend beyond that observed during the survey. The boundary was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.88 contains a representative image indicating the cultural material identified within Wattle Creek AFT 3 (AHIMS #52-4-0774).




**Figure 7.88 Ground edge quartzite river cobble fragment, a possible hand axe. Wattle Creek AFT 4 (AHIMS #52-4-0774).**

*WATTLE CREEK 5 (AHIMS #52-4-0775)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 227712 m E and 6170798 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 5 (AHIMS #52-4-0075) is situated in an open plain within the Project Area (outside the development footprint). The site is located approximately 630 m east of the main dirt track/driveway of Arthursleigh Farm's northern entrance, 200 m east of Wattle Creek 6 (AHIMS 52-4-0776) and 2.1 km south-east of the Big Hill Uniting Church. The site consists of a single quartzite core measuring 44.67 mm long, 56.02 mm wide and 35.52 mm thick.

This site was originally within SU8, however, it now lies approximately 65 m east of the development footprint.

The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.89 contains a representative image indicating the cultural material identified within Wattle Creek 5 (AHIMS #52-4-0075).




**Figure 7.89 Quartzite core. Wattle Creek 5 (AHIMS #52-4-0075).**

*WATTLE CREEK 6 (AHIMS #52-4-0776)*

| | |
|---|---|
| Site type | High Density Artefact Scatter, PAD |
| Centroid | GDA 94 Zone 56 227511 m E and 6170744 m N |
| Site Extent | 25 m X 15 m |

Wattle Creek 6 (AHIMS #52-4-0776) is situated on the lower slope of a terrace within the Project Area (outside the development footprint).

The site is located approximately 68 m west of the main dirt track/driveway of Arthursleigh Farm's northern entrance, 200 m west of Wattle Creek 5 (AHIMS #52-4-0075) and 2 km south-east of the Big Hill Uniting Church. The site consists of a stone artefact scatter of more than 100 artefacts, resulting in a density of approximately 4.5 artefacts per square m. A sample of artefacts were recorded, including a silcrete flake measuring 27.1 mm long, 18.2 mm wide and 6.7 mm thick with a flaked platform and feather termination, a quartz flake measuring 16.1 mm long, 12.9 mm wide and 4.1 mm thick with a crushed platform and feather termination, a quartzite thumbnail scraper measuring 14. mm long, 12.7 mm wide and 3. mm thick with a focal platform and feather termination, a chert core/blade slug measuring 24.1 mm long, 5.7 mm wide and 4.2 mm thick with a bipolar flaked platform, a quartz scraper measuring 12.1 mm long, 18.7 mm wide and 4.3 mm thick with a crushed platform and feather termination, a silcrete core measuring 25.4 mm long, 26.3 mm wide and 21.5 mm thick with 5 negative flake scars and a volcanic proximal fragment measuring 16.2 mm long, 17.2 mm wide and 6.7 mm thick with a facet platform.

This site was originally within SU8, however, it now lies approximately 65 m west of the development footprint.

Wattle Creek 6 (AHIMS # 52-4-0776) comprises a very high density surface artefact extending over an area of 5 m x 5 m, and an area of PAD covering 25 m x 15 m. The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members. The PAD has been determined by the width of the elevated flat landform on the southern side of the unnamed tributary of Island Creek.

Figure 7.90 and Figure 7.91 contain representative images indicating the cultural material identified within Wattle Creek 6 (AHIMS #52-4-0776).




**Figure 7.90 A selection of representative artefacts from Wattle Creek 6 (AHIMS #52-4-0776).**




**Figure 7.91 A selection of representative artefacts from Wattle Creek 6 (AHIMS #52-4-0776).**

*WATTLE CREEK 7 (AHIMS #52-4-0769)*

| | |
|---|---|
| Site type | Low Density Artefact Scatter |
| Centroid | GDA 94 Zone 56 228661 m E and 6166461 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 7 (AHIMS #52-4-0769) is situated on a crest within the Project Area (outside the development footprint). The site is located approximately 1.25 km north of Canyonleigh Road, 120 m west of the Wollondilly River and 214 m north of Wattle Creek 14 (AHIMS #52-4-0781). The site consists of two stone artefacts including an FGS blade measuring 33.3 mm long, 12.8 mm wide and 4.0 mm thick with a flaked platform, and an FGS flaked piece measuring 19.1 mm long, 31.9 mm wide and 5.8 mm thick with a flaked platform

This site was originally within SU5, however, it now lies approximately west 900 m south of the development footprint.

The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.92 contains a representative image indicating the cultural material identified within Wattle Creek 7 (AHIMS #52-4-0769).




**Figure 7.92 FGS blade (left) and FGS flaked piece (right) Wattle Creek 7 (AHIMS #52-4-0769).**

*WATTLE CREEK 8 (AHIMS #52-4-0777)*

| | |
|---|---|
| Site type | Low Density Artefact Scatter |
| Centroid | GDA 94 Zone 56 226993 m E and 6169348 m N |
| Site Extent | 2 m X 2 m |

Wattle Creek 8 (AHIMS #52-4-0777 is situated on a mid-slope in an undulation hill/plain within the Project Area (outside the development footprint). The site is located approximately 1.5 km east of the Project Area's western boundary, 2.5 km south-east of Big Hill Uniting Church and 370 m south of Island Creek. The site consists of 2 stone artefacts including a quartz blade proximal fragment measuring 46.7 mm long, 28.6 mm wide and 8.2 mm thick with a flaked platform and a quartz point proximal fragment measuring 29.7 mm long, 14.4 mm wide and 7.6 mm thick. Artefacts were found with in exposure associated with a small scour.

This site was originally within SU4, however, it now lies approximately 1.5 km west of the development footprint.

The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.93 contains a representative image indicating the cultural material identified within Wattle Creek 8 (AHIMS #52-4-0777).




**Figure 7.93 Quartz artefacts identified within Wattle Creek 8 (AHIMS #52-4-0777).**

*WATTLE CREEK 9 (AHIMS #52-4-0768)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 228708 m E and 6167636 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 9 (AHIMS #52-4-0768) is situated on a mid-slope within the Project Area (within the development footprint). The site is located approximately 1.3 km west of the main dirt track/driveway of Arthursleigh Farm and 350 m west of Wollondilly River. The site consists of a single quartz distal flake fragment measuring 14.6 mm long, 8.6 mm wide and 3.7 mm thick with a feather termination. This site was identified with in the exposure associated with a cattle pad on a mid-slope and is unlikely to be in its original context.

The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.94 contains a representative image indicating the cultural material identified within Wattle Creek 9 (AHIMS #52-4-0768).




**Figure 7.94 Quartz distal flake fragment from Wattle Creek 9 (AHIMS #52-4-0768).**

*WATTLE CREEK 10 (AHIMS #54-4-0767)*

| | |
|---|---|
| Site type | Scarred tree (Restricted site) |
| Centroid | GDA 94 Zone 56 229750 m E and 6167380 m N |
| Site Extent | 10 m X 10 m |

Wattle Creek 10 (AHIMS #54-4-0767) is situated on a hillslope within the Project Area (outside the development footprint). The site is located approximately 320 m west of the main dirt track/driveway of Arthursleigh Farm, and 720 m east of the Wollondilly River. The site consists of a stringybark scarred tree

in excellent live condition with a canopy of 10 m and an approximate diameter of 1,100 mm. The scar is on the north-east face and measures 1,300 mm long, 340 mm wide and has 250 mm of regrowth.

This site was originally within SU7, however, it now lies approximately 100 m west of the development footprint.

Figure 7.95 contains a representative image indicating the cultural material identified within Wattle Creek 10 (AHIMS #54-4-0767).

**The site will be redacted from the publicly available version of the ACHA at the request of the Aboriginal representatives on-site during the survey.*



**Figure 7.95 Scarred tree Wattle Creek 10 (AHIMS #54-4-0767).**

*WATTLE CREEK 11 (AHIMS #52-4-0766)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 230192 m E and 6165641 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 11 (AHIMS #52-4-0766) is situated on a slope within the Project Area (outside the development footprint). The site is located approximately 958 m east of the main dirt track/driveway of Arthursleigh Farm's northern entrance, 288 m south-west of Wattle Creek 6 (AHIMS #52-4-0776), 460 m north of Island Creek and 2.1 km south-east of the Big Hill Uniting Church. The site consists of a single quartzite core measuring 68.79 mm long, 65.82 mm wide and 28.39 mm thick.

This site was originally within SU3, however, it now lies approximately 315 m west of the development footprint.

The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.96 contains a representative image indicating the cultural material identified within Wattle Creek 11 (AHIMS #52-4-0766).




**Figure 7.96 Quartzite core. Wattle Creek 11 (AHIMS #52-4-0766).**

*WATTLE CREEK 12 (AHIMS #52-4-0770)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 229142 m E and 6165678 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 12 (AHIMS #52-4-0770) is situated on an elevated flat within the Project Area (outside the development footprint). The site is located approximately 390 m north of Canyonleigh Road and 180 m west of the Wollondilly River). The site consists of a quartzite core measuring 98.79 mm long, 65.82 mm wide and 28.39 mm thick with a crushed platform.

This site was originally within SU5; however, it now lies approximately 565 m west of the nearest portion of the development footprint and is separated by the Wollondilly River.

The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.97 contains a representative image indicating the cultural material identified within Wattle Creek 12 (AHIMS #52-4-0770).




**Figure 7.97 Quartzite core. Wattle Creek 12 (AHIMS #52-4-0770).**

*WATTLE CREEK 13 (AHIMS #52-4-0782)*

| | |
|---|---|
| Site type | Low Density Artefact Scatter |
| Centroid | GDA 94 Zone 56 229061 m E and 6165893 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 13 (AHIMS #52-1-0782) is situated on an elevated flat within the Project Area (outside the development footprint). The site is located approximately 600 m north of Canyonleigh Road, 180 m west of the Wollondilly River and 225 m north of Wattle Creek 12 (AHIMS #52-4-0770). The site consists of two quartzite artefacts, a flake measuring, 10.99 mm wide and 3.6 mm thick with a crushed platform and a broken flake.

This site was originally within SU5; however, it now lies approximately 660 m west of the nearest portion of the development footprint and is separated by the Wollondilly River.

The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.98 contains a representative image indicating the cultural material identified within Wattle Creek 13 (AHIMS #52-1-0782).




**Figure 7.98 Two quartzite artefacts. Wattle Creek 13 (AHIMS #52-1-0782).**

*WATTLE CREEK 14 (AHIMS #52-4-0781)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 228769 m E and 6166275 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 14 (AHIMS #52-4-0781) is situated on an elevated flat within the Project Area (outside the development footprint). The site is located approximately 1.10 km north of Canyonleigh Road, 178 m west of the Wollondilly River and 214 m south of Wattle Creek 7 (AHIMS #52-4-0769). The site consists of a single quartzite flake measuring 19.96 mm long, 17.59 mm wide and 5.57 mm thick with a crushed platform, this artefact was located on a stock track.

This site was originally within SU5; however, it now lies approximately 1 km south of the development footprint.

The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.99 contains a representative image indicating the cultural material identified within Wattle Creek 14 (AHIMS #52-4-0781).




**Figure 7.99 Quartzite flake. Wattle Creek 14 (AHIMS # 52-4-0781).**

*WATTLE CREEK 15 (AHIMS #52-4-0780)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 229817 m E and 6166927 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 15 (AHIMS #52-4-0780) is situated on an elevated flat within the Project Area (outside the development footprint). The site is located approximately 325 m west of the main dirt track/driveway of Arthursleigh Farm, 1.5 km north of Canyonleigh Road, 460 m south of Wattle Creek 10 (AHIMS #54-4-0767) and 970 m south-west of Wollondilly River. The site consists of a single quartz flake measuring 27.86 mm long, 17.74 mm wide and 7.47 mm thick with a crushed platform and feather termination. This artefact was located in an eroded gully wash-off area.

This site was originally within SU7; however, it now lies approximately 255 m west of the development footprint.

The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.100 contains a representative image indicating the cultural material identified within Wattle Creek 15 (AHIMS #52-4-0780).




**Figure 7.100 Quartz flake. Wattle Creek 15 (AHIMS #52-4-0780).**

*WATTLE CREEK 16 (AHIMS #52-4-0779)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 229986 m E and 6166876 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 16 (AHIMS #52-4-0779) is situated on a slope in a wash-off area in a gully in a mid-undulating plain within the Project Area (outside the development footprint). The site is located approximately 180 m west of the main dirt track/driveway of Arthursleigh Farm, 575 m south of Wattle Creek 10 (AHIMS #54-4-0767) and 1.3 km south-east of Wollondilly River. The site consists of a possible quartzite hand axe in two parts with one part measuring 22.75 mm long, 81.21 mm wide and 23.93 mm and the other measuring 76 mm long, 69.13 mm wide and 29.31 mm. This artefact was found under the canopy area of a tree.

This site was originally within SU7; however, it now lies approximately 52 m west of the development footprint.

The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.101 and Figure 7.102 contain representative images indicating the cultural material identified within Wattle Creek 16 (AHIMS #52-4-0779).




**Figure 7.101 Possible quartzite hand axe. Wattle Creek 16 (AHIMS #52-4-0779).**




**Figure 7.102 Possible quartzite hand axe conjoined. Wattle Creek 16 (AHIMS #52-4-0779).**

*WATTLE CREEK 17 (AHIMS #52-4-0806)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 230271 m E and 6165690 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 17 (AHIMS #52-4-0806) is situated on a slope within the Project Area (within the development footprint). The site is located approximately 190 m west of the main dirt track/driveway of Arthursleigh Farm, 216 m north of Canyonleigh Road, 370 m east of the power station and 92 m north-east of Wattle Creek 18 (AHIMS #52-4-0805). The site consists of a single quartz proximal fragment measuring 15.53 mm long, 16.44 mm wide and 8.76 mm thick with a focal platform. The site is located near an ant nest.

This site was originally within SU9; however, it now lies approximately 55 m north of the development footprint. The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.103 contains a representative image indicating the cultural material identified within Wattle Creek 17 (AHIMS #52-4-0806).




**Figure 7.103 Quartz proximal fragment. Wattle Creek 17 (AHIMS #52-4-0806).**

*WATTLE CREEK 18 (AHIMS #52-4-0805)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 228449 m E and 6167214 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek 18 (AHIMS #52-4-0805) is situated on a slope within the Project Area (within the development footprint). The site is located approximately 250 m west of the main dirt track/driveway of Arthursleigh Farm, 190 m north of Canyonleigh Road, 290 m east of the power station and 92 m north-east of Wattle Creek 17 (AHIMS #52-4-0806). The site consists of a single milky quartz flake measuring 43.02 mm long, 30.15 mm wide and 11.01 mm thick with backing to quadrants 2 and 3 and evidence of use wear. The site was located within an exposure at the base of a stringy bark tree.

This site was originally within SU9; however, it now lies approximately 35 m north of the development footprint.

The boundary of the surface artefact scatter was determined by measurement with a range pole and pedestrian search of the area by a survey team of 4 members.

Figure 7.104 and Figure 7.105 contains a representative image indicating the cultural material identified within Wattle Creek 18 (AHIMS #52-4-0805) and its environmental context.




**Figure 7.104 Quartz flake. Wattle Creek 18 (AHIMS #52-4-0805).**



**Figure 7.105 Wattle Creek 18 (AHIMS #52-4-0805) view south.**

*WATTLE CREEK AFT 13 (AHIMS #52-4-0807)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 230300 m E and 6166958 m N |
| Site Extent | 0.5 m X 0.5 m |

Wattle Creek AFT 13 (AHIMS #52-4-0807) is situated on a ridge within the Project Area (within the development footprint). The site is located approximately 1.5 km north of Canyonleigh Road, 150 m east of the main dirt track/driveway of Arthursleigh Farm and 1.5 km east of the Wollondilly River. The site consists of a single opaque quartz distal flake measuring 6.65 mm long, 8.45 mm wide and 2.85 mm thick with a feather termination.

The artefact was identified in a subsurface context, in a 500 by 500 mm test pit. The nature of the artefact and the observation that is the only one identified in testing area 1, indicates it is representative of isolated artefacts associated with the background scatter that can be seen across NSW. As such there are no further potential archaeological deposits associated with the artefact.

Figure 7.106 contains a representative image indicating the cultural material identified within Wattle Creek AFT 13 (AHIMS #52-4-0807).




**Figure 7.106 Quartz distal fragment from Wattle Creek AFT 13 (AHIMS #52-4-0807).**

*WATTLE CREEK AFT 14 (AHIMS #52-4-0808)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 229346 m E and 6167557 m N |
| Site Extent | 0.5 m X 0.5 m |

Wattle Creek AFT 14 (AHIMS #52-4-0808) is situated on a slope within the Project Area (within the development footprint). The site is located approximately 670 m west of the main dirt track/driveway of Arthursleigh Farm, 1.12 km north-west of Wattle Creek AFT 13 (AHIMS #52-4-0807) and 250 m south-east of the Wollondilly River. The site consists of a single red silcrete proximal flake measuring 19.93 mm long, 8.45 mm wide and 2.85 mm thick with a flaked platform.

The artefact was identified in a subsurface context, in a 500 by 500 mm test pit. The nature of the artefact and the observation that is the only one identified in testing area 2, indicates that it is representative of isolated artefacts associated with the background scatter that can be seen across NSW. As such there are no further potential archaeological deposits associated with the artefact.

Figure 7.107 contains a representative image indicating the cultural material identified within Wattle Creek AFT 14 (AHIMS #52-4-0808).

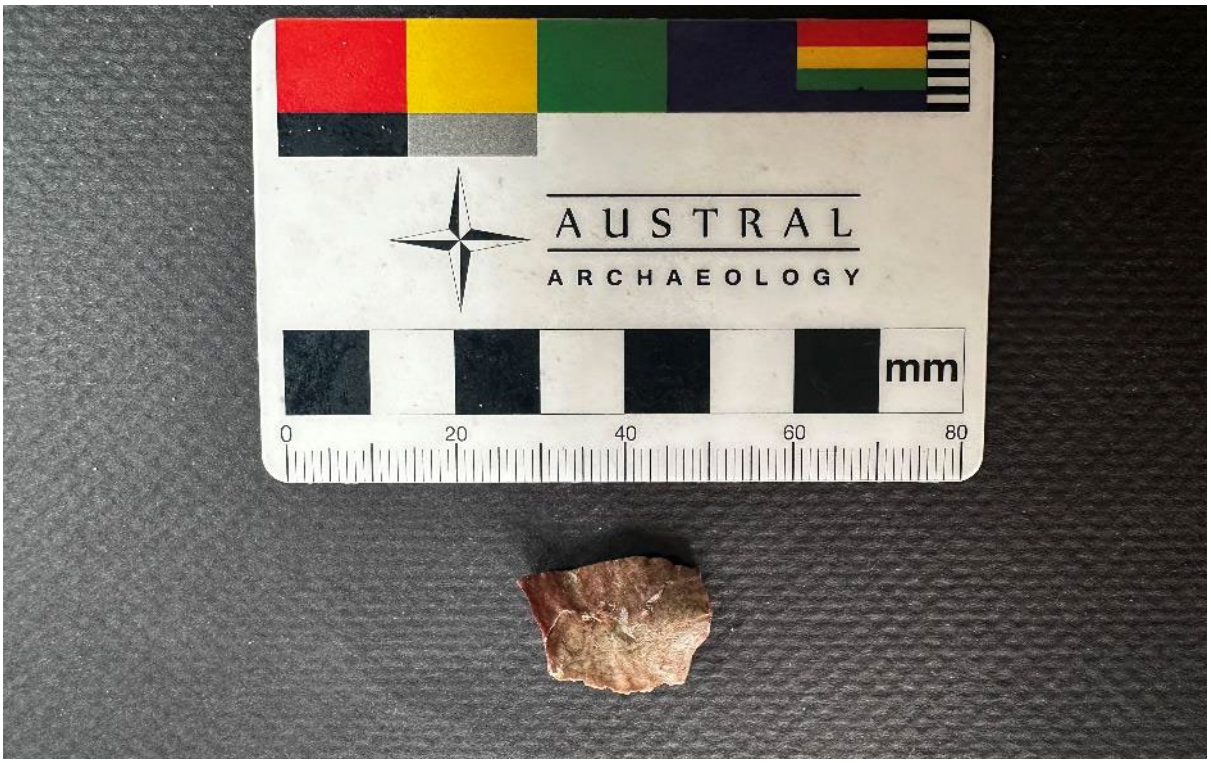



**Figure 7.107 Silcrete proximal flake. Wattle Creek AFT 14 (AHIMS #52-4-0808).**

*WATTLE CREEK AFT 15 (AHIMS #52-4-0818)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 229113 m E and 6165747 m N |
| Site Extent | 0.5 m X 0.5 m |

Wattle Creek AFT 15 (AHIMS #52-40818) is situated on an elevated flat within the Project Area (within the development footprint). The site is located approximately 500 m west of the power station, 400 m north of Canyonleigh Road, 160 m west of the Wollondilly River and 62 m south of Wattle Creek AS 5 (AHIMS #52-4-0809). The site consists of a single red silcrete scraper measuring 16.93 mm long, 27.48 mm wide and 3.84 mm thick with a flaked platform and feather termination.

The artefact was identified in a subsurface context, in a 500 by 500 mm test pit. The nature of the artefact and the observation that is located below 700 mm of the surface, indicates that it is not associated with other sites identified in the testing area. Therefore it is likely representative of isolated artefacts associated with the background scatter that can be seen across NSW. As such, there is no further potential archaeological deposits associated with the artefact.

Figure 7.108 contains a representative image indicating the cultural material identified within Wattle Creek AFT 15 (AHIMS #52-4-0818).




**Figure 7.108 Silcrete scraper from Wattle Creek AFT 15 (AHIMS #52-4-0818).**

*WATTLE CREEK AFT 16 (AHIMS #52-4-0811)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 229028 m E and 6168006 m N |
| Site Extent | 0.5 m X 0.5 m |

Wattle Creek AFT 16 (AHIMS #52-4-0811) is situated on a slope within the Project Area (within the development footprint). The site is located approximately 1 km west of the University of Sydney Arthursleigh Farm accommodation, 211 m west of the Wollondilly River and 178 m south-west of Wattle Creek AS 6 (AHIMS #52-4-0810). The site consists of a single red silcrete scraper measuring 8.86 mm long, 17.64 mm wide and 2.21 mm thick with a flaked platform, feather termination and evidence of use wear on quadrants 2 (100%) and quadrant 3 (25%).

The artefact was identified in a subsurface context, in a 500 by 500 mm test pit. The location of the artefact and the observation that is located below in the first 100 mm of the surface (indicating the possibility of it being a surface artefact) indicates that it is not associated with other sites identified in the testing area. Therefore, it is likely representative of isolated artefacts associated with the background scatter that can be seen across NSW. As such there are no further potential archaeological deposits associated with the artefact.

Figure 7.109 contains a representative image indicating the cultural material identified within Wattle Creek AFT 16 (AHIMS #52-4-0811).




**Figure 7.109 Silcrete scraper. Wattle Creek AFT 16 (AHIMS #52-4-0811).**

*WATTLE CREEK AFT 17 (AHIMS #52-4-0813)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 227687 m E and 6170676m N |
| Site Extent | 0.5 m X 0.5 m |

Wattle Creek AFT 17 (AHIMS #52-4-0813) is situated on a slope within the Project Area (outside the development footprint). The site is located approximately 2 km east of the Project Area's western boundary, 2.8 km west of the shearing shed, 2.1 km south-east of Big Hill Uniting Church and 600 m north of the Island Creek.

The site consists of a single chert core measuring 25.27 mm long, 16.05 mm wide and 12.76 mm thick with no cortex and 9 negative flake scars.

The artefact was identified in a subsurface context, in a 500 by 500 mm test pit. The nature of the artefact and the observation that is the only one identified in testing area 5, indicates that it is representative of isolated artefacts associated with the background scatter that can be seen across NSW. As such there is no further potential archaeological deposits associated with the artefact.

Figure 7.110 contains a representative image indicating the cultural material identified within Wattle Creek AFT 17 (AHIMS #52-4-0813).




**Figure 7.110 Chert core from Wattle Creek AFT 17 (AHIMS #52-4-0813).**

*WATTLE CREEK AFT 18 (AHIMS #52-4-0816)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 228449 m E and 6167214 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek AFT 18 (AHIMS #52-4-0816) is situated on a slope within the Project Area (within the development footprint). The site is located approximately 1.7 km west of the main dirt track/driveway of Arthursleigh Farm, 250 m south of Wattle Creek AS 8 (AHIMS #52-4-0814) and 330 m west of the Wollondilly River. The site consists of a single red silcrete thumbnail scraper measuring 12.82 mm long, 11.96 mm wide and 1.49 mm thick with a flaked platform, feather termination and evidence of scaler retouch on quadrants 1 (10%), 2 (100%) and 3 (30%)

The artefact was identified in a subsurface context, in a 500 by 500 mm test pit. The location of the artefact and the observation that is located below in the first 100 mm of the surface (indicating the possibility of it being a surface artefact) indicates that it is not associated with other sites identified in the testing area. Therefore, it is likely representative of isolated artefacts associated with the background scatter that can be seen across NSW. As such there are no further potential archaeological deposits associated with the artefact.

Figure 7.111 contains a representative image indicating the cultural material identified within Wattle Creek AFT 18 (AHIMS #52-4-0816).




**Figure 7.111 Silcrete thumbnail scraper of Wattle Creek AFT 18 (AHIMS #52-4-0816).**

*WATTLE CREEK AFT 19 (AHIMS #52-4-0817)*

| | |
|---|---|
| Site type | Isolated Artefact |
| Centroid | GDA 94 Zone 56 228700 m E and 6166420 m N |
| Site Extent | 1 m X 1 m |

Wattle Creek AFT 19 (AHIMS #52-4-0817) is situated on an elevated flat within the Project Area (within the development footprint). The site is located approximately 850 m south of Wattle Creek AFT 18 (AHIMS #52-4-0816), 1.6 km west of the main dirt track/driveway of Arthursleigh Farm, and 110 m west of the Wollondilly River. The site consists of a single opaque quartz flaked piece measuring 18.83 mm long, 20.86 mm wide and 4.8 mm thick with a feather termination and evidence of use wear on quadrants 1 (30%) and 2 (30%).

The artefact was identified in a subsurface context, in a 500 by 500 mm test pit. The nature of the artefact and the observation that is the only one identified in testing area 7, indicates that it is representative of isolated artefacts associated with the background scatter that can be seen across NSW. As such there is no further potential archaeological deposits associated with the artefact.

Figure 7.112 contains a representative image indicating the cultural material identified within Wattle Creek AFT 19 (AHIMS #52-4-0817).




**Figure 7.112 Quartz flaked piece. Wattle Creek AFT 19 (AHIMS #52-4-0817).**

*WATTLE CREEK AS 5 (AHIMS #52-4-0809)*

| | |
|---|---|
| Site type | Low Density Artefact Scatter |
| Centroid | GDA 94 Zone 56 229086 m E and 6165803 m N |
| Site Extent | 2 m X 2 m |

Wattle Creek AS 5 (AHIMS #52-4-0809) is situated on a footslope within the Project Area (within the development footprint). The site is located approximately 500 m west of the power station, 460 m north of Canyonleigh Road, 160 m west of the Wollondilly River and 62 m north of Wattle Creek AFT 15 (AHIMS #52-4-0818). The site consists of two artefacts a piece of silcrete debitage measuring 23.71 mm long, 7.49 mm wide and 4.3 mm thick with 25% primary cortex remaining and a quartz flake measuring 17.37 mm long, 13.65 mm wide and 2.96 mm thick with a crushed platform, feather termination and retaining 50% primary cortex. The quartz flake has evidence of use wear on all quadrants with 10% on quadrants 1 and 2, 100% on quadrant 3 and 70% on quadrant 4.

This artefact scatter was identified in a subsurface context, in a 500 by 500 mm test pit. The location of the artefact and the results of the neighbouring test pits, indicates that it is not associated with other sites identified in the testing area or have a large area surrounding it containing potential archaeological deposits, if any. Therefore, it is likely representative of isolated artefacts associated with the background scatter that can be seen across NSW.

Figure 7.113 contains a representative image indicating the cultural material identified within Wattle Creek AS 5 (AHIMS #52-4-0809).




**Figure 7.113 Quartz flake (left) and Silcrete debitage (right) of Wattle Creek AS 5 (AHIMS #52-4-0809).**

*WATTLE CREEK AS 7 (AHIMS #52-4-0812)*

| | |
|---|---|
| Site type | Low Density Artefact Scatter |
| Centroid | GDA 94 Zone 56 228869m E and 6167988 m N |
| Site Extent | 2 m X 2 m |

Wattle Creek AS 7 (AHIMS #52-4-0812) is situated on a slope within the Project Area (within the development footprint). The site is located approximately 1.2 km west of the University of Sydney Arthursleigh Farm accommodation, 350 m west of the Wollondilly River and 160 m north-west of Wattle Creek AFT 16 (AHIMS #52-4-0811). The site consists of two artefacts an opaque quartz steep edge scraper measuring 25.73 mm long, 19.98 mm wide and 8.75 mm thick with a crushed platform, feather termination, 25% weathered cortex and evidence of steep edge retouch on all quadrants with 20% on quadrants 1 and 2, 100% on quadrant 3 and 30% on quadrant 4 and a piece of red silcrete debitage measuring 8.12 mm long, 6.54 mm wide and 1.04 mm thick.

This artefact scatter was identified in a subsurface context, in a 500 by 500 mm test pit. The location and nature of the of the artefacts indicates that it is representative of the background scatter that can be seen across NSW. As such there is no further potential archaeological deposits associated with the artefact.

Figure 7.114 contains a representative image indicating the cultural material identified within Wattle Creek AS 7 (AHIMS #52-4-0812).




**Figure 7.114 Quartz steep edge scraper (left) and Silcrete debitage (right) from Wattle Creek AS 7 (AHIMS #52-4-0812).**

*WATTLE CREEK AS 6 (AHIMS #52-4-0810)*

| | |
|---|---|
| Site type | Low Density Artefact Scatter |
| Centroid | GDA 94 Zone 56 229177 m E and 6168104 m N |
| Site Extent | 45 m x 15 m |

Wattle Creek AS 6 (AHIMS #52-4-0810) is situated in an elevated flat within the Project Area (within the development footprint). The site is located approximately 940 m north-west of the University of Sydney Arthursleigh Farm accommodation, 160 m west of the Wollondilly River and 178 m north-east of Wattle Creek AFT 16 (AHIMS #52-4-0811). The site consists of 6 artefacts including a grey quartzite thumbnail scraper measuring 12.34 mm long, 18.77 mm wide and 7.12 mm thick with a cortical platform, feather termination and retaining 25% primary cortex, an opaque quartz flake measuring 19.62 mm long, 11.12 mm wide and 3.53 mm thick with a crushed platform and feather termination, a grey quartzite scraper measuring 19.84 mm long, 11.31 mm wide and 3.36 mm thick with a flaked platform and feather termination, this artefact also has evidence of use wear on all quadrants with 20% on quadrants 1 and 3, 100% on quadrant 2 and 10% on quadrant 4.

Other artefacts include a grey quartzite distal flake measuring 13.75 mm long, 18.35 mm wide and 3.91 mm thick with a feather termination, 25% weathered cortex and evidence of use wear on quadrants 1 and 2 (20%) and 100% on quadrant 3, a grey quartzite thumbnail scraper measuring 13.2 mm long, 16.16 mm wide and 3.36 mm thick with a flaked platform, a feather termination, and evidence of use wear on quadrants 1 (25%) and 2 and 3 (100%), and a grey quartzite medial flake measuring 16.68 mm long, 9.9 mm wide and 3.05 mm thick.

This artefact scatter was identified in a subsurface context, across 2 500 by 500 mm test pits. The location of the artefact and the results of the neighbouring test pits, indicates that it is not associated with other

sites identified in the testing area and confirms the maximum extent of archaeological deposit. Figure 7.115 contains a representative image indicating the cultural material identified within Wattle Creek AS 6 (AHIMS #52-4-0810).




**Figure 7.115 A selection of artefacts from Wattle Creek AS 6 (AHIMS #52-4-0810).**

*WATTLE CREEK AS 8 (AHIMS #52-4-0814)*

| | |
|---|---|
| Site type | Low Density Artefact Scatter, PAD |
| Centroid | GDA 94 Zone 56 228871 m E and 6167451 m N |
| Site Extent | 50 m X 16 m |

Wattle Creek AS8 (AHIMS #52-4-0814) is situated in a valley and hollow within the Project Area (within the development footprint). The site is located approximately 1.3 km west of the main dirt track/driveway of Arthursleigh Farm, 230 m north of Wattle Creek AS 9 (AHIMS #52-4-0815) and 130 m west of the Wollondilly River. The site consists of 4 artefacts including a translucent quartz proximal flake measuring 27.89 mm long, 17.59 mm wide and 6.27 mm thick and a flaked platform, a piece of grey quartzite debitage measuring 10.64 mm long, 7.57 mm wide and 3.85 mm thick, an opaque quartz thumbnail scraper measuring 9.75 mm long, 12.98 mm wide and 2.2 mm thick with a crushed platform, a feather termination, and evidence of use wear on quadrants 1 (100%), 2 (70%), 3 and 4 (30%), and translucent quartz thumbnail scraper measuring 10.66 mm long, 12.5 mm wide and 2.41 mm thick with flaked platform, feather termination and evidence of use wear on quadrants 1 (5%), 2 (100%) and 3 (30%).

This artefact scatter was identified in a subsurface context, across 2 500 by 500 mm test pits. The location of the artefact and the results of the neighbouring test pits, indicates that it is not associated with other sites identified in the testing area however the archaeological deposit may stretch further either side of the transect. Therefore, based on the slope, the confirmed deposit id approximately 40 m by 10 m with the potential that it extends up to 30 m either side, though it is unlikely to be that wide.

Figure 7.116 contains a representative image indicating the cultural material identified within Wattle Creek AS 8 (AHIMS #52-4-0814).




**Figure 7.116 A selection of quartz artefacts from Wattle Creek AS 8 (AHIMS #52-4-0814).**

*WATTLE CREEK AS 9 (AHIMS #52-4-0815)*

| | |
|---|---|
| Site type | Low Density Artefact Scatter |
| Centroid | GDA 94 Zone 56 228683 m E and 6167321 m N |
| Site Extent | 2 m X 2 m |

Wattle Creek AS 9 (AHIMS #52-4-0815) is situated on a slope within the Project Area (within the development footprint). The site is located approximately 1.5 km west of the main dirt track/driveway of Arthursleigh Farm, 230 m south of Wattle Creek AS 8 (AHIMS #52-4-0814) and 240 m west of the Wollondilly River. The site consists of 4 artefacts a red silcrete scraper measuring 24.43 mm long, 25.68 mm wide and 6.61 mm thick with a flaked platform, feather termination and retaining 50% primary cortex, an opaque quartz thumbnail scraper measuring 13.65 mm long, 16.95 mm wide and 3.55 mm thick with a crushed platform and feather termination, a red silcrete distal flake measuring 18.49 mm long, 12.49 mm wide and 2.36 mm thick with a feather termination and evidence of notched use wear on quadrants 1 (50%), 2 (100%) and 3 (30%) and a translucent quartz Bondi Point measuring 21.55 mm long, 8.22 mm wide and 4.91 mm thick with a crushed platform, feather termination and backing on quadrants 1 (5%) and 2 (100%).

This artefact scatter was identified in a subsurface context, in a 500 by 500 mm test pit. The location of the artefact and the results of the neighbouring test pits, indicate that it is not associated with other sites identified in the testing area or have a large area surrounding it containing potential archaeological deposits, if any. Therefore, it is likely representative of isolated artefacts associated with the background scatter that can be seen across NSW.

Figure 7.117 contains a representative image indicating the cultural material identified within Wattle Creek AS 9 (AHIMS #52-4-0815).




**Figure 7.117 Artefacts identified within Wattle Creek AS 9 (AHIMS #52-4-0815).**

*TME-OS2 WITH PAD (AHIMS # 52-4-0134)*

| | |
|---|---|
| Site type | Low Density Artefact Scatter, PAD |
| Centroid | GDA 94 Zone 56 230366 m E and 6165598 m N |
| Site Extent | 50 m by 25m |

TME-OS2 with PAD (AHIMS # 52-4-0134) is situated on a flat within the Project Area. It was noted during survey that, according to the site card map, the extent of the TME-OS2 with PAD (AHIMS # 52-4-0134) includes a section of Canyonleigh Road that is included in the proposed works and was on the western side of the entrance into Arthursleigh Farm. The description of the PAD extent in the site card, places it 100 m to the north of the road and 200 m east of the entrance gate. The OzArk (2005) report confirms that the site was located on the western side of the entrance. The survey identified that the road reserve had low archaeological potential due to the exposure present and the significant disturbance from the road. No cultural material was identified in association with location of TME-OS2 with PAD (AHIMS # 52-4-0134) during the survey. The site card has been updated to reflect this information.

## 7.7. LIMITATIONS

In the early stages of the test excavation program, work had to be suspended for a day due to heavy rainfall. As a result of this rainfall a number of limitations had to be addressed. The sieving methodology was changed from dry to wet sieving in response to the wet soil. Several springs located within the Project Area became active after the rain, resulting in vehicles and trailers not being able to access some portions of the Project Area. Also, as a result of the rain, the water level of the Wollondilly River rose, making it impassable and thus cutting off access to half the Project Area. This resulted in the excavations needing to be conducted over several weeks with extending gaps between testing to allow for the river to recede and to gain access to the testing area. The extremely wet conditions also affected the areas that were able to be tested, with some 16 proposed test pits unable to be excavated due to the amount of groundwater and boggy conditions. The wet conditions would also affect both the pH levels and the Munsell colour recorded. This explains the difference in the number of proposed pits in Figure 6.2 and the completed pits in Figure 7.59. Although these specific areas were unable to be investigated, similar landforms were excavated to evaluate the likelihood of the presence of cultural material. As such, this limitation was rectified by these additional investigations.

# 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

The majority of the Project Area has been subject to land clearing practices which include the broadscale felling of trees and removal of native shrubs, planting of pasture grasses, installation of fencing, grading of internal tracks, impacts from grazing animals and the damming of minor water courses. Other major disturbances include the installation of high voltage electricity transmission lines in the southern and eastern sections of the property. Additionally, portions of the Project Area in the centre and north have been subject to widescale rotary tilling and extensive replanting of native tube stock. A number of homesteads, outbuildings, sheds, and an airstrip are also present in the Project Area.

The testing program was conducted on four landforms consisting of a crest, elevated flats, slopes and spurs. Archaeological testing undertaken within the Project Area identified 6 subsurface sites, consisting of both isolated artefacts and low-density artefact scatters. Soil profiles across the Project Area were largely consistent, with elevated flats, lower slopes and spurs all possessing fine-grained sandy-silty soils with deep A1 horizons and shallower A2 horizons that overlayed a sterile compact clay layer. Inclusions present in the A1 and A2 horizons include rootlets and alluvial gravel smaller than 5mm. In the pits nearest the Wollondilly River in Areas 3 and 4, river cobbles up to 20 mm in diameter were present in the A2 and clay layers. Soils across the crest landform in Area 1 generally comprised a shallow friable silty soil with rootlets and minor gravel inclusions transitioning into a plastic, compact silty clay layer.

The presence of deeper soils A1 horizon soils with diffuse transitions to A2 was consistent across lower slopes, flats and terraces on the western side of the Wollondilly River. Shallower soil A1 horizons were present in testing Areas 1, 2 and 3 on the eastern side of the river, which correspond with steeper mid-slope and crest landforms. These results suggest the slow down-slope movement of soil from higher ridges and slopes by alluvial and fluvial processes, and deposition in lower-gradient areas adjacent to the river's western side. The slopes on the Wollondilly's eastern side were steeper and ended abruptly in a deeply-incised river channel subject to high fluvial movements. It is likely that much of the soil and any artefactual material in these areas is eventually subject to flood inundation and movement.

The slow downward movement of artefacts from areas of low archaeological sensitivity on ridges and steeper-gradient slopes has resulted in corresponding low numbers of surface and subsurface artefacts within the areas tested on the western side of the Wollondilly. The testing data shows that materials were generally recovered from sandy-silty soils and were generally present within the first 300 mm of soils. Given the diffuse horizons, apedal soils and difference in soil depths between crests, mid-slopes and areas of lower gradient, it is unlikely that the identified materials were recovered *in situ*.

**Table 8.1 Analysis of subsurface sites by spit**

| Site / AHIMS | Spit Number | | | | | | Total | Percentage of the total assemblage (%) |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 8 | | |
| Wattle Creek AFT 13 / #52-4-0807 | - | 1 | - | - | - | - | 1 | 4% |
| Wattle Creek AFT 14 /#52-4-0808 | - | 1 | - | - | - | - | 1 | 4% |
| Wattle Creek AFT 15 / #52-4-0818 | - | - | - | - | - | 1 | 1 | 4% |
| Wattle Creek AS5 / #52-4-0809 | - | - | 1 | - | 1 | - | 2 | 8% |
| Wattle Creek AS6 /#52-4-0810 | - | - | 4 | 2 | - | - | 6 | 24% |
| Wattle Creek AFT 16 / #52-4-0811 | 1 | - | - | - | - | - | 1 | 4% |
| Wattle Creek AFT 17/ #52-4-0813 | - | 1 | - | - | - | - | 1 | 4% |
| Wattle Creek AS7 /#52-4-0817 | 1 | - | 1 | - | - | - | 2 | 8% |
| Wattle Creek AS9 / #52-4-0815 | 3 | 1 | - | - | - | - | 4 | 16% |
| Wattle Creek AS8 / #52-4-0814 | 1 | - | 2 | - | 1 | - | 4 | 8% |
| Wattle Creek AFT 18 / #52-4-0816 | 1 | - | - | - | - | - | 1 | 4% |
| Wattle Creek AFT 19 / #52-4-0817 | 1 | - | - | - | - | - | 1 | 4% |
| **Total** | **8** | **4** | **8** | **2** | **2** | **1** | **25** | **100%** |

## 8.2. THE ARTEFACT ASSEMBLAGE

**Table 8.2 Analysis of raw material types per site**

| Site / AHIMS No. | Raw Materials | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Chert | Quartz | Quartzite | Silcrete | FGS | Volcanic | |
| Wattle Creek 1 #52-4-0772 | - | - | - | 7 | - | - | 7 |
| Wattle Creek 2 #52-4-0773 | - | - | - | 1 | - | - | 1 |
| Wattle Creek 3 #52-4-0771 | - | - | 1 | - | - | - | 1 |
| Wattle Creek 4 #52-4-0774 | - | - | 1 | - | - | - | 1 |
| Wattle Creek 5 #52-4-0075 | - | 1 | - | - | - | - | 1 |
| Wattle Creek 6 #52-4-0776 | 1 | 2 | 1 | 2 | - | 1 | 7 |
| Wattle Creek 7 #52-4-0769 | - | - | - | - | 2 | - | 2 |
| Wattle Creek 8 #52-4-0777 | - | 2 | - | - | - | - | 2 |
| Wattle Creek 9 #52-4-0768 | - | 1 | - | - | - | - | 1 |
| Wattle Creek 11 #52-4-0766 | - | - | 1 | - | - | - | 1 |
| Wattle Creek 12 #52-4-0770 | - | - | 1 | - | - | - | 1 |
| Wattle Creek 13 #52-4-0782 | - | - | 2 | - | - | - | 2 |
| Wattle Creek 14 #52-4-0781 | - | - | 1 | - | - | - | 1 |
| Wattle Creek 15 #52-4-0780 | - | 1 | | - | - | - | 1 |
| Wattle Creek 16 #52-4-0779 | - | - | 1 | - | - | - | 1 |

| Site / AHIMS No. | Raw Materials | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Chert | Quartz | Quartzite | Silcrete | FGS | Volcanic | |
| **Wattle Creek 17 #52-4-0806** | - | 1 | - | - | - | - | 1 |
| **Wattle Creek 18 #52-4-0805** | - | 1 | - | - | - | - | 1 |
| **Wattle Creek AFT 13 #52-4-0807** | - | 1 | - | - | - | - | 1 |
| **Wattle Creek AFT 14 #52-4-0808** | - | - | - | 1 | - | - | 1 |
| **Wattle Creek 15 #52-4-0780** | - | 1 | | - | - | - | 1 |
| **Wattle Creek AS 6 #52-4-0181** | - | 1 | 5 | - | - | - | 6 |
| **Wattle Creek AFT 16 #52-4-0811** | - | - | - | 1 | - | - | 1 |
| **Wattle Creek AFT 17 #52-4-0813** | 1 | - | - | - | - | - | 1 |
| **Wattle Creek AFT 18 #52-4-0816** | - | - | - | 1 | - | - | 1 |
| **Wattle Creek AFT19 #52-4-0817** | - | 1 | - | - | - | - | 1 |
| **Wattle Creek AS 7 #52-4-0812** | - | 1 | - | 1 | - | - | 2 |
| **Wattle Creek AS 8 #52-4-0814** | - | 4 | 1 | 1 | - | - | 6 |
| **Wattle Creek AS 5 #52-4-0809** | - | 1 | - | 1 | - | - | 2 |
| **Wattle Creek AS 9 #52-4-0815** | - | 1 | - | 1 | - | - | 2 |
| **Total** | 2 | 20 | 15 | 17 | 2 | 1 | 57 |

Quartz was the main raw material within the overall assemblage for the Project Area, accounting for 35.09% (n=20), followed by silcrete which accounted for 29.82% (n=17) and quartzite for 26.31% (n=15) [Table 8.2].

**Table 8.3 Analysis of artefact type by site**

| Site / AHIMS No. | Artefact Type | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Scraper | Core | Debitage | Flake | Thumbnail Scraper | Broken / Pieces | Other | |
| Wattle Creek 1 #52-4-0772 | - | - | - | - | - | - | 7 | 7 |
| Wattle Creek 2 #52-4-0773 | 1 | - | - | - | - | - | - | 1 |
| Wattle Creek 3 #52-4-0771 | - | - | - | - | - | - | Ground edge mortar | 1 |
| Wattle Creek 4 #52-4-0774 | - | - | - | - | - | - | Ground edge possible hand axe | 1 |
| Wattle Creek 5 #52-4-0075 | - | 1 | - | - | - | - | - | 1 |
| Wattle Creek 6* #52-4-0776 | 1 | 2 | - | 2 | 1 | 1 | | 7 |
| Wattle Creek 7 #52-4-0769 | - | - | - | - | - | 1 | Blade | 2 |
| Wattle Creek 8 #52-4-0777 | - | - | - | - | - | 2 | - | 2 |
| Wattle Creek 9 #52-4-0768 | - | - | - | - | - | 1 | - | 1 |
| Wattle Creek 11 #52-4-0766 | - | 1 | - | - | - | - | - | 1 |
| Wattle Creek 12 #52-4-0770 | - | 1 | - | - | - | - | - | 1 |
| Wattle Creek 13 #52-4-0782 | - | - | - | 2 | - | - | - | 2 |
| Wattle Creek 14 #52-4-0781 | - | - | - | 1 | - | - | - | 1 |
| Wattle Creek 15 #52-4-0780 | - | - | - | 1 | - | - | - | 1 |

| Site / AHIMS No. | Artefact Type | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Scraper | Core | Debitage | Flake | Thumbnail Scraper | Broken / Pieces | Other | |
| Wattle Creek 16 #52-4-0779 | - | - | - | - | - | - | Possible hand axe | 1 |
| Wattle Creek 17 #52-4-0806 | - | - | - | - | - | 1 | - | 1 |
| Wattle Creek 18 #52-4-0805 | - | - | - | 1 | - | - | - | 1 |
| Wattle Creek AFT 13 #52-4-0807 | - | - | - | - | - | 1 | - | 1 |
| Wattle Creek AFT 14 #52-4-0808 | - | - | - | - | - | 1 | - | 1 |
| Wattle Creek AFT 15 #52-4-0818 | 1 | - | - | - | - | - | - | 1 |
| Wattle Creek AS 6 #52-4-0810 | 1 | - | - | 1 | 2 | 2 | - | 6 |
| Wattle Creek AFT 16 #52-4-0811 | 1 | - | - | - | - | - | - | 1 |
| Wattle Creek AFT 17 # 52-4-0813 | - | 1 | - | - | - | - | - | 1 |
| Wattle Creek AFT 18 #52-4-0816 | - | - | - | - | 1 | - | - | 1 |
| Wattle Creek AFT 19 #52-4-0817 | - | - | - | - | - | 1 | - | 1 |
| Wattle Creek AS 5 #52-4-0809 | - | - | 1 | 1 | - | - | - | 2 |
| Wattle Creek AS 7 #52-4-0812 | 1 | - | 1 | - | - | - | - | 2 |

| Site / AHIMS No. | Artefact Type | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|
| | Scraper | Core | Debitage | Flake | Thumbnail Scraper | Broken / Pieces | Other | |
| **Wattle Creek AS 8 #52-4-0814** | 1 | - | 1 | 1 | 3 | - | - | 6 |
| **Wattle Creek AS 9 #52-4-0815** | - | - | - | - | - | 1 | Bondi Point | 2 |
| **Total** | 7 | 6 | 3 | 10 | 7 | 12 | 12 | 57 |

*** Wattle Creek 6 #52-4-0776 had a** high number **artefacts, with over 100 artefacts observed, only a representative sample was recorded and included in the assemblage.**

Table 8.3 shows that alongside other artefact types, the most common artefact types broken/pieces, which form 21.05% (n=12) each of the record. Apart form Wattle Creek 6 (AHIMS #52-4-0776), which has an extremely high density of artefacts for the Project Area, Wattle Creek 1 (AHIMS #52-4-0772) contains the highest number of artefact features forming 12.28% (n=7), however, the information recorded does not provide enough information on the specific artefact type.

## 8.3. ARCHAEOLOGICAL ANALYSIS

The results of the archaeological survey and testing within the development footprint generally support the predictive statements made in Section 5.2. The predictive statements noted that isolated artefacts and low-density artefact scatters were likely to be the most common site types identified in the development footprint, with modified trees encountered in lower numbers. Both the survey and testing results support these statements.

Thirty new sites were recorded during the investigation, of these 18 (60%) were isolated artefacts and 11 (36.66%) were artefact scatters, including one that contained a high density of artefacts and one scarred tree (3.33%). The high-density artefact scatter and one scarred tree were located in areas outside of the development footprint.

The predictive statements, as well as previous studies in the local area (e.g. Umwelt 2005, Biosis Pty Ltd 2008, Navin Officer 2012) indicated that most sites would be located within 200 m of water sources, with the majority located within 50 m on low-gradient sloping terrain. In other areas, isolated artefacts may occur anywhere in the landscape in very low numbers. In particular, ridgelines and steep slopes between drainage lines were predicted to have very low archaeological potential. The results of the overall survey of the entire Project Area confirm these assertions, with 6 sites (20%) located within 50 m of water courses, and 11 sites (36.66%) located more than 200 m from water (Table 8.4).

**Table 8.4 Distance to water by sites type**

| Site Type | Distance to water | | | | | Total |
|---|---|---|---|---|---|---|
| | 0-49.99 | 50-99.99 | 100-149.99 | 150-199.99 | 200-249.99 | |
| **Artefact** | 4 | 4 | 5 | 8 | 1 | 18 |
| **Artefact Scatter** | 1 | 2 | 1 | 3 | - | 11 |
| **Scar Tree** | 1 | - | - | - | - | 1 |
| **Total** | **6** | **6** | **6** | **10** | **1** | **30** |

Twenty of the sites (66.6%) occurred on slope landforms, including mid and lower slopes, while six (20%) occurred on elevated flats. This broadly conforms with the predictive statements in Section 5, and with the results of other archaeological investigations in the local area (Navin Officer 2012b; Umwelt 2005). As mentioned above, landforms with steep gradients and higher elevations, such as ridgelines, spurs and crests located more than 200 m from water sources possessed low archaeological potential. Few surface artefacts were identified on these landforms. Twenty of the sites (66.6%) occurred on slope landforms, including mid and lower slopes, while six (20%) occurred on elevated flats. This broadly conforms with the predictive statements in Section 5, and with the results of other archaeological investigations in the local area (Navin Officer 2012b; Umwelt 2005). As mentioned above, landforms with steep gradients and higher elevations, such as ridgelines, spurs and crests located more than 200 m from water sources possessed low archaeological potential. Few surface artefacts were identified on these landforms. This broadly conforms with the predictive statements in Section 5, and with the results of other archaeological investigations in the local area (Navin Officer 2012b; Umwelt 2005). As mentioned above, landforms with steep gradients and higher elevations, such as ridgelines, spurs and crests located more than 200 m from water sources possessed low archaeological potential. Few surface artefacts were identified on these landforms.

The results also align with the predictive statements made about site distribution across soils, geology and landforms within the Project Area. The predictive statements suggested that sites were most likely to be found within the Residual Deposits geological formation on elevated flats, footslopes, and low gradient spur crests above creek lines in areas of fine-grained sediments.

Additionally, 65% of sites were predicted to fall within the Wollondilly – Bindook Tablelands and Gorges soil landscape, while 34% would occur in the Bungonia Tableland and Gorge soil type.

The majority of newly recorded sites were identified in the Residual Deposits geological formation (n=15, 50%), while 8 sites (26.6%) occurred in the Pleasant Hill Granite formation. Twenty-four (80%) of the sites occurred in the Wollondilly – Bindook Tablelands and Gorges soil landscape, while 5 (16.6%) were in the Bungonia Tablelands and Gorges soil landscape.

Raw material types in both the field survey and testing program also conformed with the predictive statements, with quartz and silcrete dominating the assemblages. Previous investigations also noted that both surface and subsurface assemblages were dominated by quartz and silcrete (Biosis Pty Ltd 2008; Kinhill Engineers Pty Ltd 1996; Navin Officer 2012b; Umwelt 2005, 2015). The recorded assemblage is dominated by quartz (n=8, 47.05%) with lower numbers of quartzite and silcrete recorded (Raw material types in both the field survey and testing program also conformed with the predictive statements, with quartz and silcrete dominating the assemblages).

Previous investigations also noted that both surface and subsurface assemblages were dominated by quartz and silcrete (Biosis Pty Ltd 2008; Kinhill Engineers Pty Ltd 1996; Navin Officer 2012b; Umwelt 2005, 2015). The recorded assemblage is dominated by quartz (n=8, 47.05%) with lower numbers of quartzite and silcrete recorded (Table 8.2).

The only exception to the predominance of quartz and silcrete in local assemblages appears in the investigation carried out by Premise at the Marulan Solar Farm project, located approximately 18 km south-west of the Project Area. Here, a raw material identified by Premise as '*indurated mudstone, silicified tuff, chert*' (IMSTC), dominated the subsurface assemblage, comprising 66.5% of the recovered lithics (Premise Pty Ltd 2022). Premise (2022, p.52) concluded that the dominance IMSTC in the assemblage was due to the local availability of this material in the immediate area of their testing program.

Cortex was present on just under half (41.18%, n=7) of the artefact assemblage recovered in the testing program (). Previous investigations in the local area vary between amounts of cortex recorded in assemblages. For example, Premise (2022) recorded low percentages of cortex, comprising around 20% of the assemblage. This contrasts with Navin Officer (2012), who noted higher percentages of cortex on surface artefacts found on descending spurs and elevated ground adjacent to large alluvial cobble and gravel deposits. The predictive statements in Section 5.2 were modelled on the results of surface investigations undertaken for the construction of the Kerrawarry Power Station by (Biosis (2008) and Navin Officer (2012), located adjacent to the southern part of the Project Area. The predictive statement suggested that a significant portion of raw materials would be locally sourced from quartz outcrops and alluvial cobbles; consequently, a higher proportion of cortex would be expected in the assemblage as materials were locally sourced. The results of the testing program appear to support these statements.

Both the surface and subsurface assemblages were dominated by flakes, broken flakes and flaked pieces, while the subsurface assemblage contained a high number of thumbnail scrapers (29.41%, n=5) and broken pieces (29.41%, n=5). Other investigations in the local area also note that assemblages are dominated by flakes and flaked pieces, with lower numbers of cores, Bondi points and scrapers (Biosis Pty Ltd 2008; Navin Officer 2012c; OzArk Environment & Heritage Management Pty Ltd 2005; Premise Pty Ltd 2022; Umwelt 2005, 2015). Likewise, the majority of artefacts (80%, n=20) were recovered from spit 3, a depth of 200mm-300mm (41.17%, n=7), followed by spit 1 (17.65%, n=3). These results generally reflect those of other testing or salvage programs carried out in the Marulan area, where the majority of subsurface artefacts were recovered between depths of 0mm-400mm (Premise Pty Ltd 2022; Umwelt 2005, 2015).

Finally, comparative artefact densities from previous studies where testing was undertaken are limited in the Marulan area; however, the results were broadly comparable with the statements made by Umwelt 2015), where low numbers of surface artefacts predicted low numbers below the surface. The overall average artefact density of the total tested area of 10 $m^2$ is 9.16 artefacts per $m^2$ (Table 7.14). Testing area 6 had the largest average artefact density with 6 artefacts per while testing area 4 had an average artefact density of 2.4 artefacts per $m^2$. These results are discussed further in the following section.

## 8.4. DISCUSSION

At a general level, the results of the survey and testing program reflect those of previous investigations in the Marulan area, as well as predictive models developed for the Southern Highlands/Tablelands region (OzArk Environment & Heritage Management Pty Ltd 2005, Umwelt 2005, Australian Museum Business Services 2012, Premise Pty Ltd 2022). Raw materials and their frequencies within the surface and subsurface assemblages, in particular, high percentages of silcrete and quartz, are similar to those found in other assemblages within the Marulan area and broader Southern Highlands/Tablelands regions. Tool types, levels of reduction, and the high deposition of artefacts in spits 1 to 3 (0 mm-400 mm) also mirror those of other studies in the local area. However, the results also contain some important variations in comparison to those reported by other local investigations.

Both the surface and subsurface investigations recorded very low numbers of artefactual material when compared with other studies nearby. This is partly explained by significant portions of the Project Area comprising areas of low archaeological sensitivity, such as ridgelines and steep-to-moderate slopes between drainage lines, along with extensive grass coverage resulting in low levels of GSV, and localised flooding. Additionally, much of the land had been subject to clearing and disturbance from agricultural activities. However, these factors do not adequately account for the results of the testing in landforms identified as having moderate archaeological potential near the Wollondilly River.

Of particular note here are the surface site densities recorded by Biosis (2008) and Navin Officer (2012) at the Kerrawarry Power Station, directly adjacent to the southern part of the Project Area. Between them, the Biosis (2008) and Navin Officer (2012) studies recorded 16 sites, comprising 12 isolated artefacts or artefact scatters, and 4 artefact/PAD sites. Test pits in the current investigation were purposely located on elevated flats and low-gradient-slopes and spurs on the opposite side of the Wollondilly River to the Biosis (2008) and Navin Officer (2012) assessment areas. Of the 27 test pits completed in this area, only 5 artefacts were recovered, following the recording of four isolated surface artefacts during the survey. Testing in this area was undertaken in identical geological and soil formations to the Kerrawarry investigations, comprising the Residual Deposits formation and the Wollondilly – Bindook Tablelands and Gorges soil landscape. It was expected that higher numbers of subsurface artefacts would have been present; however, this was not the case.

One potential explanation for this is the difference in landforms and site aspects between the Project Area on the western side of the Wollondilly River in comparison with that on the east. In the Biosis (2008) and Navin Officer (2012) studies, the majority of sites were recorded on an alluvial terraces or elevated terraces within 250 m of the Wollondilly River's eastern banks. Additionally, most of these sites are located within a shallow valley with a west or north-west-facing aspect, protected by a gentle ridgeline that runs roughly North-North-West/South-South-Easterly directly behind it. Arguably, the shelter from the prevailing westerly winds and north-westerly aspect suggests that this area would have offered Aboriginal people a warmer and more favourable location for repeated occupation and campsites.

In comparison, testing in the current investigation took place on elevated flats and low-gradient-slopes and spurs within 100 m of the Wollondilly River's western bank, immediately above the steep slopes leading down to fluvial river terraces and banks. The steep slopes, banks and terraces on the western side of the river are subject to high levels of erosion and disturbance from flooding and lack the broad, slightly elevated alluvial terraces and flats present around the Kerrawarry site on the Wollondilly's eastern side. The site aspect also differs from the Kerrawarry investigations in that it faces east-to-south-east and is relatively exposed to prevailing winds. Likewise, testing in areas near the BESS and on the spur and elevated flat in area 6 (refer to Section 7.3.6) resulted in similarly low numbers of artefacts. Again, despite their proximity to a major water source, these areas appear to be relatively exposed to prevailing winds and would have offered little shelter to Aboriginal people in terms of campsites or places where sedentary

activities were carried out. Rather, as with the high ridgelines and steep-to-moderate slopes, the spurs, elevated flats and crests within 200 m of the Wollondilly River's western bank appear to represent transient use by Aboriginal people.

The lone high-density artefact scatter, Wattle Creek 6 (AHIMS #52-4-0776), recorded during the field survey, possesses favourable characteristics for occupation in regard to distance to water, landform and site aspect. Although this site is outside of the development footprint, it is located adjacent to a 2nd order stream, on a sheltered, elevated flat with a northern aspect. The site is protected on the northern side by a steep ridgeline and on the southern side by a low spur. With its sheltered, sunny aspect on flat ground above a semi-permanent water source, the site would have been ideal as a campsite and for more sedentary activities such as knapping and food preparation. The survey team noted that, even today, the location would have made a perfect campsite.

Additionally, it is possible that low numbers of subsurface artefacts predict low numbers of subsurface artefacts in the local area. Umwelt's (2015) investigations undertaken at the Lynwood Quarry demonstrated that low numbers of surface artefacts resulted in low numbers of subsurface artefacts. The testing program undertaken by Premise (2022) at Carrick, approximately 18 km south-west of the current Project Area, recorded subsurface artefacts at 5 out of 6 sites where surface artefacts were located. Generally, the results of Premise's investigation found that surface artefact density predicted subsurface artefact density. Further subsurface investigations in the Marulan area are required to confirm whether this is the case.

Based on the results of the testing, the following statements can be made about the areas of archaeological sensitivity identified during the archaeological survey:

- Ridges and steep-to-moderate slope landforms across the Project Area possess low archaeological sensitivity
- Disturbance from land clearing and agricultural activities across much of the Project Area have impacted the upper 100mm-200m of soil, resulting in impacts to archaeological sensitivity.
- Isolated artefacts may occur in low numbers on most landforms within the Project Area.
- High-to-moderate levels of archaeological sensitivity occur on elevated flats and terraces adjacent to higher-order streams and permanent water courses.
- Elevated flats, low-gradient slopes and spurs with south or south-easterly aspect are likely to possess lower archaeological sensitivity than those with sheltered, northerly aspects.
- Surface artefact density may predict subsurface artefact density.

A reassessment of archaeological sensitivity is outlined in Figure 8.1.

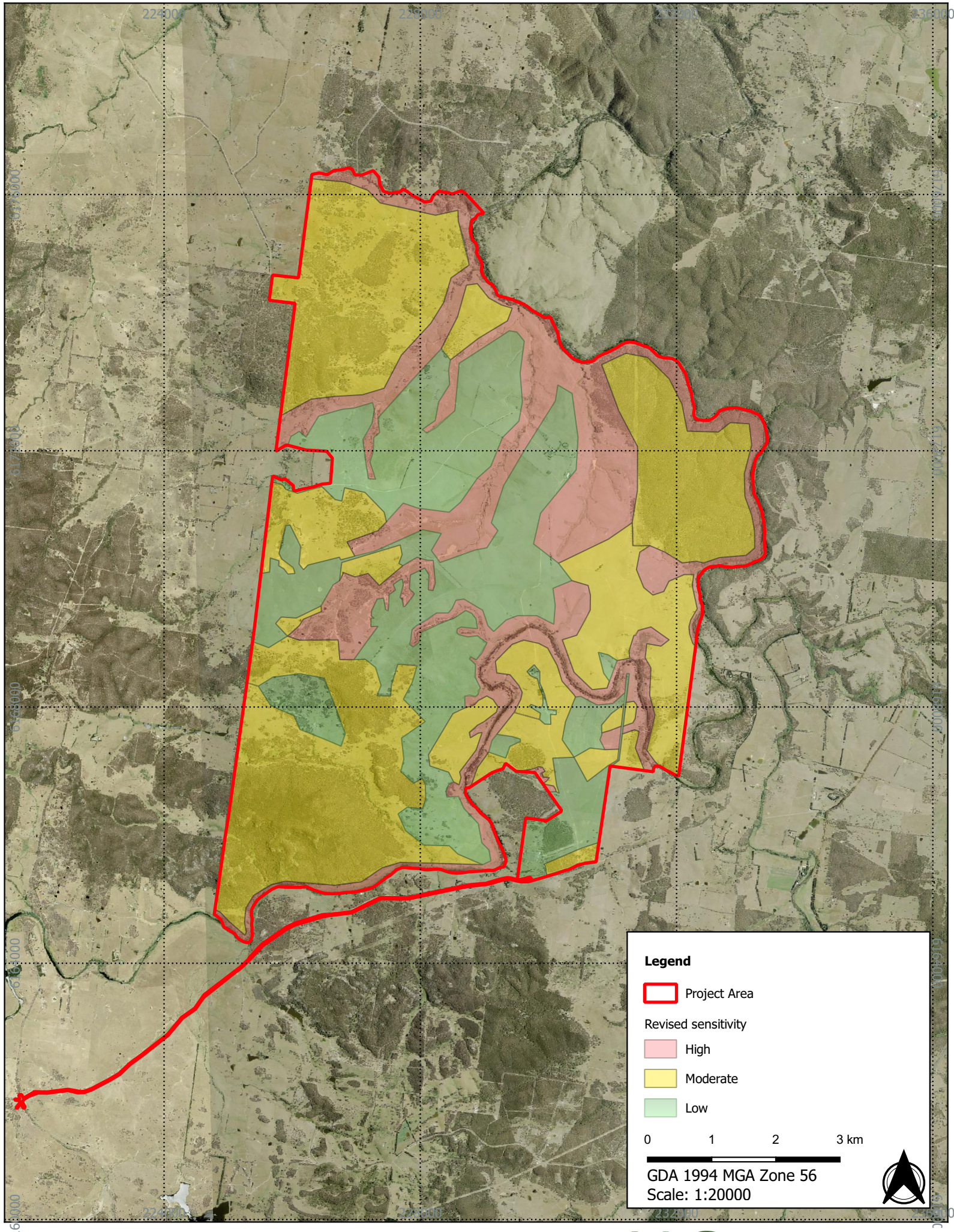



**Figure 8.1 - Revised archaeological sensitivity**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial*

*Drawn by: PB Date: 2026-01-31*

AUSTRAL ARCHAEOLOGY

# 9. CULTURAL HERITAGE 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: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. |

| Value | Definition |
|---|---|
| **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.<br>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.<br>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 and DEWHA 2009; Department of Environment, Climate Change and Water NSW 2010b; NSW Heritage Office 2001; OEH 2011).

The Guide (OEH 2011:10) states that the following criteria from the NSW Heritage Office (2001:9) 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 (2011:10) 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 Project Area and its constituent features. These are outlined in Table 9.2.

**Table 9.2 Gradings used to assess the cultural values of the Project Area**

| Grading | Definition |
|---|---|
| **Exceptional** | The Project 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 Project 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 Project 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 Project 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 Project 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.

There are several topographic features located within the Project Area that contribute to the aesthetic value. These landforms vary from rolling hills to elevated plains and named features such as the Wollondilly River and Mt Pleasant. In the past, these areas would have been utilised by Aboriginal people, particularly due to the close water source, the elevated areas providing focal viewpoints and the low-lying areas to protect from weather, however following European settlement the use of the Project Area has mostly orientated toward agricultural practices which have negatively impacted the aesthetic value of the Project Area. More recently, rocket testing and the construction of a runway have also negatively impacted the aesthetic of the Project Area, reducing the overall significance.

Based on this assessment, the Project Area is considered to have **moderate** aesthetic significance values.

### 9.2.2. HISTORIC SIGNIFICANCE VALUES

The assessment of historic values refers to associations with particular 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 Project Area is located near Mt Pleasant and the Wollondilly River, which are both associated with tangible and intangible cultural heritage. Historically, the presence of a permanent freshwater resource and diverse topographical features would have resulted in the Project Area being part of a beneficial location for daily life and cultural practice.

In regard to European heritage, a SoHI has been prepared concurrently with this ACHA which details the Project Area's non-Aboriginal historical significance, including structures and people.

Based on this assessment, the Project Area is considered to have **moderate** 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 life-ways of Aboriginal people. Australia ICOMOS (2013b: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 2011:10) 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 Project Area is outlined in Table 9.3.

**Table 9.3 Scientific significance of Aboriginal sites in the Project Area**

| Site name | AHIMS No. | Assessment of significance | Grading |
|---|---|---|---|
| **MGPS5** | 48-4-0119 | MGPS5 (AHIMS #48-4-0119) is an isolated artefact that was identified on the crest of a small ridge line, approximately 1 km from the Wollondilly River. MGPS5 (AHIMS #48-4-0119) is a milky quartz flake with a serrated edge. The site is a locally common type of artefact and is a typical raw material. In addition, there is limited research or educational potential and therefore MGPS5 (AHIMS #48-4-0119) is determined to have low scientific significance. | Low |
| **1 Arthursleigh; Arthursleigh;** | 52-4-0085 | 1 Arthursleigh; Arthursleigh; (AHIMS #52-4-0085) is an isolated artefact that was identified on the north-west slope of a hilltop, approximately 3 km from the Wollondilly River. 1 Arthursleigh; Arthursleigh (AHIMS #52-4-0085) consist of 12 recorded artefacts in a 40m by 40m area made from quartz and silcrete and included flakes and cores. The site is a locally common type of artefact and is a typical raw material. In addition, there is limited research or educational potential and therefore 1 Arthursleigh; Arthursleigh (AHIMS #52-4-0085) is determined to have low scientific significance. | Low |
| **TME-OS5** | 52-4-0131 | TME-OS5 (AHIMS #52-4-0131) is an artefact scatter on a flat, adjacent to the Wollondilly River and consists of more than 50 artefacts of mostly silcrete artefacts, TME-OS5 (AHIMS #52-4-0131) contains common artefact typologies and has a typical raw material. In addition, there is limited research or educational potential and therefore TME-OS5 (AHIMS #52-4-0131) is determined to have low scientific significance. | Low |
| **TME-OS4** | 52-4-0132 | TME-OS4 (AHIMS #52-4-0132) is a low-density artefact scatter located on a drainage line that flows into the Wollondilly River. Consisting of 3 silcrete artefacts. TME-OS4 (AHIMS #52-4-0132) has locally common types of artefacts and is a typical raw material. In addition, there is limited research or educational potential and therefore MGPS5 (AHIMS #48-4-0119) is determined to have low scientific significance. | Low |

| Site name | AHIMS No. | Assessment of significance | Grading |
|---|---|---|---|
| **TME-OS3 with PAD** | 52-4-0133 | TME-OS3 (AHIMS #52-4-0133) is a low-density artefact scatter with a PAD and is located on a drainage line that flows into Wollondilly Creek. The scatter is described within the site card as containing 'many artefacts of silcrete and quartz' and the PAD identified within the ploughed environment as further investigations into TME-OS3 (AHIMS #52-4-0133) have not been undertaken, the current scientific significance is unknown. | Unknown |
| **TME-OS2 with PAD** | 52-4-0134 | TME-OS2 (AHIMS #52-4-0134) is an open artefact scatter with a PAD and is located near Mt Pleasant. As further investigations into TME-OS3 (AHIMS #52-4-0133) have not been undertaken, the current scientific significance is unknown. | Unknown |
| **BH11 (Canyon Leigh)** | 52-4-0237 | BH11 (Canyon Leigh) [AHIMS #52-4-0237] is a low-density artefact scatter consisting of a quartz core and 4 flakes. Located on the western bank of the Wollondilly River, BH11 (Canyon Leigh) [AHIMS #52-4-0237] has locally common types of artefacts and is a typical raw material. In addition, there is limited research or educational potential and therefore, BH11 (Canyon Leigh) [AHIMS #52-4-0237] is determined to have low scientific significance. | Low |
| **BH12 (Canyon Leigh)** | 52-4-0238 | BH12 (Canyon Leigh) [AHIMS #52-4-0238] is a low-density artefact scatter containing 5 artefacts of 1 quartz and silcrete materials. Located 80m from the Wollondilly, BH12 (Canyon Leigh) [AHIMS #52-4-0238] contains both cores and 'other tool types' according to the site card. BH12 (Canyon Leigh) [AHIMS #52-4-0238] has locally common types of artefacts and has typical raw materials. In addition, there is limited research or educational potential and therefore, BH12 (Canyon Leigh) [AHIMS #52-4-0238] is determined to have low scientific significance. | Low |
| **BH13 (Canyon Leigh)** | 52-4-0239 | BH13 (Canyon Leigh) [AHIMS #52-4-0239] is an artefact scatter located on the saddle of a large ridgeline. Containing 20 artefacts of quartzite, quartz, silcrete and chalcedony with typologies of flakes, cores and tools, BH13 (Canyon Leigh) [AHIMS #52-4-0239] has locally common types of artefacts and has typical raw materials. In addition, there is limited research or educational potential and therefore, BH13 (Canyon Leigh) [AHIMS #52-4-0239] is determined to have low scientific significance. | Low |
| **BH14 (Canyon Leigh)** | 52-4-0240 | BH14 (Canyon Leigh) [AHIMS #52-4-0240] is an isolated quartzite flake located on an elevated flat. Due to the presence of similar sites in the area, BH14 (Canyon Leigh) [AHIMS #52-4-0240] is not rare, nor does it contain any educational or research opportunities. As such, BH14 (Canyon Leigh) [AHIMS #52-4-0240] is therefore considered to have low scientific value. | Low |

| Site name | AHIMS No. | Assessment of significance | Grading |
|---|---|---|---|
| **BH15 (Canyon Leigh)** | 52-4-0244 | BH15 (Canyon Leigh) [AHIMS #52-4-0244] is an artefact scatter located adjacent to a creek line. Made up of a quartzite flake, a silcrete core and a piece of worked quartz. BH15 (Canyon Leigh) [AHIMS #52-4-0244] has locally common types of artefacts and has typical raw materials. In addition, there is limited research or educational potential and therefore, BH15 (Canyon Leigh) [AHIMS #52-4-0240] is determined to have low scientific significance. | Low |
| **KA4a** | 52-4-0335 | KA4a (AHIMS #52-4-0335) is located on a low gradient ridge crest and is an artefact scatter with a PAD. At least 20 artefacts were identified. As further investigations into KA4a (AHIMS #52-4-0335) have not been undertaken, the current scientific significance is unknown. | Unknown |
| **KA5a** | 52-4-0336 | KA5a (AHIMS #52-4-0336) is located on a low gradient slope and is an artefact scatter of 3 artefacts with a PAD. The artefacts were silcrete and quartz flakes. As further investigations into KA5a (AHIMS #52-4-0336) have not been undertaken, the current scientific significance is unknown. | Unknown |
| **KA6a** | 52-4-0337 | KA6a (AHIMS #52-4-0337) consists of 2 *ex-situ* artefacts located on a ridge. No information regarding the site card has been provided. As the information provided is limited, KA6a (AHIMS #52-4-0337) scientific significance is unknown | Unknown |
| **KA7** | 52-4-0338 | KA7 (AHIMS #52-4-0338) is an artefact scatter and PAD that are located on a terrace. Although there are more than 50 artefacts at the site there is also a PAD with unknown potential. As further investigations into KA7 (AHIMS #52-4-0338) have not been undertaken, the current scientific significance is unknown. | Unknown |
| **KPAD-3** | 52-4-0348 | KPAD-3 (AHIMS #52-4-0348) is a PAD located on a toe slope of a spur crest. As further investigations into KPAD-3 (AHIMS #52-4-0348) have not been undertaken, the current scientific significance is unknown. | Unknown |
| **KPAD-4** | 52-4-0349 | KPAD-4 (AHIMS #52-4-0349) is a PAD located on the spur crest. As further investigations into KPAD-4 (AHIMS #52-4-0349) have not been undertaken, the current scientific significance is unknown. | Unknown |
| **KPAD-5** | 52-4-0350 | KPAD-5 (AHIMS #52-4-0350) is a PAD located on the spur crest. As further investigations into KPAD-5 (AHIMS #52-4-0350) have not been undertaken, the current scientific significance is unknown. | Unknown |
| **KPAD-6** | 52-4-0351 | KPAD 6 (AHIMS #52-4-0351) is a PAD located on an alluvial terrace. As further investigations into KPAD-6 (AHIMS #52-4-0351) have not been undertaken, the current scientific significance is unknown. | Unknown |

| Site name | AHIMS No. | Assessment of significance | Grading |
|---|---|---|---|
| **Wattle Creek 1** | 52-4-0772 | Wattle Creek AS 1 (AHIMS #52-4-0772) is a low-density artefact scatter located on a mid to low slope. The artefact scatter consists of 7 silcrete artefacts including 3 cores, 3 flakes and 1 piece of debitage. Due to the presence of similar sites in the area, Wattle Creek 1 (AHIMS #52-4-0772) is not rare, nor does it contain any educational or research opportunities. As such, Wattle Creek 1 (AHIMS #52-4-0772) is therefore considered to have low scientific value. | Low |
| **Wattle Creek 2** | 52-4-0773 | Wattle Creek 2 (AHIMS #52-4-0773) is an isolated artefact located on the mid to low slope. The isolated artefact consists of a single reddish-grey silcrete core scraper. Within the region and the locality, several silcrete tools have been identified, limiting the rarity of Wattle Creek 2 (AHIMS #52-4-0773). As such, Wattle Creek 2 (AHIMS #52-4-0773) offers little educational and/or research potential and is therefore considered to have low scientific value. | Low |
| **Wattle Creek 3** | 52-4-0771 | Wattle Creek 3 (AHIMS #52-4-0771) is an isolated artefact located on the mid to low slope. The site comprises a single quartzite river cobble with a ground edge that was likely used as a mortar. Within the region and within the locality, similar tools have been identified, limiting the rarity of Wattle Creek 3 (AHIMS #52-4-0771). As such, Wattle Creek 3 (AHIMS #52-4-0771) offers little educational and/or research potential and is therefore considered to have low scientific value. | Low |
| **Wattle Creek 4** | 52-4-0774 | Wattle Creek 4 (AHIMS #52-4-0774) is an isolated artefact located on a crest/upper slope. Wattle Creek 4 (AHIMS #52-4-0774) is a single quartzite river cobble with a ground edge and is likely a hand axe. Within the region and the locality, axes have been identified however they are not common. As a result, Wattle Creek 4 (AHIMS #52-4-0774) may have further educational and/or research potential and is therefore considered to have moderate scientific value. | Low |
| **Wattle Creek 5** | 52-4-0775 | Wattle Creek 5 (AHIMS #52-4-0775) is an isolated single quartz core located on an open plain. Within the region and the locality, similar tools have been identified, limiting the rarity of Wattle Creek 5 (AHIMS #52-4-0775). As such, Wattle Creek 5 (AHIMS #52-4-0775) offers little educational and/or research potential and is therefore considered to have low scientific value. | Low |
| **Wattle Creek 6** | 52-4-0076 | Wattle Creek 6 (AHIMS #52-4-0776) is a high-density artefact scatter located on the lower slope of a terrace on an unnamed creek. Wattle Creek 6 (AHIMS #52-4-0776) consists of silcrete, quartz, quartzite, chert and volcanic raw material with cores, scrapers and flakes. Due to the high number of artefacts, Wattle Creek 6 (AHIMS #52-4-0776) has the potential to be further investigated. Therefore, Wattle Creek 6 (AHIMS #52-4-0776) is considered to have moderate potential. | Moderate |

| Site name | AHIMS No. | Assessment of significance | Grading |
|---|---|---|---|
| **Wattle Creek 7** | 52-4-0769 | Wattle Creek 7 (AHIMS #52-4-0769) is a low-density artefact scatter, located on a crest landform. Consisting of 2 fine siliceous artefacts, Wattle Creek 7 (AHIMS #52-4-0769) has both a blade and flaked piece tool type. As artefact scatters are common in the area, Wattle Creek 7 (AHIMS #52-4-0769) is not rare, nor does it contribute to the wider record. Therefore, Wattle Creek 7 (AHIMS #52-4-0769) is considered to have limited research and education values and is considered to be of low scientific value. | Low |
| **Wattle Creek 8** | 52-4-0777 | Wattle Creek 8 (AHIMS #52-4-0777) is located on the mid slope and consists of a low-density artefact scatter. Containing 2 quartz artefacts, Wattle Creek 8 (AHIMS #52-4-0777) is formed from a blade and point. As artefact scatters are common in the area, Wattle Creek 8 (AHIMS #52-4-0777) is not rare, nor does it contribute to the wider record. Therefore, Wattle Creek 8 (AHIMS #52-4-0777) is considered to have limited research and education values and is considered to be of low scientific value. | Low |
| **Wattle Creek 9** | 52-4-0768 | Wattle Creek 9 (AHIMS #52-4-0768) is located on a mid-slope and consists of a quartz distal flake. Within the region and the locality, similar sites have been identified, limiting the rarity of Wattle Creek 9 (AHIMS #52-4-0768). As such, Wattle Creek 9 (AHIMS #52-4-0768) offers little educational and/or research potential and is therefore considered to have low scientific value. | Low |
| **Wattle Creek 10** | 52-4-0767 | Wattle Creek 10 (AHIMS #52-4-0767) is a culturally modified stringybark scarred tree located on a slope landform. The scarred tree is not associated with any other sites in the area and cultural scarring is common in the surrounding region. Scarred trees are finite archaeological sites as they are dependent on the life expectancy of the tree and surrounding environmental conditions. The scar tree has the potential for further research Due to the presence of other similar culturally scarred trees Wattle Creek 10 (AHIMS #52-4-0767) offers little educational and/or research potential and is therefore considered to have a low scientific value. | Moderate |
| **Wattle Creek 11** | 52-4-0766 | Wattle Creek 11 (AHIMS #52-4-0766) is an isolated quartzite core located on a slope. Within the region and the locality, similar sites have been identified, limiting the rarity of Wattle Creek 11 (AHIMS #52-4-0766). As such, Wattle Creek 11 (AHIMS #52-4-0766) offers little educational and/or research potential and is therefore considered to have low scientific value. | Low |
| **Wattle Creek 12** | 52-4-0770 | Wattle Creek 12 (AHIMS #52-4-0782) is an isolated artefact located on an elevated flat. Wattle Creek 12 (AHIMS #52-4-0782) consists of a quartzite core that is not rare or unique in the area. Therefore, Wattle Creek 12 (AHIMS #52-4-0782) offers little educational and/or research potential and is considered to have low scientific value. | low |

| Site name | AHIMS No. | Assessment of significance | Grading |
|---|---|---|---|
| **Wattle Creek 13** | 52-4-0782 | Wattle Creek 13 (AHIMS #52-4-0782) is a low-density artefact scatter, consisting of 2 artefacts on an elevated flat. Wattle Creek 13 (AHIMS #52-4-0782) consists of 2 quartzite flakes that are not rare or unique in the area. Therefore, Wattle Creek 13 (AHIMS #52-4-0782) offers little educational and/or research potential and is considered to have low scientific value. | Low |
| **Wattle Creek 14** | 52-4-0781 | Wattle Creek 14 (AHIMS #52-4-0781) is an isolated artefact located on an elevated flat. Wattle Creek 14 (AHIMS #52-4-0781) is a quartzite flake, which is a common feature in the region and is therefore not rare. Due to the presence of other sites in the region, Wattle Creek 14 (AHIMS #52-4-0781) offers little educational and/or research potential and is therefore considered to have low scientific values. | Low |
| **Wattle Creek 15** | 52-4-0780 | Wattle Creek 15 (AHIMS #52-4-0780) is a single quartz flake and is located on an elevated flat. Comprising a single quartz flake, Wattle Creek 15 (AHIMS #52-4-0780) is not a rare feature in the wider context and therefore offers little educational and/or research potential. As a result, Wattle Creek 15 (AHIMS #52-4-0780) is considered to have low scientific values. | Low |
| **Wattle Creek 16** | 52-4-0779 | Wattle Creek 16 (AHIMS #52-4-0779) is a low-density artefact scatter located on a slope. Recorded as 2 quartzite artefacts, with one site possibly a hand axe, Wattle Creek 16 (AHIMS #52-4-0779) does not contain features that are rare or that would provide additional educational or research potential. Therefore, Wattle Creek 16 (AHIMS #52-4-0779) is considered to have low scientific significance. | Low |
| **Wattle Creek 17** | 52-4-0806 | Wattle Creek 17 (AHIMS #52-4-0806) is an isolated artefact located on a slope. Wattle Creek 17 (AHIMS #52-4-0806) is a quartz fragment, which is not rare or unique in the local area. As such, Wattle Creek 17 (AHIMS #52-4-0806) offers little educational and/or research potential and is considered to have low scientific value. | Low |
| **Wattle Creek 18** | 52-4-0805 | Wattle Creek 18 (AHIMS #52-4-0805) is an isolated artefact that was identified on a slope. Recorded as a milky quartz flake, Wattle Creek 18 (AHIMS #52-4-0805) is not rare or unique in the local area. As such, Wattle Creek 18 (AHIMS #52-4-0805) offers little educational and/or research potential and is considered to have low scientific value. | Low |

| Site name | AHIMS No. | Assessment of significance | Grading |
|---|---|---|---|
| **Wattle Creek AFT13** | 52-4-0807 | Wattle Creek AFT 13 (AHIMS #52-4-0807) is an isolated artefact located on a ridge. Wattle Creek AFT 13 (AHIMS #52-4-0807) consists of a single opaque quartz distal flake, which is not uncommon in the local region. Due to the presence of similar sites in the area, Wattle Creek AFT 13 (AHIMS #52-4-0807) is not rare, nor does it contain any educational or research opportunities. As such, Wattle Creek AFT 13 (AHIMS #52-4-0807) is therefore considered to have low scientific value. | Low |
| **Wattle Creek AFT14** | 52-4-0808 | Wattle Creek AFT 14 (AHIMS #52-4-0808) is an isolated artefact located on a hollow landform. Consisting of a single silcrete proximal flake Wattle Creek AFT 14 (AHIMS #52-4-0808) is not unique or rare and has limited research and or educational value. As such, Wattle Creek AFT 14 (AHIMS #52-4-0808) is determined to have low scientific value | Low |
| **Wattle Creek AFT15** | 52-4-0818 | Wattle Creek AFT 15 (AHIMS #52-4-0818) is an isolated artefact located on a footslope. Wattle Creek AFT 15 (AHIMS #52-4-0818) is a single red silcrete scraper. Due to the presence of similar sites in the area, Wattle Creek AFT 15 (AHIMS #52-4-0818) is not rare, nor does it contain any educational or research opportunities. As such, Wattle Creek AFT 15 (AHIMS #52-4-0818) is considered to have low scientific value at a local level. | Low |
| **Wattle Creek AS5** | 52-4-0809 | Wattle Creek AS5 (AHIMS #52-4-0809) is a low-density artefact scatter located on An elevated flat. Wattle Creek AS5 (AHIMS #52-4-0809) consists of 2 artefacts including silcrete debitage and a quartz flake. Due to the presence of similar sites in the area, Wattle Creek AS5 (AHIMS #52-4-0809) is not rare, nor does it contain any educational or research opportunities. As such, Wattle Creek AS5 (AHIMS #52-4-0809) is considered to have low scientific value at a local level. | Low |
| **Wattle Creek AS6** | 52-4-0810 | Wattle Creek AS6 (AHIMS #52-4-0810) is an artefacts scatter that is situated in a valley. Considered a low-density artefact scatter with 6 artefacts, Wattle Creek AS6 (AHIMS #52-4-0810) consists of a quartz flake, a quartzite scraper, a quartzite distal flake, a quartzite thumbnail scraper and a grey quartzite medial flake. The artefacts within Wattle Creek AS6 (AHIMS #52-4-0810) are not uncommon in the area. In addition, there are limited opportunities to further explore educational or research potential. As such, Wattle Creek AS6 (AHIMS #52-4-0810) is considered to have low scientific significance. | Low |
| **Wattle Creek AFT16** | 52-4-0811 | Wattle Creek AFT16 (AHIMS #52-4-0810) is an isolated red silcrete scraper located within a valley. Wattle Creek AFT16 (AHIMS #52-4-0810) is not rare, nor does it contain any educational or research opportunities. As such, Wattle Creek AFT 16 (AHIMS #52-4-0810) is therefore considered to have low scientific value at a local level. | Low |

| Site name | AHIMS No. | Assessment of significance | Grading |
|---|---|---|---|
| **Wattle Creek AS7** | 52-4-0812 | Wattle Creek AS 7 (AHIMS #52-4-0812) is a low-density artefact scatter located on a slope. The 2 artefacts consist of an opaque quartz scraper and a piece of red silcrete debitage. The artefacts within Wattle Creek AS7 (AHIMS #52-4-0812) are not uncommon in the area. In addition, there are limited opportunities to further explore educational or research potential. As such, Wattle Creek AS 7 (AHIMS #52-4-0812) is considered to have low scientific significance. | Low |
| **Wattle Creek AFT17** | 52-4-0813 | Wattle Creek AFT17 (AHIMS #52-4-0813) is an isolated artefact located on the slope. Consisting of a single chert core Wattle Creek AFT 17 (AHIMS #52-4-0813) is not rare, nor does it contain any educational or research opportunities. As such, Wattle Creek AFT 17 (AHIMS #52-4-0813) is therefore considered to have low scientific value at a local level. | Low |
| **Wattle Creek AS8** | 52-4-0814 | Wattle Creek AS8 (AHIMS #52-4-0814) is an artefact scatter that is located within a valley and a hollow. Consisting of 6 artefacts of silcrete, quartz and quartzite materials Wattle Creek AS8 (AHIMS #52-4-0814) includes scraper, thumbnail scrapers, flakes and debitage tool types. These features are common in the region and although there are specific tools, the low-density nature of the artefact scatter limits the research and educational potential. Therefore, Wattle Creek AS8 (AHIMS #52-4-0814) is considered to have low scientific significance. | Low |
| **Wattle Creek AS9** | 52-4-0815 | Wattle Creek AS9 (AHIMS #52-4-0815) is an artefact scatter situated on a slope. The low-density artefact scatter consists of 2 artefacts, a silcrete distal flake and a translucent quartz Bondi Point. The artefacts within Wattle Creek AS9 (AHIMS #52-4-0815) are not uncommon in the area. In addition, there are limited opportunities to further explore educational or research potential. As such, Wattle Creek AS9 (AHIMS #52-4-0815) is considered to have low scientific significance. | Low |
| **Wattle Creek AFT18** | 52-4-0816 | Wattle Creek AFT 18 (AHIMS #52-4-0816) is an isolated artefact located on a slope. The site, Wattle Creek AFT 18 (AHIMS # PENDING) is a red silcrete thumbnail scraper with scalar retouch. Wattle Creek AFT 18 (AHIMS #52-4-0816) is not rare in the local or regional area, nor does it contain any educational or research opportunities. As such, Wattle Creek AFT 18 (AHIMS #52-4-0816) is therefore considered to have low scientific value at a local level. | Low |
| **Wattle Creek AFT19** | 52-4-0817 | Wattle Creek AFT 19 (AHIMS #52-4-0817) is an isolated artefact located on the valley floor. Wattle Creek AFT 19 (AHIMS #52-4-0817) is a single opaque quartz flaked piece. Quartz is the most common material in the area and flaked pieces are often identified, therefore Wattle Creek AFT 19 (AHIMS #52-4-0817) does not display any rarity. In addition, there are limited opportunities to further explore educational or research potential. As such, Wattle Creek AFT 19 (AHIMS #52-4-0817) is considered to have low scientific significance. | 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 following submissions were received from Anonymous Party 1 during the completion of the Project:

Anonymous Party 1:

> *"The subject site has high significance, including intangible elements and the Wollondilly River".*

> *"The site proposed for the Wattle Creek Solar Farm [including the BESS] was likely utilised as an important hunting ground and location for sourcing a variety of food. Fresh water was plentiful"*

## 9.3. STATEMENT OF SIGNIFICANCE

Statements of significance for identified Aboriginal sites within the Project Area are presented in Table 9.4. The statements of significance have been formulated using the Burra Charter significance values and relevant NSW guidelines (Australia ICOMOS 2013a; Department of Environment, Climate Change and Water NSW 2010b; OEH 2011).

**Table 9.4 Statements of significance for Aboriginal sites in the Project Area**

| Site name | Statement of significance |
|---|---|
| **MGPS5 / AHIMS #48-1-0119** | MGPS5 (AHIMS #48-4-0119) is an isolated artefact, identified on the crest of a small ridge line and located approximately 1 km from the Wollondilly River. MGPS5 (AHIMS #48-4-0119) is a milky quartz flake with a serrated edge, with the site typology and material often identified in the local area. Although all cultural heritage sites are considered to have social significance, MGPS5 (AHIMS #48-4-0119) has been assessed to not have research, historic or aesthetic significance. This is determined on the basis that the site type is common in the local area with limited research potential and is not associated with any known historical individual or event. |
| **1 Arthursleigh; Arthursleigh; /AHIMS #52-4-0085** | 1 Arthursleigh; Arthursleigh; (AHIMS #52-4-0085) is an isolated artefact that was identified on the north-west slope of a hilltop, approximately 3 km from the Wollondilly River. 1 Arthursleigh; Arthursleigh (AHIMS #52-4-0085) consist of 12 recorded artefacts in a 40m by 40m area made from quartz and silcrete and included flakes and cores. Although all cultural heritage sites are considered to have social significance, 1 Arthursleigh; Arthursleigh; (AHIMS #52-4-0085) has been assessed to not have research, historic or aesthetic significance. This is determined on the basis that the site type is common in the local area with limited research potential and is not associated with any known historical individual or event. |
| **TME-OS5 / AHIMS #52-4-0131** | TME-OS5 (AHIMS #52-4-0131) is an artefact scatter on a flat, adjacent to the Wollondilly River and consists of more than 50 artefacts of mostly silcrete artefacts. TME-OS5 (AHIMS #52-4-0131) contains common artefact typologies and has a typical to the local area raw material. Based on these findings, the site may not have research potential. TME-OS5 (AHIMS #52-4-0131) has been assessed to not have historic or aesthetic values. This is on the basis that the site is not associated with any historical person or event and although all artefacts have aesthetic, the site is not unique in its value. |

| Site name | Statement of significance |
|---|---|
| **TME-OS4 / AHIMS #52-4-0132** | TME-OS4 (AHIMS #52-4-0132) is a low-density artefact scatter located on a drainage line that flows into the Wollondilly River. Consisting of 3 silcrete artefacts. TME-OS4 (AHIMS #52-4-0132) has locally common types of artefact and is a typical raw material. In addition, there is limited research or educational potential and therefore MGPS5 (AHIMS #48-4-0119) is determined to have low scientific significance. Based on these findings, the site may not have research potential. Although all cultural heritage sites are considered to have social significance, MGPS5 (AHIMS #48-4-0119) has been assessed to not have historic or aesthetic values. This is on the basis that the site is not associated with any historical person or event and although all artefacts have aesthetic, the site is not unique in its value. |
| **TME-OS3 with PAD / AHIMS #52-4-0133** | TME-OS3 (AHIMS #52-4-0133) is a low-density artefact scatter with a PAD and is located on a drainage line that flows into Wollondilly Creek. The scatter is described within the site card as containing 'many artefacts of silcrete and quartz' and the PAD identified within a ploughed environment. As further investigations into TME-OS3 (AHIMS #52-4-0133) have not been undertaken, the site cannot be assessed since the extent and nature of the site have not been determined. |
| **TME-OS2 with PAD / AHIMS #52-4-0134** | TME-OS2 (AHIMS #52-4-0134) is an open artefact scatter with a PAD and is located near Mt Pleasant. As further investigations into TME-OS3 (AHIMS #52-4-0133) have not been undertaken, the site cannot be assessed since the extent and nature of the site have not been determined. |
| **BH11 (Canyon Leigh) / AHIMS #52—0137** | BH11 (Canyon Leigh) [AHIMS #52-4-0237] is a low-density artefact scatter consisting of a quartz core and 4 flakes. Located on the western bank of the Wollondilly River, BH11 (Canyon Leigh) [AHIMS #52-4-0237] has locally common types of artefacts and is a typical raw material. Based on these findings, the site may not have research potential. All cultural heritage sites are considered to have social significance but BH11 (Canyon Leigh) [AHIMS #52-4-0237] has been assessed to not have historic and aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |
| **BH12 (Canyon Leigh) / AHIMS #52-4-0238** | BH12 (Canyon Leigh) [AHIMS #52-4-0238] is a low-density artefact scatter containing 5 artefacts of 1 quartz and silcrete materials. Located 80m from the Wollondilly, BH12 (Canyon Leigh) [AHIMS #52-4-0238] contains both cores and 'other tool types' according to the site card. BH12 (Canyon Leigh) [AHIMS #52-4-0238] has locally common types of artefact and has typical raw materials. Based on these findings, the site may not have research potential. Although all cultural heritage sites are considered to have social significance, BH12 (Canyon Leigh) [AHIMS #52-4-0238] has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |
| **BH13 (Canyon Leigh) / AHIMS #52-4-0239** | BH13 (Canyon Leigh) [AHIMS #52-4-0239] is an artefact scatter located on the saddle of a large ridgeline. Containing 20 artefacts of quartzite, quartz, silcrete and chalcedony with typologies of flakes, cores and tools, BH13 (Canyon Leigh) [AHIMS #52-4-0239] has locally common types of artefact and has typical raw materials. Based on these findings, the site may not have research potential. BH13 (Canyon Leigh) [AHIMS #52-4-0239] has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |

| Site name | Statement of significance |
|---|---|
| **BH14 (Canyon Leigh) / AHIMS #52-4-0240** | BH14 (Canyon Leigh) [AHIMS #52-4-0240] is an isolated quartzite flake located on an elevated flat. Due to the presence of similar sites in the area, BH14 (Canyon Leigh) [AHIMS #52-4-0240] and based on these findings may not have research potential. Although all cultural heritage sites are considered to have social significance, BH14 (Canyon Leigh) [AHIMS #52-4-0240] has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |
| **BH15 (Canyon Leigh) / AHIMS #52-4-0244** | BH15 (Canyon Leigh) [AHIMS #52-4-0244] is an artefact scatter located adjacent to a creek line. Made up of a quartzite flake, a silcrete core and a piece of worked quartz. BH15 (Canyon Leigh) [AHIMS #52-4-0244] has locally common types of artefact and has typical raw materials. In addition, there is limited research or educational potential. Although all cultural heritage sites are considered to have social significance, BH15 (Canyon Leigh) [AHIMS #52-4-0240] has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |
| **KA4a / AHIMS #52-4-0335** | KA4a (AHIMS #52-4-0335) is located on a low gradient ridge crest and is an artefact scatter with a PAD. At least 20 artefacts were identified. As further investigations into KA4a (AHIMS #52-4-0335) have not been undertaken, the site cannot be assessed since the extent and nature of the site have not been determined. |
| **KA5a/AHIMS #52-4-0336** | KA5a (AHIMS #52-4-0336) is located on a low gradient slope and is an artefact scatter of 3 artefacts with a PAD. The artefacts were silcrete and quartz flakes. As the information provided is limited, KA5a (AHIMS #52-4-0336) significance cannot be determined. |
| **KA6a / AHIMS #52-4-0337** | KA6a (AHIMS #52-4-0337) consists of 2 *ex-situ* artefacts located on a ridge. No information regarding the site card has been provided. As the information provided is limited, KA6a's (AHIMS #52-4-0337) significance cannot be determined. |
| **KA7 / AHIMS #52-4-0338** | KA7 (AHIMS #52-4-0338) is an artefact scatter and PAD that are located on a terrace. Although there are more than 50 artefacts at the site there is also a PAD with unknown potential. As further investigations into KA7 (AHIMS #52-4-0338) have not been undertaken, the site cannot be assessed since the extent and nature of the site have not been determined. |
| **KPAD-3 / AHIMS #52-4-0348** | KPAD-3 (AHIMS #52-4-0348) is a PAD located on a toe slope of a spur crest. As further investigations into KPAD-3 (AHIMS #52-4-0348) have not been undertaken, the site cannot be assessed since the extent and nature of the site have not been determined. |
| **KPAD-4 / AHIMS #52-4-0349** | KPAD-4 (AHIMS #52-4-0349) is a PAD located on the spur crest. As further investigations into KPAD-4 (AHIMS #52-4-0349), the site cannot be assessed since the extent and nature of the site have not been determined. |
| **KPAD-5 / AHIMS #52-4-0350** | KPAD-5 (AHIMS #52-4-0350) is a PAD located on the spur crest. As further investigations into KPAD-5 (AHIMS #52-4-0350) have not been undertaken, the site cannot be assessed since the extent and nature of the site have not been determined. |
| **KPAD 6 / AHIMS #52-4-0351** | KPAD 6 (AHIMS #52-4-0351) is a PAD located on an alluvial terrace. As further investigations into KPAD-6 (AHIMS #52-4-0351) have not been undertaken, the site cannot be assessed since the extent and nature of the site have not been determined. |

| Site name | Statement of significance |
|---|---|
| **Wattle Creek 1 / AHIMS #52-4-0772** | Wattle Creek 1 (AHIMS #52-4-0762) is a low density artefact scatter identified on a mid to low slope. Consisting of 7 silcrete artefacts, Wattle Creek 1 (AHIMS #52-4-0762) includes 3 cores, 3 flakes and 1 piece of debitage and was identified within a 1m x1m site extent. The 7 artefacts are of a raw material and typology that is common to the local area. Although all sites are considered to have social significance, the site has low aesthetic, historical and scientific values with a limited ability to provide additional information about Aboriginal lifeways in the Wattle Creek area beyond the general use of the broader landscape. |
| **Wattle Creek 2 / AHIMS #52-4-0773** | Wattle Creek 2 (AHIMS #52-4-0773) is an isolated silcrete core scraper that was identified *ex-situ* in a location where earthworks had previously taken place. Isolated artefacts are not uncommon in the local area and the silcrete core scraper is both a typology and material commonly identified. In addition, the site is located in a highly disturbed area and has moved from its *in situ* location, limiting the scientific significance of the site. Wattle Creek 2 (AHIMS #52-4-0773)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, Although all Aboriginal sites have social significance, Wattle Creek 2 (AHIMS #52-4-0773) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek 3 / AHIMS #52-4-0771** | Wattle Creek 3 (AHIMS #52-4-0771) is an isolated silcrete core scraper that was identified *ex-situ* in a location where earthworks had previously taken place. Isolated artefacts are not uncommon in the local area and the silcrete core scraper is both a typology and material commonly identified. In addition, the site is located in a highly disturbed area and has moved from its *in situ* location, limiting the scientific significance of the site. Wattle Creek 3 (AHIMS #52-4-0771)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, although all Aboriginal sites have social significance, Wattle Creek 3 (AHIMS #52-4-0771) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek 4 / AHIMS #52-4-0774** | Wattle Creek 4 (AHIMS #52-4-0774) is an isolated quartzite river cobble that has likely been used as an axe. Identified on a slope, Wattle Creek 4 (AHIMS #52-4-0774) was located as part of a survey and adjacent to an informal farm track. The site was identified *ex situ* with the raw material and typology common in the local area, limiting the research and therefore scientific significance. The overall location and site have low aesthetic and historical significance, due to being in a disturbed location and not being associated with any historical figure or event. As a result, Wattle Creek 4(AHIMS #524-0774) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek 5 / AHIMS #52-4-0775** | Wattle Creek 5 (AHIMS #52-4-0775) is an isolated artefact located on an elevated terrace. The site is in poor condition and consists of a quartz core that was eroding out of the bank of the gully. Wattle Creek 5 (AHIMS #52-4-0775) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Based on these findings, the site may not have research potential. Wattle Creek 5 (AHIMS #52-4-0775) has also been assessed to have social significance but not historic and aesthetic significance. This is due to there being no known historical figures or events associated with the site and although all artefacts have aesthetics, the site is not unique in its value. |

| Site name | Statement of significance |
|---|---|
| **Wattle Creek 6 / AHIMS #52-4-0776** | Wattle Creek 6 (AHIMS #52-4-0776) is an artefact scatter containing approximately 100 artefacts. Located on a disturbed and elevated terrace, Wattle Creek 6 (AHIMS #52-4-0776) extends over an area of 5m x 5m. The raw materials within the site included silcrete, quartz, quartzite and volcanic materials with cores, scrapers and flake typologies. Due to a large number of artefacts, Wattle Creek 6 (AHIMS #52-4-0776) has the potential to provide additional information about Aboriginal activities. Wattle Creek 6 (AHIMS #52-4-0776)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. |
| **Wattle Creek 7 / AHIMS #52-4-0769** | Wattle Creek 7 (AHIMS #52-4-0769) is a low-density artefact scatter containing 2 fine-grained siliceous artefacts located within an eroded slope. The artefacts of Wattle Creek 7 (AHIMS #52-4-0769) consist of a blade and a flaked piece. Wattle Creek 7 (AHIMS #52-4-0769) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Wattle Creek 7 (AHIMS #52-4-0769). Wattle Creek 7 (AHIMS #52-4-0769)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. |
| **Wattle Creek 8 / AHIMS #52-4-0777** | Wattle Creek 8 (AHIMS #52-4-0777) contains 2 quartz artefacts and was located on a midslope. Wattle Creek 8 (AHIMS #52-4-0777) is a blade and point (proximal). Wattle Creek 8 (AHIMS #52-4-0777) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Wattle Creek 8 (AHIMS #52-4-0777)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. |
| **Wattle Creek 9 / AHIMS #52-4-0768** | Wattle Creek 9 (AHIMS #52-4-0768) is an isolated quartz distal flake eroding out of a cattle pad on a mid-slope landform. Wattle Creek 9 (AHIMS #52-4-0768) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Although all cultural heritage sites are considered to have social significance, Wattle Creek 9 (AHIMS #52-4-0768) has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |
| **Wattle Creek 10 / AHIMS #54-4-0767** | Wattle Creek 10 (AHIMS #54-4-0767) is a culturally scarred tree that is alive and in good condition. Located 780m from water, Wattle Creek 10 (AHIMS #54-4-0767) has a single rectangular-shaped scar orientated to the north-north-east. Although present in the local area, modified trees are not common and may provide further information on Aboriginal lifeways and activities in the local area. Although all cultural heritage sites are considered to have social significance, Wattle Creek 10 (AHIMS #54-4-0767) has been assessed to not have historic significance and limited aesthetic value. This has been determined on the basis that the site is not associated with any known historical figures or events and although the tree is in good condition in the wider landscape, there have been signs of landscape modification. |
| **Wattle Creek 11 / AHIMS #54-4-0766** | Wattle Creek 11 (AHIMS #54-4-0766) is an isolated artefact comprising a single quartzite core and was located adjacent to an open stock corridor in a disturbed slope. Wattle Creek 11 (AHIMS #52-4-0766) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Although all cultural heritage sites are considered to have social significance, Wattle Creek 11 (AHIMS #54-4-0766) has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |

| Site name | Statement of significance |
|---|---|
| **Wattle Creek 12 / AHIMS #54-4-0770** | Wattle Creek 12 (AHIMS #54-4-0770) is an isolated artefact comprising a single quartzite core that was located on an exposed and disturbed plain. Wattle Creek 12 (AHIMS #52-4-0770) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Although all cultural heritage sites are considered to have social significance, Wattle Creek 12 (AHIMS #54-4-0770) has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |
| **Wattle Creek 13 / AHIMS #52-4-0782** | Wattle Creek 13 (AHIMS #52-4-0782) is an artefact scatter that was identified on a plain. Comprising 2 quartzite flakes, Wattle Creek 13 (AHIMS #52-4-0782) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Although all cultural heritage sites are considered to have social significance, Wattle Creek 13 (AHIMS #54-4-0782) has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |
| **Wattle Creek 14 / AHIMS #52-4-0781** | Wattle Creek 14 (AHIMS #52-4-0781) is an isolated artefact located on a stock track within a plain. Recorded as a quartzite flake, Wattle Creek 14 (AHIMS #52-4-0781) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Although all cultural heritage sites are considered to have social significance, Wattle Creek 14 (AHIMS #54-4-0781) has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |
| **Wattle Creek 15 / AHIMS #52-4-0780** | Wattle Creek 15 (AHIMS #52-4-0780) is an isolated artefact that consists of a single quartz flake. Located on an elevated flat, Wattle Creek 15 (AHIMS #52-4-0780) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Wattle Creek 15 (AHIMS #52-4-0780)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, Although all Aboriginal sites have social significance, Wattle Creek 15 (AHIMS #52-4-0780) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek 16 / AHIMS #52-4-0779** | Wattle Creek 16 (AHIMS #52-4-0779) is a low density artefact scatter that was located on a plain. The 2 quartzite artefacts, likely a hand axe, refit together. Wattle Creek 16 (AHIMS #52-4-0779) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Wattle Creek 16 (AHIMS #52-4-0779)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, Although all Aboriginal sites have social significance, Wattle Creek 16 (AHIMS #52-4-0779) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |

| Site name | Statement of significance |
|---|---|
| **Wattle Creek 17 / AHIMS #52-4-0806** | Wattle Creek 17 (AHIMS #52-4-0806) is an isolated artefact that was situated on a slope. Described as a single quartz proximal fragment, Wattle Creek 17 (AHIMS #52-4-0806) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Wattle Creek 17 (AHIMS #52-4-0806)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, Although all Aboriginal sites have social significance, Wattle Creek 17 (AHIMS #52-4-0806) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek 18 / AHIMS #52-4-0805** | Wattle Creek 18 (AHIMS #52-4-0805) is an isolated artefact located within a slope landform and was eroding out of an exposure at the base of a stringybark tree. Consisting of a milky quartz flake, Wattle Creek 18 (AHIMS #52-4-0805) does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek AFT 13 / AHIMS #52-4-0807** | Wattle Creek AFT 13 (AHIMS #52-4-0807) is an isolated artefact that is situated on a ridge landform. Described as an opaque quartz distal flake, Wattle Creek AFT 13 (AHIMS #52-4-0807) has a similar typology and material to sites in the local area and has limited potential to provide additional information about Aboriginal lifeways beyond the general use of the broader landscape. Wattle Creek AFT 13 (AHIMS #52-4-0807)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, Although all Aboriginal sites have social significance, Wattle Creek AFT 13 (AHIMS #52-4-0807) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek AFT 14 / AHIMS #52-4-0808** | Wattle Creek AFT 14 (AHIMS #52-4-0808) is located within a slope and consists of an isolated silcrete proximal flake. Wattle Creek AFT 14 (AHIMS #52-4-0808) has a typology and material that is common in the local area and does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Wattle Creek AFT 14 (AHIMS #52-4-0808)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, Although all Aboriginal sites have social significance, Wattle Creek AFT 14 (AHIMS #52-4-0808) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek AFT 15 / AHIMS #52-4-0818** | Wattle Creek AFT 15 (AHIMS #52-4-0818) is an isolated silcrete scraper that was identified on an elevated flat. Wattle Creek AFT 15 (AHIMS #52-4-0818) has a typology and material that is common in the local area and does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Although all cultural heritage sites are considered to have social significance, Wattle Creek AFT 15 (AHIMS #52-4-0818) has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |

| Site name | Statement of significance |
|---|---|
| **Wattle Creek AS 5 / AHIMS #52-4-0809** | Wattle Creek AS 5 (AHIMS #52-4-0809) is a low density artefact scatter, consisting of silcrete debitage and a quartz flake. Situated on a footslope, Wattle Creek AS 5 (AHIMS #52-4-0809) has a typology and material that is common in the local area and does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Wattle Creek AS 5 (AHIMS #52-4-0809)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, Although all Aboriginal sites have social significance, Wattle Creek AS 5 (AHIMS #52-4-0809) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek AS 6 / AHIMS #52-4-0810** | Wattle Creek AS 6 (AHIMS #52-4-0810) is an artefact scatter consisting of 6 artefacts located on an elevated flat. The artefacts within the site include a grey quartzite silcrete thumbnail scraper, an opaque quartz flake, a grey quartzite scraper, a grey quartzite distal flake, a grey quartzite thumbnail scraper and a grey quartzite medial fragment. The artefacts within Wattle Creek AS 6 (AHIMS #52-4-0810) have a typology and material that is common in the local area and does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Wattle Creek AS 6 (AHIMS #52-4-0810)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, Although all Aboriginal sites have social significance, Wattle Creek AS 6 (AHIMS #52-4-0810 has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek AFT 16 / AHIMS #52-4-0811** | Wattle Creek AFT 16 (AHIMS #52-4-0811) is an isolated artefact that was located on a slope landform. Consisting of a red silcrete scraper, Wattle Creek AFT 16 (AHIMS #52-4-0811) has a typology and material that is common in the local area and does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Wattle Creek AFT 16 (AHIMS #52-4-0811)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, Although all Aboriginal sites have social significance, Wattle Creek AFT 16 (AHIMS #52-4-0811) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek AS 7 / AHIMS #52-4-0812** | Wattle Creek AS 7 (AHIMS #52-4-0812) is a low-density artefact scatter that is located on a slope. Containing 2 artefacts, a quartz steep edge scraper and a piece of silcrete debitage, Wattle Creek AS 7 (AHIMS #52-4-0812) has a typology and material that is common in the local area and does not contain any rare or unique features and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Wattle Creek AS 7 (AHIMS #52-4-0812)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, Although all Aboriginal sites have social significance, Wattle Creek AS 7 (AHIMS #52-4-0812) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek AFT 17 / AHIMS #52-4-0813** | Wattle Creek AFT 17 (AHIMS #52-4-0813) is located on a slope and consists of an isolated chert core. Wattle Creek AFT 17 (AHIMS #52-4-0813) has a typology and material that is common in the local area and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |

| Site name | Statement of significance |
|---|---|
| **Wattle Creek AS 8 / AHIMS #52-4-0814** | Wattle Creek AS 8 (AHIMS #52-4-0814) is a low-density artefact scatter that is located within a valley and hollow. The low-density artefact scatter consists of 4 artefacts, including a quartz proximal flake, a piece of grey quartzite debitage, an opaque quartz thumbnail scraper and a translucent quartz thumbnail scraper. Wattle Creek AS 8 (AHIMS #52-4-0814)'s artefacts have a typology and material that is common in the local area and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Although all cultural heritage sites are considered to have social significance, Wattle Creek AS 8 (AHIMS #52-4-0814) has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |
| **Wattle Creek AS 9 / AHIMS #52-4-0815** | Wattle Creek AS 9 (AHIMS #52-4-0815) is a low-density artefact scatter that is located within a valley and hollow. The low-density artefact scatter consists of 4 artefacts, including a silcrete scraper, a red silcrete distal fragment, a quartz Bondi point and an opaque quartz thumbnail scraper. Wattle Creek AS 9 (AHIMS #52-4-0815)'s artefacts have a typology and material that is common in the local area and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek AFT 18 / AHIMS #52-4-0816** | Wattle Creek AFT 18 (AHIMS #52-4-0816) is an isolated artefact that is situated on a slope. Recorded as a red silcrete thumbnail scraper, Wattle Creek AFT 18 (AHIMS #52-4-0816) does not have rare or unique features, with the typology and material commonly identified in the local area and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Wattle Creek AFT 18 (AHIMS #52-4-0816)'s environmental location is one of low aesthetic and historical significance due to landscape modification and the lack of a connection with any historical person or event. Overall, Although all Aboriginal sites have social significance, Wattle Creek AFT 18 (AHIMS #52-4-0816) has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. |
| **Wattle Creek AFT 19 / AHIMS #52-4-0817** | Wattle Creek AFT 19 (AHIMS #52-4-0817) is an isolated artefact identified on an elevated flat. Consisting of an opaque quartz flaked piece, Wattle Creek AFT 19 (AHIMS #52-4-0817) does not have rare or unique features, with the typology and material commonly identified in the local area and therefore has limited potential to provide additional information about Aboriginal lifeway beyond the general use of the broader landscape. Although all cultural heritage sites are considered to have social significance, Wattle Creek AFT 19 (AHIMS #52-4-0817) has been assessed to not have historic or aesthetic significance. This has been determined on the basis that the site is not associated with any known historical figures or events and although all artefacts have aesthetics, the site is not unique in its value. |

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"* (Department of Environment, Climate Change and Water NSW 2010c).

Investigations completed to inform this ACHA indicate that due to both large and low-density artefact scatters as well as isolated artefacts being present within the Project Area, there would likely have been short and long-term occupational activities undertaken. The proximity of the Project Area to the Wollondilly River and Mt Pleasant would have not only have provided resources but also been an aesthetic location. As a result, the Project Area contains important landscape features that would have been invaluable to their daily lives as well as cultural practices.

# 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 Project Area (Department of Environment, Climate Change and Water NSW 2010b; OEH 2011).

## 10.1. LAND USE HISTORY

The Project Area is found within an area under constant artificial change. Deforestation and vegetation clearance have occurred throughout most of the Project Area. Historically the Project Area was used for grazing and other relatively low-impact agricultural activity, with little development beyond access tracks, bores, dams, roads, airstrip and the construction of buildings such as houses, barns, shearing sheds, shears accommodation and Sydney University student accommodation.

Livestock grazing activities have resulted in broadscale soil disturbance and topsoil movement across the Project Area. The impact of this on Aboriginal cultural heritage material includes displacement and damage to stone artefacts.

A summary of past land use within the Project Area are shown in Table 10.1.

**Table 10.1 Summary of past land use within the Project Area**

| Past land uses | Potential impacts on archaeological resources |
|---|---|
| **Deforestation and vegetation clearance** | The deforestation and vegetation clearance of the Project Area and surrounds in the past may have resulted in a loss of archaeological potential. Aboriginal scarred trees may have been destroyed, or severely damaged. |
| **Animal grazing** | Animal grazing could have resulted in the displacement of archaeological artefacts and/or damage to subsurface archaeological artefacts (if present). It could also result in unnatural movements of artefacts through the stratigraphic record. |
| **Construction of access tracks, bores, dams, roads and airstrip** | The construction of access tracks, bores, dams, roads and airstrip within the Project Area would have involved significant groundworks which may have resulted in significant artefact displacement. |
| **Construction of buildings such as houses, barns, shearing sheds, shears accommodation and Sydney University student accommodation.** | The construction of buildings such as houses, barns, shearing sheds, shears accommodation and Sydney University student accommodation within the Project Area would have involved significant groundworks which may have resulted in significant artefact displacement. |

## 10.2. PROPOSED ACTIVITY

The conceptual project layout for SSD-63345458 represents a Development Footprint of approximately 75 ha, including associated ancillary infrastructure (i.e. transmission lines substations, the operations and maintenance facility, and test bed).

## 10.3. DESIGN REFINEMENT AND AVOIDANCE

Following the archaeological survey, the SSD-63345458 development footprint was refined to avoid impacts to the sites listed in Table 10.2. These sites are now wholly excluded from the development footprint.

**Table 10.2 Sites that will be avoided due to a refinement in the Project design**

| Site Name | AHIMS Number | Scientific Significance |
|---|---|---|
| Wattle Creek 1 | #52-4-0772 | Low |
| Wattle Creek 2 | #52-4-0773 | Low |
| Wattle Creek 15 | #52-4-0780 | Low |
| Wattle Creek 16 | #52-4-0779 | Low |
| TME-OS2 with PAD | 52-4-0134 | Unknown |

## 10.4. ASSESSING HARM

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

### 10.4.1. 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 that the present generation has a responsibility to 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.*" (Department of Environment and Climate Change NSW 2009:26).

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 (Department of Environment and Climate Change NSW 2009:26).

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*" (Department of Environment and Climate Change NSW 2009:26).

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 (2009:26) 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.

### 10.4.2. 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 2011:12), and are summarised in

Table 10.3. 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 (Department of Environment, Climate Change and Water NSW 2010d:21).

**Table 10.3 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. |

## 10.5. IMPACT ASSESSMENT

This ACHA has included a programme of investigations that have characterised the nature, extent and significance of Aboriginal sites within the development footprint associated with the Project.

Following the desktop, survey and excavation investigations a total of 49 sites were identified within the Project Area with 19 being previously recorded and 30 being identified during the survey and excavation

investigation (Table 11.1). As part of the proposed works for SSD-63345458 a total of 9 sites will be directly impacted by the construction of the Project. There is also one site which is in close proximity to that the development footprint. So that no cultural material at this site will be impacted, an exclusion zone will be created.

Activities that may harm Aboriginal cultural material include the construction of the BESS, transmission lines, operation and maintenance facility- including a site office, operation and maintenance buildings, amenities, equipment sheds, storage, parking area, underground cables, new access tracks, upgrades to existing access tracks, minor upgrade to the existing access point from Canyonleigh Road, static water tanks, potential construction material areas such as borrow pits, quarry and rock crushing facilities, laydown areas and the use of heavy vehicles to transport equipment. All sites located within the development footprint will be directly impacted by the proposed works. Another site will be indirectly impacted due to its close proximity to the development footprint.

Table 10.4 provides the impact assessment for all sites identified within the Project Area (as requested by HNSW), including sites outside of the development footprint. It identifies what sites will be impacted by the Project and the Wattle Creek Solar Farm noting that there are shared proposed impacts between the two; such as, but not limited to, roads and transmission. Details of the proposed activity in relation to identified Aboriginal sites is shown in Figure 10.1.

**Table 10.4 Assessment of harm to identified Aboriginal sites with the Project Area**

| Site name / AHIMS No. | Impact | | Type of harm | Degree of harm | Consequence of harm |
|---|---|---|---|---|---|
| | BESS | Wattle Creek Solar Farm Project | | | |
| **Wattle Creek 1 / #52-4-0772** | None | None | None | None | No loss of value |
| **Wattle Creek 2 / #52-4-0773** | None | None | None | None | No loss of value |
| **Wattle Creek 3 / #52-4-0771** | Yes | Yes | Direct | Total | Total loss of value |
| **Wattle Creek 4 / #52-4-0774** | Yes | Yes | Direct | Total | Total loss of value |
| **Wattle Creek 5 / #52-4-0775** | None | None | None | None | No loss of value |
| **Wattle Creek 6 / #52-4-0776** | None | None | None | None | No loss of value |
| **Wattle Creek 7 / #52-4-0769** | None | None | None | None | No loss of value |
| **Wattle Creek 8 / #52-4-0777** | None | None | None | None | No loss of value |
| **Wattle Creek 9 / #52-4-0768** | Yes | Yes | Direct | Total | Total loss of value |
| **Wattle Creek 10 / #54-4-0767** | None | None | None | None | No loss of value |

| Site name / AHIMS No. | Impact | | Type of harm | Degree of harm | Consequence of harm |
|---|---|---|---|---|---|
| | BESS | Wattle Creek Solar Farm Project | | | |
| **Wattle Creek 11/#52-4-0766** | None | None | None | None | No loss of value |
| **Wattle Creek 12/#52-4-0770** | None | None | None | None | No loss of value |
| **Wattle Creek 13/#52-4-0782** | None | None | None | None | No loss of value |
| **Wattle Creek 14/#52-4-0781** | None | None | None | None | No loss of value |
| **Wattle Creek 15 / #52-4-0780** | None | None | None | None | No loss of value |
| **Wattle Creek 16 / #52-4-0779** | None | None | None | None | No loss of value |
| **Wattle Creek 17 / #52-4-0806** | None | None | None | None | No loss of value |
| **Wattle Creek 18 / #52-4-0805** | None | None | None | None | No loss of value |
| **Wattle Creek AFT 13 / #52-4-0807** | Yes | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AFT 14 / #52-4-0808** | Yes | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AFT 15 / #52-4-0818** | None | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AFT 16 / #52-4-0811** | Yes | None | Direct | Total | Total loss of value |
| **Wattle Creek AFT 17 / #52-4-0813** | Yes | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AFT 18 / #52-4-0816** | None | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AFT 19 / #52-4-0817** | None | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AS 5 / #52-4-0809** | None | Yes | Direct | Total | Total loss of value |
| **Wattle Creek AS 6 / #52-4-0810** | Yes | None | Direct | Total | Total loss of value |
| **Wattle Creek AS 7 / # 52-4-0812** | Yes | None | Direct | Total | Total loss of value |
| **Wattle Creek AS 8 / #52-4-0814** | None | Yes | Direct | Total | Total loss of value |

| Site name / AHIMS No. | Impact | | Type of harm | Degree of harm | Consequence of harm |
|---|---|---|---|---|---|
| | BESS | Wattle Creek Solar Farm Project | | | |
| **Wattle Creek AS 9 / #52-4-0815** | None | Yes | Direct | Total | Total loss of value |
| **KA5a/ #52-4-0336** | None | None | None | None | No loss of value |
| **BH15 (Canyon Leigh) / #52-4-0244** | None | None | None | None | No loss of value |
| **BH14 (Canyon Leigh) / #52-4-0240** | None | None | None | None | No loss of value |
| **BH13 (Canyon Leigh) / #52-4-0239** | None | None | None | None | No loss of value |
| **TME-OS2 / #52-4-0134** | None | None | None | None | No loss of value |
| **BH11 (Canyon Leigh) / #52-4-0237** | None | None | None | None | No loss of value |
| **BH12 (Canyon Leigh) / #52-4-0238** | None | Yes | Direct | Total | Total loss of value |
| **MGPS5 / #48-4-0119** | None | None | None | None | No loss of value |
| **KPAD-4 / #52-4-0349** | None | None | None | None | No loss of value |
| **KA4a / #52-4-0335** | None | None | None | None | No loss of value |
| **1 Arthursleigh; Arthursleigh / #52-4-0085** | None | None | None | None | No loss of value |
| **KPAD-3 / #52-4-0348** | None | None | None | None | No loss of value |
| **KA5a / #52-4-0336** | None | None | None | None | No loss of value |
| **TME-OS3 with PAD / #52-4-0133** | None | None | None | None | No loss of value |
| **KA6a / #52-4-0337** | None | None | None | None | No loss of value |
| **TME-OS4 / #52-4-0132** | None | None | None | None | No loss of value |
| **TME-OS5 / #52-4-0131** | None | None | None | None | No loss of value |
| **KPAD-5 / #52-4-0350** | None | None | None | None | No loss of value |
| **KPAD-6 / #52-4-0351** | None | None | None | None | No loss of value |
| **KA7 / #52-4-0338** | None | None | None | None | No loss of value |

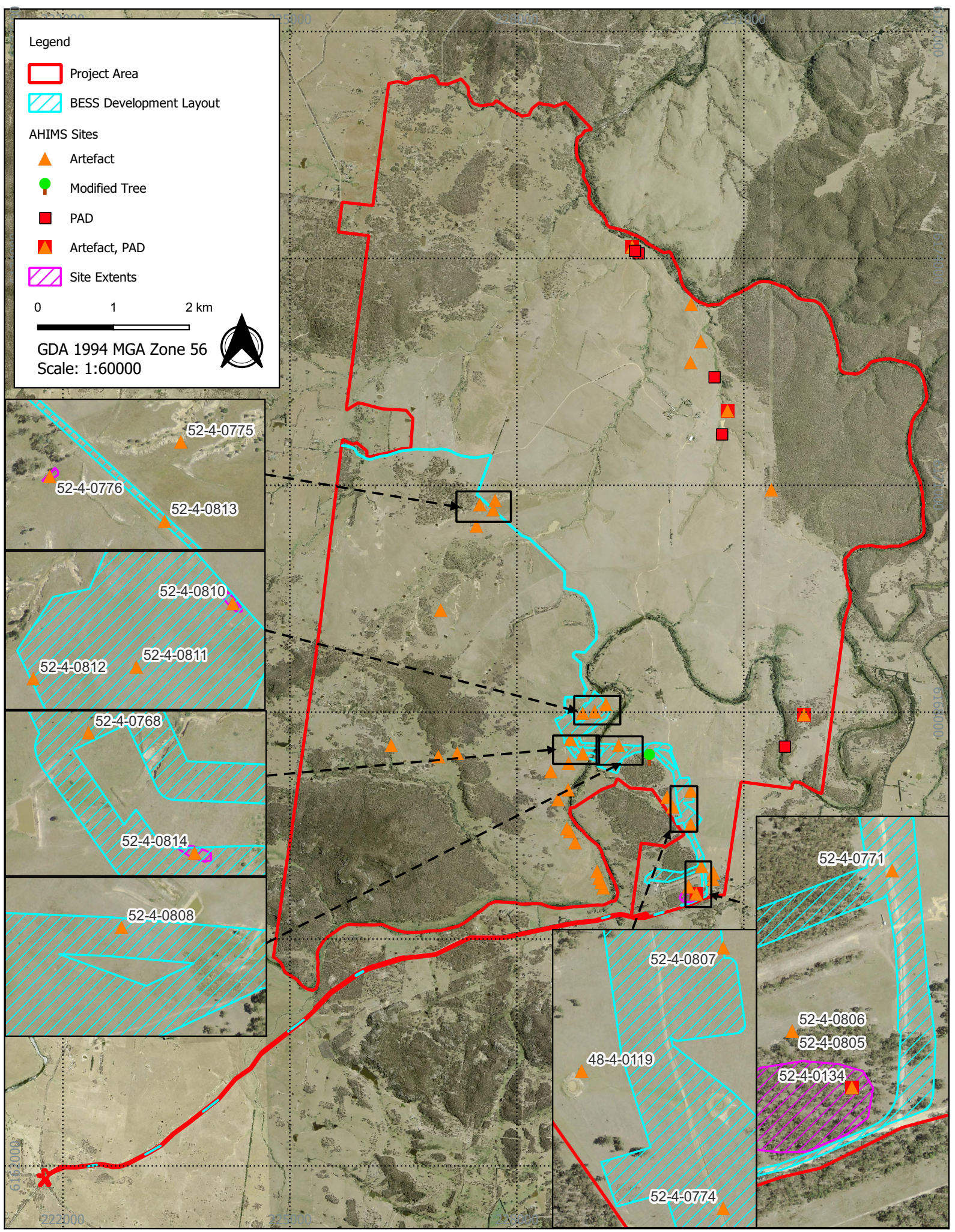



**Figure 10.1 Details of the proposed activity in relation to identified Aboriginal sites within the Project Area**

22070 - Wattle Creek BESS - ACHA

*Source: NSW LPI Aerial*

*Drawn by: PB Date: 2026-01-31*

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: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

The Project Area is located within an area of predominantly rural farmland which has been utilised as pastoral grazing land for agricultural purposes and by the University of Sydney for drone testing. As such, most impacts to the Project Area have been caused by human development, with previous agricultural, and pastoral processes as well as the University of Sydney rocket testing having limited, but significant effects, on the Aboriginal cultural material that was likely to be present in the Project Area. The construction of the Project will result in disturbance to the entire development footprint, this will result in harm to Aboriginal cultural material identified within this area.

As part of this ACHA, the proposed extent of the proposed works and associated disturbance have been altered to reduce harm to sites where possible. These sites are listed in Table 10.2. This section may be updated following Stage 4. Some, sites however can not be avoided and therefore management strategies will need to be developed to reduce the loss of value to the sites.

All the sites that will be impacted are sites of low significance. Artefact sites that consist of either an isolated or low-density scatters. There are 3 sites located on the surface while all other sites are located in the subsurface. For sites located on the surface, they can be easily collected there for it is reasonable to have these sites collected and relocated.

For the subsurface sites that will be impacted, due to the low density of the artefacts it is impractical to expect that excavations be conducted to collect artefacts that contain low significance. For these sites, no mitigation measures can be developed.

## 11.2. PRINCIPLES OF ESD AND CUMULATIVE IMPACTS

The NSW Government, through the Energy Corporation of NSW (EnergyCo) seeks to maximise opportunities created by the transformation of the NSW electricity system by coordinating investment in Renewable Energy Zones (REZs) across NSW. A REZ is the equivalent of modern-day power stations, combining new renewable energy infrastructure, including generators (such as solar and wind farms), storage (such as batteries and pumped hydro) and high-voltage transmission infrastructure for connection to the National Electricity Market (NEM). Five (5) REZs have been declared in NSW to date. The Project is not located within a current REZ.

The Guide to Reporting requires this ACHA to consider the effects of cumulative impacts under the principles of ESD. These principles are outlined in Section 10.4.1. In essence, this requires the acknowledgement that while a single development might have minimal impact, it forms part of an urbanisation process which results in the widespread loss of environmental and cultural resources.

Parts of the South Eastern Highlands Bioregion are managed in conservation tenures which account for 14.86% or 726,530.55 ha of the total bioregion, with nature reserves and national parks accounting for 12.22 % or 596,638.58 ha of the conservation total. There are 12 wilderness areas totalling 177,381.15

ha (3.63%) which are managed under the Wilderness ACT 1987, and a further 15,858.92 ha (0.327%) conserved under tenures (NSW Department of Planning, Industry and Environment 2021).

In addition, landholders have voluntarily entered conservation agreements, covering approximately 2,889.07 ha, or 0.06% of the bioregion, and landholders of 96 properties manage 68,776.84 ha of wildlife refuges, accounting for 1.41% of the bioregion. Landholders of 141 properties have entered property agreements under the NVC Act 1997. The conservation zones of the agreements account for approximately 6,354.29 ha or 0.13% of the bioregion.

The Forestry Act 1916 manages thirteen flora reserves, which cover 4,654.83 ha or 0.10% of the bioregion and help conserve biodiversity. State forests maintained 357,262.24 ha (7.31% of the bioregion) forestry activities under the Forestry Act 1916.

A significant proportion of the bioregion, 1,015,258.25 ha or 20.77%, receives supplementary management under the provisions of SEPP 58 [Protecting Sydney's Water Supply] (NSW Department of Planning, Industry and Environment 2021)..

However, parts of the South Eastern Highlands Bioregion, including the Project Area, have been subject to progressive and continuing agricultural and pastoral practices, which have and will continue to place pressure on the archaeological resources within the region.

This Project is one of the many similar REZ projects in the region, including the Wattle Creek Solar Farm and the Marualn Gas Fired Power Station, that are large scale and focused on energy resources.

To assess whether the impacts from the Project will have a broader impact on the cultural resources of the region, Austral has undertaken an analysis of AHIMS sites associated with current or previous AHIPs based on the results of the extensive AHIMS search completed for this Project.

As the Project is an SSD, no AHIPs will be required (subject to Section 4.41 of the EP&A Act). There is the potential for additional Aboriginal archaeological sites in the region that have been assessed via other SSDs, which are not required to have an AHIP, which would still be on the AHIMS register. This assessment does not consider the archaeological sites listed on AHIMs that are not subject to AHIPs, for example, those identified during SSD projects.

AHIMS sites were additionally analysed in relation to their current or future zoned use. The purpose behind this analysis is to determine the volume of AHIMS sites that are located within zonings that have or are likely to be subject to progressive development. This assumed that sites located within land zoned for residential (R1 – R5), business (B1 – B5) and industrial (IN1 – IN4) purposes are more likely to have been harmed or may be under threat of harm. Sites that are zoned for environmental (E1 – E5), recreational (RE1 – RE2) and rural (RU1 – RU6) purposes are likely to be subject to agricultural activities and renewable energy development. This analysis is presented in Table 12.1.

**Table 11.1 Analysis of the number of AHIMS sites in relation to land zoning**

| Land Zone Classification | No. of Sites by Zone | % Sites by Zone |
|---|---|---|
| **RU2: Rural Landscape** | 67 | 78.82 |
| **RU1 Primary Production** | 18 | 21.18 |

Although not always possible, avoiding sites and protecting them with buffers means these sites will continue to contribute to the cultural and social knowledge of past Aboriginal use of the area. As an alternative to complete destruction, community collection is recommended as a way of preserving the objects located within the site. Given, the extensive clearing and agricultural practices of the site it is unlikely that a number of the sites occur *in situ* and therefore their removal will have less impact due to being out of their original context.

No AHIPs have been listed against any of the AHIMS identified during this project.

## 11.3. STRATEGIES TO MINIMISE HARM

The Project includes ground disturbance activities that will impact any Aboriginal cultural heritage present. Although, the conceptual project layout has been refined to avoid direct impact to 5 of the sites (listed in Table 10.2). There are still sites that will be 9 sites directly impacted by the Project.

To ensure that contractors do not accidentally impact sites outside of the proposed development, general conditions will be developed as part of a Cultural Heritage Management Plan (CHMP) for SSD-63345458. This would include the requirement of cultural heritage induction, clear signage and fencing where required. The CHMP will also include specific conditions for sites that will be directly impacted. These will be based on the nature and significance of the site and how they are going to be impacted..

To ensure that no direct impact will occur to the artefact and PAD site that is located in close proximity to the Development Footprint, an exclusion zone is to be erected around the extent of the PAD. This exclusion zone will have a minimum buffer of 3 m and be constructed from the steel posts and bunting.

To mitigate harm to sites located on the ground surface, it is recommended that a community salvage program for the artefacts be initiated. Although harm will occur as part of this activity, the salvage and relocation of these sites will minimise the harm that would occur as part of the proposed works, either directly or indirectly. three isolated artefact sites will be harmed through this community salvage program.

For the 4 isolated artefacts and 2 low-density artefact scatters that are located in the subsurface that will be impacted, no further mitigation measures will be required. The subsurface isolated artefacts have already been relocated as part of the test excavation and therefore there is no cultural material located at the site location. For the 2 subsurface artefact scatters, some material has already been collected that provides insight into the nature of the sites. Due to the low-density of the artefacts at each of the sites, a salvage program would not provide any further information about the site. Based on these observations, harm will be allowed to the 6 sub-surface artefact sites.

Stage 4 of the consultation suggested that the artefacts be returned to Country in a safe location following the Community Collection.

A breakdown detailing the management strategies for each of the sites within the Project Area is presented in Table 11.2.

**Table 11.2 Management conditions by site.**

| Site name / AHIMS No. | Site Type | Significance | Cause of harm | | Management conditions |
|---|---|---|---|---|---|
| | | | BESS | Solar Farm | |
| **Wattle Creek 1 / #52-4-0772** | Low Density Artefact Scatter | Low | None | None | General |
| **Wattle Creek 2 / #52-4-0773** | Isolated Artefact | Low | None | None | General |
| **Wattle Creek 3 / #52-4-0771** | Isolated Artefact | Low | Yes | Yes | Community Salvage |
| **Wattle Creek 4 / #52-4-0774** | Isolated Artefact | Low | Yes | Yes | Community Salvage |
| **Wattle Creek 5 / #52-4-0775** | Isolated Artefact | Low | None | None | General |
| **Wattle Creek 6 / #52-4-0776** | High Density Artefact Scatter, PAD | Moderate | None | None | General |
| **Wattle Creek 7 / #52-4-0769** | Low Density Artefact Scatter | Low | None | None | General |
| **Wattle Creek 8 / #52-4-0777** | Low Density Artefact Scatter | Moderate | None | None | General |
| **Wattle Creek 9 / #52-4-0768** | Isolated Artefact | Low | Yes | Yes | Community Salvage |
| **Wattle Creek 10 / #54-4-0767** | Scared Tree | High | None | None | General |
| **Wattle Creek 11/#52-4-0766** | Isolated Artefact | Low | None | None | General |
| **Wattle Creek 12/#52-4-0770** | Isolated Artefact | Low | None | None | General |
| **Wattle Creek 13/#52-4-0782** | Low Density Artefact Scatter | Low | None | None | General |
| **Wattle Creek 14/#52-4-0781** | Isolated Artefact | Low | None | None | General |
| **Wattle Creek 15 / #52-4-0780** | Isolated Artefact | Low | None | None | General |
| **Wattle Creek 16 / #52-4-0779** | Isolated Artefact | Low | None | None | General |
| **Wattle Creek 17 / #52-4-0806** | Isolated Artefact | Low | None | None | General |
| **Wattle Creek 18 / #52-4-0805** | Isolated Artefact | Low | None | None | General |

| Site name / AHIMS No. | Site Type | Significance | Cause of harm | | Management conditions |
|---|---|---|---|---|---|
| | | | BESS | Solar Farm | |
| **Wattle Creek AFT 13 / #52-4-0807** | Isolated Artefact | Low | Yes | Yes | No Management conditions |
| **Wattle Creek AFT 14 / #52-4-0808** | Isolated Artefact | Low | Yes | Yes | No Management conditions |
| **Wattle Creek AFT 15 / #52-4-0818** | Isolated Artefact | Low | No | Yes | Under SSD-63344210 CHMP |
| **Wattle Creek AFT 16 / #52-4-0811** | Isolated Artefact | Low | Yes | No | No Management conditions |
| **Wattle Creek AFT 17 / #52-4-0813** | Isolated Artefact | Low | Yes | Yes | No Management conditions |
| **Wattle Creek AFT 18 / #52-4-0816** | Isolated Artefact | Low | No | Yes | Under SSD-63344210 CHMP |
| **Wattle Creek AFT 19 / #52-4-0817** | Isolated Artefact | Low | No | Yes | Under SSD-63344210 CHMP |
| **Wattle Creek AS 5 / #52-4-0809** | Isolated Artefact | Low | No | Yes | Under SSD-63344210 CHMP |
| **Wattle Creek AS 6 / #52-4-0810** | Low Density Artefact Scatter | Low | Yes | No | No Management conditions |
| **Wattle Creek AS 7 / # 52-4-0812** | Low Density Artefact Scatter | Low | Yes | No | No Management conditions |
| **Wattle Creek AS 8 / #52-4-0814** | Low Density Artefact Scatter, PAD | Low | No | Yes | Under SSD-63344210 CHMP |
| **Wattle Creek AS 9 / #52-4-0815** | Low Density Artefact Scatter | Low | No | Yes | Under SSD-63344210 CHMP |
| **BH15 (Canyon Leigh) / #52-4-0244** | Artefact | Low | None | None | General |
| **BH14 (Canyon Leigh) / #52-4-0240** | Artefact | Low | None | None | General |
| **BH13 (Canyon Leigh) / #52-4-0239** | Artefact | Low | None | None | General |
| **TME-OS2 / #52-4-0134** | Artefact, PAD | Unknown | None | None | Exclusion Fencing |
| **BH11 (Canyon Leigh) / #52-4-0237** | Artefact | Low | None | None | General |
| **BH12 (Canyon Leigh) / #52-4-0238** | Artefact | Low | No | Yes | Under SSD-63344210 CHMP |
| **MGPS5 / #48-4-0119** | Artefact | Low | None | None | General |
| **KPAD-4 / #52-4-0349** | PAD | Unknown | None | None | General |
| **KA4a / #52-4-0335** | Artefact, PAD | Unknown | None | None | General |

| Site name / AHIMS No. | Site Type | Significance | Cause of harm | | Management conditions |
|---|---|---|---|---|---|
| | | | BESS | Solar Farm | |
| **1 Arthursleigh; Arthursleigh / #52-4-0085** | Artefact | Unknown | None | None | General |
| **KPAD-3 / #52-4-0348** | PAD | Unknown | None | None | General |
| **KA5a / #52-4-0336** | Artefact, PAD | Unknown | None | None | General |
| **TME-OS3 with PAD / #52-4-0133** | PAD | Unknown | None | None | General |
| **KA6a / #52-4-0337** | Artefact | Unknown | None | None | General |
| **TME-OS4 / #52-4-0132** | Artefact | Low | None | None | General |
| **TME-OS5 / #52-4-0131** | Artefact | Low | None | None | General |
| **KPAD-5 / #52-4-0350** | PAD | Unknown | None | None | General |
| **KPAD-6 / #52-4-0351** | PAD | Unknown | None | None | General |
| **KA7 / #52-4-0338** | Artefact, PAD | Unknown | None | None | General |

# 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, the findings of the test excavation program and the predicted impact of the planning proposal on archaeological resources. They will provided mitigation measures for sites located within the Development footprint displayed in Table 12.1.

**Table 12.1 AHIMS sites impacted by Development Footprint.**

| Site name / AHIMS No. | Type of harm | Degree of harm | Consequence of harm |
|---|---|---|---|
| **Wattle Creek 3 / #52-4-0771** | Direct | Total | Total loss of value |
| **Wattle Creek 4 / #52-4-0774** | Direct | Total | Total loss of value |
| **Wattle Creek 9 / #52-4-0768** | Direct | Total | Total loss of value |
| **Wattle Creek AFT 13 / #52-4-0807** | Direct | Total | Total loss of value |
| **Wattle Creek AFT 14 / #52-4-0808** | Direct | Total | Total loss of value |
| **Wattle Creek AFT 16 / #52-4-0811** | Direct | Total | Total loss of value |
| **Wattle Creek AFT 17 / #52-4-0813** | Direct | Total | Total loss of value |
| **Wattle Creek AS 6 / #52-4-0810** | Direct | Total | Total loss of value |
| **Wattle Creek AS 7 / #52-4-0812** | Direct | Total | Total loss of value |

It is recommended that:

7. No further assessment of the development footprint is required. Sites located within the development footprint are listed in Table 11.1 and have been assessed as possessing low archaeological significance. Works may proceed with caution at this location. Aboriginal objects collected from this site during test excavations should be subject to the long-term management strategy developed in Recommendation 3 below.
8. Before any works occur, Spark Renewables should develop an Aboriginal Cultural Heritage Management Plan (ACHMP) to mitigate and manage impacts to all Aboriginal heritage sites within and directly adjacent to the Project Area. These sites are protected under Section 90 of the *NSW National Parks and Wildlife Act 1974*. The ACHMP should form part of the Project's construction environmental management plan (CEMP), and the conditions contained within it should apply to the construction, operational and decommissioning phases of the Project.

9. It is recommended that the ACHMP contains the following management and mitigation conditions:
    - A methodology for the community collection of isolated artefacts Wattle Creek 3 (AHIMS #52-4-0771), Wattle Creek 4 (AHIMS #52-4-0774) and Wattle Creek 9 (AHIMS # 52-4-0768) as they will be harmed by the Project.
    - A methodology for the construction of the exclusion zone for TME-OS2 (AHIMS #52-4-0134).
    - Allow harm to Wattle Creek AFT 13 (AHIMS # 52-4-0807) , Wattle Creek AFT 14 (AHIMS # 52-4-0808), Wattle Creek AFT 16 (AHIMS # 52-4-0811), Wattle Creek AFT 17 (AHIMS # 52-4-0813), Wattle Creek AS 6 (AHIMS # 52-4-0810), and Wattle Creek AS 7 (AHIMS # 52-4-0812).
    - A strategy for the long-term management of all Aboriginal objects collected during the community collection and test excavation program. The strategy should include provisions for reburial at a location nominated by Registered Aboriginal Parties adjacent to the development footprint. The strategy must be developed in consultation with Registered Aboriginal Parties.
    - Provisions for protecting Aboriginal heritage items within the Project Area but outside the development footprint.
    - Include protocols for managing the discovery of human remains and previously unidentified heritage items within and adjacent to the development footprint.
    - Contain a contingency plan and reporting procedure if Aboriginal heritage items within or outside the development footprint are damaged.
    - Include protocols for conducting further archaeological and heritage assessment in any disturbance areas where this assessment has not already been carried out.
    - Ensuring any workers on-site receive suitable heritage inductions prior to carrying out any work on site.
    - Maintain and manage reasonable access for Aboriginal stakeholders to heritage items on site.
    - Provide for ongoing consultation with Aboriginal stakeholders in the conservation and management of Aboriginal cultural heritage on site.
    - Contain a program to monitor and report on the effectiveness of these measures and any heritage impacts of the Project.
10. In the event that unexpected finds occur during any activity within the Project Area, all works in the vicinity must cease immediately. The find must be left in place and protected from any further harm. Depending on the nature of the find, the following processes must be followed:
    - If, while undertaking the activity, an Aboriginal object is identified, it is a legal requirement under Section 89A of the NPW Act to notify Heritage NSW, as soon as possible.
    - 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.
11. It is recommended that Spark Renewables continue to inform Aboriginal stakeholders about the management of Aboriginal cultural heritage within the Project Area throughout the life of the Project. The consultation outlined as part of this ACHA is valid for a period of 6 months and must

be maintained after this by the Proponent for it to remain continuous and comply with Consultation Requirements (Department of Environment, Climate Change and Water NSW 2010a).

12. A copy of this report should be forwarded to all Aboriginal stakeholder groups who have registered an interest in the Project.

# 13. REFERENCES

Andrefsky Jr, W. 1998 *Lithics: Macroscopic Approaches to Analysis*. Cambridge, United Kingdom: Cambridge University Press.

Austral Archaeology Pty Ltd 2023 Cultural Heritage Advice for Scoping Report for 22492 - Wattle Creek Energy Hub - Scoping Report. Cultural Heritage Advice, Prepared for Umwelt Pty Ltd.

Australia ICOMOS 2013a *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*. Burwood, VIC: Australia ICOMOS.

Australia ICOMOS 2013b Practice Note: Understanding and Assessing Cultural Significance.

Australian Heritage Council and DEWHA 2009 Guidelines for the Assessment of Places for the National Heritage List.

Australian Museum Business Services 2012 Goulburn Mulwaree LGA Aboriginal Heritage Study. Report for the Goulburn Mulwaree Council.

Biosis Pty Ltd 2008 Marulan Gas Turbine Facilities Environmental Assessment: Appendix G Cultural Heritage Assessment.

Bousman, C.B. 2005 Coping with Risk: Later Stone Age Technological Strategies at Blydefontein Rock Shelter, South Africa. *Journal of Anthropological Archaeology* (24):193–226.

Bowern, N. 2018 *The Aborigines of the Southern Highlands, New South Wales (1820-1850).*

Bureau of Meteorology 2025 Climate Statistics for Australian Locations. Retrieved 22 October 2020 < http://www.bom.gov.au/climate/averages/tables/cw_068188.shtml >.

Colquhoun, G.P., K.S. Hughes, L. Deyssing, J.C. Ballard, G. Phillips, A.L. Troedson, C.B. Folkes, and J.A. Fitzherbet 2019 NSW Seamless Geology Dataset v. 1.1 (Digital Dataset). Maitland: NSW Department of Planning and Environment.

CSIRO 2016 The Australian Soil Classification. The Australian Soil Classification. Government Website. Retrieved 13 July 2020 < https://www.clw.csiro.au/aclep/asc_re_on_line_V2/soilhome.htm >.

DECCW 2010 Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW. Sydney, Department of Environment, Climate Change and Water.

Department of Environment and Climate Change NSW 2009 Operational Policy: Protecting Aboriginal Cultural Heritage.

Department of Environment, Climate Change and Water NSW 2010a *Aboriginal Cultural Heritage Consultation Requirements for Proponents*. Department of Environment, Climate Change and Water NSW.

Department of Environment, Climate Change and Water NSW 2010b *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. Department of Environment, Climate Change and Water NSW.

Department of Environment, Climate Change and Water NSW 2010c Fact Sheet 2: What Is an Aboriginal Cultural Landscape? Department of Environment, Climate Change and Water NSW.

Department of Environment, Climate Change and Water NSW 2010d September 13 Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales. Department of Environment, Climate Change and Water NSW.

Dibden, J. 2010 "Proposed Subdivision Lot 1 DP 614607 East Crescent Culburra Beach Subsurface Test Excavation AHIP #1113917". Unpublished Report to FENFAR Pty Ltd Prepared by New South Wales Archaeology Pty Limited.

EMM Consulting 2017 Hume Coal Project - Aboriginal Cultural Heritage Assessment Report.

Fletcher, C. 2002 *Arthursleigh: A History of the Property 1819 to 1979*. Everbest Printing.

Flood, J. 1973 The Moth Hunters - Investigations Towards a Prehistory of the South-Eastern Highlands of Australia. Department of Prehistory Australian National University Canberra.

Gundungurra Tribal Council (n.d.). Our History. Gundungurra Tribe History. Retrieved 30 March 2022 < https://gundungurra.org.au/gundungurra-tribe-history/ >.

Hawkesbury-Nepean Catchment Management Authority 2008 Hawkesbury-Nepean Catchment Action Plan 2007-2016. Hawkesbury-Nepean Catchment Management Authority.

Holdaway, S. and N. Stern 2004 A Record in Stone: The Study of Australia's Flaked Stone Artefacts. *Museum Victoria and Aboriginal Studies Press, Canberra.*

Jackson-Nakano, A. 2001 *The Kamberri: A History of Aboriginal Families in the ACT and Surrounds. Aboriginal History Monograph 8.* Canberra: Aboriginal History Inc.

Jasiewicz, J. and T. Stepinski 2013 Geomorphons - a pattern recognition approach to classification and mapping of landforms. *Geomorphology* 182:147–157.

Jervis, J. 1973 *A History of the Berrima District*. Second edition. North Sydney: Berrima City Council.

Kinhill Engineers Pty Ltd 1996 An Archaeological Assessment of the Proposed Jadinbrunbi Equestrian Centre, RMB 255 Tugalong Road, Canyonleigh, NSW. Archaeological Assessment, Prepared for Dino Burattini & Associates Pty Ltd.

Koettig, M. 1981a Hoddles Crossing to Alpine - Archaeological Survey of the Proposed F5 Extension.

Koettig, M. 1981b Hoddles Crossing to Alpine: Archaeological Survey of the Proposed F5 Extension. Report to the Department of Main Roads, NSW. Archaeological Survey, NSW.

Lamb, J. 2019 *What Settlers Saw*.

Lester Firth Associates Pty Ltd 1983 Goulburn Heritage Study.

McCarthy, F.D. 1976 *The Stone Implements of Australia*. Sydney: The Australian Museum Trust.

Mitchell, P. 2002 Descriptions for NSW (Mitchell) Landscapes - Version 2. p.149. 2002nd edition. Department of Environment and Climate Change.

Mount Gibraltar Landcare and Bushcare 2007 *The Gib*. Wingecarribee Shire Council.

Navin Officer 2012a Highlands Source Project Subsurface Testing and Salvage at Aboriginal Sites between Goulburn and Wingecarribee Reservoir, NSW.

Navin Officer 2012b Karrawary Power Station Project, Big Hill, NSW Cutrual Heritage Assessment. Report for Origin Energy, NSW.

Navin Officer 2012c Kerrawary Power Station Project Big Hill, NSW. CHA.

NGH Pty Ltd 2021 Aboriginal Due Diligence Assessment Arthursleigh Farm - Brayton and Big Hill NSW. Due Diligence Assessment.

Northern Illawarra Aboriginal Collective Inc. 2008 Aboriginal Cultural Heritage Assessment of Bayoong Bayoong ('Bong Bong') Common, near Moss Vale.

NSW Department of Planning, Industry and Environment 2021 Bioregions of NSW. NSW Department of Planning, Industry and Environment.

NSW Heritage Office 2001 Assessing Heritage Significance. NSW Heritage Office.

OEH 2011 Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW.

Office of Environment and Heritage 2011 *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*. Department of Premier and Cabinet.

Organ, M. 1990 *A Documentary History of the Illawarra and South Coast Aborigines 1770-1850*. Wollongong: Aboriginal Education Unit, Wollongong University.

OzArk Environment & Heritage Management Pty Ltd 2005 Proposed Transmission Line from Taralga to Marulan, NSW. Aboriginal Cultural Heritage Assessment, Report for Sinclair Knight Merz on behalf of RES Southern Cross.

Parr, L. 2005 *Greenwich Park: Compiled for the Back to Greenwich Park Weekend 12-13 March 2005*.

Parsons, V. 1967 Throsby, Charles (1777-1828). *Australian Dictionary of Biography*. National Centre of Biography, Australian National University.

Premise Pty Ltd 2022 Marulan Solar Farm. Aboriginal Cultural Heritage Assessment, Prepared for Terrain Solar Pty Ltd.

Rich, E. 1988 Wingecarribee River Proposed Management Project: Archaeological Survey for Aboriginal and Historic Sites. Report for the Water Board.

Sahukar, R., C. Gallery, J. Smart, and P. Michell 2003 *The Bioregions of New South Wales: Their Biodiversity, Conservation and History*. (I. Dunn, ed.). National Parks and Wildlife Service (NSW).

Schofield, J. 2000 *Celebrating 50 Years Colo Vale Community Association Inc.* Colo Vale Community Association Inc.

Smith, J. 1992 *Aborigines of the Goulburn District*. Goulburn & District Historical Society.

Speight, J.G. 2009 *Landform in Australian Soil and Land Survey Field Handbook*. Collingwood: National Committee on Soil and Terrain, CSIRO.

Stepinski, T. and J. Jasiewicz 2011 Geomorphons - a new approach to classification of landform. *Proceedings of Geomorphometry 2011*, pp.109–112. Redlands.

Umwelt 2005 Aboriginal Archaeological Assessment for the Proposed Lymwood Quarry, Marulan. Aboriginal Cultural Heritage Assessment, Prepared for Readymix Holdings Pty Ltd.

Umwelt 2015 Lynwood Quarry Extraction Area Modification: Aboriginal Cultural Heritage and Archaeological Assessment. p.195.

# APPENDICES

## APPENDIX A – SEE VOLUME 2, CONSULTATION DOCUMENTS