Appendix D

Aboriginal Cultural Heritage Assessment Report

Prepared for
Neoen Australia Pty Ltd
ABN: 57 160 905 706

AECOM

Great Western Battery

Aboriginal Cultural Heritage Assessment Report

08-Dec-2021

aecom.com

Delivering a better world

Great Western Battery

Aboriginal Cultural Heritage Assessment Report

Client: Neoen Australia Pty Ltd

ABN: 57 160 905 706

Prepared by

AECOM Australia Pty Ltd
Level 21, 420 George Street, Sydney NSW 2000, PO Box Q410, QVB Post Office NSW 1230, Australia
T +61 2 8934 0000 F +61 2 8934 0001 www.aecom.com
ABN 20 093 846 925

08-Dec-2021

Job No.: 60639954

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

Aboriginal and Torres Strait Islander peoples are advised that this report contains references to people who have passed away.

Table of Contents

List of Figures

List of Tables

List of Plates

Executive Summary

Neoen Australia Pty Ltd (Neoen) is seeking development consent to construct, operate and maintain a large-scale Battery Energy Storage System (BESS) of approximately 500 megawatts (MW) and up to 1000 megawatt-hour (MWh) at Brays Lane, Wallerawang, NSW, as well as a new transmission line that would connect the BESS to the existing TransGrid 330 kilovolt (kV) substation at Wallerawang (the Project). The Project is considered State Significant Development (SSD) under the *Environmental Planning and Assessment Act 1979* (EP&A Act) as it satisfies the requirements of Clause 8 of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP).

AECOM Australia Pty Ltd (AECOM) was commissioned by Neoen to undertake an Aboriginal cultural heritage assessment for the Project in accordance with the Secretary's Environmental Assessment Requirements (SEARs) and relevant Heritage NSW guidelines. This Aboriginal Cultural Heritage Assessment Report (ACHAR) documents the results of this assessment and has been compiled in accordance with Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a), *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) and *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011).

The study area for this Aboriginal cultural heritage assessment is made up of two distinct components:

1. The proposed BESS site (the Site); and
2. An approximately 1.5 km long, 30 m wide linear corridor centred on the Project's proposed transmission line alignment (the 'transmission line corridor').

Bounded to the south and east by Brays Lane and to the north and west by rural land parcels, the Site occupies part of Lot 4 on Deposited Plan (DP) 751651 and is about 13 hectares (ha) in size. A single residential dwelling with associated outbuildings and fenced yards occupies the southeastern portion of Lot 4. However, these features and the land immediately surrounding them do not form part of the Site. Land within the Site consists predominantly of cleared grazing (pasture) land, with four farm dams and a small area of potential remnant native vegetation also present, the latter located in the northwestern portion of the Site. The transmission line corridor extends northeastward from the study area toward the confluence of Pipers Flat Creek and the Coxs River. After passing underneath the existing coal conveyor system linking Springvale Colliery to Mount Piper Power Station, Wallerawang Power Station and Lidsdale Siding, the corridor turns southward and follows the existing railway line though the northern end of Lidsdale Siding, across Main Street and along the western boundary of the now decommissioned Wallerawang Power Station. After crossing the Main Western Railway Line, the corridor ends at the existing TransGrid Wallerawang 330 kV substation.

Information regarding the Aboriginal heritage values of the study area was obtained through a combination of background research, archaeological fieldwork and Aboriginal community consultation. A total of nine Registered Aboriginal Parties (RAPs) were consulted for the assessment, with key consultation activities including:

- RAP review of AECOM's draft assessment methodology
- RAP review of AECOM's draft test excavation methodology
- RAP participation in archaeological field investigations
- RAP review of a draft of this ACHAR.

A search of the AHIMS database on 17 February 2021 for a 5 x 5 km area centred on the study area returned 32 site entries. Registered centroid coordinates for previously recorded Aboriginal sites within the AHIMS search area place five within 200 m of the study area. However, a review of associated site cards and reports indicates that all but one of these sites - artefact scatter SU1a-A5 (45-1-2716) - are located wholly outside of the study area. Identified as part of a cultural heritage assessment for the Lidsdale Siding Upgrade Project, artefact scatter SU1a-A5 is located partially within the study area.

Archaeological survey of the study area was undertaken on 16 June 2021 by a combined field team of two AECOM archaeologists of three RAP representatives. All landforms elements, excluding areas of severely disturbed terrain within the fenced Lidsdale Siding facility and existing TransGrid Wallerawang

330 kV substation, were subject to survey, with particular attention paid to areas of higher Ground Surface Visibility (GSV) therein. Recorded transect data indicate that a total survey coverage of approximately 14.9 ha was achieved. Excluding those portions of transects located outside of the study area provides a revised survey coverage of 11.7 ha, representing around 64.3% of the study area.

Two Aboriginal archaeological sites, consisting of previously identified artefact scatter SU1a-A5 (AHIMS ID #45-1-2716) and a new stone quarry site (GWB-STQ1-21), were identified during survey. In addition to these surface sites, three areas of subsurface archaeological sensitivity were also identified, two within the transmission line corridor and one within the Site. Designated in the field as 'ASAS-1', 'ASAS-2' and 'ASAS-3', these areas were assessed by the survey team as retaining moderate to high potential for the presence of subsurface archaeological deposits, albeit of variable character, extent and integrity. ASAS1 incorporated the crest and upper flanks of the main low gradient ridgeline within the Site, while ASAS-2 and ASAS-3 encompassed sections of the left bank floodplain of Pipers Flat Creek. Those portions of GWB-STQ1-21 and SU1a-A5 located within the study area fell within ASAS-1 and ASAS-2 respectively.

Archaeological test excavations within ASAS1, ASAS-2 and ASAS-3 were undertaken over a four day period in October 2021 (5-8 October 2021). As per Requirement 14 of the Code of Practice, the overarching aim of the test excavation program undertaken for the current assessment was to collect information about the nature and extent of any subsurface Aboriginal objects present within these areas. Subsidiary objectives included site delineation and an assessment of levels of historical land disturbance.

Test excavations in ASAS-1, ASAS-2 and ASAS-3 were completed in two phases under a systematic sampling design. For ASAS-1, Phase 1 testing involved the excavation of 50 x 50 centimetres test pits across all non-severely-disturbed sections of the PAD area, with pits placed on an underlying 25 m grid. For ASAS-2 and ASAS-3, Phase 1 testing involved the completion of two linear transects of 50 x 50 cm test pits, with pits on each transect spaced at 25 m intervals. Phase 2 of the test excavation program involved small expansion excavations around four Phase 1 test pits, two located within ASAS-1 (TPs 12 and 21) and two within ASAS-2 (TPs 42 and 52). These pits were selected for expansion on the basis of artefact yields and/or the technological characteristics of their associated Phase 1 artefact assemblages. In all instances, expansions involved the excavation of an additional three 50 x 50 cm test pits around the original test pit, producing 1 m^2 pits.

A total of 71 subsurface Aboriginal objects, consisting exclusively of flaked stone artefacts, were recovered from ASAS-1 and ASAS-2, with the majority (n = 58, 81.7%) coming from ASAS-1. Subsurface densities in both areas were uniformly low, with a maximum Phase 1 density of 7 artefacts per 0.25 m^2 occurring in ASAS-1. Phase 2 expansion excavations in ASAS-2 failed to yield any additional Aboriginal objects while those in ASAS-2 yielded a further 16 objects. Subsurface testing results for ASAS-2 are deemed consistent with existing surface evidence for GWB-STQ1-21 in attesting, amongst other activities, to low intensity Aboriginal quarrying and on-site reduction of naturally occurring quartz pebbles and cobbles derived from the Early Permian Shoalhaven Group. East of Brays Lane, subsurface evidence from ASAS-2, associated with artefact scatter site SU1a-A5, suggest low intensity Aboriginal use of the left bank floodplain of Pipers Flat Creek.

Taking into account the results of the archaeological survey and test excavation works detailed in this ACHAR, a total of two Aboriginal archaeological sites are recognised within the study area: surface and subsurface artefact scatter SU1a-A5 (AHIMS ID #45-1-2716) and surface and subsurface stone quarry site GWB-STQ1-21 (AHIMS ID #45-1-2853). Both sites extend outside of the study area. An assessment of the scientific significance of SU1a-A5 and GWB-STQ1-21 has attributed low significance to SU1a-A5 and moderate significance to GWB-STQ1-21.

Proposed ground disturbance activities within the study area would directly impact GWB-STQ1-21, resulting in a near complete loss of value for this site. Construction of the transmission line within and immediately surrounding artefact scatter SU1a-A5 would occur using an underboring methodology (i.e. horizonal directional drilling (HDD) at a nominal depth of 1.5 m below ground level (b.g.l). No launch pits are proposed within artefact scatter SU1a-A5. In view of the maximum observed depth of subsurface Aboriginal objects within SU1a-A5 (i.e. 40 cm b.g.l), no direct HDD impacts to the site are anticipated. Subject to the implementation of appropriate protective measures (e.g. high-visibility fencing), light and/or heavy vehicle movements associated with the HDD process are assessed as carrying a negligible impact risk for SU1a-A5.

Measures to both mitigate and manage the potential impacts of the Project on the identified Aboriginal cultural heritage values of the study area have been developed and it is recommended that these measures be detailed in an Aboriginal Cultural Heritage Management Plan (ACHMP) for the Project. Key components of the proposed ACHMP for the Project include:

- An archaeological salvage program for impacted stone quarry site GWB-STQ1-21, incorporating surface collection and open area salvage excavations
- Protective fencing of artefact scatter SU1a-A5
- Protocols for ongoing consultation with RAPs
- The incorporation of an Aboriginal heritage component into the Project's standard environmental site induction
- An Unexpected Aboriginal Heritage Finds Procedure (UAHFP) covering all Aboriginal objects, including human skeletal remains.

1.0 Introduction and background

1.1 Introduction

Neoen Australia Pty Ltd (Neoen) is seeking development consent to construct, operate and maintain a large-scale Battery Energy Storage System (BESS) of approximately 500 megawatts (MW) and approximately 1000 megawatt-hour (MWh) at 173 Brays Lane, Wallerawang, NSW (the Site), as well as a new transmission line that would connect the BESS to the existing TransGrid 330 kilovolt (kV) substation at Wallerawang (the Project).

The Project is located in the Central Tablelands of NSW, in the suburb of Wallerawang, about 110 km west of Sydney. Wallerawang is located in the Lithgow City Local Government Area (LGA). The regional context of the Project location is shown on **Figure 1**.

The Project is considered State Significant Development (SSD) under the *Environmental Planning and Assessment Act 1979* (EP&A Act) as it satisfies the requirements of Clause 8 of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP).

AECOM Australia Pty Ltd (AECOM) was commissioned by Neoen to undertake an Aboriginal cultural heritage assessment for the Project in accordance with the Secretary's Environmental Assessment Requirements (SEARs) and relevant Heritage NSW guidelines.

This Aboriginal Cultural Heritage Assessment Report (ACHAR) forms part of the Environmental Impact Statement (EIS) being prepared for the Project and has been completed with reference to Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a), *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b) and *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011).

Figure 1
Regional context of the Project Location

Legend

- Site boundary
- TransGrid 330 kV Wallerawang Substation
- The Project Area
- State Forest
- NPWS Reserve
- Watercourse
- Primary road

N

0 1 2 km

AECOM

1.2 Project description

1.2.1 Overview

As described above, the Project would comprise the construction and operation of a large-scale BESS, as well as a new underground transmission line that would connect the BESS to the existing TransGrid 330 kV substation at Wallerawang.

The new transmission line would be constructed using underboring where required to avoid areas of sensitivity, including Aboriginal heritage, biodiversity, Pipers Flat Creek, and road and rail crossings where required. The remainder would be constructed using an open trenching methodology. The majority of the new transmission line would be installed underground. The exception to this would comprise a small portion located within the TransGrid Wallerawang 330kV substation, which would be required to be installed above ground in order to connect to the substation.

Key components of the Project are shown on **Figure 2** and would include:

- Site establishment, including installation of fencing, environmental controls, grading and other civil works
- Establishment of a new driveway and access road (up to 10 m wide), located at the south-western boundary of the Site, providing access to the Site from Brays Lane
- Establishment of an internal access road
- Construction of a permanent car parking area with spaces for up to eight light vehicles
- Construction of two permanent operations and management (O&M) buildings, including staff amenities
- Construction of new switch rooms and control room
- Construction of new 330/33 kV substation on the Site (including outdoor switchgear (up to 330 kV) and transformers)
- A 10 m buffer (or Asset Protection Zone (APZ)) would be established around all battery storage and transformer infrastructure. This buffer area would comprise non-combustible ground cover with no vegetation present
- Construction of stormwater controls
- Installation of two 45 kL metal water tanks
- Provision of fire alert equipment
- A spare 3 to 6 mega volt ampere (MVA) transformer and a spare battery / inverter module would be stored at the Site (at one of the O&M buildings) for use during operation, if required
- A 400 kilovolt ampere (kVA) diesel generator with a 24 hour tank capacity would be stored at the Site (at one of the O&M buildings) for use during operation or use in case of an emergency
- Construction of lighting and installation of security devices around the perimeter of the BESS compound and 330/33 kV substation on the Site
- Establishment of 10 m noise walls
- Establishment of landscaping and screening vegetation
- Upgrades to the Wallerawang 330 kV substation switchyard
- Connection to the existing potable water supply and the 11 kV transmission line in Brays Lane.

Following the completion of construction, Lot 4 DP 751651 would be subdivided to separate the proposed BESS from the reminder of the Lot, returning as much land a practicable to the existing residential property to the south east of the Site.

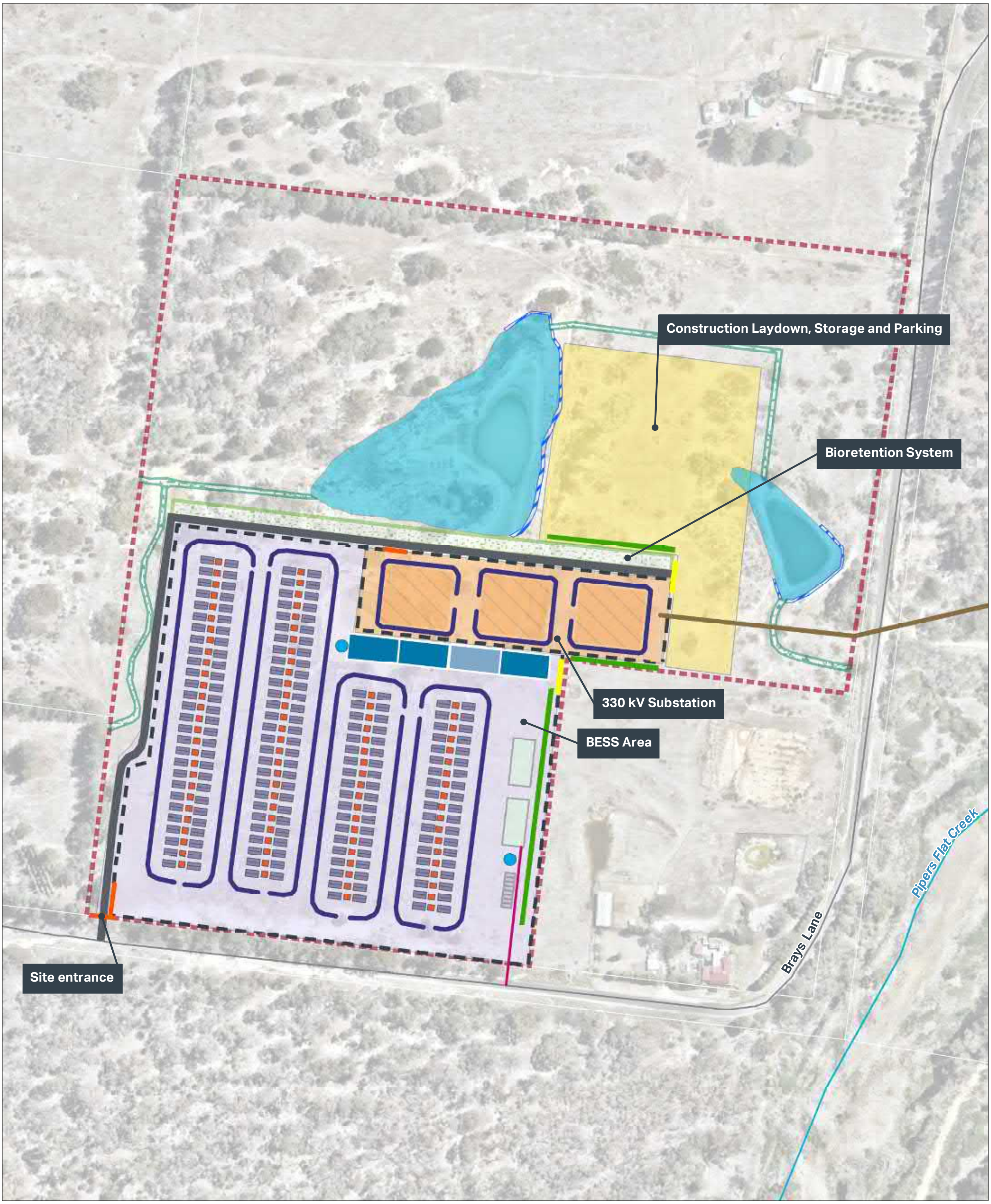


Figure 2
Indicative layout of the Site

Legend

- The Site
- Substation
- Internal access road
- Noise wall
- Access Gate
- Security Fencing
- Water Connection Point
- Transmission Line Alignment
- Emergency Exit
- Watercourse
- Local road
- Water Tank
- Large Transformers
- Battery and Inverter
- Transformers
- Bioretention System
- Dam Walls
- Swales
- 330 kV Substation
- Control Room
- Switch Rooms
- Landscape Planting
- O&M Building
- Carpark
- Approx Extent Of Dam Modification
- Construction Laydown, Storage And Parking
- BESS Area

N

0 30 60 m

AECOM

Source: Imagery © Nearmap, 2020.

1.2.2 Construction

Construction of the Project will take approximately 12 months to complete. Construction works for the Project would involve:

- Enabling works and prefabrication
- Civil, structural, mechanical and electrical works
- Installation of transmission line
- Commissioning
- Finishes and demobilisation.

A construction laydown, stockpiling and parking area would also be provided on the Site.

Up to 250 construction workers would be required at the busiest peak of construction for a period of about two months. Outside of this peak time, an average of about 50 workers a day would be required. These workers would be preferentially sourced locally where appropriate skill sets are economically available.

The construction activities would be primarily carried out during standard construction hours, as defined by the NSW Environment Protection Authority's (EPA) Draft Construction Noise Guideline (2020), being:

- 7am to 6pm, Monday to Friday
- 8am to 1pm, Saturdays
- No work on Sundays or public holidays.

While it is anticipated that work would primarily take place during standard construction hours, some works may be required to be undertaken outside of standard hours. Where this would be required, this would occur Monday to Saturday, 6am to 6pm. Where work outside of standard hours may be required, the noisiest works would be scheduled to occur during standard hours listed above.

On average, construction of the Project would require up to 50 light vehicles, and 20 heavy vehicles per day. During the two months that would comprise the peak construction period, up to 100 vehicle movements a day would be required.

Oversized and over mass vehicles are expected to be required to deliver large pre-fabricated elements for the construction of the Project. This is likely to include eight (8) oversized vehicles to transport the transformers and prefabricated structures to the Site.

1.2.3 Operation

The BESS is expected to operate on a 24 hour per day, seven days per week basis and is expected to undergo approximately one charge and discharge cycle per day, averaging 365 full cycles per year.

The Project has an initial design life of 20 years with components anticipated to be replaced or upgraded, as required with the potential to extend the life beyond 20 years.

The Project would be an unmanned facility that is managed remotely. Between five to six employees would be required to attend the Site periodically for maintenance activities.

Areas within the Site not required for the operation of the BESS would be rehabilitated to as close to its existing condition as practical. This remaining land would be fenced with stock fencing or similar. The BESS itself would be surrounded by security fencing and all access to the BESS would be controlled through a secure access point off Brays Lane.

1.3 The Project Area

The area that would be required to construct and operate the Project (including the BESS, the new transmission line, and part of the TransGrid 330 kV Wallerawang substation) is collectively referred to as the Project Area and is shown on **Figure 3**.

The Site is located at 173 Brays Lane, Wallerawang NSW, 2854 (Lot 4 Deposited Plan (DP) 751651). The area that would be required to construct the Project at this lot is referred to as the Site as is shown on **Figure 3**.

The Site is privately owned and is currently occupied by a residential property and agricultural buildings at the south eastern corner of the Site with marginal agricultural land making up the remainder of the land. Beyond the residential property, the majority of the Site is used for occasional horse grazing. As a result of its use for grazing and residential purposes, the Site has undergone vegetation removal and the majority of vegetation on the Site consists of pasture grasses. A small area of mature vegetation in located in the north western corner of the Site. The Site is currently accessed through an entrance close to the residential property.

A series of small man-made dams are located on the Site. The dams are fed by two ephemeral drainage lines that enter the Site on the western boundary and it is assumed flow east during periods of high rainfall before entering the largest dam onsite and becoming one drainage line. This drainage line passes through one more dam before leaving the Site along the southern part of the eastern boundary before draining to Pipers Flat Creek offsite.

The Site is located nearby the TransGrid Wallerawang 330 kV substation, which at its closest point, is about 1.25 km south east from the Site. The substation is located at Lot 91 of DP 1043967. The substation is located on freehold land owned by Electricity Transmission Ministerial Holding Corporation (ETMHC) and operated by TransGrid.

The new transmission line for the Project would be located on land that is currently owned and / or managed privately, by Transport for NSW / John Holland Rail, Lithgow City Council, and TransGrid. The new transmission line would connect the BESS to the TransGrid Wallerawang 330 kV substation. The new transmission line would exit from the eastern boundary of the Site, crossing Brays Lane and entering into the vegetated area to the east of Brays Lane. From here, it would travel in a north easterly direction, before passing under Pipers Flat Creek and into the existing rail corridor where it would travel south east along the rail corridor (including its crossing of Main Street) to connect to the north western portion of the TransGrid Wallerawang 330 kV substation.

The new transmission line would also pass under the existing coal conveyor belt that transports coal between the nearby Springvale Colliery, Mt Piper Power Station Springdale Coal Services, and Lidsdale Siding (coal loader). The location of the conveyer belt relative to the Project is shown on **Figure 3.**

It is proposed that Lot 4 DP 751651 (the Lot) would be subdivided as part of the Project to delineate the proposed BESS from the existing residential landuse at the south east portion of the Lot. Following subdivision of the Lot, the remaining operational area that would be used for the Project would be about 7 hectares (ha) in size. Following subdivision, the existing residential landuse would occupy an area of about 9.5 ha.

Figure 3
The Project Area

N
0 200 400 m

Legend
- The Site
- Transgrid 330kV Wallerawang Substation
- The Project Area
- Cadastre Boundaries
- Transmission Line
- Railway
- Watercourse

1.4 Secretary's Environmental Assessment Requirements (SEARs)

The Secretary of the NSW Department of Planning, Industry and Environment (DPIE) (now referred to as NSW Department of Planning and Environment (DPE)) issued the SEARs for the Project on 4 February 2021. For heritage, the SEARs require:

> *An assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the development and consultation with the local Aboriginal community in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents*.

This ACHAR, which documents the results of the Aboriginal cultural heritage assessment for the Project, fulfills this requirement with respect to Aboriginal heritage.

1.5 Report structure

This report contains twelve sections. This section - **Section 1.0** - has provided background information on the Project. The remainder of the report is structured as follows:

- **Section 2.0** outlines the statutory framework within which this assessment has been undertaken
- **Section 3.0** provides an overview of the assessment methodology
- **Section 4.0** details the Aboriginal community consultation program completed for this assessment
- **Section 5.0** describes the existing environment of the study area and its associated archaeological implications
- **Section 6.0** describes the archaeological context of the study area on a regional and local scale. Predictions regarding the nature of the study area's Aboriginal archaeological record are also provided
- **Section 7.0** summarises relevant ethnohistorical information for the study area
- **Section 8.0** presents the results of the archaeological survey and test excavation works undertaken to support this assessment
- **Section 9.0** assesses the Aboriginal heritage significance of land within the study area
- **Section 10.0** provides an assessment of the potential impacts of the Project on identified Aboriginal heritage values
- **Section 11.0** details an appropriate management strategy for the identified Aboriginal heritage values of the study area
- **Section 12.0** lists the references cited in-text.

2.0 Applicable policy & legislation

2.1 Commonwealth Legislation

2.1.1 Aboriginal and Torres Strait Islander Protection Act 1984

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (the ATSIHP Act) provides for the preservation and protection of places, areas and objects of particular significance to Indigenous Australians. The stated purpose of the ATSIHP Act is the "*preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters, being areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition*" (Part I, Section 4).

Under the Act, 'Aboriginal tradition' is defined as "*the body of traditions, observances, customs and beliefs of Aboriginals generally or of a particular community or group of Aboriginals, and includes any such traditions, observances, customs or beliefs relating to particular persons, areas, objects or relationships*" (Part I, Section 3). A 'significant Aboriginal area' is an area of land or water in Australia that is of "*particular significance to Aboriginals in accordance with Aboriginal tradition*" (Part I, Section 3). A 'significant Aboriginal object', meanwhile, refers to an object (including Aboriginal remains) of like significance.

For the purposes of the Act, an area or object is considered to have been injured or desecrated if:

a. In the case of an area:
    i. it is used or treated in a manner inconsistent with Aboriginal tradition;
    ii. the use or significance of the area in accordance with Aboriginal tradition is adversely affected; and
    iii. passage through, or over, or entry upon, the area by any person occurs in a manner inconsistent with Aboriginal tradition
b. in the case of an object:
    i. it is used or treated in a manner inconsistent with Aboriginal tradition.

The ATSIHP Act can override state and territory laws in situations where a state or territory has approved an activity, but the Commonwealth Minister prevents the activity from occurring by making a declaration to protect an area or object. However, the Minister can only make a decision after receiving a legally valid application under the ATSIHP Act and, in the case of long term protection, after considering a report on the matter. Before making a declaration to protect an area or object in a state or territory, the Commonwealth Minister must consult the appropriate minister of that state or territory (Part 2, Section 13).

No declarations relevant to the study area have been made under the ATSIHP Act.

2.1.2 Native Title Act 1993

The *Native Title Act 1993* (NTA) provides for the recognition and protection of native title for Aboriginal peoples and Torres Strait Islanders. The NTA recognises native title for land over which native title has not been extinguished and where persons able to establish native title are able to prove continuous use, occupation or other classes of behaviour and actions consistent with a traditional cultural possession of those lands. It also makes provision for Indigenous Land Use Agreements (ILUA) to be formed as well as a framework for notification of Native Title Stakeholders for certain future acts on land where Native Title has not been extinguished.

Searches of the *National Native Title Register*, *Register of Native Title Claims* and *Register of Indigenous Land Use Agreements* were undertaken in April 2021 for the Lithgow LGA.

These searches returned no registered native title determinations or relevant Indigenous Land Use Agreements (ILUAs) but did identify one active registered native title claim: NC2018/002 - Warrabinga-Wiradjuri #7. The claim's associated register extract identifies Blackshield Lawyers as the relevant contact entity for the claim group. NC2018/002 was registered on 22 November 2018. Reference to the accompanying map for this claim indicates that the study area is situated wholly within the NC2018/002 claim area. It is noted the area subject to the claim excludes freehold land and land used for public works such as roads, schools and hospitals. Land within the study area consists exclusively of freehold land and thus does not form part of the land subject to claim NC2018/002.

2.1.3 Environment Protection and Biodiversity Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) took effect on 16 July 2000. Under Part 9 of the EPBC Act, any action that is likely to have a significant impact on a Matter of National Environmental Significance may only progress with approval of the Commonwealth Minister for the Environment. An action is defined as a project, development, undertaking, activity, series of activities, or alteration. An action will also require approval if:

- It is undertaken on Commonwealth land and will have or is likely to have a significant impact;
- It is undertaken outside Commonwealth land and will have or is likely to have a significant impact on the environment on Commonwealth land; and
- It is undertaken by the Commonwealth and will have or is likely to have a significant impact.

The EPBC Act defines 'environment' as incorporating both natural and cultural environments and therefore includes Aboriginal heritage. Under the EPBC Act, protected heritage items are listed on the National Heritage List (items of significance to the nation) or the Commonwealth Heritage List (items belonging to the Commonwealth or its agencies). These two lists replaced the Register of the National Estate (RNE), which was closed in 2007 and is no longer a statutory list. Statutory references to the RNE in the EPBC Act were removed on 19 February 2012. However, the RNE remains an archive of over 13,000 heritage places throughout Australia.

A search of the Australian Heritage Database, which includes places listed on the World Heritage List (WHL), National Heritage List (NHL), Commonwealth Heritage List (CHL), RNE and List of Overseas Places of Historic Significance to Australia, was undertaken in April 2021, with no relevant listings identified for the study area.

2.2 State Legislation

2.2.1 Aboriginal Land Rights Act 1983

The *Aboriginal Land Rights Act 1983* (ALR Act) was established to return land in NSW to Aboriginal peoples through a process of lodging claims for certain Crown lands. The Act, administrated by the NSW Department of Aboriginal Affairs, is a compensatory regime which recognises that land is of spiritual, social, cultural and economic importance to Aboriginal people.

The ALR Act establishes the NSW Aboriginal Land Council (NSWALC) and a network of over 120 autonomous Local Aboriginal Land Councils (LALCs) and requires these bodies to:

a. take action to protect the culture and heritage of Aboriginal persons in the LALC's area, subject to any other law

b. to promote awareness in the community of the culture and heritage of Aboriginal persons in the LALC's area.

LALCs constituted under the ALR Act can make claims. The Registrar of the ALR Act has responsibility for maintaining the Register of Aboriginal Land Claims under section 166 of the Act. All land claims that have been made since the Act came into force in 1983 have been recorded in the Register.

Under Section 36(1) of the ALR Act 'claimable Crown lands' are defined as those that:

a. are able to be lawfully sold or leased, or are reserved or dedicated for any purpose, under the *Crown Lands Consolidation Act 1913* or the *Western Lands Act 1901*,

b. are not lawfully used or occupied,

b1. do not comprise lands which, in the opinion of the Crown Lands Minister, are needed or are likely to be needed as residential lands,

c. are not needed, nor likely to be needed, for an essential public service,

d. do not comprise lands that are the subject of an application for a determination of native title (other than a non-claimant application that is an unopposed application) that has been registered in accordance with the Commonwealth Native Title Act, and

e. do not comprise lands that are the subject of an approved determination of native title (within the meaning of the Commonwealth Native Title Act) (other than an approved determination that no native title exists in the lands).

Land within the study area consists exclusively of freehold land and thus it is not claimable under the ALR Act.

2.2.2 Environmental Planning and Assessment Act 1979

The EP&A Act, administered by DPE, requires that consideration be given to environmental impacts as part of the land use planning process in NSW. In NSW, environmental impacts are interpreted as including impacts to Aboriginal and non-Aboriginal (i.e. European) cultural heritage.

Neoen is seeking approval for the Project under Division 4.7 of the EP&A Act. Pursuant to section 4.41 of the EP&A Act, Aboriginal Heritage Impact Permits (AHIPs) are not required for approved SSD projects. Impacts to Aboriginal heritage values associated with such projects are typically managed under Aboriginal Cultural Heritage Management Plans (ACHMPs), which are statutorily binding once approved by DPE.

2.2.3 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act), administered by Heritage NSW, is the primary legislation for the protection of Aboriginal cultural heritage in NSW. The NPW Act gives the Director-General of the Department of the Premier and Cabinet (DPC) responsibility for the proper care, preservation and protection of 'Aboriginal objects' and 'Aboriginal places', defined under the Act as follows:

- An *Aboriginal object* is any deposit, object or material evidence (that is not a handicraft made for sale) relating to Aboriginal habitation of NSW, before or during the occupation of that area by persons of non-Aboriginal extraction (and includes Aboriginal remains).
- An *Aboriginal place* is a place declared so by the Minister administering the NPW Act because the place is or was of special significance to Aboriginal culture. It may or may not contain Aboriginal objects.

Part 6 of the NPW Act provides specific protection for Aboriginal objects and places by making it an offence to harm them and includes a 'strict liability offence' for such harm. A 'strict liability offence' does not require someone to know that it is an Aboriginal object or place they are causing harm to in order to be prosecuted. Defences against the 'strict liability offence' in the NPW Act include the carrying out of certain 'Low Impact Activities', prescribed in Clause 58 of the *National Parks and Wildlife Amendment Regulation 2019* (NPW Regulation), and the demonstration of due diligence.

An AHIP issued under Section 90 of the NPW Act is required if impacts to Aboriginal objects and/or places cannot be avoided. An AHIP is a defence to a prosecution for harming Aboriginal objects and places if the harm was authorised by the AHIP and the conditions of that AHIP were not contravened.

Applications for AHIPs must be supported by an ACHAR compiled in accordance with Section 3 of Heritage NSW's *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and an Aboriginal Archaeological Report (AAR) compiled in accordance with Section 2.3 of Heritage NSW's *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b). A process of Aboriginal community consultation carried out in accordance with Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a) must also be demonstrated. AHIPs may be issued in relation to a specified Aboriginal object, Aboriginal place, land, activity or person or specified types or classes of Aboriginal objects, Aboriginal places, land, activities or persons.

As indicated in **Section 2.1.3**, pursuant to section 4.41 of the EP&A Act, AHIPs are not required for approved SSD projects. Impacts to Aboriginal heritage values associated with such projects are typically managed under ACHMPs, which are statutorily binding once approved by DPE.

Section 89A of the NPW Act requires notification of the location of Aboriginal sites within a reasonable time, with penalties for non-notification. Section 89A is binding in all instances, including SSD projects.

2.3 Local Government

2.3.1 Lithgow Local Environmental Plan 2014

Clause 5.10 of the *Lithgow Local Environmental Plan 2014* (Lithgow LEP 2014) provides specific provisions for the protection of heritage items, heritage conservation areas, archaeological sites, Aboriginal objects and Aboriginal places of heritage significance within the City of Lithgow, defined in the LEP as follows:

- A *heritage item* means a building, work, place, relic, tree, object or archaeological site, the location and nature of which is described in Schedule 5 of the LEP
- A *heritage conservation area* means an area of land of heritage significance:
  - shown on the Heritage Map as a heritage conservation area;
  - the location and nature of which is described in Schedule 5 of the LEP; and
  - includes any heritage items situated on or within that area.
- An *Aboriginal object* means any deposit, object or other material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of an area of New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains
- An *Aboriginal place of heritage significance* means an area of land, the general location of which is identified in an Aboriginal heritage study adopted by the Council after public exhibition and that may be shown on the Heritage Map, that is:
  - The site of one or more Aboriginal objects or a place that has the physical remains of pre-European occupation by, or is of contemporary significance to, the Aboriginal people. It may (but need not) include items and remnants of the occupation of the land by Aboriginal people, such as burial places, engraving sites, rock art, midden deposits, scarred and sacred trees and sharpening grooves; or
  - A natural Aboriginal sacred site or other sacred feature. It includes natural features such as creeks or mountains of long-standing cultural significance, as well as initiation, ceremonial or story places or areas of more contemporary cultural significance
- An archaeological site means a place that contains one or more relics.

Under Section 2 of Clause 5.10 of the Lithgow LEP 2014, development consent is required for any of the following:

a. *demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):*

   (i) a heritage item,

   (ii) an Aboriginal object,

   (iii) a building, work, relic or tree within a heritage conservation area,

b. *altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,*

c. *disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed,*

d. *disturbing or excavating an Aboriginal place of heritage significance,*

e. *erecting a building on land:*

(i) on which a heritage item is located or that is within a heritage conservation area, or

(ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,

f. subdividing land:

(i) on which a heritage item is located or that is within a heritage conservation area, or

(ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.

Schedule 5 of the Lithgow LEP 2014 provides a list of heritage items, heritage conservation areas and archaeological sites within the Lithgow LGA. There are no Aboriginal objects or places of Aboriginal heritage significance listed in this schedule that are located within or immediately adjacent to the study area.

3.0 Methodology

3.1 Study area

The study area for this assessment, shown on **Figure 4**, is made up of two distinct components:

1. The Site (shaded in blue)
2. An approximately 1.5 km long, 30 m wide linear corridor centred on the Project's proposed new transmission line (the 'transmission line corridor', shaded in green).

A detailed description of both components is provided in **Section 5.1**

3.2 Assessment objectives

The objectives of this Aboriginal cultural heritage assessment are as follows:

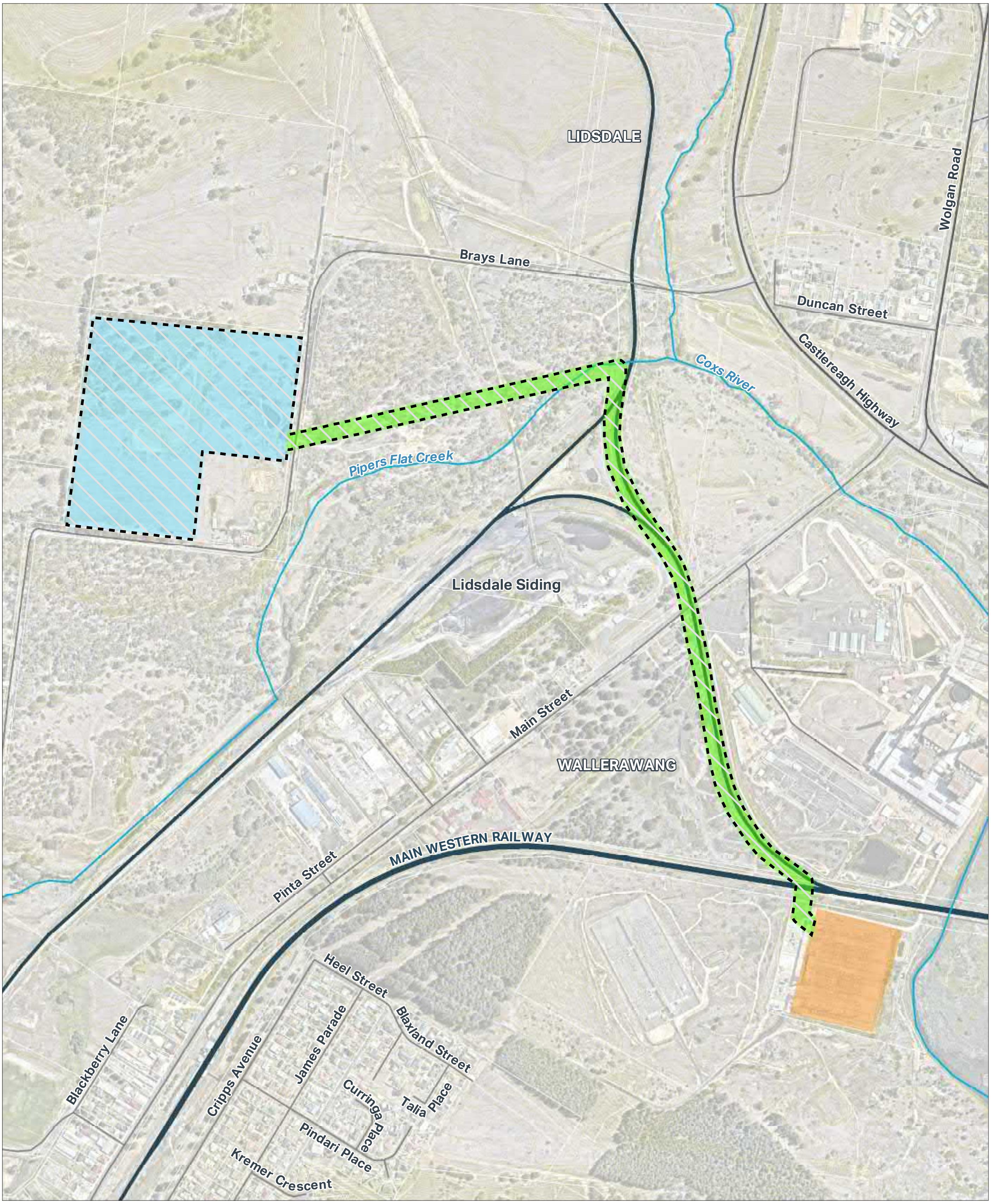
- To identify the Aboriginal cultural heritage values of the study area by way of background research, archaeological fieldwork and consultation with RAPs
- To assess the potential impacts of the Project on the identified Aboriginal cultural heritage values of the study area
- To provide an appropriate management strategy to avoid or minimise potential harm to these values
- To compile an ACHAR that is in accordance with the relevant guidelines and will assist DPE in their assessment of Neoen's SSD application.

3.3 Methodology overview

This assessment has been undertaken in accordance with Heritage NSW's *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011), *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a) and *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b). As such, its key requirements have been:

- to conduct a search of the Aboriginal Heritage Information Management System (AHIMS)
- to review the landscape context of the study area, with specific consideration to its implications for past Aboriginal land use and the survival of associated archaeological materials
- to review relevant archaeological and ethnohistoric information for the study area and environs
- to prepare a predictive model for the Aboriginal archaeological record of the study area
- to undertake an archaeological survey of the study area
- to undertake archaeological test excavations in areas deemed likely to contain subsurface Aboriginal depsoits of potential conservation potential, and which may be physically impacted as a result of the Project
- to identify, notify and register Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the study area
- to provide RAPs with information about the scope of the proposed works and Aboriginal heritage assessment process
- to facilitate a process whereby RAPs can:
  - contribute culturally appropriate information to the proposed assessment methodology;
  - provide information that will enable the cultural significance of Aboriginal objects and/or places within the study area to be determined; and

  - have input into the development of cultural heritage management options.
- to prepare and finalise an ACHAR with input from RAPs.



L:\Secure\Projects\606x\60639954\900_CAD_GIS\920_GIS\02_Maps\G015_01_A4P_F4_Wallerawang_StudyArea_211020.mxd Date Saved: 21/10/2021

Figure 4
Study Area

N

0 200 400 m

AECOM

Legend

- Study Area
- The Site
- Transmission Line Corridor
- TransGrid 330kV Wallerawang Substation
- Watercourse
- Primary Road
- Local Road
- Railway
- Contours

3.4 Project team

Dr Andrew McLaren (Principal Aboriginal Heritage Specialist, AECOM) managed the current assessment and was the primary author of this report. Rebecca Hibberd (Graduate Archaeologist, AECOM) prepared **Table 17** in **Section 6.2.3** and also contributed to **Section 7.0**. The archaeological survey and test excavation works detailed in **Section 8.0** were undertaken by a combined field team of AECOM archaeologists and RAP field representatives, with relevant RAP personnel listed in **Table 19** and **Table 23** in **Section 8.0**. Technical and QA review of this report was undertaken by Geordie Oakes and Will Miles (Technical Director, AECOM) respectively.

Aboriginal community consultation for this assessment was undertaken in accordance with Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a). Full details of the consultation process undertaken are provided in **Section 4.0**. Aboriginal organisations consulted as part of this assessment are listed in **Table 1**.

Table 1 Registered Aboriginal Parties for the current assessment

Organisation	Date of registration	Primary Contact Person(s)
Warrabinga-Wiradjuri #7 Native Title Claimant Group	02.02.2021	Simon Blackshield (Blackshield Lawyers)
Bathurst Local Aboriginal Land Council (LALC)	17.02.2021	Toni-Lee Scott
North East Wiradjuri Company	04.02.2021	Virginia Doig
Didge Ngunawal Clan	04.02.2021	Paul Boyd
Murra Bidgee Mullangari Aboriginal Corporation	08.02.2021	Darleen Johnson
Merrigarn	08.02.2021	Shaun Carroll
Muragadi	08.02.2021	Jesse Johnson
Corroboree Aboriginal Corporation	10.02.2021	Marilyn Carroll-Johnson
Gunjeewong Aboriginal Heritage Corporation	10.02.2021	Cherie (Carroll) Turrise & Julie Hall

4.0 Aboriginal community consultation

Aboriginal community consultation acknowledges the right of Aboriginal people to be involved, through direct participation, on matters that directly affect their heritage. Involving Aboriginal people in all facets of the assessment process ensures that they are given adequate opportunity to share information about cultural values, and to actively participate in the development of appropriate management and/or mitigations measures. The successful identification, assessment and management of Aboriginal cultural heritage values are dependent on an inclusive and transparent consultation process.

Aboriginal community consultation for the current assessment was undertaken in accordance with Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (the Consultation Requirements). The results of the consultation process undertaken are detailed below. A consultation log is provided as **Appendix A**.

4.1 Stage 1 - notification and registration

The aim of Stage 1 of the Consultation Requirements is to identify, notify and register Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Project Area.

4.1.1 Consultation with regulatory agencies

Section 4.1.2 of the Consultation Requirements stipulates that proponents are responsible for ascertaining, from reasonable sources of information, the names of Aboriginal people who may hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places. Proponents are required to compile a list of Aboriginal people who may have an interest in the Project Area and hold knowledge relevant to determining the cultural significance of Aboriginal objects and/or places by writing to:

a. Heritage NSW (formerly Office of Environment and Heritage)

b. the relevant Local Aboriginal Land Council(s) (LALC)

c. the Registrar, Aboriginal Land Rights Act 1983 for a list of Aboriginal owners

d. the National Native Title Tribunal for a list of registered native title claimants, native title holders and registered Indigenous Land Use Agreements;

e. NTSCORP Limited

f. The relevant local council(s)

g. The relevant catchment management authorities for contact details of any established Aboriginal reference group

In accordance with this requirement, the following agencies were contacted via letter on 8 January 2021 requesting information on relevant Aboriginal persons and organisations:

- Heritage NSW
- Bathurst LALC
- Office of the Registrar, *Aboriginal Land Rights Act 1983* (NSW)
- The National Native Title Tribunal (NNTT)
- NTSCORP Limited
- Lithgow City Council
- Central Tablelands Local Land Services (Central Tablelands LLS).

Responses were received from three agencies and are attached as **Appendix B**.

- Heritage NSW responded on 18 January 2021 providing a list of Aboriginal parties for the Lithgow LGA

- Lithgow City Council responded on 25 January 2021 providing a list of relevant Aboriginal stakeholder groups and organisations
- The Office of the Registrar responded on 4 February 2021 advising that a search of the Register of Aboriginal Owners (RAO) indicates that there are no RAOs for land within the study area.

4.1.2 Public notification

Section 4.1.3 of the Consultation Requirements requires that, in addition to writing to the Aboriginal people identified by the agencies listed in Section 3.1.1, the proponent must also place a notice in the local newspaper circulating in the general location of the proposed project. The notification must outline the project and identify its location.

In accordance with this requirement, a public notice was placed in the Lithgow Mercury on 29 January 2021 (**Appendix C**). The closing date for registration via this notice was 13 February 2021, which provided the necessary minimum 14-day period for an expression of interest.

4.1.3 Expressions of interest

Section 4.1.3 of the Consultation Requirements requires that proponents must write to the Aboriginal people whose names were obtained through the regulatory agencies and the relevant LALC(s) to notify them of the proposed project and invite them to register an interest in participating in a process of community consultation.

In accordance with this requirement, on 2 February 2021, a letter inviting an expression of interest and containing summary information on the Project was sent to all Aboriginal persons and organisations identified by the regulatory agencies (excluding the Warrabinga-Wiradjuri #7 Native Title Claimant Group, who were automatically registered and advised of the current assessment on 30 March 2021). Excluding the claimant group, a total of 19 Aboriginal individuals and organisations were invited to register an interest in being consulted. The closing date for expressions of interest was 17 February 2021, which provided the necessary minimum 14-day period for registering interest.

Ultimately, a total of seven organisations registered an interest in being consulted for the current assessment. No response to the expression of interest letter was received from Bathurst LALC before or after the closing date of 17 February 2021. However, as with the Warrabinga-Wiradjuri #7 Native Title Claimant Group, the LALC was automatically registered for consultation.

Summary information on all RAPs for this assessment, including registration dates, is provided in **Table 2**.

Table 2 Registered Aboriginal Parties (RAPs) for the current assessment

Organisation	Date of registration	Primary Contact Person(s)
Warrabinga-Wiradjuri #7 Native Title Claimant Group	02.02.2021 (automatically registered)	Simon Blackshield (Blackshield Lawyers)
Bathurst LALC	17.02.2021 (automatically registered)	Toni-Lee Scott
North East Wiradjuri Company	04.02.2021	Virginia Doig
Didge Ngunawal Clan	04.02.2021	Paul Boyd
Murra Bidgee Mullangari Aboriginal Corporation	08.02.2021	Darleen Johnson
Merrigarn	08.02.2021	Shaun Carroll
Muragadi	08.02.2021	Jesse Johnson
Corroboree Aboriginal Corporation	10.02.2021	Marilyn Carroll-Johnson
Gunjeewong Cultural Heritage Aboriginal Corporation	10.02.2021	Cherie (Carroll) Turrise & Julie Hall

4.1.4 Notification of Registered Aboriginal Parties (RAPs)

Section 4.1.6 of the Consultation Requirements requires that the proponent make a record of the names of each Aboriginal person who registered an interest and provide a copy of that record, along with a copy of the expression of interest letter forwarded to the Aboriginal parties, to the relevant Heritage NSW regional office and LALC. Section 4.1.5 of the Consultation Requirements provides the opportunity for Aboriginal persons to withhold their details from being forwarded to these parties.

In accordance with these requirements, on 12 April 2021, a list of RAPs for the current assessment was forwarded to Heritage NSW and the Bathurst LALC. A copy of the expression of interest letter sent out on 2 February 2021 was included in this correspondence. Two parties requested that their contact details be withheld from Heritage NSW and/or Bathurst LALC and were excluded from this correspondence.

4.2 Stage 2 - Presentation of information about project

The aim of Stage 2 of the Consultation Requirements is to provide RAPs with information about the scope of the proposed project and the proposed cultural heritage assessment process.

For the current assessment, presentation of information about the Project was provided to RAPs as part of the draft assessment methodology review process (**Section 4.3.2**). Summary information on the Project was included in the draft assessment methodology forwarded to all RAPs.

4.3 Stage 3 – Gathering information about cultural significance

The aim of Stage 3 of the Consultation Requirements is to facilitate a process whereby RAPs can:

a. Contribute to culturally appropriate information gathering and the assessment methodology;

b. Provide information that will enable the cultural significance of Aboriginal objects and/or places on the study area to be determined; and

c. To have input into the development of any cultural heritage management measures.

For this assessment, consultation with RAPs regarding the cultural heritage values of the study area included:

- A request with the draft assessment methodology package for any initial comments regarding the cultural values of the study area
- Discussion of cultural heritage values during the archaeological field investigations detailed in **Section 8.0**
- The provision of a draft of this ACHAR to all RAPs for comment prior to finalisation.

4.3.1 Registration of interest

No information on the cultural values of the study area or its environs was provided by RAPs as part of their responses to AECOM's expression of interest letter.

4.3.2 Draft assessment methodology

Sections 4.3.1 and 4.3.2 of the Consultation Requirements require that the proponent present and/or provide the proposed methodology for the cultural heritage assessment to RAPs and that RAPs be given a minimum of 28 days to review and provide feedback on this methodology.

All RAPs, excluding the Warrabinga-Wiradjuri #7 Native Title Claimant Group (see below), were forwarded a draft of AECOM's proposed assessment methodology for the Project on 23 February 2021 (**Appendix D**). The specified closing date for comments on the methodology was 24 March 2021, which provided the necessary minimum 28-day period for comment.

A copy of the draft methodology was forwarded to the Warrabinga-Wiradjuri #7 Native Title Claimant Group on 30 March 2021. The claimant group was requested to provide comment on the methodology by 28 April 2021, which provided the necessary minimum 28-day period for comment. On 28 April 2021, the lawyer acting for the claimant group, Simon Blackshield of Blackshield Lawyers, contacted AECOM to request an extension to the comment period to 14 May 2021. AECOM responded on 30 April 2021 indicating that this was acceptable.

Written responses to the draft methodology were ultimately provided by three RAPs and are attached as **Appendix E**. Responses are presented in **Table 3** below.

4.3.3 Draft test excavation methodology

As test excavation was not covered by the draft assessment methodology provided to RAPs, on 10 September 2021, a copy of AECOM's draft test excavation methodology for the Project, attached as **Appendix F**, was forwarded to all RAPs for their review and comment. RAPs were requested to provide comment on the draft methodology by Monday 27 September 2021.

Responses to the draft methodology were provided by seven RAPs, six in writing and one verbally. Responses are provided in **Table 4** below, with written responses attached as **Appendix G**.

Table 3 RAP responses to draft assessment methodology

RAP Organisation	Representative(s)	Date of response	Type	Response	AECOM Response
Didge Ngunawal Clan	Lilly Carroll & Paul Boyd	23/02/21	Written (e-mail)	"DNC agrees to all proposals for NSW Big battery project and we look forward to the survey. We are Currently completing the Centennial coal survey which isn't far from Wallerawang"	-
Muragadi	Jesse Johnson	24/02/21	Written (e-mail)	"I have read the project information ACHAR and methodology for the above project, I agree with the recommendations made"	-
Darleen Johnson	Ryan Johnson	23/02/21	Written (e-mail)	"I have read the project information ACHAR and methodology for the above project, I endorse the recommendations made"	-

Table 4 RAP responses to draft test excavation methodology

RAP Organisation	Representative(s)	Date of response	Type	Response	AECOM Response
Bathurst LALC	Tonilee Scott	29/09/21	Written (e-mail)	"…all looks good, looks like you cover all basis [sic]"	-
Murra Bidgee Mullangari Aboriginal Corporation	Darleen Johnson	29/09/21	Written (e-mail)	"I have read the project information and methodology for the above project, I endorse the recommendations made"	-
Didge Ngunawal Clan	Lilly Carroll & Paul Boyd	10/09/21	Written (e-mail)	"…we all agree from our end for the [sic] draft test excavation methodology that has been proposed by you guys"	-
Muragadi	Jesse Johnson	15/09/21	Written (e-mail)	"I have read the project information and methodology for the above project, I agree with the recommendations made"	-
Warrabinga-Wiradjuri #7 Native Title Claimant Group	Martin de Launey	14/09/21	Written (e-mail)	"I have read the excavation methodology and despite it passing my "pub test" (and I'm sure has approval of peers), one of my main concerns to date, is ensuring that the access route is fully surveyed prior to any surface scrapes or use of heavy machinery; access roads are often considered less important because a few cars have already been on them. The riverside aspect of the site and recorded archaeology piques my curiosity so, sight unseen, I would still like to be considered to make an "in Person" site visit - as rostering and covid restrictions allow"	Access to the Site would be via Brays Lane, an existing sealed road. No physical impacts to Brays Lane are proposed as part of the Project. All existing vehicle tracks within the study area were subject to survey on 16 June 2021 (refer to **Section 8.1**)
North East Wiradjuri Company	Virginia Doig	24/09/21	Verbal	No issues with the methodology. Seems fine.	-
Merrigarn	Shaun Carroll	30/09/21	Written (e-mail)	"I have read the draft test excavation methodology for the above project, I agree with the recommendations made"	-

4.3.4 Archaeological survey

All RAPs were invited to participate in an archaeological survey on the study area on 16 June 2021, with invitations to participate forwarded on 2 June 2021. Ultimately, four RAPs provided site officers for the survey, with attending site officers listed by organisation in **Table 5**.

Table 5 RAP personnel involved in archaeological survey of the study area on 16 June 2021

Organisation	Representative
Didgee Ngunawal Clan	Paul Boyd
Corroboree Aboriginal Corporation	Steve Johnson
Muragadi	Courtney Taylor
Murra Bidgee Mullangari Aboriginal Corporation	Gareth Conyard

4.3.5 Test excavation program

All RAPs were invited to participate in the archaeological test excavation program detailed in **Section 8.2**. Due to the current COVID-19 pandemic, RAPs were given the opportunity to either attend site in person or receive daily updates via e-mail and/or phone (refer to **Appendix F**).

Fieldwork notifications for the testing program were forwarded to all but one RAP on 21 September 2021, with the remaining party notified on 24 September 2021. Prior to fieldwork, all RAPs expressed an interest in having one or more of their site officers/members attend site in person. However, only five RAPs were ultimately able to participate. RAP site officers are listed by organisation in **Table 6**.

Regardless of their physical representation on-site, all RAPs were kept informed of the results of the test excavation program via daily e-mail updates.

Table 6 RAP personnel involved in archaeological test excavation program

Organisation	Representative	Dates on-site
Didgee Ngunawal Clan	Paul Boyd	5, 6, 7 and 8 October 2021
Corroboree Aboriginal Corporation	Steve Johnson	7 & 8 October 2021
Merrigarn	Shaun Carroll	6 & 7 October 2021
Murra Bidgee Mullangari Aboriginal Corporation	Jack Moores	5 & 6 October 2021
Bathurst LALC	Donald Morgan	5 & 8 October 2021

4.4 Identified cultural values

RAP site officers involved in the archaeological survey and test excavation works detailed in **Section 8.0** identified the following cultural values during fieldwork, with values raised and discussed informally between various team members:

- The study area forms part of a much larger cultural landscape for the Aboriginal community. This landscape includes a number of highly significant cultural sites, with local examples including the Lidsdale burial ground and Maiyingu Marragu (Blackfellows Hand rockshelter).
- The Lidsdale burial ground, located in close proximity to the study area, is a sacred site and has associated cultural protocols and restrictions
- The Coxs River and Pipers Flat Creek would have been focal resource features for Aboriginal people occupying the local area, offering a range of plant and animal foods, as well as rocks for flaked and edge-ground stone tool manufacture
- Campsites in the local area would have been sited in areas of elevated, low gradient terrain overlooking, and providing ready access to, the floodplains of the Coxs River and Pipers Flat Creek

- Excavations for the realignment of the Castlereagh Highway in the mid 2000s, which investigated elevated, low gradient landforms adjacent to the Coxs River, northeast of the study area, yielded thousands of stone artefacts, indicative of a major camping area
- Stone artefact assemblages from the greater Lithgow-Wallerawang area tend to be dominated by artefacts manufactured out of quartz, a widely available but generally difficult material to work
- Quarrying of the gravels exposed within the Site was likely opportunistic in nature, with people utilising gravels exposed naturally as opposed to digging for them
- The silicified tuff present within the study area was likely obtained through trade as this high-quality material does not occur locally.

4.5 Stage 4 - Review of draft assessment report

The aim of Stage 4 of the Consultation Requirements is to prepare and finalise an ACHAR with input from RAPs.

In accordance with Section 4 of the Consultation Requirements, on 25 October 2021, a draft of this ACHAR was issued to all RAPs for their review. The closing date for comments was 23 November 2021, which provided the necessary minimum 28-day period for comment.

Responses to the draft ACHAR were provided by six RAPs. Responses are presented in **Table 7** and attached as **Appendix N**.

Table 7 RAP responses to draft ACHAR

RAP Organisation	Representative(s)	Date of response	Type	Response	AECOM Response
Muragadi	Jesse Johnson	01.11.21	Written (e-mail)	"I have read the draft ACHAR for the above project, I agree with the recommendations made"	-
Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson	06.11.21	Written (e-mail)	"We agree with draft"	-
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Johnson	11.11.21	Written (e-mail)	"I have read the project information and draft ACHAR for the above project, I endorse the recommendations made"	-
Didge Ngunawal Clan	Paul Boyd	23.11.21	Written (e-mail)	"DNC is happy with the report"	-
Merrigarn	Shaun Carroll	23.11.21	Written (e-mail)	"I have read the project information and draft ACHAR for the above project, I agree with the recommendations made"	-
Warrabinga-Wiradjuri #7 Native Title Claimant Group	Martin de Launey	23.11.21	Written (e-mail)	"In continuing my response to the Great Western Battery proposal and previous correspondence, I have a few comments on the Draft ACHMP, because I am agreed on the Anthropological assessment and Aboriginal Cultural Heritage evidence at hand (in that, the timeline and land use occupation pre European impact is accepted as accurate). As such, this reinforces my own conclusion after having done some substantial study over the whole region (and into the eastern escarpment side and connecting easting waterways of the Great Dividing Range), there was a holistic network of interacting Clans connected over a huge range – even to the point of having elderly and youngsters being more permanent to an area for more than one season. This can be evidenced by the large Cox's Creek site, remnant "Blackfellows Hands" – and similar sites - as well as the Lidsdale Burial Ground. The main disappointment I have, is that archaeologists tend to determine a site of "Minor" importance because it may sit in an area of a largely destroyed terrain, or, is even expected to be severely impacted (e.g. The borrow - pit site of Sta1-21) although being categorically assessed as "Moderate"; to my mind, even a flake is a "site" which has Historic and Aesthetic value and has consequence when accorded impact. Overall, I am happy with the UAHFP proposal (Unexpected Aboriginal Heritage Finds Procedure) of 11.1.3. I also consider the rest of the mitigation measures (apart from sta1-21 as I've stated) appropriate in context of the ACHMP"	Previously recorded artefact scatter SU1a-A5 has been assessed as being of low scientific significance in accordance with standard archaeological significance assessment criteria. However, AECOM acknowledges that all Aboriginal sites, irrespective of assessed levels of scientific significance, hold cultural value for Aboriginal people. As detailed in **Section 10.0**, SU1a-A5 would not be impacted by the Project.

5.0 Landscape context

This section describes the landform context of the study area as a basis for both predicting the nature of its Aboriginal archaeological record and interpreting the results of the archaeological field investigations detailed in **Section 8.0**. Consideration of the landscape context of the study area is based on the proposition that the nature and distribution of Aboriginal archaeological materials are closely connected to the environments in which they occur. Environmental variables such as topography, geology, hydrology and the composition of local floral and faunal communities will have played an important role in influencing how Aboriginal people moved within and utilised their respective Country. Amongst other things, these variables will have affected the availability of suitable campsites, drinking water, economic plant and animal resources, and raw materials for the production of stone and organic implements. At the same time, an assessment of historical and contemporary land use activities, as well as geomorphic processes such as soil erosion and aggradation, is critical to understanding the formation and integrity of archaeological deposits, as well as any assessments of subsurface archaeological potential.

5.1 Physical setting

As indicated in **Section 3.1** and shown on **Figure 4**, the study area for this assessment is made up of two distinct components:

1. The Site; and
2. An approximately 1.5 km long, 30 m wide linear corridor centred on the Project's proposed transmission line alignment (the 'transmission line corridor').

Bounded to the south and east by Brays Lane and to the north and west by rural land parcels, the Site occupies part of Lot 4 on Deposited Plan (DP) 751651 and is about 13 hectares (ha) in size. A single residential dwelling with associated outbuildings and fenced yards occupies the southeastern portion of Lot 4. However, these features, and the land immediately surrounding them, do not form part of the Site. Land within the Site has been zoned as 'RU1 - Primary Production' and consists predominantly of cleared grazing (pasture) land, with four farm dams and a small area of remnant native vegetation also present, the latter located in the northwestern portion of the site.

Two unnamed 1st order drainage lines, both ephemeral, traverse the Site on a roughly east-west axis and join within it to form a 2nd order drainage line, also ephemeral. This stream joins Pipers Flat Creek, the closest named watercourse, around 110 metres to the east of the site. Pipers Flat Creek, in turn, discharges into the Coxs River approximately 700 metres to the east of the Site. At its closest point, the Lidsdale Siding facility is located around 330 metres to the south of the site. The now decommissioned Wallerawang power station, meanwhile, is situated about 1.25 kilometres to the southeast.

Brays Lane and the Site can be accessed from the Castlereagh Highway, c.870 m to the east, or from Pipers Flat Road, c.1.4 km to the south. Brays Lane, from its intersection with the Castlereagh Highway to the bridge crossing of Coxs River, is a well maintained, wide, paved, dual lane road. The bridge crossing is one-lane wide. Between the bridge and the Site, Brays Lane becomes a partially unsealed, narrow but bi-directional road.

The transmission line corridor, as shown on **Figure 4**, extends northeastward from the study area toward the junction of Pipers Flat Creek and the Coxs River. After passing underneath the existing coal conveyor system linking Springvale Colliery to Mount Piper Power Station, Wallerawang Power Station and Lidsdale Siding, the corridor turns southward and follows the existing railway line though the northern end of Lidsdale Siding, across Main Street and along the western boundary of the now decommissioned Wallerawang Power Station. After crossing the Main Western Railway Line, the corridor ends at the existing TransGrid Wallerawang 330 kV substation. Land within the transmission line corridor, which covers an area of 5.4 ha, is currently owned and/or managed privately by TfNSW, Lithgow City Council and TransGrid, and has been zoned as RU1 – Primary Production; IN1 – General Industrial; and SP2 – Rail Infrastructure Facility. Traversed land parcels include:

- Lots 8 and 9 on DP 252472
- Lot 2 on DP108089

- Lot 1 on DP108089
- Lot 10 on DP1168824
- Lot 1115 on DP1204803
- Lot 91 on DP1043967

Reference to the NSW Geographical Names Register indicates that the study area is located within the Parish of Lidsdale in the County of Cook. Ben Bullen State Forest is located to the east of the Site and Lidsdale State Forest is located to the south. Both are managed by the Forestry Corporation of NSW and are accessible to the public for hiking and four-wheel driving. However, their primary function is as a forestry resource. Marrangaroo National Park is located about 3.5 km to the south of the Site and is managed by the NSW National Parks and Wildlife Service (NSW NPWS).

5.2 Topography

The topography of the study area is typical of the local area, encompassing sections of both elevated rolling terrain and floodplain, as well as severely disturbed landform elements. Two broad ridgelines dominate the topography of the Site, with the more prominent of the two occupying the north western portion of the property and characterised by steeper flanks. These ridgelines are separated within the Site by open drainage depressions associated with ephemeral drainage lines. Elevations within the Site range from 906 m to 882 m AHD, providing a total local relief of 24 m. Slopes are predominantly very gently (1-3%) to gently (3-10%) inclined. However, moderately (10-32%) inclined slopes are also represented predominantly in the north western part of the Site.

To the east of the Site, within the transmission line corridor, the elevated rolling terrain of the Cullen Bullen Soil Landscape (cb) gives way to the level to very gently undulating floodplain of Pipers Flat Creek, mapped as part of the Pipers Flat Soil Landscape (pf). At this point along its course, the creek's left bank floodplain has a maximum width of around 220 m and sits at an elevation of approximately 875 m AHD. In the northeastern portion of the transmission line corridor, the floodplains of Pipers Flat Creek and the Coxs River merge, with historical aerial imagery and contour data indicating the former presence of a prominent river meander in this area. South of the confluence of Pipers Flat Creek and the Coxs River, the natural topography of the transmission line corridor has been significantly altered by a range of historical land use activities, with the most significant impacts to natural landform elements associated with road and rail construction. Nonetheless, available reference materials suggest a pre- and early-post European settlement topography comparable to that described by King (1993: 79) for the Cullen Bullen Soil Landscape (i.e. rolling low hills and rises).

Table 8 provides a breakdown of the relative representation of landform units within the study area, with unit extents shown on **Figure 5**.

Table 8 Landform units within the study area

Landform unit	Area (ha)	%
Crest	2.7	14.8
Disturbed	7.8	42.9
Drainage depression	1.1	6
Floodplain	1.2	6.8
Slope	5.4	29.5
Total	**18.2**	**100**

5.3 Hydrology

The study area is located within the upper Coxs River sub-catchment and encompasses parts of several mapped streams. As shown on **Figure 7**, the Site incorporates sections of two ephemeral drainage lines, which join within it to form a southeasterly trending single drainage line. All drainage lines on the Site are ephemeral, unnamed and have been modified through historical land use activities; namely, the construction of farm dams and/or road/vehicle track construction.

Water from the Site would ultimately drain to Pipers Creek Flat around 120 m to the southeast of the Site. Pipers Flat Creek, a locally significant >4th order watercourse, flows in a north easterly direction between the BESS Site and Lidsdale Siding, traversing the north eastern portion of the transmission line corridor before its confluence with the Coxs River. As indicated above, at this point along its course, the creek's left bank floodplain has a maximum width of around 220 m and sits at an elevation of about 875 m AHD. While sections of Pipers Flat Creek, both within and outside of the study area, are known to have been modified historically, the original alignment of the creek adjacent to the study area appears to have been largely preserved.

Pipers Flat Creek is fed within and immediately adjacent to the study area by three unnamed streams, the most significant of which comprises a 3rd order stream and follows, in part, the alignment of a former Coxs River meander in this area. Historical aerial imagery indicates that this meander was artificially 'cut off' from the river in the 1950s, with the Coxs realigned to flow in a general north-south direction around 100 m to the east of the study area. A probable paleomeander is also evident along this stretch of the Coxs River, extending westward to the base of the Permian slopes that mark the probable western extent of the river's paleofloodplain.

Prior to being diverted, the Coxs River appears to have directly abutted the north eastern portion of the transmission line corridor. A tributary of the Nepean River, the Coxs river drains a catchment of approximately 2630 km^2 on the western side of the Blue Mountains. From its confluence with Pipers Creek Flat, the river flows southward through the Wallerawang Power Station before entering Lake Wallace in the vicinity of the existing TransGrid Wallerawang 330 kV substation.

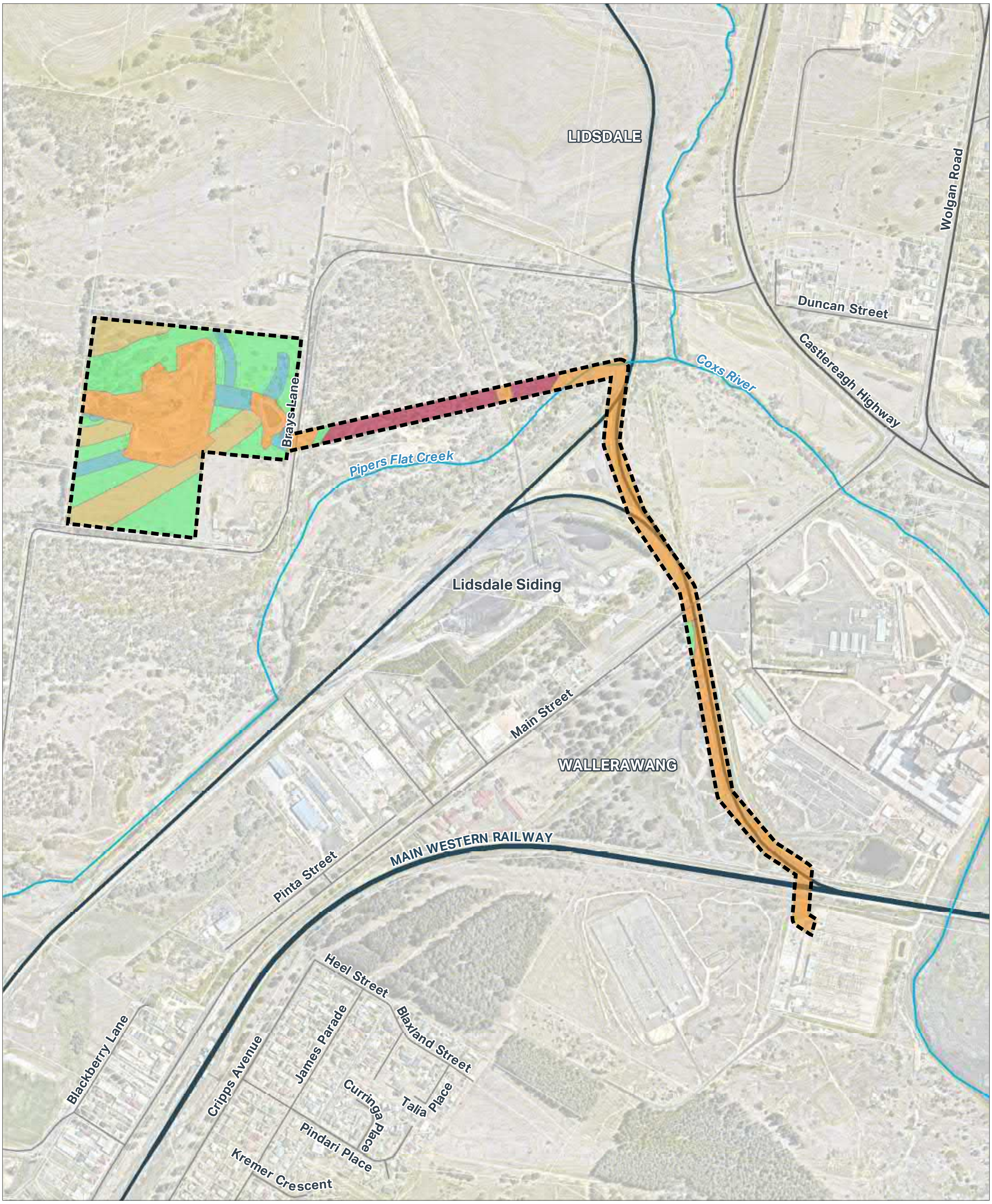


Figure 5
Landform Units

Legend
- Study Area
- Watercourse
- Railway
- Primary Road
- Local Road
- Contours

Landform Units
- Crest
- Disturbed
- Drainage depression
- Floodplain
- Slope

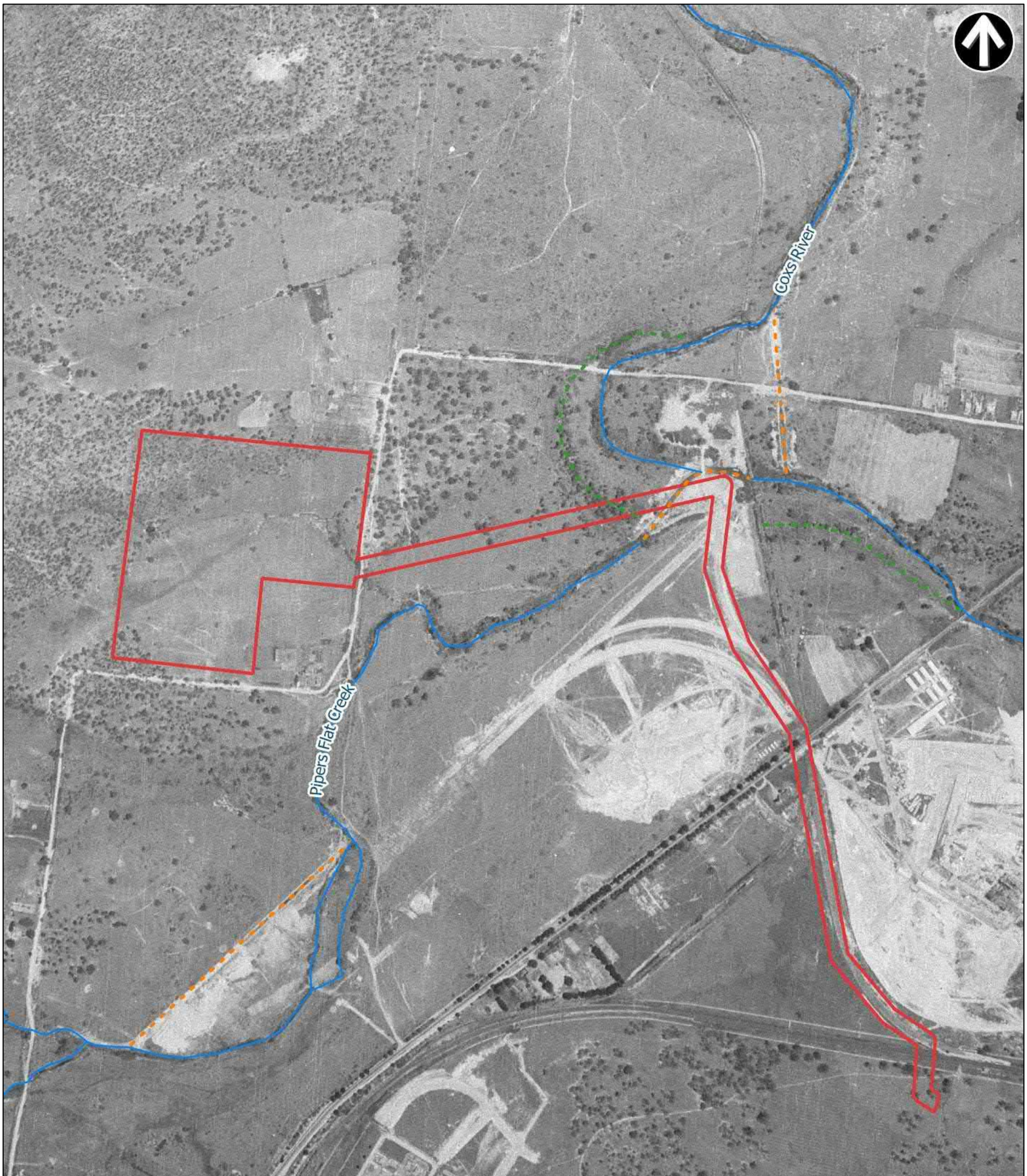


Figure 6 **Georeferenced 1954 aerial of the study area and environs showing the original (1950s) alignments of Pipers Flat Creek and the Coxs River, as well as a potential Coxs River paleochannel. Historical channel modifications/diversions are also indicated.**

5.4 Geology and soils

Reference to the 1:100 000 geological map sheet for the Western Coalfield (south) indicates that the surface geology of the study area is of Permian to Quaternary antiquity, with rocks of the Early to Late Permian Shoalhaven Group (Ps) underlying its elevated rolling terrain and Quaternary alluvium (Qa) mantling the floodplains of both Pipers Flat Creek and the Coxs River.

Unconformably overlying metamorphic rocks of Silurian and Devonian antiquity, the Early to Late Permian Shoalhaven Group is made up to two geological formations: the Early Permian Snapper Point Formation and the Late Permian Berry Siltstone (previously known as the Berry Formation) (Yoo et al., 2001: 9). Approximately 90 m thick, the Snapper Point Formation comprises a medium-grained sandstone with sporadic pebbly layers throughout. Conglomerates are also present, predominantly in the basal portion of the formation. The overlying Berry Siltstone, meanwhile, consists predominantly of a grey micaceous sandy siltstone. Boulders of granite, quartzite and other igneous rocks are also present, with those in the basal portion of the formation larger and more angular than those in its upper parts (Yoo et al., 2001: 10).

Existing archaeological data for the greater Wallerawang-Lidsdale area indicate that Aboriginal people occupying this area utilised a diverse range of rock types for flaked and edge-ground stone tool manufacture. Nonetheless, quartz and silicified tuff are particularly well represented in recorded assemblages (see, in particular, White, 2004: 5, Table 1). A review of existing geological reference materials for the area suggests that, alongside a range of other lithologies (e.g. quartzite, silcrete, basalt, hornfels), both materials could have been sourced from gravel deposits associated with the Coxs River and at least some of its major tributaries[1]. Locally occurring colluvial gravel deposits associated with the Shoalhaven Group and Illawarra Coal Measures can be identified as another potentially significant source of these materials. Conglomerate layers in the sandstones of the Narrabeen Group are likewise known to contain both quartz and tuff / chert (Attenbrow, 2009: 114).

Soils within the study area have been mapped by King (1993) as belonging to the Cullen Bullen (cb), Lithgow (li), Pipers Flat (pf) and Disturbed (xx) soil landscapes. Dominant soil materials for the Cullen Bullen, Lithgow and Pipers Flat landscapes, including their occurrence and relationships, are described in **Table 9**. Soils within the Disturbed soil landscape (xx) are described as having been disturbed to a depth of at least 100 cm, with original soils either removed, buried or otherwise severely disturbed (King, 1993: 117).

[1] Depending, of course, on their pre- and early-post-European settlement morphologies.

Table 9 Soil landscapes of the study area: dominant soil materials (after King, 1993)

Soil landscape	Dominant soil materials	Colour	Topsoil or subsoil?	Soil pH	Erodibility	Permeability	Coarse fragments	Occurrence & relationships
Cullen Bullen (cb)	Dark reddish brown sandy clay loam (cb1)	Dark reddish brown (5YR 3/3) to greyish yellow brown (10YR 4/2)	Topsoil	6.0-6.5	High (NC) High (C)	Moderate	Few	**Crests:** 0-20 cm of cb1 overlies <30cm of cb2. Clear boundary to <50cm of cb3 or bedrock. **Upper and mid-slopes:** Up to 25 cm of cb1 overlies <30cm of cb2. Clear boundary to <80 cm of cb3. **Lower slopes and along drainage lines:** Up to 25 cm of cb1 overlies <30cm of cb2. Clear or abrupt boundary to <80 cm of cb3. **Low scarps:** Shoulders of scarps - <20cm of cb1 overlies <30cm of cb2. Immediately below scarps - <20cm of cb1 overlies bedrock
	Hardsetting bleached massive fine sandy clay loam (cb2)	Dull yellowish brown (10YR 4/3) to greyish brown (5YR 5/2) which is typically bleached dull yellow orange (10YR 7/3)	Topsoil	5.5-7.0	High (NC) High (C)	Slow to moderate	Few rounded conglomerate-derived gravels and platy shale fragments	
	Bright brown moderately pedal clay (cb3)	Bright brown (2.5YR 5/6), orange (2.5YR 6/6), bright yellowish brown (10YR 6/8) to yellow orange (7.5YR 7/8); light brownish grey (7.5YR 7/2) and occasionally reddish brown (2.5YR 4/6) mottles occur as pipe mottles	Subsoil	5.5-7.0	Moderate (NC) Very High (C)	Moderate to slow	Abundant to few angular tabular to angular platy medium and fine gravel-sized shale and sandstone fragments	
Lithgow (li)	Dull yellowish brown sandy loam (li1)	Dull yellowish brown (1oYR 5/4) to brownish black (10YR 2/2)	Topsoil	6.0-6.5	High (NC) High (C)	High	Occasional sub-angular sandstone fragments	**Crests, upper slopes and well-drained areas:** 0-20 cm of li1 or li2 overlies <20cm of li3 which, in turn, overlies up to 70 cm of li4 **Lower slopes and less well-drained areas:** Up to 35 cm of li1 or li2 overlies <30 cm of li3. Clear boundary to up to 100 cm of li4.
	Dark reddish brown clay loam (li2)	Dark reddish brown (5YR 3/3) to greyish yellow brown (10YR 4/2)	Topsoil	6.0-6.5	Moderate (NC) Moderate (C)	Moderate	Occasional platy shale fragments	

Soil landscape	Dominant soil materials	Colour	Topsoil or subsoil?	Soil pH	Erodibility	Permeability	Coarse fragments	Occurrence & relationships
	Hardsetting bleached massive fine sandy clay loam (li3)	Dull yellow orange (10YR 6/3) to yellowish brown (10YR 5/6) to bright reddish brown (5YR5/6), conspicuously bleached	Topsoil	5.5-6.5	High (NC) Moderate (C)	Slow	Few to common angular platy shale and siltstone gravels and occasional cobbles	
	Angular blocky medium clay (li4)	Variable from reddish brown (5YR 4/8) to bright yellowish brown (10YR 7/6) with white/grey mottles increasing with depth	Subsoil	6.0-7.5	Moderate (NC) High (C)	Slow to moderate	Few	
Pipers flat (pf)	Brownish grey sandy clay loam (pf1)	Brownish grey (10YR 4/1) to olive brown (2.5Y 4/1)	Topsoil	6.0-6.5	High (NC) High (C)	Moderate	Few (<10%) subrounded gravels	**Upper floodplains:** <30 cm of pf1 overlies <70 cm of pf2. Pf3 may occur as a subsoil layer. **Lower floodplains:** Up to 30 cm of pf1 overlies <120 cm of pf2 and pf3. Bands of alluvial gravel often present in pf3.
	Bleached sandy clay loam (pf2)	Variable from yellowish grey (2.5Y 4/1), brownish black (10YR 3/1) to greyish yellow brown (10YR 6/2); commonly bleached when dry	Topsoil	6.0-7.0	High (NC) High (C)	Slow to moderate	Few to none, alluvial gravels	
	Yellowish brown medium clay (pf3)	Bright yellowish brown (10YR 6/6) with orange and grey mottles, often piped	Subsoil	5.5-7.0	High (NC) High (C)	Slow to moderate	Concentrated bands of alluvial gravels often present	

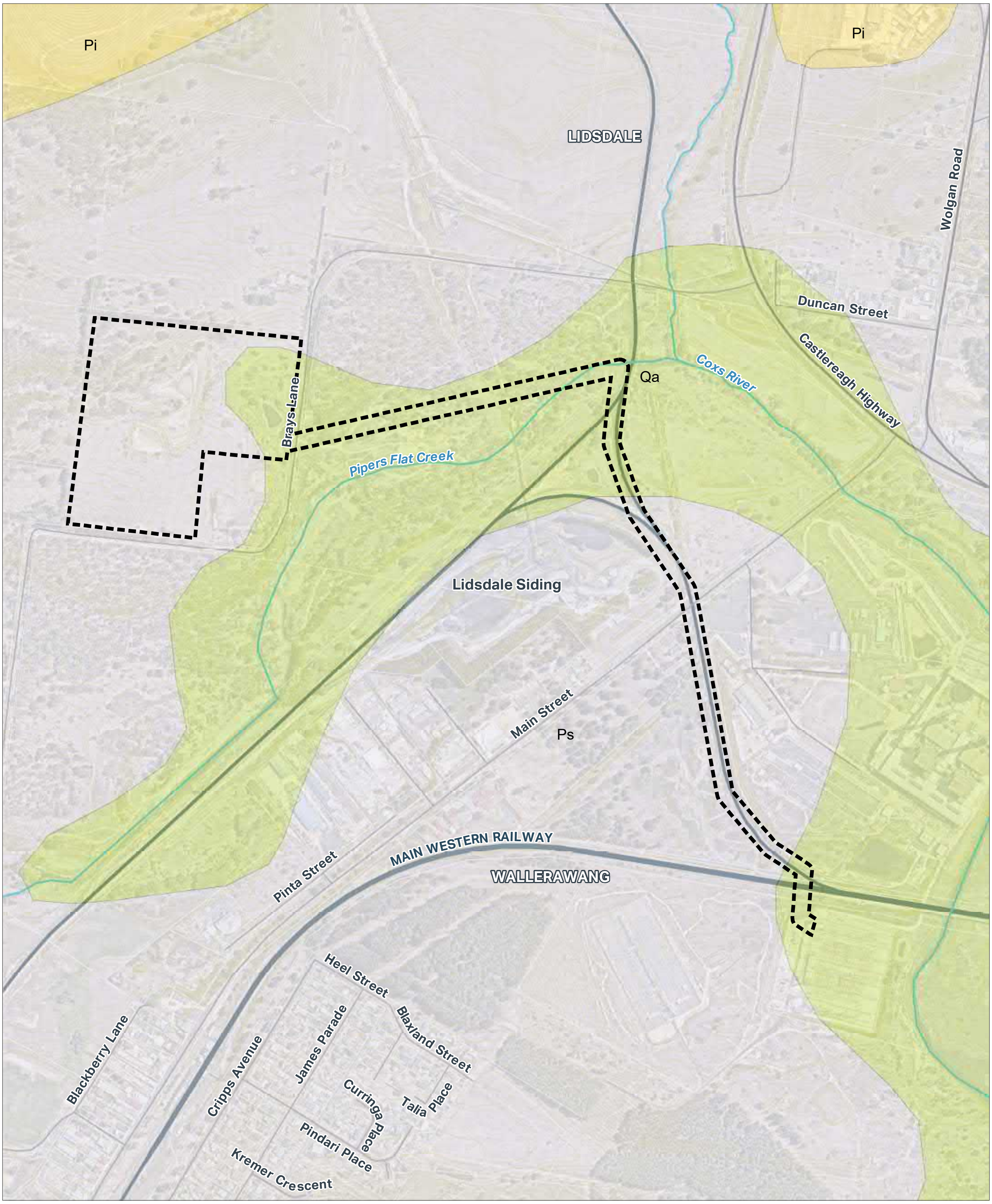


Figure 7
Surface Geology

N
0 200 400 m

AECOM

Legend
- Study Area
- Watercourse
- Railway
- Primary Road
- Local Road
- Contours

Surface Geology
- Pi
- Ps
- Qa

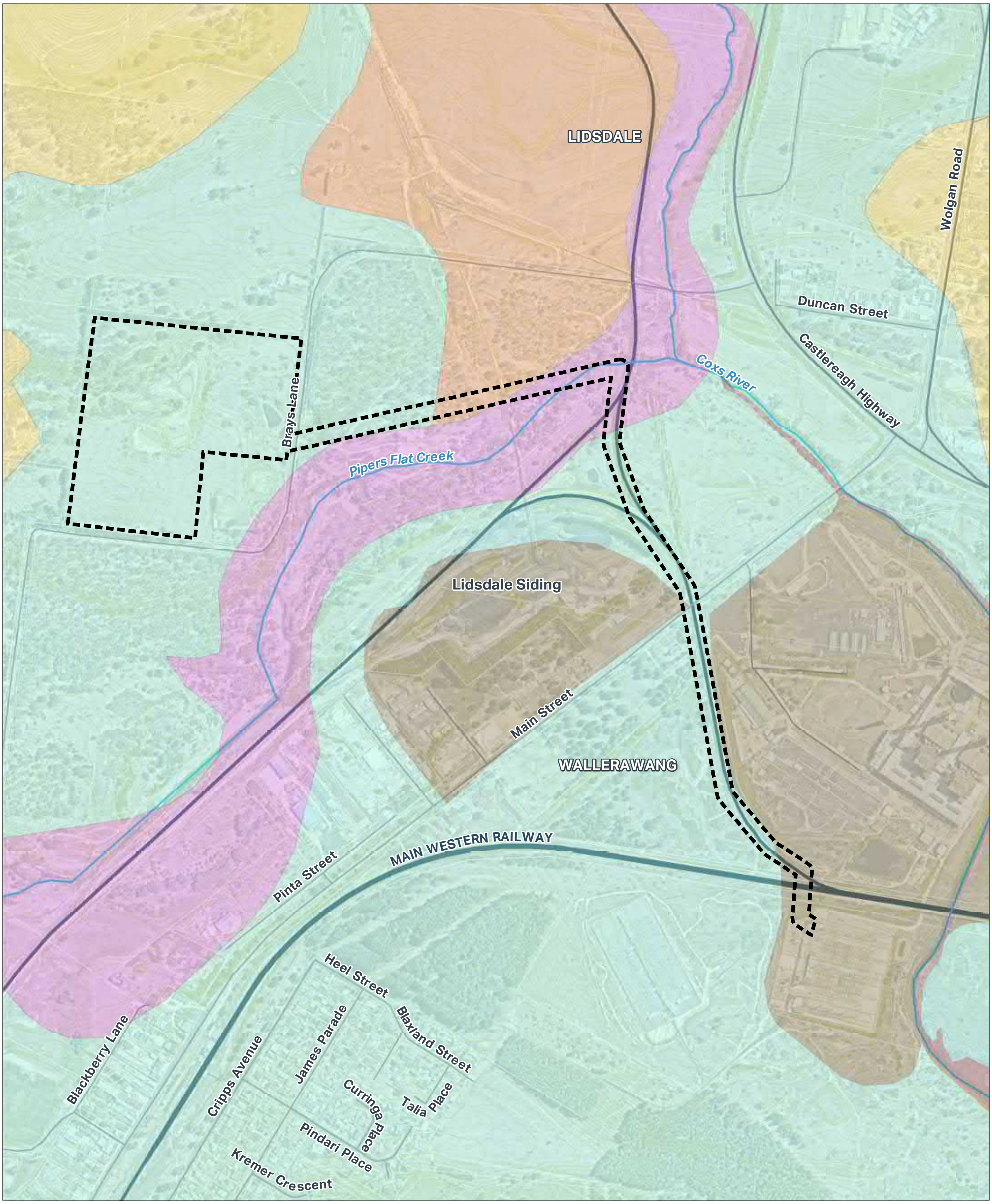


Figure 8
Soil Landscapes

Legend
- Study
- Watercourse
- Railway
- Primary Road
- Local Road
- Contours

Soil Landscapes
- Cullen Bullen
- Disturbed Terrain
- Hassans Walls
- Lithgow
- Pipers Flat
- Water

Source: Imagery © Nearmap, 2020.

5.5 Vegetation

Native vegetation within and immediately surrounding the study area has been extensively modified as a result of European land use activities, with the majority cleared historically for stock grazing and other activities (e.g. road and rail construction, power generation). Historical clearance activities notwithstanding, field observations and existing vegetation mapping for the study area and environs (e.g. DEC, 2006) indicate a pre- and early post-European settlement vegetation regime incorporating both open forest and woodland communities (**Figure 9**), with the former concentrated on the floodplains of Pipers Flat Creek and the Coxs River, and the latter, the elevated rolling terrain bordering these landforms. Relevant communities appear to have comprised Tableland Hollows Black Gum-Black Sally Grassy Open Forest (MU15) and Cox's Permian Red Stringybark-Brittle Gum Woodland (MU37) (DEC, 2006), described below.

Found on alluvial flats at elevations between 800 and 980 m AHD, Tableland Hollows Black Gum-Black Sally Grassy Open Forest comprises a moderately tall forest of black gum (*Eucalyptus aggregata)* and black sally (*E.stellulata*), with manna gum (*E. viminalis*), snow gum (*E. pauciflora*) and apple box (*E.bridgesiana*) sometimes also present (DEC, 2006: 46). The understorey is characterised by a very sparse shrub layer and a dense cover of grasses such as common tussock grass (*Poa labillardierei*) and weeping grass (*Microlaena stipoides var*. stipoides). Woody herbs may also be present (DEC, 2006: 46-47).

Cox's Permian Red Stringybark-Brittle Gum Woodland occupies the exposed Permian escarpment slopes and ridges of the upper Coxs River subcatchment, occurring at elevations between 840 and 1020 m AHD (DEC, 2006: 114). Dominant trees species, as per the community's name, include the red stringybark (*E.macrohyncha*) and brittle gum (*E.mannifera*), with Tablelands scribbly gum (*E. rossii*), candlebark (*E. rubida*) and peppermint (*E. dives*) sometimes also present, either in combination or in localised areas (DEC, 2006: 114). Understories are inconsistent, with some locations very open and devoid of shrubs and others supporting a patchy cover of shrubs such as peach heath (*Lissanthe strigosa*), narrow-leaved geebung (*Persoonia linearis*) and hoary guinea flower (*Hibbertia obtusifolia*). Ground covers include forbs and grasses such as red bidibid (*Acaena novae-zelandiae*), rough bedstraw (*Galium gaudichaudii*), native geranium (*Geranium solanderi*), wattle mat-rush (*Lomandra filiformis*), *Oxalis radicosa*, hairy speedwell (*Veronica calycina*) and arrowhead violet (*Viola betonicifolia*) (DEC, 2006: 115).

5.6 Land disturbance

Alongside field observations, historical aerial photographs provide an avenue for assessing the nature and extent of past ground disturbance within and immediately surrounding the study area. Aerials from 1954 to 2019, provided in **Appendix I**, indicate a range of ground-disturbing land use activities, with those of particular note including:

- Native vegetation clearance
- Road and light vehicle track construction
- Modifications to Pipers Flat Creek and the Coxs River
- The construction of multiple farm dams within the Site
- Agricultural activities such as livestock grazing
- Power generation (i.e. Wallerawang Power Station)
- Coal transport and handling (i.e. Lidsdale Siding and its associated overland conveyor)
- Rail construction
- Substation construction / decommissioning.

To varying degrees, all of the above cited activities are relevant to the survival, integrity and identification of Aboriginal archaeological deposits within the study area. Key implications for the current assessment include:

- The destruction of a proportion of the study area's Aboriginal archaeological record

- The disturbance of pre-existing archaeological deposits through both direct (e.g. earthworks) and indirect (e.g. erosion) means, resulting in a loss of archaeological integrity
- A substantially reduced likelihood for the presence of culturally scarred trees
- An increase of archaeological site visibility in areas affected by erosion.

Figure 10 comprises a land disturbance map for the study area. For the current assessment, two basic levels of disturbance are recognised: 'low' and 'high'. Any Aboriginal archaeological deposits located within areas of high disturbance are likely to have been either destroyed or severely disturbed. Areas of low disturbance, in contrast, retain potential for the presence of intact archaeological deposits, albeit of variable character depending on localised environmental conditions (e.g, slope, distance to water, stream order).

5.7 Key observations

Key observations drawn from a review of the environmental context of the study area are as follows:

- The topography of the study area is typical of the local area, encompassing sections of both elevated rolling terrain and floodplain, as well as severely disturbed landform elements. Landform elements amenable to occupation by Aboriginal people are present within both the BESS Site and transmission line corridor
- The Site incorporates two ephemeral drainage lines, which join within it to form one southeasterly trending ephemeral drainage line. All drainage lines on the Site are ephemeral, unnamed. Additionally, they have been heavily modified through historical land use activities (including construction of farm dams and/or road/vehicle tracks) and no evidence of natural stream morphology (such as defined banks, beds or riparian vegetation) can be observed
- The study area is located within the upper Coxs River sub-catchment and encompasses parts of several mapped ephemeral streams. Pipers Flat Creek, a locally significant >4th order watercourse, flows in a northeasterly direction between the Site and the Lidsdale Siding facility, traversing the northeastern portion of the transmission line corridor before its confluence with the Coxs River. At this point along its course, the creek's left bank floodplain has a maximum width of around 220 m and sits at an elevation of about 875 m AHD
- While sections of Pipers Flat Creek, both within and outside of the study area, are known to have been modified historically (including where the new transmission line would be installed under Pipers Flat Creek), the original alignment of the creek adjacent to the study area appears to have been largely preserved
- Pipers Flat Creek is fed within and immediately adjacent to the study area by three unnamed streams, the most significant of which comprises a 3rd order stream and follows, in part, the alignment of a former Coxs River meander in this area. Historical aerial imagery indicates that this meander was artificially 'cut off' from the river in the 1950s, with the Coxs River realigned to flow in a general north-south direction around 100 m to the east of the study area. Prior to being diverted, the Coxs River appears to have directly abutted the northeastern portion of the transmission line corridor
- Stones suitable for flaked and/or ground stone artefact manufacture are available locally, occurring in both riverine and hillslope contexts
- Prior to European settlement, the floral and faunal resources of the study area and its immediate environs would have been sufficient to facilitate intensive and/or repeated occupation by Aboriginal people
- Native vegetation within the study area has been extensively modified, with the majority cleared historically for grazing and other activities. Nonetheless, there remains some, albeit limited, potential for the study area to contain mature trees with cultural scarring
- Examination of historical aerial imagery for the study area indicates a range of ground disturbing land use activities. While parts of the study area have been severely disturbed and retain low to

negligible Aboriginal archaeological potential others retain *at least* a moderate degree of integrity and the potential for intact to relatively intact archaeological deposits.

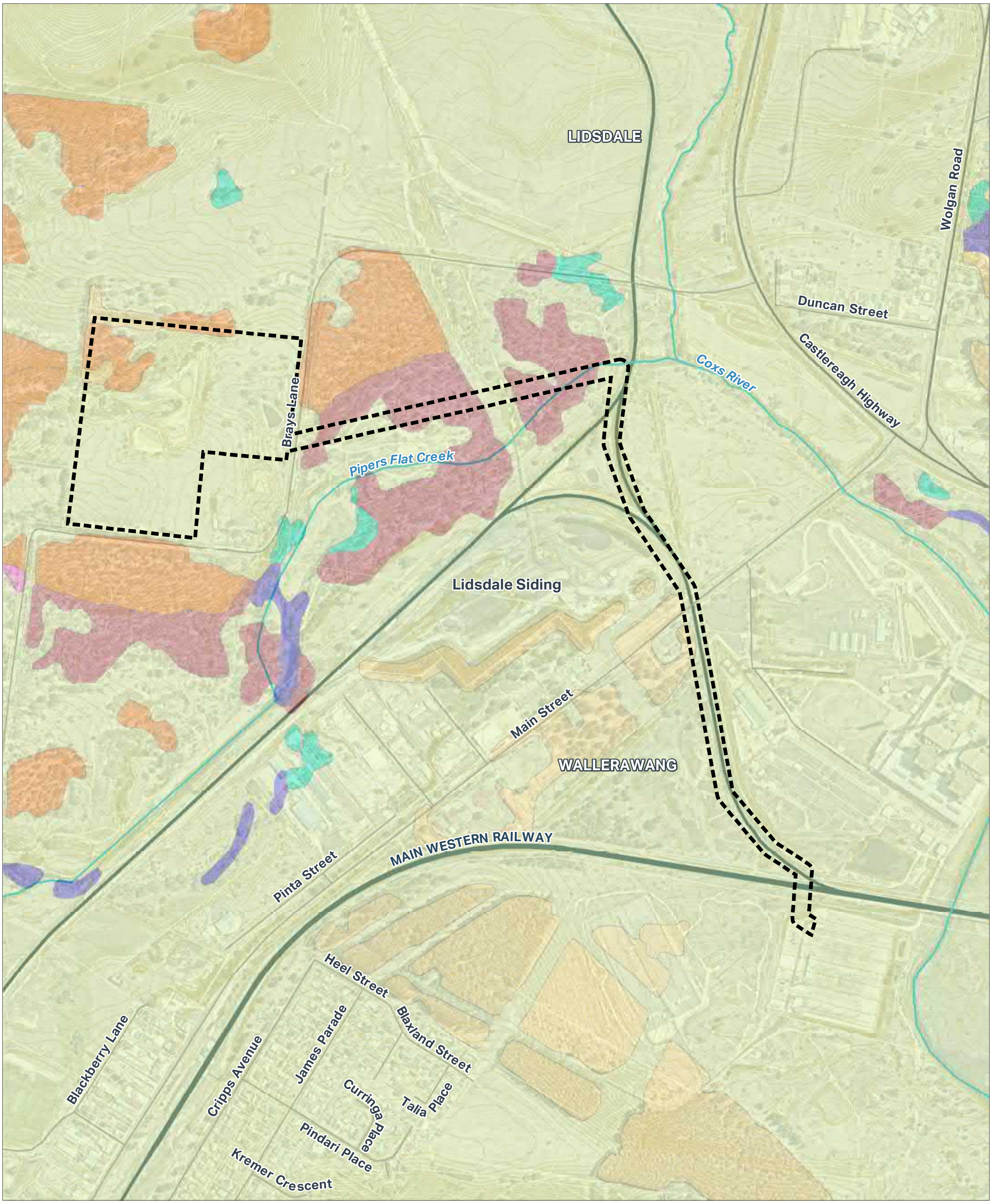


Figure 9
Vegetation Communities

Legend

- Study Area
- Watercourse
- Railway
- Primary Road
- Local Road
- Contours

Vegetation Communities

- Tableland Gully Snow Gum - Ribbon Gum Montane Grassy Forest
- Tableland Hollows Black Gum - Black Sally Open Forest
- Coxs Permian Red Stringybark - Brittle Gum Woodland
- Non-native Vegetation - Pine plantation / woodlot / shelter
- Non-native Vegetation - Other exotics (willow etc)
- Unclassified (<1ha patch of remnant vegetation adjacent / within cleared lands)
- Cleared and Severely Disturbed Lands

Source: Imagery © Nearmap, 2020.

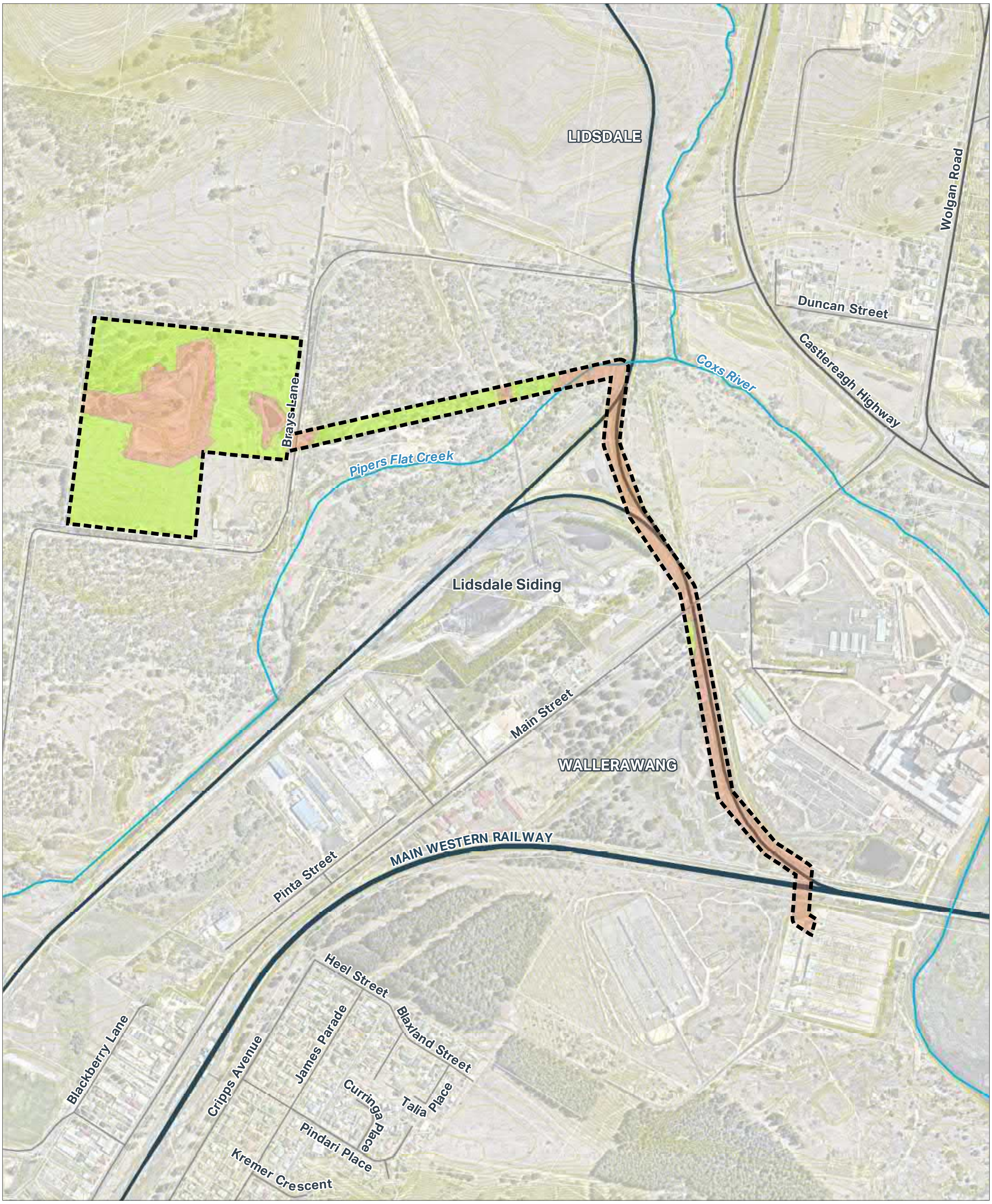


Figure 10
Land Disturbance

Legend
- Study Area
- Watercourse
- Railway
- Primary Road
- Local Road
- Contours

Land Disturbance
- High
- Low

6.0 Archaeological context

6.1 Regional context

6.1.1 The Central Tablelands

Formal scientific interest in the Aboriginal archaeological record of the Central Tablelands of NSW can be traced to the late 1930s, with F.D.MCarthy and colleagues' 1939 excavation of the Blackfellows Hands rockshelter, north of Lithgow, yielding small assemblages of flaked stone and animal bone. Close to two decades later, between 1958 and 1962, McCarthy would oversee the excavation of five rockshelters in the Capertee Valley, called Capertee 1 to 5 (McCarthy, 1964). McCarthy's excavations here would play a critical role in the development of his highly influential *Eastern Regional Sequence* (ERS) of stone artefact assemblages, which remains, with some modification, the dominant chronological framework for Aboriginal peoples' occupation of southeastern Australia (Hiscock & Attenbrow, 2005). Subsequent investigations of the Aboriginal archaeological record of the Central Tablelands have been undertaken in both academic and compliance-based contexts, with recent decades, in particular, witnessing a dramatic increase the number of compliance-based investigations, many tied to coal mining and other power-related projects. Collectively, surveys and excavations completed to date have revealed a rich and diverse record of past Aboriginal occupation, land use and subsistence strategies, with thousands of Aboriginal archaeological sites, including sites of confirmed or potential late Pleistocene to early Holocene antiquity, having been identified across the region and registered on the AHIMS database. While a detailed review of the Aboriginal archaeology of the Central Tablelands is beyond the scope of this report, some key themes are detailed in brief below.

6.1.2 Open artefact sites: distribution, contents & definition

Surface and subsurface distributions of stone artefacts in 'open air' contexts, variously referred to as open artefact sites, artefact scatters and open camp sites, dominate the Aboriginal archaeological record of the Central Tablelands. Excluding rockshelters (refer to **Section 6.1.3**), other site types, such as scarred trees, quarries (stone and ochre), grinding grooves and stone arrangements, are comparatively poorly represented. Accordingly, open artefact sites remain one of the most intensively investigated components of the region's archaeological record, with site distribution and the technology of associated stone artefact assemblages comprising key research topics. To date, analyses of the distribution and contents of open artefact sites have primarily been based on surface (i.e. survey) datasets and been concerned with identifying broad-scale patterns in artefact distribution, raw material use and assemblage composition (e.g. Navin Officer, 2005; Hamm, 2006, 2008; Kuskie, 2009). However, more detailed investigations of open site structure and the technology of associated stone artefact assemblages have also been undertaken as part of some test and salvage excavation programs (e.g. Hamm & Foley, 2010; O'Driscoll & Kuskie, 2015; OzArk, 2004a, 2004b).

Existing archaeological survey data for the "off plateau"[2] portions of the Central Tablelands indicate a strong trend for the presence of open artefact sites along watercourses; specifically, on creek banks and 'flats' (i.e. flood/drainage plains), terraces and bordering lower slopes and rises. Although this distribution pattern can be attributed in part to geomorphic dynamics and archaeological sampling bias, with extensive fluvial erosion activity along watercourses resulting in higher levels of surface visibility and, by extension, concentrated survey effort, an occupational emphasis on watercourses is supported by the results of multiple large-scale surveys (e.g. Navin Officer, 2005; Hamm, 2006, 2008; Kuskie, 2009, 2013a, 2013b; RPS, 2015), as well as various subsurface investigations (e.g. Hamm and Foley, 2010; Apex Archaeology, 2014; O'Driscoll and Kuskie, 2015; OzArk Environmental & Heritage Pty Ltd, 2004a, 2004b).Collectively, these investigations have demonstrated that assemblage size and complexity tend to vary significantly in relation to stream order and landform, with larger, more complex[3] assemblages concentrated on elevated, low gradient landform elements adjacent to higher order watercourses. Artefact distributions associated with major creek lines and confluences tend to consist of localised high density artefact concentrations set within lower density artefact scatters. Outside of these contexts, surface and subsurface artefact distributions have typically been found to be sparse and

[2] i.e. areas outside of the elevated, dissected sandstone terrain of the Narrabeen Group.
[3] Those containing a wider variety of raw materials and technological types and/or higher mean artefact densities and features such as knapping floors.

discontinuous and are consistent with what has been described elsewhere as 'background scatter', being "artefactual material which is insufficient in number or in association with other material to suggest focussed activity in a particular location".

Open artefact sites identified in surface contexts have varied significantly in terms of both their size (i.e. visible site area) and the number of stone artefacts recorded within them, ranging from isolated artefacts to artefact scatters occupying areas in excess of 150,000 m² and containing over 500 artefacts (e.g. Navin Officer, 2005; Kuskie, 2009). The typological composition of associated stone artefact assemblages has likewise varied significantly, with assemblage richness or diversity closely tied to sample size (Hiscock, 2001). Stone artefact assemblages recovered from test and salvage excavations within the boundaries of open artefact sites have likewise varied significantly in size and composition, with some of the largest and most complex assemblages to date derived from test and/or salvage excavation programs within the Moolarben and Wilpinjong coal mine complexes, north/north-east of Mudgee (Apex Archaeology, 2014; Hamm and Foley, 2010; O'Driscoll and Kuskie, 2015), as well as excavations carried out in 'riverine' contexts (e.g. Yamble Bridge, west of Gulgong (OzArk, 2004), and Site L2, adjacent to the Coxs River, in Lidsdale, (OzArk, 2004b). Notably, few open site assemblages that could, through comparison with the nearby Sydney and Hunter regions (e.g. McDonald, 2008: 34-35, Table 4.1), be described as 'large' or 'very large' (>5000 artefacts) have been identified within the region (but see OzArk, 2004b), a situation that could be argued to reflect comparatively non-intensive Aboriginal occupation. However, given the comparatively limited amount of open site excavation that has occurred in Central Tablelands to date, as well as the demonstrably large size of some of the region's excavated rockshelter sites (e.g. Moore, 1970; White, 2001), this is highly unlikely.

Flaked stone artefacts dominate archaeological finds assemblages from recorded open artefact sites across the region. Items such as complete and broken grindstones, hammerstones and edge-ground hatchet heads have also been recorded though comparatively infrequently. With the notable exception of 'knapping floors'[4], a relatively common component of the Aboriginal archaeological record of the Central Tablelands, associated archaeological features (e.g. hearths, ground ovens and heat treatment pits) have likewise proven elusive. As in surrounding regions, investigated knapping floors across the Central Tablelands attest to considerable variability in the size and complexity of these features (e.g. Hamm and Foley, 2010). Backed artefacts (e.g. Bondi points, geometric microliths) are a common component of knapping floors and many of these features were likely specifically associated with their production. In common with regions such as the Hunter Valley (e.g. Hiscock, 1993; Moore, 2000) and Sydney's Cumberland Plain (e.g. (Jo McDonald CHM, 2001, 2005a, 2007)), available evidence supports the suggestion that backed artefact manufacture across the Central Tablelands was a structured or systematic activity.

Although relevant to a variety of site types, geomorphic processes such as soil erosion and colluvial/fluvial aggradation are of particular relevance to the identification and definition of open artefact sites. As in other archaeological contexts (e.g. Dean-Jones & Mitchell, 1993), the visibility of open artefact sites across the Central Tablelands can, for the most part, be attributed to such processes, which have variously exposed or obscured them. Critically, surface artefacts invariably represent only a fraction of the total number of artefacts present within recorded surface open artefact sites across the region. Artefact exposure, unsurprisingly, is highest on erosional surfaces and lowest on depositional ones. At the same time, in many areas, surface artefacts have been shown through dispersed testing programs to form part of more-or-less continuous subsurface distributions of artefacts, albeit with highly variable artefact densities linked to environmental variables such as distance to water, stream order and landform.

Such evidence poses a significant analytical and interpretive dilemma for archaeologists. Defining sites on the basis of surface artefacts alone is clearly problematic, with modern site boundaries invariably reflecting the size and distribution of surface exposures as opposed to the actions of Aboriginal people in the past. Nonetheless, for pragmatic reasons, this is the most commonly used approach, with 'distance' and 'density-based' definitions dominating. In NSW, two of the most commonly employed distance-definitions are '*two artefacts within 50m of each other*' and '*two artefacts within 100 m of each other*'. Neither definition is derived from a particular theoretical approach or body of empirical research - they are simply pragmatic devices for site definition. Definitions based on artefact density also vary in

[4] Following White (1997: 8), knapping floors can be defined as activity areas "*where primacy was given the systematic reduction of stone, with or without additional activities being carried out*"

their particulars. However, one of most commonly used definitions is that which isolates, within an arbitrarily defined ‘background scatter’ of one artefact per 100 m², higher density clusters that are subsequently defined as ‘sites’. Non-site or distributional archaeology offers an alternative approach to distance and density-based site definitions (Ebert, 1992; Foley, 1981), with individual artefacts, not sites, treated as the basic units of analysis (for published Australian examples see Doelman, 2008; Holdaway et al., 2000; McNiven, 1992; Robins, 1997; Shiner, 2008). While recognising the interpretive potential of non-site approaches with respect to data analysis and discussion, their implementation in the context of cultural heritage management studies is difficult. Here, the identification of ‘sites’ is required for reasons of recording (i.e. their entry into site databases such as AHIMS), as well as ease of relocation, protection, and ongoing management. The identification of spatially-discrete ‘sites’, therefore, arguably offers the most pragmatic approach to Aboriginal heritage management in impact assessment contexts and remains the most widely adopted approach.

6.1.3 Rockshelter sites: distribution, contents and definition

Though outnumbered by open artefact sites, rockshelter sites are nonetheless a common component of the Aboriginal archaeological record of the Central Tablelands, with known examples concentrated in the easternmost portion of the region in association with the elevated, dissected sandstone plateaux of the Triassic Narrabeen Group unit. Previously identified Aboriginal rockshelter sites within the region can be divided into two groups:

1. Those containing evidence of use by Aboriginal people, most commonly flaked and/or ground stone artefacts in surface and/or subsurface contexts, but also engraved and/or pigment art on shelter walls and/or roofs, grinding grooves and other cultural features / materials (e.g. hearths, animal bone, shell, plant remains); and
2. Rockshelters without any observable evidence of use that have been assessed, on the basis of variables such as habitable floor area, outlook, aspect and ease of access, as retaining the potential for artefact-bearing deposits in subsurface contexts. Such shelters are referred to as ‘rockshelters with Potential Archaeological Deposit (PAD)’.

In terms of site location, existing archaeological survey data for the region indicate that Aboriginal rockshelter sites - both utilised and with PAD - can occur in a variety of topographic contexts, with the presence of a suitably-sized rock overhang, whether formed by cavernous weathering and/or block-fall or block-glide, and an associated habitable floor space, the only *fundamental requirements* for an shelter’s potential use by Aboriginal people. Other variables, such as outlook, aspect, ease of access and distance to water and other economic resources are also relevant, however, and are particularly germane to assessments of *intensity of use*, as opposed to use alone.

Rockshelters that meet the fundamental requirements of accessibility and the presence of a suitably-sized overhang and an associated habitable floor space occur in abundance in association with the region’s sandstone plateaux, frequently occurring along the base of sandstone cliff lines but also on associated colluvial slopes[5] and adjacent landforms elements (e.g. creek flats). While any such rockshelters could have been used by Aboriginal people in the past, available archaeological data for the region (e.g. Moore, 1970; Haglund, 1981c, 1996, 2001; Pearson, 1981) provide a basis from which to argue that rockshelters located in environmentally-favourable or strategic locations (e.g. those close to established watercourses with good outlooks and favourable aspects) will have witnessed the most intensive use (i.e. repeated and/or longer term occupation episodes), with other, less environmentally-favourable shelters used in a more transient manner.

Despite their strong representation in the Aboriginal archaeological record of the tablelands, relatively few rockshelter sites have been excavated to date. McCarthy’s excavations of the Capertee 1 to 5 rockshelters in the Capertee Valley, referenced above, are notable not only for demonstrating ‘early’ Aboriginal occupation of the region but also producing, from Capertee 3, a regionally significant flaked stone artefact assemblage that continues, over 60 years later, to feature prominently in broader archaeological discourse regarding southeastern Australian Aboriginal lithic technologies (e.g. Hiscock & Attenbrow, 2004, 2005, 2011). Tindale’s May 1961 excavation of the Noola or Capertee 6 rockshelter in the valley of the Bogee Nile Creek, a tributary of the Capertee River, is similarly noteworthy, with

[5] Rockshelter sites in hillslope contexts have been identified in association with both outcropping bedrock and freestanding boulders

excavation here demonstrating Aboriginal occupation from around 12,000 BP. Capertee 3 and Noola would later be revisited by Johnson (1979), who re-excavated both sites with the aim of reassessing McCarthy's and Tindale's findings; in particular, the former's description and dating of the Capertee 3 lithic sequence. Around the same time, Johnson would also lead the excavation of the Abercrombie Arch shelter, 58 km south-southwest of Bathurst, an excavation which produced over 10,000 stone artefacts, as well as a diverse faunal assemblage including a variety of marsupials, rodents, reptiles, birds, fish and land gastropods (Johnson, 1977).

In the easternmost portion of the region, on the Newnes Plateau, McIntyre (1990) test excavated ten rockshelter sites as part of a compliance based Aboriginal heritage impact assessment for the Kariwara Longwall Coal Mine. Radiocarbon determinations obtained from seven of these sites range from 2390±60 (Beta-25063) to 13,940±90 BP (Beta-25070), with three pre-dating 6,000 BP. Of the three earliest dates (6420±70 BP (Beta-25064), 13,940±90 BP (Beta-25070) and 9490±110 BP (Beta-25067), however, only one (Beta-25067) was unequivocally associated with Aboriginal occupation, coming from a hearth in Site 35, a long shallow rockshelter located on a tributary of Sawyers Swamp Creek. Beta-25064 and Beta-25070, in contrast, were obtained from contexts underlying the lowest artefact-containing spits in each site. Regardless, viewed collectively, McIntyre's results are consistent with existing radiocarbon dates for the Blue Mountains, which point, most conservatively, to Aboriginal occupation from around 12,000 years ago (Kelleher, 2002: 99).

In the north of the region, Moore's 1967 excavation of the BOB/1 rockshelter on Queens Creek, close to the source of the Goulburn River, yielded what remains to the present day the largest assemblage of stone artefacts recovered from a single Aboriginal site within the Central Tablelands, with over 16,000 artefacts, including more than 500 backed artefacts, recovered from *c*.4m^3 of excavated deposit. Smaller assemblages of animal bone and shell, restricted to the top three excavation units (Levels 1-3), were also recovered, with various freshwater, terrestrial and avian fauna represented (Moore, 1970: 48) Radiocarbon determinations for this site range from 730±70 BP (ANU-123) to 7750±120 BP (ANU-124), with Moore (1981) proposing occupation from around 6,000 BP.

Pearson's (1981) excavation of the Botobolar 5 rockshelter, one of a group of five shelters located on Bara Creek in the Upper Botobolar area, demonstrated occupation of comparable antiquity and produced a diverse array of cultural materials, including plant food remains[6]. While small when compared with that recovered from BOB/1, the stone artefact assemblage from Botobolar 5 was argued by Pearson (1981:132-145) to contain distinct Bondaian and Capertian components, with the former characterised by the presence of backed artefacts, restricted to the upper 20 cm of excavated deposit and associated with a date of 1,170±60 BP (ANU-1574). The latter, in contrast, was characterised by both an absence of backed artefacts and the presence of the saw, or dentated edge flake, and was associated with dates of 5,590±90 BP (ANU-1574) and 5,770±100 BP (ANU-1574).

Undertaken around the same time as Pearson's (1981) Botobolar 5 excavation, Haglund's early (1981a, 1981c) archaeological investigations within the Ulan Mine Complex (UMC) included test excavations within fourteen rockshelters. More recently, Haglund (1996, 2001) undertook comprehensive salvage excavations of two rockshelter sites within the UMC - site ID#116 (36-3-177) and Spring Gully 5 (SG5), with the latter excavation producing an assemblage of over 10,000 stone artefacts, analysed and reported on by White (2001), as well as several radiocarbon determinations. Additional subsurface investigations of Aboriginal rockshelter sites within the UMC have recently been undertaken by Peter Kuskie and colleagues (South East Archaeology Pty Ltd), with several rockshelter sites subject to test excavation as a result of potential subsidence impacts. Interim results for three of these sites (i.e. ID#104, 105 and1420) have been reported by Kuskie (2012), with those for other tested shelters forthcoming.

Analysis of archaeological finds assemblages from excavated rockshelter sites across the region have provided a range of insights into pre-contact Aboriginal settlement and subsistence patterns, with excavated faunal and plant food assemblages, in particular, offering insights thus far unavailable from investigated open site deposits. For their part, recovered faunal assemblages have complemented existing ethnohistorical accounts for the region in attesting to the exploitation of a diverse range of terrestrial, freshwater and avian fauna (see Moore, 1970: 48; Brown in Haglund, 1981c and Pearson 1981:128-129 for examples). Alongside plant food remains, which have been recovered from only a

[6] Specifically, seeds of the geebung (Persoonia) and Macrozamia nuts

handful of sites, such assemblages are important for the reconstruction of pre-contact diets and subsistence behaviours, as well as assessments of seasonal mobility patterns. Excavated stone artefact assemblages have likewise provided a range of insights into pre-contact settlement and subsistence behaviours, with large, well-dated assemblages, in particular, facilitating an assessment of temporal and spatial variability in the organisation of stone tool technologies, as well as the analytical and interpretive applicability of McCarthy's (1967) ERS and its variants (see, in particular, White, 2001).

Relatively few rockshelters with art have been identified within the region to date. Nonetheless, previously recorded rock art in shelter contexts, which includes both engraved and pigment art on shelter walls and/or roofs, indicates a diverse range of artistic motifs and techniques. Human hands, typically in red pigment but also in white, are a regionally common motif and appear, on the basis of available data, to have been most commonly applied using a stencilling technique. However, a range of other motifs, including human footprints, animals and/or their tracks, material culture items (e.g. axes, spears, boomerangs) and non-figurative representations, have also been recorded, as have various 'wet' and 'dry' application techniques. While detailed regional and/or sub-regional assessments of the rock art record of the Central Tablelands are lacking, reference to the results of McDonald's (2008) comprehensive investigation of Sydney Basin rock art suggests that such art likely served as a communicative medium for both the assertion of local group identify and broader culture area cohesion.

6.1.4 Flaked stone artefact technology

Virtually indestructible, flaked stone artefacts are a ubiquitous element of the Aboriginal archaeological record of the Central Tablelands and, as such, have assumed a prominent position in archaeological reconstructions of past Aboriginal occupation across the region. Alongside the quantification of assemblages of stone artefacts recorded during field surveys, both site-specific and area-wide (e.g. Navin Officer, 2005; Hamm, 2006, 2008; Kuskie, 2009), studies of excavated and surface collected stone artefact assemblages to date have ranged from basic descriptive accounts of assemblage composition[7] to detailed reconstructions of past stone reduction behaviours (e.g. Hamm & Foley, 2010; Moore, 1970; O'Driscoll & Kuskie, 2015; OzArk, 2004a, 2004b; Pearson, 1981; White, 2001). Subject to varying degrees of analysis, excavated and/or surface collected assemblages of particular interpretive value have included those recovered from the Capertee 3 (Hiscock & Attenbrow, 2004, 2005, 2011; Johnson, 1979; McCarthy, 1964), BOB/1 (D. R. Moore, 1970), Botobolar 5 (Pearson, 1981) and SG5 (White, 2001) rockshelters, as well as open air sites at Yamble Bridge (OzArk, 2004a), Lidsdale (OzArk, 2004b), the MCC (Hamm and Foley, 2010; O'Driscoll and Kuskie, 2015) and Wilpinjong Coal Mine (Apex Archaeology, 2014).

Available technological and typological data for surface collected and excavated flaked stone artefact assemblages from the region suggest that the majority of these assemblages belong to what is known as the 'Australian small-tool tradition', a term coined by Gould (1969) to describe what was then thought to be the first appearance, in the mid-Holocene[8], of a new suite of flaked stone tool forms in the Aboriginal archaeological record of Australia, including backed artefacts (i.e. Bondi points and geometric microliths), adzes and points, both unifacially and bifacially flaked. Complex, hierarchically-organised reduction sequences associated with the production of these tools contrast markedly with the simple sequences of earlier periods (Moore 2013). Tools of the Australian small-tool tradition, it has been suggested, formed part of a portable, standardised and multifunctional tool kit aimed specifically at risk reduction (Hiscock 1994, 2002, 2006). Stone artefact assemblages from late Pleistocene and early Holocene contexts, in contrast, are described by archaeologists as belonging to the 'Australian core tool and scraper tradition', a term first used by Bowler *et al.* (1970) to describe the Pleistocene assemblages recovered from Lake Mungo in western New South Wales. Bowler *et al.* (1970) saw the main components of these assemblages - core tools, steep-edged scrapers and flat scrapers - as characteristic of early Australian Aboriginal assemblages and as being of a distinctly different character to those associated with the proceeding small-tool tradition.

In southeastern Australia, including the Central Tablelands, the Australian 'small-tool' and 'core tool and scraper' traditions are most commonly described in terms of McCarthy's (1967) ESR, with 'Capertian' assemblages assigned to the latter tradition and 'Bondaian' assemblages, the former. Based on appreciable changes in the composition of chipped stone artefact assemblages over time, the ERS

---

[7] i.e. with respect to the relative representation of different artefact types and raw materials

[8] More recent research into the chronology of backed artefacts in Australia (e.g. Hamm et al., 2016; Hiscock & Attenbrow, 2004; Slack et al. 2004), for example, has demonstrated a long history of production and use for these implements.

hypothesises a three phase sequence of ‘Capertian’ (earliest), ‘Bondaian’ and ‘Eloueran’ (most recent) assemblages and was developed on the basis of McCarthy’s (1948, 1964) pioneering analyses of stratified flaked stone assemblages from the Lapstone Creek rockshelter, on the lower slopes of the Blue Mountains eastern escarpment, and the Capertee 3 rockshelter, north of Lithgow. At present, the most widely cited characterisation of the ERS is that of a four-phase sequence beginning with the Pre-Bondaian (McCarthy’s Capertian) and moving successively through the Early, Middle and Late phases of the Bondaian, the last of which equates to McCarthy’s (1967) Eloueran phase. The tripartite division of the Bondaian is based principally on the presence/absence and relative abundance of backed artefacts (Attenbrow, 2010: 101). However, other factors, such as changes in the abundance of bipolar artefacts and different stone materials, as well as the presence/absence of ground implements are also relevant. Importantly, while there is now a general consensus amongst researchers regarding the naming and key technological / typological characteristics of the various phases of the ESR, it should be noted that, based as they are on spatially and temporally-specific archaeological datasets, published and unpublished versions of the sequence do differ with respect to the dating of individual phases (**Table 10**), as well the relative frequencies of diagnostic traits (**Table 11** and **Table 12**).

Flaked stone artefact assemblages from surface collected/recorded and excavated sites within the study region attest to the exploitation of a diverse range of lithic raw materials (see, for example, Haglund, 1981c: Appendix C; White, 2001:32, Table 5; OzArk, 2004: 45, Table 8; Hamm, 2006: 77, Table 20; Kuskie, 2009: 119, Table 7.5). However, two rock types - quartz and silicified tuff[9] - are particularly well represented, with available data indicating intra-regional variation, both spatial and temporal, in the relative use of these raw materials. For most of the study region, existing site assemblages demonstrate an emphasis on the procurement and reduction of quartz (‘milky’ and crystal), with the majority overwhelmingly dominated by artefacts manufactured out of this material. For quartz and silicified tuff, polymictic conglomerate lenses within geological formations such as the Triassic Narrabeen Group (Rn), Jurassic Pilliga Sandstone Formation (Jp) and Permian Illawarra Coal Measures (Pi) have been identified as key raw material sources, with alluvial and colluvial deposits of conglomerate-derived gravels widely and abundantly distributed across the region. Silicified tuff is also present as seams within the Permian Illawarra Coal Measures (Pi) and occurs in form of exposed seams / outcrops as well as tabular colluvial gravels on hillslopes and in adjacent drainage depressions (e.g. Kuskie, 2009: 122). In common with conglomerate-derived gravels, direct evidence for the procurement and reduction of seam-derived tuff[10] has been identified within the region (see, for example, Kuskie, 2009: 121-122). For quartz, Aboriginal exploitation of bedrock sources (i.e. reef outcrops) has also been demonstrated (Helen Brayshaw, 1986; L. Smith, 1987).

Although few researchers have considered the issue in detail (but see OzArk, 2004a, 2004b; White, 2001), change over time in the relative importance of different raw materials - namely quartz and fine-grained siliceous materials (i.e. chert, silicified tuff and FGS) - is apparent at number of excavated sites, principally rockshelters (e.g. Moore, 1970; Pearson, 1981; White, 2001) but also open artefact sites (e.g. OzArk, 2004a, 2004b). At the Bobadeen and Botobolar 5 rockshelters, for example, low relative frequencies of quartz in the deepest or oldest spits give way to higher frequencies that subsequently decline again over time, albeit gradually (see OzArk, 2004: 76, Fig. 24). A different pattern, meanwhile, is apparent for the SG5 rockshelter assemblage, with quartz dominant in the site’s bottom three (Spits 7-10) and upper four (Spits 1-4) spits, potentially of Early Bondaian and Late Bondaian association respectively, and ‘chert’[11] dominant in Spits 5-6, potentially of Middle Bondaian association. At Yamble Bridge and Lidsdale, quartz is the dominant raw material throughout. However, opposing patterns are evident for silicified tuff, with frequencies of this material both increasing (Yamble Bridge) and decreasing (Lidsdale) with depth (OzArk, 2004a: 76, Fig. 24, 2004b: 57, Table 12).

Change over time in the flaked stone artefact technologies employed by Aboriginal knappers occupying the tablelands are likewise apparent, with the Capertee 3 assemblage comprising a ‘type assemblage’ in this regard (Hiscock & Attenbrow, 2005; Johnson, 1979; McCarthy, 1964)). As alluded to above, backed artefacts have been identified as a key technological indicator marking the transition from the Pre-Bondaian (Capertian) to the Bondaian in this region. While backed artefacts are now known to have

[9] This rock type has historically been variously referred to as ‘chert’, ‘mudstone’ and ‘indurated mudstone’, albeit technically incorrectly (see discussion in Hughes et al., 2011)..
[10] I.e. tuff characterised by tabular cortex
[11] For the purposes of her SG5 analysis, White (2001: 22) used the term ‘chert’ as a “very wide ranging term” for fine-grained siliceous materials, including chert and silicified tuff.

been produced from the early Holocene, at Capertee 3 for example (Hiscock & Attenbrow, 2004), available data indicate that production rates remained low until the Middle Bondaian, when rates dramatically increased (the so called "backed artefact proliferation event") (Hiscock & Attenbrow, 2004; see also Hiscock, 1994, 2002). Changes in the relative importance of associated core reduction methods have also been identified, with pre-Bondaian assemblages, for example, lacking evidence of what Johnson (1979:110) has referred to as "*more controlled flaking techniques giving rise to smaller and more elongated flakes*". Other Bondaian developments, it has been suggested, include a greater concern with raw material quality, the production of a wider range of tool types and a general reduction in artefact size (Johnson, 1979: 94-106).

Backed artefacts dominate the retouched components of the majority of excavated and surface collected stone artefact assemblages from the region and, as such, the technology of their manufacture has been a topic of particular interest to researchers (e.g. Moore, 1970; White, 2001; Low, 2015). In common with the nearby Sydney and Hunter regions, available technological data suggest that backed artefact manufacture across the tablelands was a structured or systematic activity involving a complex system of raw material procurement, transportation, preparation and reduction. While differences in the technological character of recovered cores across the region suggest a significant degree of variability in the methods used by Aboriginal knappers to produce flakes for backed artefact manufacture, the demonstrated importance of certain flaking techniques (e.g. asymmetric alternating flaking), coupled with evidence for the standardisation of these implements (e.g. Low, 2015), provides support for Hiscock's (1994, 2002) suggestion that backed artefacts served as standardised components of flexible, multi-functional composite tools that reduced foraging risk[12] because of their versatility, reliability and maintainability.

Table 10 Chronology of the ESR, as proposed by Attenbrow (1987, 2004) and McDonald (1994, 2008)

McCarthy's (1967) phasing	Current phasing (after Stockton and Holland, 1974)	Attenbrow 1987	McDonald 1994	Attenbrow 2004	McDonald 2008
Capertian	Pre-Bondaian	Pre-5,000 BP	Pre-5,000 BP	11,300-5,000 BP	30,000 BP-8,000 BP
Bondaian	Early Bondaian	5,000-2,800 BP	5,000-3,000 BP	5,000-2,800 BP	8,000 BP-4,000 BP
	Middle Bondaian	2,800 BP-1,600 BP	3,000-1,000 BP	2,800 BP-1,600 BP	4,000 BP-1,000 BP
Eloueran	Late Bondaian	1,600 BP-110 BP	1,000 BP to contact	1,600 BP-110 BP	1,000 BP to contact

Table 11 MCarthy's (1967) Eastern Regional Sequence (ESR) of stone artefact assemblages, as proposed by McDonald (2008) for the Sydney region. Following Attenbrow (2004: 73, Table 3.8), number of •• indicates relative frequency within analysed assemblages; Y, N indicates yes, no.

Current Phasing	McCarthy's (1967) Phase	Date range	Diagnostic criteria				
			Backed artefacts	Ground stone	Bipolar artefacts	S. tuff predom.	Other FGS predom.
Pre-Bondaian	Capertian	30,000 BP-8,000 BP	-	N	•	Y	N
Early Bondaian	Bondaian	8,000 BP-4,000 BP	••	N	•	N	Y
Middle Bondaian		4,000 BP-1,000 BP	•••	Y	••	N	Y
Late Bondaian	Eloueran	1,000 BP to contact	•	Y	•••	N	Y

[12] Hiscock (2006: 70), following Bamforth and Bleed (1997), has defined foraging risk as "*the probability and cost of a failure to procure resources in a timely and cost efficient manner*".

Table 12 MCarthy's (1967) Eastern Regional Sequence (ESR) of stone artefact assemblages, as proposed by Attenbrow (2004) for the Upper Mangrove Creek catchment. Following Attenbrow (2004: 73, Table 3.8), number of •• indicates relative frequency within analysed assemblages; Y, N indicates yes, no.

Current Phasing	McCarthy's (1967) Phase	Date range	Diagnostic criteria					
			Bondi points	Other backed	Ground stone	Bipolar artefacts	Quartz predom.	FGS predom.
Pre-Bondaian	Capertian	11,300-5,000 BP	•	-	-	•	N	Y
Early Bondaian	Bondaian	5,000-2,800 BP	••	•	•	•	N	Y
Middle Bondaian		2,800 BP-1,600 BP	•••	••	••	••	Y	N
Late Bondaian	Eloueran	1,600 BP-110 BP	-	•	•••	•••	Y	N

6.1.5 Chronology of occupation

Available radiometric age determinations indicate that Aboriginal people have occupied the Central Tablelands for *at least* 12,000 years. As in the nearby Hunter, Sydney and Blue Mountains regions (see, for example, Stockton and Holland, 1974; McDonald, 2008; Attenbrow, 2010; Hughes et al., 2014), evidence for Pre-Bondaian (Capertian) occupation of the region remains sparse, with cultural deposits of confirmed or probable pre-Bondaian antiquity identified at only a handful of sites (i.e. Capertee 3 (Johnson, 1979; McCarthy, 1964), Site 35, Newnes Plateau (McIntyre, 1990), Botobolar 5 (Pearson, 1981), Noola (Johnson, 1979; Tindale, 1961), Yamble Bridge (OzArk, 2004a) and Site L2 in Lidsdale (OzArk, 2004b)). Evidence for Bondaian occupation of the tablelands, in contrast, abounds, with hundreds, if not thousands of sites of Bondaian antiquity (principally middle-to-late) having been identified to date. Taken at face value, this disparity is suggestive of a significant increase in the region's Aboriginal population over time. However, other factors, such as the better preservation of younger archaeological deposits and the well documented difficulties of dating open air assemblages must also be taken into consideration. Available radiocarbon dates for excavated rockshelter and open air sites across the Central Tablelands are provided in **Table 13** below. Not shown but also of note here are the two OSL dates obtained for an artefact-bearing soil profile at Site L2 in Lidsdale (i.e. 7,400±700 years before 2000 AD and 13,500±1000 years before 2000 AD), both of which support technological indicators of a pre-Bondaian presence at this site.

While evidence of pre-Bondaian Aboriginal occupation of the tablelands remains scarce, geomorphic contexts favourable to the preservation of 'early' occupation deposits are well represented. Outside of rockshelters, whose potential in this regard has been amply demonstrated both within and outside of the study region (e.g. Attenbrow, 2004, 2010; Moore, 1970, 1981; Pearson 1981), documented examples have included Pleistocene creek terraces and associated colluvial deposits (e.g. Kuskie and Clarke, 2005), source bordering sand sheets of probable Late Pleistocene antiquity (e.g. OzArk, 2004a), and deep alluvial soils adjacent to major watercourses[13] (e.g. Navin Officer, 2005). While area-specific, Mitchell's (2005, 2007) geomorphological observations concerning the size and integrity of selected creek catchments in the MCC and adjoining Wilpinjong Coal Mine are also of note here, with Mitchell noting generally limited amounts of post-European soil erosion in these contexts[14] and proposing higher preservation potential for Aboriginal sites of all ages, including those of Late Pleistocene / early Holocene antiquity.

Table 13 Radiometric dates for excavated rockshelter and open artefact sites across the Central Tablelands

Site	Site type	Unit / Spit	Lab ID	Sample	Radiocarbon Age (BP)	Reference(s)
BOB/1	Rockshelter	Sq. E / Lvl. 1	ANU-123	Charcoal	730±70 BP	Moore, 1970
BOB/1	Rockshelter	Sq. E / Lvl. 5	ANU-790	Charcoal	4,120±175 BP	Moore, 1981

[13] In some areas (e.g. Navin Officer, 2005: 35), these have been observed to contain multiple buried soil horizons, albeit of unknown antiquity.
[14] Particularly when compared with similar-sized catchments in the Hunter Valley (see, for example, Dean-Jones and Mitchell, 1993)

Site	Site type	Unit / Spit	Lab ID	Sample	Radiocarbon Age (BP)	Reference(s)
BOB/1	Rockshelter	Sq. E / Lvl. 7	ANU-287	Charcoal	5,150±170 BP	Moore, 1981
BOB/1	Rockshelter	Sq. E / Lvl. 7	ANU-124	Charcoal	7,750±120 BP**	Moore, 1970
Botobolar 5	Rockshelter	Spits B4-5 (Intrusive)	ANU-1572	Charcoal	270±80 BP	Pearson, 1981
Botobolar 5	Rockshelter	Spit A1	ANU-1724	Charcoal	1,170±60 BP	Pearson, 1981
Botobolar 5	Rockshelter	Spit B4	ANU-1573	Charcoal	5,590±190 BP	Pearson, 1981
Botobolar 5	Rockshelter	Spit B7	ANU-1574	Charcoal	5,770±100 BP	Pearson, 1981
Capertee 3	Rockshelter	Q13/A	ANU-2136	Charcoal	1080±100 BP	Hiscock & Attenbrow, 2005: 26, Table 5
Capertee 3	Rockshelter	6/A	SUA-1163	Charcoal	1550±70 BP	Hiscock & Attenbrow, 2005: 26, Table 5
Capertee 3	Rockshelter	6/A	SUA-1165	Macrozamia	2040±70 BP	Hiscock & Attenbrow, 2005: 26, Table 5
Capertee 3	Rockshelter	6/A	SUA-1164	Mussel shell	2285±75 BP	Hiscock & Attenbrow, 2005: 26, Table 5
Capertee 3	Rockshelter	6/B	V33	Charcoal	2865±57 BP	Hiscock & Attenbrow, 2005: 26, Table 5
Capertee 3	Rockshelter	Q13/C	ANU-2137	Charcoal	2330±160 BP	Hiscock & Attenbrow, 2005: 26, Table 5
Capertee 3	Rockshelter	Q13/F	ANU-2138	Charcoal	4680±450 BP	Hiscock & Attenbrow, 2005: 26, Table 5
Capertee 3	Rockshelter	2or6/G	V34	Charcoal	3623±69 BP	Hiscock & Attenbrow, 2005: 26, Table 5
Capertee 3	Rockshelter	8/I/J	V18	Charcoal	7360±125 BP	Hiscock & Attenbrow, 2005: 26, Table 5
Noola	Rockshelter	376	ANU-2098	Charcoal	8050±240 BP	Johnson, 1979: Table 6
Noola	Rockshelter	364-365	V35	Charcoal	12550±185 BP	Johnson, 1979: Table 6
Noola	Rockshelter	496-501	V36	Charcoal	5320±80 BP	Johnson, 1979: Table 6
Noola	Rockshelter	620	GaK-334	Charcoal	11,600±400 BP	Johnson, 1979: Table 6
Site 21 (Newnes Plateau)	Rockshelter	Test pit C/Spits 5 & 6	Beta-25069	Charcoal	3,240±80 BP	McIntyre, 1990
Site 22 (Newnes Plateau)	Rockshelter	Spit 9*	Beta-25070	Charcoal	13,940±90 BP	McIntyre, 1990
Site 24 (Newnes Plateau)	Rockshelter	Spit 2	N/A	Charcoal	5,670±90 BP	McIntyre, 1990
Site 30 (Newnes Plateau)	Rockshelter	Spit 4	Beta-25063	Charcoal	2,390±60 BP	McIntyre, 1990

Site	Site type	Unit / Spit	Lab ID	Sample	Radiocarbon Age (BP)	Reference(s)
Site 30 (Newnes Plateau)	Rockshelter	Spit 11*	Beta-25064	Charcoal	6,420±70 BP	McIntyre, 1990
Site 32 (Newnes Plateau)	Rockshelter	Spits 5 & 6	Beta-25060	Charcoal	2,490±80 BP	McIntyre, 1990
Site 33 (Newnes Plateau)	Rockshelter	Spit 8	Beta-25065	Charcoal	2,470±70 BP	McIntyre, 1990
Site 35 (Newnes Plateau)	Rockshelter	Hearth (Spit 4)	Beta-25067	Charcoal	9,490±110 BP	McIntyre, 1990
SG5	Rockshelter	Spit 7 / G6a2	NZA-10762	Charcoal	3,080±60 BP	Haglund, 2001
SG5	Rockshelter	Spit 5 / G6b4	NZA-10765	Charcoal	393±70 BP	Haglund, 2001
SG5	Rockshelter	Spit 4 / G6b3	NZA-10763	Charcoal	346±60 BP	Haglund, 2001
SG5	Rockshelter	Spit 2 / F5d3	NZA-10761	Charcoal	433±60 BP	Haglund, 2001
SG5	Rockshelter	Spit 8 / N5b4	NZA-10766	Charcoal	4,147±60 BP	Haglund, 2001
SG5	Rockshelter	Spit 4 / N5d4	NZA-10767	Charcoal	952±70 BP	Haglund, 2001
ID#104	Rockshelter	B	Wk-33777	Charcoal	231±28 BP	Kuskie, 2012
ID#105	Rockshelter	B	Wk-33278	Charcoal	3,154±52 BP	Kuskie, 2012
ID#164	Rockshelter	C/4	Wk42645	Charcoal	2,518±20 BP	Kuskie, in prep
ID#166	Rockshelter	C/3	Wk42647	Charcoal	3,641±35 BP	Kuskie, in prep
ID#166	Rockshelter	B/7	Wk42646	Charcoal	3,728±20 BP	Kuskie, in prep
ID#166	Rockshelter	C/9	Wk42648	Charcoal	3,712±20 BP	Kuskie, in prep
S1MC343	Rockshelter	A3 / 9	Beta-412274	Charcoal	810±30 BP	AECOM, 2016
S1MC343	Rockshelter	A3 / 17	Beta-412275	Charcoal	2,170±30 BP	AECOM, 2016
S1MC343	Rockshelter	A3 / 21	Beta-412276	Charcoal	2,490±30 BP	AECOM, 2016
WCP216/ WCP126	Open artefact site	443E556N / Spit 2	N/A	Charcoal	250±30 BP***	Apex Archaeology, 2014
WCP216/ WCP126	Open artefact site	483E588N / Spit 2	N/A	Charcoal	5,650±30 BP****	Apex Archaeology, 2014
WCP216/ WCP126	Open artefact site	564E489N / Spit 1	N/A	Charcoal	50±30 BP****	Apex Archaeology, 2014

*Dated sample retrieved from spit *below* the lowest artefact-containing spit

** Note that Moore (1981) has argued that the oldest radiocarbon date available for BOB/1 (i.e. 7,750±120 BP) pre-

dates Aboriginal occupation of the shelter and has proposed habitation from around 6,000 BP.
***Dated charcoal from potential Aboriginal hearth
****Dated charcoal from burnt tree stump / root

6.1.1 Occupation / site distribution models

Key occupation and site distribution models for the Central Tablelands include those formulated by Pearson (1981), McIntyre (1990), White (2001) and Kuskie (2009). Each is summarised below.

6.1.1.1 Pearson 1981

Formulated as part of a wide-ranging investigation into pre- and post-contact Aboriginal occupation in the upper Macquarie River region, Pearson's (1981) land use model was based, in part, on an analysis of archaeological site distribution within four selected sample areas (i.e. the 'Wellington', 'Mudgee-Cooyal, 'Central Macquarie' and 'Lewis Ponds' areas). Consistent with the results of more recent site distribution analyses, Pearson (1981) found that the size of Aboriginal camp sites in his dataset (n =42), defined by him as "*the area of ground covered with a reasonable density of artefacts*", increased as distance from water decreased. In other words, larger sites were concentrated along watercourses. While acknowledging that several factors may have been responsible for this trend, Pearson (1981: 94) identified the spatial and economic requirements of larger groups as potentially important factors. Away from creeklines, in areas of hilly or undulating terrain, Pearson (1981: 99) identified a preference for dry, well-drained locations, with the majority of sites also sheltered from prevailing winds (or located near such shelter) and/or offering commanding views over nearby watercourses.

Drawing the various strands of his analysis together, Pearson (1981: 101) concluded that the "desirable features" of a camp site within the selected sample areas were accessibility to water, good drainage, favourable elevation, the presence of level ground, a sunny leeward aspect and adequate fuel. Landform contexts identified by Pearson (1981:101) as meeting these needs included gentle (i.e. low gradient) hillslopes and undulating ground, flat areas on ridges (particularly at lower elevations), river flats and creek banks, with the last two offering "*accessibility to water but few of the other desirable features*" (Pearson, 1981: 101). While pertinent to camp site selection, Pearson (1981: 101) cautioned that the location of non-occupational sites, such as quarries, burials, grinding groove and ceremonial sites, was likely based on different locational principles.

Together with available ethnohistorical records, the results of the above-described site distribution analysis were used by Pearson (1981) to infer a picture of "*traditional Aboriginal settlement patterns*" for the upper Macquarie region as a whole. According to Pearson (1981: 118-119), the region appears to have supported a relatively small Aboriginal population that was, at least at contact, broken into three 'clans' centred around the Wellington, Mudgee-Rylstone and Bathurst areas respectively. Relations between these clans, each of which contained a number of smaller, self-sufficient groups (i.e. bands) for the purposes of day-to-day subsistence, varied from friendly to "warlike" (Pearson, 1981: 119). Individual bands moved camp regularly, with the length of stay in any one location limited by factors such as the availability and attractiveness of food and other economic resources, camp hygiene, ceremonial obligations and "*a desire for a change of scene*" (Pearson, 1981: 119). Low gradient, well-drained landform elements close to water were favoured as camp sites, with differences in group size influencing the location of a camp in relation to water. Individual clan territories will have included a central, highly productive sub-region, with other, less productive sub-regions around it (Pearson, 1981: 119-120).

6.1.1.2 McIntyre 1990

McIntyre's (1990) environmentally-based model of Aboriginal site distribution and land use in the northwestern portion of the Blue Mountains was developed as part of a compliance-based archaeological investigation for the Kariwara Coal Mine on the Newnes Plateau, northeast of Lithgow. Re-evaluated and verified several times over the years (e.g. Barton & McDonald, 1995; H. Brayshaw & Haglund, 1995; Kelleher, 2002; Rich & Gorman, 1992), McIntyre's model is of particular interpretive value for the deeply dissected sandstone plateaux of the easternmost portion of the tablelands. Framed, in part, as a series of "predictive statements", the model holds that:

- Major site complexes in this portion of the Blue Mountains are generally located:
  - At the head of gullies and valleys where there is relatively easy access from ridgetops to the resources provided by major creeks and rivers

- On the plateau at locations which offer a good vantage point and specialist resources

- Large sites occur along the western flank of the plateau (i.e. the Newnes Plateau), where major creek gullies enter the Coxs River Valley. Such gullies would have provided shelter from winds and are located close to the swamp resources of the Coxs River
- Small sites located on long ridges likely represent sporadic but repeated use for the purposes of hunting or travel. Such ridges would have provided access to the ends of spurs of other long ridges
- Ephemeral sites found below the cliff line in areas easily accessible from the plateau likely represent limited or 'one-off' usage by small groups
- Creeks and rivers on the plateau are unlikely to have been be used as travel routes due to harsh / difficult environmental conditions
- Long interconnecting ridges would have been used travel routes due to ease of access, with travel along these ridges further facilitated by burning practises
- Travel routes and occupation/resource areas in "off plateau" contexts are likely to have been associated with major river valleys.

6.1.1.3 White 2001

Drawing, in particular, on McDonald's (1994) behavioural land use model for the greater Sydney region, as well as the results of her technological analysis of the lihtic assemblage recovered from the SG5 rockshelter within the UMC, White (2001: 144-146) proposed a revised behavioural model for prehistoric Aboriginal land use across the northern Sydney Basin. Framed within McCarthy's ESR, White's model can be summarised as follows.

- **Pre-Bondaian phase**. Aboriginal groups occupying the northern Sydney Basin during the late Pleistocene and early Holocene periods (i.e. during the Pre-Bondaian period) were highly mobile and employed portable or mobile toolkits (*sensu* Kuhn, 1994). These toolkits, which appear to have included some large items, may have been conserved and not regularly discarded, a strategy reflected archaeologically by relatively low numbers of artefacts. Where available and of a quality sufficient to complete requisite tasks, locally available stone will have been used for tool stone tool manufacture. Inter-site variation in assemblage composition is expected due to the exploitation of local raw material sources, as well as differences in the frequency / duration of occupational events (White, 2001: 144).
- **Early-Bondaian phase**. Occupation of the region increased. However, groups continued to practice a settlement pattern of high residential mobility and employ mobile toolkits. Backed artefacts were favoured over other retouched and unmodified utilised tools and were likely used for a range of on- and off-site tasks (White, 2001: 144-145). Following McDonald (1994), increased social interactions during this period encouraged the development of figurative pigment, and possibly open engraved art.
- **Middle-Bondaian phase.** Occupation of the region was well-established, with groups occupying the basin's elevated sandstone country on a permanent basis. As in the preceding Early Bondaian phase, groups remained highly mobile and continued to employ mobile toolkits. Backed artefacts remained an integral component of the toolkit and were produced *en masse* during this period, with production concentrated within more open valleys. Demonstrably high artefacts discard rates within shelters at this time likely reflect the mass production of backed artefacts as opposed to more intensive or sustained occupation. With increased population densities, social mechanisms for mediate uncontrolled and potentially hostile interactions between groups were necessary, with pigment and engraved art serving as one such mechanism. Such art, as proposed by McDonald (1994), was used to assert local group distinctiveness but also larger-scale (i.e. cultural bloc) cohesion. At the same time, backed artefacts and backed artefact production techniques may also have been used to convey social information.
- **Late-Bondaian phase.** During the Late Bondaian period, levels of residential mobility are argued to have decreased markedly, with groups occupying residential sites for longer periods of time but not semi-permanently or in a sedentary manner. There was also a reduced emphasis on the occupation of rockshelters, with open camp site locations now foci for habitation (White, 2001:

146). This shift away from rockshelters was a response to the increased spatial requirements of larger social groups. Toolkit restructure, meanwhile, is evidenced by decreased discard of backed artefacts, increased discard of edge-ground axes and grindstones, and the increased use of bipolar flaking (White, 2001: 145).

6.1.1.4 Kuskie 2009

While developed with particular reference to the Ulan locality, Kuskie's (2009) proposed a general occupation model for this area that can be profitably applied to other parts of the Central Tablelands. Central to Kuskie's model is the concept of 'resource zones', with three such zones identified.

Primary resource zones are broadly defined by Kuskie (2009: 80) as "*the relatively more abundant and diverse resource rich zones within the north-east Wiradjuri territory*". While specifics are lacking, reference to Kuskie (2009: 80) suggests that low gradient landform elements adjacent to major reliable water sources and offering ready access to a large and diverse range of subsistence resources could be classified as primary resource zones. Occupation within primary resource zones, Kuskie (2009) proposes, could have included nuclear/extended family base camps, community base camps and, where resources permitted, occasional larger aggregations of people. Owing to abundant resources and reliable water, camps within primary resource zones were likely used more frequently and for longer periods of time[15]. This is expected to be reflected archaeologically though substantially higher artefact counts, densities and assemblage richness values, as well as greater numbers of activity areas, increased superimposition of these features and evidence of multiple, temporally-discrete occupation episodes in the form of stratified occupation deposits.

Relative to primary resource zones, occupation of secondary resource zones (i.e. low gradient landform elements adjacent to semi-reliable watercourses and swamps/wetlands) is argued to have been predominantly sporadic, with such zones utilised by small hunting/gathering parties and nuclear/extended family groups during the course of the seasonal round. Relative to other areas (see below), Kuskie (2009) suggests that a greater range of subsistence activities will have been undertaken at camps established in secondary resource zones, with camps within these zones occupied for varying lengths of time, but typically of short duration. Occupation within secondary resource zones is expected, relative to that in tertiary resource zones, to result in moderately higher artefact counts, densities, assemblage richness values and numbers of activity areas, albeit with values for each variable significantly lower than in primary resource areas.

Aboriginal occupation of areas outside of primary and secondary resource zones, Kuskie's (2009) model holds, is likely to have consisted of hunting and gathering activities by small parties of men and/or women and children, transitory movement between locations and the procurement of stone materials. Utilisation of these zones was far less intense than that of primary and secondary resource zones, and probably occurred during the normal daily round, with groups camped in primary and secondary resource zones exploiting the resources of these areas as part of logistical hunting and/or gathering forays up to 10 km in radii. In contrast to primary and secondary resource zones, archaeological evidence of Aboriginal use of such areas is expected to include low to very low artefact counts, densities and numbers of activity areas, as well as dates/stratigraphy indicative of sporadic occupation over time (Kuskie, 2009: 80).

More broadly, Kuskie (2009: 84-86) identifies a series of a series of occupation strategies and outlines their expected archaeological correlates. These strategies are summarised in **Table 14**.

[15] I.e. relative to those in secondary resource zones

Table 14 General occupation strategies and their archaeological correlates, according to Kuskie (2009)

Occupation strategy / pattern	Behavioural context	Environmental context	Archaeological expectations
Transitory movement	• Individual or group of people moving between base camps, or from a campsite to resources or a ceremonial or other special purpose location • Duration less than a day. Most likely less than a few hours • Evidence may represent accidental discard, repair of hunting or gathering equipment, children's play or knapping activity	• All landscape zones but frequently on ridge and spur crests, along watercourses and across valley flats • Proximity to water not important • Proximity to food resources not important	• Assemblages of low density and diversity (i.e. 'background discard') • Evidence of tool maintenance and/or repair
Hunting and/or gathering (without camping)	• Individual or small group of closely related people engaging in hunting or gathering activities • Duration less than a day, with participants returning to camp to sleep • Evidence may represent accidental discard, loss during use, repair of hunting or gathering equipment, children's play or knapping activity	• All landscape zones • Proximity to water not important • Proximity to food resources important	• Assemblages of low density and diversity (i.e. 'background discard') • Evidence of tool loss or discard
Camping by small hunting and/or gathering parties	• Individual or small group of closely related people engaged in hunting or gathering activities camp overnight near the resource being exploited • Duration of one or several days • Evidence may represent accidental discard, repair of hunting or gathering equipment, children's play, knapping activity, food processing or temporary camp fires	• All landscape zones • Proximity to water important • Proximity to food resources important	• Assemblages of low-to-moderate density and diversity, distinguishable from 'background discard' • Reasonably broad range of artefact and stone types • No site furniture (i.e. grindstones) • No heat treatment pits or ovens
Nuclear family base camp	• Single nuclear family or extended family camping together	• Level to very gently inclined land surfaces	• Assemblages of high density and diversity

Occupation strategy / pattern	Behavioural context	Environmental context	Archaeological expectations
	• Encampment area may consist of several small huts • Duration dependent on availability of food resources and potable water • Evidence may represent accidental discard, repair of hunting or gathering equipment, children's play, knapping activity, food processing, campfires, heat treatment and tool manufacture	• Proximity to water important • Proximity to food resources important •	• Site furniture (i.e. grindstones) • Common evidence for expedient stone reduction and tool production • Heat treatment pits and ovens possible
Community base camp	• Number of nuclear families camping together • Encampment area may exceed 100 m^2 and consist of a number of individual groups and huts • Duration dependent on availability of food resources and potable water	• Level to very gently inclined land surfaces • Proximity to water important • Proximity to food resources important	• Assemblages of high density and diversity • Spatially discrete evidence of individual campsites (where sites not affected by disturbance or superimpositioning) • Site furniture (i.e. grindstones) • Common evidence for expedient stone reduction and tool production • Heat treatment pits unlikely • Ochre may be present
Larger congregation of groups	• Special events (i.e. major ceremonies) or opportunistic food resource 'events' • Short duration (<1-2 weeks) but potentially for longer duration • Large encampment or multiple encampments • Variable numbers but potentially >100 individuals	• Level to very gently inclined land surfaces • Proximity to water important • Proximity to food resources important	• Assemblages of high density and diversity (comparable to community base camp) • Spatially discrete evidence of individual campsites (where sites not affected by disturbance or superimpositioning) • Site furniture (i.e. grindstones) • Common evidence for expedient stone reduction and tool production • Heat treatment pits unlikely • Evidence for the processing of uncommon food resources

6.2 Local Context

6.2.1 AHIMS database

The AHIMS database, administered by Heritage NSW, contains records of all Aboriginal objects reported to the Director General of the Department of Premier and Cabinet in accordance with Section 89A of the NPW Act. It also contains information about Aboriginal places, which have been declared by the Minister to have special significance with respect to Aboriginal culture. Previously recorded Aboriginal objects and declared Aboriginal places are known as 'Aboriginal sites'.

A search of the AHIMS database on 17 February 2021 for a 5 x 5 km area centred on the study area (AHIMS search area) returned 32 site entries. Removal of a single duplicate entry provides a revised total of 31 sites (**Table 15**). As is typical for the local area, open artefact sites are the most common site type within the AHIMS search area, accounting for 67.7% of recorded sites. Other less common site types include five rockshelter sites, two burial sites, two grinding groove sites a single area of Potential Archaeological Deposit (PAD).

Registered centroid coordinates for previously recorded Aboriginal sites within the AHIMS search area place five within 200 m of the study area (**Table 16**). However, a review of associated sites cards and reports indicates that all but one of these sites - artefact scatter SU1a-A5 (45-1-2716) - are located wholly outside of the study area. Identified as part of a cultural heritage assessment for the Lidsdale Siding Upgrade Project, artefact scatter SU1a-A5 is located partially within the study area (refer to **Figure 11**). RPS (2012: 38) provide the following description of SU1a-A5 in their report:

> *Artefact scatter SU1a - A5 (AHIMS # 45-1-2716) was located in a clearing, on a dirt track towards the western extent of the Survey Unit. The nearest water source was a small tributary off Piper's Flat Creek, approximately 51.3 m northeast of the site. A total of 19 artefacts were located in an area measuring 120 m (east - west) by 20m (north - south) with a ground surface area of approximately 2,141 m². The majority of artefacts consisted of complete flakes (n=11 pieces) and transversely broken flake fragments (n=4 pieces). Only two pieces of debris and two multi-platform cores were recorded.*
>
> *A range of raw material types were exploited for artefact manufacture, with the most common material exploited being quartz (n=12; 63%) while silcrete (n=4; 21%), chalcedony (n=2;10%) and mudstone (n=1; 5%) occurred less frequently. The majority of the artefacts were the product of secondary core reduction, displaying 1 – 2 negative flake scars on the dorsal surface. Artefact scatter SU1a - A5 is located in close proximity to a permanent water source (Piper's Flat tributary) which would have provided fresh water for drinking and subsequently have attracted animals to gather and therefore was a place suitable for hunting. The site was also on relatively flat terrain which would have been easy to access in the past, with higher ground towards the northeastern extent.*

SU1a-A5 was assessed by RPS as being of moderate scientific significance on a local scale and low scientific significance on a regional scale. The site is listed on the AHIMS database as a valid site and is located on land covered by Centennial Coal's approved Aboriginal Cultural Heritage Management Plan (ACHMP) for their Western Operations.

Table 15 AHIMS search results

Site type	AHIMS feature(s)	Number	%
Open artefact site	AFT; PAD	21	67.7
Rockshelter	AFT; GRD; ART	5	16.1
Burial	BUR; TRE	2	6.5
Grinding groove(s)	GRD	2	6.5
Potential Archaeological Deposit (PAD)	PAD	1	3.2
Total	-	**31**	**100**

Table 16 AHIMS registered Aboriginal sites within 200 m of the study area

AHIMS ID	Site name	Centroid coordinates		Site type	AHIMS status (September 2021)	Site description	Location relative to study area	Reference(s)
		MGAE	MGAN					
45-1-2799	Brays Lane AS1	227039	6300622	Open artefact site	Valid	Eight artefacts, consisting of seven grindstone fragments and one flaked glass electrical insulator, identified in an area of remnant woodland c.80 m north of an unmapped drainage line. Two additional insulators, both unmodified, were also identified.	Wholly outside	Biosis (2017)
45-1-0211	S2 (Wallerawang)	227811	6300741	Open artefact site	Valid	Approximately 100 artefacts identified in a bulldozed area measuring *c.*200 m long by 40 m wide. Two "more-or-less" in situ quartz knapping floors present. Artefacts predominantly manufactured out of quartz, with a few indurated mudstone pieces also present. Broken quartz scraper and quartz backed artefact noted.	Wholly outside	Rich & Gorman (1992)
45-1-2716	SU1a-A5	227585	6300837	Open artefact site	Valid	See **Section 6.2.1**	Partially within	RPS Australia East Pty Ltd (2012)
45-1-0247	Wallerawang School House	228345	6300699	Open artefact site	Valid	Two definite flaked stone artefacts, consisting of a quartz flake and a quartzite flake, identified during archaeological monitoring works at the Wallerawang schoolhouse site. Quartz flake recovered from spoil. Quartzite flake found in situ in trench wall at depth of 30 cm b.g.l.	Wholly outside	White & Lavelle (1996)
45-1-0237	Springvale Colliery	228105	6301189	Open artefact site	Valid	Subsurface artefact scatter identified during test excavation program undertaken as part of then proposed Springvale-Mt Piper coal conveyor project. Area identified as having the	Wholly outside	McIntyre (1993)

AHIMS ID	Site name	Centroid coordinates		Site type	AHIMS status (September 2021)	Site description	Location relative to study area	Reference(s)
		MGAE	MGAN					
						potential to contain Aboriginal burials on the basis of oral history from local informant. No skeletal remains were uncovered during testing. However, approximately 50 stone artefacts and a possible hearth were identified. Site noted as having been disturbed by flooding and rabbit/cattle activity.		

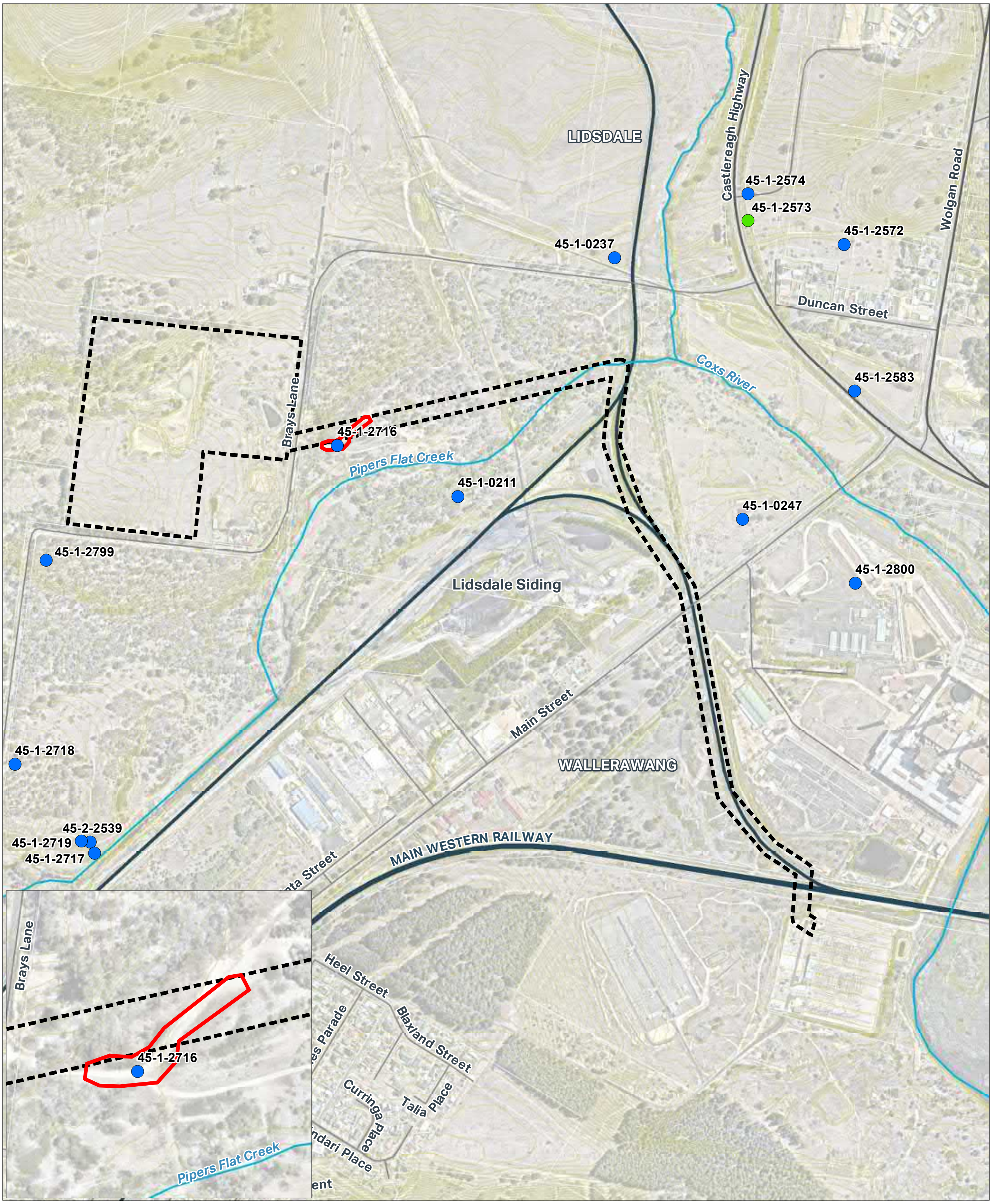


Figure 11
AHIMS Registered Aboriginal Sites

Legend
- Study Area
- Watercourse
- Railway
- Primary Road
- Local Road
- Contours

Aboriginal Sites
- Open artefact site
- PAD
- SU1a-A5 (45-1-2716) (RPS,2012)

6.2.2 NSW State Heritage Inventory

The NSW State Heritage Inventory, administered by Heritage NSW, is an online database containing more than 30,000 heritage items and places on statutory lists in NSW. The inventory, which can now be searched using an interactive map, includes:

- Declared Aboriginal Places
- Items listed on the State Heritage Register (SHR)
- Listed Interim Heritage Orders
- Items of local heritage significance listed in the heritage schedules of Local Environmental Plans.

Of relevance to the current assessment are declared Aboriginal places. As per the AHIMS search results above, reference to the State Heritage Inventory interactive map (accessed 6 September 2021) confirms that there are no declared Aboriginal places located within or immediately adjacent to the study area, with the closest example being the Blackfellows Hand rockshelter (also known as Maiyingu Marragu), located around 7.5 km from the Site, in a north-northeasterly direction.

6.2.3 Previous Aboriginal archaeological investigations

Existing AHIMS data for the greater Wallerawang-Lidsdale area indicate that numerous Aboriginal archaeological investigations have been carried out in this area over the past 40 years, with the majority linked to power generation and coal mining projects. As in other parts of the Central Tablelands, the majority of investigations to date have been limited to survey. However, a number of investigations involving test and/or salvage excavations have also been undertaken, with OzArk's (2004b) salvage excavation of Site L2 (45-1-2574), an extensive open artefact site impacted by the realignment of the Castlereagh Highway in Lidsdale of particular significance. For contextual purposes, the results of a selection of investigations undertaken in the area are provided in **Table 17**.

As for the study area itself, to date, physical investigation of the Aboriginal archaeological record of this area has been limited to survey, with a section of the current transmission line corridor surveyed by RPS (2012) as part of a cultural heritage assessment for the Lidsdale Siding Upgrade Project. As indicated in **Section 6.2.1**, RPS's survey in this area resulted in the identification of artefact scatter SU1a-A5 (45-1-2716), the location of which is shown on **Figure** 11.

Taken together, the results of previous surface and subsurface investigations within the greater Wallerawang-Lidsdale area have painted a picture of past Aboriginal occupation and land use generally consistent with the Central Tablelands as a whole. Open artefact sites are the dominant site type in this area, with recorded examples varying substantially in size and contents. Other site types, such as grinding grooves, rockshelters, scarred trees and burials, have also been identified, though comparatively infrequently, with known rockshelter sites concentrated in areas of elevated sandstone terrain. Consistent with broader regional trends, available surface and subsurface archaeological datasets for the "off-plateau" components of the greater Wallerawang-Lidsdale area confirm an occupational emphasis on elevated low gradient landform elements adjacent to higher order watercourses, as well as an emphasis on the procurement and reduction of both quartz and silicified tuff. The Coxs River, in particular, appears to have been a focal feature for Aboriginal peoples occupying this area, with the river and its associated economic resources likely facilitating sustained and/or repeated occupation over thousands of years. Known sites appear overwhelmingly to be of mid-to-late Holocene antiquity. However, pre-Bondaian occupation is also indicated.

Table 17 Previous archaeological investigations

Consultant/Researcher	Year	Project	Investigation type	Location relative to the study area	Summary of investigation & results	Reference
J.V.S. Wright	1979	Mt Piper Power Station development, Mt Piper	Survey	4.8km northwest	Pedestrian survey of the area proposed for Mr Piper power station development. The central plant area had been highly disturbed due to open-cut mining, with the area surrounding the plant expected to be further disturbed during construction and deemed to be of no archaeological value. Areas for proposed Ash dam in the Neubecks Creek area contained no rockshelters, artefacts or burials. In the area designated for the water storage dam, a rockshelter with PAD was identified.	Wright 1979
R. Silcox	1989	Proposed deviation of Great Western Hwy	Test Excavation	4km south	Test excavation was carried out following a 1988 survey (Archaeological Services, 1988) that located four open sites (W1-W4) and three locations for potential sites (X, Y, Z) that were recommended for further investigation. Excavation at locations Y and Z (changed to W5 and W6 respectively) was carried out as their location lay in the path of the new freeway. The location of site X lay outside of the construction impact zone and further investigation was deemed unnecessary. W5 was a naturally occurring shallow depression on a gently sloping Lower Carboniferous granite landscape, lying amongst granite boulder outcrops. Transect A (TA) of 51m was excavated with 13 pits (1mx25cm) laid out in intervals. Transect B was excavated across TA extending along the depressions southern margin up the slope through an interval of 4 pits across 25m. Bulk removal of pit deposits occurred in most pits and then wet sieved in the adjacent creek. As a result of the artefact density from TA9-TA11, secondary pits TA9A, TA10A, and TA11B (1x1m) were excavated to increase the sample size of artefacts. A total of 381 artefacts were recovered from 10 out of the 17 pits excavated at W5, with artefacts made of either quartz or indurated mudstone. TA9-TA11 recovered 45, 49, and 21 artefacts respectively whilst the remaining 7 pits recovered less than 5 artefacts each. A total of 248 artefacts were recovered from the three extra pits (TA9A, TA10A, and TA11B). Artefacts included flakes, flaked pieces, cores, bipolar cores and a backed blade. W6 occurred on a heavily timbered ridge of Upper Devonian sedimentary landscape, where no ploughing had occurred. Transect A (TA) was	Archaeological Services 1989

Consultant/Researcher	Year	Project	Investigation type	Location relative to the study area	Summary of investigation & results	Reference
					excavated along the top of the ridge with 11 pits at intervals over 41m. Transect B was excavated parallel to TA with 8 pits over 51m. Transect C (TC) was excavated at TA33 where artefacts and an associated gravel deposit was uncovered. TC consisted of 2 pits across 5m. All pit deposits at W6 were dry sieved. Artefact deposits in W6 were considerably less than W5, with a total of 7 artefacts recovered from the site. TA33 contained 5 of the 7 artefacts found in association with a gravel bed comprising of 4 quartz pieces and a chert broken flake with retouch/use-wear. The other two artefacts were a hammerstone from TA19 and a quartz flaked piece from TA1. The excavators concluded that, despite the lack of disturbance and artefact yields, W5 and W6 are were not significantly different to other known open sites in the local area and did not require further archaeological investigation.	
S. McIntyre	1989	Wallerawang Power Station Buffer Zone	Survey	1.2 km east	Pedestrian survey of the power station property as part of the background investigations for the Wallerawang Power Station management plan. Five new Aboriginal sites and six PADs were identified during survey. Sites 1-4 were rockshelters with deposit, while site 5 was an axe grinding groove site. All six PADS were recommended for test excavation by the consultants. Two previously identified sites were relocated (sites 6 and 7) and comprised of sparse artefact scatters. They were investigated previously as part of the EIS of a proposed Angus Place to Mount Piper Coal Conveyor (Rich 1985).	McIntyre 1989
E. Rich & A. Gorman	1992	Proposed Springvale Colliery & Conveyor, Wallerawang	Survey	Directly adjacent	Pedestrian survey was carried out on the proposed site of the Springvale Colliery & Conveyor at the pit top area, conveyor route and washer site. The area proposed for underground mining was also checked for further archaeological assessment. During survey consultants identified a total of nine open sites, two potential site locations, a shelter with PAD, and an isolated find. Of the open sites, site 2 had the largest number of visible artefacts; however, it has been disturbed by bulldozing and was suggested that only a small area may still be intact. The open sites had scatterings of artefacts and quartz but little	Rich & Gorman 1992

Consultant/Researcher	Year	Project	Investigation type	Location relative to the study area	Summary of investigation & results	Reference
					archaeological deposits. The PAD shelter was recommended for test excavation to determine its archaeological significance. The consultants reidentified two previously recorded sites and two PADs. The two sites had red and grey drawings, one of which also had an extensive occupation deposit with artefacts. The other site and PADs were expected to have similar deposits and were recommended for test excavation.	
H. Brayshaw	1993	Proposed open cut extension to Western Main Colliery	Survey	4.7km north	Pedestrian survey within the proposed open cut mine extension was undertaken to identify any sites of Aboriginal historical significance. At the time of survey, the area was predominantly woodland, well grassed with no rock surfaces suitable for engravings but with small exposures of sandstone. The upper layer of exposed soil was identified as a yellowish sandy loam. Three open sites were identified with a sparse scatter of quartz fragments noted in other areas. Western Main 1 was a sparse distribution of quartz artefacts but had been disturbed with vehicle tracks and bulldozed areas. Western Main 2 had a larger artefact density, was less disturbed but included a cleared area for transmission line construction. Western main 3 had sparsely distributed artefacts along a 200m strip that had been exposed by a bulldozer. Both sites 1 and 3 due to small assemblages and high disturbance were rated as having a low significance and no further assessment was recommended. Site 2 was also rated low due to high disturbance unless future subsurface testing was to indicate otherwise.	Brayshaw McDonald Pty Ltd 1993
E White & S. Lavelle	1996	Monitoring of Drainage works, Wallerawang Schoolhouse, Wallerawang	Monitoring Excavation	900m east	Archaeological monitoring of drainage works was undertaken to assist in the essential conservation of the sandstone schoolhouse. Three 50m wide trenches (Trench A-C) were excavated by backhoe and were between 20cm (Trench B) – 50cm (Trench A & C) deep. The soil profile consisted of an upper dark brown moist loam on top of an orange-coloured silty loam. Amongst the spoil, consultants noted small pebbles and cobbles. The trench spoils and walls were inspected for artefacts. During the monitoring, two Aboriginal flakes made of quartz and quartzite, and ten pieces of quartz were recovered. The quartz pieces have smooth glossy surfaces but may have occurred naturally. Consultants suggested that the	Environmental Services 1996

Consultant/Researcher	Year	Project	Investigation type	Location relative to the study area	Summary of investigation & results	Reference
					assemblage indicates the presence of a previously unreported Aboriginal site on the known Historic site. Due to the disturbances around the building, it is suggested that less disturbed deposits maybe found below the schoolhouse floor.	
J. Kelton	1998	Replacement of Lidsdale overbridge and Castlereagh Hwy realignment.	Survey	2.3km east	Pedestrian survey of proposed new alignment of Castlereagh Hwy associated with the removal of a low brick railway bridge overpass in Lidsdale. At the time of survey, there was no previously recorded sites on the National Parks and Wildlife Service (NPWS) database within 900 m of survey area. Consultant found no Aboriginal sites during survey which they attributed to a high level of surface disturbance from past rail/road construction and agricultural development, suggesting little or no potential to impact Aboriginal sites. Consultant did note a possible area of archaeological sensitivity south of the overbridge, on the eastern side of the highway, and recommended for further archaeological assessment of this area.	Central West Archaeological and Heritage Services 1998
J. Kelton	1999	Proposed Silicon Plant, Wallerawang	Survey	2.4km southeast	Pedestrian survey across a 30-hectare site for the proposed Silicon Plant located outside of Wallerawang, adjacent and west to the Castlereagh Hwy, and land adjoining the Wallerawang Electricity Station. No Aboriginal sites were identified by the consultant during the survey. This was attributed to a high level of surface disturbance from previous construction for road and rail, development of the electrical station, and agricultural history. The survey area had also been cleared of all native timber growth. The survey assessed the potential for subsurface deposits to be extremely low and did not recommend further archaeological assessment for Aboriginal sites.	Central West Archaeological and Heritage Services 1999
L. Gay	1999	Realignment of the Castlereagh Hwy	Survey	925m northeast	Pedestrian survey assessing area for Aboriginal archaeological sites at the proposed bridge replacement and along the four route options in the upgrade of Castlereagh Hwy. The area was located on the floodplains of the Coxs River and had been extensively cleared for grazing. An Aboriginal camp site was located at the southern end of the study area, 30m east of route option 3. Located on a rise above the floodplain, its	Heritage Search 1999

Consultant/Researcher	Year	Project	Investigation type	Location relative to the study area	Summary of investigation & results	Reference
					exposure has been connected to the construction of a drain and subjected to significant disturbance. Eight artefacts were recorded, made of grey chert, including a backed blade, six broken flakes, and a whole flake. Gay concluded that the cluster of artefacts may represent the remains of a knapping floor. A burial area was located 200m west of route option 3. No other Aboriginal sites were identified during the survey, and no Aboriginal archaeological constraints were determined along route options 1, 2, and 4.	
J.N Benton	2004	Proposed corridor for the Castlereagh Hwy	Salvage excavation + Monitoring Program	650m Northeast	Archaeological salvage excavation at site L2 which lay within the proposed corridor for the Castlereagh Hwy. Previous test excavation (Benton 2003) assessed L2 as being of high Aboriginal and archaeological significance. Three areas were excavated (Area I-III) one on the lower terrace and two on the upper terrace, previously designated as PAD 1 and PAD 2 respectfully during test excavation. A total of 124 pits (1x1m) were hand excavated and wet sieved across all three sites. A transect consisting of 10 pits joining Areas I and II was excavated as a relational transect. At the time of salvage, the entire excavation area had minor disturbance from vegetation clearance and was thickly grassed for grazing purposes with no evidence of ploughing. Soil profile of the area consisted of gradational yellow earths and yellow podzolic. Approximately 5,900 artefacts were recovered across all three areas. Quartz artefacts made up 57% of the assemblage, with 27% of artefacts being silicified tug, and the remaining 9% made of a variety of raw material including silcrete, quartzite and a single piece of yellow ochre. Artefact density varied across excavation areas with the highest densities occurring in Areas I (43 artefacts/m^2) and II (58 artefacts/m^2). A variety of artefact types were recovered including hammer stones, anvils, flake tools, backed artefacts, bipolar cores, and a variety of other retouched artefacts. Artefact frequencies varied between excavation areas. Backed artefacts were more common in Area II, hammers and anvils were more predominate in Area I, bipolar artefacts relatively more frequent in TI-II transect, and handheld cores were more frequent in Area III and TI-II transect.	OzArk 2004

Consultant/Researcher	Year	Project	Investigation type	Location relative to the study area	Summary of investigation & results	Reference
					Luminescence dating of Area I from soil samples at depths of 30cm and 45cm indicates elements have been buried for 6,700-8,100 and 12,500-14,500 years respectfully. During destruction of L2, the monitoring programme was to ensure any archaeological features would not be destroyed if missed during salvage excavation. All freshly exposed surfaces were inspected for relevant material. The only features noted during monitoring were burnt tree stumps. A few concentrations of artefacts were noted, with 441 artefacts retrieved for analysis.	
J. Benton	2006	Flood mitigation works and realignment of the Castlereagh Hwy	Survey	650m northeast	Pedestrian survey across three discrete areas including the proposed levee bank, an elevated track comprised of imported fill for the banks construction, and the location of proposed shoulder for the Castlereagh Hwy. This follows previous test excavations of the area by OzArk (OzArk 2003). All three areas were noted as being highly disturbed due to farming and previous Hwy construction. Consultants found no new sites or artefacts during survey. The closest previously recorded site (AHIMS #45-05-2527) was relocated to determine proximity to study area. The site was successfully identified and deemed outside of the area of impact from the proposal. No new artefacts were discovered at its location.	OzArk 2006
J. Benton & H. Kolkert	2010	Mt Piper Power Station ash replacement project, Mt Piper	Survey	2.8km northwest	Pedestrian survey across two proposed areas, Lamberts North and Lamberts South, for ash emplacement at the Mt Piper Power Station. Recommendations for two additional sites Neubecks Creek and Ivanhoe No. 4 were also requested. Previous archaeological surveys identified several Aboriginal sites in these two areas, all of which have been destroyed over time due to mining activities in the area. The survey aimed to identify the level of disturbance in the area and relocate two undestroyed sites. Lamberts North and Lamberts South at the time of survey were open cut pits causing extensive disturbance to the area and were devoid of any vegetation except along the area boundaries. No non-indigenous sites were identified during the survey. At the time of survey two previously recorded sites (AHIMS# 45-1-0218 and 45-01-0261) were protected under an Aboriginal CHMP during mining at Lamberts South; they were not revisited during survey. Consultants determined that the location of the sites	OzArk Environmental & Heritage Management 2010

Consultant/Researcher	Year	Project	Investigation type	Location relative to the study area	Summary of investigation & results	Reference
					appeared undisturbed and discussions with mine manager indicated that the sites were still intact and beyond current mining disturbances. The two sites were not expected to be affected by the proposed project and mitigation measures were recommended for continued protection. No new Aboriginal sites were located during the visit with little potential to discover any future sites due to the level of disturbance. A desktop assessment of the two other proposed sites, Neubecks Creek and Ivanhoe No 4 was also performed. Due to the existing evidence of Aboriginal occupation in these two areas, it was recommended that further assessment and survey be performed to ensure all sites were adequately documented.	
RPS	2012	Proposed upgrade to Lidsdale Siding rail loading facility, Lidsdale		Partially within	Pedestrian survey of the proposed site of upgrade for the Lidsdale Siding Rail Loading Facility. The study area was located north-west of Main Street, Wallerawang and is largely within existing area of activity involving coal loading. Consultants performed a desktop assessment, identifying multiple existing sites in the surrounding area, but no sites fell within the study area and would not be affected by the proposed works. The study area was separated into six survey units (SU1a-SU1f). In SU1a an artefact scatter (AHIMS# 45-01-2716) was located, identifying a total of 19 artefacts, the majority of which were complete flakes or broken flake fragments and two multi-platform cores. An isolated artefact (AHIMS# 45-01-2715), a silcrete single platform core with three negative flake scars was also located in this survey unit. Across SU1b three isolated finds (AHIMS# 45-01-2717, 45-01-2718 and 45-01-2719) were located and identified respectively as a complete flake of dark grey silcrete, distal fragment of marbled chert, and a quartz multi-platform core with two scars. The survey unit also encompassed an artefact scatter (AHIMS# 45-2-2539) with three complete flakes and a flake fragment. No new Aboriginal sites were identified in SU1c – SU1f as the area was highly disturbed due to heavy vehicle and railway use. Previous records suggested that AHIMS site # 45-01-0237 was located within SU1d but was not visitable to consultants during survey as a fence line prevented access. The artefact scatters from SU1a and SU1b	RPS (2012)

Consultant/Researcher	Year	Project	Investigation type	Location relative to the study area	Summary of investigation & results	Reference
					were assessed as having a low significance based on the relatively poor integrity of the sites. Consultants recommended all six Aboriginal sites for mitigation measures in the future.	
Biosis	2017	Decommissioning of Wallerawang Power Station, Wallerawang	Survey	1.2km east	Pedestrian survey of two study areas, the southern area consisted of the Wallerawang Power Plant and the northern area consisted of the Kerosene Vale Ash Repository, the Sawyers Swamp Creek Ash Dam, and the Lidsdale Cut. A previously recorded AHIMS site (#45-1-0211) was revisited by consultants to confirm site location lay outside the boundaries of the study area. Aboriginal artefacts were only recovered in the southern area including an isolated chert artefact (14.0 x 24.0 x 4.0 mm) in an area that showed evidence of heavy surface disturbances including lawn maintenance. Two possible archaeological sites were identified, one on the southern side of the Coxs River, the other on the western side. The consultant noted that both sites showed minimal disturbance in the way of vegetation clearing and recommended test excavation to determine scientific significance.	Biosis 2017
Biosis	2017	Rollout of National Broadband Network (NBN), Lidsdale and Wallerawang	Survey	Directly adjacent	A pedestrian survey was conducted within the towns of Lidsdale and Wallerawang due to the proposed rollout of the NBN program and to identify whether it will harm any Aboriginal objects. The entire study area was assessed as having a high disturbance level due to residential development including drainage and subsurface utilities. Of the 46 AHIMS registered sites identified by the consultant, 11 sites were identified to be within the study area. The sites were revisited during the survey whereby 9 sites were assessed as having no impact from the proposed works. Neither AHIMS #45-1-0048 (a burial and modified tree) or AHIMS #45-1-2718 (isolated artefact) were reidentified by the consultant, which was attributed to a highly disturbed context. A no-go zone was recommended to ensure site avoidance during construction. Inspection of Brays Lane identified an area containing eight artefacts consisting of seven grindstone fragments and one flaked glass electrical insulator. The consultant identified the site as a post contact Aboriginal site due to the combination of Aboriginal objects and historical relics and was identified as a no-go zone during	Biosis 2017

Consultant/Researcher	Year	Project	Investigation type	Location relative to the study area	Summary of investigation & results	Reference
					construction. At the time of report, the AHIMS site number designation was still pending, site was therefore named Brays Lane AS1.	
Navin Officer Heritage Consultants	2018	Proposed Western Coal Unloader, Piper Flats	Survey	3.4km West	Pedestrian survey across the area proposed for the Piper Flat rail loop and corridor for the proposed conveyor alignment. A loop had already been approved, but Energy Australia wanted to realign the loop. Within the study area seven PADs (WUC PAD1-7) and one isolated find (WCU 1) were located. All seven PADs were deemed to have moderate to high archaeological potential with low to moderate significance, meeting the requirements to conduct additional investigation. The isolated find was found 200m east of the conveyor at the base of a fallen tree, embedded in the soil. It was identified as a quartzite flakes considered to be of low significance. Previously recorded sites were revisited including two rockshelters (AHIMS# 45-01-0018 and 45-01-0075), an artefact scatter (AHISM# 45-01-0076), and a PAD (PAD 7, Mills 1998). The two rockshelters were outside of the study area and impact zone. The artefact scatter will be impacted by the coal unloading facility and rail loop but was assessed as having low significance. The PAD will be affected by the conveyor construction, but low site significance suggested that it does not meet the requirements for further investigation. The modified rail loop would impact four PADs (WCU PAD3-6) directly with a potential to impact WCU PAD7. Consultants determined that the proposed modified loop would impact less sites than the initially approved loop.	Navin Officer Heritage Consultants 2018

6.2.4 The Lidsdale Aboriginal burial site

While uncertainty over its exact location exists, available data sources point to the presence of an Aboriginal burial site outside of, but in close proximity to the study area. **Figure 12** shows two potential locations for the burial site in question, as reported by McIntrye (1993: 10, Fig. 4) and Gay (1999: 20, Fig. 4). AHIMS coordinates for the same site (45-1-0048) place it around 1.4 km to the south of the Site (refer to **Figure** 11). However, these coordinates appear to be incorrect, with existing sources supporting a location to the northeast of the study area, in association with the Coxs River.

The presence of an Aboriginal burial site at Lidsdale first came to light in 1993 when local Aboriginal and non-Aboriginal residents altered the NPWS and Pacific Power to the potential presence of Aboriginal burials in the vicinity of the Springvale to Mt Piper coal conveyor, then under construction. In response to this information, Pacific Power engaged archaeologist Sue McIntyre to investigate the purported burial site in more detail and to assess the likelihood of construction works intercepting Aboriginal skeletal remains. McIntyre's (1993) subsequent investigation involved a combination of desktop research, interviews with local residents and other relevant individuals, and a targeted test excavation program.

Based primarily on information provided by a Mrs Fay Hasler of Lithgow, who grew up in the Lidsdale area and had direct, personal knowledge of the site, McIntyre (1993: 12) concluded that an Aboriginal burial site was indeed present in the Lidsdale area, with the site roughly delineated "by the western edge of the railway easement, Duncan Street, approximately 200 m to the east of the deviated river, and a point approximately 200 m north of Duncan Street" (**Figure 13)**. While conclusive proof was lacking, McIntyre thought it likely that the burial ground reported by Mrs Hasler and others was the same as that indicated in an October 1880 illustration of the purported burial site of local Aboriginal elder King Myall (Myles) at Wallerawang, featured in the Sydney Illustrated News. Entitled "*Burial Place of the Last of the Native Kings at Wallerawang*", this illustration, reproduced in **Figure 14**, shows a man and women overlooking a burial mound with two accompanying carved trees.

As a precautionary measure, McIntyre (1993) excavated a series of test pits and auger holes in areas proposed for ground disturbance within the bounds of the burial site (as defined above) (see **Figure 13** for test pit and auger holes locations). No skeletal remains were intercepted as a result of the test excavations. However, the remains of a disturbed occupation site, represented by approximately 50 stone artefacts and a single hearth, was identified and subsequently registered as subsurface artefact scatter "Springvale Colliery" (45-1-0237).

Additional investigation of the burial site was undertaken as part of Gay's (1999) Indigenous heritage assessment for the realignment of the Castlereagh Highway at Lidsdale. As part of this assessment, McIntyre's primary informant, Mrs Fay Hasler, was re-interviewed by Gay and brought into the field to assist in defining its location. As reported by Gay (1999: 15-16):

> *The consultant, Richard Peters (Bathurst LALC) and Peter Hasler (Fay's son) were shown the approximate location of the burial area by Fay Hasler during field survey on 11 May 1999…Fay explained that the burial area took in the river flat either side of the current alignment of the Cox's River. She says that the colliery railway line was constructed through the middle of this rea in the 1920s. The realignment of the Cox's River in the 1950s would also have disturbed the area…Fay also showed the group the location on the hillside where and Aboriginal stone cairn used to be situated and the spot where two carved trees once stood.*
>
> *While in the field, Fay told the group what she knew of the Aboriginal burial area. Some of this information has been passed down to Fay from her father and grandfather while other aspects relate to her own experience. The quotes presented below are drawn from this field visit and a taped interview with Fay on the 19th March 1999.*
>
> *Fay informed the group that her grandfather Nolan lived in Lidsdale in the 1870s and witnessed the burial of at least one Aboriginal person in this area.*
>
> *"According to Grandfather Nolan this was the burial ground for the Aboriginal people in the area…He said that the area had always been an Aboriginal cemetery and everyone knew it".*
>
> *In the 1950s, Fay's father brought home an Aboriginal persons skull that had been washed out of the bank of the Cox's River.*

> *“Every time that we had really heavy rain, and it flooded, bones would run down the river…”*
>
> *“When we were children, because there was no super on the paddocks behind the house, we would pick big mushrooms. But mum would never allow us to pick mushrooms where the blackfellows cemetery was. It just wasn’t the right thing to do”.*

Fay also recalls that there used to be three carved trees located on the west side of the river and one on the east side of the river. Carved trees are traditionally associated with either burials or ceremonial grounds (NSW NPWS 1988: 24). The trees were destroyed by fire when the area was cleared in the 1950s.

> *“When I was a child the trees were lying on the ground just down from where we lived. We used to go down every Sunday and collect the wood and the bark for mum to set the copper for the next morning and the trees were on the ground and they were all carved. We’d run along when with a stick going up and down. My grandfather Nolan had said that when he was young the trees were still standing up…”*

As shown on **Figure 12**, Gay’s (1999) mapping of the burial site differs from McIntyre’s (1993), with the former placing the site further upstream. While acknowledging Fay Hasler as the source of Gay’s information, on the balance of available evidence, AECOM considers McIntyre’s (1993) original mapping of the site, which includes the purported locations of the carved trees recalled by Mrs Hasler, to be more accurate. If McIntyre’s mapping is accepted, at its closest point, the burial site is located around 155 m metres to the north of the current transmission line corridor.

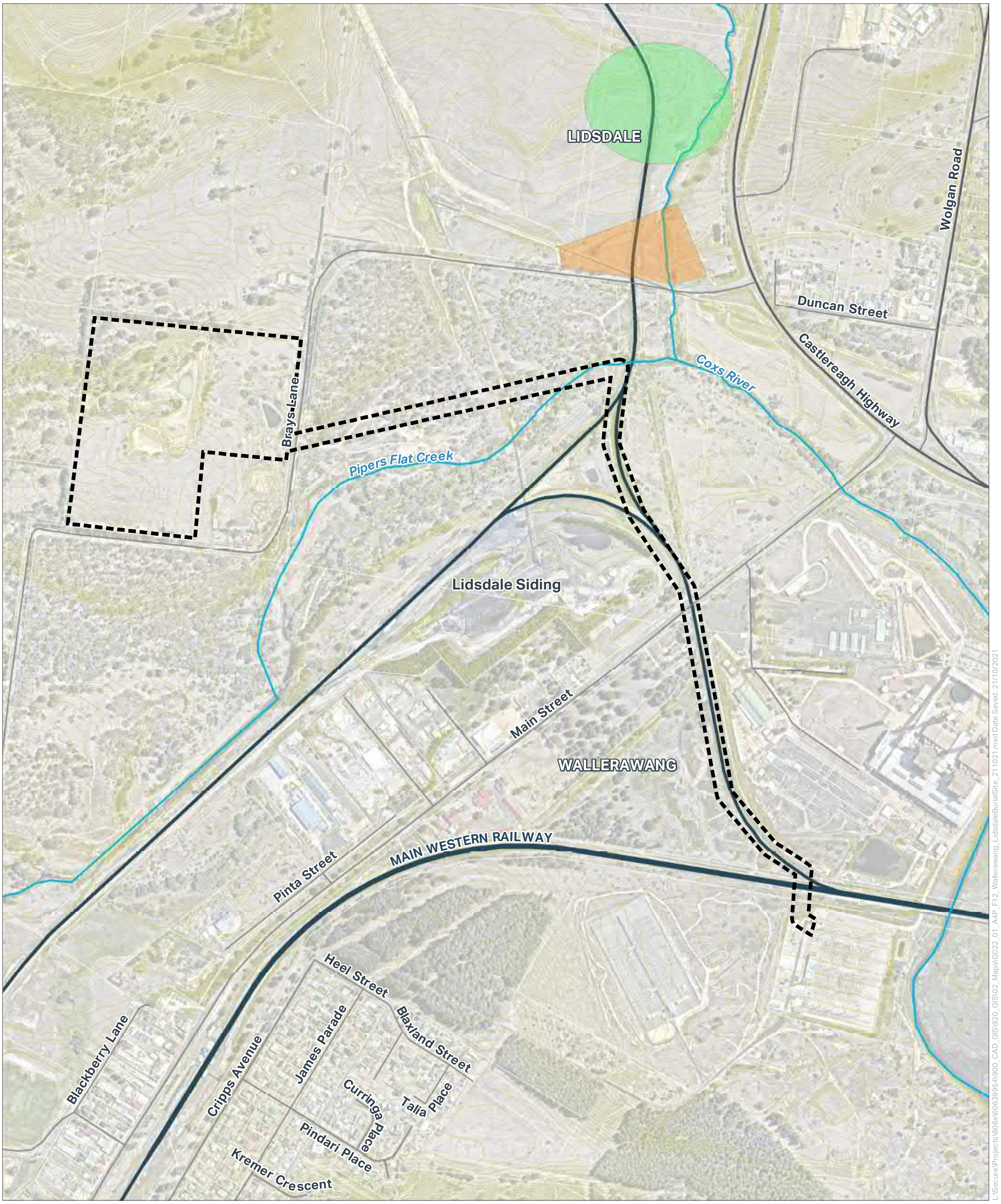


Figure 12
Lidsdale Burial Site

Legend
- Study Area
- Watercourse
- Railway
- Primary Road
- Local Road
- Contours

Name
- Gay (1999)
- McIntyre (1993)

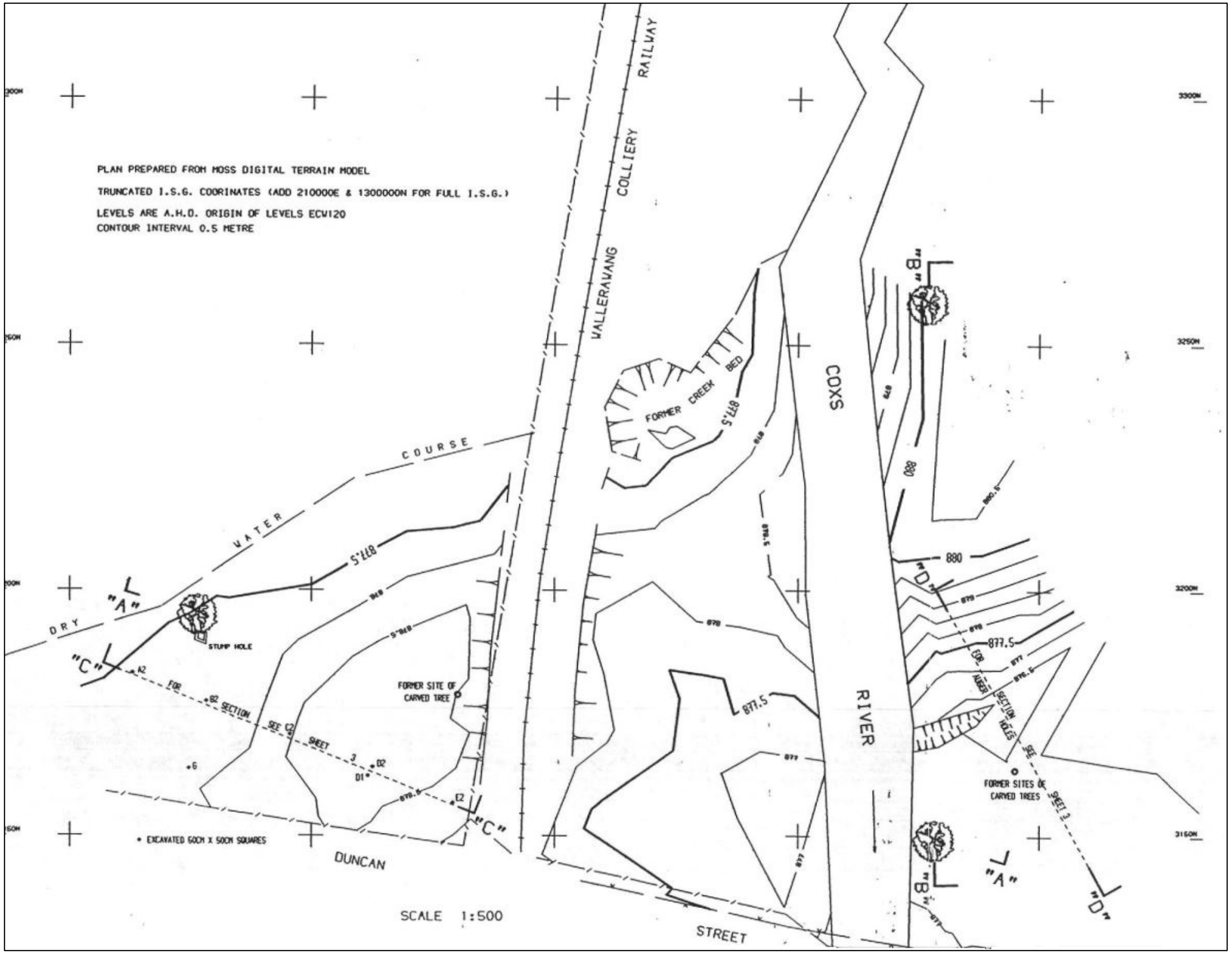


Figure 13 McIntyre's (1993) plan of Lidsdale Aboriginal burial site showing purported locations of carved trees (Source: McIntyre, 1993: 10, Fig. 4)

Figure 14 "Burial Place of the Last of the Native Kings at Wallerawang", Sydney Illustrated News, October 1880 (Source: Trove)

6.3 Key observations

Key observations to be drawn from a review of the local and regional archaeological context of the study area are as follows:

- Available radiometric dates indicate that Aboriginal people have occupied the Central Tablelands of NSW for *at least* 12,000 years. However, 'early' (i.e. late Pleistocene / early Holocene) occupational evidence remains scarce, with the overwhelming majority of sites identified to date likely of mid-to-late Holocene antiquity
- Existing AHIMs data indicate that open artefact sites are the most common site type in the greater Wallerawang-Lidsdale area. Other site types, such as rockshelters, scarred trees, PADs, grinding grooves and burials, have also been recorded but are comparatively rare
- Existing archaeological survey data for the "off-plateau" portions of the greater Wallerawang-Lidsdale area (i.e. areas outside of the elevated, dissected sandstone terrain of the Hawkesbury Sandstone unit) indicate a strong trend for the presence of open artefact sites along watercourses, specifically, on creek banks and 'flats' (i.e. flood/drainage plains), terraces and bordering lower slopes and rises
- Flaked stone artefacts dominate archaeological finds assemblages from recorded open artefact sites across the Central Tablelands, including the greater Wallerawang-Lidsdale area. Other stone artefacts, such as edge-ground hatchet heads, grindstones and hammerstones, have also been recorded, although comparatively infrequently, as have artefacts manufactured out of glass
- Unless severely disturbed through historical or contemporary land use activities, all landform elements within the greater Wallerawang-Lidsdale area retain potential for the presence of Aboriginal archaeological materials, albeit of highly variable character and extent
- Local archaeological datasets indicate that assemblage size and complexity tend to vary significantly in relation to stream order and landform, with larger, more complex assemblages concentrated on elevated, low gradient landform elements adjacent to higher order watercourses (e.g. the Coxs River)
- Artefacts manufactured out of quartz tend to dominate locally recorded flaked stone artefact assemblages. However, silicified tuff is also well represented.
- Locally recorded stone artefact assemblages suggest an emphasis on the exploitation of alluvial and/or colluvial gravel deposits
- Registered centroid coordinates for previously recorded Aboriginal sites within a 5 x 5 km area centred on the study area (AHIMS search area) place five sites within 200 m of the study area. However, a review of associated sites cards and reports indicates that all but one of these sites - artefact scatter SU1a-A5 (45-1-2716) - are located wholly outside of the study area
- Previously recorded artefact scatter SU1a-A5 (45-1-2716) is located partially within the study area
- While uncertainty over its exact location exists, available data sources point to the presence of an Aboriginal burial site outside of, but in close proximity to, the study area.

6.4 Archaeological predictions

Taking into account the landscape context of the study area (**Section 5.0)**, as well as the local and regional archaeological data reviewed in this chapter, the following predictions are made regarding the Aboriginal archaeological record of the study area:

1. Open artefact sites will be the dominant site type
2. Site types with *reasonable* potential to occur include scarred trees, stone quarries and grinding grooves
3. Site types with *limited* potential to occur include stone arrangements and burials

4. In view of the study area's proximity to the historical 'core' of Wallerawang, as well as the presence of post-contact glass artefacts in nearby artefact scatter Brays Lane AS1 (45-1-2799), there exists moderate to high potential for one or more open artefact sites within the study area to contain post-contact materials (e.g. flaked bottle glass and/or ceramics)
5. Subsurface artefact distribution within the study area will vary significantly in relation to landform, distance to water and stream order
6. Subsurface artefact density within the study area will be highest in the crest landform unit followed by the floodplain unit
7. Most, if not all, of the Aboriginal archaeological materials present within the study area will be of mid-to-late Holocene antiquity
8. Grinding groove sites, if present, will occur in direct association with mapped watercourses
9. Aboriginal burials, if present, will be located in floodplain contexts
10. The dominant raw material for flaked stone artefact production within the study area will be quartz, with silicified tuff the second most common material
11. Flaked stone assemblages will be dominated by flake debitage items (*sensu* Andrefsky 2005), with formed objects (i.e.., cores and retouched flakes) comparatively poorly represented
12. Knapping floors, if present, will exhibit evidence indicative of systematic backed artefact manufacture
13. Complete and/or fragmentary backed artefacts will dominate the retouched components of recorded flaked stone artefact assemblages
14. Tool types of demonstrated temporal significance, if present, will be limited to edge-ground hatchet heads and backed artefacts.

7.0 Ethnohistoric context

Section 6.0 summarised the archaeological context of the study area on both a regional and local scale. This section builds on this foundation by summarising relevant ethnohistoric information for the study area. As in other parts of New South Wales and Australia more broadly, non-Aboriginal people occupying the greater Blue Mountains and Central Tablelands regions began to document Aboriginal culture from first contact, with explorers, missionaries, settlers and the like recording their observations of Aboriginal people and/or their material culture in letters, journals and official reports. Many of these accounts are overtly Eurocentric in tone and the content and veracity of some is, at best, questionable. Nonetheless, taken together, they form an important source of information on Aboriginal lifeways during the contact period and can, in conjunction with available archaeological data, be used to generate working predictive models of prehistoric Aboriginal land use.

7.1 The greater Wallerawang-Lidsdale area

Reconstructing the social and territorial organisation of the Aboriginal groups occupying the greater Wallerawang-Lidsdale area around the time of European contact is difficult given both inconsistencies in available reference materials and the enormous social upheaval that accompanied permanent European settlement of this area.

As shown on **Figure 15**, Tindale's (1974) oft-cited tribal map places Wallerawang at the eastern extremity of Wiradjuri country, no more than a few kilometres west of the Wiradjuri's eastern boundary with the Darug speaking peoples of the Sydney and Blue Mountains regions. MacDonald (1983) likewise includes Wallerawang in Wiradjuri country, citing the eastern extent of Wiradjuri lands as occurring "within fifty kilometres of the Great Dividing Range". However, other sources (e.g. Bowdler, 1983; Smith, 1990) suggest that this area was, in fact, occupied by Gundungurra speaking peoples or, alternatively, comprised a 'zone of interaction' between the Wiradjuri, Gundungurra and Darug language groups. Smith (1990), in particular, has proposed that the Upper Coxs River region was occupied by a band of Gundungurra speakers known as the 'Wywandy'. According to Smith (1990: 2), the Wywandy were "headquartered" along Pipers Flat Creek but moved seasonally within their country and also made long distance journeys into other tribal territories. Smith (1990) cites but does not name a "late observer" who claimed that the Wywandy spent winters in the Hartley Valley and summers at Lidsdale. However, he also notes that it "just as likely that they spent some of the year in the caves along Piper's Flat Creek and part in the Wolgan Valley" (Smith, 1990: 2).

Smith's (1990) suggestion that the Wallerawang area was occupied by a group known as the Wywandy accords with the recollections of former Lidsdale resident Mrs Fay Hasler, a member of the Lithgow & District Family History Society whose family is said to have resided in the Lidsdale area for at least five generations. In a brief undated account of the Aboriginal history of the Wallerawang-Lidsdale area, published in the Lithgow Mercury and summarised by Kelton (1998), Mrs Hasler reports that the local Aboriginal group were known as the 'Wywandy tribe' and that this group travelled regularly over the mountains to undertake raids on Aboriginal groups living in the North Richmond area. According to Mrs Hasler, a large Aboriginal 'settlement' was located at Pipers Flat Creek and a burial ground at Lidsdale. Violent confrontations between the Wywandy and local White settlers, Mrs Hasler reports, took place around 1824, with several Wywandy either shot or taken prisoner. By the 1860s, Mrs Hasler describes the local Aboriginal population as having been ravaged by introduced diseases, with stories of massacres also abounding. Mrs Hasler states that, by the early 1900s, her mother could recall only three families of Aboriginal descent living in the Lidsdale district.

The first European to venture into Wallerawang area was James Blackman, who surveyed the first road from Bathurst to Wallerawang in 1820. Settlers soon followed, with James Walker taking up a 2000 acre land grant at Wallerawang in 1824. Walked named his station 'Wallerawang" (also spelt Wallerowong), a local Aboriginal word variously cited as meaning "water on rocks", "plenty of water" or "place near wood and water". In common with Andrew Brown of "Cooerwull", in nearby Lithgow, Walker is reported to have had an Aboriginal camp located around 500 m from his homestead (Smith, 1990: 4). According to Smith (1990:4), this camp was occupied until the late 1880s, with residing Aboriginal people both employed for casual work and given handouts. In addition to permanent European settlement, the year 1824 would also see acts of Aboriginal resistance occurring in the Bathurst area, to the west of Wallerawang, with Governor Brisbane declaring martial law over "all the country westward of Mt York".

As reported by Smith (1990: 4), while the Aboriginal occupants of the Upper Coxs River valley are unlikely to have taken part in the hostilities around Bathurst, they were nonetheless “subject to the arbitrary reprisals of groups of soldiers patrolling the country enforcing Brisbane’s objective of keeping them “in a constant state of alarm””.

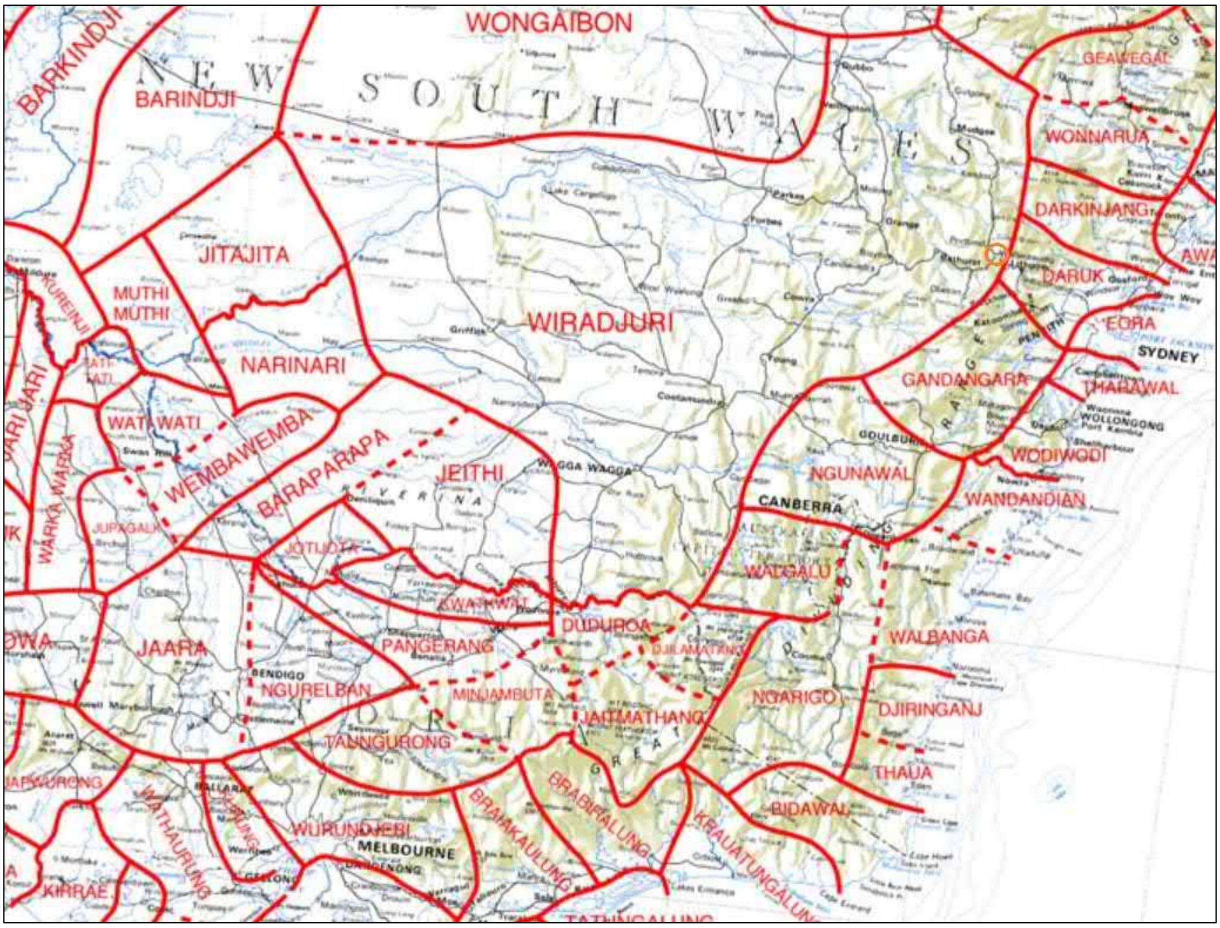


Figure 15 Excerpt from Tindale’s (1974) tribal map with location of Wallerawang marked by orange circle

As in other parts of NSW, available sources suggest that, alongside frontier violence, introduced diseases and products, as well as a reduction in natural game numbers, were responsible for a substantial decline in the local Aboriginal population. In August 1831, Aboriginal people travelling into the Wallerawang area from the Lachlan River reportedly brought with them smallpox, with early Lithgow settler Andrew Brown commenting that “[s]ome of the Wallerawang blacks…had fled to Emu Plains to escape infection; three of the number having afterwards returned were seized with it” (Brown in Smith, 1990: 5). Shortly thereafter, in 1836, famed British naturalist Charles Darwin would make his excursion to Bathurst, visiting Wallerawang in the process. Of the Aboriginal population of the areas he passed through, Darwin would write:

> *“The number of Aborigines is rapidly decreasing...This decrease, no doubt, must be partly owing to the introduction of spirits, to European diseases (even the milder ones of which, as the measles, prove very destructive), and to the gradual extinction of the wild animals...wherever the European has trod, death seems to pursue the aboriginal'* (Darwin, 1839: 230 in Johnson, 1979: 13).

Although they must be interpreted with caution for a variety of reasons, blanket lists or returns for Hartley for the years 1838 to 1842, do suggest a significant decline in the local Aboriginal population over time, with 82 individuals recorded in 1838 and only 42 in 1842. Viewed holistically, Smith’s (1990) estimates of Aboriginal numbers in the Upper Coxs region between 1827 and 1895 (**Table 18**) are similarly suggestive.

Despite the enormous social upheaval that accompanied European settlement of the area, traditional ceremonial activities continued to take place. In an unpublished diary entry, for example, Miss Jane Piper (1831-1904) describes an initiation ceremony at Wallerawang in the 1840s:

> *Sometime in the forties there was a meeting of several tribes near Wallerawang. They remained a month there and seemed to be performing mystic rites. Sentinels were places around the camp to guard against intrusion. On going to the camp after the blacks had left, several large rings had been found to have been formed in the earth, at intervals in these rings quaint day figures were placed, in front of these (it was five feet high) there were traces of fires having been made. These figures wore hideous to look at. The blacks who were questioned about the affair refused to reveal anything but it was supposed that the meeting had to do with their religion* (Piper in Smith, 1990: 7)

Gemmell-Smith (2018: 149) notes that corroborees attended by Aboriginal groups "from west and from Hartley" were still being performed in the 1860s at the Joolundoo waterhole on the Duckmaloi River, south of Oberon.

As reported by Mrs Hasler, available sources indicate that the Aboriginal occupants of the Wallerawang area, referred to by some early observers as the "Piper's Flat blacks" or "Piper's Flat tribe", would carry out long distance raids on the 'Belmont tribe' at North Richmond[16], on the banks of the Hawkesbury-Nepean River, ostensibly to capture women. Samuel Broughton, writing in 1903 under the nom-de-plume of Cooramill, describes how one of these raids in 1823 was noticed by Archibald Bell, and ultimately resulted in the opening of the Bells Line of Road:

> *As I before stated, it was through the last battle between the Belmont and Piper's Flat blacks the road was opened. It appears the latter were victorious, and carried away six of the Belmont gins, and in about six days one of the gins returned alone, but from a different direction than by the way she was taken off; and when questioned as to how she came back, she pointed to the Big Hill (Kurrajong Heights), saying, "that feller." This event caused some surprise, not only to the Bells, but to the blacks also, as it was thought there was no other way of getting over the mountains than by Springwood. Mr. Bell, after a little term, organised a party, taking the gin with them, and blazed a track through to what is now Lithgow, for which Mr. Bell was amply rewarded by the authorities. Hence Bell's line of road* (Boughton, 1903).

According to Smith (1990: 6), it was not until 1897 that the name of a member of the Wywandy band was published, occurring in Queensland pioneer and pastoralist Thomas Archer's "Recollections of a Rambling Life". Reminiscing about his time at Wallerawang, Archer makes mention of the role of a local Aboriginal man, "old Miles", in the capture of the bushranger Lambert in 1839. Described as "a native black head of the Wallerawang tribe", My-ill, or Myall, commonly spelt as Myles by early European observers, is said to have been born about 1781. By the late 1830s, Myall and his family were residing at Walker's Wallerawang property and are listed on the 1838 to 1842 Hartley blanket lists (Smith, 1990: 6). Myall had two sons, Jemmy (Aboriginal name: Abai) and Jackie (Aboriginal name: Bundar), and two daughters, Nelly and Jenny. Thomas Walker, son of James Walker, is known to have had a king breast plate made for Myall. A surviving breast plate for Jemmy, born around 1819, reads: "Jemmy Myles - Prince of the Wywandy". Myall died in 1848, aged about 66, with an engraving of his reputed burial place in Wallerawang later appearing in the Illustrated Sydney News (see **Figure 14** and **Section 6.2.4**). Notably, Myles daughter Nelly would marry an Aboriginal man known as Bobby, who died in 1856 and was commemorated by the Walker family through the placement of tombstone in their private family cemetery. Bobby's tombstone, comprising a slab of dressed sandstone four inches thick, four feet high and two feet wide, reads:

Erected by

Archibald James Walker

In memory of BOBBY and the WALLEROWONG ABORIGINE

TRIBE

May 4, 1856

---

[16] Smith (1990: 3) identifies this 'tribe' as the Booreberongal band of the Darug language group

Following Bobby's and her father's deaths, Nelly is known to have moved to James Murray's property "Warrawong", near Yetholme, and to have worked there as domestic servant. Murray's diary for 1846-1850 is somewhat unique in providing insight into Nelly's life at "Warrawong" and, more broadly, the lives of Aboriginal people working on the early pastoral properties of the district. Nelly's jobs at Warrawong, for example, included "weeding the shallots", shooting possums, cutting and carrying firewood, "heeling up potatoes", washing up, sweeping, collection "baking bark", carrying water, "wheeling dung", cleaning wheat", looking after "Spot the cow", "cleaning out the room", "washing sheets at the well", "cutting down a tree", "cleaning the guts" and taking out the sheep.

An 1888 report in the Town and Country Journal suggests that, by late 1880s, the district's Aboriginal population had all but stopped collecting blankets:

> *"GOVERNMENT MANAGEMENT. - A bale of blankets supplied by the Government for the Aboriginals of Hartley district is now lying at the courthouse, Lithgow, waiting to be claimed by the original inhabitants of New South Wales. These blankets will possibly remain there a good while, as only a very few Aboriginals are now in this district; and those who are here, I think, are too proud to take Government assistance in any way. A little while ago the Hartley district had a tribe of blacks; but they are all gone. When they departed the blankets came". (Australian Town and Country Journal, 30 June 1888: 16)*

Taken at face value, this report suggests, at best, a drastic reduction in the Aboriginal population of the district and, at worst, their 'extinction'. However, as Smith (1990: 8) notes, any suggestion that district's Aboriginal population had died off by this period is unwarranted. According to Smith (1990: 8), between 1882 and 1887, the majority of Aboriginal families and individuals from the district had moved into the Megalong Valley, with others moving west for work or marrying into European families. Nonetheless, as Smith (1990: 9) also notes, after 1895, there appears to have been no Aboriginal families associated with Lithgow itself, their descendants by then living in camps throughout the Kanimbla and Megalong Valleys.

Today, many Aboriginal people with cultural connections to the greater Wallerawang-Lidsdale area are actively involved in the protection and promotion of their culture for future generations.

Table 18 Smith's (1990) estimates of post-contact Aboriginal numbers in the Upper Coxs region

Year	Number of individuals	Location
1827	60	Coxs River
1838	82	Hartley
1839	45	Hartley
1841	53	Hartley
1842	42	Hartley
1846	20	Hartley
1848	22	Vale of Clywdd
1858	12	Hartley
1859	6	Hartley
1860	6	Hartley
1861	12	Hartley
1876	24	Hartley
1880	30	Hartley
1882	49	Hartley
1887	3+	Hartley Vale
1889	8	Hartley Vale
1890	9	Hartley Vale

Year	Number of individuals	Location
1891	7	Hartley Vale
1892	15	Hartley Vale
1893	17	Hartley Vale
1894	17	Hartley Vale
1895	16	Hartley Vale

8.0 Archaeological survey & test excavation

8.1 Archaeological survey

8.1.1 Aims, objectives and survey strategy

The overarching aim of the archaeological survey undertaken for this assessment was to identify and record any existing surface evidence of past Aboriginal occupation within the study area. Specific, nested objectives, meanwhile, were as follows:

- To re-locate and reassess previously recorded artefact scatter SU1a-A5 (45-1-2716)
- To ground-truth levels of past ground disturbance across the study area
- To identify areas of subsurface Aboriginal archaeological sensitivity (if present).

As per the draft methodology issued to RAPs in February 2021, a full coverage survey strategy was adopted for the current survey. Ultimately, with the exception of areas of severely disturbed terrain within the fenced Lidsdale Siding facility and existing TransGrid Wallerawang 330 kV substation, all landform elements within the study area were subject to survey.

8.1.2 Field team and methods

Survey of the study area was undertaken on 16 June 2021, with the survey team as per **Table 19**. All survey was conducted on foot, with a total of seven transects completed over the course of the survey. As indicated above, all landforms elements, excluding areas of severely disturbed terrain within the fenced Lidsdale Siding facility and existing TransGrid Wallerawang 330 kV substation, were subject to survey, with particular attention paid to areas of higher Ground Surface Visibility (GSV) therein. All survey within rail corridor land to the east of Brays Lane was undertaken under the supervision of a rail protection officer in accordance with a Minor Activity Works Licence (000723) issued to Neoen by John Holland Rail Pty Ltd (JHR) on behalf of the Transport Asset Holding Entity of New South Wales.

All mature trees encountered during the survey were inspected for cultural scarring. The location of each transect completed during survey, including start and end points, was recorded using a handheld differential GPS unit, with associated transect data (e.g. levels of visibility and exposure) entered directly into the same unit upon the completion of each transect.

All Aboriginal archaeological sites identified during the survey were recorded in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*. For each site located or re-visited, individual artefact locations were captured by differential GPS. Attribute data for all identified Aboriginal objects were entered directly into a GPS unit using AECOM's standard digital open site recording form. All sites were comprehensively photographed following recording.

Table 19 Survey team

Organisation	Representative	Position
AECOM	Andrew McLaren	Archaeologist
AECOM	Geordie Oakes	Archaeologist
Didgee Ngunawal Clan	Paul Boyd	Site officer
Corroboree Aboriginal Corporation	Steve Johnson	Site officer
Muragadi	Courtney Taylor	Site officer
Murrabidgee Mullangari	Gareth Conyard	Site officer

8.1.3 Results

8.1.4 Survey coverage and effective coverage

As indicated in **Section 8.1.2** and shown on **Figure** 16, a total of seven pedestrian transects were completed over the course of the survey. Recorded transect data indicate that a total survey coverage of approximately 14.9 ha was achieved. Excluding those portions of transects located outside of the study area provides a revised survey coverage of 11.7 ha, representing around 64.3% of the study area. A breakdown of survey coverage by landform is provided in **Table 20**.

Effective coverage is an estimate of the area in which archaeological materials are 'detectable'. Calculation of the total effective coverage obtained for the survey indicates that approximately 1.9 ha of the study area was effectively surveyed for Aboriginal archaeological materials. This equates to around 10.4% of the study area and 16.2% of the total area surveyed within this area (i.e. 11.7 ha).

Tabulated estimates of the effective coverage achieved for each of the seven pedestrian transects completed during the survey are provided in **Table 21**. In general, GSV within the Site was very poor due to extensive grass cover (**Plate 1** and **Plate 2**). Nonethless, several areas of enhanced visibility were encountered in this portion of the study area, the most significant of which were associated with dam construction (**Plate 3**) and hillslope erosion (**Plate 4**). East of the Brays Lane, GSV within the transmission line corridor was, in common with the Site, generally poor due to existing vegetation growth (**Plate 5**). Of the areas of enhanced GSV noted in this portion of the study area, the most significant comprised vehicle tracks (**Plate 6**).

Consideration of levels of effective survey coverage by landform (**Table 22**) shows that effective coverage was highest within the disturbed landform unit (0.67 ha), followed by the slope (0.62 ha), crest (0.34 ha), floodplain (0.21 ha) and drainage depression (0.05 ha) units. Landform-based artefact counts do not accord with these data, with the slope, crest and floodplain units exhibiting comparable frequencies. No artefacts were identified within the disturbed or drainage depression landform units.

Table 20 Survey coverage by landform (study area only)

Landform unit	Area (ha)	%
Crest	2.1	17.5
Slope	4	34.3
Drainage depression	0.8	6.7
Floodplain	1.2	10.1
Disturbed	3.7	31.5
Total	**11.7**	**100**

Table 21 Survey coverage data for individual transects

Transect Id	Landform unit(s)[1]	Length (m)	Survey unit area (m²)	Visibility (%)	Exposure (%)	Effective coverage area (m²)	Effective coverage (%)
01	1,2,3 & 5	447	18,363	60	10	1102	6
02	1,2,3 & 5	407	17,495	40	5	350	2
03	1,2 & 5	551	22,665	90	40	8159	36
04	1,2,3 & 5	666	27,215	90	20	4899	18
05	2,4 & 5	805	32,984	90	20	5937	18
06	2	133	1,398	40	40	224	16

Transect Id	Landform unit(s)[1]	Length (m)	Survey unit area (m²)	Visibility (%)	Exposure (%)	Effective coverage area (m²)	Effective coverage (%)
07	2 & 5	693	28,693	50	20	2869	10

[1]Landform key: 1 = Crest; 2 = Disturbed; 3 = Drainage depression; 4 = Floodplain; 5 = Slope

Table 22 Effective coverage by landform unit with surface artefact counts

Landform unit	Effective coverage (ha)	% of total effective coverage	Number of surface artefacts[1]	% of total artefacts
Disturbed	0.67	35.4	-	-
Slope	0.62	32.6	11	37.9
Crest	0.34	18.2	8	27.6
Floodplain	0.21	11.2	10	34.5
Drainage depression	0.05	2.6	-	-
Total	**1.9**	**100**	**29**	**100**

[1]Study area only (n = 29)

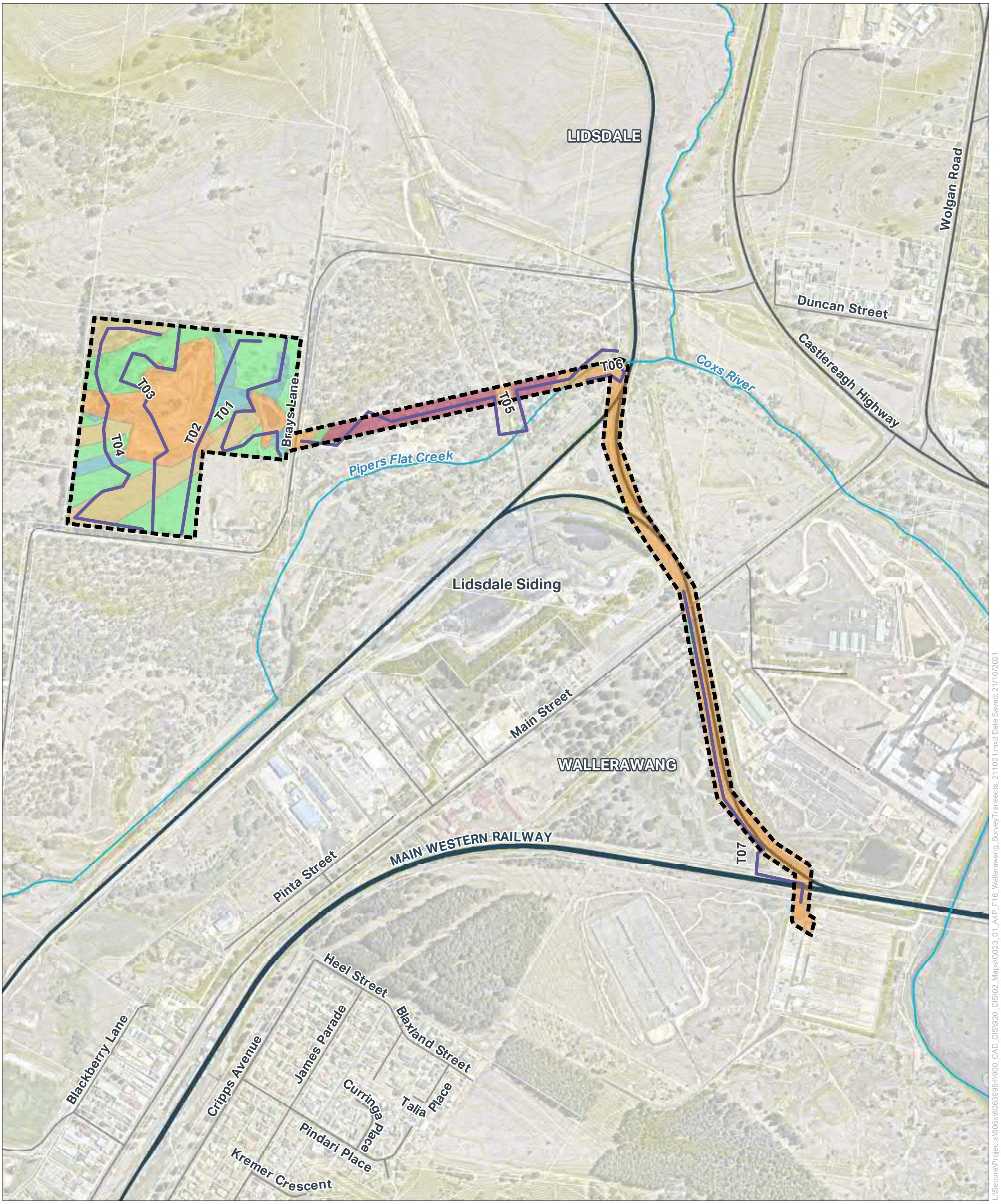


Figure 16
Survey Transects

Legend
- Study Area
- Watercourse
- Railway
- Primary Road
- Local Road
- Contours
- Survey Transects

Landform Units
- Crest
- Disturbed
- Drainage depression
- Floodplain
- Slope

AECOM

Plate 1 View across easternmost portion of the Site, Transect #1. Note very poor GSV due to grass growth.

Plate 2 View south across the Site, Transect #2. Note very poor GSV due to grass growth.

Plate 3 View across the largest of the farm dams within the Site, Transect #3. Note areas of enhanced GSV on sections of bank and basin.

Plate 4 View west across erosion exposure adjacent to southern boundary of the Site. Note excellent GSV within exposure.

Plate 5 View across heavily vegetated section of right bank floodplain of Pipers Flat Creek (Transect #5), with rutted vehicle track in foreground. Note enhanced GSV on track.

Plate 6 View across section of vehicle track (Transect #5) with excellent GSV.

8.1.5 Aboriginal sites

Two Aboriginal archaeological sites, consisting of previously identified artefact scatter SU1a-A5 (45-1-2716) and a new stone quarry site (GWB-STQ1-21, 45-1-2853), were identified during survey. Descriptions of each site are provided below, with site locations shown on Figure **17**. Attribute data for individual stone artefacts within each site is provided in **Appendix L**.

8.1.5.1 SU1a-A5 (45-1-2716)

Site type: Artefact scatter **GPS coordinates:** GDA Zone 56 227602E 6300856N

Date recorded: 16 June 2021 **1:25,000 topographic map:** Lithgow 8931-3S

Site area: 2,373 m^2 **Landform unit(s):** Slope & Floodplain

Vegetation: Cleared (formerly Tableland Hollows Black Gum-Black Sally Open Forest)

Slope: Gently to very gently inclined **GSV (%):** 30-90% **Ground Integrity:** Low

Disturbance factors: Native vegetation clearance, vehicle track construction/use, erosion

Distance to nearest mapped watercourse (name, order): *c.*25 m (unnamed, 2nd order)

Site description:

Artefact scatter SU1a-A5 (45-1-2716) was first identified by RPS (2012) as part of archaeological survey undertaken for the Lidsdale Siding Project. At that time, a total of 19 stone artefacts were identified on a north-easterly trending vehicle track to the east of Brays Lane. Artefacts were identified across an area measuring approximately 120 m (east-west) by 20 m (north-south) and consisted primarily of flake debitage items (n = 15, 78.9%), with quartz (n = 12, 63.2%) the dominant raw material. Formed objects were limited to two multidirectional cores, one manufactured out of ‘mudstone’ (likely silicified tuff) and the other chalcedony.

During the current survey, a total of ten stone artefacts were identified on and immediately adjacent to the vehicle track surveyed by RPS, with artefacts restricted topographically to the floodplain of Pipers Flat Creek (**Plate 7** and **Plate 8**). Artefacts identified during survey were clustered towards the northern end of the site, as mapped by RPS (2012). Consistent with RPS’s (2012) observations, recorded artefacts were primarily manufactured out of quartz (n = 7, 70%), with one quartzite and two silicified tuff artefacts also represented. No silcrete or chalcedony artefacts were observed (cf. RPS, 2012: 85-86). Artefact types recorded during the current survey included four flake shatter fragments, one complete flake, two proximal flakes (**Plate 10**), one split flake, a multidirectional quartz core and a unidirectional silicified tuff core made on a flake (**Plate 9**).

GSV on the vehicle track on which SU1a-A5 is located currently ranges from *c.*30% to 90%. Reference to RPS’s 2012 photographs of SU1a-A5 (**Plate 11** and **Plate 12**) suggest that the reduction in artefact numbers between RPS’s survey and the current survey can be attributed to differing GSV conditions, with GSV on the track in 2012 appearing uniformly excellent. Today, parts of the track have substantially revegetated, with grass cover obscuring the ground surface (**Plate 8**).

Plate 7 View across central and northern extent of artefact scatter SU1a-A5 (45-1-2716), looking southwest.

Plate 8 View across southern extent of artefact scatter SU1a-A5 (45-1-2716), looking southwest

Plate 9 SU1a-A5: unidirectional silicified tuff core made on flake

Plate 10 SU1a-A5: proximal quartz flakes

Plate 11 View across southernmost extent of SU1a-A5 in 2012. Note excellent GSV on vehicle track (from RPS, 2012: 59, Plate 24)

Plate 12 View across SU1a-A5 in 2012. Note excellent GSV on vehicle track (from RPS, 2012: 59, Plate 25)

8.1.5.2 GWB-STQ1-21

Site type: Stone quarry **GPS coordinates:** GDA Zone 56 227149E 6300684N

Date recorded: 16 June 2021 **1:25,000 topographic map:** Lithgow 8931-3S

Site area: 1,395 m^2 **Landform unit(s):** Crest & Slope

Vegetation: Cleared (formerly Coxs Permian Red Stringybark-Brittle Gum Woodland)

Slope: Gently inclined **GSV (%):** 90% (in exposures) **Ground Integrity:** Low to moderate

Disturbance factors: Native vegetation clearance, erosion

Distance to nearest mapped watercourse (name, order): *c.*100 m (unnamed, 1^{st} order)

Site description:

GWB-AS1-21 consists of a scatter of flaked stone artefacts in association with naturally occurring pebbles/cobbles derived from the Early Permian Shoalhaven Group. Artefacts and unmodified quartz pebbles/cobbles occur in a series of erosion exposures running along part of the southern boundary of Lot 4 DP751651 (**Plate 13**). Topographically, the site is situated on the crest and upper eastern flank of a locally prominent, northeasterly trending ridgeline bordered to the west and north by two ephemeral, unnamed drainage lines. A total of 58 artefacts were identified during the current survey, with the majority clustered in the westernmost portion of the site, in an area measuring approximately 30 m (east-west) by 10 m (north-south). In this portion of the site, the maximum observed density was five artefacts per m^2. GSV in extant exposures is excellent but poor to very poor outside of them.

Quartz was the dominant raw material overall (n = 41, 70.7%), with other minor lithologies comprising silicified tuff (n = 13, 22.4%) and quartzite (n = 4, 6.9%). Material procured on site appears to have consisted predominantly, if not exclusively, of quartz. Artefacts manufactured out of silicified tuff have been imported from elsewhere. Complete unmodified quartz clasts (n = 12) noted during survey exhibited an average maximum linear dimension of 50.8±17.9 mm. Recorded artefacts, the majority of which comprised items of flake debitage, comprised 17 complete flakes (including one redirecting flake) (**Plate 14**), 11 proximal flakes, seven flake shatter fragments, eight angular shatter fragments, nine multidirectional cores (**Plate 15**, **Plate 16** and **Plate 17**), two unidirectional cores, one core fragment, two backed artefacts (**Plate 17**) and a single hammerstone (**Plate 18**). All complete cores were manufactured out of quartz and were, in general, quite large, exhibiting an average maximum linear dimension of 65±29.5 mm (range: 26.5-118 mm). Recorded backed artefacts, both of which were manufactured out of silicified tuff, consisted of a near-complete geometric microlith and a complete Bondi point (**Plate 17**).

8.1.6 Areas of subsurface archaeological sensitivity

In addition to the surface sites described above, three areas of subsurface archaeological sensitivity were identified during survey, two within the transmission line corridor and one within the Site (**Figure** 18). Designated in the field as 'ASAS-1', 'ASAS-2' and 'ASAS-3', these areas were assessed by the survey team as retaining moderate to high potential for the presence of subsurface archaeological deposits, albeit of variable character, extent and integrity. Assessments of subsurface sensitivity were made, in part, on the basis of observed surface archaeology but also the results of AECOM's desktop review of existing archaeological and environmental data for the study area, which were discussed in-field by the survey team.

As shown on **Figure 18**, ASAS1 incorporated the crest and upper flanks of the main low gradient ridgeline within the Site, while ASAS-2 and ASAS-3 encompassed sections of the left bank floodplain of Pipers Flat Creek[17]. Those portions of sites GWB-STQ1-21 and SU1a-A5 located within the study area fell within ASAS-1 and ASAS-2 respectively.

[17] Note that, consistent with the landform mapping provided in **Figure 18**, field observations confirmed that a small section of slope was present at the westernmost extremity of ASAS-2.

Plate 13 View across newly identified artefact scatter GWB-STQ1-21, facing east.

Plate 14 GWB-STQ1-21: complete silicified tuff flakes

Plate 15 GWB-STQ1-21: complete multidirectional quartz core

Plate 16 GWB-STQ1-21: multidirectional quartz core (top) and complete quartz flakes (bottom)

Plate 17 GWB-STQ1-21: silicified tuff backed artefacts. Near complete geometric microlith (left) and complete Bondi point (right).

Plate 18 GWB-STQ1-21: complete quartzite(?) hammerstone. Inset shows pitting on one end.

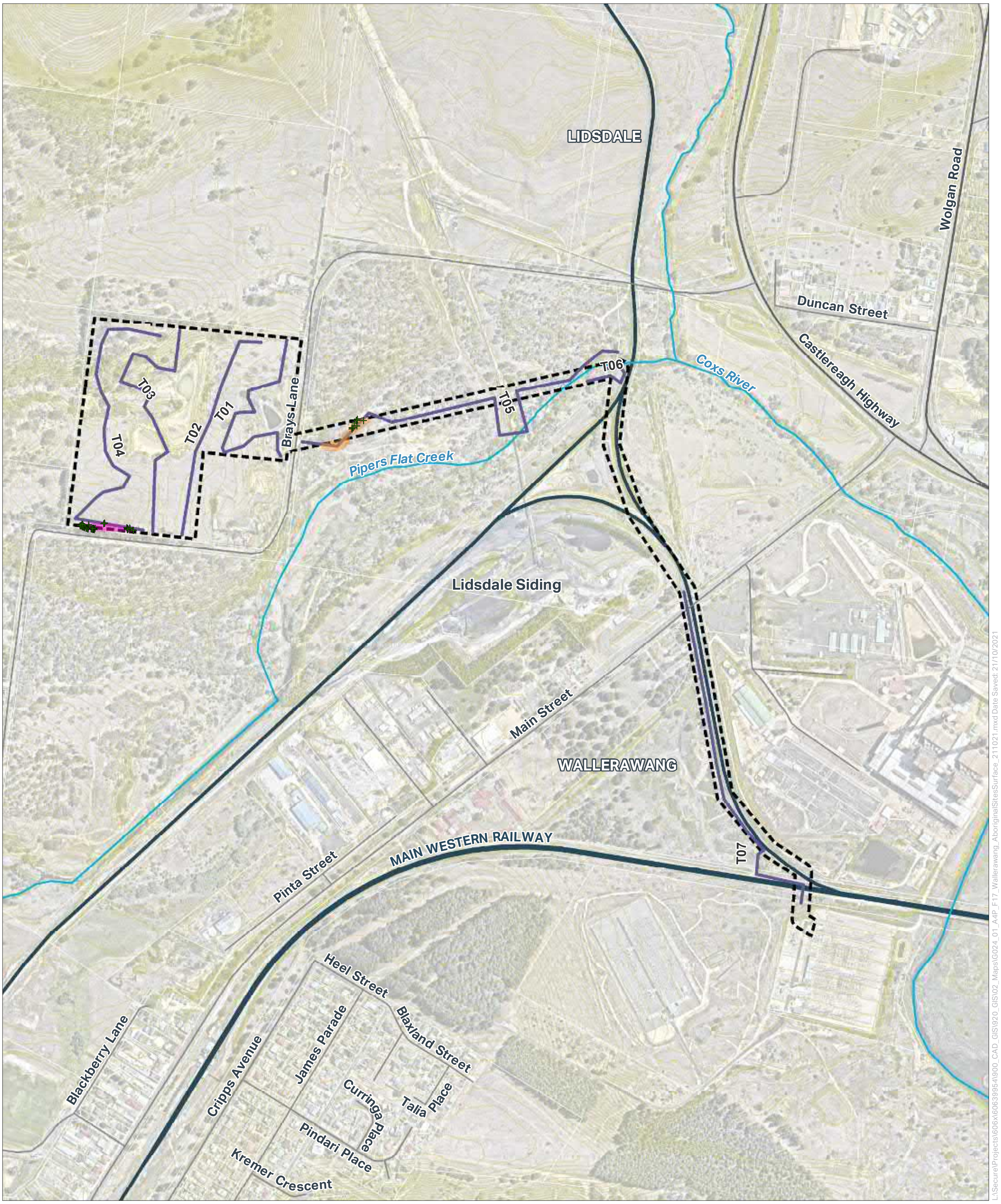


Figure 17
Aboriginal Sites (Surface)

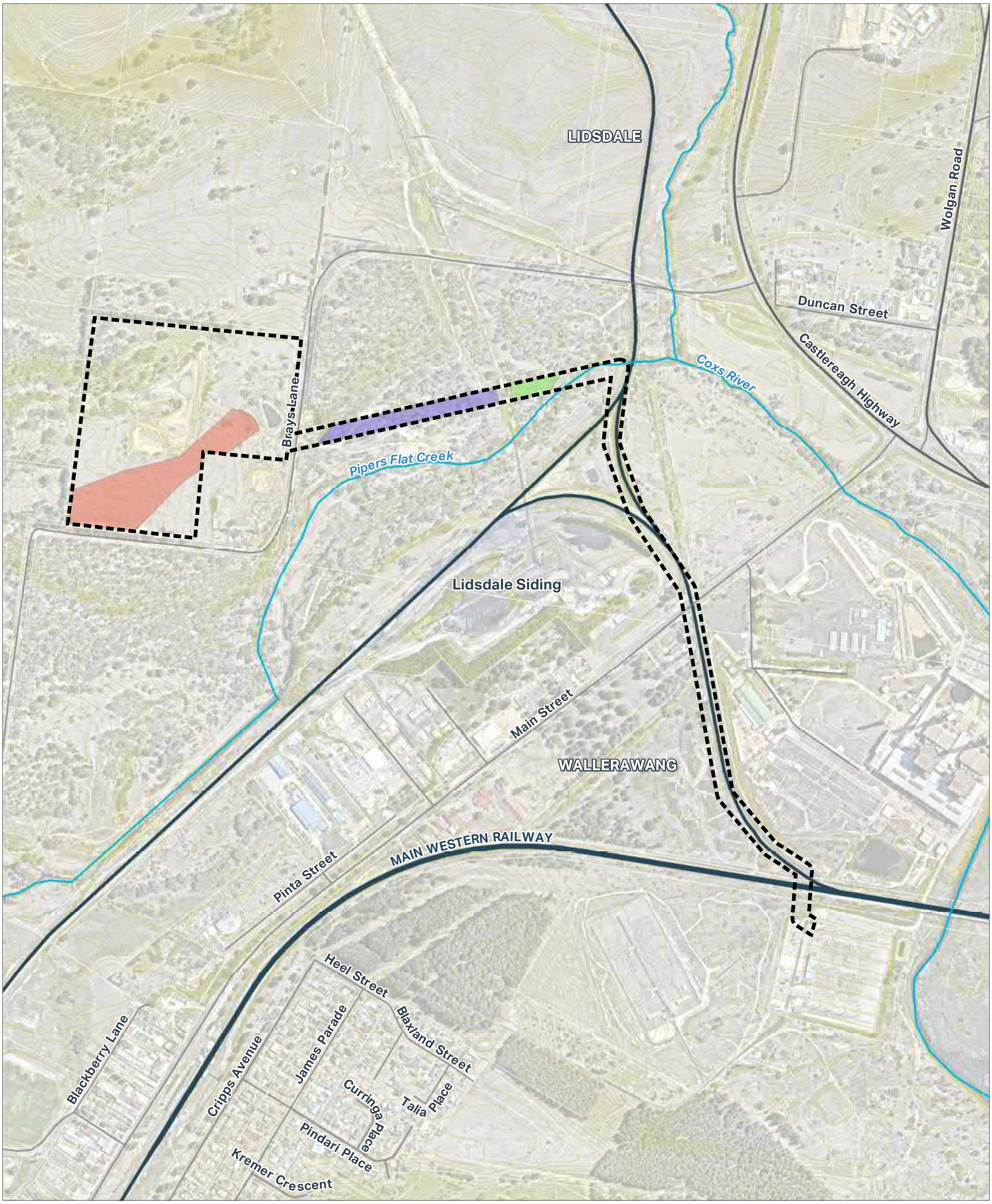
N

0 200 400 m

AECOM

Legend
- Study Area
- Watercourse
- Railway
- Primary Road
- Local Road
- Survey Transects
- Contours
- + Stone Artefacts

Aboriginal Sites
- GWB-STQ1-21
- SU1a-A5



L:\Secure\Projects\606x\60639954\900_CAD_GIS\920_GIS\02_Maps\G025_01_A4P_F18_Wallerawang_SubsurfaceArchaeologicalSensitivity_211021.mxd Date Saved: 22/10/2021

Figure 18
Areas of Subsurface Archaeological Sensitivity

N 0 200 400 m

AECOM

Legend
- Study Area
- Watercourse
- Railway
- Primary Road
- Local Road
- Contours

Areas of Sensitivity
- ASAS-1
- ASAS-2
- ASAS-3

8.2 Test Excavation

8.2.1 Purpose, sampling strategy and methods

As per Requirement 14 of the Code of Practice, the overarching aim of the test excavation program undertaken for the current assessment was to collect information about the nature and extent of any subsurface Aboriginal objects present within the three areas of subsurface archaeological sensitivity identified within the study area, designated as ASAS-1, ASAS-2 and ASAS-3 (**Figure 18**). Subsidiary objectives included site delineation and an assessment of levels of historical land disturbance.

While originally scheduled to occur in late July 2021, delays associated with the COVID-19 pandemic meant that the test excavation program was ultimately carried out over a four day period in October 2021 (5 to 8 October 2021). The field team comprised personnel from AECOM and five RAPs, with a maximum daily workforce of eight people (**Table 23**). Works within ASAS-2 and ASAS-3 were undertaken under the supervision of a rail protection officer, as per the survey detailed in **Section 8.1.2**.

In compliance with Requirement 15c of the Code of Practice, notification of AECOM's intention to undertake the test excavation program detailed in this ACHAR was provided, in writing, to Heritage NSW on 10 September 2021 (**Appendix H**).

Test excavations in ASAS-1, ASAS-2 and ASAS-3 were completed in two phases under a systematic sampling design. For ASAS-1, Phase 1 testing involved the excavation of 50 x 50 centimetres test pits across all non-severely-disturbed parts of the PAD area, with pits placed on an underlying 25 m grid. For ASAS-2 and ASAS-3, both of which encompassed sections of the left bank floodplain of Pipers Flat Creek[18], Phase 1 testing involved the completion of two linear transects of 50 x 50 cm test pits, with pits on each transect spaced at 25 m intervals. As shown on **Figure 16**, transects in each area were placed on the same northeast-southwest alignment in the centre of the transmission line corridor. While separated by an area of severely disturbed terrain associated with Centennial Coal's overland coal conveyor system, given near-identical landform settings, it is noted that ASAS-2 and ASAS-3 were treated in the field as a single entity, with consecutive test pit numbering employed across their associated test pit transects. In the sections that follow, results from ASAS-2 and ASAS-3 are presented collectively.

Phase 2 of the test excavation program involved small expansion excavations around four Phase 1 test pits, two located within ASAS-1 (TPs 12 and 21) and two within ASAS-2 (TPs 42 and 52). These pits were selected for expansion on the basis of artefact yields and/or the technological characteristics of their associated Phase 1 artefact assemblages. In all instances, expansions involved the excavation of an additional three 50 x 50 cm test pits around the original test pit, producing 1 m^2 pits.

Clause 5(ii) of Requirement 16a of the Code of Practice stipulates that the maximum surface area of test excavation units within any given site/area of PAD must be no greater than 0.5 per cent of the site/PAD being investigated. The test excavation program carried out for the current investigation was executed in compliance with this clause, with the combined surface areas of excavated test pits within each tested area constituting less than 0.5 per cent of their respective surface areas (**Table 24**).

In accordance with the Code of Practice, all test pits were hand excavated as 50 x 50 cm units, with five centimetre spits employed during the excavation of the first Phase 1 test pit in each PAD and 10 centimetre spits thereafter. Requirement 16a (9) of the Code of Practice states that test units must be excavated to at least the base of the identified Aboriginal object-bearing units and must continue to confirm the soils below are culturally sterile. In ASAS-1, Phase 1 testing indicated that Aboriginal objects were restricted to the A1 soil horizon and the uppermost portion of the underlying A2 soil horizon, with objects in the latter horizon assessed in the field as representing the down profile movement, through bioturbation, of artefacts from the A1 horizon. Accordingly, all pits within this area were excavated to at least the base of extant biomantles and were continued beyond to varying depths. In ASAS2 and ASAS3, Phase 1 testing revealed the presence, in places, of deep alluvial soil profiles with gravel-rich horizons indicative of one or more former channel systems. Artefacts in both areas were recovered from inferred topsoil units only. Accordingly, excavations in all object-bearing pits in ASAS-2

[18] Note that, consistent with the landform mapping provided in **Figure 5**, field observations confirmed that the westernmost portion of ASAS-2, at and immediately surrounding test pit TP41, comprised a section of slope, as opposed to floodplain.

and ASAS-3 were excavated to at least of base of extant topsoil units and were extended, again to varying depths, into underlying subsoil units to confirm cultural sterility.

Table 23 Field team for test excavation program

Date	RAP representative	RAP organisation	AECOM personnel
05-10-2021	Paul Boyd Jack Moores Donald Morgan	Didge Ngunawal Clan Murra Bidgee Mullangari Aboriginal Corporation Bathurst LALC	Andrew McLaren Rebecca Hibberd Darran Jordan Geordie Oakes Luke Wolfe
06-10-2021	Paul Boyd Jack Moores Shaun Carroll	Didge Ngunawal Clan Murra Bidgee Mullangari Aboriginal Corporation Merrigarn	Andrew McLaren Rebecca Hibberd Darran Jordan Geordie Oakes Luke Wolfe
07-10-2021	Paul Boyd Shaun Carroll Steve Johnson	Didge Ngunawal Clan Merrigarn Corroboree Aboriginal Corporation	Andrew McLaren Rebecca Hibberd Darran Jordan Luke Wolfe
08-10-2021	Paul Boyd Shaun Carroll Steve Johnson Donald Morgan	Didge Ngunawal Clan Merrigarn Corroboree Aboriginal Corporation Bathurst LALC	Andrew McLaren Rebecca Hibberd Darran Jordan Luke Wolfe

Table 24 Test excavation allowances under the Code of Practice

Area of subsurface sensitivity	Area (m^2)	M^2 allowance under the Code	Phase 1 testing (m^2)	Phase 2 testing (m^2)	Total (m^2)	% of allowance under the Code
ASAS-1	26,230	131.2	10	1.5	11.5	8.8
ASAS-2	9,977	48.9	3.5	1.5	5	10.2
ASAS-3	2,535	12.7	1	-	1	7.8

All excavated sediment was dry-sieved on-site through five millimetre wire-mesh sieves. Wet sieving was not utilised due to the predominantly sandy nature of the study area's dominant soil materials, which facilitated effective archaeological screening. All definite and potential cultural lithic items were collected at the sieves and bagged by square and spit. In order to guide Phase 2 testing, artefact counts for each Phase 1 test pit were made and recorded at the sieves by the applicable supervising archaeologist.

Representative profiles in all Phase 1 and 2 test pits were drawn and photographed, with test pit stratigraphy recorded on pro forma test pit recording sheets using standard sedimentological terms and criteria (after McDonald & Isbell 2009). All pits were backfilled after excavation.

8.2.2 Lithic analysis methodology

All flaked stone artefacts recovered as a result of the test excavation program were subject to macroscopic attribute analysis, with the number of attributes recorded per specimen differing by technological type (**Appendix O**). Following Hiscock (2005), recovered lithic items were only accepted as artefacts if they possessed one or more of the following diagnostic attributes of stone flaking:

- A striking platform
- Signs of an external initiation to the fracture surface, namely a ring crack or cone of force
- A bulb of force on the ventral surface of a flake
- A termination to the conchoidal fracture plane
- One or more negative flake scars.

Attributes recorded for the current lithic analysis are listed and defined in **Table 25**. Utilised artefact types, meanwhile, are listed and defined in **Table 26**.

Table 25 Attributed recorded during lithic analysis

Attribute	Definition	Recorded for
Technological Type	The type of technological process used to produce an artefact	All lithic items
Raw material	Lithic raw material (e.g. silcrete, silicified tuff, chert, quartz, FGS)	All lithic items
Weight	Weight to nearest 0.01 gram, measured using an electronic scale	All lithic items
Maximum Linear Dimension (MLD)	Maximum linear dimension of artefact in millimetres	All lithic items
Cortex	Presence/absence of cortical surfaces	All lithic items
Colour	Primary/secondary colour of lithic item (e.g. red, red/grey, yellow, yellow/red)	All lithic items
Lustre	Presence/absence of lustrous flaked surfaces	All lithic items
Thermal damage	Presence/absence of evidence of thermal damage (e.g. potlid scars; crenated surface(s) and/or fracture(s); crazing)	All lithic items
Flake length (mm)	Distance between the point of percussion and the furthest distal point of the flake (i.e. length to the most distal point) (after Holdaway and Stern 2004: 138).	All complete flakes
Flake width (mm)	Longest line that can be drawn at right angles to the length dimension (ie, maximum width) (after Holdaway and Stern 2004: 139).	All complete flakes
Flake thickness (mm)	Maximum distance from dorsal to ventral face (i.e. maximum thickness) (after Holdaway and Stern 2004: 140).	All complete flakes
Platform surface	Nature of the platform surface on complete and proximal flakes: 1) Single scar; 2) Multiple scar; 3) Punctiform; 4) Crenated; 5) Cortical; and 6) Collapsed / crushed	All complete and proximal flakes

Attribute	Definition	Recorded for
Platform width (mm)	Maximum distance between the two lateral margins of a flake, measured across the platform surface.	All complete and proximal flakes
Platform thickness (mm)	Maximum distance between the ventral and dorsal surfaces of a flake.	All complete and proximal flakes
Dorsal cortex	Amount of cortex on dorsal surface of flake: 1) None; 2) 1-25%; 3) 26-50%; 4) 51-75%; 76-99%; and 5) 100%.	All complete flakes
Dorsal Flake Scar Orientation	Direction of scars on dorsal surface of flake: 1) 90 degrees; 2) Irregular; 3) Parallel; 4) Opposed; and 5) Indeterminate	All complete flakes
Flake termination	Shape of the distal end of complete flakes: 1) Feather; 2) Hinge; 3) Step; 4) Plunging; and 5) Abrupt.	All complete flakes
Core length (mm)	Maximum linear dimension of core	All cores
Core width (mm)	Width at mid-point of maximum dimension	All cores
Core thickness (mm)	Thickness at mid-point of maximum dimension	All cores
Core blank	Stone package on which the core was made: 1) Pebble / Cobble, 2) Flake; 3) Heat shatter; and 4) Indeterminate.	All cores
Cortex (core)	Amount of cortex remaining on core at discard: 1) None; 2) 1-25%; 3) 26-50%; 4) 51-75%; and 5) 76-99%	All cores
Number of striking platforms	Number of striking platforms preserved on core at discard.	All cores
Number of removals	Number of complete and partial flake scars (>5 mm) preserved on core.	All cores
Core scars	Length and width of all complete core scars >5 mm in MLD.	All cores
Longest flake scar	Length of longest complete flake scar preserved on core.	All cores
Aberrant terminations	Presence/absence of aberrant terminations on core.	All cores
Raw material quality	Subjective assessment of raw material quality: 1) Good; 2) Average; and 3) Poor.	All cores
Backed type	Backed artefact type: 1) Bondi point; 2) Geometric microlith; 3) Elouera; and 4) Indeterminate	All backed artefacts
Backed artefact state	Completeness: 1) Complete; and 2) Broken.	All backed artefacts
Blank	Stone package on which the backed artefact was made.	All backed artefacts
Completeness	Completeness, after AMBS (2000): 1) Complete; 2) Proximal (just tip missing, ≥75% of original); 3) Tip (distal broken point, ≤25% of original)); 4) Distal (larger than tip, 50-75% of original); 5) Butt (broken fragment including butt, <75% of original); 6) Medial (broken fragment lacking butt or distal tip).	All Bondi points
Tool length (mm)	Maximum linear dimension of backed artefact, in mm.	All backed artefacts

Attribute	Definition	Recorded for
Tool width (mm)	Maximum width of backed artefact, in mm.	All backed artefacts
Tool thickness (mm)	Maximum thickness of back artefact, in mm.	All backed artefacts
Platform type	Nature of the flake platform surface: 1) Single scar; 2) Multiple scar; 3) Faceted; 4) Punctiform; 5) Natural flaw; 6) Crenated; 7) Cortical; 8) Collapsed / crushed; 9) Backed; 10) Absent.	All backed artefacts
Platform width	As per complete and proximal flakes (excluding backed platforms).	All backed artefacts
Platform thickness	As per complete and proximal flakes (excluding backed platforms).	All backed artefacts
Backing direction	Direction of backing scars: 1) Unidirectional; and 2) Bidirectional.	All backed artefacts
Chord length (mm)	Length of the chord.	All complete backed artefacts
Backed edge angle	Backed edge angle, taken by hand at three evenly spaced locations along the longest backed edge using a goniometer.	All backed artefacts
Unretouched edge angle	Unretouched edge angle, taken by hand at three evenly spaced locations along the chord using a goniometer.	All backed artefacts
Chord damage / wear	Edge-damage and/or wear: 1) No macroscopic edge damage/wear; 2) Unifacial edge damage; 3) Bifacial edge damage; 4) Edge rounding; 5) [4] with [2] or [3].	All backed artefacts
Backing extent	Extent of backing along margin: 1) complete; 2) proximal; 3) medial/distal; and 4) distal.	All backed artefacts
Orientation	Lateral margin selected for backing: 1) Right lateral margin; 2) Left lateral margin; 3) Indeterminate.	All backed artefacts

Table 26 Artefact type definitions

Type	Definition	Reference
Complete flake	A flake that has a striking platform or impact point, lateral margins, a termination and a ventral surface that preserves a compete fracture plane.	Holdaway and Stern (2004: 111)
Proximal flake	Broken flake that lacks termination but retains one or more of the following: platform and/or impact point, bulb of percussion, bulbar scar, fissures.	Holdaway and Stern (2004: 111)
Split flake	Flake that has been split longitudinally. Split flakes retain portions of platforms and/or impact points and have identifiable terminations.	Holdaway and Stern (2004: 111)
Redirecting flake	Complete or proximal flake whose dorsal surface preserves an old platform edge.	Attenbrow (2010: 207)
Flake shatter fragment	Flake fragment with no recognizable striking platform or impact point.	Andrefsky (2005: 83)

Type	Definition	Reference
Angular shatter fragment	Non-flake debitage item analogous to Hiscock's (1986) 'Flaked piece'	Andrefsky (2005: 84)
Unidirectional core	Core with scars originating from a single platform.	Holdaway and Stern (2004: 180)
Multidirectional core	Core with scars originating from two or more platforms.	Holdaway and Stern (2004: 180)
Bifacial core	Core with single platform but flakes detached from two core faces.	Holdaway and Stern (2004: 180)
Bidirectional core	Core with two opposing platforms.	Holdaway and Stern (2004: 111)
Core fragment	Lithic item identifiable as a core but broken pre- or post-discard.	This report
Bondi point	Flake, broken flake or flake fragment that has been backed along one lateral margin and comes to a point at its distal end. Bondi points are asymmetrical around their longitudinal axes.	Holdaway and Stern (2004: 261)
Geometric microlith	Flake, broken flake or flake fragment that has been backed at distal and/or proximal end and/or on one lateral margin. Geometric microliths are symmetrical around their transverse axes.	Holdaway and Stern (2004: 262)
Backed artefact (indeterminate)	Backed artefact of indeterminate form due to breakage	This report

8.3 ASAS-1

8.3.1 Description

ASAS-1 encompasses the crest and upper flanks of a broad, low gradient ridgeline within the Site. The ridgeline, which trends southwest to northeast, runs from the southwestern corner of the Site to a farm dam in the easternmost portion of Lot 4 DP751651, and offers expansive views to the east and northeast. The ridgeline is approximately 400 m long and has a maximum width of around 100 m. Slope gradients range from very gentle (1-3%) to moderate (10-32%) but are predominantly gentle (3-10%). As shown on **Figure** 19, the ridgeline is bordered to the north and west by ephemeral drainage lines that have been modified historically through the construction of farm dams. At its closest point, Pipers Flat Creek is located around 175 metres to the southeast of ASAS-1.

Native vegetation within ASAS-1 has been substantially modified and consists almost exclusively of pasture grasses and weeds. For the most part, land within the mapped boundary of ASAS-1 retains a moderate degree of integrity, having been cleared historically for grazing but not subject to severe disturbance in the form of earthworks or the like. Nonetheless, a portion of the ridgeline, northwest of the existing residential property, has been severely disturbed by historical dam construction activities. Areas of significant hillslope erosion are also present in the westernmost portion of ASAS-1, running along the southern boundary of the Site. Flaked stone artefacts are present within these areas.

8.3.2 Phase 1 testing

Phase 1 testing within ASAS-1 involved the excavation of 40 50 x 50 cm test pits across all non-severely-disturbed sections of the PAD area, with test pits placed on a 25 metre grid. Summary information on Phase 1 test pits within ASAS-1, including observed topsoil depths, are provided in **Table 27**. Test pit locations are shown on **Figure** 19.

Table 27 ASAS-1: Phase 1 testing results

Test Pit ID	Coordinates (MGA Easting & Northing, Zone 56)		Landform unit	Slope	Topsoil depth (cm)	Max depth (cm)	Aboriginal objects (*N*)
1	227100	6300691	Crest	3-10%	26	28	1
2	227100	6300716	Crest	3-10%	30	36	2
3	227100	6300741	Slope	3-10%	>33	33	0
4	227125	6300691	Crest	3-10%	>37	37	1
5	227125	6300716	Crest	3-10%	>60	60	0
6	227125	6300741	Slope	3-10%	>27	27	0
7	227125	6300766	Slope	3-10%	20	23	0
8	227150	6300691	Crest	3-10%	>45	45	0
9	227150	6300716	Crest	3-10%	>45	45	0
10	227150	6300741	Crest	3-10%	>45	45	0
11	227150	6300766	Slope	3-10%	>30	30	1
12	227175	6300691	Slope	3-10%	28	28	5
13	227175	6300716	Crest	3-10%	26	29	0
14	227175	6300741	Crest	3-10%	>30	30	0
15	227175	6300766	Slope	3-10%	>35	35	0
16	227200	6300691	Slope	3-10%	>29	29	0
17	227200	6300716	Crest	3-10%	51	51	0
18	227200	6300741	Crest	3-10%	29	29	0
19	227200	6300766	Crest	3-10%	>31	31	2
20	227199	6300791	Slope	3-10%	>40	40	0
21	227225	6300716	Slope	3-10%	>31	31	7
22	227225	6300741	Crest	3-10%	>40	40	0
23	227225	6300766	Crest	3-10%	31	37	2
24	227225	6300791	Slope	3-10%	>32	32	0
25	227250	6300741	Crest	3-10%	>39	39	2
26	227250	6300766	Crest	3-10%	>42	42	2
27	227250	6300791	Crest	3-10%	>63	63	0
28	227275	6300766	Crest	1-3%	>42	42	2

Test Pit ID	Coordinates (MGA Easting & Northing, Zone 56)		Landform unit	Slope	Topsoil depth (cm)	Max depth (cm)	Aboriginal objects (*N*)
29	227275	6300791	Crest	1-3%	>76	76	0
30	227300	6300791	Crest	1-3%	48	56	0
31	227325	6300791	Crest	1-3%	>43	43	0
32	227350	6300866	Slope	3-10%	33	38	4
33	227375	6300841	Crest	3-10%	38	38	0
34	227375	6300866	Crest	3-10%	35	40	0
35	227375	6300892	Slope	3-10%	>37	37	0
36	227400	6300841	Crest	3-10%	>30	30	1
37	227400	6300866	Crest	3-10%	28	28	1
38	227400	6300891	Crest	3-10%	>20	20	5
39	227425	6300866	Crest	3-10%	>32	32	0
40	227424	6300892	Crest	3-10%	>34	34	1

8.3.3 Phase 2 testing

Phase 2 testing at within ASAS-1 involved the expansion of two test pits (TPs 12 and 21) to 1 m^2 (**Plate 26** and **Plate 28**). TP21 was selected on for expansion on the basis of it exhibiting the highest Phase 1 artefact density (7 artefacts per $0.25m^2$). Phase 1 pits TP12 and TP38 both yielded five artefacts. However, TP12 was selected for expansion on the grounds that, unlike TP38, it contained more than one raw material, had larger artefacts and contained a single formed object (i.e. a core fragment).

Of the three expansion pits completed around TP12, only one (12D) yielded additional artefacts. In contrast, all three expansion at TP21 pits contained artefacts. Summary information on Aboriginal object bearing Phase 2 test pits within ASAS1 is provided in **Table 28**.

Table 28 ASAS-1: Phase 2 testing results

Test Pit ID	Coordinates (MGA Easting & Northing, Zone 56)		Landform unit	Slope	Topsoil depth (cm)	Max depth (cm)	Aboriginal objects (*N*)
12D	227175	6300691	Slope	3-10%	28	28	2
21B	227225	6300716	Slope	3-10%	>31	31	5
21C	227225	6300716	Slope	3-10%	>31	31	8
21D	227225	6300716	Slope	3-10%	>31	31	3

8.3.4 Soils, stratigraphy and disturbance

Test pit depths across ASAS1 varied from 20 to 76 cm in depth, with an average depth of 37.7±11.2 cm. Observed soil profiles were generally consistent with those described by King (1993)) for the Cullen Bullen soil landscape, with sandy loam topsoils, divisible into distinct A1 and A2 horizons (i.e. cb1 and cb2 respectively, after King, 1993), overlying medium B horizon clays (cb3, after King, 1993) (see **Plate 19**, **Plate 20**, **Plate 21**, **Plate 22**, **Plate 23**, **Plate 24** and **Plate 25**). In general, extant soil profiles were assessed in the field as being in good condition, with evidence of disturbance restricted to partial topsoil loss through hillslope erosion. Notably, horizons interpreted in the field as cb2 (after King, 1993) varied significantly in both thickness and gravel content, including over small distances (25 m). Where present, conglomerate-derived gravels within excavated cb1 and cb2 horizons were rounded in shape and pebble to cobble-sized.

8.3.5 Aboriginal objects

8.3.5.1 Artefact distribution

A total of 57 Aboriginal objects, consisting exclusively of flaked stone artefacts, were recovered as a result of subsurface testing across ASAS-1, with the majority (n = 39, 68%) coming from Phase 1 pits. As shown on **Figure 19**, artefact-yielding Phase 1 pits (n = 16) were widely distributed across the site with no obvious clustering apparent.

Densities for Phase 1 test pits ranged from one to seven artefacts per 0.25 m^2 (mean = 2.4±1.8 artefacts/0.25m^2). All but three Phase 1 pits (TPs 12, 21, 38) contained fewer than five artefacts. Phase 2 expansion excavations around TPs 12 and 21 resulted in densities of seven and 23 artefacts per m^2 respectively. Collectively, artefacts recovered as a result of Phase 1 and 2 testing across ASAS-1 (n = 57) provide a mean artefact density of 4.9 artefacts per m^2.

Analysis of artefact distribution in relation to landform (**Table 29**) indicates that mean artefact density was highest in the slope unit (6.7 artefacts/m2) followed by the crest unit (3.9 artefacts/m^2).

Vertical distribution data for the combined Phase 1/2 ASAS-1 lithic assemblage are presented in **Table 30**. These indicate that the majority of artefacts (c.75%) were recovered from the top 10 cm of excavated deposit. No artefacts were recovered below 20 cm b.g.l.

Table 29 ASAS-1: artefact distribution in relation to landfrom

Landform unit	Number of test pits	Number of pits with artefacts	% of excavated pits	Total number of artefacts	Mean per pit	Total area excavated	Mean density/m2
Crest	28	12	42.9	27	1	7	3.9
Slope	18	8	44.4	30	1.7	4.5	6.7
Total	**46**	**20**	**-**	**57**	**-**	**11.5**	**-**

Table 30 ASAS-1: vertical distribution data for combined Phase1/2 lithic assemblage

Depth b.g.l (cm)	Count	%
0-10	43	75.4
10-20	14	24.6
Total	**57**	**100**

8.3.5.2 Assemblage composition

A typological breakdown of the combined Phase 1/2 lithic assemblage from ASAS-1 (**Table 31**), which has a total combined weight of 228.2 grams, shows that it is dominated by flake debitage (n = 45, 78.9%), with non-flake debitage (n = 7, 12.2%) and formed objects (n = 5, 8.8%) comparatively poorly represented.

Recovered flake debitage items include 17 complete flakes, nine proximal flakes, six split flakes, one redirecting flake and 12 flake shatter fragments. 'Formed objects' (after Moore et al., 2009) include two multidirectional quartz cores, one bidirectional quartz core and two quartz core fragments.

Quartz is the dominant raw material, accounting for 93% of the assemblage by count (n = 53) and 94.3% by weight (215.2 g). Other minor lithologies represented include silicified tuff (n = 3) and Fine Grained Siliceous (FGS) (n = 1). Cortex is poorly represented in the assemblage, with only two items retaining cortical surfaces. In both instances, these suggest the exploitation of rounded quartz pebbles/cobbles.

Recovered artefacts are, in general, relatively small and lightweight, exhibiting an average maximum linear dimension of 20.7±8.8 mm (range: 8-53 mm) and average weight of 3.8±8.7 g (range: 0.1-63.9 g).

Table 31 ASAS-1: typological breakdown of combined Phase1/2 assemblage by test pit

Test pit	Complete flake	Proximal flake	Split flake	Redirecting flake	Flake shatter	Angular shatter	Bidirectional core	Core fragment	Multidirectional core	Tot al
1	1	-	-	-	-	-	-	-	-	1
2	-	-	-	-	-	-	1	-	1	2
4	-	-	-	-	-	-	-	-	1	1
11	-	-	-	-	-	-	-	1	-	1
12	2	-	-	-	2	-	-	1	-	5
19	2	-	-	-	-	-	-	-	-	2
21	1	1	2	-	3	-	-	-	-	7
23	1	-	-	-	1	-	-	-	-	2
25	1	-	-	-	-	1	-	-	-	2
26	-	-	-	-	-	2	-	-	-	2
28	1	1	-	-	-	-	-	-	-	2
32	2	1	-	1	-	-	-	-	-	4
36	-	-	-	-	-	1	-	-	-	1
37	1	-	-	-	-	-	-	-	-	1
38	1	1	1	-	2	-	-	-	-	5
40	1	-	-	-	-	-	-	-	-	1
12D	-	1	-	-	1	-	-	-	-	2
21B	2	-	1	-	1	1	-	-	-	5
21C	-	4	1	-	2	1	-	-	-	8
21D	1	-	1	-	-	1	-	-	-	3
Total	**17**	**9**	**6**	**1**	**12**	**7**	**1**	**2**	**2**	**57**

Table 32 ASAS-1: raw materials by test pit (phase 1 and 2)

Test pit	Quartz	S.tuff	FGS	Total
1	1	-	-	1
2	2	-	-	2
4	1	-	-	1
11	1	-	-	1
12	4	1	-	5
19	2	-	-	2
21	7	-	-	7
23	2	-	-	2
25	2	-	-	2
26	2	-	-	2
28	2	-	-	2
32	3	1	-	4
36	-	1	-	1
37	-	-	1	1
38	5	-	-	5
40	1	-	-	1
12D	2	-	-	2
21B	5	-	-	5
21C	8	-	-	8
21D	3	-	-	3
Total	**53 (93%)**	**3 (5.3%)**	**1 (1.7%)**	**57**

8.3.6 Summary of testing and results

A summary of the results of subsurface testing across ASAS-1 is provided below:

- Phase 1 testing at ASAS-1 involved the excavation of 40 50 x 50 centimetre test pits across all non-severely-disturbed sections of the PAD area, with pits placed on a 25 m grid.
- Test pit depths across ASAS1 varied from 20 to 76 cm in depth, with an average depth of 37.7±11.2 cm.
- Observed soil profiles were generally consistent with those described by King (1993)) for the Cullen Bullen soil landscape (cb), with sandy loam topsoils, divisible into distinct A1 and A2 horizons, overlying medium B horizon clays.
- Sixteen Phase 1 test pit contained Aboriginal objects, with recovered objects consisting exclusively of flaked stone artefacts. Artefact yielding Phase 1 test pits were widely distributed across the site with no obvious clustering apparent.
- Densities for Phase 1 test pits were uniformly low, ranging from one to seven artefacts per 0.25 m^2 (mean = 2.4±1.8 artefacts/0.25m^2). All but three Phase 1 pits (TPs 12, 21, 38) contained fewer than five artefacts.
- Phase 2 expansion excavations around TPs 12 and 21 resulted in densities of seven and 23 artefacts per m^2 respectively.
- Analysis of artefact distribution in relation to landform indicates that mean artefact density was highest in the slope unit (6.7 artefacts/m2) followed by the crest unit (3.9 artefacts/m^2).

- Vertical distribution data for the combined Phase 1/2 ASAS-1 lithic assemblage indicate that the majority of artefacts (c.75%) were recovered from the top 10 cm of excavated deposits. No artefacts were recovered below 20 cm b.g.l.
- The combined Phase 1/2 lithic assemblage is dominated by flake debitage (n = 45, 79%) and artefacts manufactured out of quartz (n = 53, 93%).
- Testing results for ASAS1 are consistent with existing surface evidence for GWB-STQ1-21 in attesting to the on-site procurement and reduction of conglomerate-derived gravels (consisting predominantly, if not exclusively, quartz pebbles/cobbles).

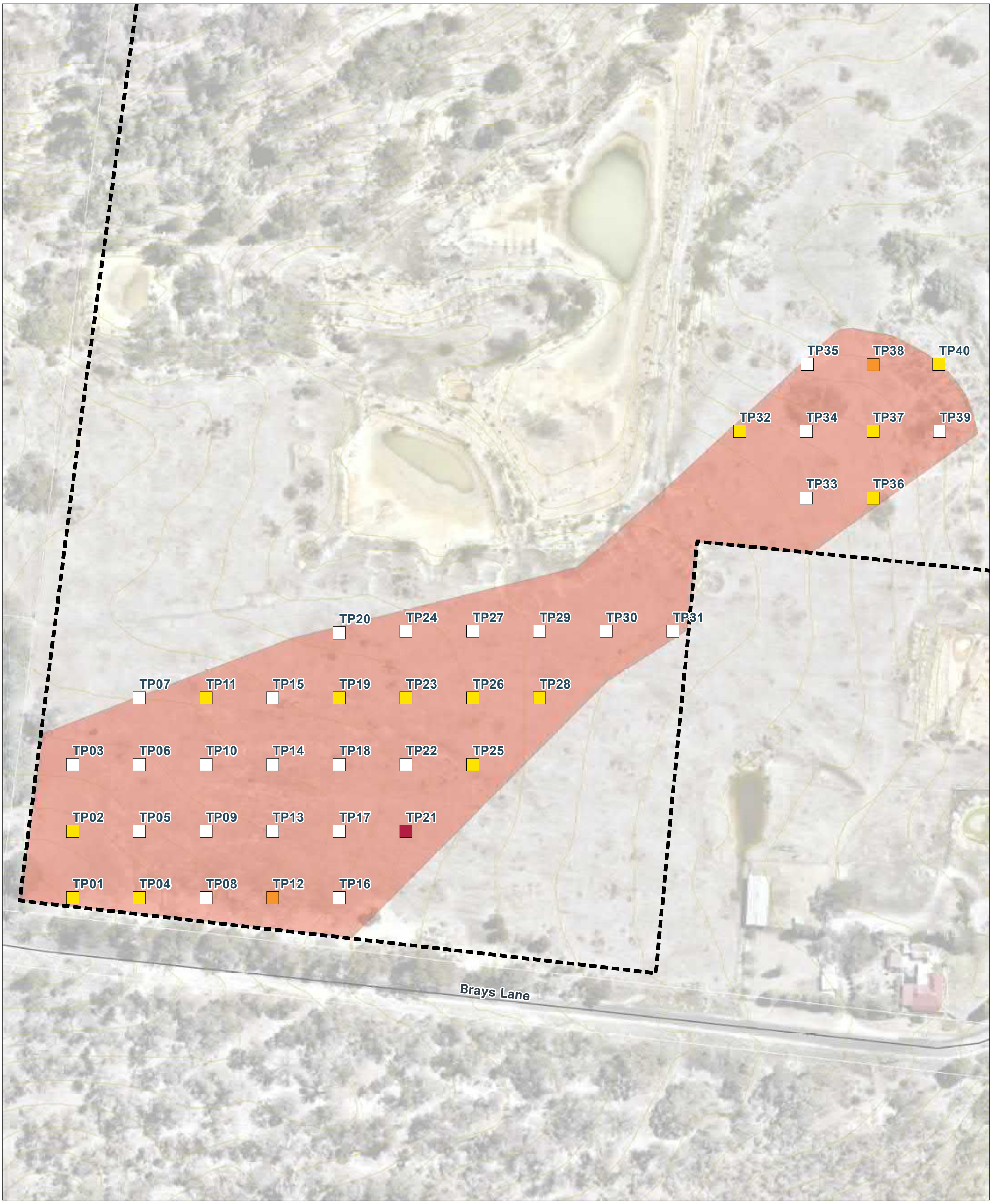


Figure 19
ASAS-1: Phase 1 Test Pits

N
0 30 60 m

AECOM

Legend
Study Area
ASAS-1
Watercourse
Railway
Local Road
Contours

Phase 1 Test Pits (Artefacts/ 0.25m^2)
0
1-3
3-5
5+

Plate 19: ASAS-1: TP1 end of excavation. Cb1, cb2 and cb3 represented.

Plate 20: ASAS-1: TP23 end of excavation. Cb1, cb2 and cb3 represented.

Plate 21: ASAS-1: TP2 end of excavation. Cb1, cb2 and cb3 represented.

Plate 22: ASAS-1: TP5 end of excavation. Cb1 and cb2 represented.

Plate 23: ASAS-1: TP3 end of excavation. Cb1 and cb2 represented. Note gravel content in cb2.

Plate 24: ASAS-1: TP26 end of excavation. Cb1 and cb2 represented.

Plate 25: ASAS-1: TP10 end of excavation. Cb1 and cb2 represented.

Plate 26: ASAS-1: view across completed Phase 2 expansion excavation at TP12

Plate 27: ASAS-1: TP12 expansion excavation, east section, end of excavation. Cb1 and cb2 represented. Excavation terminated at surface of cb3.

Plate 28: view across completed Phase 2 expansion excavation at TP21.

Plate 29: ASAS-1: TP21 expansion excavation, south section, end of excavation. Cb1 and cb2 represented.

Plate 30: ASAS-1: bidirectional (left) and multidirectional (right) quartz cores from TP2.

Plate 31: ASAS-1: multidirectional quartz core from TP4, made on quartz cobble

8.4 ASAS-2 and ASAS-3

8.4.1 Description

ASAS-2 and ASAS-3 are located to the east of the Site within the transmission line corridor. With the exception of a small section of slope at the western extremity of ASAS-2, the landform context of both areas consists of the very gently inclined (1-3%) left bank floodplain of Pipers Flat Creek. At this point along its course, the floodplain has a maximum width of around 220 m and sits at an elevation of about 875 m AHD. While sections of Pipers Flat Creek, both within and outside of the study area, are known to have been modified historically, the original alignment of the creek adjacent to ASAS-2 and ASAS-3 appears to have been largely preserved. Areas of potential remnant vegetation on the Pipers Flat Creek floodplain, including those within ASAS-2 and ASAS-3, have been mapped as Tableland Hollows Black Gum-Black Sally Open Forest. Ground integrity within ASAS-2 and ASAS-3 is variable but generally quite high. Parts of both areas have been significantly disturbed through the construction of vehicle tracks.

8.4.2 Phase 1 testing

Phase 1 testing within ASAS-2 and ASAS-3 involved the excavation of a total of 18 test pits across two transects placed on the same northeast-southwest alignment within the centre of the transmission line corridor. Test pits on both transects were spaced at 25 m intervals, with 14 pits excavated within ASAS-2 and four within ASAS-3. Summary information on Phase 1 test pits within both areas, including observed topsoil depths, are provided in **Table 33**. Test pit locations are shown on **Figure** 20.

Table 33 ASAS-1: Phase 1 testing results

Test Pit ID	Coordinates (MGA Easting & Northing, Zone 56)		Landform unit	Slope	Topsoil depth (cm)	Max depth (cm)	Aboriginal objects (*N*)
41	227564	6300861	Slope	3-10%	48	56	1
42	227588	6300866	Floodplain	1-3%	38	42	4
43	227612	6300872	Floodplain	1-3%	38	44	1
44	227637	6300877	Floodplain	1-3%	24	42	0
45	227661	6300882	Floodplain	1-3%	32	50	1
46	227686	6300888	Floodplain	1-3%	18	37	0
47	227710	6300893	Floodplain	1-3%	32	55	1
48	227735	6300898	Floodplain	1-3%	43	57	0
49	227759	6300904	Floodplain	1-3%	28	38	2
50	227783	6300909	Floodplain	1-3%	21	27	0
51	227808	6300914	Floodplain	1-3%	43	48	0
52	227832	6300920	Floodplain	1-3%	25	55	4
53	227857	6300925	Floodplain	1-3%	20	50	0
54	227881	6300930	Floodplain	1-3%	21	21	0
55	227912	6300937	Floodplain	1-3%	23	26	0
56	227936	6300942	Floodplain	1-3%	29	35	0

Test Pit ID	Coordinates (MGA Easting & Northing, Zone 56)		Landform unit	Slope	Topsoil depth (cm)	Max depth (cm)	Aboriginal objects (*N*)
57	227961	6300948	Floodplain	1-3%	27	33	0
58	227985	6300953	Floodplain	1-3%	25	30	0

8.4.3 Phase 2 testing

Phase 2 testing at ASAS-2 and ASAS-3 involved the expansion of two test pits within ASAS-2 to 1 m^2: TPs 42 and 52. Located 250 m apart, these pits were selected for expansion on the basis of exhibiting the equal highest Phase 1 artefact count (n = 4) across ASAS-2. No pits within ASAS-3 contained artefacts. Phase 2 expansion excavations at TPs 42 and 52 produced no additional artefacts.

8.4.4 Soils, stratigraphy and disturbance

Test pit depths across ASAS-2 and ASAS-3 ranged from 21 to 57 cm in depth, with an average depth of 41.4±11.3 cm. TP41, located in a slope context, exhibited a profile similar to those to the west of Brays Lane, with distinct A1 and A2 sandy loam topsoil horizons overlying a fine sandy clay subsoil (B horizon) (**Plate 32**). Soils on the floodplain of Pipers Flat creek, meanwhile, were generally consistent with those described by King (1993) for the Pipers Flat soil landscape, with sandy loam to clay loam topsoils overlying silty to sandy clay subsoils. Alluvial gravels were present in several pits, with concentrated layers of such, representing one or more former channel systems, occurring in TPs 44, 45, 46, 47, 48, 49, 52 and 53 (e.g. **Plate 34**, **Plate 35** and **Plate 41**). Together with that in TP54, located at the eastern extremity of ASAS-2, test pits within ASAS-3 exhibited soils consistent with low energy floodplain deposition (i.e. flood deposits), with clay loam topsoils lacking larger alluvial gravels overlying silty clay subsoils (**Plate 36** and **Plate 37**).

In general, extant soil profiles were assessed in the field as being in good condition, with obvious evidence of disturbance restricted to TP55 in ASAS-3, located on a vehicle track running parallel to the existing Mt Piper-Lidsdale Siding coal conveyor. In this pit, the top 7 cm of deposit contained abundant imported gravel fragments and coal pieces (**Plate 36**).

8.4.5 Aboriginal objects

8.4.5.1 Artefact distribution

A total of 14 Aboriginal objects, consisting exclusively of flaked stone artefacts, were recovered as a result of subsurface testing across ASAS-2 and ASAS-3, with all artefact-yielding pits (n = 7) located within ASAS-2. As shown on **Figure 20**, artefact-yielding pits were spread widely across ASAS-2. However, the majority (n = 5) occurred in the eastern half of the PAD area.

Densities for Phase 1 test pits within ASAS-2 ranged from one to four artefacts per 0.25 m^2 (mean = 2±1.4 artefacts/0.25m^2). All pits contained fewer than five artefacts, with TPs 42 and 52 containing the equal highest count (n = 4). As indicated above, Phase 2 expansion excavations at TPs 42 and 52 produced no additional artefacts. Collectively, artefacts recovered as a result of Phase 1 and 2 testing across ASAS-2 and ASAS-3 (n = 14) provide a mean artefact density of 2.3 artefacts per m^2.

Vertical distribution data for the combined Phase 1/2 ASAS-2 lithic assemblage are presented in **Table 34**. Artefacts were recovered to a maximum depth of 40 cm b.g.l.

Table 34 ASAS-2: vertical distribution data for Phase1 lithic assemblage

Depth b.g.l (cm)	Count	%
0-10	3	21.4
10-20	3	21.4
20-30	7	50
30-40	1	7.14
Total	**14**	**100**

8.4.5.2 Assemblage composition

A typological breakdown of the Phase 1 lithic assemblage from ASAS-2 is provided in **Table 35**. Flake debitage predominates, accounting for 71.4% of the assemblage by count (n = 10). Formed objects consist of three cores (one unidirectional and two bipolar) and a single backed artefact.

Quartz is the dominant raw material, with all but four artefacts manufactured out of it. Other lithologies include silicified tuff (n = 3) and FGS (n = 1). Cortex occurs on a single artefact only.

Recovered artefacts exhibit an average maximum linear dimension of 18±8.5 mm (range: 8.8-35.9 mm) and average weight of 2.4±4.8 g (range: 0.1-17.7 g).

The backed artefact from TP49, made out of quartz, is broken and of indeterminate form.

Table 35 ASAS-2: typological breakdown of combined Phase1/2 assemblage by test pit

Test pit	Complete flake	Flake shatter	Bipolar core	Unidirectional core	Backed artefact	Grand Total
41	1	-	-	-	-	1
42	1	3	-	-	-	4
43	-	1	-	-	-	1
45	-	-	-	1	-	1
47	1	-	-	-	-	1
49	-	1	-	-	1	2
52	2	-	2	-	-	4
Grand Total	**5**	**5**	**2**	**1**	**1**	**14**

8.4.6 Summary of testing and results

A summary of the results of subsurface testing across ASAS-2 and ASAS-3 is provided below:

- Phase 1 testing within ASAS-2 and ASAS-3 involved the excavation of a total of 18 test pits across two transects placed on the same northeast-southwest alignment within the centre of the transmission line corridor. Test pits on both transects were spaced at 25 m intervals, with 14 pits excavated within ASAS-2 and four within ASAS-3.
- Test pit depths across ASAS-2 and ASAS-3 ranged from 21 to 57 cm in depth, with an average depth of 41.4±11.3 cm.
- Soils on the floodplain of Pipers Flat creek were generally consistent with those described by King (1993) for the Pipers Flat soil landscape, with sandy loam to clay loam topsoils overlying silty to sandy clay subsoils.
- Concentrated layers of alluvial gravels, representing one or more former channel systems, occurred in several of the pits excavated within ASAS-2.
- Alongside TP54, located at the eastern extremity of ASAS-2, test pits within ASAS-3 exhibited soils consistent with low energy floodplain deposition (i.e. flood deposits).
- A total of 14 Aboriginal objects, consisting exclusively of flaked stone artefacts, were recovered as a result of subsurface testing across ASAS-2 and ASAS-3, with all artefact-yielding pits (n = 7) located within ASAS-2.
- Artefact-yielding Phase 1 test pits within ASAS-2 were widely distributed across the tested area. However, the majority (n = 5, 71.4%) occurred in its western half.
- Densities for Phase 1 test pits within ASAS-2 ranged from one to four artefacts per 0.25 m^2 (mean = 2±1.4 artefacts/0.25m^2). All pits contained fewer than five artefacts, with TPs 42 and 52 containing the equal highest count (n = 4).
- Phase 2 expansion excavations at TPs 42 and 52 produced no additional artefacts.

- Artefacts within ASAS-2 occurred to maximum depth of 40 cm b.g.l.

Figure 20
ASAS-2 & ASAS-3: Phase 1 Test Pits

Legend

- Study
- ASAS-2
- ASAS-3
- Watercourse
- Railway
- Local Road
- Contours

Phase 1 Test Pits (Artefacts/ 0.25m^2)

- 0
- 1-3
- 3-5
- 5+

N

0 50 100 m

AECOM

L:\Secure\Projects\606x\60639954\900_CAD_GIS\920_GIS\02_Maps\G027_01_A4P_F20_Wallerawang_ASAS2_3PhaseITP_211021.mxd Date Saved: 21/10/2021

Plate 32: ASAS-2: TP41 end of excavation	Plate 33: ASAS-2: TP42 end of excavation

Plate 34: ASAS-2: TP45 end of excavation	Plate 35: ASAS-2: TP46 end of excavation

Plate 36: ASAS-3: TP55 end of excavation. Note imported gravels in uppermost portion of profile.	Plate 37: ASAS-3: TP57 end of excavation

Plate 38: ASAS-2: View across completed TP42 expansion excavation

Plate 39: ASAS-2: TP42 expansion excavation, south section, end of excavation

Plate 40: ASAS-2: View across completed TP52 expansion excavation

Plate 41: ASAS-2: TP52 end of excavation

Plate 42: ASAS-2: Artefacts from Phase 1 test pit TP52. Complete silicified tuff flakes and quartz bipolar cores.

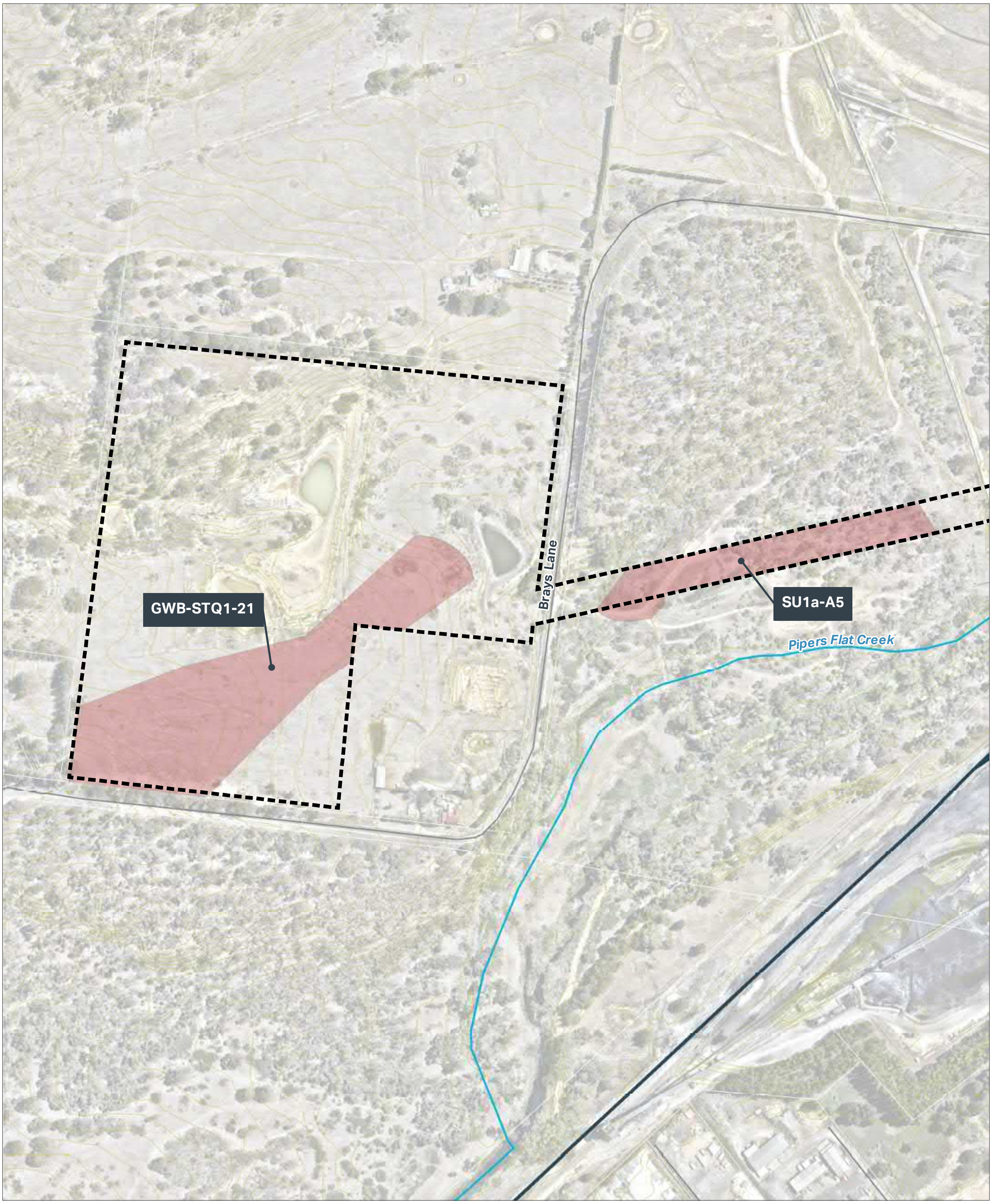
Plate 43: ASAS-2: broken backed artefact from TP49

8.5 Aboriginal sites

Taking into account the results of the archaeological survey and test excavation works detailed in this chapter, a total of two Aboriginal archaeological sites are recognised within the study area. Identified sites, the extents of which are shown on **Figure 21**, consist of surface and subsurface artefact scatter SU1a-A5 (45-1-2716) and surface and subsurface stone quarry site GWB-STQ1-21. Summary information on both sites is provided in **Table 36**.

Table 36 Aboriginal sites within study area

Site Name	Centroid Coordinates		AHIMS Id(s)	Type	AHIMS Site Feature(s)	Landform unit(s)	Size (Area m^2)	Location relative to study area
	MGAE	MGAN						
SU1a-A5	227691	6300884	45-1-2716	Artefact scatter (surface and subsurface)	AFT; PAD	Floodplain & slope	9,460	Partially within
GWB-STQ1-21	227238	6300771	45-1-2853	Stone quarry (surface and subsurface)	STQ; AFT PAD	Crest & slope	26,821	Partially within



L:\Secure\Projects\606x\60639954\900_CAD_GIS\920_GIS\02_Maps\G028_01_A4P_F21_Wallerawang_AboriginalSites_211021.mxd Date Saved: 21/10/2021

Figure 5-2
Aboriginal Sites

AECOM

Legend
- Study Area
- Watercourse
- Railway
- Local Road
- Contours
- Aboriginal Sites

9.0 Significance assessment

9.1 Principles of assessment

Heritage sites hold value for different communities in a variety of different ways. All sites are not equally significant and thus not equally worthy of conservation and management (Pearson & Sullivan, 1995: 17). One of the primary responsibilities of cultural heritage practitioners, therefore, is to determine which sites are worthy of preservation and management (and why) and, conversely, which are not (and why) (Smith & Burke, 2007: 227). This process is known as the assessment of cultural significance and, as highlighted by Pearson and Sullivan (1995: 127), incorporates two interrelated and interdependent components. The first involves identifying, through documentary, physical or oral evidence, the elements that make a heritage site significant, as well as the type(s) of significance it manifests. The second involves determining the degree of value that the site holds for society (i.e. its cultural significance) (Pearson & Sullivan, 1995: 126).

In Australia, the primary guide to the assessment of cultural significance is the Australian ICOMOS Charter for Places of Cultural Significance (2013), informally known as The Burra Charter, which defines cultural significance as the "*aesthetic, historic, scientific, social or spiritual value for past, present or future generations*" of a site or place (ICOMOS Australia, 2013: 2). Under the Burra Charter model, the cultural significance of a heritage site or place is assessed in terms of its aesthetic, historic, scientific, social and spiritual values, none of which are mutually exclusive (**Table 37**). Establishing cultural significance under the Burra Charter model involves assessing all information relevant to an understanding of the site and its fabric (i.e. its physical make-up). The assessment of cultural significance and the preparation of a statement of cultural significance are critical prerequisites to making decisions about the management of any heritage site or place.

Table 37 Values relevant to determining cultural significance, as defined by The Burra Charter

Value	Definition
Aesthetic	"Aesthetic value refers to the sensory and perceptual experience of a place-that is, how we respond 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" (Australia ICOMOS, 2013: 3)
Historic	"Historic value is intended to encompass all aspects of history. 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" (Australia ICOMOS, 2013: 3)
Scientific	"Scientific value 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" (Australia ICOMOS, 2013: 4)
Social	"Social value 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" (Australia ICOMOS, 2013: 4)
Spiritual	"Spiritual value 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" (Australia ICOMOS, 2013: 4)

9.2 Scientific Values

Scientific value or significance refers to the importance of a place in terms of its rarity, representativeness and the extent to which it may contribute further information (i.e. its research potential) (OEH, 2011: 9).

9.2.1 Rarity and representativeness

Rarity and representativeness are related concepts. Rarity refers to the relative uniqueness of a site within its local and regional context. The scientific significance of a site is assessed as higher if it is unique or rare within either context. Conversely, it is considered to be of lower significance if it is common in one or both. The concept of representativeness, meanwhile, refers to the question of whether or not a site is "*a good example of its type, illustrating clearly the attributes of its significance*" (Burke & Smith 2004: 247). Representativeness is an important criterion as one of the primary goals of cultural heritage management is to preserve for future generations a representative sample of all archaeological site types in their full range of environmental contexts.

9.2.2 Research potential

Research potential can be defined as the potential of an archaeological site to address what Bowdler (1981: 129) has referred to as "*timely and specific research questions*". These questions may relate to any number of issues concerning past human lifeways and environments and, as suggested by Bowdler's quote, will inevitably reflect current trends or problems in academic research (Burke & Smith, 2004: 249). For their part, Bowdler and Bickford (1984: 23-4) suggest that the research potential of an archaeological site can be determined by answering the following series of questions:

1. Can the site contribute knowledge which no other resource can?
2. Can the site contribute knowledge which no other such site can?
3. Is this knowledge relevant to general questions about human history or other substantiative subjects?

Several criteria can be used to assess the research potential of an archaeological site. Particularly important in the context of Aboriginal archaeology are the intactness or integrity of the site in question, its complexity and its potential for archaeological deposit (NPWS, 1997: 7). The connectedness of the site to other sites or natural landscape features may also be relevant, as may its educational potential and aesthetic qualities.

Integrity refers to the extent to which a site has been disturbed by natural and/or anthropogenic phenomena and includes both the state of preservation of particular remains (e.g. animal bones, plant remains) and, where applicable, stratigraphic integrity. Assessments of archaeological integrity are predicated on the notion that undisturbed or minimally disturbed sites are likely to yield higher quality archaeological and/or environmental data than those whose integrity has been significantly compromised by natural and/or anthropogenic phenomena. Establishing levels of preservation or integrity in the context of a surface survey is difficult. Nonetheless, useful rating schemes are available for open artefact sites (Coutts & Witter, 1977: 34) and scarred trees (Long, 2003).

The *complexity* of a site refers primarily to the nature or character of the artefactual materials or features that constitute it but also includes site structure (e.g. the physical size of the site, spatial patterning in observed cultural materials). In the case of open artefact sites, the principal criteria used to assess complexity are the site's size (i.e. number of artefacts and/or spatial extent), the presence, range and frequency of artefact and raw material types, and the presence of features such as hearths.

Potential for archaeological deposit refers to the potential of a site to contain subsurface archaeological evidence which may, through controlled excavation and analysis, assist in answering questions that are of contemporary archaeological interest. Assessing subsurface potential in the absence of subsurface investigation is difficult. Nonetheless, consideration of a range of factors, including the integrity of the site, the complexity of extant surface evidence, local geomorphic conditions (as established through surface observations and documentary research) and the results of previous archaeological excavations in the area, help inform assessment of this criterion.

Connectedness concerns the relationship between archaeological sites within a given area and may be expressed through a combination of factors such as site location, type and contents. It may, for example, be possible to establish a connection between a stone quarry and discarded edge-ground hatchet head found nearby. Demonstrating connectedness archaeologically, however, is far from straightforward, especially when dealing with surface evidence alone. Ultimately, this difficulty rests with the need to demonstrate contemporaneity between sites that may have been created hundreds, if not thousands, of years apart. As Shiner (2008: 13) has observed with respect to surface sites, "*much of the surface archaeological record documents the accumulation of materials from multiple behavioural episodes occurring over long periods of discontinuous time*". Contemporaneity, then, needs to be demonstrated not assumed.

9.2.3 Identification process for the current assessment

Information on the scientific values of the study area (i.e. with respect to Aboriginal cultural heritage) has been obtained through a desktop review of existing environmental, archaeological and ethnohistorical data for the study and its environs (**Sections 5.0**, **6.0** and **7.0**), as well as archaeological survey (**Section 8.1**) and a targeted test excavation program (**Section 8.2**).

9.2.4 Identified scientific values

The scientific values of the study area rest with the Aboriginal archaeological sites that have been identified within its bounds. As indicated in **Section 8.5** , a total of two Aboriginal archaeological sites are recognised within the study area: surface and subsurface artefact scatter SU1a-A5 (45-1-2716) and surface and subsurface stone quarry site GWB-STQ1-21.

An assessment of the scientific significance of SU1a-A5 and GWB-STQ1-21 is presented in **Table 38**. Following AMBS (2009b, 2009c), a scored ranking system has been employed for the current assessment, with overall significance ratings based on a cumulative 'score' derived from a ranked assessment of the research potential, rarity and representativeness of each site on a local and regional scale. Rankings for each of the criteria discussed above are associated with one of three potentials scores: low (score = 1), moderate (score = 2) and high (score = 3). Overall significance ratings are defined as follows:

- Low significance: score 10-15
- Moderate significance: score 16-25
- High significance: score 26-30.

Table 38 Scientific significance assessment

Site	Site type	Rarity		Represen-tativeness		Integrity		Complexity		PAD		Overall score	Overall significance
		L	R	L	R	L	R	L	R	L	R		
SU1a-A5	AS	1	1	1	1	2	2	1	1	2	1	13	Low
GWB-STQ1-21	STQ	3	2	2	2	2	2	2	1	2	1	19	Moderate

9.3 Cultural values

Social or cultural value refers to the spiritual, traditional, historic and contemporary associations and attachments a place or area has for Aboriginal people and can only be identified through consultation with Aboriginal people (OEH, 2011: 8). RAPs consulted for the current assessment have identified the following social or cultural values for the study area and its environs:

- The study area forms part of a much larger cultural landscape for the Aboriginal community. This landscape includes a number of highly significant cultural sites, with local examples including the Lidsdale burial ground and Maiyingu Marragu (Blackfellows Hand rockshelter).
- The Lidsdale burial ground, located in close proximity to the study area, is a sacred site and has associated cultural protocols and restrictions.

- The Coxs River and Pipers Flat Creek would have been focal resource features for Aboriginal people occupying the local area, offering a range of plant and animal foods, as well as rocks for flaked and edge-ground stone tool manufacture.
- Campsites in the local area would have been sited in areas of elevated, low gradient terrain overlooking, and providing ready access to, the floodplains of the Coxs River and Pipers Flat Creek.
- Excavations for the realignment of the Castlereagh Highway in the mid 2000s, which investigated elevated, low gradient landforms adjacent to the Coxs River, northeast of the study area, yielded thousands of stone artefacts, indicative of a major camping area.
- Stone artefact assemblages from the greater Lithgow-Wallerawang area tend to be dominated by artefacts manufactured out of quartz, a widely available but generally difficult material to work.
- Quarrying of the gravels exposed within the Site was likely opportunistic in nature, with people utilising gravels exposed naturally as opposed to digging for them.
- The silicified tuff present within the study area was likely obtained through trade as this high-quality material does not occur locally.

9.4 Historical values

Historic value refers to the associations that a place has with a historically important person, event, phase or activity in an Aboriginal community (OEH, 2011: 9). Historic values can but will not necessarily be represented by physical evidence. For the current assessment, an understanding of the historic values of the study area has been established through a combination of documentary research and consultation with RAPs.

Together with verbal advice from RAPs, available historical reference materials indicate that the historical values of the study area rest with:

- Its direct physical association (in part) with Pipers Flat Creek, which appears to have been a focal landscape feature for Aboriginal people occupying the greater Wallerawang area in the post-contact period
- Its proximity to the historically documented Lidsdale Aboriginal burial site
- Its direct physical association (in part) with James Walker’s initial 2000 acre land grant at Wallerawang, which is reported to have contained an Aboriginal camp that was in use until the 1880s
- The presence of a contact site in its immediate vicinity (i.e. previously recorded artefact scatter Brays Lane AS1 (45-1-2799)).

These values notwithstanding, in the absence of any *specific* physical or documentary evidence regarding Aboriginal peoples’ use of the study area post-contact, the study area is assessed as being of low historical significance.

9.5 Aesthetic values

Aesthetic value refers to the sensory, scenic, architectural and creative aspects of a place and is manifested through a range of physical and non-physical attributes (OEH, 2011: 9). Aesthetic values are not inherent in places but rather rest with peoples’ sensory and emotional responses to them. Accordingly, radical variation in responses, both within and between social and cultural groups, is to be expected (NSW NPWS, 1997: 29). *Protecting Local Heritage Places: A National Guide for Local Government and Communities* (2009:43) provides the following questions to assist individuals and groups in determining the aesthetic values of heritage places:

- *Does the place have natural or cultural features which are inspirational or evoke strong feelings or special meanings?*
- *What are those features, and to what extent are they evocative?*

- *Is the place a distinctive feature that is a prominent visual landmark?*
- *Does the place evoke awe from its grandeur of scale? To what extent is this important?*
- *Does the place evoke a strong sense of age, history or time depth? How does it do this, and to what extent?*
- *Is the place symbolic for its aesthetic qualities? Has it been represented in art, poetry, photography, literature, folk-art, folklore mythology or other imagery?*
- *Does the place have outstanding composition qualities involving any combinations of colour, form, texture, detail, movement, unity, sounds, scents, spatial definition and so on? To what extent is this important?*

While a significant proportion of the study area has been severely disturbed through historical land use activities, parts of both the Site and transmission line corridor remain undeveloped and are considered to retain moderate aesthetic significance on the basis of their contemporary scenic qualities and/or the retention of a natural ambience. Features of particular note here include the primary low gradient ridgeline within the Site, which offers expansive views to the east/northeast, and areas of potential remnant vegetation within the transmission line corridor.

9.6 Consolidated statement of significance

The study area forms part of a larger cultural landscape of high cultural significance to Wiradjuri, Darug and Gundungurra people. The study area contains evidence of Aboriginal peoples' long physical and spiritual association with the land and natural resources of the valleys housing both the Coxs River and Pipers Flat Creek. Known Indigenous sites within and immediately surrounding the study area hold cultural significance to contemporary Wiradjuri, Darug and Gundungurra people, attesting to traditional habitation, subsistence and land use patterns, including stone procurement and tool manufacturing systems, as well as burial practises.

Existing archaeological datasets for the study area, including the results of the current assessment, suggest a widespread Aboriginal presence in the past. Amongst other activities, surface and subsurface evidence from the Site attests to Aboriginal quarrying of quartz-dominant gravel deposits associated with the Late Permian Shoalhaven Group. Quartz pebbles and cobbles were sourced and worked on-site, with available evidence suggesting the presence of multiple quartz reduction sites across the broad, low gradient ridgeline that dominates the topography of the Site. Further subsurface investigations across newly identified stone quarry site GWB-STQ1-21 are expected to yield a sizeable cultural lithic assemblage, the analysis of which could be used to address a range of research questions concerning past Aboriginal quarrying activities, as well as broader habitation, mobility and land use patterns. Aboriginal stone quarries are rare on a local scale and relatively rare on a regional scale. As a reasonable example of its type, GWB-STQ1-21 has been assigned moderate scientific significance.

East of Brays Lane, surface and subsurface evidence associated with artefact scatter site SU1a-A5 suggest low intensity Aboriginal use of the left bank floodplain of Pipers Flat Creek. Artefact scatters are a locally and regionally common site type and SU1a-A5 is considered a poor example of its type. Accordingly, it has been assigned low scientific significance.

Together with verbal advice from RAPs, available historical reference materials indicate that the historical values of the study area rest with its direct physical associations with Pipers Flat Creek and James Walker's initial 2000 acre land grant at Wallerawang, features of reported significance to Aboriginal families occupying the greater Wallerawang area in the post-contact period, as well as its proximity to the historically documented Lidsdale Aboriginal burial site and previously recorded contact site Brays Lane AS1 (45-1-2799)). These values notwithstanding, in the absence of any *specific* physical or documentary evidence regarding Aboriginal peoples' use of the study area post-contact, this area is considered to be of low historical significance.

With regards to its aesthetic qualities, while a significant proportion of the study area has been severely disturbed through historical land use activities, parts of both the Site and transmission line corridor remain undeveloped and are considered to retain moderate aesthetic significance on the basis of their contemporary scenic qualities and/or the retention of a natural ambience. Features of particular note here include the primary low gradient ridgeline within the Site, which offers expansive views to the east/northeast, and areas of potential remnant vegetation within the transmission line corridor.

Figure 22
Scientific Significance

N
0 100 200 m

Legend
- Study Area
- Watercourse
- Railway
- Local Road
- Contours

Scientific Significance of Aboriginal Sites
- Low
- Moderate

10.0 Impact assessment

10.1 Proposed construction activities

The construction of the Project would be likely to include the following:

10.1.1 Enabling works

- Site preparation: establishing site access, establishing erosion and sediment controls, establishing marked no go areas, site clearing, installing security fencing, establishing laydown areas, establishing construction amenities (including temporary offices, lunchrooms, storage areas and washrooms)
- Transportation of plant, equipment, materials and workforce to and from the Site as required
- Provision of construction power: installing on site generators until power can be sourced from the existing distribution network.

10.1.2 Civil, structural, mechanical and electrical works

- Earthworks to form a level and benched BESS pad and new substation area, as well as to infill dams as required and expand retained dams to store and help treat water at the Site. These works would include potential import or export of fill as required
- Installation of Site drainage (including swales), stormwater management measures and underground utilities installation
- Hardstand foundations in the form of compressed gravel or concrete slab would be laid to support BESS battery enclosures, site facilities and ancillary components (including the small carpark, new substation and water tank)
- Transport of Project elements including but not limited to the batteries, transformers, water tank, and operation and maintenance buildings
- Connections to surrounding utilities located in Brays Lane
- Installation of noise walls
- Construction, installation and connection of aboveground civil, mechanical and electrical plant equipment and structures, including battery enclosures, invertors, transformers, substation infrastructure and connection infrastructure
- Construction of supporting structures, e.g. operation and maintenance buildings and associated amenities, formal access, permanent fencing and internal roads
- Construction of transmission connection between the Site and the TransGrid Wallerawang 330 kV substation including installation of supporting infrastructure, laying and connecting the transmission line, and minor enabling works at the TransGrid Wallerawang 330 kV substation.

10.1.3 Commissioning

- Testing and commissioning activities. Commissioning would include the operation of all elements of the Project ensuring the Project is operating safely and in accordance with quality and environmental management systems and processes.

10.1.4 Finishes and demobilisation

- Installation of landscaping and rehabilitation of disturbed areas (e.g. laydown areas)
- Removal of construction equipment and construction facilities.

10.1.5 Materials, stockpiling and laydown areas

The location at the Site for construction laydown, storage and parking is shown on **Figure 23**, and would provide for:

- Spoil handling and storage
- Dangerous goods storage (such as diesel to fuel generators on the Site)
- Equipment storage
- Onsite construction parking
- Large vehicle turn-around area
- Construction compounds with site offices and staff amenities.

The location of where each of these specific elements would occur would be outlined within the Construction Environmental Management Plan (CEMP). The CEMP would be prepared by the contractor prior to the commencement of construction.

Construction laydown, storage and parking areas would be compacted and sheeted (for example with asphalt), as required. All areas would have adequate drainage and erosion and sediment controls installed.

10.1.6 Transmission line connection

The proposed new transmission line would be installed below ground using a combination of open trench and underboring methods.

To construct the new transmission line using open trenching, a small excavator would be used to dig a trench to the appropriate depth, and excavated materials would be temporarily stockpiled adjacent to the trench to use as backfill. The depth to which the trench would be dug would allow for the correct overlying coverage required by the relevant Australian standards, codes, regulations and guidelines (such as the National Electricity Network Safety Code for a 330kV cable and the Electricity Supply (Safety and Network Management) Regulation 2014). However, the depth of the trench is unlikely to exceed 1.5 m b.g.l. A ballast such as sand would be laid in the trench, followed by the cable and any required cable accessories and connections. Once the cable installed, the trench would be backfilled using the previously stockpiled materials (where possible). The method would be employed progressively along the alignment, to limit the extent of exposed soil at any given time during the construction of the new transmission line.

Underboring would take place using horizontal direction drilling (HDD). HDD is a trenchless construction method for installing conduits that is associated with less surface ground disturbance than trenching.

For HDD, a launch pit would be constructed to accommodate plant and equipment (including an area to layout the conduit, conduct pipe-stringing activities, and to set up a drill rig). A drill rig is used to bore an opening in the ground through which a pipe is passed through. The hole is opened by passing progressively larger pipes through the bore hole until a sufficient diameter is reached to allow the conduits to be passed through. Drilling fluid is used in the process of HDD, which comprises a mixture of water and biologically neutral drill additives (such as bentonite). This fluid is continuously pumped through the bore and serves multiple purposes, including cooling the drill cutting head, removing cuttings, stabilising the bore hole and lubricating the passage of the conduits. Slurry generated from the drilling fluid would be primarily be captured and reused in the HDD process. When this is no longer feasible the waste slurry would be collected and appropriately disposed.

10.2 Aboriginal heritage impacts

Proposed ground disturbance activities within the study area are anticipated to result in a near-complete loss of value for stone quarry GWB-STQ1-21 and, subject to appropriate protective measures, no loss of value for artefact scatter SU1a-A5 (**Table 39**). As shown on **Figure 23**, impacts to GWB-STQ1-21 would occur as a result of the construction of multiple project components, with the most significant impacts to artefact-bearing soil profiles and surfaces within the site associated with the construction of the benched BESS pad and new substation area.

Construction of the transmission line within and immediately surrounding artefact scatter SU1a-A5 would occur using HDD at a nominal depth of 1.5 m b.g.l. No launch pits are proposed within the SU1a-A5 site. In view of the maximum observed depth of subsurface Aboriginal objects within SU1a-A5 (i.e. 40 cm b.g.l) no HDD impacts to the site are anticipated.

Subject to the implementation of appropriate protective measures (e.g. high-visibility fencing), light and/or heavy vehicle movements associated with the HDD process are assessed as carrying a negligible impact risk for SU1a-A5.

Table 39 Impact assessment for Aboriginal sites within the study area

Site name	AHIMS ID(s)	Site type	Type of harm	Degree of harm	Consequence of harm	Site area (m^2)	Area of Impact (m^2)	Total%
SU1a-A5	45-1-2716	Artefact scatter (surface and subsurface)	Will not be harmed	None	No loss of value	9,460	-	-
GWB-STQ1-21	45-1-2853	Stone quarry (surface and subsurface)	Direct	Partial	Partial loss of value	26,821	25,791	96.2%

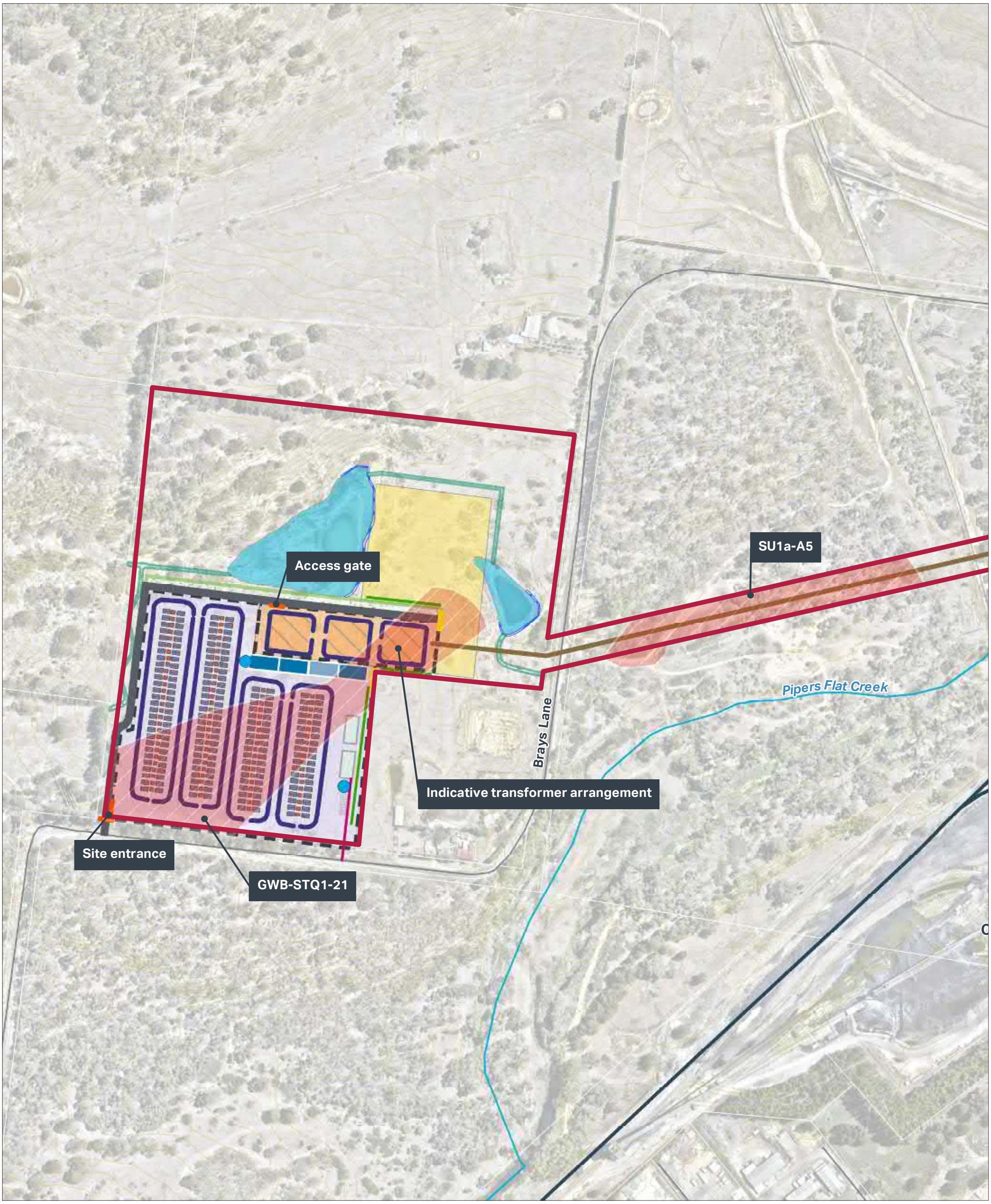


Figure 23
Impact Assessment

- Study Area
- Aboriginal Sites
- Internal access road
- Noise wall
- Access Gate
- Security Fencing
- Water Connection Point
- Transmission Line Alignment
- Emergency Exit
- Watercourse
- Local Road
- Railway
- Contours
- Water Tank
- Large Transformers
- Bioretention System
- Dam Walls
- Swales
- 330 kV Substation
- Control Room
- Switch Rooms
- Landscape Planting
- O&M Building
- Carpark
- Approx Extent Of Dam Modification
- Construction Laydown, Storage And Parking
- BESS Area
- Battery and Inverter
- Transformers

N

0 60 120 m

AECOM

10.3 Cumulative impact assessment

10.3.1 Assessment of ecologically sustainable development

In NSW, the NPW Act provides the legislative framework for the protection of Aboriginal objects and places. Section 2A(2) of the NPW Act stipulates that such protection is to be achieved by applying the principles of ecologically sustainable development. Ecologically sustainable development requires the integration of economic and environmental considerations (including cultural heritage) in decision-making processes and, in the context of Aboriginal cultural heritage, can be achieved through the implementation of two key principles: intergenerational equity and the precautionary principle.

Intergenerational equity is the principle whereby the present generation should ensure the health, diversity and productivity of the environment for the benefit of future generations. With regards to Aboriginal heritage, intergenerational equity can be assessed in terms of cumulative impacts to Aboriginal objects and places in a region. Central to any assessment of intergenerational equity is the proposition that regions with fewer Aboriginal objects and places necessarily retain fewer opportunities for future generations of Aboriginal people to enjoy their cultural heritage. Accordingly, information regarding the known and potential Aboriginal heritage resource of a given region is critical to any assessment of intergenerational equity.

The precautionary principle holds that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation. In NSW, the precautionary principle is relevant to DPE's consideration of potential impacts to Aboriginal cultural heritage in situations where:

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

In these instances, Heritage NSW has indicated that a precautionary approach should be taken, and all cost-effective measures implemented to prevent or reduce damage to Aboriginal objects and/or places. In addition to these measures, a cumulative impact assessment should be undertaken to gain an understanding and appreciation of the impacts that development will have on NSW's Aboriginal cultural heritage.

It should be noted that the results of cumulative impact assessments undertaken for cultural heritage sites and places, Aboriginal or otherwise, must be interpreted with caution, not least because they are based in part on heritage datasets that are inevitably incomplete and contain various inconsistencies and errors. Godwin (2011), in particular, has questioned the value of cumulative impact assessments to cultural heritage management in Australia, arguing that the 'fundamentals' necessary for undertaking such assessments simply do not exist. The 'fundamentals' Godwin is referring are robust regional and national data sets for measuring proposed impacts and the determination of acceptable scientific and cultural impact thresholds. While recognising the validity of the issues raised by Godwin (2011), current Heritage NSW guidelines necessitate that a cumulative impact assessment be undertaken as part of any Aboriginal cultural heritage assessment in NSW.

10.3.2 Intergenerational equity - cumulative impact assessment

Two avenues for assessing the cumulative impact of the Project on Aboriginal heritage can be pursued:

1. A comparison, using the results of searches of the AHIMS database, of the identified Aboriginal archaeological record of the study area with that of the surrounding region, defined here as an arbitrary 30 x 30 km (900 km^2) area centred on the study area; and
2. The use of existing environmental data sources to identify the potential for stone quarries comparable to GWB-STQ1-21 to exist within the broader study region.

10.3.3 Known resource

Alongside those identified within the study area, existing Aboriginal sites in the study region offer opportunities for future research, conservation and education. Accordingly, it is necessary to quantify the impacts of the Project on this combined cultural resource. As indicated in **Section 8.5**, a total of two Aboriginal sites have been identified within the study area: artefact scatter SU1a-A5 and stone quarry GWB-STQ1-21. An assessment of the potential impacts of the Project on these sites has identified a near-complete loss of value for GWB-STQ1-21 and no loss of value for SU1a-A5.

AHIMS data indicate that artefact scatter SU1a-A5 currently represents 0.5% of the extant open artefact resource of the study region (**Table 40**), with searches of the AHIMS database on 15 October 2021 returning 195 'Valid' and ten 'Partially Destroyed' open artefact site entries for this area. In contrast, no Aboriginal stone quarries have been registered within the study region to date. Other site types present within the study region but not represented within the study area include rockshelters, scarred trees, grinding grooves, PADs, burials, rock art sites and stone arrangements.

While acknowledging the various limitations of the AHIMS database, on the basis of the data presented in **Table 40** and the significance assessment provided in **Section 9.0**, it is concluded that proposed impacts to GWB-STQ1-21 within the study area would constitute a moderate adverse impact to the Aboriginal archaeological record of the study region. A moderate rating is deemed prudent in this context given GWB-STQ1-21's moderate scientific significance and the fact that, although numerous Aboriginal archaeological investigations incorporating survey and/or excavation have been undertaken within the study region to date, the majority of land within this area has not been physically inspected for Aboriginal sites.

Table 40 AHIMS search results for cumulative impact study region

Site type	Valid	Partially Destroyed	Destroyed	Total	%
Open artefact site	195	10	8	213	62.5
Rockshelter	94	-	-	94	27.6
Scarred tree	11	-	-	11	3.2
Grinding groove(s)	9	-	-	9	2.6
PAD	4	-	1	5	1.5
Burial	3	-	-	3	0.9
Rock art	3	-	-	3	0.9
Stone Arrangement	3	-	-	3	0.9
Grand Total	**322**	**10**	**9**	**341**	**100**

10.4 Potential resource

Based on the results of archaeological investigations covering only a fraction of the study region, the AHIMS data described above provide an insufficient picture of the cumulative impact of the Project on the region's Aboriginal archaeological record. Accordingly, an assessment of the potential resource of this area, focussing on Aboriginal stone quarries, is required. For the present analysis, a combination of digital environmental data sources, including NSW land use data (dated 2017), regional surface geology and topographic data, have been used to prepare a provisional assessment of this resource.

As a starting point, it is necessary to quantify the amount of land within the study region that has the *potential* to retain to stone quarries comparable to GWB-STQ1-21. A basic assumption here is that areas of severely disturbed terrain are unlikely to retain such sites whereas areas of intact, or relatively intact terrain, are likely to retain sites. Analysis of the most recent digital land use data available for the study region, obtained from the NSW Government SEED resource, indicates that severely modified or disturbed terrain (e.g. roads and railways, urban areas, mined land, dams, man-made lakes) accounts for around 9% of land within the region. Outside of severely disturbed areas, grazing land and plantation forests are particularly well represented, accounting for around 37% and 35% of land within the region respectively. Cropped agricultural land (including horticultural crops) is comparatively poorly represented at c.1.5%. Areas of remnant or regenerating native vegetation, meanwhile, account for around 16.5 % of land within the region. Natural water features (e.g. rivers, wetlands) make up the remaining c.1.5 per cent.

Viewed from an archaeological perspective, the results of the land use analysis presented in **Figure 18** suggest that around 91% of land within the study region retains potential for the presence of Aboriginal archaeological deposits in surface and/or subsurface contexts (albeit of variable character and integrity), including those with evidence of stone quarrying. As indicated, land in which such deposits are unlikely to survive accounts for around 9% of land within the region. This figure increases to 82% if agricultural and grazing land, as well areas of plantation forestry, are included. However, as indicated by the results of numerous Aboriginal archaeological investigations, both within and outside of the study region, such areas can and frequently do retain such deposits.

In order to quantify the impact of the Project on the potential Aboriginal archaeological resource of the study region, we must first quantify the amount of land within the study area that would be significantly disturbed by the Project. To this end, assuming a complete loss of archaeological potential in areas earmarked for key site features, and noting existing levels of land disturbance within the study area, the Project would be expected to result in a c.0.02 per cent decline in the region's potential Aboriginal archaeological resource. On this basis, it is concluded that the impact of the Project on this resource would be negligible.

With regards to the existence, outside of the study area, of environmental contexts that have the potential to Aboriginal stone quarries comparable to GWB-STQ1-21, existing geological and topographic datasets for the study region indicate that many such contexts exist. Geological units conducive to the presence of such sites (e.g. the Triassic Narrabeen Group, the Late Permian Illawarra Coal Measures, the Early Permian Shoalhaven Group) are strongly represented across the region, as is low gradient terrain conducive to Aboriginal use in the past. For the "off-plateau" components of the study region under investigation, elevated, low gradient landform elements adjacent to higher order watercourses such as the Coxs River, Pipers Flat Creek, Dulhuntys Creek, Farmers Creek and Thompsons Creek are expected to contain a significant, as yet unidentified, Aboriginal archaeological resource, including multiple, as yet unidentified stone quarries.

Table 41 Land use analysis

Land use	Ha	%
Nature conservation	4656.8	5.17
Managed resource protection	5.1	0.01
Other minimal use	10154.5	11.28
Grazing native vegetation	18328.9	20.37
Production native forestry	30967.7	34.41
Plantation forests	150.9	0.17
Grazing modified pastures	15184.1	16.87
Cropping	1296.0	1.44
Perennial horticulture	23.8	0.03
Irrigated cropping	15.5	0.02
Intensive horticulture	0.5	0.001
Intensive animal production	11.5	0.01
Manufacturing and industrial	120.1	0.13
Residential and farm infrastructure	3227.4	3.59
Services	1413.8	1.57
Utilities	379.5	0.42
Transport and communication	857.4	0.95
Mining	1278.5	1.42
Waste treatment and disposal	68.9	0.08

Land use	Ha	%
Lake	375.9	0.42
Reservoir/dam	87.9	0.10
River	1133.5	1.26
Marsh/wetland	261.8	0.29
Total	**90,000**	**100**

11.0 Management strategy

Measures to both mitigate and manage the potential impacts of the Project on the identified Aboriginal cultural heritage values of the study area have been developed on the basis of:

- The results of the archaeological field investigations described in **Section 8.0**
- The results of previous archaeological investigations surrounding the study area
- The significance and impact assessments detailed in **Section 9.0** and **Section 10.0**
- Consultation with RAPs
- Neoen's legal responsibilities under the NPW Act.

It is recommended that the measures outlined below be detailed in an ACHMP for the Project, which should be prepared in consultation with RAPs and DPE. Subject to its approval by DPE, this document would guide the management of Aboriginal cultural heritage within the study area throughout the life of the Project. Key components of the ACHMP are outlined below.

11.1.1 Archaeological salvage of stone quarry GWB-STQ1-21

Newly identified surface and subsurface stone quarry site GWB-STQ1-21 would be directly impacted by the Project, resulting in a near-complete loss of value. To mitigate the impact of the Project on this site, which has been assessed as being of moderate scientific significance, an archaeological salvage program incorporating surface collection and manual open area excavation is recommended for GWB-STQ1-21. Salvage activities within GWB-STQ1-21 should occur prior to the commencement of any construction activities within the Site and be undertaken in accordance with the salvage methodology provided in **Appendix M** of this ACHAR.

11.1.2 Protective fencing of artefact scatter SU1a-A5

Surface and subsurface artefact scatter SU1a-A5 is not expected to be impacted by the Project. Nonetheless, to avoid any inadvertent impacts during construction, it is recommended that the site be protected via the installation of high-visibility fencing. Fencing should be installed along the boundary of the site (**Figure** 21) prior to the commencement of any construction activities within the transmission line corridor and be actively maintained throughout the construction phase of the Project. The location of SU1a-A5 should be clearly defined within the CEMP and any associated plans as an 'environmental no go zone'.

Should Neoen and/or its contractors require use of the vehicle track within SU1a-A5, alternative access arrangements should be investigated and detailed in the ACHMP.

11.1.3 Unexpected Aboriginal Heritage Finds Procedure (UAHFP)

An Unexpected Aboriginal Heritage Finds Procedure (UAHFP) should be included in the ACHMP to cover the unanticipated discovery, at any point outside of the GWB-STQ1-21 salvage program, of an actual or potential Aboriginal heritage item for which Neoen does not have an existing management process in place. The procedure should cover all Aboriginal objects (as defined by the NPW Act), including human skeletal remains.

Management action(s) for unexpected finds will vary according to the type of evidence identified, its significance (both scientific and cultural) and the nature of potential impacts.

11.1.4 Consultation protocols

Provisions regarding appropriate consultation protocols with RAPs should be incorporated into the ACHMP. Contact details and preferred contact methods for each RAP, as well as other relevant stakeholders, should be specified.

11.1.5 Aboriginal cultural heritage awareness

Neoen should ensure that the Project's standard environmental site induction includes an Aboriginal heritage component. At a minimum, this should outline current protocols and responsibilities with respect to the management of Aboriginal cultural heritage within the study area (including the UAHFP) and provide an overview of the diagnostic features of potential Aboriginal site types/objects.

11.1.6 Reporting under the ACHMP

Any Aboriginal archaeological works carried out under the ACHMP for the Project should be prepared to a standard comparable to that required by the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*. Printed and/or digital copies of any associated reports should be made available to RAPs upon request.

11.1.7 Periodic Review of ACHMP

The ACHMP for the Project should be subject to periodic review to ensure that all management policies are being adhered to and are working effectively. Periodic reviews will also provide an opportunity to make modifications to existing policies and to add, where appropriate, new policies.

12.0 References cited

AECOM Australia Pty Ltd. (2016). *Archaeological Test Excavation of Aboriginal Rockshelter Sites S1MC331, S1MC343 and S1MC344 Moolarben Mine Complex, Ulan, NSW*.

Andrefsky, W. (2005). *Lithics: Macroscopic Approaches to Analysis*. Cambridge: Cambridge University Press.

Apex Archaeology. (2014). *Wilpinjong Coal Mine : Aboriginal Archaeological Excavation Report WCP126, WCP214 and WCP216*. Unpublished report for Wilpinjong Coal Pty Limited.

Attenbrow, V. (2010). *Sydney's Aboriginal Past: Investigating the Archaeological and Historical Records*. Sydney: UNSW Press.

Attenbrow, Val. (2006). *What's Changing: Population Size or Land-Use Patterns? The Archaeology of Upper Mangrove Creek, Sydney Basin* (Terra Aust). Canberra: ANE E-Press.

Attenbrow, Val. (2009). The Mountain Darug. In *Blue Mountains Dreaming: the Aboriginal heritage* (2nd ed., pp. 105–128). Leura: Megalong Books.

Australia ICOMOS. (2013). Understanding and Assessing Cultural Significance. Australia ICOMOS Incorporated.

Australian Museum Business Services. (2000). *Mungerie Park Town Centre: Archaeological Salvage Excavations near Kellyville, Cumberland Plain, NSW*.

Australian Museum Business Services. (2009a). *Kurri-Redbank Feeder 953/95R (132kV) Upgrade: Aboriginal Heritage Assessment, Hunter Valley,NSW*. Unpublished report for Energy Australia.

Australian Museum Business Services. (2009b). *Kurri Kurri Aboriginal Heritage Assessment for the 33kV Kurri-Rutherford Feeder Split: Stage 1 and Stage 2 Works*. Unpublished report for Energy Australia.

Bamforth, D. B., & Bleed, P. (1997). Technology, Flaked Stone Technology, and Risk. In C. M. Barton & G. A. Clark (Eds.), *Rediscovering Darwin: Evolutionary Theory and Archaeological Explanation* (Archaeolog, pp. 109–139). Washington: American Anthropological Association.

Barton, H., & McDonald, J. (1995). *Archaeological Investigation of Sites affected by Augmentation works at Lyell Dam, near Lithgow, NSW*. Unpublished report for Pacific Power.

Bickford, A., & Sullivan, S. (1984). Assessing the research significance of historic sites. In S. Sullivan & S. Bowdler (Eds.), *Site survey and significance assessment in Australian Archaeology* (1st ed., pp. 19–26). Canberra: Australian Institute of Aboriginal Affairs.

Biosis Pty Ltd. (2017). *Aboriginal Due Diligence Assessment for Wallerawang (2WAL-20), NSW*. Unpublished report for Tata Consultancy Services.

Bowdler, S. (1983). *Aboriginal Sites on the Crown-Timber Lands of NSW*. Unpublished report for Forestry Commission of NSW.

Bowdler, Sandra. (1981). Unconsidered Trifles? Cultural Resource Management, Environmental Impact Statements and Archaeological Research in New South Wales. *Australian Archaeology*, *12*.

Bowler, J., Jones, R., Allen, H., & Thorne, A. (1970). Pleistocene Human Remains From Australia: A Living Site and Human Cremation from Lake Mungo, Western New South Wales. *World Archaeology*, *2*, 29–60.

Brayshaw, H., & Haglund, L. (1995). *St Columba's Springwood Central Blue Mountains - Aboriginal Heritage*. Unpublished report for Blue Mountains City Council.

Brayshaw, Helen. (1986). *Archaeological Survey of a Hard Rock Quarry Near Gulgong, NSW*. Unpublished report for Boral Limited.

Burke, H, & Smith, C. (2004). *The Archaeologist's Field Handbook*. Sydney: Allen & Unwin.

Burke, Heather, & Smith, C. (2004). *The Archaeologist's Field Handbook*. Sydney: Allen & Unwin.

Central West Archaeological and Heritage Services. (1998). *An archaeological study for the proposed replacement of the Lidsdale Overbridge and Highway Realignment, State Highway 18 Castlereagh Highway, Lidsdale, in the Central Tablelands of NSW*. Unpublished Report to Terra Sciences Pty Ltd.

Coutts, P. J. F., & Witter, D. C. (1977). Summer Field Programme of the Victoria Archaeological Survey. *Australian Archaeology*, *6*.

Dean-Jones, P., & Mitchell, P. B. (1993). *Hunter Valley Aboriginal Sites Assessment Project. Environmental Modelling for Archaeological Site Potential in the Central Lowlands of the Hunter Valley.* Unpublished report for NSW National Parks and Wildlife Service.

Department of Environment & Conservation. (2006). *The Vegetation of the Western Blue Mountains (including the Capertee, Cox's, Jenolan and Gurnang Areas). Volume 2: Vegetation Community Profiles*. Unpublished report funded by the Hawkesbury-Nepean Catchment Management Authority.

Doelman, T. (2008). *Time to Quarry: The Archaeology of Stone Procurement in Northwestern New South Wales, Australia* (BAR Intern). Oxford: Archaeopress.

Ebert, J. I. (1992). *Distributional Archaeology*. Albuquerque: University of New Mexico Press.

English Heritage. (2011). *Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation*. London: English Heritage.

Environmental Services. (1996). *Archaeological Monitoring of Drainage Works, Wallerawang Schoolhouse*. Unpublished Report for Delta Electricity: Unpublished report for Delta Electricity.

Fanning, P. C., & Holdaway, S. J. (2004). Artifact Visibility at Open Sites in Western New South Wales, Australia. *Journal of Field Archaeology*, *29*, 255–271.

Fanning, P. C., Holdaway, S. J., Rhodes, E. J., & Bryant, T. G. (2009). The Surface Archaeological Record in Arid Australia: Geomorphic Controls on Preservation, Exposure, and Visibility. *Geoarchaeology*, *24*(2), 121–146.

Foley, R. (1981). *Off-site Archaeology and Human Adaption in Eastern Africa. An Analysis of Regional Artefact Density in the Amboseli, Southern Kenya* (BAR Intern). Oxford: British Archaeological Reports.

Gemmell-Smith, P. (2018). *Mountain Beings: Relationships with Land in the Oberon District 1800-1900*. University of Technology, Sydney.

Godwin, L. (2011). The Application of Assessment of Cumulative Impacts in Cultural Heritage Management: A Critique. *Australian Archaeology*, *73*(73), 88–91.

Gould, R. (1969). Puntutjarpa Rockshelter: A Reply to Messrs Glover and Lampert. *Archaeology and Physical Anthropology in Oceania*, *4*, 229–237.

Haglund, L. (1981). Archaeological Investigations in the Area of the Proposed Kerrabee Dam: Part I (Report). Unpublished report for NSW National Parks and Wildlife Service.

Haglund, Laila. (1981). *Archaeological Survey and Sampling at the Site of the Ulan Coal Mine, Ulan, NSW*. Unpublished report for Longworth and McKenzie Pty Ltd.

Haglund, Laila. (1996). *Salvage Excavation Completed for Ulan Coal Mines Ltd: NPWS Site 36-3-177, Ulan Heritage Identifier 116*. Unpublished report for Ulan Coal Mines Ltd.

Haglund, Laila. (2001). *Salvage Excavation Completed for Ulan Coal Mines Ltd: Site SG5, Aboriginal Rockshelter Site, in Compliance with Requirements Under NPWS Consent #1002. Volume 1. Overview.* Unpublished report for Ulan Coal Mines Ltd.

Hamm, G., Mitchell, P., Arnold, L. J., Prideaux, G. J., Questiaux, D., Spooner, N. A., … Johnston, D. (2016). Cultural Innovation and Megafauna Interaction in the Early Settlement of Arid Australia.

Nature, *539*, 280–283.

Hamm, Giles. (2006). *Moolarben Coal Project - Aboriginal Cultural Heritage Assessment Report*. Unpublished report for Moolarben Coal Mines Pty Ltd.

Hamm, Giles. (2008). *Moolarben Coal Project - Aboriginal Cultural Heritage Assessment Report Stage 2*. Unpublished report for Moolarben Coal Mines Pty Ltd.

Hamm, Giles, & Foley, L. (2010). *Cultural Heritage Management Report on Moolarben Coal Project Stage 1: Open Cut 1 & Main Infrastructure Area*. Unpublished report for Moolarben Coal Operations Pty Ltd.

Heritage Search. (1999). *Proposed Realignment of the Castlereagh Highway, Lidsdale, NSW: Indigenous Heritage Assessment*. Unpublished report to RTA Technology: Unpublished report for RTA Technology.

Hiscock, P., & Attenbrow, V. (2004). A Revised Sequence of Backed Artefact Production at Capertee 3. *Archaeology in Oceania*, *39*(2), 49–63.

Hiscock, P., & Attenbrow, V. (2005). *Australia's Eastern Regional Sequence Revisited: Technology and Change at Capertee 3* (BAR Intern). Oxford: British Archaeological Reports.

Hiscock, P., & Attenbrow, V. (2011). Technology and Technological Change in Eastern Australia: The Example of Capertee 3. In *Keeping your Edge: Recent Approaches to the Organisation of Stone Artefact Technology* (BAR Intern). Oxford: Archaeopress.

Hiscock, Peter. (1993). Bondaian Technology in the Hunter Valley, New South Wales. *Archaeology in Oceania*, *28*, 65–76.

Hiscock, Peter. (1994). Technological Responses to Risk in Holocene Australia. *Journal of World Prehistory*, *8*(3), 267–292.

Hiscock, Peter. (2001). Sizing up Prehistory: Sample Size and Composition of Artefact Assemblages. *Australian Aboriginal Studies*, *1*, 48–62.

Hiscock, Peter. (2002). Pattern and Context in the Holocene Proliferation of Backed Artefacts in Australia. In R. Elston & S. Kuhn (Eds.), *Thinking Small: Global Perspectives on Microlithization* (pp. 163–177). Archaeological Papers of the American Anthropological Association.

Hiscock, Peter. (2005). Artefacts on Aru: Evaluating the Technological Sequences. In S. O'Connor, M. Spriggs, & P. Veth (Eds.), *The Archaeology of the Aru Islands, Eastern Indonesia* (pp. 205–234). Canberra: Pandanus Books.

Hiscock, Peter. (2006). Blunt and to the Point: Changing Technological Strategies in Holocene Australia. In I. Lilley (Ed.), *Archaeology of Oceania: Australia and the Pacific Islands* (pp. 69–95). Oxford: Blackwell.

Holdaway, S. J., Fanning, P., & Witter, D. C. (2000). Prehistoric Aboriginal Occupation of the Rangelands: Interpreting the Surface Archaeological Record of Far Western NSW. *The Rangeland Journal*, *22*(1), 44–57.

Holdaway, S. J., & Stern, N. (2004). *A Record in Stone: The Study of Australia's Flaked Stone Artefacts*. Canberra: Aboriginal Studies Press.

Hughes, P. J., Hiscock, P., & Watchman, A. (2011). Terminological Debate in the Upper Hunter Valley: Indurated Mudstone versus Tuff. *Australian Archaeology*, *72*.

Hughes, P. J., Spooner, N., & Questiaux, D. (2014). The Central Lowlands of the Hunter valley, NSW: Why So Few Early Sites Have Been Found in this Archaeologically-rich Landscape. *Australian Archaeology*, *79*, 34–44.

ICOMOS (Australia). (2013). *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*. Burwood, Victoria, Victoria: Australia ICOMOS. Retrieved from http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf

Jo McDonald Cultural Heritage Management Pty Ltd. (2001). *Salvage Excavations of Six Sites along Caddies, Second Ponds, Smalls and Cattai Creeks in the Rouse Hill Development Area, NSW*. Unpublished report for Rouse Hill Infrastructure Consortium.

Jo McDonald Cultural Heritage Management Pty Ltd. (2005). *Archaeological Salvage Excavation of Eight Archaeological Landscapes in the Second Ponds Creek Valley, Rouse Hill Development Area, NSW*. Unpublished report for Rouse Hill Infrastructure Pty Ltd and Landcom.

Jo McDonald Cultural Heritage Management Pty Ltd. (2007). *Salvage Excavation of Four Archaeological Sites in the Caddies Creek Precinct, Rouse Hill Regional Centre, NSW*. Unpublished report for Lend Lease GPT (Rouse Hill) Pty Ltd.

Johnson, I. (1977). Abercrombie Arch Shelter: An Excavation near Bathurst, N.S.W. *Australian Archaeology*, *6*, 28–40.

Johnson, Ian. (1979). *The Getting of Data: A Case Study from the Recent Industries of Australia*. Australian National University.

Kelleher, M. (2002). *Archaeology of Sacred Space: The Spatial Nature of Religious Behaviour in the Blue Mountains National Park Australia*. University of Sydney.

King, D. P. (1993). *Soil Landscapes of the Wallarewang 1:1000 000 Sheet*. Department of Conservation and Land Management.

Kuhn, S. (1994). A Formal Approach to the Design and Assembly of Mobile Toolkits. *American Antiquity*, *59*(3), 426–442.

Kuskie, P. (2009). *Ulan Coal Continued Operations: Aboriginal Heritage Assessment*. Unpublished report for Umwelt (Australia) Pty Limited. https://doi.org/10.1017/CBO9781107415324.004

Kuskie, P. (2012). *Ulan Coal Continued Operations Project: Test Excavation of Aboriginal Rock Shelter Sites Within The North 1 Panels - Interim Report*. Unpublished report for Ulan Coal Mines Ltd.

Kuskie, P. (2013a). *Moolarben Coal Project - Stage 1 Optimisation Modification, Near Ulan, Central Tablelands of New South Wales: Aboriginal Cultural Heritage Assessment*. Unpublished report for Moolarben Coal Pty Ltd.

Kuskie, P. (2013b). *Wilpinjong Coal Mine, Central Tablelands of NSW - Modification: Aboriginal Cultural Heritage Assessment*. Unpublished report for Wilpinjong Coal Pty Ltd.

Kuskie, P., & Clarke, E. (2005). *Proposed Open Cut Mine Extension and Additional Infrastructure at Ulan Coal Mine, New South Wales: Aboriginal Cultural Heritage Assessment*. Unpublished report for Ulan Coal Mines Ltd.

Long, A. (2003). *Scarred Trees: An Identification and Recording Manual*. Prepared for Aboriginal Affairs Victoria.

Low, M. (2015). Investigating Standardisation in the Form of Backed Artefacts at Two Sites in the Hunter River Valley, NSW, Australia. *Australian Archaeology*, *80*, 60–69.

Macdonald, G. M. (1983). *The Concept of Boundaries in Relation to the Wiradjuri People of Inland New South Wales: An Assessment of Inter-Group Relations at the Time of European Contact*. Report prepared on behalf od Wiradjuri Land Council.

McCarthy, F.D. (1948). The Lapstone Creek Excavation: Two Culture Periods Revealed in Eastern New South Wales. *Records of the Australian Museum*, *22*(1), 1–34.

McCarthy, F.D. (1964). The Archaeology of the Capertee Valley, New South Wales. *Records of the Australian Museum*, *26*(6), 197–264.

McCarthy, Frederick David. (1967). *Australian Aboriginal Stone Implements* (2nd Ed.). Sydney: The Australian Museum Trust.

McDonald, J. (1994). *Dreamtime Superhighway: An Analysis of Sydney Basin Rock Art and Prehistoric Information Exchange*. Australian National University, Canberra.

McDonald, J. (2008). *Dreamtime Superhighway: Sydney Basin Rock Art and Prehistoric Information Exchange*. Canberra: Australian National University Press.

McDonald, R. C., & Isbell, R. F. (2009). Soil Profile. In *Australian Soil and Land Survey Field Handbook* (Third Edit, pp. 147–200). Collingwood: CSIRO Publishing.

McIntyre, S. (1990). *Archaeological Survey of the Proposed Kariwara Longwall Coal Mine*. Unpublished report for Electricity Commission of New South Wales.

McIntyre, S. (1993). *Springvale Coal Project: An Investigation to Determine the Likelihood of Aboriginal Skeletal Material Occurring in the area to be affected by the Springvale- Mt Piper Coal conveyor at the Cox's River, Lidsdale*. Unpublished report for Pacific Power.

McNiven, I. (1992). Shell Middens and Mobility: The Use of Off-Site Faunal Remains, Queensland, Australia. *Journal of Field Archaeology*, *19*(4), 495–508.

Mitchell, P. (2005). *Geomorphic Evaluation of EL6169, Wilpinjong Coal Project in Relation to Aboriginal Archaeology*. Unpublished report for Navin Officer Heritage Consultants.

Mitchell, P. (2007). *Preliminary Geomorphic Evaluation of the Southern Part of the Moolarben Coal Project Area EL 6288 in Relation to Aboriginal Archaeology*. Unpublished report for Archaeological Risk Assessment Services.

Moore, D. R. (1970). Results of an Archaeological Survey of the Hunter River Valley, New South Wales, Australia. *Records of the Australian Museum*, *28*(2), 25–64. https://doi.org/10.3853/j.0067-1975.28.1970.421

Moore, M.W. (2013). Simple Stone Flaking in Australasia: Patterns and Implications. *Quaternary International*, *285*, 140–149.

Moore, M.W., Sutikna, T., Jatmiko, Moorwood, M. J., & Brumm, A. (2009). Continuities in Stone Flaking Technology at Liang Bua, Flores, Indonesia. *Journal of Human Evolution*, *57*, 503–526.

Moore, Mark W. (2000). Technology of Hunter Valley microlith assemblages, New South Wales. *Australian Archaeology*, *51*, 28–39.

Navin Officer Heritage Consultants Pty Ltd. (2005). *Wilpinjong Coal Project Aboriginal Cultural Heritage Assessment*. Unpublished report for Wilpinjong Coal Pty Limited.

NSW Department of Environment Climate Change & Water. (2010a). *Aboriginal Cultural Heritage Consultation Requirements for Proponents*. Department of Environment, Climate Change and Water.

NSW Department of Environment Climate Change & Water. (2010b). *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. Department of Environment, Climate Change and Water.

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

NSW Office of Environment & Heritage. (2011). *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*. Office of Environment and Heritage.

O'Driscoll, C., & Kuskie, P. (2015). *Moolarben Coal Project, Central Tablelands of New South Wales: Stage 1 Open Cut 2 - Report on Additional Aboriginal Heritage Survey and Salvage*. Unpublished report for Moolarben Coal Operations.

OzArk Environmental & Heritage Pty Ltd. (2004a). *Archaeological Test Excavation of Site #36-2-106 and PAD #36-2-105; Yamble Bridge, MR233, 22.5km west of Gulgong, NSW*. Unpublished report for RTA Western Region.

OzArk Environmental & Heritage Pty Ltd. (2004b). *Salvage Excavation of Site L2 (DECCW AHIMS #45-1-2573 & 2574) - Proposed Corridor of the New Castlereagh Highway 86, Lidsdale, NSW*. Unpublished Report for NSW Roads & Traffic Authority: Unpublished report for NSW Roads & Traffic Authority.

Pearson, M. (1981). *Seen Through Different Eyes: Changing Land Use and Settlement Patterns in the Upper Macquarie River Region of NSW from Prehistoric Times to 1860*. Unpublished PhD Thesis, Australian National University.

Pearson, Michael, & Sullivan, S. (1995). *Looking After Heritage Places: The Basics of Heritage Planning for Managers, Landowners and Administrators*. Carlton: Melbourne University Press.

Rich, E., & Gorman, A. (1992). *Proposed Springvale Colliery & Conveyor, Wallerawang: Archaeological Survey for Aboriginal Sites*. Unpublished report for Sinclair Knight: Unpublished report for Sinclair Knight.

Robins, R. (1997). Patterns in the Landscape: A Case Study in Nonsite Archaeology from Southwest Queensland. *Memoirs of the Queensland Museum, Cultural Heritage Series*, *1*(1), 23–56.

RPS Australia East Pty Ltd. (2012). *Cultural Heritage Assessment: Lidsdale Siding Project*. Unpublished report for Centennial Coal Company.

RPS Australia East Pty Ltd. (2015). *Bylong Coal Project Aboriginal Archaeology and Cultural Heritage Impact Assessment*. Unpublished report for Hansen Bailey.

Shiner, J. (2008). *Place as Occupational Histories: An Investigation of the Deflated Surface Archaeological Record of Pine Point and Langwell Stations, Western New South Wales, Australia* (BAR Intern). Oxford: Archaeopress.

Slack, M., Fullagar, R., Field, J., & Border, A. (2004). New Pleistocene Dates for Backed Artefact Technology in Australia. *Archaeology in Oceania*, *39*, 131–137.

Smith, C., & Burke, H. (2007). *Digging It Up Down Under: A Practical Guide to Doing Archaeology in Australia*. New York: Springer.

Smith, J. (1990). *Wywandy and Therabut: the Aborigines of the Upper Cox River and their association with Hartley and Lithgow*. Lithgow: Lithgow District Historical Society (Occasional Papers No.49).

Smith, L. (1987). *Archaeological Survey of Land Near a Proposed Hard Rock Quarry, Cudgegong River, Near Gulgong, NSW*. Unpublished report for Boral Limited.

Stockton, E., & Holland, W. (1974). Cultural Sites and their Environment in the Blue Mountains. *Archaeology and Physical Anthropology in Oceania*, *22*(3), 36–65.

Tindale, N. B. (1961). Archaeological Excavations of Noola Rockshelter. *Records of the South Australian Museum*, *14*, 193–196.

United States Geological Survey. (2015). U.S. Geological Survey Luminescence Dating Laboratory Optically Stimulated Luminescence (OSL) Sampling Instructions. U.S. Geological Survey.

White, B. (2004). *Salvage of Site #45-1-2574, Lidsdale, NSW: Artefact Analysis*. Unpublished report prepared for Ozark Cultural Heritage Management.

White, E. (1997). *Knapping Floors in the Central Hunter Lowlands, NSW*. Unpublished manuscript.

White, E. (2001). *Artefact Analysis: Site SG5, Ulan, NSW*. Unpublished report for Haglund & Associates.

Yoo, E. K., Tadroz, N. Z., & Bayly, K. W. (2001). *Western Coalfield: Notes to Accompany the Western Coalfield Geology Maps* (Geological). Sydney: Department of Mineral Resources.

AECOM Australia Pty Ltd. (2016). *Archaeological Test Excavation of Aboriginal Rockshelter Sites S1MC331, S1MC343 and S1MC344 Moolarben Mine Complex, Ulan, NSW*.

Andrefsky, W. (2005). *Lithics: Macroscopic Approaches to Analysis*. Cambridge: Cambridge University Press.

Apex Archaeology. (2014). *Wilpinjong Coal Mine : Aboriginal Archaeological Excavation Report WCP126, WCP214 and WCP216*. Unpublished report for Wilpinjong Coal Pty Limited.

Attenbrow, V. (2010). *Sydney's Aboriginal Past: Investigating the Archaeological and Historical*

Records. Sydney: UNSW Press.

Attenbrow, Val. (2006). *What's Changing: Population Size or Land-Use Patterns? The Archaeology of Upper Mangrove Creek, Sydney Basin* (Terra Aust). Canberra: ANE E-Press.

Attenbrow, Val. (2009). The Mountain Darug. In *Blue Mountains Dreaming: the Aboriginal heritage* (2nd ed., pp. 105–128). Leura: Megalong Books.

Australia ICOMOS. (2013). Understanding and Assessing Cultural Significance. Australia ICOMOS Incorporated.

Australian Museum Business Services. (2000). *Mungerie Park Town Centre: Archaeological Salvage Excavations near Kellyville, Cumberland Plain, NSW*.

Australian Museum Business Services. (2009a). *Kurri-Redbank Feeder 953/95R (132kV) Upgrade: Aboriginal Heritage Assessment, Hunter Valley,NSW*. Unpublished report for Energy Australia.

Australian Museum Business Services. (2009b). *Kurri Kurri Aboriginal Heritage Assessment for the 33kV Kurri-Rutherford Feeder Split: Stage 1 and Stage 2 Works*. Unpublished report for Energy Australia.

Bamforth, D. B., & Bleed, P. (1997). Technology, Flaked Stone Technology, and Risk. In C. M. Barton & G. A. Clark (Eds.), *Rediscovering Darwin: Evolutionary Theory and Archaeological Explanation* (Archaeolog, pp. 109–139). Washington: American Anthropological Association.

Barton, H., & McDonald, J. (1995). *Archaeological Investigation of Sites affected by Augmentation works at Lyell Dam, near Lithgow, NSW*. Unpublished report for Pacific Power.

Bickford, A., & Sullivan, S. (1984). Assessing the research significance of historic sites. In S. Sullivan & S. Bowdler (Eds.), *Site survey and significance assessment in Australian Archaeology* (1st ed., pp. 19–26). Canberra: Australian Institute of Aboriginal Affairs.

Biosis Pty Ltd. (2017). *Aboriginal Due Diligence Assessment for Wallerawang (2WAL-20), NSW*. Unpublished report for Tata Consultancy Services.

Bowdler, S. (1983). *Aboriginal Sites on the Crown-Timber Lands of NSW*. Unpublished report for Forestry Commission of NSW.

Bowdler, Sandra. (1981). Unconsidered Trifles? Cultural Resource Management, Environmental Impact Statements and Archaeological Research in New South Wales. *Australian Archaeology*, *12*.

Bowler, J., Jones, R., Allen, H., & Thorne, A. (1970). Pleistocene Human Remains From Australia: A Living Site and Human Cremation from Lake Mungo, Western New South Wales. *World Archaeology*, *2*, 29–60.

Brayshaw, H., & Haglund, L. (1995). *St Columba's Springwood Central Blue Mountains - Aboriginal Heritage*. Unpublished report for Blue Mountains City Council.

Brayshaw, Helen. (1986). *Archaeological Survey of a Hard Rock Quarry Near Gulgong, NSW*. Unpublished report for Boral Limited.

Burke, H, & Smith, C. (2004). *The Archaeologist's Field Handbook*. Sydney: Allen & Unwin.

Burke, Heather, & Smith, C. (2004). *The Archaeologist's Field Handbook*. Sydney: Allen & Unwin.

Central West Archaeological and Heritage Services. (1998). *An archaeological study for the proposed replacement of the Lidsdale Overbridge and Highway Realignment, State Highway 18 Castlereagh Highway, Lidsdale, in the Central Tablelands of NSW*. Unpublished Report to Terra Sciences Pty Ltd.

Coutts, P. J. F., & Witter, D. C. (1977). Summer Field Programme of the Victoria Archaeological Survey. *Australian Archaeology*, *6*.

Dean-Jones, P., & Mitchell, P. B. (1993). *Hunter Valley Aboriginal Sites Assessment Project. Environmental Modelling for Archaeological Site Potential in the Central Lowlands of the Hunter Valley.* Unpublished report for NSW National Parks and Wildlife Service.

Department of Environment & Conservation. (2006). *The Vegetation of the Western Blue Mountains (including the Capertee, Cox's, Jenolan and Gurnang Areas). Volume 2: Vegetation Community Profiles*. Unpublished report funded by the Hawkesbury-Nepean Catchment Management Authority.

Doelman, T. (2008). *Time to Quarry: The Archaeology of Stone Procurement in Northwestern New South Wales, Australia* (BAR Intern). Oxford: Archaeopress.

Ebert, J. I. (1992). *Distributional Archaeology*. Albuquerque: University of New Mexico Press.

English Heritage. (2011). *Environmental Archaeology: A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation*. London: English Heritage.

Environmental Services. (1996). *Archaeological Monitoring of Drainage Works, Wallerawang Schoolhouse*. Unpublished Report for Delta Electricity: Unpublished report for Delta Electricity.

Fanning, P. C., & Holdaway, S. J. (2004). Artifact Visibility at Open Sites in Western New South Wales, Australia. *Journal of Field Archaeology*, *29*, 255–271.

Fanning, P. C., Holdaway, S. J., Rhodes, E. J., & Bryant, T. G. (2009). The Surface Archaeological Record in Arid Australia: Geomorphic Controls on Preservation, Exposure, and Visibility. *Geoarchaeology*, *24*(2), 121–146.

Foley, R. (1981). *Off-site Archaeology and Human Adaption in Eastern Africa. An Analysis of Regional Artefact Density in the Amboseli, Southern Kenya* (BAR Intern). Oxford: British Archaeological Reports.

Gemmell-Smith, P. (2018). *Mountain Beings: Relationships with Land in the Oberon District 1800-1900*. University of Technology, Sydney.

Godwin, L. (2011). The Application of Assessment of Cumulative Impacts in Cultural Heritage Management: A Critique. *Australian Archaeology*, *73*(73), 88–91.

Gould, R. (1969). Puntutjarpa Rockshelter: A Reply to Messrs Glover and Lampert. *Archaeology and Physical Anthropology in Oceania*, *4*, 229–237.

Haglund, L. (1981). Archaeological Investigations in the Area of the Proposed Kerrabee Dam: Part I (Report). Unpublished report for NSW National Parks and Wildlife Service.

Haglund, Laila. (1981). *Archaeological Survey and Sampling at the Site of the Ulan Coal Mine, Ulan, NSW*. Unpublished report for Longworth and McKenzie Pty Ltd.

Haglund, Laila. (1996). *Salvage Excavation Completed for Ulan Coal Mines Ltd: NPWS Site 36-3-177, Ulan Heritage Identifier 116*. Unpublished report for Ulan Coal Mines Ltd.

Haglund, Laila. (2001). *Salvage Excavation Completed for Ulan Coal Mines Ltd: Site SG5, Aboriginal Rockshelter Site, in Compliance with Requirements Under NPWS Consent #1002. Volume 1. Overview.* Unpublished report for Ulan Coal Mines Ltd.

Hamm, G., Mitchell, P., Arnold, L. J., Prideaux, G. J., Questiaux, D., Spooner, N. A., … Johnston, D. (2016). Cultural Innovation and Megafauna Interaction in the Early Settlement of Arid Australia. *Nature*, *539*, 280–283.

Hamm, Giles. (2006). *Moolarben Coal Project - Aboriginal Cultural Heritage Assessment Report*. Unpublished report for Moolarben Coal Mines Pty Ltd.

Hamm, Giles. (2008). *Moolarben Coal Project - Aboriginal Cultural Heritage Assessment Report Stage 2*. Unpublished report for Moolarben Coal Mines Pty Ltd.

Hamm, Giles, & Foley, L. (2010). *Cultural Heritage Management Report on Moolarben Coal Project Stage 1: Open Cut 1 & Main Infrastructure Area*. Unpublished report for Moolarben Coal Operations Pty Ltd.

Heritage Search. (1999). *Proposed Realignment of the Castlereagh Highway, Lidsdale, NSW: Indigenous Heritage Assessment*. Unpublished report to RTA Technology: Unpublished report for

RTA Technology.

Hiscock, P., & Attenbrow, V. (2004). A Revised Sequence of Backed Artefact Production at Capertee 3. *Archaeology in Oceania*, *39*(2), 49–63.

Hiscock, P., & Attenbrow, V. (2005). *Australia's Eastern Regional Sequence Revisited: Technology and Change at Capertee 3* (BAR Intern). Oxford: British Archaeological Reports.

Hiscock, P., & Attenbrow, V. (2011). Technology and Technological Change in Eastern Australia: The Example of Capertee 3. In *Keeping your Edge: Recent Approaches to the Organisation of Stone Artefact Technology* (BAR Intern). Oxford: Archaeopress.

Hiscock, Peter. (1993). Bondaian Technology in the Hunter Valley, New South Wales. *Archaeology in Oceania*, *28*, 65–76.

Hiscock, Peter. (1994). Technological Responses to Risk in Holocene Australia. *Journal of World Prehistory*, *8*(3), 267–292.

Hiscock, Peter. (2001). Sizing up Prehistory: Sample Size and Composition of Artefact Assemblages. *Australian Aboriginal Studies*, *1*, 48–62.

Hiscock, Peter. (2002). Pattern and Context in the Holocene Proliferation of Backed Artefacts in Australia. In R. Elston & S. Kuhn (Eds.), *Thinking Small: Global Perspectives on Microlithization* (pp. 163–177). Archaeological Papers of the American Anthropological Association.

Hiscock, Peter. (2005). Artefacts on Aru: Evaluating the Technological Sequences. In S. O'Connor, M. Spriggs, & P. Veth (Eds.), *The Archaeology of the Aru Islands, Eastern Indonesia* (pp. 205–234). Canberra: Pandanus Books.

Hiscock, Peter. (2006). Blunt and to the Point: Changing Technological Strategies in Holocene Australia. In I. Lilley (Ed.), *Archaeology of Oceania: Australia and the Pacific Islands* (pp. 69–95). Oxford: Blackwell.

Holdaway, S. J., Fanning, P., & Witter, D. C. (2000). Prehistoric Aboriginal Occupation of the Rangelands: Interpreting the Surface Archaeological Record of Far Western NSW. *The Rangeland Journal*, *22*(1), 44–57.

Holdaway, S. J., & Stern, N. (2004). *A Record in Stone: The Study of Australia's Flaked Stone Artefacts*. Canberra: Aboriginal Studies Press.

Hughes, P. J., Hiscock, P., & Watchman, A. (2011). Terminological Debate in the Upper Hunter Valley: Indurated Mudstone versus Tuff. *Australian Archaeology*, *72*.

Hughes, P. J., Spooner, N., & Questiaux, D. (2014). The Central Lowlands of the Hunter valley, NSW: Why So Few Early Sites Have Been Found in this Archaeologically-rich Landscape. *Australian Archaeology*, *79*, 34–44.

ICOMOS (Australia). (2013). *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*. Burwood, Victoria, Victoria: Australia ICOMOS. Retrieved from http://australia.icomos.org/wp-content/uploads/The-Burra-Charter-2013-Adopted-31.10.2013.pdf

Jo McDonald Cultural Heritage Management Pty Ltd. (2001). *Salvage Excavations of Six Sites along Caddies, Second Ponds, Smalls and Cattai Creeks in the Rouse Hill Development Area, NSW*. Unpublished report for Rouse Hill Infrastructure Consortium.

Jo McDonald Cultural Heritage Management Pty Ltd. (2005). *Archaeological Salvage Excavation of Eight Archaeological Landscapes in the Second Ponds Creek Valley, Rouse Hill Development Area, NSW*. Unpublished report for Rouse Hill Infrastructure Pty Ltd and Landcom.

Jo McDonald Cultural Heritage Management Pty Ltd. (2007). *Salvage Excavation of Four Archaeological Sites in the Caddies Creek Precinct, Rouse Hill Regional Centre, NSW*. Unpublished report for Lend Lease GPT (Rouse Hill) Pty Ltd.

Johnson, I. (1977). Abercrombie Arch Shelter: An Excavation near Bathurst, N.S.W. *Australian Archaeology*, *6*, 28–40.

Johnson, Ian. (1979). *The Getting of Data: A Case Study from the Recent Industries of Australia*. Australian National University.

Kelleher, M. (2002). *Archaeology of Sacred Space: The Spatial Nature of Religious Behaviour in the Blue Mountains National Park Australia*. University of Sydney.

King, D. P. (1993). *Soil Landscapes of the Wallarewang 1:1000 000 Sheet*. Department of Conservation and Land Management.

Kuhn, S. (1994). A Formal Approach to the Design and Assembly of Mobile Toolkits. *American Antiquity*, *59*(3), 426–442.

Kuskie, P. (2009). *Ulan Coal Continued Operations: Aboriginal Heritage Assessment*. Unpublished report for Umwelt (Australia) Pty Limited. https://doi.org/10.1017/CBO9781107415324.004

Kuskie, P. (2012). *Ulan Coal Continued Operations Project: Test Excavation of Aboriginal Rock Shelter Sites Within The North 1 Panels - Interim Report*. Unpublished report for Ulan Coal Mines Ltd.

Kuskie, P. (2013a). *Moolarben Coal Project - Stage 1 Optimisation Modification, Near Ulan, Central Tablelands of New South Wales: Aboriginal Cultural Heritage Assessment*. Unpublished report for Moolarben Coal Pty Ltd.

Kuskie, P. (2013b). *Wilpinjong Coal Mine, Central Tablelands of NSW - Modification: Aboriginal Cultural Heritage Assessment*. Unpublished report for Wilpinjong Coal Pty Ltd.

Kuskie, P., & Clarke, E. (2005). *Proposed Open Cut Mine Extension and Additional Infrastructure at Ulan Coal Mine, New South Wales: Aboriginal Cultural Heritage Assessment*. Unpublished report for Ulan Coal Mines Ltd.

Long, A. (2003). *Scarred Trees: An Identification and Recording Manual*. Prepared for Aboriginal Affairs Victoria.

Low, M. (2015). Investigating Standardisation in the Form of Backed Artefacts at Two Sites in the Hunter River Valley, NSW, Australia. *Australian Archaeology*, *80*, 60–69.

Macdonald, G. M. (1983). *The Concept of Boundaries in Relation to the Wiradjuri People of Inland New South Wales: An Assessment of Inter-Group Relations at the Time of European Contact*. Report prepared on behalf od Wiradjuri Land Council.

McCarthy, F.D. (1948). The Lapstone Creek Excavation: Two Culture Periods Revealed in Eastern New South Wales. *Records of the Australian Museum*, *22*(1), 1–34.

McCarthy, F.D. (1964). The Archaeology of the Capertee Valley, New South Wales. *Records of the Australian Museum*, *26*(6), 197–264.

McCarthy, Frederick David. (1967). *Australian Aboriginal Stone Implements* (2nd Ed.). Sydney: The Australian Museum Trust.

McDonald, J. (1994). *Dreamtime Superhighway: An Analysis of Sydney Basin Rock Art and Prehistoric Information Exchange*. Australian National University, Canberra.

McDonald, J. (2008). *Dreamtime Superhighway: Sydney Basin Rock Art and Prehistoric Information Exchange*. Canberra: Australian National University Press.

McDonald, R. C., & Isbell, R. F. (2009). Soil Profile. In *Australian Soil and Land Survey Field Handbook* (Third Edit, pp. 147–200). Collingwood: CSIRO Publishing.

McIntyre, S. (1990). *Archaeological Survey of the Proposed Kariwara Longwall Coal Mine*. Unpublished report for Electricity Commission of New South Wales.

McIntyre, S. (1993). *Springvale Coal Project: An Investigation to Determine the Likelihood of Aboriginal Skeletal Material Occurring in the area to be affected by the Springvale- Mt Piper Coal conveyor at the Cox's River, Lidsdale*. Unpublished report for Pacific Power.

McNiven, I. (1992). Shell Middens and Mobility: The Use of Off-Site Faunal Remains, Queensland, Australia. *Journal of Field Archaeology*, *19*(4), 495–508.

Mitchell, P. (2005). *Geomorphic Evaluation of EL6169, Wilpinjong Coal Project in Relation to Aboriginal Archaeology*. Unpublished report for Navin Officer Heritage Consultants.

Mitchell, P. (2007). *Preliminary Geomorphic Evaluation of the Southern Part of the Moolarben Coal Project Area EL 6288 in Relation to Aboriginal Archaeology*. Unpublished report for Archaeological Risk Assessment Services.

Moore, D. R. (1970). Results of an Archaeological Survey of the Hunter River Valley, New South Wales, Australia. *Records of the Australian Museum*, *28*(2), 25–64. https://doi.org/10.3853/j.0067-1975.28.1970.421

Moore, M.W. (2013). Simple Stone Flaking in Australasia: Patterns and Implications. *Quaternary International*, *285*, 140–149.

Moore, M.W., Sutikna, T., Jatmiko, Moorwood, M. J., & Brumm, A. (2009). Continuities in Stone Flaking Technology at Liang Bua, Flores, Indonesia. *Journal of Human Evolution*, *57*, 503–526.

Moore, Mark W. (2000). Technology of Hunter Valley microlith assemblages, New South Wales. *Australian Archaeology*, *51*, 28–39.

Navin Officer Heritage Consultants Pty Ltd. (2005). *Wilpinjong Coal Project Aboriginal Cultural Heritage Assessment*. Unpublished report for Wilpinjong Coal Pty Limited.

NSW Department of Environment Climate Change & Water. (2010a). *Aboriginal Cultural Heritage Consultation Requirements for Proponents*. Department of Environment, Climate Change and Water.

NSW Department of Environment Climate Change & Water. (2010b). *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. Department of Environment, Climate Change and Water.

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

NSW Office of Environment & Heritage. (2011). *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*. Office of Environment and Heritage.

O'Driscoll, C., & Kuskie, P. (2015). *Moolarben Coal Project, Central Tablelands of New South Wales: Stage 1 Open Cut 2 - Report on Additional Aboriginal Heritage Survey and Salvage*. Unpublished report for Moolarben Coal Operations.

OzArk Environmental & Heritage Pty Ltd. (2004a). *Archaeological Test Excavation of Site #36-2-106 and PAD #36-2-105; Yamble Bridge, MR233, 22.5km west of Gulgong, NSW*. Unpublished report for RTA Western Region.

OzArk Environmental & Heritage Pty Ltd. (2004b). *Salvage Excavation of Site L2 (DECCW AHIMS #45-1-2573 & 2574) - Proposed Corridor of the New Castlereagh Highway 86, Lidsdale, NSW*. Unpublished Report for NSW Roads & Traffic Authority: Unpublished report for NSW Roads & Traffic Authority.

Pearson, M. (1981). *Seen Through Different Eyes: Changing Land Use and Settlement Patterns in the Upper Macquarie River Region of NSW from Prehistoric Times to 1860*. Unpublished PhD Thesis, Australian National University.

Pearson, Michael, & Sullivan, S. (1995). *Looking After Heritage Places: The Basics of Heritage Planning for Managers, Landowners and Administrators*. Carlton: Melbourne University Press.

Rich, E., & Gorman, A. (1992). *Proposed Springvale Colliery & Conveyor, Wallerawang: Archaeological Survey for Aboriginal Sites*. Unpublished report for Sinclair Knight: Unpublished report for Sinclair Knight.

Robins, R. (1997). Patterns in the Landscape: A Case Study in Nonsite Archaeology from Southwest Queensland. *Memoirs of the Queensland Museum, Cultural Heritage Series*, *1*(1), 23–56.

RPS Australia East Pty Ltd. (2012). *Cultural Heritage Assessment: Lidsdale Siding Project*.

Unpublished report for Centennial Coal Company.

RPS Australia East Pty Ltd. (2015). *Bylong Coal Project Aboriginal Archaeology and Cultural Heritage Impact Assessment*. Unpublished report for Hansen Bailey.

Shiner, J. (2008). *Place as Occupational Histories: An Investigation of the Deflated Surface Archaeological Record of Pine Point and Langwell Stations, Western New South Wales, Australia* (BAR Intern). Oxford: Archaeopress.

Slack, M., Fullagar, R., Field, J., & Border, A. (2004). New Pleistocene Dates for Backed Artefact Technology in Australia. *Archaeology in Oceania*, *39*, 131–137.

Smith, C., & Burke, H. (2007). *Digging It Up Down Under: A Practical Guide to Doing Archaeology in Australia*. New York: Springer.

Smith, J. (1990). *Wywandy and Therabut: the Aborigines of the Upper Cox River and their association with Hartley and Lithgow*. Lithgow: Lithgow District Historical Society (Occasional Papers No.49).

Smith, L. (1987). *Archaeological Survey of Land Near a Proposed Hard Rock Quarry, Cudgegong River, Near Gulgong, NSW*. Unpublished report for Boral Limited.

Stockton, E., & Holland, W. (1974). Cultural Sites and their Environment in the Blue Mountains. *Archaeology and Physical Anthropology in Oceania*, *22*(3), 36–65.

Tindale, N. B. (1961). Archaeological Excavations of Noola Rockshelter. *Records of the South Australian Museum*, *14*, 193–196.

United States Geological Survey. (2015). U.S. Geological Survey Luminescence Dating Laboratory Optically Stimulated Luminescence (OSL) Sampling Instructions. U.S. Geological Survey.

White, B. (2004). *Salvage of Site #45-1-2574, Lidsdale, NSW: Artefact Analysis*. Unpublished report prepared for Ozark Cultural Heritage Management.

White, E. (1997). *Knapping Floors in the Central Hunter Lowlands, NSW*. Unpublished manuscript.

White, E. (2001). *Artefact Analysis: Site SG5, Ulan, NSW*. Unpublished report for Haglund & Associates.

Yoo, E. K., Tadroz, N. Z., & Bayly, K. W. (2001). *Western Coalfield: Notes to Accompany the Western Coalfield Geology Maps* (Geological). Sydney: Department of Mineral Resources.

Appendix A

Consultation Log

Date	To/From AECOM	Organisation	Contact person(s)	Method of contact	AECOM representative	Summary
08.01.21	From AECOM	Heritage NSW	N/A	Letter	G.Oakes	Request for Aboriginal stakeholder information letter
08.01.21	From AECOM	National Native Title Tribunal (NNTT)	N/A	Letter	G.Oakes	As above
08.01.21	From AECOM	NTSCORP Limited	N/A	Letter	G.Oakes	As above
08.01.21	From AECOM	Office of the Registrar	N/A	Letter	G.Oakes	As above
08.01.21	From AECOM	Lithgow City Council	N/A	Letter	G.Oakes	As above
08.01.21	From AECOM	Local Land Services (Central Tablelands)	N/A	Letter	G.Oakes	As above
08.01.21	From AECOM	Bathurst LALC	N/A	Letter	G.Oakes	As above
25.01.21	To AECOM	Heritage NSW		Letter	G.Oakes	Response to request for Aboriginal stakeholder information. Refer to **Appendix B**.
25.01.21	To AECOM	Lithgow City Council	Lachlan Sims	E-mail with letter attachment	G.Oakes	As above
04.02.21	To AECOM	Office of the Registrar	Rachel Rewiri	E-mail with letter attachment	G.Oakes	As above
02.02.21	From AECOM	Aboriginal individuals and organisations identified by agencies (n = 19)	Various	Letters & e-mails with letter attachments	G.Oakes	EOI letter for assessment
04.02.21	To AECOM	North East Wiradjuri Company	Virginia Doig	E-mail	G.Oakes	Registering interest
04.02.21	To AECOM	Didge Ngunawal Clan	Paul Boyd	E-mail	G.Oakes	Registering interest
08.02.21	To AECOM	Murrabidgee Mullangari	Darleen Johnson	E-mail	G.Oakes	Registering interest
08.02.21	To AECOM	Merrigarn	Shaun Carroll	E-mail	G.Oakes	Registering interest
10.02.21	To AECOM	Muragadi	Jesse Johnson	E-mail	G.Oakes	Registering interest
10.02.21	To AECOM	Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson	E-mail	G.Oakes	Registering interest. Has advised that they do not want details passed on to Heritage NSW or Bathurst LALC.

Date	To/From AECOM	Organisation	Contact person(s)	Method of contact	AECOM representative	Summary
10.02.21	To AECOM	Gunjeewong Cultural Heritage Corporation	Cherie (Carroll) Turrise	E-mail	G.Oakes	Registering interest. Has advised that they do not want details passed on to Heritage NSW or Bathurst LALC.
23.02.21	From AECOM	All RAPs (excluding Warrabinga-Wiradjuri #7 Native Title Claimant Group)	Various	E-mail with letter attachment	G.Oakes	Draft assessment methodology
23.02.21	To AECOM	Didge Ngunawal Clan	Paul Boyd	E-mail	A.McLaren	Response to draft methodology. Refer to **Appendix E**.
23.02.21	To AECOM	Murrabidgee Mullangari	Darleen Johnson	E-mail	A.McLaren	As above
24.02.21	To AECOM	Muragadi	Jesse Johnson	E-mail	A.McLaren	As above
30.03.21	From AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Simon Blackshield	E-mail	A.McLaren	EOI forwarded, along with draft assessment methodology. Comment requested by 28 April 2021.
12.04.21	From AECOM	Heritage NSW	Paul Houston	E-mail with letter attachment	A.McLaren	Notification of RAPs, as per Section 4.1.6 of Consultation Requirements.
12.04.21	From AECOM	Bathurst LALC	Tonilee Scott	E-mail with letter attachment	A.McLaren	Notification of RAPs, as per Section 4.1.6 of Consultation Requirements.
28.04.21	To AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Simon Blackshield	E-mail	A.McLaren	Simon has indicated that he acts for the registered claimant group. Has requested additional time (to Friday 14 May 2021) to provide initial comments requested. Has indicated that claimant group will wish to nominate Rap participants for survey.
30.04.21	From AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Simon Blackshield	E-mail	A.McLaren	Response to above. Have indicated no problems with additional time for response. Advised scheduled survey dates. Have also advised that, in the absence of an approved determination of native title, we are required to comply with requirements 4.1.2 to 4.1.7 of the Consultation Requirements, as they pertain to consultation with RAPs.

Date	To/From AECOM	Organisation	Contact person(s)	Method of contact	AECOM representative	Summary
01.05.21	To AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Simon Blackshield	E-mail	A.McLaren	Has suggested that AECOM contact the Warrabinga Working Party directly. E-mail addresses provided.
02.06.21	From AECOM	All RAPs	Various	E-mail	A.McLaren	Fieldwork notification for survey
02.06.21	To AECOM	Muragadi	Jesse Johnson	E-mail	A.McLaren	Has advised that Muragadi will be available for the survey
02.06.21	To AECOM	Murrabidgee Mullangari	Darleen Johnson	E-mail	A.McLaren	Has advised that they will have a site officer available
03.06.21	To AECOM	Bathurst LALC	Tonilee Scott	E-mail	A.McLaren	Has advised that site officer will be Donald Morgan.
03.06.21	To AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Martin de Launey	E-mail (cc'd)	A.McLaren	Martin has asked other WWP members if anyone has a rep available for survey
03.06.21	To AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Peter Swain	E-mail (cc'd)	A.McLaren	Peter has indicated he is busy that day
07.06.21	To AECOM	Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson	E-mail	A.McLaren	Having difficulty with John Holland induction. Has requested assistance with logging in.
07.06.21	From AECOM	Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson	E-mail	A.McLaren	Have advised that password reset link has been sent. Have also suggested using a PC instead of MAC.
08.06.21	To AECOM	Murrabidgee Mullangari	Darleen Johnson	E-mail	A.McLaren	Checking whether we received everything required to start project on 16th.
08.06.21	From AECOM	Murrabidgee Mullangari	Darleen Johnson	E-mail	A.McLaren	Have advised that no-one has been contact. Have also advised that main thing is to have site officer complete the induction.
08.06.21	To AECOM	Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson	E-mail	A.McLaren	Has completed induction modules. Has provided screenshots of certificates.
11.06.21	To AECOM	Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson	E-mail	A.McLaren	Confirming that site officer for survey will be Steve.
09.09.21	From AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Various (n = 6)	E-mail	A.McLaren	Notifying group about upcoming testing. Have requested feedback regarding preference of group members re attending site or receiving telephone updates.

Date	To/From AECOM	Organisation	Contact person(s)	Method of contact	AECOM representative	Summary
09.09.21	From AECOM	North East Wiradjuri Company	Virginia Doig	E-mail	A.McLaren	Notifying about upcoming testing. Have requested feedback regarding preference for attending site or receiving telephone updates.
09.09.21	From AECOM	Murrabidgee Mullangari	Ryan Johnson	Phone	A.McLaren	Phone call to discuss upcoming fieldwork. Ryan has indicated they are happy to attend site and should have someone available.
09.09.21	From AECOM	Bathurst LALC	Tonilee Scott	Phone	A.McLaren	Phone call to discuss upcoming fieldwork. No problems attending site.
09.09.21	From AECOM	Didge Ngunawal Clan	Paul Boyd	Phone	A.McLaren	Phone call to discuss upcoming fieldwork. Happy to attend site.
09.09.21	From AECOM	Corroboree Aboriginal Corporation	Steve Johnson	Phone	A.McLaren	Phone call to discuss upcoming fieldwork. No answer. Left voicemail.
09.09.21	From AECOM	Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson	Phone	A.McLaren	Phone call to discuss upcoming fieldwork. Happy to attend site. Site officer will be Steve.
09.09.21	From AECOM	Gunjeewong Cultural Heritage Corporation	Julie	Phone	A.McLaren	Phone call to discuss upcoming fieldwork. No answer. Left voicemail.
09.09.21	From AECOM	Muragadi	Jesse Johnson	Phone	A.McLaren	Phone call to discuss upcoming fieldwork. No answer. Left voicemail.
09.09.21	To AECOM	Murrabidgee Mullangari & Merrigarn	Darleen Johnson & Shaun Carroll	Phone	A.McLaren	Darleen following up re fieldwork and AM's discussion with Ryan. MM is happy to attend site and will have someone available. Also spoke with Shaun. He too is happy to attend site.
09.09.21	From AECOM	Murrabidgee Mullangari	Darleen Johnson	Phone	A.McLaren	Just checking if Darleen has Jesse Johnson's number. Darleen has indicated that Jesse has misplaced his phone but will want to be involved in fieldwork.
09.09.21	To AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Jack Pennell	Phone	A.McLaren	Jack would like to be involved in the fieldwork. However, he is unsure if he will have someone available. Regardless, he would like to be updated during the testing program re results.
10.09.21	From AECOM	All RAPs	Various	E-mail with letter attachment	A.McLaren	Draft test excavation methodology (w/ cover letter)

Date	To/From AECOM	Organisation	Contact person(s)	Method of contact	AECOM representative	Summary
10.09.21	From AECOM	Heritage NSW	-	E-mail with letter attachment	A.McLaren	Test excavation notification, as per Requirement 15c of Code of Practice.
10.09.21	To AECOM	Didge Ngunawal Clan	Paul Boyd	E-mail	A.McLaren	Response to draft test excavation methodology. Refer to **Appendix G**.
14.09.21	To AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Martin de Launey	E-mail	A.McLaren	Response to draft test excavation methodology. Refer to **Appendix G**.
15.09.21	To AECOM	Muragadi	Jesse Johnson	Email	A.McLaren	Response to draft test excavation methodology. Refer to **Appendix G**.
21.09.21	From AECOM	All RAPs (excluding North East Wiradjuri Company)	Various	E-mail	A.McLaren	Fieldwork notification and site officer request
24.09.21	To AECOM	North East Wiradjuri Company	Virginia Doig	Phone	A.McLaren	Phone call to discuss upcoming fieldwork. Would like to be involved and should have someone available. AM to provide fieldwork notification. Happy with methodology.
24.09.21	From AECOM	North East Wiradjuri Company	Virginia Doig	E-mail	A.McLaren	Fieldwork notification and site officer request
27.09.21	To AECOM	Bathurst LALC	Tonilee Scott	E-mail	A.McLaren	Site officer will be unavailable on 6th and 7th due to other fieldwork commitments.
27.09.21	From AECOM	Bathurst LALC	Tonilee Scott	E-mail	A.McLaren	Responding to above. Have advised that LALC can attend whichever days suit.
29.09.21	From AECOM	Murrabidgee Mullangari	Darleen Johnson	E-mail	A.McLaren	Follow-up regarding test exc. methodology.
29.09.21	From AECOM	Bathurst LALC	Tonilee Scott	E-mail	A.McLaren	As above
29.09.21	From AECOM	Gunjeewong Cultural Heritage Corporation	Julie Hall	E-mail	A.McLaren	As above
05.10.21	To AECOM	North East Wiradjuri Company	Virginia Doig	Phone	A.McLaren	Planned reps will not be able to make it due to accommodation issues / COVID restrictions.
05.10.21	From AECOM	All RAPs	Various	E-mail	A.McLaren	Fieldwork update for Day #1
06.10.21	From AECOM	All RAPs	Various	E-mail	A.McLaren	Fieldwork update for Day #2

Date	To/From AECOM	Organisation	Contact person(s)	Method of contact	AECOM representative	Summary
06.10.21	To AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Jack Pennell	E-mail	A.McLaren	Apologies for not having a rep available for work. Would like to be kept up-to-date as dig progresses. Would like to know what's happening with the artefacts recovered through testing.
06.10.21	From AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Jack Pennell	E-mail	A.McLaren	Response to above. Artefacts will be securely stored at AECOM's head office until a decision is reached (in consultation with RAPs) regarding their long term management.
06.10.21	To AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Martin de Launey	E-mail	A.McLaren	Martin has requested the pit numbers for the pits on the Site that were excavated but not able to be sieved on Monday
06.10.21	From AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Martin de Launey	E-mail	A.McLaren	Response to above. TPs 1 and 2.
07.10.21	From AECOM	All RAPs	Various	E-mail	A.McLaren	Fieldwork update for Day #3
10.09.21	To AECOM	Didge Ngunawal Clan	Paul Boyd & Lilly Carroll	E-mail	A.McLaren	Thanks for updates
08.10.21	To AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Martin de Launey	E-mail	A.McLaren	Response to update #3. Martin notes that it appears the older gentle sloping spurs above the creek are the most revealing.
11.10.21	From AECOM	All RAPs	Various	E-mail	A.McLaren	Fieldwork update for Day #4 (8th October)
13.10.21	To AECOM	North East Wiradjuri Company	Virginia Doig	Phone	A.McLaren	Many thanks for updates
25.10.21	From AECOM	All RAPs	Various	E-mail	A.McLaren	Draft ACHAR for RAP review
01.11.21	To AECOM	Muragadi	Jesse Johnson	E-mail	J.Zickar	Response to draft ACHAR. See **Table 7** in **Section 4.5**
06.11.21	To AECOM	Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson	E-mail	J.Zickar / A.McLaren	Response to draft ACHAR. See **Table 7** in **Section 4.5**
11.11.21	To AECOM	Murrabidgee Mullangari & Merrigarn	Ryan Johnson	E-mail	A.McLaren	Response to draft ACHAR. See **Table 7** in **Section 4.5**
23.11.21	From AECOM	All RAPs (excluding above ACHAR respondents)	Various	E-mail	A.McLaren	Follow-up to request comment on draft ACHAR
23.11.21	To AECOM	Didge Ngunawal Clan	Paul Boyd	E-mail	A.McLaren	Response to draft ACHAR. See **Table 7** in **Section 4.5**

Date	To/From AECOM	Organisation	Contact person(s)	Method of contact	AECOM representative	Summary
23.11.21	To AECOM	Merrigarn	Shaun Carroll	E-mail	A.McLaren	Response to draft ACHAR. See **Table 7** in **Section 4.5**
23.11.21	To AECOM	Warrabinga-Wiradjuri #7 Native Title Claimant Group	Martin de Launey	E-mail	A.McLaren	Response to draft ACHAR. See **Table 7** in **Section 4.5**

Appendix B

Agency Responses

NSW GOVERNMENT | Premier & Cabinet

Reference: DOC21/17844-1

Geordie Oakes
AECOM Australia Pty Ltd
PO Box Q410
QVB Post Office
SYDNEY NSW 1230
Geordie.Oakes@aecom.com

RE: Request for information on Aboriginal stakeholders for an Aboriginal cultural heritage assessment of the proposed "Neoen NSW Big Battery Energy Storage Project located in Wallerawang NSW –City of Lithgow LGA"

Dear Geordie,

Thank you for your letter of 08 January 2021 about Aboriginal cultural heritage consultation for the proposed "Neoen NSW Big Battery Energy Storage Project located in Wallerawang NSW", within the Lithgow local government area. I appreciate the opportunity to provide input.

Please find enclosed a list of known Aboriginal parties for the Lithgow local government area (Attachment 1) that we consider likely to have an interest in the proposal. Note this is not an exhaustive list of all interested Aboriginal parties. Receipt of this list does not remove the requirement for a proponent/consultant to advertise the proposal in the local print media and contact other bodies and community groups seeking interested Aboriginal parties, in accordance with the '*Aboriginal cultural heritage consultation requirements for proponents 2010'* (the CRs).

We would also like to take this opportunity to remind the proponent and consultant to:

- Ensure that consultation is fair, equitable and transparent. If the Aboriginal parties express concern or are opposed to parts of or the entire project, we expect that evidence will be provided to demonstrate the efforts made to find common ground between the opponents and the proponent.

If you have any questions about this advice, please do not hesitate to contact me via paul.houston@environment.nsw.gov.au or 02 68835361.

Yours sincerely

Paul Houston

Paul Houston
Aboriginal Heritage Planning Officer
Aboriginal Cultural Heritage Regulation - Northern
Heritage NSW

Department of Premier and Cabinet
18 January 2021

ATTACHMENT A

Table 1: List of Aboriginal stakeholder groups within the Lithgow LGA. **- that may have an interest in the project; provided as per the "OEH Aboriginal cultural heritage requirement for proponents 2010".**

Organisation/Affiliation	Name/Title	Address
Bill Allen		1/1a Miriyan Drive, Kelso NSW 2795
Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson, Director	PO Box 3340, ROUSE HILL NSW 2155
Dhuuluu-Yala Aboriginal Corporation	Chairperson	63 Stanley Street, Bathurst NSW 2795
Didge Ngunawal Clan	Lilly Carroll/ Paul Boyd	33 Carlyle Crescent Cambridge Gardens NSW 2747
Gundungurra Aboriginal Heritage Association inc	Chairperson	PO Box 31, Lawson NSW 2783
Gundungurra Tribal Council Aboriginal Corporation	Chairperson	14 Oak St, Katoomba NSW 2780
Hawkesbury- Nepean Catchment Management Authority	Aboriginal Reference Group	PO Box 556, Windsor NSW 2756
Lyn Syme	North-East Wiraduri	PO Box 29, Kandos NSW 2848
Mingaan Aboriginal Corporation	Helen Riley	38 Tweed Road, Lithgow NSW 2790
Mooka	Neville Williams	PO Box 70, Cowra NSW 2794
Murra BidgeeAboriginal Corporation, Cultural Heritage	PO Box 246, Seven Hills NSW 2147	
North- Eastern Wiradjuri		PO Box 29, Kandos NSW 2848
Trevor Robinson		C/- 14 Condon Place Dubbo NSW 2830
Warrabinga Native Title Claimants Aboriginal Corporation	The Board of Directors	PO Box 282, Mudgee NSW 2850
Wiradjuri Council of Elders	Robert Clegg	28 Hodges Street, Parkes NSW 2870
Wiradjuri Interim Working Party		C/- 14 Condon Place Dubbo NSW 2830

18579810:LAS

Lithgow CITY COUNCIL

25 January 2021

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office
SYDNEY NSW 1230

By email: Geordie.Oakes@aecom.com

Dear Geordie,

RE: Request for Relevant Aboriginal Stakeholder Information for the Neoen NSW Big Battery Energy Storage Project - Wallerawang

I refer to your request dated 8 January 2021 seeking relevant Aboriginal stakeholder information for the proposed Neoen battery project in Wallerawang.

Council is happy to provide you with assistance in relation to this project and I have attached contact information for local Aboriginal stakeholder groups and organisations who should be able to provide relevant feedback and cultural engagement on the project.

Please contact me I can provide any further assistance in this matter or if you require any further information or clarification.

Yours faithfully,

Lachlan Sims
ACTING TEAM LEADER DEVELOPMENT

ABORIGINAL STAKEHOLDER CONTACTS
LITHGOW CITY COUNCIL LOCAL GOVERNMENT AREA

Bathurst Local Aboriginal Land Council (Bathurst LALC)
149 Russell Street
PO Box 1500
BATHURST NSW 2795
Bathlalc2@bigpond.com
(02) 6332 6835 (Tonilee Scott)

Gunjeewong Cultural Heritage Aboriginal Corporation
1 Bellevue Place
PORTLAND NSW 2847
cheriecarroll68@yahoo.com
(Cherie Carroll Turrise)

Warrabinga Native Title Claimants Aboriginal Corporation
PO Box 282
MUDGEE NSW 2850
info@warrabinga.com.au
(Kristen Kerr)

Murra Bidgee Mullangari Aboriginal Corporation
PO Box 246
SEVEN HILLS NSW 2147
murrabidgeemullangari@yahoo.com.au
(Ryan & Darleen Johnson)

Muragadi Heritage Indigenous Corporation
5 Hession Road
NELSON NSW 2765
muragadi@yahoo.com.au
(Jesse Johnson & Vickylee Paddison)

North-East Wiradjuri
PO Box 29
KANDOS NSW 2848
(Lyn Syme)

Dhuuluu-yala Aboriginal Corporation
63 Stanley Street
BATHURST NSW 2795

Mingaan Aboriginal Corporation
38 Tweed Road
LITHGOW NSW 2790
Mingaan.lithgow@ymail.com
0411 507 230 (Helen Riley)

Wiradjuri Council of Elders
PO Box 8565
KOORINGAL NSW 2650
(Robert Clegg) (also at 28 Hodges St, Parkes 2870)

Gundungurra Tribal Council Aboriginal Corporation
14 Oak Street
KATOOMBA NSW 2780
(02) 4782 6578 (Sharon Brown)

Gundungurra Aboriginal Heritage Association
PO Box 31
LAWSON NSW 2783
0419 466 583 (Merle Williams)
0428 270 594 (Sharon Hall)

Warrabinga Native Title Claimants Aboriginal Corporation
535 Pheasants Nest Road
PHEASANTS NEST NSW 2574

Mooka Traditional Owners
PO Box 70
COWRA NSW 2794
(Neville Williams)

Wiradjuri Interim Working Party
PO Box 73
PEAK HILL NSW 2869
(Trevor Robinson)

04 February 2021

By email: Geordie.Oakes@aecom.com

Geordie Oakes
AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office
STANMORE NSW 1230

Dear Geordie,

Request - Search for Registered Aboriginal Owners - NSW Big Battery Energy Storage Project located in Wallerawang NSW -City of Lithgow LGA

We refer to your letter dated 08 January 2021 seeking the identification of Aboriginal organisations and people who may have an interest in the proposed development of a high capacity Battery Energy Storage System (BESS) at Wallerawang, NSW, within the Lithgow LGA

Under Section 170 of the Aboriginal Land Rights Act 1983 the Office of the Registrar is required to maintain the Register of Aboriginal Owners (RAO). A search of the RAO has shown that there are currently no Registered Aboriginal Owners in the project area.

We suggest you contact the Bathurst Local Aboriginal Land Council on (02) 6332 6835 or via email bathlalc2@bigpond.com as they may wish to participate.

Yours sincerely

Rachel Rewiri
Project Officer
Office of the Registrar, Aboriginal Land Rights Act 1983

Appendix C

Newspaper Advertisement

Aboriginal Stakeholder Consultation

Battery Storage Development

Wallerawang, NSW | Lot 4 DP 751651

NEOEN

(10/227 Elizabeth Street, Sydney NSW 2000)

AECOM, on behalf of NEOEN, is seeking Aboriginal persons or organisations who wish to be consulted about an Aboriginal heritage assessment being prepared for a proposed development at Wallerawang, NSW.

The purpose of community consultation with Aboriginal people is to assist the proposed applicant in the preparation of an application for an Aboriginal Heritage Impact Permit and to assist Heritage NSW (Department of Premier and Cabinet) in its consideration and determination of the application.

Interested Aboriginal persons or stakeholders who hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) in the development area and wish to participate in the community consultation process are requested to register their interest in writing to:

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office, Sydney, NSW 1230
Ph: +0410513509 | Fax: +61 2 8934 0001 | Email: Geordie.Oakes@aecom.com

Please be advised that if you register an interest in consultation, your details will be forwarded to the Heritage NSW and Local Aboriginal Land Council, unless you specify that you do not want your details released. The closing date for registration is 13/02/21

RM6773530

Appendix D

Draft Assessment Methodology

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

23 February 2021

Dear RAP,

RE: Proposed Aboriginal Cultural Heritage Assessment Methodology for the NEOEN NSW Big Battery Energy Storage Project, Wallerawang NSW

AECOM Australia Pty Ltd (AECOM) has been commissioned by Neoen to undertake an Aboriginal cultural heritage assessment for the proposed development of a high capacity Battery Energy Storage System (BESS) at Wallerawang, NSW, within the Lithgow LGA (the “study area”, Figure 1).

Please find enclosed for your review the proposed assessment methodology for this project. This assessment methodology details AECOM’s proposed approach to the assessment and is being provided to all Registered Aboriginal Parties (RAPs) in accordance with Sections 4.3.1 and 4.3.2 of Heritage NSW’s *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010). A brief review of existing environmental and archaeological data for the study area is also provided for contextual purposes.

Comments on the proposed methodology must be received by 24 March 2021. Comments can be provided in writing or by phone. I would also like to take this opportunity to request from you any initial comments regarding the cultural values of the study area.

Geordie Oakes
c/- AECOM Australia Pty Ltd
PO Box Q410, QVB Post Office,
Sydney, NSW 1230
Ph: 0410513509
Fax: +61 2 8934 0001
Email: geordie.oakes@aecom.com

We look forward to your participation in the assessment of this project.

Yours faithfully

Geordie Oakes
Principal Heritage Specialist
geordie.oakes@aecom.com

Direct Dial: 0410 513 509
Direct Fax: +64 2 89340001

AECOM Imagine it. Delivered.

NEOEN NSW Big Battery Energy Storage System Project Aboriginal Heritage Assessment Draft Methodology

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) has been commissioned by Neoen to undertake an Aboriginal cultural heritage assessment for the proposed development of a high capacity Battery Energy Storage System (BESS) at Wallerawang, NSW, within the Lithgow LGA (the “study area”, Figure 1).

The objectives of the Aboriginal heritage assessment are to identify the Aboriginal heritage values, both archaeological and cultural, of the study area and to determine appropriate mitigation and/or management measures. The assessment will involve background research, Aboriginal community consultation, archaeological field survey and production of an Aboriginal Cultural Heritage Assessment Report (ACHAR).

In accordance with Heritage NSW’s *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a), AECOM is providing for your review a proposed (draft) assessment methodology for the Project.

RAPs are invited to comment on this draft methodology and to provide comments regarding the Aboriginal heritage cultural values of the study area.

2.0 Project Overview

The Project would involve the construction, commissioning, and operation of a high capacity BESS with a generation capacity of about 500 megawatts (MW). The project works are expected to consist of:

- Site establishment, including excavation and grading works;
- Installation, commissioning, and operation of a large-scale BESS including battery enclosures, inverters, and transformers;
- Establishment of a new private access road from Brays Lane to the Project as well as internal access roads and car parking;
- Construction of permanent office and staff amenities;
- Construction of stormwater controls, lighting, fencing and installation of security devices around the perimeter of the BESS compound;
- Establishment of landscaping and screening vegetation;
- Above ground and/or underground transmission line connections from the BESS to the existing Wallerawang substation switchyard; and
- Ancillary upgrades to the existing Wallerawang substation switchyard.

Figure 1 Study area

3.0 The Study Area

The Project is located in the Central Tablelands of NSW, in the suburb of Wallerawang, about 110 kilometres west of Sydney. Wallerawang is located within the Lithgow City Local Government Area (LGA). The BESS Site (the Site) would be situated off Brays Lane about two kilometres north of the Wallerawang town centre, on Lot 4 Deposited Plan (DP) 751651. The Site area is approximately 13 hectares in size. The Project would only occupy a portion of the total area of the Site. The Site is privately owned and is currently occupied by a residential property and is also used for the agistment of a small number of horses. It is proposed that the lot on which the Project would be located would be subdivided to accommodate the Project, while maintaining the existing property on the south east corner of the Site.

The transmission line for the Project would be located on land that is currently privately owned, or owned by Lithgow City Council, TransGrid, and the State Rail Authority. The transmission line would connect the BESS to the TransGrid Wallerawang 330 kV substation (located at Lot 91 DP 1043965).

Accessed via the Castlereagh Highway, which feeds traffic directly onto Brays Lane, the Site is located about 1.5 kilometres from the intersection of the Castlereagh Highway and Brays Lane. From this intersection to the bridge crossing of Cox's River, Brays Lane is a well maintained, wide, paved, dual lane road. The bridge crossing is one-lane wide. Between the bridge and the Site, Brays Lane becomes partially unsealed, narrow but bi-directional road. Brays Lane borders the Site to the south and east.

Topographically, land within the Site comprises slopes from surrounding ridges that grade down towards the 2nd order drainage channel that bisects the centre of the site. Elevations across the Site range from 882 to 960 metres (m) Australian Height Datum (AHD) providing a total relief of 78 m. Vegetation across the Site has been largely cleared with the exception of the northwestern corner where freestanding woodland is regenerating. A series of small dams are located within the Site associated with the 2nd order ephemeral drainage channel that feeds into Pipers Flat Creek approximately 100 m to the southeast.

The proposed transmission line would be mostly installed using an open trenching method. The transmission line would cross Pipers Flat Creek and several tributaries, as well as an area of bushland before following the rail corridor to the existing substation. Where the transmission line would be located in sensitive areas (such as where it would traverse waterways or would need to avoid existing underground utilities) it is anticipated that the transmission line would be installed using an underboring method.

4.0 AHIMS Database

The Aboriginal Heritage Information Management System (AHIMS) database, administered by Heritage NSW, contains records of all Aboriginal objects reported to the Director General of the Department of Premier and Cabinet in accordance with Section 89A of the *National Parks and Wildlife Act 1974*. It also contains information about Aboriginal places, which have been declared by the Minister to have special significance with respect to Aboriginal culture. Previously recorded Aboriginal objects and declared Aboriginal places are known as 'Aboriginal sites'.

A search of the AHIMS database undertaken on 17 February 2021 for a 5 x 5 km area centred on the study area resulted in the identification of 32 Aboriginal sites, comprising 21 open artefact sites (i.e., isolated artefacts and artefact scatters), five rockshelters with various associated features, two grinding grooves, two areas of Potential Archaeological Deposit (PAD),and two burials (Table 1, Figure 2).

Consideration of the site coordinates of previously recorded Aboriginal sites indicates that none are located directly within the study area. The closest AHMS site coordinates to the Site is open artefact site "Brays Lane AS1" (ID#45-1-2799) located 80 m to the south. The closest AHIMS site coordinates to the transmission line corridor is open artefact site "SU1a-A5" (ID#45-1-2716) located 10 m south of the eastern section of transmission line (Table 2).

Table 1 Site search results (5 x 5 km area)

Site Type	Count	%
Open artefact site (i.e., isolated artefacts and artefact scatters)	21	65.6
Rockshelters	5	15.5
Grinding grooves	2	6.3
PAD	2	6.3
Burials	2	6.3
Total	**32**	**100**

Table 2 Sites within 200 m of the study area

AHIMS Site ID	Site name	AHIMS Centroid Coordinates		Site type	Location
		MGAE	MGAN		
45-1-0247	Wallerawang Schoolhouse;	228345	6300699	Artefact	165 m west
45-1-2716	SU1a - A5	227585	6300837	Artefact	10 m south
45-1-2799	Brays Lane AS1	227039	6300622	Artefact	70 m south
45-1-0211	S2;Wallerawang;	227811	6300741	Artefact	170 m south

AECOM Imagine it. Delivered.

Figure 2 Study area and AHIMS sites

5.0 Methodology

In accordance with Heritage NSW's *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010b), the approach that AECOM intends to adopt for undertaking the assessment includes the following key components:

A. Background research;

B. Archaeological survey of the study area with RAPs;

C. Consultation with RAPs in order to identify the Aboriginal cultural heritage values of the study area; and

D. Preparation of an ACHAR for the study area detailing the results of the above. Appropriate management/mitigation measures for the identified Aboriginal heritage values of the study area will be provided in this report.

The proposed methodologies for each of these components are detailed in the sections below.

5.1 A. Background Research

The following tasks will be undertaken for the background research component of the assessment:

- Updated searches of Heritage NSW's AHIMS database;
- A review associated site cards and reports to clarify site contents, extents and statuses;
- A review of the landscape context of the study area, with a particular emphasis on its implications for the nature and distribution of Aboriginal archaeological materials;
- A review of relevant archaeological and ethnohistoric information for the study area and environs; and
- Preparation of a predictive model for the Aboriginal archaeological record of the study area.

5.2 B. Archaeological Survey

AECOM proposes full coverage" archaeological survey strategy across the study area. The survey will be undertaken by a combined field team of two AECOM archaeologists and an appropriate number of RAP field representatives. While vehicles may be used to transport the survey team between survey localities, all survey will be completed on foot. Linear transects of variable length and width, depending on ground conditions and occupational health and safety (OH&S) considerations are proposed. The location of all transects completed during the survey, including their start and end points, will be recorded using one of two handheld differential GPS units, with associated transect data (e.g., levels of visibility and exposure, disturbance factors) entered directly into the same unit upon the completion of each transect.

All Aboriginal archaeological sites identified during the survey will be recorded to the standard required by the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b). For each site located, individual artefact locations will be captured by differential GPS. As with that recorded for individual survey transects, attribute data for all identified flaked stone artefacts will be entered directly into a GPS unit using AECOM's standard digital open site recording form. All sites will be comprehensively photographed following artefact recording and where not previously recorded, will be registered on Heritage NSW's AHIMS database.

The results of the archaeological survey will be recorded in an Aboriginal Archaeological Report (AAR) which will form an appendix to the ACHAR.

5.3 C. Consultation

RAP representatives are in the best position to provide information on the Aboriginal social/cultural heritage values of a given area. During the assessment process, AECOM archaeologists will consult with RAPs regarding the cultural heritage values of objects and places in the study area. This will include:

- A request (with this draft methodology) for any initial comments regarding the Aboriginal cultural heritage values of the study area;

- The provision of this draft assessment methodology to all RAPs for comment prior to fieldwork;
- RAP participation in field survey;
- Discussion of cultural heritage values with RAPs during fieldwork and generally throughout the process, until the end of the draft ACHAR review period; and
- Provision of draft ACHAR to all RAPs for comment prior to finalisation.

The identification of cultural values will include places of social, spiritual and cultural value, historic places with cultural significance, and potential places/areas of historic, social, spiritual and/or cultural significance.

As noted in Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a), some information obtained from registered Aboriginal parties may be sensitive or have restricted public access. AECOM, in consultation with relevant RAPs, will develop appropriate protocols for sensitive or restricted information, including:

1. Cultural restrictions on access to the material.
2. Cultural restrictions on communication of the material.
3. Cultural restrictions on the location of the material.
4. Cultural recommendations on handling the material.
5. Any other contextual information.
6. The names and contact details of persons authorised within the relevant Aboriginal group to make decisions concerning the Aboriginal material and the degree of authorisation.
7. Details of any consent given in accordance with customary law.
8. Level of confidentiality to be accorded to the material.
9. Access and use, by the registered Aboriginal parties, of the cultural information in the material.

It is also noted that the purpose of community consultation with Aboriginal people is to assist AECOM and NEOEN in the preparation of an application for an Aboriginal Heritage Impact Permit (although such a permit is not expected to be necessary given the Project will be assessed as an SSD) and to assist the Planning Secretary (DECCW, 2010) in his or her consideration and determination of the application.

5.4 E. Preparation of an ACHAR

AECOM will prepare an ACHAR for the Project detailing the results of the above archaeological survey and consultation with RAPs. The ACHAR will provide appropriate management and mitigation measures for the study area's Aboriginal heritage values. RAPs will have the opportunity to comment on management and mitigation options proposed in the ACHAR prior to finalisation.

6.0 Project Timeline

An indicative timeline for the ACHAR is provided below:

- Collation of culturally significant information – ongoing throughout process until the end of the draft ACHAR review period.
- RAP review on this draft methodology – March 2021.
- Archaeological survey – End of March 2021.
- Provision of a draft ACHAR report to each RAP for review and comment – April 2021.
- Period for comment on the draft ACHAR report – a minimum of 28 days following provision of the draft report.
- Preparation of a final ACHAR report in consideration of comments received – anticipated to occur in May.

7.0 References

NSW Department of Environment Climate Change & Water. (2010a). *Aboriginal Cultural Heritage Consultation Requirements for Proponents*. Department of Environment, Climate Change and

Water.

NSW Department of Environment Climate Change & Water. (2010b). *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. Department of Environment, Climate Change and Water.

Appendix E

RAP Submissions on Draft Methodology

Oakes, Geordie

From: lilly carroll <didgengunawalclan@yahoo.com.au>
Sent: Tuesday, 23 February 2021 5:07 PM
To: Oakes, Geordie
Subject: [EXTERNAL] Re: NEOEN NSW Big Battery - ACHAR Methodology

Hi Geordie

DNC agrees to all proposals for NSW Big battery project And we look forward to the survey. We are Currently completing the Centennial coal survey which isn't far from Wallerawang

Sent from Yahoo Mail for iPhone

On Tuesday, February 23, 2021, 2:48 pm, Oakes, Geordie <Geordie.Oakes@aecom.com> wrote:

Dear RAP,

Please find attached the proposed ACHAR assessment methodology for the NEON Big Battery Energy Storage System Project in Wallerawang. If you have any comments or questions, please provide these by COB 24 March 2021.

All the best,

Geordie

Geordie Oakes
Principal Heritage Specialist
D 0410513509
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
www.aecom.com

Oakes, Geordie

From: jesse johnson <muragadi@yahoo.com.au>
Sent: Wednesday, 24 February 2021 9:12 AM
To: Oakes, Geordie
Subject: [EXTERNAL] Re: NEOEN NSW Big Battery - ACHAR Methodology
Attachments: NEOEN Cover letter +Methodology_2021_02_23.pdf

Hi Geordie,
I have read the project information ACHAR and methodology for the above project, I agree with the recommendations made.
Kind regards
Jesse Johnson

On Tuesday, 23 February 2021, 02:48:55 pm AEDT, Oakes, Geordie <geordie.oakes@aecom.com> wrote:

Dear RAP,

Please find attached the proposed ACHAR assessment methodology for the NEON Big Battery Energy Storage System Project in Wallerawang. If you have any comments or questions, please provide these by COB 24 March 2021.

All the best,

Geordie

Geordie Oakes
Principal Heritage Specialist
D 0410513509
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
www.aecom.com

Oakes, Geordie

From:	Darleen Johnson <murrabidgeemullangari@yahoo.com.au>
Sent:	Tuesday, 23 February 2021 5:29 PM
To:	Oakes, Geordie
Subject:	[EXTERNAL] Re: NEOEN NSW Big Battery - ACHAR Methodology
Attachments:	NEOEN Cover letter +Methodology_2021_02_23.pdf

Hi Geordie,
I have read the project information ACHAR and methodology for the above project, I endorse the recommendations made.
Kind regards
Ryan Johnson
0475565517

On Tuesday, 23 February 2021, 02:48:55 pm AEDT, Oakes, Geordie <geordie.oakes@aecom.com> wrote:

Dear RAP,

Please find attached the proposed ACHAR assessment methodology for the NEON Big Battery Energy Storage System Project in Wallerawang. If you have any comments or questions, please provide these by COB 24 March 2021.

All the best,

Geordie

Geordie Oakes
Principal Heritage Specialist
D 0410513509
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000   F +61 2 8934 0001
www.aecom.com

Appendix F

Draft Test Excavation Methodology

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

10 September 2021

Registered Aboriginal Party (RAP)
Great Western Battery Project
Wallerawang, NSW

Dear RAP representative,

Re: Draft Test Excavation Methodology - Great Western Batter Project, Wallerawang, NSW

In accordance with Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents*, please find below for your review a draft methodology for AECOM's proposed test excavation program for the Great Western Battery Project (the Project) in Wallerawang, NSW.

As you would be aware, AECOM is preparing an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Project, with supporting works comprising a combination of desktop research, consultation with Registered Aboriginal Parties (RAPs) and archaeological field investigations. AECOM's ACHAR, as previously advised, will form part of the Environmental Impact Statement (EIS) that is being prepared for the Project in accordance with Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act 1979).

As per the draft assessment methodology issued to you on 23 February 2021, and our verbal and/or written communications with you since this time, AECOM can advise that the archaeological survey component of AECOM's assessment was undertaken on 16 June 2021, with the survey team comprising two AECOM archaeologists and four RAP field representatives. AECOM can advise that the survey resulted in the identification of two Aboriginal archaeological sites within ACHAR study area, both comprising surface scatters of flaked stone artefacts (one previously recorded and one new). In addition to these surface sites, three areas of subsurface archaeological sensitivity were identified within the study area, one within the main battery site, west of Brays Lane, and two within the proposed transmission line easement, east of Brays Lane. The location of these areas, which wholly encompass the mapped extent of the two scatters identified during survey, are shown on Figure 1 below, as are the locations of the two artefact scatters.

Based on the survey results and in-field discussions with attending RAP site officers, AECOM is proposing to undertake a program of archaeological test excavation within the ACHAR study area, the results of which will be used to inform AECOM's assessment of the scientific significance of Aboriginal archaeological sites within the study area, as well as the potential impacts of the Project on Aboriginal heritage values more broadly. Test excavation results will also be used to assist with the definition of archaeological site boundaries within the study area. As per the methodology outlined below, AECOM propose to restrict subsurface testing to the areas of subsurface sensitivity shown on Figure 1 and to carry out the testing in accordance with the relevant provisions of Heritage NSW's *Code of the Practice for Archaeological investigation of Aboriginal Objects in NSW*.

AECOM, on behalf of Neoen, will be providing all RAPs with the opportunity to participate in the proposed test excavation program in either a physical or non-physical capacity (subject to personal preference) in view of the current COVID situation in NSW. Subject to meeting current NSW government COVID requirements, those who wish to attend site in person will be provided with an opportunity to do so on a paid, rostered basis. For those who do not wish to attend site, AECOM proposes to provide daily updates on the excavation via e-mail (or telephone, if preferred) and to reimburse you for your time reviewing this information or participating in calls.

For those who wish to attend site, please be advised that AECOM is fully committed to ensuring we deliver our services in a safe manner and meet the Work Health and Safety (WHS) Act 2011 and regulations. We have in-house WHS professionals and have achieved certification to AS/NZS4801 and OHSAS18001 and undertake annual reviews to ensure we consistently meet WHS requirements. For this project, AECOM's project manager, in partnership with myself, will prepare a Safe Work Method Statement (SWMS) with COVID-19 specific controls to ensure all field staff will be able to complete the works in a safe manner. AECOM will provide this document to all RAPs for approval prior to site works. RAPs are advised that all AECOM staff are first aid trained and have many years' experience undertaking test excavation works. Each day a toolbox talk will be completed with RAPs and staff to discuss the fieldwork and any relevant safety procedures.

As indicated, we are seeking your feedback on AECOM's draft test excavation methodology for the testing program. Comments on the methodology can be provided in writing or by phone and are requested by Close of Business (COB) on Monday 27 September 2021.

Yours faithfully,

Dr Andrew P McLaren
Archaeologist
andrew.mclaren@aecom.com

Mobile: 0403 753 165
Direct Dial: +61 2 8934 0547
Direct Fax: +61 2 8934 0001

AECOM

Draft Test Excavation Methodology – Great Western Battery Project, Wallerawang

1.0 Rationale

Archaeological survey of the ACHAR study area, shown on Figure 1 below, has resulted in the identification of three areas of subsurface Aboriginal archaeological sensitivity. As indicated on Figure 2, two of these areas are located in the proposed transmission line corridor and encompass parts of the left bank floodplain of Pipers Flat Creek, while the third is located within the main battery site and covers the crest and upper flanks of a locally prominent low gradient ridgeline. Two out of three areas encompass surface artefact scatters identified during survey, one previously recorded and registered on AHIMS (45-1-2716) and the other previously unrecorded. Together with field observations, existing archaeological and environmental datasets for the study area suggest that the areas of subsurface sensitivity demarcated on Figure 2 retain moderate to high potential for the presence of subsurface Aboriginal archaeological deposits. Archaeological test excavation within these areas is deemed warranted to facilitate a robust assessment of the potential impacts of the Project on the Aboriginal heritage values of the study area.

2.0 Objectives

The overarching objectives of the test excavation program to be undertaken are as follows:

1. To collect information about the nature and extent of sub-surface Aboriginal objects within the identified areas of subsurface sensitivity shown on Figure 2, based on a sample derived from sub-surface investigations;
2. To generate data pertinent to determining the potential for the Project to harm Aboriginal objects (as defined by the National Parks and Wildlife Act 1974); and
3. To generate data that can be used to inform the design of the Project (if appropriate), as well as any mitigation measures that may be required.

3.0 Sampling Strategy and Field Methods

AECOM propose a systematic, two-phase program of testing within each area of sensitivity. In the main battery site, Phase 1 testing will involve hand excavation of 50 x 50 cm test pits across the entirety of the area of sensitivity demarcated on Figure 2, with test pits to be placed on an underlying 25 m grid. In the transmission line corridor, Phase 1 test pits will be excavated along linear transects, with test pits spaced at 25 m intervals. Proposed test pit locations in each area of sensitivity are shown on Figure 2. Phase 2 works, if required, would involve targeted expansions around Phase 1 pits with locally high artefact densities and/or features potential Aboriginal origin (e.g., hearths, heat treatment pits).

As per Heritage NSW's *Code of the Practice for Archaeological investigation of Aboriginal Objects in NS*W, the following standard excavation methodology is proposed:

- All excavation will be carried out manually using trowels, shovels and mattocks;
- Excavation will proceed in 50 x 50 cm units;
- The first excavation unit in each area of sensitivity will be excavated and documented in 5 cm spits. Based on these pits, 10 cm spits or sediment profile/stratigraphic excavation will be employed thereafter;
- All test excavation units will be excavated to at least the base of the identified Aboriginal object-bearing units.
- Phase 1 units may be combined and excavated as necessary in Phase 2 to understand the site characteristics; however, the maximum continuous surface area of a combination of Phase 1 units at any single excavation point will not exceed 3 m^2;
- Test pit stratigraphy for each excavation unit will be recorded on pro-forma recording sheets using standard sedimentological terms and criteria. Representative soil profiles will be photographed and drawn to scale;
- Should a feature of probable or definite Aboriginal cultural origin, such as a hearth or heat treatment pit be identified during the excavation, the surface of the feature will initially be cleared to define its extent. Surrounding pits will be excavated to achieve this, as required. The surface of the feature will be planned and photographed to record the upper cut and then half-sectioned to more accurately assess its origin, with excavation proceeding stratigraphically. All confirmed and suspected archaeological features will be photographed in cross-section. Cross-sections will also be drawn to scale. Upon completion of cross-section excavation and recording, features will be excavated in their entirety. All associated cultural materials will be retained for potential additional analysis (e.g, radiometric dating, lipid/pollen analysis).

- Should potential skeletal human remains be identified at any point during excavation, the procedure outlined in Section 5.0 of this methodology will be followed.
- If encountered, charcoal and/or other organic materials deemed suitable for radiocarbon dating will be collected using best practice guidelines (e.g., Burke and Smith 2004: 154);
- Soil samples from representative soil horizons will be retained for potential pH testing and other laboratory-based analyses (e.g., Particle Size Analysis);
- Should substantial intact cultural deposits be identified within a test pit, soil samples for potential OSL dating will be collected from selected strata using best practice guidelines (e.g., United States Geological Survey 2015);
- All excavated soils will dry-sieved on-site through 5 mm sieves;
- Artefacts recovered during sieving will be retained in plastic zip-lock bags and labelled with appropriate provenance data;
- All test pits will be backfilled upon conclusion of the testing program.

4.0 Post-Excavation Analyses

Post-excavations analyses for the testing program will be dictated by its results, as per the below:

- Should test excavations within the study area result in the recovery of flaked or ground stone artefacts, these will be subject to technological analysis by a qualified lithic specialist. Artefacts will be analysed to a level comparable to that achieved in previous analyses of excavated lithic assemblages from the Central Tablelands, so as to facilitate a meaningful comparative analysis of assemblage size and composition.
- Should test excavations within the study area result in the recovery of faunal remains of probable or definite Aboriginal cultural association, a suitably qualified specialist may be engaged to analyse these materials for the purposes of species identification and identifying evidence of cultural modification.
- Should test excavations within the study area result in the identification of one or more Aboriginal burials, subject to the agreement of RAPs, a suitably qualified specialist will be engaged to undertake a forensic analysis of associated skeletal materials (as per the procedure outlined in Section 5.0).
- If required for the purposes of determining significance, an appropriate number of organic and/or soil samples, to be determined in consultation in Neoen, will be submitted to commercial dating facilities for processing.
- Any soil samples selected for PSA and/or soil chemistry analysis will be submitted to an appropriate commercial soil testing facility for analysis. All resulting analytical outputs/reports will be attached to the ACHAR as standalone appendices.

5.0 Procedure for the management of potential human skeletal remains

Should potential human skeletal material be identified at any point during the test excavation program, the following actions will be undertaken:

1. All works in the vicinity of the test pit containing the skeletal material should cease immediately;
2. All soils excavated from the relevant test pit, including any removed from the immediate area for sieving, should be identified, recovered and stored adjacent to the pit;
3. The test pit should be isolated from access using temporary, high-visibility fencing materials;
4. The find should be reported to Neoen’s Project Manager;
5. The find should be comprehensively photographed *in situ* but not disturbed in any way;
6. Should it be readily apparent that the material is human, Neoen’s Project Manager should inform the NSW Police of the discovery as soon as practicable (required under law);
7. Where uncertainty over the origin of the material exists, the advice of a suitably qualified specialist should be should be sought ***within 24 hours*** to assist in the determination of origin, ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or modern). It may be necessary for the specialist to inspect the exposed material *in situ.* If so, this inspection should take place as soon as practicable.

8. If the engaged specialist confirms or suspects the skeletal material is human in origin, Neoen, or its delegate AECOM, should inform the NSW Police as soon as practicable (required under law). It should be assumed that the police will take command of the site until otherwise directed.
9. If the remains are identified as pre-contact or historic Aboriginal, Neoen, or its delegate AECOM, should formally notify all RAPs, as well as Heritage NSW, ***within 48 hours***. Management options for the remains, including avoidance of the location through design changes, exhumation and relocation to a designated keeping place, and exhumation and relocation to a non-impact area close to the original, should be presented to RAPs as part of the notification process. Ultimately, the wishes of the RAPs will guide the management option selected.
10. If required, AECOM, in consultation with Heritage NSW, RAPs and a suitably qualified specialist, should develop a specific methodology to carefully and sensitively recover the remains and to undertake agreed forensic analysis. A culturally appropriate repatriation, in a location jointly agreed by Neoen and the RAPs, should follow the completion of forensic analysis as soon as practicable.
11. If the remains are identified as historic (non-Aboriginal), Neoen, or its delegate AECOM, should notify Heritage NSW and seek their advice on appropriate management; and
12. If the skeletal remains are identified as faunal remains, they should be dealt with archaeologically. Excavation works within the relevant test pit can proceed with caution.

6.0 Care and Control of Aboriginal Objects

Should any Aboriginal objects be recovered as a result of the proposed test excavation program, RAPs will be consulted regarding their appropriate management following analysis and reporting. Options include :

- On-site reburial in a non-impact area;
- Off-site reburial in a location jointly agreed by Neoen and RAPs; and
- RAP retention of the objects under an National Parks and Wildlife Act 1974 Care Agreement.

Artefact deposition and storage, if selected, will be undertaken in accordance with Requirement 26 of the *Code of the Practice for Archaeological investigation of Aboriginal Objects in NS*W.

7.0 RAP Participation & Consultation

All RAPs will be given the opportunity to participate in the archaeological test excavation program detailed in this methodology and will be consulted throughout the works regarding the cultural significance of any intercepted deposits, as well as appropriate management actions.

8.0 Reporting

The results of the archaeological test program detailed above will be incorporated into AECOM's ACHAR for the Project.

AECOM

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

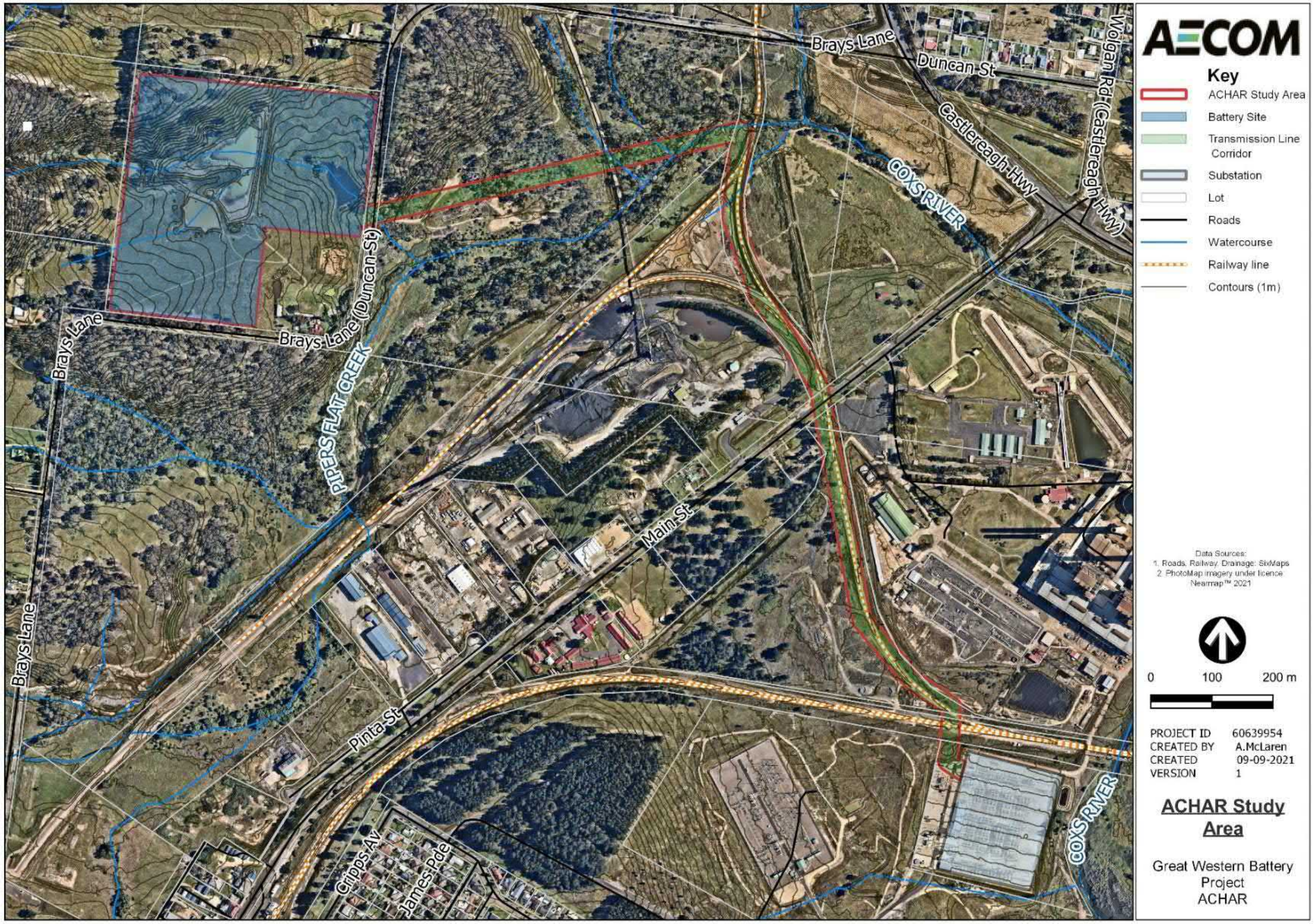


Figure 1 ACHAR Study Area

AECOM

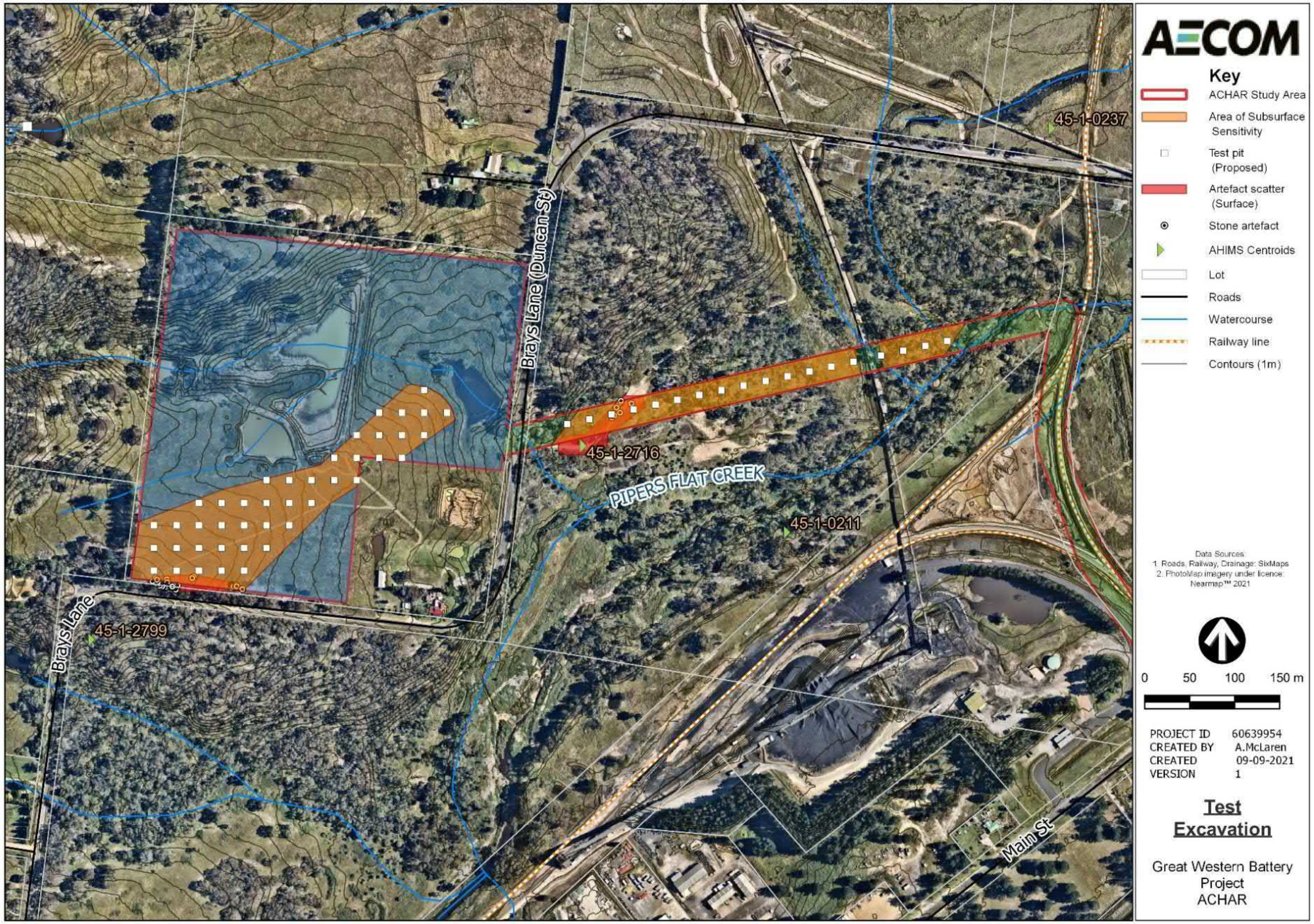


Figure 2 Test Excavation

Appendix G

RAP Responses to Draft Test Excavation Methodology

McLaren, Andrew

From: Martin de Launey <mudyi@bigpond.com>
Sent: Tuesday, 14 September 2021 3:56 PM
To: McLaren, Andrew
Subject: [EXTERNAL] RE: Draft test excavation methodology - Great Western Battery Project, Wallerawang

Thanks Dr Andrew

I have read the excavation methodology and despite it passing my "pub test" (and I'm sure has approval of peers), one of my main concerns to date, is ensuring that the access route is fully surveyed prior to any surface scrapes or use of heavy machinery; access roads are often considered less important because a few cars have already been on them. The riverside aspect of the site and recorded archaeology piques my curiosity so, sight unseen, I would still like to be considered to make an "in Person" site visit - as rostering and covid restrictions allow. My Mob. Number is 0450158281. Thanks again,

Martin de Launey

From: McLaren, Andrew [mailto:Andrew.McLaren@aecom.com]
Sent: Friday, September 10, 2021 12:40 PM
To: McLaren, Andrew
Subject: Draft test excavation methodology - Great Western Battery Project, Wallerawang

Dear Registered Aboriginal Party (RAP),

In accordance Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents*, please find attached for your review a draft of AECOM's test excavation methodology for the Great Western Battery Project at Wallerawang. Please note that the closing date for comments is **Monday 27 September 2021**. Comments can be provided by mail, e-mail or phone using the contact details below.

I will be in touch soon to discuss the fieldwork, which is currently scheduled for 4-8 October.

If you have any queries please feel free to give me buzz.

Kind regards,

Andy McLaren

Dr Andrew McLaren
Principal Aboriginal Heritage Specialist
M 0403 753 165
Andrew.McLaren@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
www.aecom.com

McLaren, Andrew

From: lilly carroll <didgengunawalclan@yahoo.com.au>
Sent: Friday, 10 September 2021 5:02 PM
To: McLaren, Andrew
Subject: [EXTERNAL] Re: Draft test excavation methodology - Great Western Battery Project, Wallerawang

Hi Andrew we all agree from our end for the drive test excavation methodology that has been proposed by you guys

Sent from Yahoo Mail for iPhone

On Friday, September 10, 2021, 12:41 pm, McLaren, Andrew <Andrew.McLaren@aecom.com> wrote:

Dear Registered Aboriginal Party (RAP),

In accordance Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents*, please find attached for your review a draft of AECOM's test excavation methodology for the Great Western Battery Project at Wallerawang. Please note that the closing date for comments is **Monday 27 September 2021**. Comments can be provided by mail, e-mail or phone using the contact details below.

I will be in touch soon to discuss the fieldwork, which is currently scheduled for 4-8 October.

If you have any queries please feel free to give me buzz.

Kind regards,

Andy McLaren

Dr Andrew McLaren

Principal Aboriginal Heritage Specialist

M 0403 753 165

Andrew.McLaren@aecom.com

AECOM

Level 21, 420 George Street, Sydney, NSW 2000

PO Box Q410, QVB PO, Sydney, NSW, 1230

T +61 2 8934 0000   F +61 2 8934 0001

www.aecom.com

Please consider the environment before printing this email

McLaren, Andrew

From: jesse johnson <muragadi@yahoo.com.au>
Sent: Wednesday, 15 September 2021 1:09 PM
To: McLaren, Andrew
Subject: [EXTERNAL] Re: Draft test excavation methodology - Great Western Battery Project, Wallerawang
Attachments: GWB_Test_Exc_Method_RAP_20210909.pdf

Hi Andrew,
I have read the project information and methodology for the above project, I agree with the recommendations made.
Kind regards
Jesse Johnson

On Friday, 10 September 2021, 12:41:06 pm AEST, McLaren, Andrew <andrew.mclaren@aecom.com> wrote:

Dear Registered Aboriginal Party (RAP),

In accordance Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents*, please find attached for your review a draft of AECOM's test excavation methodology for the Great Western Battery Project at Wallerawang. Please note that the closing date for comments is **Monday 27 September 2021**. Comments can be provided by mail, e-mail or phone using the contact details below.

I will be in touch soon to discuss the fieldwork, which is currently scheduled for 4-8 October.

If you have any queries please feel free to give me buzz.

Kind regards,

Andy McLaren

Dr Andrew McLaren

Principal Aboriginal Heritage Specialist

M 0403 753 165

Andrew.McLaren@aecom.com

AECOM

Level 21, 420 George Street, Sydney, NSW 2000

PO Box Q410, QVB PO, Sydney, NSW, 1230

T +61 2 8934 0000   F +61 2 8934 0001

www.aecom.com

McLaren, Andrew

From:	Tonilee Scott <CEO@Bathurstlalc.com>
Sent:	Wednesday, 29 September 2021 9:17 AM
To:	McLaren, Andrew
Subject:	[EXTERNAL] Re: Great Western Battery Project, Wallerawang

Hi Andrew,

No all looks good, looks like you cover all basis.

Tonilee Scott
Bathurst Local Aboriginal Land Council
149 Russell Street
Bathurst NSW 2795
P: 026332 6835
F: 026332 3623
E: ceo@bathurstlalc.com
E: bathlalc2@bigpond.com

We acknowledge and respect the Wiradjuri people, the traditional owners and custodians of this region.
We honor their cultural, spiritual, and emotional connection to this land.
We also acknowledge the other Indigenous nations and people whose traditional home this land is.

Bathurst Local Aboriginal Land Council

From: "McLaren, Andrew" <Andrew.McLaren@aecom.com>
Date: Wednesday, 29 September 2021 at 9:13 am
To: Tonilee Scott <CEO@Bathurstlalc.com>
Subject: Great Western Battery Project, Wallerawang

Morning Tonilee,

Forgot to ask in my reply Monday, did you have comments on the testing methodology for this job, issued 10/09? Attached again FYI.

Just wanted to check you're happy with the proposed approach.

All the best,

Andy

Dr Andrew McLaren
Principal Aboriginal Heritage Specialist
M 0403 753 165
Andrew.McLaren@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000   F +61 2 8934 0001
www.aecom.com

McLaren, Andrew

From: Ryan Johnson <murrabidgeemullangari@yahoo.com.au>
Sent: Wednesday, 29 September 2021 10:42 AM
To: McLaren, Andrew
Subject: [EXTERNAL] Re: Draft test exc methodology - Great Wester Battery Project, Wallerawang

Hi Andrew
I have read the project information and methodology for the above project, I endorse the recommendations made.
Kind regards
Darleen Johnson

On 29 Sep 2021, at 9:11 am, McLaren, Andrew <Andrew.McLaren@aecom.com> wrote:

Morning Darleen,

Just following up re the draft test excavation methodology for this job, issued on 10/09. Attached again FYI.

Are you happy with the suggested approach? Any other comments?

All the best,

Andy

Dr Andrew McLaren
Principal Aboriginal Heritage Specialist
M 0403 753 165
Andrew.McLaren@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000   F +61 2 8934 0001
www.aecom.com

<GWB_Test_Exc_Method_RAP_20210909.pdf>

McLaren, Andrew

From: Shaun Carroll <Merrigarn@hotmail.com>
Sent: Thursday, 30 September 2021 11:51 AM
To: McLaren, Andrew
Subject: [EXTERNAL] RE: Draft test excavation methodology - Great Western Battery Project, Wallerawang

Hi Andrew,
I have read the draft test excavation methodology for the above project, I agree with the recommendations made.
Kind regards
Shaun Carroll
0497956533

Sent from Mail for Windows

From: McLaren, Andrew
Sent: Friday, 10 September 2021 12:40 PM
To: McLaren, Andrew
Subject: Draft test excavation methodology - Great Western Battery Project, Wallerawang

Dear Registered Aboriginal Party (RAP),

In accordance Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents*, please find attached for your review a draft of AECOM's test excavation methodology for the Great Western Battery Project at Wallerawang. Please note that the closing date for comments is **Monday 27 September 2021**. Comments can be provided by mail, e-mail or phone using the contact details below.

I will be in touch soon to discuss the fieldwork, which is currently scheduled for 4-8 October.

If you have any queries please feel free to give me buzz.

Kind regards,

Andy McLaren

Dr Andrew McLaren
Principal Aboriginal Heritage Specialist
M 0403 753 165
Andrew.McLaren@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8934 0000 F +61 2 8934 0001
www.aecom.com

Appendix H

Test Excavation Notification

AECOM

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney NSW 2000
PO Box Q410
QVB Post Office NSW 1230
Australia
www.aecom.com

+61 2 8934 0000 tel
+61 2 8934 0001 fax
ABN 20 093 846 925

10 September 2021

Aboriginal Heritage Planning
Heritage NSW
Locked Bag 5020
Parramatta NSW 2124

To Whom it May Concern,

Re: Notification of Archaeological Test Excavation Program for the State Significant Development (SSD) Great Western Battery Project, Wallerawang, NSW

1.0 Introduction

In accordance with Requirement 15c of *the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (the Code of Practice), I am writing to inform you of a program of archaeological test excavation that is be undertaken as part of AECOM's Aboriginal cultural heritage assessment for the Great Western Battery Project (the Project) in Wallerawang, NSW. The testing program is currently scheduled to occur over five days between 4 and 8 October 2021, providing the necessary 14 day notification period required under the Code of Practice.

2.0 Project Background & ACHAR Study Area

Neoen Australia Pty Ltd (Neoen) is seeking development consent to construct, operate and maintain a large-scale Battery Energy Storage System (BESS) of approximately 500 megawatts (MW) and up to 1000megawatt-hour (MWh) at Brays Lane, Wallerawang, NSW, as well as a new transmission line that would connect the BESS to the existing TransGrid 330 kilovolt (kV) substation at Wallerawang (the Project). The Project is considered State Significant Development (SSD) under the Environmental Planning and Assessment Act 1979 (EP&A Act) as it satisfies the requirements of Clause 8 of the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP).

The study area for AECOM's Aboriginal cultural heritage assessment, shown on **Figure 1**, includes two distinct components:

1. the proposed BESS Site, shaded in blue; and
2. a *c*.1.8 km long, 30 m wide linear corridor centred on the Project's proposed transmission line alignment (the 'transmission line corridor'), shaded in green.

Bounded to the south and east by Brays Lane and to the north and west by undeveloped rural land (both occupied and unoccupied), the BESS Site occupies part of Lot 4 on Deposited Plan (DP) 751651 and is 13.5 hectares in size. A single residential dwelling with associated outbuildings and fenced yards occupies the southeastern portion of Lot 4. However, these features, and the land immediately surrounding them, do not form part of the BESS Site.

Land within the BESS Site has been zoned as 'RU1 - Primary Production' and consists predominantly of cleared grazing (pasture) land, with four farm dams and a small area of remnant native vegetation also present, the latter located in the northwestern portion of the site. Two unnamed drainage lines, both ephemeral, traverse the BESS Site on a roughly east-west axis and join within it to form a second order drainage line, also ephemeral. This stream joins Pipers Flat Creek, the closest named watercourse, around 110 metres to the east of the site. Pipers Flat Creek, in turn, discharges into the Coxs River approximately 700 metres to the east of the BESS Site. At its closest point, the Lidsdale Siding facility is located around 330 metres to the south of the site. The now decommissioned Wallerawang power station, meanwhile, is situated about 1.3 kilometres to the southeast.

Brays Lane and the BESS Site can be accessed from the Castlereagh Highway, c.870 m to the east, or from Pipers Flat Road, c.1.4 km to the south. Brays Lane, from its intersection with the Castlereagh Highway to the bridge crossing of Coxs River, is a well maintained, wide, paved, dual lane road. The bridge crossing is one-lane wide. Between the bridge and the BESS Site, Brays Lane becomes a partially unsealed, narrow but bi-directional road.

The transmission line corridor, as shown on **Figure 1**, extends eastward from the study area toward the junction of Pipers Flat Creek and the Coxs River before turning southward and following the existing railway line though the northern end of the Lidsdale Siding facility, across Main Street and along the western boundary of the Wallerawang Power Station facility. After crossing the Main Western Railway Line the corridor ends at the existing TransGrid Wallerawang 330 kV substation. Land within the transmission line corridor, which covers an area of 5.4

ha, is currently owned and/or managed privately by Lithgow City Council, TransGrid and John Holland Rail. Traversed land parcels include Lots 8 and 9 on DP 252472, Lot 2 on DP108089, Lot 1 on DP108089, Lot 10 on DP1168824, Lot 1115 on DP1204803 and Lot 91 on DP1043967.

Ben Bullen State Forest is located to the east of the Project area, while Lidsdale State Forest and Marrangaroo National Park are located to the south.

3.0 Proponent & Archaeologist Details

Neoen is the legal entity responsible for the Project. Neoen's details are as follows:

Nominated contact: Sebastien Roebben

Office address: 10/227 Elizabeth St, Sydney NSW 2000

Phone: 0455 450 011

E-mail: sebastien.roebben@neoen.com

AECOM archaeologist Dr Andrew McLaren will be managing the test excavation program of behalf of Neoen. Contact details for Dr McLaren are as follows:

Office address: Level 8, 420 George Street, Sydney, NSW 2000

Phone: 0403 753 165

E-mail: andrew.mclaren@aecom.com

4.0 Archaeological Test Excavation Program

4.1.1 Rationale

Archaeological survey of the ACHAR study area (**Figure 1**) has resulted in the identification of three areas of subsurface Aboriginal archaeological sensitivity. As indicated on **Figure 2**, two of these areas are located in the proposed transmission line corridor and encompass parts of the left bank floodplain of Pipers Flat Creek, while the third is located within the main battery site and covers the crest and upper flanks of a locally prominent low gradient ridgeline. Two out of three areas encompass surface artefact scatters identified during survey, one previously recorded and registered on AHIMS (45-1-2716) and the other previously unrecorded. Together with field observations, existing archaeological and environmental datasets for the study area suggest that the areas of subsurface sensitivity demarcated on **Figure 2** retain moderate to high potential for the presence of subsurface Aboriginal archaeological deposits. Archaeological test excavation within these areas is deemed warranted to facilitate a robust assessment of the potential impacts of the Project on the Aboriginal heritage values of the study area.

4.1.2 Objectives

The overarching objectives of the test excavation program to be undertaken are as follows:

1. To collect information about the nature and extent of sub-surface Aboriginal objects within the identified areas of subsurface sensitivity shown on **Figure 2**, based on a sample derived from sub-surface investigations;
2. To generate data pertinent to determining the potential for the Project to harm Aboriginal objects (as defined by the National Parks and Wildlife Act 1974); and
3. To generate data that can be used to inform the design of the Project (if appropriate), as well as any mitigation measures that may be required.

4.1.3 Sampling Strategy and Field Methods

AECOM propose a systematic, two-phase program of testing within each area of sensitivity. In the main battery site, Phase 1 testing will involve hand excavation of 50 x 50 cm test pits across the entirety of the area of sensitivity demarcated on **Figure 2**, with test pits to be placed on an underlying 25 m grid. In the transmission line corridor, Phase 1 test pits will be excavated along linear transects, with test pits spaced at 25 m intervals. Proposed test pit locations in each area of sensitivity are shown on Figure 2. Phase 2 works, if required, would involve targeted expansions around Phase 1 pits with locally high artefact densities and/or features potential Aboriginal origin (e.g., hearths, heat treatment pits).

As per Heritage NSW's *Code of the Practice for Archaeological investigation of Aboriginal Objects in NS*W, the following standard excavation methodology is proposed:

- All excavation will be carried out manually using trowels, shovels and mattocks;
- Excavation will proceed in 50 x 50 cm units;
- The first excavation unit in each area of sensitivity will be excavated and documented in 5 cm spits. Based on these pits, 10 cm spits or sediment profile/stratigraphic excavation will be employed thereafter;
- All test excavation units will be excavated to at least the base of the identified Aboriginal object-bearing units. Cultural sterility of underlying sedimentary units will be established via a minimum of one Phase 1 test pit in each area.
- Phase 1 units may be combined and excavated as necessary in Phase 2 to understand the site characteristics; however, the maximum continuous surface area of a combination of Phase 1 units at any single excavation point will not exceed 3 m^2;
- Test pit stratigraphy for each excavation unit will be recorded on pro-forma recording sheets using standard sedimentological terms and criteria. Representative soil profiles will be photographed and drawn to scale;
- Should a feature of probable or definite Aboriginal cultural origin, such as a hearth or heat treatment pit be identified during the excavation, the surface of the feature will initially be cleared to define its extent. Surrounding pits will be excavated to achieve this, as required. The surface of the feature will be planned and photographed to record the upper cut and then half-sectioned to more accurately assess its origin, with excavation proceeding stratigraphically. All confirmed and suspected archaeological features will be photographed in cross-section. Cross-sections will also be drawn to scale. Upon completion of cross-section excavation and recording, features will be excavated in their entirety. All associated cultural materials will be retained for potential additional analysis (e.g, radiometric dating, lipid/pollen analysis).
- Should potential skeletal human remains be identified at any point during excavation, the procedure outlined in Section 5.0 of this methodology will be followed.
- If encountered, charcoal and/or other organic materials deemed suitable for radiocarbon dating will be collected using best practice guidelines (e.g., Burke and Smith 2004: 154);
- Soil samples from all identified soil horizons will be retained for pH testing and other laboratory-based analyses (e.g., Particle Size Analysis);
- Should substantial intact cultural deposits be identified within a test pit, soil samples for potential OSL dating will be collected from selected strata using best practice guidelines (e.g., United States Geological Survey 2015);
- All excavated soils will dry-sieved on-site through 5 mm sieves;
- Artefacts recovered during sieving will be retained in plastic zip-lock bags and labelled with appropriate provenance data;
- All test pits will be backfilled upon conclusion of the testing program.

4.1.4 Post-Excavation Analyses

Post-excavations analyses for the testing program will be dictated by its results, as per the below:

- Should test excavations within the study area result in the recovery of flaked or ground stone artefacts, these will be subject to technological analysis by a qualified lithic specialist. Artefacts will be analysed to a level comparable to that achieved in previous analyses of excavated lithic assemblages from the Central Tablelands, so as to facilitate a meaningful comparative analysis of assemblage size and composition.
- Should test excavations within the study area result in the recovery of faunal remains of probable or definite Aboriginal cultural association, a suitably qualified specialist may be engaged to analyse these materials for the purposes of species identification and identifying evidence of cultural modification.
- Should test excavations within the study area result in the identification of one or more Aboriginal burials, subject to the agreement of RAPs, a suitably qualified specialist will be engaged to undertake a forensic analysis of associated skeletal materials (as per the procedure outlined in Section 5.0).
- If required for the purposes of determining significance, an appropriate number of organic and/or soil samples, to be determined in consultation in Neoen, will be submitted to commercial dating facilities for processing.

- Any soil samples selected for PSA and/or soil chemistry analysis will be submitted to an appropriate commercial soil testing facility for analysis. All resulting analytical outputs/reports will be attached to the ACHAR as standalone appendices.

4.1.5 Procedure for the management of potential human skeletal remains

Should potential human skeletal material be identified at any point during the test excavation program, the following actions will be undertaken:

1. All works in the vicinity of the test pit containing the skeletal material should cease immediately;
2. All soils excavated from the relevant test pit, including any removed from the immediate area for sieving, should be identified, recovered and stored adjacent to the pit;
3. The test pit should be isolated from access using temporary, high-visibility fencing materials;
4. The find should be reported to Neoen's Project Manager;
5. The find should be comprehensively photographed *in situ* but not disturbed in any way;
6. Should it be readily apparent that the material is human, Neoen's Project Manager should inform the NSW Police of the discovery as soon as practicable (required under law);
7. Where uncertainty over the origin of the material exists, the advice of a suitably qualified specialist in human and/or faunal skeletal remains should be sought ***within 24 hours*** to assist in the determination of origin, ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or modern). It may be necessary for the specialist to inspect the exposed material *in situ.* If so, this inspection should take place as soon as practicable.
8. If the engaged specialist confirms or suspects the skeletal material is human in origin, Neoen, or its delegate AECOM, should inform the NSW Police as soon as practicable (required under law). It should be assumed that the police will take command of the site until otherwise directed.
9. If the remains are identified as pre-contact or historic Aboriginal, Neoen, or its delegate AECOM, should formally notify all RAPs, as well as Heritage NSW, ***within 48 hours***. Management options for the remains, including avoidance of the location through design changes, exhumation and relocation to a designated keeping place, and exhumation and relocation to a non-impact area close to the original, should be presented to RAPs as part of the notification process. Ultimately, the wishes of the RAPs will guide the management option selected.
10. If required, AECOM, in consultation with Heritage NSW, RAPs and a suitably qualified specialist in human and/or faunal remains, should develop a specific methodology to carefully and sensitively recover the remains and to undertake agreed forensic analysis. A culturally appropriate repatriation, in a location jointly agreed by Neoen and the RAPs, should follow the completion of forensic analysis as soon as practicable.
11. If the remains are identified as historic (non-Aboriginal), Neoen, or its delegate AECOM, should notify Heritage NSW and seek their advice on appropriate management; and
12. If the skeletal remains are identified as faunal remains, they should be dealt with archaeologically. Excavation works within the relevant test pit can proceed with caution.

4.1.6 Care and Control of Aboriginal Objects

Should any Aboriginal objects be recovered as a result of the proposed test excavation program, RAPs will be consulted regarding their appropriate management following analysis and reporting. Options include :

- On-site reburial in a non-impact area;
- Off-site reburial in a location jointly agreed by Neoen and RAPs; and
- RAP retention of the objects under an National Parks and Wildlife Act 1974 Care Agreement.

Artefact deposition and storage, if selected, will be undertaken in accordance with Requirement 26 of the *Code of the Practice for Archaeological investigation of Aboriginal Objects in NS*W.

4.1.7 RAP Participation & Consultation

All RAPs will be given the opportunity to participate in the archaeological test excavation program detailed in this methodology and will be consulted throughout the works regarding the cultural significance of any intercepted deposits, as well as appropriate management actions.

4.1.8 Reporting

The results of the archaeological test program detailed above will be incorporated into AECOM's ACHAR for the Project.

Yours faithfully,

Dr Andrew P McLaren
Archaeologist
andrew.mclaren@aecom.com

Mobile: 0403 753 165

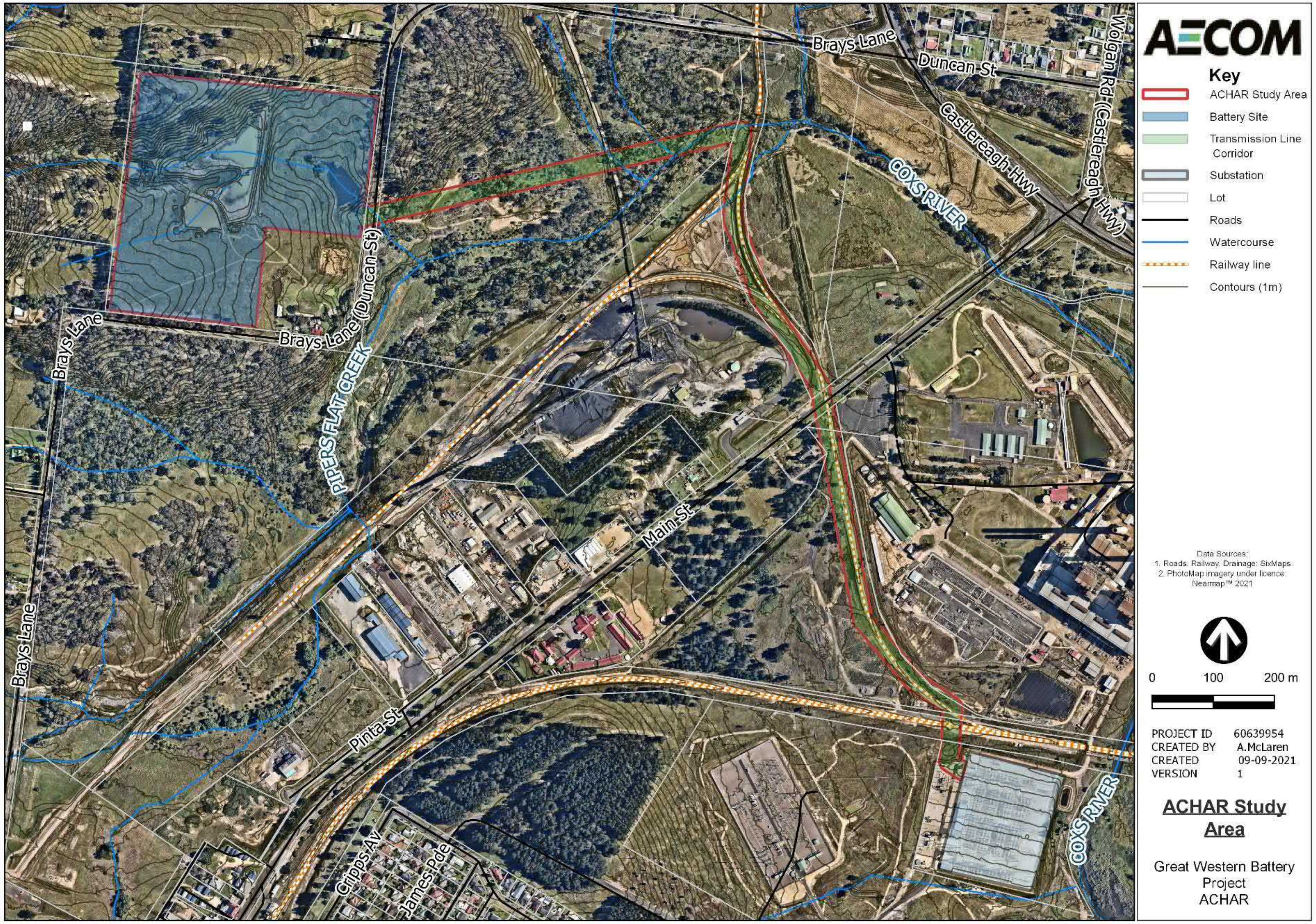


Figure 1: ACHAR Study Area

AECOM

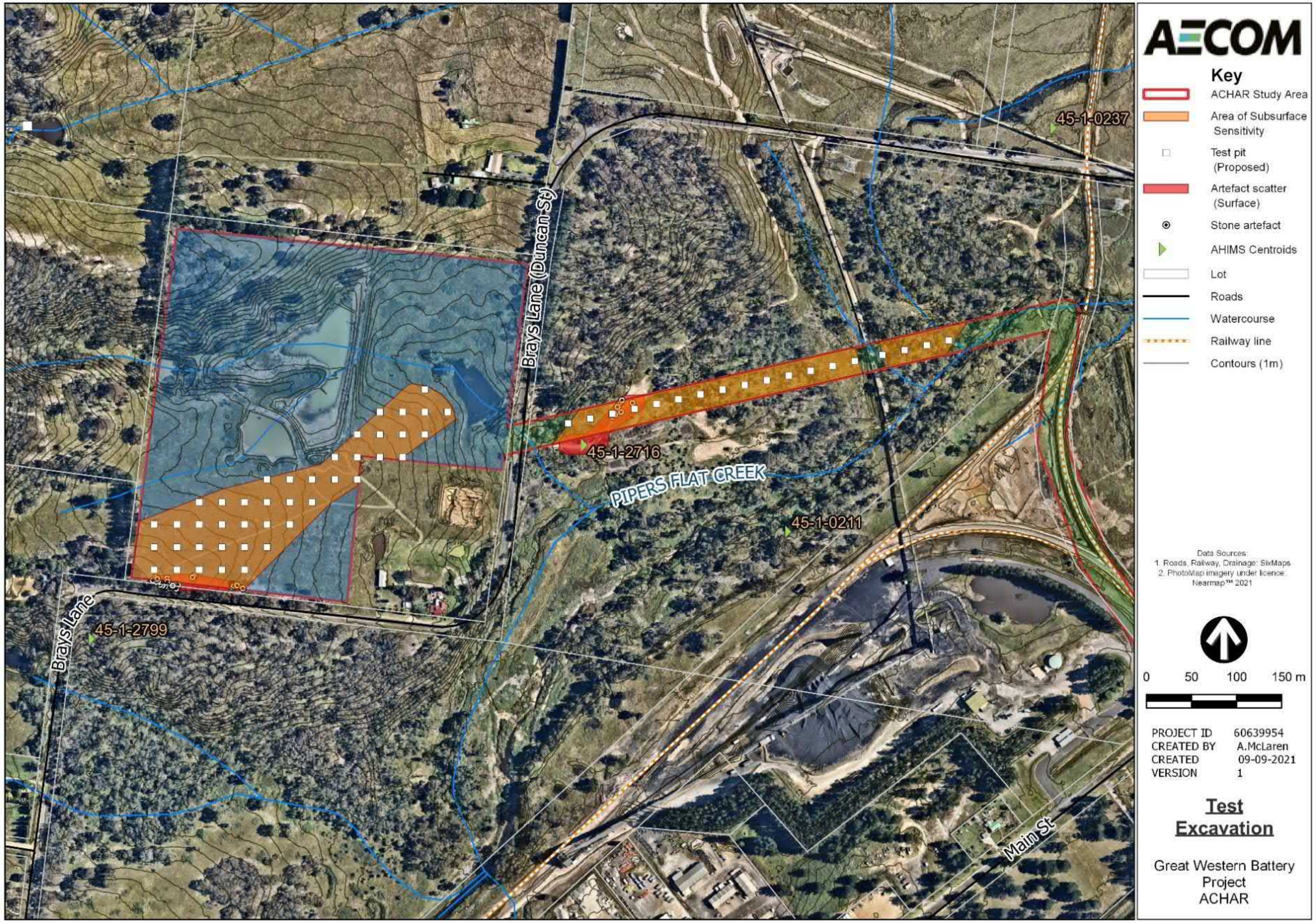


Figure 2: Test excavation

Appendix I

Historical Aerials

LOTSEARCH AERIALS

Date: 31 Mar 2021

Reference: LS019212 EA

Address: Great Western Battery, Wallerawang, NSW 2845

Aerial Imagery 2019

Great Western Battery, Wallerawang, NSW 2845

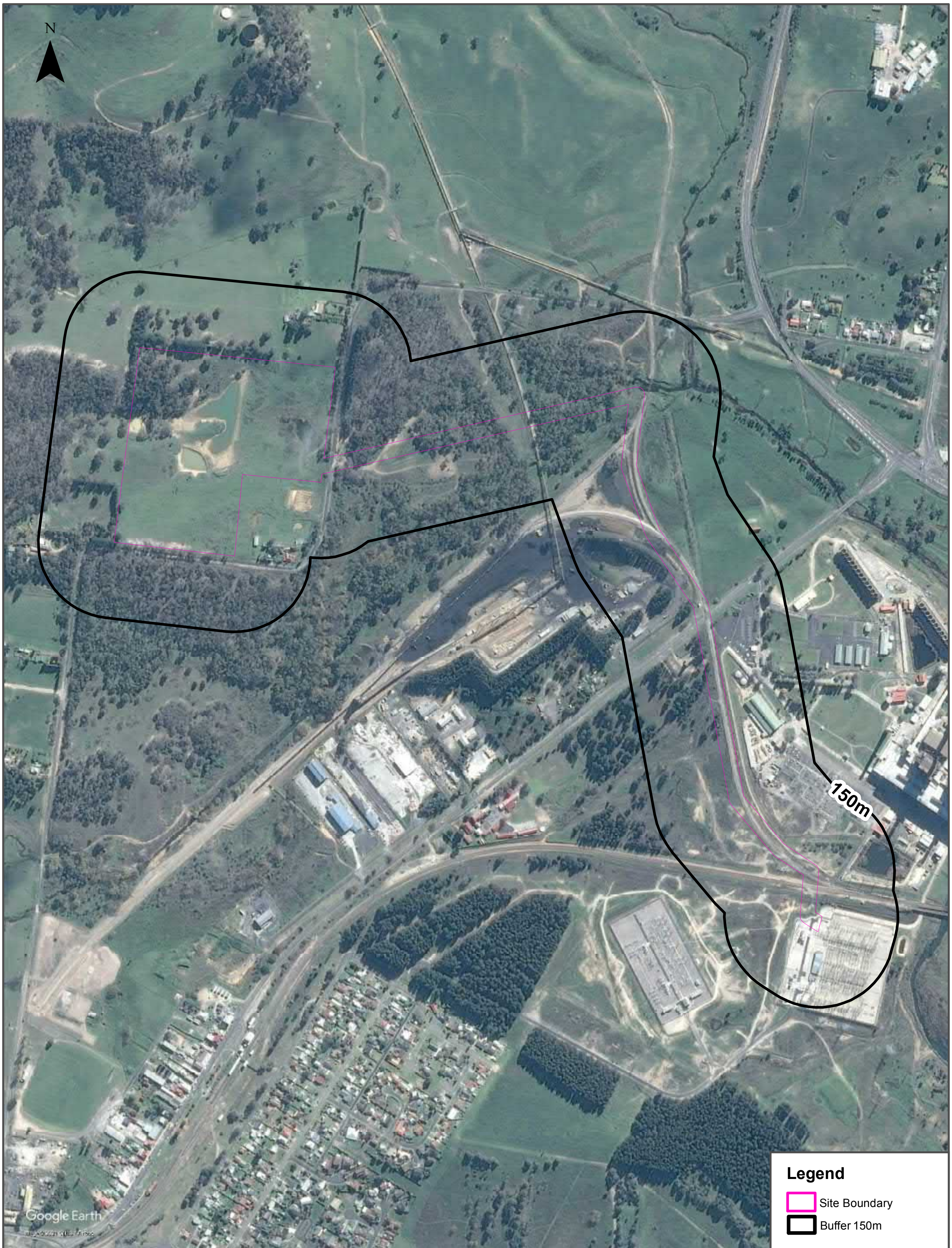
Legend

- Site Boundary
- Buffer 150m

Scale: 0 120 240 360 480 Meters	Data Source Aerial Imagery: © 2021 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 30 March 2021

Aerial Imagery 2014

Great Western Battery, Wallerawang, NSW 2845



Scale: 0 120 240 360 480 Meters	Data Source Aerial Imagery: © 2021 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 30 March 2021

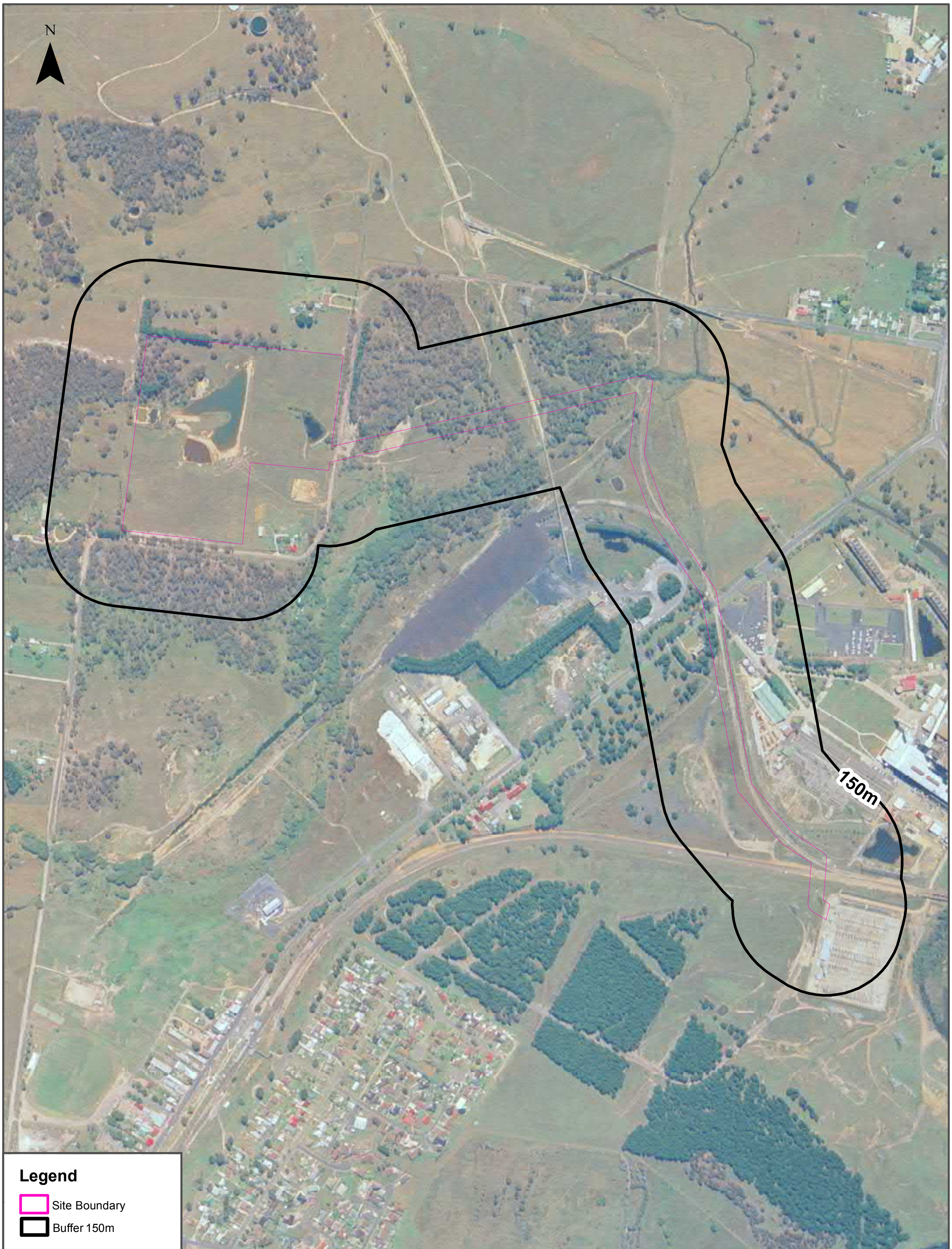
Aerial Imagery 2006

Great Western Battery, Wallerawang, NSW 2845

Scale: 0 120 240 360 480 Meters	Data Source Aerial Imagery: © 2021 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 30 March 2021

Aerial Imagery 2001

Great Western Battery, Wallerawang, NSW 2845



Legend

Site Boundary

Buffer 150m

Scale: 0 120 240 360 480 Meters	Data Source Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 30 March 2021

Aerial Imagery 1998

Great Western Battery, Wallerawang, NSW 2845

Scale: 0 120 240 360 480 Meters

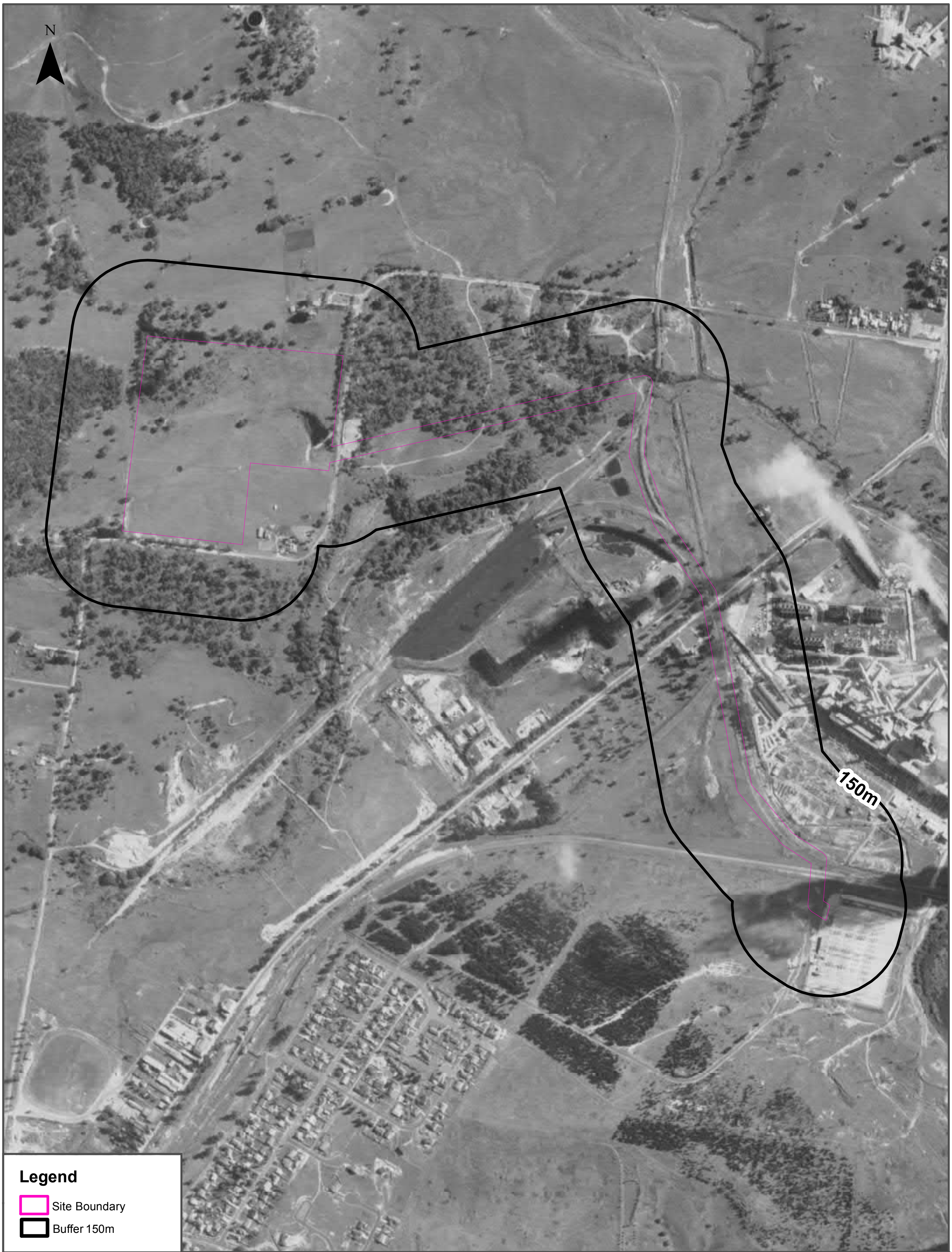
Data Source Aerial Imagery:
© NSW Department of Customer Service

Coordinate System:
GDA 1994 MGA Zone 56

Date: 30 March 2021

Aerial Imagery 1989

Great Western Battery, Wallerawang, NSW 2845



Scale: 0 120 240 360 480 Meters

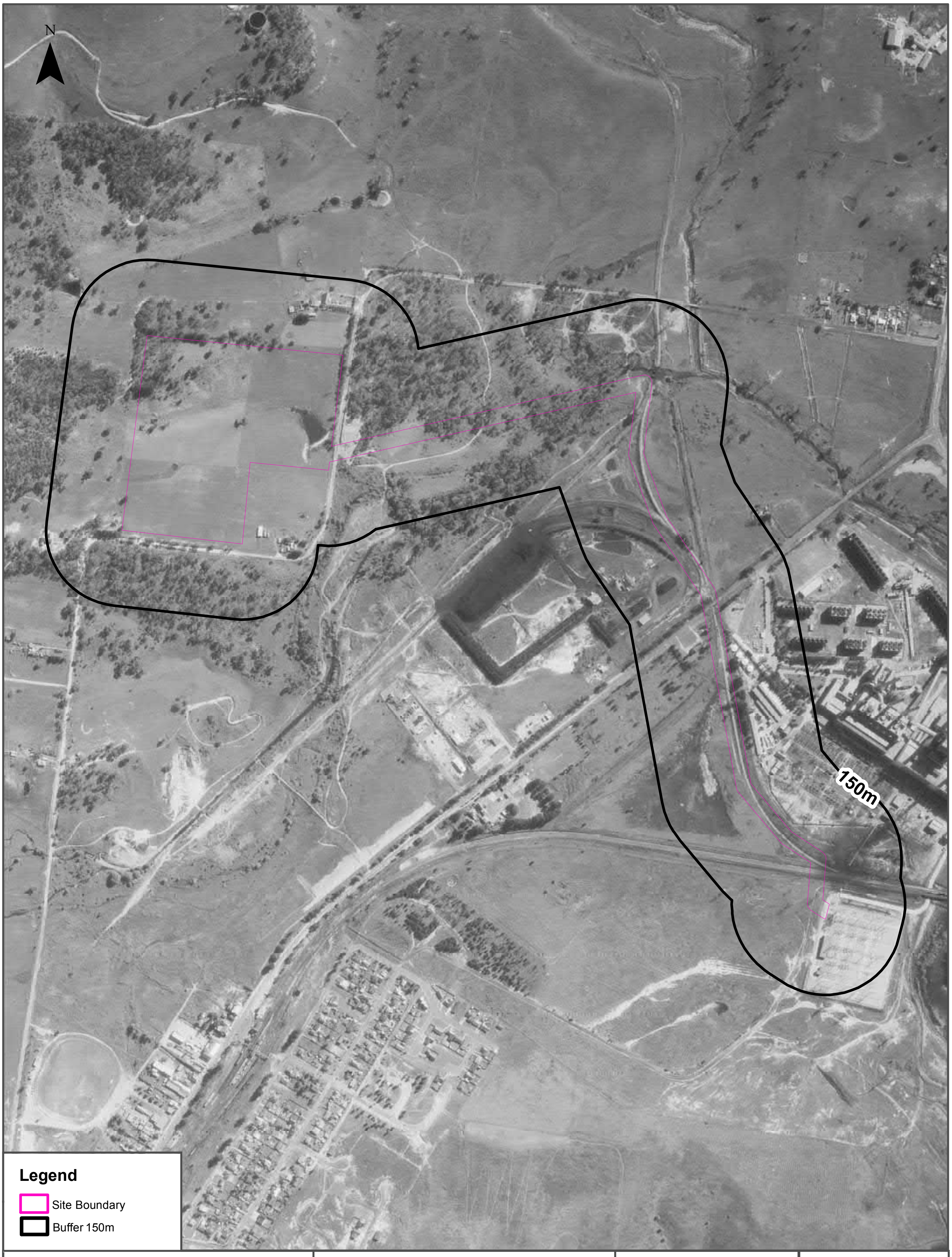
Data Source Aerial Imagery:
©2021 Geoscience Australia

Coordinate System:
GDA 1994 MGA Zone 56

Date: 30 March 2021

Aerial Imagery 1984

Great Western Battery, Wallerawang, NSW 2845



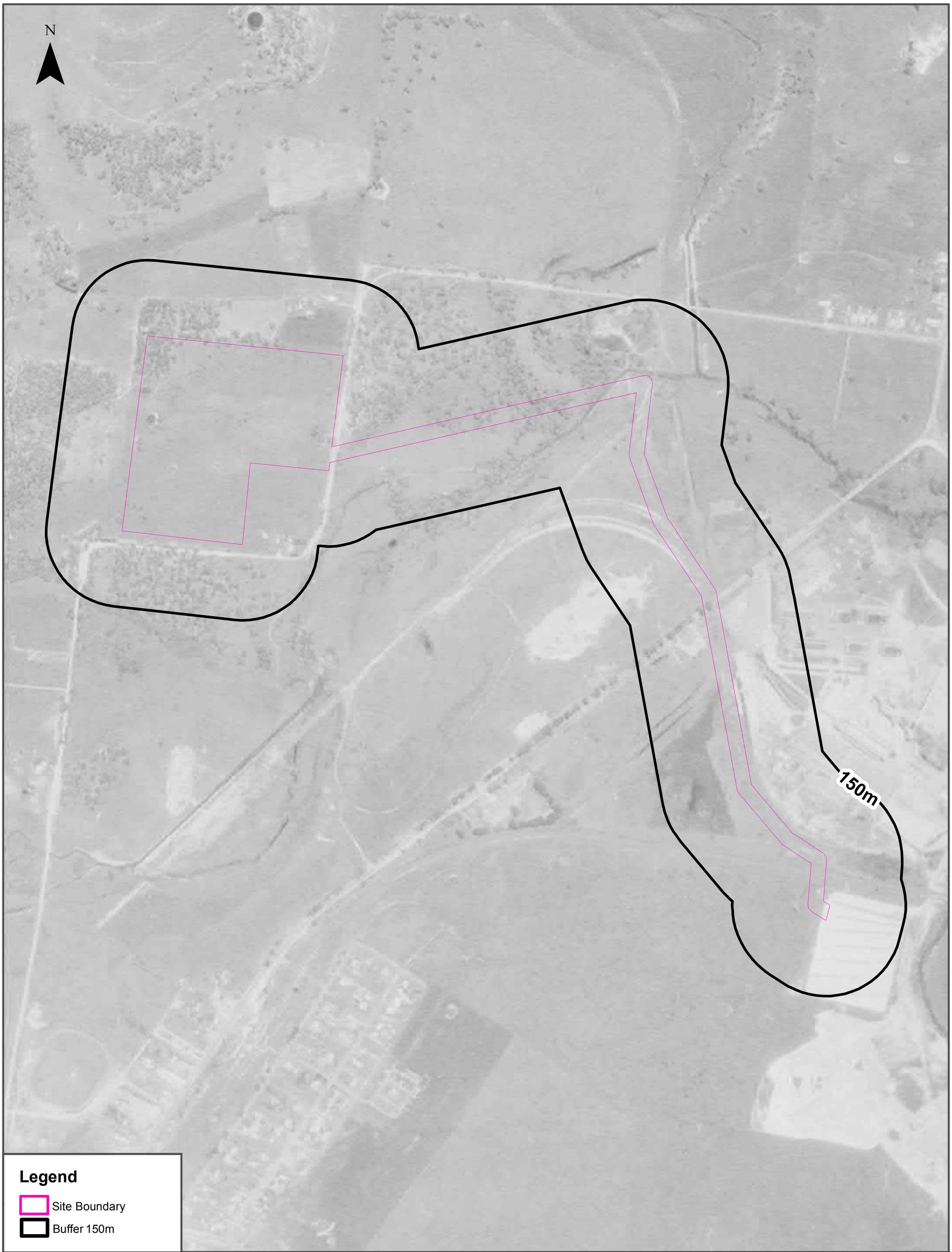
Legend

- Site Boundary
- Buffer 150m

Scale: 0 120 240 360 480 Meters	Data Source Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 30 March 2021

Aerial Imagery 1972

Great Western Battery, Wallerawang, NSW 2845



Scale: 0 120 240 360 480 Meters	Data Source Aerial Imagery: ©2021 Geoscience Australia	Coordinate System: GDA 1994 MGA Zone 56	Date: 30 March 2021

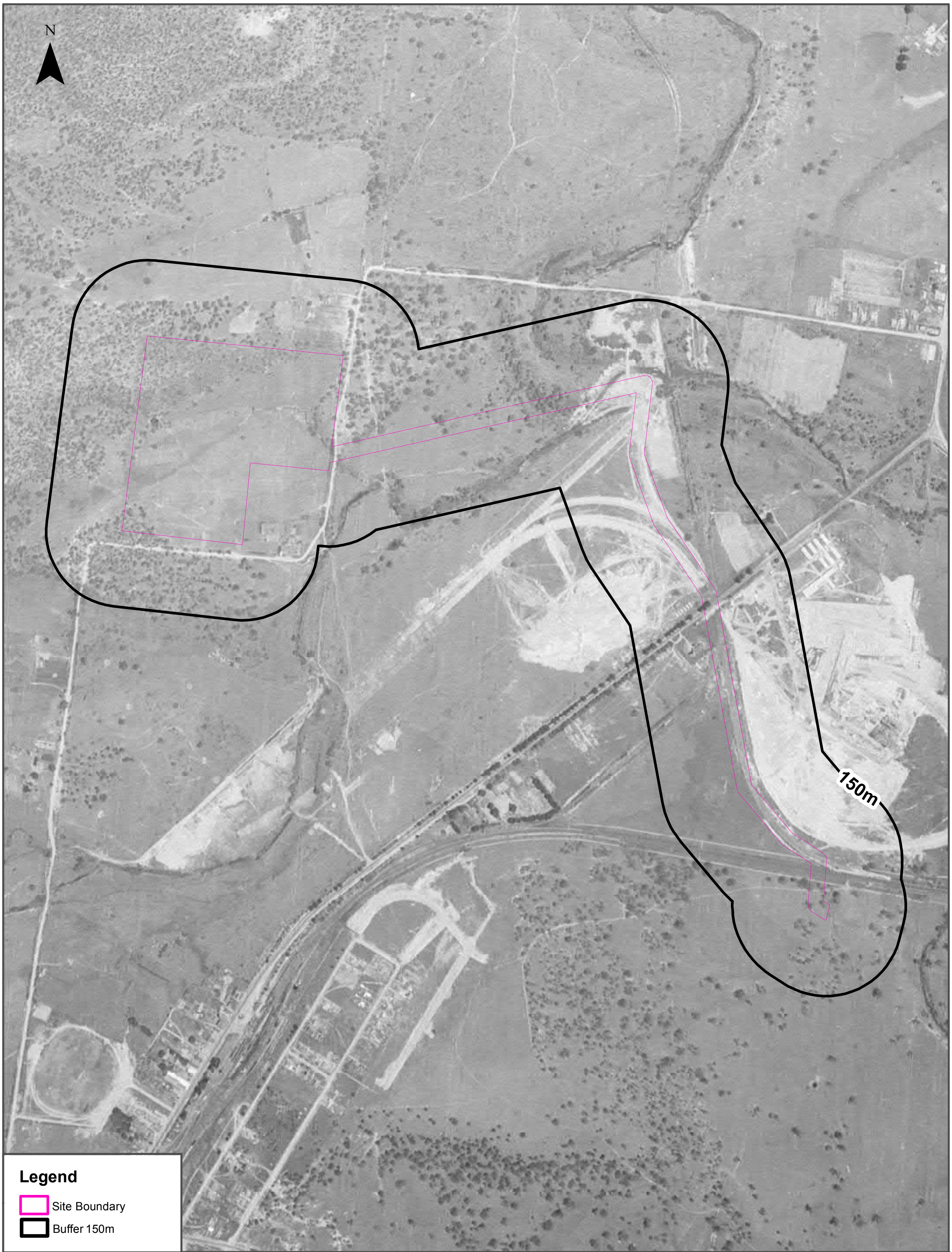
Aerial Imagery 1969

Great Western Battery, Wallerawang, NSW 2845

Scale: 0 120 240 360 480 Meters	Data Source Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 56	Date: 30 March 2021

Aerial Imagery 1954

Great Western Battery, Wallerawang, NSW 2845



Scale:

0 120 240 360 480
Meters

Data Source Aerial Imagery:
©2021 Geoscience Australia

Coordinate System:
GDA 1994 MGA Zone 56

Date: 30 March 2021

USE OF REPORT - APPLICABLE TERMS

The following terms apply to any person (End User) who is given the Report by the person who purchased the Report from Lotsearch Pty Ltd (ABN: 89 600 168 018) (Lotsearch) or who otherwise has access to the Report (Terms). The contract terms that apply between Lotsearch and the purchaser of the Report are specified in the order form pursuant to which the Report was ordered and the terms set out below are of no effect as between Lotsearch and the purchaser of the Report.

1. End User acknowledges and agrees that:
   (a) the Report is compiled from or using content (**Third Party Content**) which is comprised of:
      (i) content provided to Lotsearch by third party content suppliers with whom Lotsearch has contractual arrangements or content which is freely available or methodologies licensed to Lotsearch by third parties with whom Lotsearch has contractual arrangements (**Third Party Content Suppliers**); and
      (ii) content which is derived from content described in paragraph (i);
   (b) Neither Lotsearch nor Third Party Content Suppliers takes any responsibility for or give any warranty in relation to the accuracy or completeness of any Third Party Content included in the Report including any contaminated land assessment or other assessment included as part of a Report;
   (c) the Third Party Content Suppliers do not constitute an exhaustive set of all repositories or sources of information available in relation to the property which is the subject of the Report (**Property**) and accordingly neither Lotsearch nor Third Party Content Suppliers gives any warranty in relation to the accuracy or completeness of the Third Party Content incorporated into the report including any contaminated land assessment or other assessment included as part of a Report;
   (d) Reports are generated at a point in time (as specified by the date/time stamp appearing on the Report) and accordingly the Report is based on the information available at that point in time and Lotsearch is not obliged to undertake any additional reporting to take into consideration any information that may become available between the point in time specified by the date/time stamp and the date on which the Report was provided by Lotsearch to the purchaser of the Report;
   (e) Reports must be used or reproduced in their entirety and End User must not reproduce or make available to other persons only parts of the Report;
   (f) Lotsearch has not undertaken any physical inspection of the property;
   (g) neither Lotsearch nor Third Party Content Suppliers warrants that all land uses or features whether past or current are identified in the Report;
   (h) the Report does not include any information relating to the actual state or condition of the Property;
   (i) the Report should not be used or taken to indicate or exclude actual fitness or unfitness of Land or Property for any particular purpose
   (j) the Report should not be relied upon for determining saleability or value or making any other decisions in relation to the Property and in particular should not be taken to be a rating or assessment of the desirability or market value of the property or its features; and
   (k) the End User should undertake its own inspections of the Land or Property to satisfy itself that there are no defects or failures
2. The End User may not make the Report or any copies or extracts of the report or any part of it available to any other person. If End User wishes to provide the Report to any other person or make extracts or copies of the Report, it must contact the purchaser of the Report before doing so to ensure the proposed use is consistent with the contract terms between Lotsearch and the purchaser.
3. Neither Lotsearch (nor any of its officers, employees or agents) nor any of its Third Party Content Suppliers will have any liability to End User or any person to whom End User provides the Report and End User must not represent that Lotsearch or any of its Third Party Content Suppliers accepts liability to any such person or make any other representation to any such person on behalf of Lotsearch or any Third Party Content Supplier.
4. The End User hereby to the maximum extent permitted by law:
   (a) acknowledges that the Lotsearch (nor any of its officers, employees or agents), nor any of its Third Party Content Supplier have any liability to it under or in connection with the

Report or these Terms;

(b) waives any right it may have to claim against Third Party Content Supplier in connection with the Report, or the negotiation of, entry into, performance of, or termination of these Terms; and

(c) releases each Third Party Content Supplier from any claim it may have otherwise had in connection with the Report, or the negotiation of, entry into, performance of, or termination of these Terms.

5. The End User acknowledges that any Third Party Supplier shall be entitled to plead the benefits conferred on it under clause 4, despite not being a party to these terms.
6. End User must not remove any copyright notices, trade marks, digital rights management information, other embedded information, disclaimers or limitations from the Report or authorise any person to do so.
7. End User acknowledges and agrees that Lotsearch and Third Party Content Suppliers retain ownership of all copyright, patent, design right (registered or unregistered), trade marks (registered or unregistered), database right or other data right, moral right or know how or any other intellectual property right in any Report or any other item, information or data included in or provided as part of a Report.
8. To the extent permitted by law and subject to paragraph 9, all implied terms, representations and warranties whether statutory or otherwise relating to the subject matter of these Terms other than as expressly set out in these Terms are excluded.
9. Subject to paragraph 6, Lotsearch excludes liability to End User for loss or damage of any kind, however caused, due to Lotsearch's negligence, breach of contract, breach of any law, in equity, under indemnities or otherwise, arising out of all acts, omissions and events whenever occurring.
10. Lotsearch acknowledges that if, under applicable State, Territory or Commonwealth law, End User is a consumer certain rights may be conferred on End User which cannot be excluded, restricted or modified. If so, and if that law applies to Lotsearch, then, Lotsearch's liability is limited to the greater of an amount equal to the cost of resupplying the Report and the maximum extent permitted under applicable laws.
11. Subject to paragraph 9, neither Lotsearch nor the End User is liable to the other for:
    (a) any indirect, incidental, consequential, special or exemplary damages arising out of or in relation to the Report or these Terms; or
    (b) any loss of profit, loss of revenue, loss of interest, loss of data, loss of goodwill or loss of business opportunities, business interruption arising directly or indirectly out of or in relation to the Report or these Terms,

    irrespective of how that liability arises including in contract or tort, liability under indemnity or for any other common law, equitable or statutory cause of action or otherwise.
12. These Terms are subject to New South Wales law.

Appendix J

AHIMS Search Results

Office of Environment & Heritage

AHIMS Web Services (AWS)

Your Ref/PO Number : 60639954

Client Service ID : 568788

Site ID	Site name	Datum	Zone	Easting	Northing	Context	Site status	Site features	Site types	Recorders	Reports	Permits	Longitude GDA94	Latitude GDA94
45-6-2355	Lamberts Creek 6;	AGD	56	225480	6303070	Open site	Destroyed	Artefact : -	Open Camp Site	Ms.Laila Haglund,Ms.Jillian Comber		405	150.05	-33.37
45-1-2572	Site 1, Catlereagh High	AGD	56	228430	6301025	Open site	Valid	Artefact : -		Ms.Louise Gay	4549		150.08	-33.39
45-1-2573	PAD 1, Castlereagh Hi	AGD	56	228250	6301070	Open site	Destroyed	Potential Archaeological Deposit (PAD) : -		Ms.Louise Gay	98700,102443	1436,1666	150.08	-33.39
45-1-2574	PAD 2, Castlereagh Hi	AGD	56	228250	6301120	Open site	Partially Destroyed	Artefact : -, Potential Archaeological Deposit (PA		Ms.Louise Gay	98700,102443	1436,1707	150.08	-33.39
45-1-2583	Duncan/Main Street PA	AGD	56	228450	6300750	Open site	Valid	Artefact : -		Doctor.Jodie Benton		1793	150.08	-33.40
41-1-0238	Duncan Street PAD(ref	AGD	56	228450	6300750	Open site	Deleted	Potential Archaeological Deposit (PAD) : -		Doctor.Jodie Benton			150.08	-33.40
45-1-2715	SU1a - A4	GDA	56	228046	6301960	Open site	Valid	Artefact : 1		Ms.Cheng-Yen Loo,RPS East Australia Pty Ltd - Echuca Vic			150.08	-33.39
45-1-2716	SU1a - A5	GDA	56	227585	6300837	Open site	Valid	Artefact : 19		Ms.Cheng-Yen Loo,RPS East Australia Pty Ltd - Echuca Vic			150.07	-33.40
45-2-2539	SU1a - A7	GDA	56	227122	6300093	Open site	Valid	Artefact : 4		Ms.Cheng-Yen Loo,RPS East Australia Pty Ltd - Echuca Vic			150.07	-33.40
45-1-2717	SU1a - A8	GDA	56	227130	6300072	Open site	Valid	Artefact : 1		Ms.Cheng-Yen Loo,RPS East Australia Pty Ltd - Echuca Vic			150.07	-33.40
45-1-2718	SU1a - A9	GDA	56	226981	6300239	Open site	Valid	Artefact : 1		Ms.Cheng-Yen Loo,RPS East Australia Pty Ltd - Echuca Vic			150.06	-33.40
45-1-2719	SU1a - A6	GDA	56	227105	6300095	Open site	Valid	Artefact : 1		Ms.Cheng-Yen Loo,RPS East Australia Pty Ltd - Echuca Vic			150.07	-33.40
45-1-2799	Brays Lane AS1	GDA	56	227039	6300622	Open site	Valid	Artefact : -		Biosis Pty Ltd - Wollongong,Mrs.Samantha Keats			150.07	-33.40
45-1-2800	WPS-IF1	GDA	56	228556	6300579	Open site	Valid	Artefact : -		Biosis Pty Ltd - Wollong	104157,104158		150.08	-33.40
45-1-0071	Mt Piper;Lamberts Cree	AGD	56	225325	6302130	Closed sit	Valid	Artefact : -	Shelter with Deposit	Helen Brayshaw,Ms.Lail	2294		150.05	-33.38
45-1-0206	S9;Lidsdale;	AGD	56	227750	6301500	Open site	Valid	Artefact : -	Open Camp Site	Elizabeth Rich,Alice Go	2300		150.07	-33.39
45-1-0207	S8;Blackmans Flat;	AGD	56	226520	6303050	Open site	Valid	Artefact : -	Open Camp Site	Elizabeth Rich,Alice Go	2300		150.06	-33.38
45-1-0208	S5;Blackmans Flat;	AGD	56	225550	6303050	Open site	Valid	Artefact : -	Open Camp Site	Elizabeth Rich	2300	361	150.05	-33.38
45-1-0209	S4;Wallerawang;	AGD	56	226300	6302550	Open site	Valid	Artefact : -	Open Camp Site	Elizabeth Rich	2300		150.06	-33.38
45-1-0210	S3;Wallerawang;	AGD	56	226600	6302350	Open site	Valid	Artefact : -	Open Camp Site	Elizabeth Rich	2300	472	150.06	-33.38
45-1-0211	S2;Wallerawang;	GDA	56	227811	6300741	Open site	Valid	Artefact : -	Open Camp Site	Mr.Neville Baker,Elizab	2300	467	150.07	-33.40
45-1-0215	Lamberts Ck 5;Mt Piper	AGD	56	225300	6302480	Open site	Valid	Artefact : -	Open Camp Site	Helen Brayshaw,Ms.Lail	2294		150.05	-33.38
45-1-0237	Springvale Colliery;	AGD	56	228000	6301000	Open site	Valid	Artefact : -	Open Camp Site	Doctor.Susan (left ahms) Mcintyre-Tamwoy		496	150.08	-33.39
45-1-0247	Wallerawang Schoolho	AGD	56	228240	6300510	Open site	Valid	Artefact : -	Open Camp Site	Ms.Elizabeth White	3818		150.08	-33.40
45-1-0010	Pipers Flat Creek;	AGD	56	225600	6300700	Closed sit	Valid	Artefact : -, Grinding Gr	Axe Grinding Groove,Sh	D Miller	1515		150.05	-33.40
45-1-0019	Irondale;	AGD	56	225500	6302750	Closed sit	Valid	Artefact : -, Grinding Gr	Axe Grinding Groove,Sh	R Miller			150.05	-33.38
45-1-0020	Pipers Flat Creek;	AGD	56	225750	6300300	Closed sit	Valid	Artefact : -, Art (Pigmen	Axe Grinding Groove,Sh	R Miller			150.05	-33.40
45-1-0021	Pipers Flat Creek;	AGD	56	225700	6300250	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	R Miller			150.05	-33.40
45-1-0022	Pipers Flat Creek;Bald	AGD	56	226630	6300510	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	R Miller			150.06	-33.40
45-1-0023	Pipers Flat Creek;Bald	AGD	56	226500	6300500	Closed sit	Valid	Artefact : -	Shelter with Deposit	R Miller			150.06	-33.40
45-1-0048	Wallerawang; Lithgow;	AGD	56	226900	6299100	Open site	Valid	Burial : -, Modified Tree	Burial/s,Carved Tree	David Bell,NPWS - Blackheath Office,Betty Mee		473	150.06	-33.41
45-1-2545	Wallerowong Station M	AGD	56	228600	6298500	Open site	Valid	Burial : -	Burial/s	Ms.Adrienne Howe-Piening			150.08	-33.42

Report generated by AHIMS Web Service on 01/06/2021 for Geordie Oakes for the following area at Datum :GDA, Zone : 56, Eastings : 225380 - 230380, Northings : 6298273 - 6303273 with a Buffer of 0 meters. Additional Info : Assessment. Number of Aboriginal sites and Aboriginal objects found is 32

Appendix K

AHIMS Site Cards

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 45-1-2799

Date recorded: 06-02-2018

Site Location Information

Site name: Brays Lane AS1

Easting: 227039

Northing: 6300622

Coordinates must be in GDA (MGA)

Horizontal Accuracy (m): 5

Zone: 56

Location method: Differential GPS

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mrs.	Keats	Samantha

Organisation: Biosis Pty Ltd

Address: 8 Tate Street, Wollongong NSW 2500

Phone: 0242011061

E-mail: ahims@biosis.com.au

Site Context Information

Land Form Pattern: Rolling Hills

Land Use: Residential

Land Form Unit: Crest

Vegetation: Open Woodland

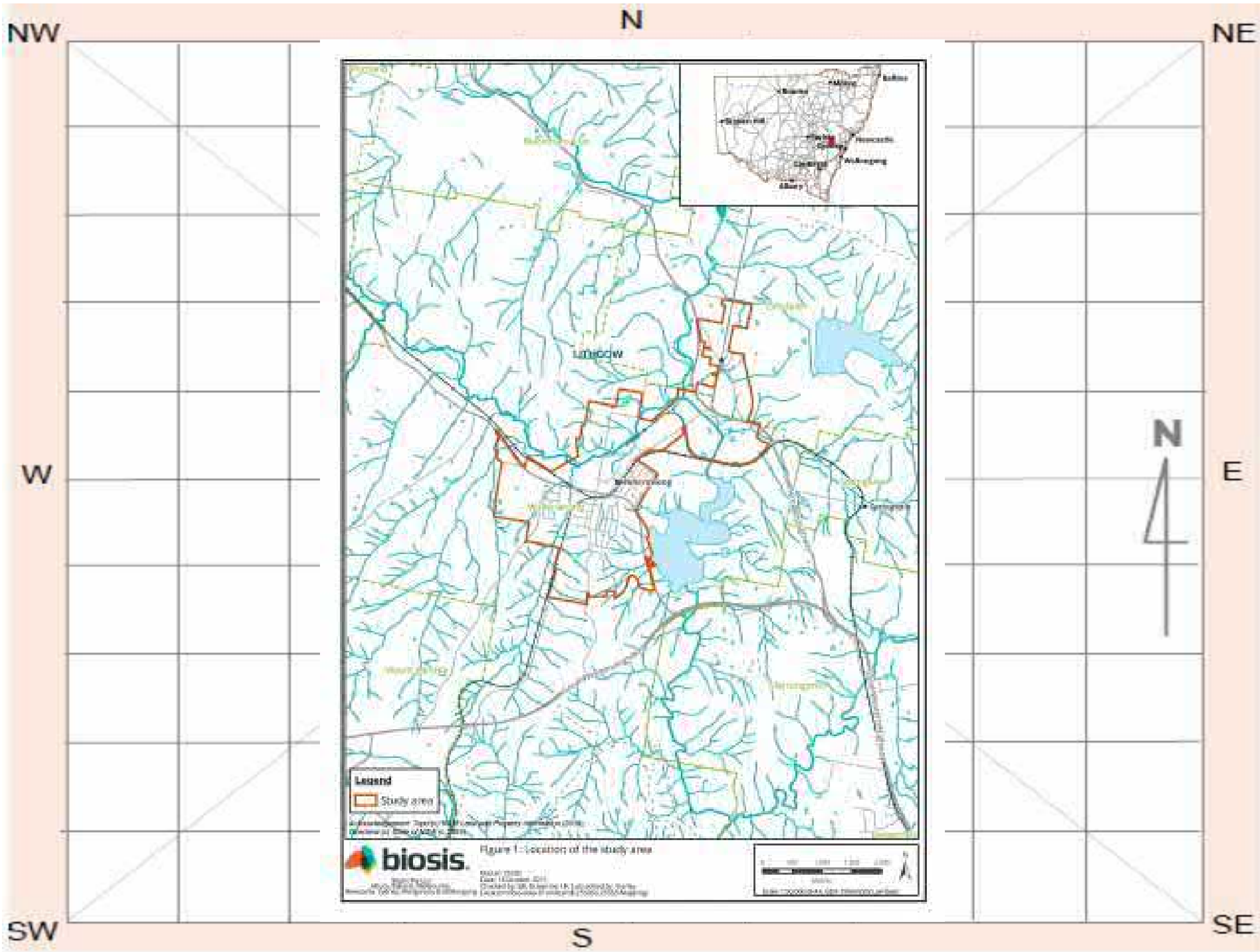
Distance to Water (m): 570

Primary Report: Aboriginal due diligence assessment Wallerawang (2WAL-20), NSW

How to get to the site: Follows Brays Lane, approximately 1.3 kilometres north of Pipers Flat Road, till you arrive at a right hand turn in road. The artefacts are located within native open woodland

Other site information:

Site location map



Site contents information

open/closed site: Open

Site condition: Good

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1. Artefact	8	50	10				

Description:

Brays Lane AS1 contains eight artefacts: seven grindstone fragments and one flaked glass electrical insulator. There were also two complete additional electrical insulators identified. The combination of Aboriginal objects and historical relics identifies the site as a post contact Aboriginal site.

Features:	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
4.							

Description:

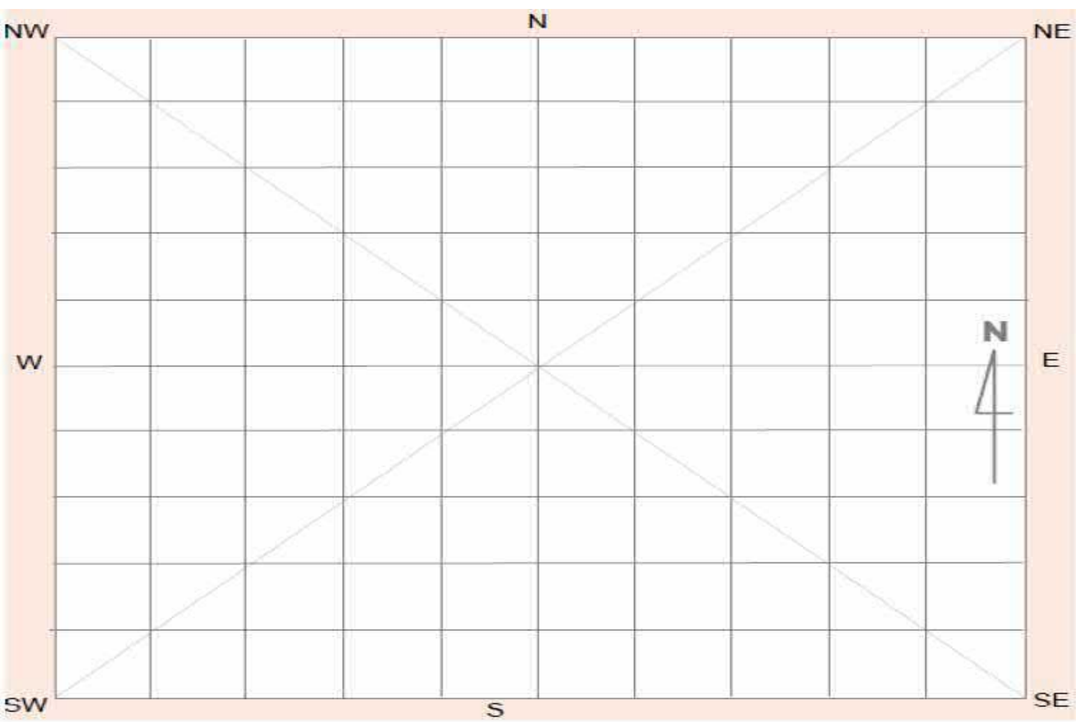
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
5.							

Description:

Other Site Info:

Site plan



Site photographs

Description: Location of where artefacts were located

Description: Grinding stone fragment

Description: Grinding stone fragment

Description: Flaked glass electrical insulator

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title	**Surname**	**First name**

Organisation:

Address:

Phone: **E-mail:**

CONSENT TO DESTROY ISSUED
8/7/93

[✓] New recording [ ] Additional Info

National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444

Standard Site Recording Form Revised 5/88

45-1-0211

1:250,000 map sheet: SYDNEY NPWS Code 45.1

AMG Grid reference: 250K / 25K: 228700 mE; 250K / 25K: 6300550 mN

Full reference - please include leading digits

Scale of map used for grid reference: [✓] 25K, 50K (preferred) [ ] 100K [ ] 250K

Please use largest scale available

1:25K, 50K, 100K map name: Lithgow

HEAD OFFICE USE ONLY:

NPWS Site no: 45-1-211

Site types: Open

Accessioned by: SFields Date: 19-8-92

Data entered by: Date:

Owner/Manager:

Address:

Site name: S2

Locality/property name: Wallerawang

NPWS District: Blue Mtns

Region: Central

Reason for investigation

Archaeological Survey Proposed Springvale Conveyor

Portion no: 169

Parish: Lidsdale

Photos taken? One

How many attached? copy

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff. (Draw diagram on separate sheet.)

From intersection of Duncan St + Mudgee Rd Drive east along Duncan St for 950 km Walk/Drive along track to south for 300m. Walk across Pipers Flat Ck. Site is adjacent to Railway line.

Other sites in locality? yes

Site Types include: open

Are sites in NPWS Register? yes

Have artefacts been removed from site? no

When?

By whom?

Deposited where?

Is site important to local Aborigines?

Give contact(s) name(s) + address(es)

John Bug
Windradyne LALC
125 William St Bathurst

Rolly Williams Regional LALC
Erik Boney Local.
31/4/92

Contacted for this recording?

(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report).

Rich, E + Gorman A 1992 'Proposed Springvale Colliery + Conveyor, Wallerawang: A/S for Aboriginal Sites'

NPWS Report Catalogue # C-2300

Checklist: surface visibility, damage/disturbance/ threat to site

Condition of site: Poor. Most appears to have been graded/bulldozed. Less disturbed deposit may be present adjacent to creek.

Recommendations for management & protection (attach separate sheet if necessary):

Proposed development be marked out on ground + site be reinspected to ascertain likely/exact impact + whether salvage warranted prior to destruction.

Site recorded by: E Rich + N. Baker

Date: January 1992

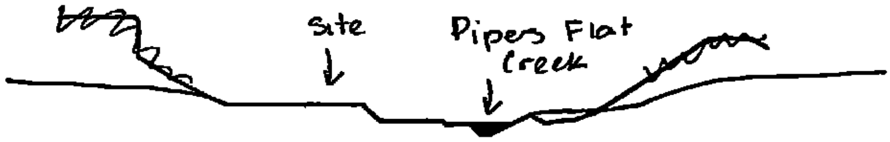
Address/Institution: 1A Angel Rd
Strathfield 2135

SITE POSITION & ENVIRONMENT

OFFICE USE ONLY: NPWS site no: 45-1-

1. Land form a. beach/hill slope/ridge top, etc: rise above creek b. site aspect: north c. slope: gentle

d. mark on diagram provided *or* on your own sketch the position of the site:



e. Describe briefly: Site located on a low rise above + adjacent to Pipers Flat Creek.

f. Local rock type: Berry Formation of Shoalhaven Group g. Land use/effect: Railway uses

2. Distance from drinking water: at site Source: Pipers Flat Creek

3. Resource Zone associated with site (estuarine, riverine, forest etc): ? woodland

4. Vegetation: woodland

5. Edible plants noted:

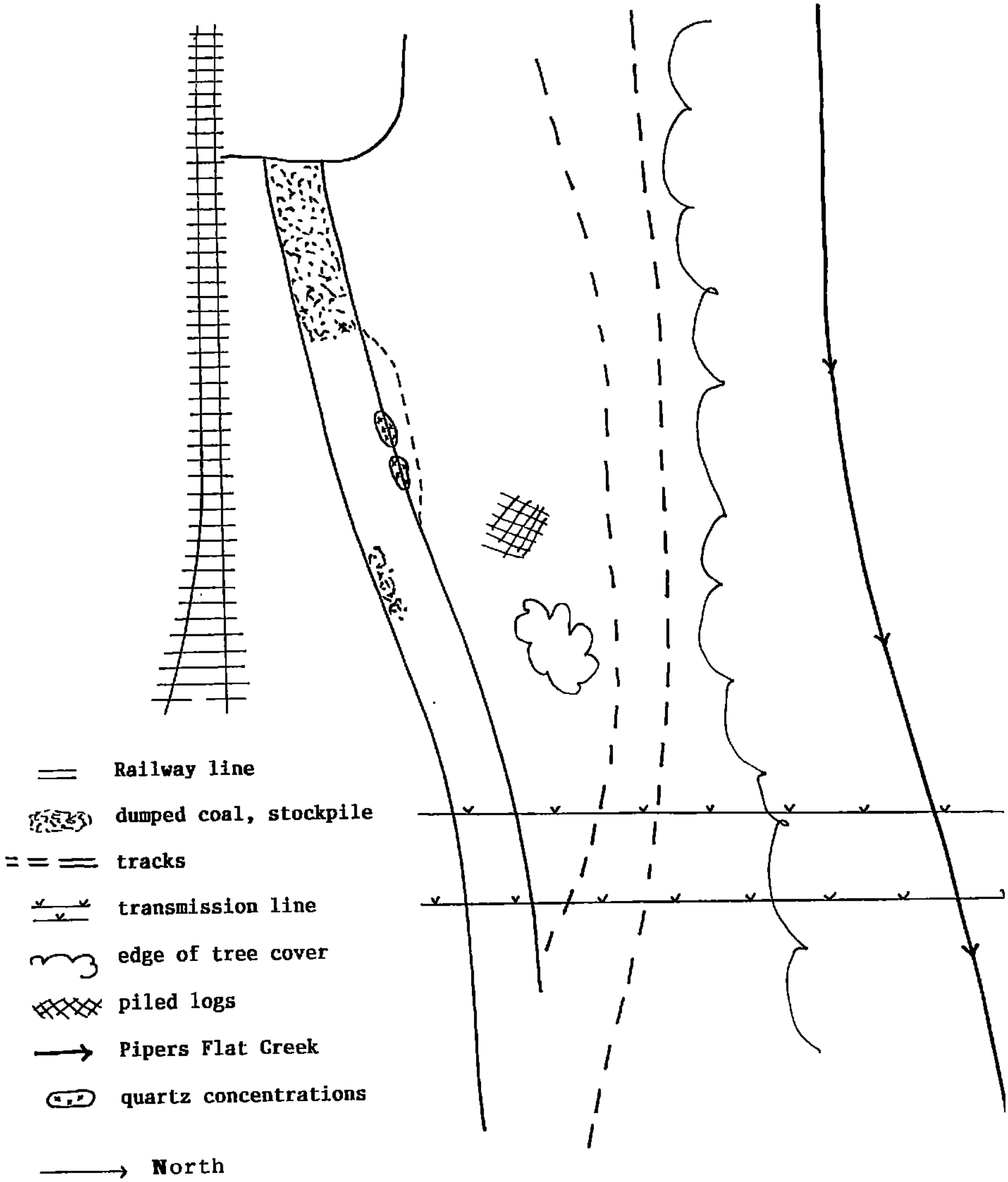
6. Faunal resources (include shellfish):

7. Other exploitable resources (river pebbles, ochre, etc):

Site type:	DESCRIPTION OF SITE & CONTENTS.
Open site	Note state of preservation of site & contents. Do **NOT** dig, disturb, damage site or contents.
CHECKLIST TO HELP: length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. **DEPOSIT:** colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. **ART:** area of surface decorated, motifs, colours, wet, dry pigment, technique of engraving, no. of figures, sizes, patination. **BURIALS:** number & condition of bone, position, age, sex, associated artefacts. **TREES:** number, alive, dead, likely age, scar shape, position, size, patterns, axe marks, regrowth. **QUARRIES:** rock type, debris, recognisable artefacts, percentage quarried. **OTHER SITES EG.** structures (fish traps, stone arrangements, bora rings, mia mias), mythological sites, rock holes, engraved groove channels, contact sites (missions massacres cemeteries) as appropriate	About 100 artefacts includes 2 ~~adjacent~~ adjacent clusters of quartz that appear to be knapping floor/s Also a quartz backed blade Attach sketches etc. eg. plan & section of shelter, show relation between site contents, indicate north, show scale. Attach annotated photos (stereo where useful) showing scale, particularly for art sites.

45-1-211

Map 14: Site 2
[field sketch, not to scale]



NOT TO SCALE

45-1-211

SITE 2

Location: Lithgow 1:25,000 grid ref $^{2}2870$ $^{63}0055$

The site is located along the south side of Pipers Flat Creek, between the creek and the railway line.

Description: About 100 artefacts were seen within an area about 200m long x 40m wide. The area had been bulldozed, but two quartz clusters appeared to be more-or-less *insitu* working floors. It seems that in places only the upper ground surface has been disturbed. Relatively intact deposit may be present amongst trees just above the creek.

The greatest number of artefacts were within and around the quartz working floors. These had been exposed along the northern edge of a vehicle track [see Map 14]. Ground visibility here reached 80%. A low density scatter of artefacts occurred along the northern edge of another track closer to the creek, but ground visibility was poorer at <20% and more artefacts are likely to be present.

The artefacts were predominantly quartz with a few indurated mudstone pieces. A broken quartz scraper and a quartz backed blade were seen. A sample of 34 artefacts were recorded. There were very few artefacts with cortex and no definite bipolar pieces were seen.

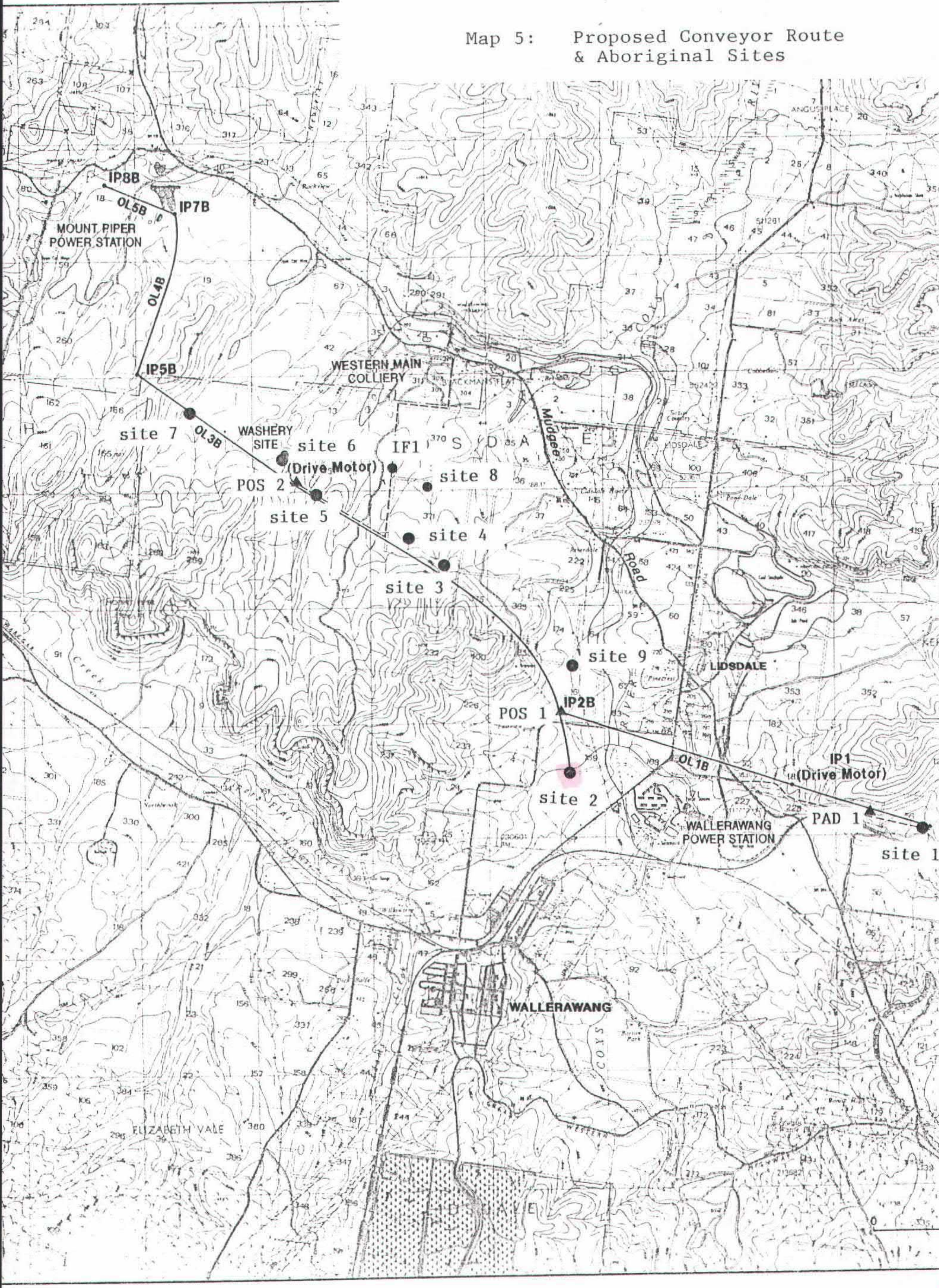
Relation to Proposed Conveyor Route: The site is within the vicinity of the route, but the route had not been pegged and its precise location in relation to the site has not been determined.

Photo 8: Site 2. Taken from the east looking west. The person is standing at the quartz clusters.

0

45+1-211

Map 5: Proposed Conveyor Route & Aboriginal Sites



25-1-211

ARTEFACT DESCRIPTIONS

SITE	No	RAW MATERIAL	SIZE in cm	L x W x T	ARTEFACT TYPE	CORE PLATFORM	FLAKE PLATFORM	PLATFORM PREPARATION	CORTEX	AMOUNT % surface	RU
1	01	IM	1-2		Proximal End		Broad	Facetted			
	02	Quartz	1-2		Proximal End		Broad	Plain			
	03	Quartz	1-2		Whole Flake		Focal	Plain			
	04	Quartz	1-2		Medial Piece						
	05	IM	1-2		Distal Piece						
	06	Quartz	1-2		Proximal End		platform not recorded		Dorsal	20	
	07	Quartz	1-2		Medial Piece						
	08	IM	2-3	25 20 6	Whole Flake		Broad	Plain			Lateral
	09	Quartz	2-3	17 24 9	Whole Flake		Broad	Facetted	Dorsal	30	Distal
	10	Quartz	1-2		Flaked Piece						
	11	Quartz	3-4	33 24 18	Core	Plain			Yes	20	
	12	Quartz	0-1		Whole Flake		not recorded				
2	1	Quartz	3-4		Flaked Piece						
	2	Quartz	2-3		Broken Flake						
	3	Quartz	0-1		Piece						
	4	Quartz	2-3		Broken Flake						
	5	Quartz	0-1		Piece						
	6	Quartz	3-4		Flaked Piece						
	7	Quartz	3-4		Flaked Piece						
	8	IM	2-3		Whole Flake		Focal	overhang removal			
	9	Quartz	0-1		Piece						
	10	Quartz	1-2		Flaked Piece						
	11	Quartz	1-2		Broken Flake		Broad	Plain			
	12	IM	1-2		Broken Flake		Focal	Plain & overhang removal			
	13	Quartz	1-2		Cone-split Flake		Broad	Plain			
	14	Quartz	1-2		Broken Flake						
	15	Quartz	0-1		Piece						
	16	Quartz	0-1		Piece						
	17	Quartz	3-4		Flaked Piece						
	18	Quartz	2-3		Whole Flake		Focal	Plain			
	19	Quartz	0-1		Piece						
	20	Quartz	1-2		Whole Flake		Focal	Plain			
	21	Quartz	1-2		Broken Flake				Dorsal	20%	
	22	Quartz	1-2		Whole Flake		Broad	Plain			
	23	Quartz	0-1		Broken Flake		Broad	Plain			
	24	Quartz	1-2		Flaked Piece						
	25	Quartz	1-2		Whole Flake		Broad	Plain			
	26	Quartz	0-1		Broken Flake		Broad	Plain			
	27	Quartz	1-2		Broken Flake						
	28	Quartz	0-1		Piece						
	29	Quartz	0-1		Piece						

45-1-211

SITE	No	RAW MATERIAL	SIZE in cm	L x W x T			ARTEFACT TYPE	CORE PLATFORM	FLAKE PLATFORM	PLATFORM PREPARATION	CORTEX	AMOUNT % surface	RU
2	a	Quartz	1-2	(29)	21	6	Backed Blade						
	b	IM	5-6	(51)	39	15	Broken Flake						one edge
	c	Quartz	3-4	39	35	18	Bifacial Core						
	d	Chert	2-3	22	7	8	Blade Core						
3	1	Quartz	2-3	26	24	14	Bipolar Core	Scars			Yes	70%	
	2	Quartz	2-3	22	19	14	Bipolar Core	Scars					
	3	Quartz	1-2	15	15	6	Bipolar flake			Plain			
	4	Quartz	1-2	18	12	10	Flaked Piece						
	5	Quartz	3-4	30	24	14	Whole Flake		Broad	Plain			
	6	IM	1-2	10	(10)	2	Broken Flake		Broad	Plain			Lateral
4	1	Quartz	2-3	26	24	13	Bipolar Core	Scars					
	2	Quartz	1-2	18	20	4	Whole Flake		Broad	Plain	Dorsal	40%	
5	1	Quartz	2-3	21	11	5	Bipolar Flake		Focal				
	2	Quartz	2-3	28	22	10	Distal End				Dorsal	40%	
6	1	Quartz	2-3	22	20	10	Bipolar Core	Scars					
	2	Quartz	1-2	15	15	4	Bipolar Flake						
	3	Quartz	1-2	15	5	3	Bipolar Flake						
	4	Quartz	1-2	11	7	4	Flaked Piece						
	5	Quartz	2-3	27	17	12	Bipolar Flake						
	6	Quartz	2-3	22	18	13	Bipolar Core	Scars			Yes	40%	
	7	Quartz	1-2	10	5	5	Flaked Piece						
	8	Quartz	1-2	8	11	4	Flaked Piece						
	9	Quartz	1-2	15	9	3	Flaked Piece						
	10	Quartz	0-1	9	9	3	Flaked Piece						
	11	Qu'zite	2-3	22	(15)	11	Flaked Piece				Yes	50%	1 edge
	12	Qu'zite	3-4	33	28	28	Flaked Piece						
	13	Quartz	3-4	38	34	25	Bipolar Core	Scars					
	14	Qu'zite	2-3	20	22	10	Whole Flake		Broad	Plain	Yes	60%	
	15	Quartz	2-3	25	27	26	Core	Plain			Yes	70%	
7	1	Quartz	2-3				Broken Flake						
	2	Quartz	1-2				Broken Flake		Broad	Plain			
	3	FGS	1-2				Broken Flake						
	4	Quartz	0-1				Piece						
	5	Quartz	2-3				Broken Flake						
	6	Quartz	3-4	32	22	21	Core Altern-ating Pattern						
	7	Quartz	1-2				Flaked Piece						
	8	Quartz	1-2				Flaked Piece						
	9	Quartz	2-3	28	21	13	Core	Plain					
	10	Quartz	2-3				Flaked Piece						

CONSENT #: 516

45-1-211

NATIONAL PARKS AND WILDLIFE ACT 1974
SECTION 90

CONSENT

CONSENT TO CARRY OUT THE DESTRUCTION OF AN ABORIGINAL RELIC/PLACE

WHEREAS the Aboriginal relics described in Schedule "A" are situated upon the land described in Schedule "B", and which constitute relics within the meaning of Section 90 of the National Parks and Wildlife Act 1974, and WHEREAS application has been made by:

Howie, Herring and Forsyth Pty Ltd
for Springvale Colliery
Level 6, 200 Pacific Highway
Crows Nest 2065

FOR CONSENT to destroy those relics in the course of:

Construction of a coal conveyor at Springvale colliery

NOW I, Neil Craig Shepherd, Director-General of National Parks and Wildlife, in pursuance of Section 90 of the said Act, and subject to the Conditions hereunder set out DO HEREBY CONSENT to the destruction of the said relics by the said applicant.

TERMS AND CONDITIONS OF THIS CONSENT

This Consent is issued subject to General Terms and Conditions covering all archaeological Permits and Consents, as well as the Specific Terms and Conditions pertaining to Consents to destroy Aboriginal relics all of which conditions are detailed in the attached pages.

DATED at Sydney this 8th day of July, 1993

H. Clemens

for Director-General
of National Parks and Wildlife

0

SCHEDULE A:

Part of site S2 (NPWS 45-1-0211) comprising five quartz artifacts, open site S12 (NPWS 45-1-0243) consisting of four quartz artifacts and site S13 (NPWS 45-1-0244) consisting of five quartz and one mudstone artifacts.

SCHEDULE B:

Located at AMGs 228700 6300350, 224970 6303900 and 224750 6304040 respectively.

SPECIAL CONDITIONS:

1. Only that part of site S2 (NPWS 45-1-0211) located in the existing transmission line easement is covered by this Consent.

2. This Consent to Destroy is issued subject to the delineation of the section of site S2 (NPWS 45-1-0211) located within the transmission line easement being surveyed and marked, with plastic flagging, **prior** to any clearing, bulldozing or disturbance for the construction of the coal conveyor.

SPECIFIC CONDITIONS APPLYING TO CONSENTS TO DESTROY ABORIGINAL RELICS

1 The Consent covers only those relics described in the instrument of Consent and in any Schedules thereto.

2 In the case of Consents granted to cover development activities, the Consent is granted to cover only those circumstances described in the Schedules, and subject to there not being discovered in the course of further operations, in the progress of that development requiring the Consent, any other relics which will be damaged or destroyed by the continuation of the operation. (Destruction of such relics would require the granting of a separate Consent).

3 The Consent is conditional upon all relevant development approvals having been obtained.

4 Should the relics listed in Schedule 'A' above remain in existence two (2) years from the date of this document, the Consent shall be deemed to be void, and any further damage to the relics will require the preparation of a new Consent document.

5 (i) In the case of Consents granted in conjunction with Permits to excavate or record the Consent covers only material from the site(s) covered by the Permit to excavate.

(ii) A Consent so granted as in (i) above is valid for two years or until such date as excavated material must be lodged with The Australian Museum under the terms of the Permit.

(iii) The holder of the Consent granted as in (i) above shall furnish the National Parks and Wildlife Service with a report on the activities carried out under the Consent, which report shall be part of the final report to the Service (as per Condition 3, Specific Terms and Conditions for Salvage Permits).

0

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville 2220 NSW

AHIMS site ID: 45-1-0211

Date recorded: 15-02-2018

Site Location Information

Site name: S2

Easting: 227811

Northing: 6300741

Coordinates must be in GDA (MGA)

Horizontal Accuracy (m): 10

Zone: 56

Location method: Client GIS or CAD system

Recorder Information

(The person responsible for the completion and submission of this form)

Title	Surname	First name
Mrs.	Keats	Samantha

Organisation: Biosis Pty Ltd

Address: 8 Tate Street, Wollongong NSW 2500

Phone: 0242011061

E-mail: ahims@biosis.com.au

Site Context Information

Land Form Pattern:

Land Use:

Land Form Unit:

Vegetation:

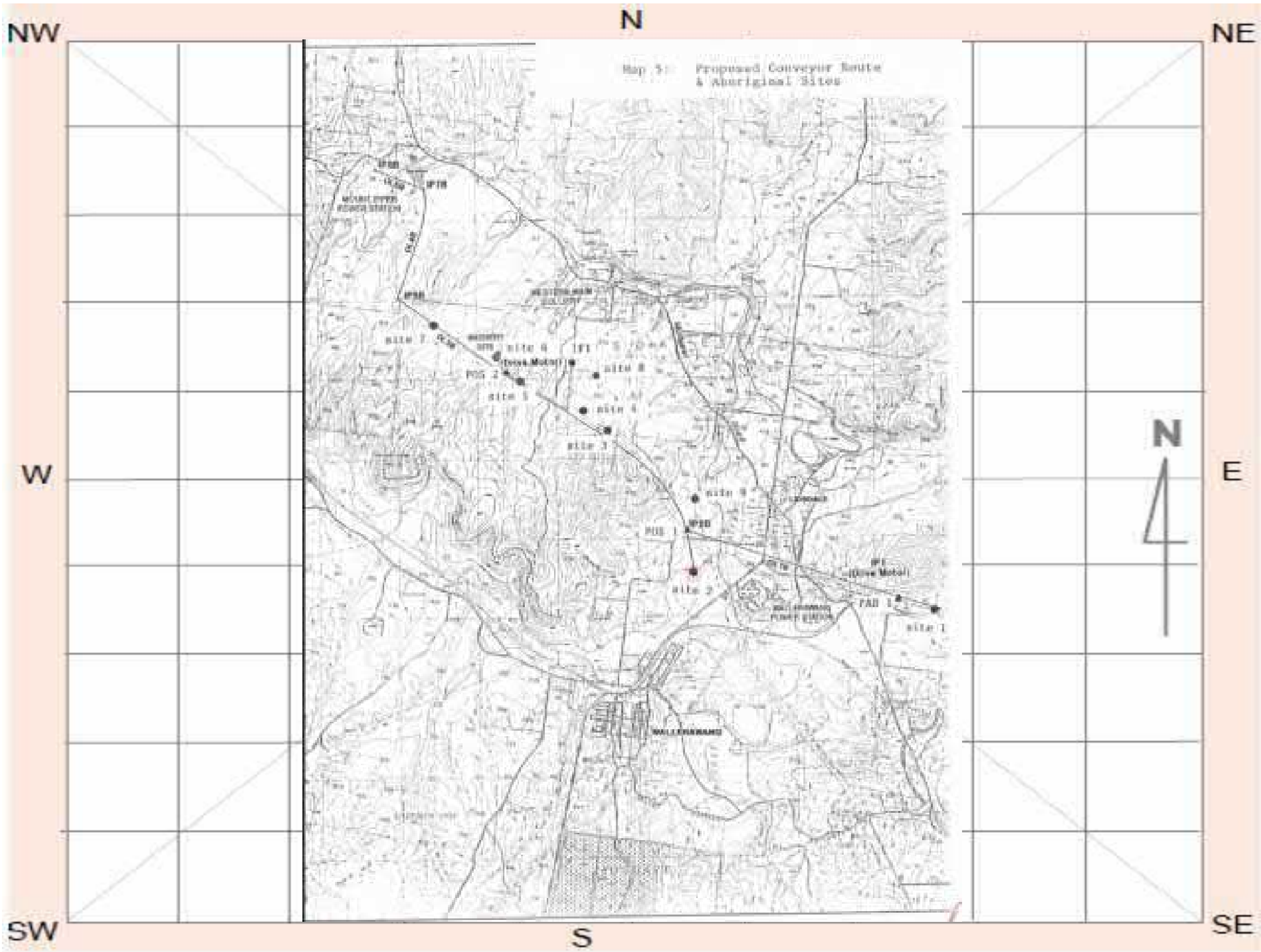
Distance to Water (m):

Primary Report:

How to get to the site:

Other site information: Initial site location recording incorrect, placing the site ~1000m east of its actual location. Revised co-ordinates based off information in original AHIMS site card. Recorded location inspected to confirm that it is not the location of site S2.

Site location map



Site contents information

open/closed site: Open

Site condition: Disturbed

Features:

	Features	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
1.	Artefact	100	200	40				

Description:

Approximately 100 stone artefacts within a Bulldozed area 200m long by 40m wide.

Features:

	Features	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Scarred Trees: Regrowth (cm)	Scarred Trees: Scar shape	Scarred Trees: Tree Species
2.								

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
3.							

Description:

Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
4.							

Description:

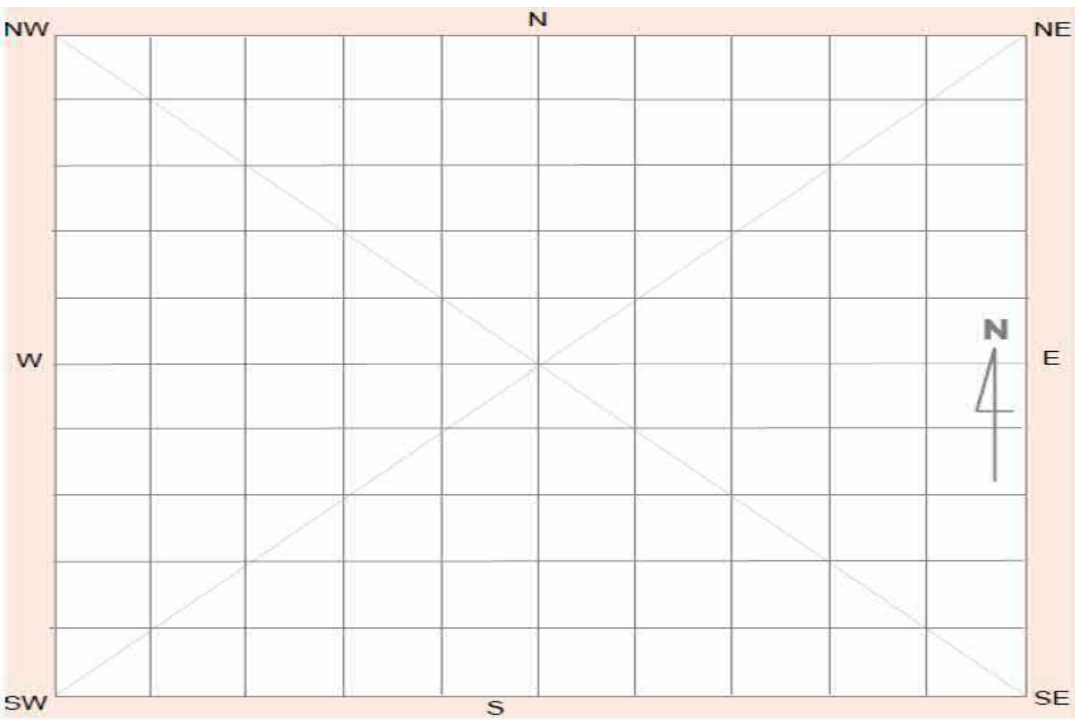
Features:

	Number of features	Length of feature(s) extent (m)	Width of feature (s) extent (m)	Scarred Trees: Scar Depth (cm)	Regrowth (cm)	Scar shape	Tree Species
5.							

Description:

Other Site Info: Initial site location recording incorrect, placing the site ~1000m east of its actual location. Revised co-ordinates based off information in original AHIMS site card. Recorded location inspected to confirm that it is not the location of site S2.

Site plan



Site photographs

Description: Location of site S2

Description:

Description:

Description:

Site restrictions

Do you want to Restrict this site?:

Restriction type: Gender General Location

Why is this site restricted?:

Further information contact

Title	**Surname**	**First name**

Organisation:

Address:

Phone: **E-mail:**

Aboriginal Site Recording Form

AHIMS Registrar
PO Box 1967, Hurstville NSW 2220

Office of Environment & Heritage

Office Use Only

Site Number 45-1-2716

Date received / /　Date entered into system / /　Date catalogued / /

Entered by (I.D.)

Information Access

☐ Gender/male ☐ Gender/female ☐ Location restriction ☐ General restriction ☐ No access

Office Use Only

For Further Information Contact:

☐ **Nominated Trustee**

Title	Surname	First Name	Initials

Organisation

Address

Phone number　Fax

Client on system ☐

☐ **Knowledge Holder**

Title	Surname	First Name	Initials

Organisation

Address

Phone number　Fax

Client on system ☐

Aboriginal Heritage Unit or Cultural Heritage Division Contacts

Geographic Location

Site Name: SU1a-A5

Easting: 227585　Northing: 6300837　AGD/GDA: GDA

Mapsheet: Lithgow

Zone 56　Location Method: Non-Differential GPS

Other Registration

Primary Recorder

Title	Surname	First Name	Initials
Ms	Loo	Cheng Yen	CY

Organisation: RPS

Address: PO BOX 428 HAMILTON NSW 2303

Phone number: 249404200　Fax: 249616794

Date recorded: 19/01/2012

Client on system ☐

NPWS Aboriginal Site Recording Form - Site Information

OPEN/CLOSE SITE Open Site

Site Context

Landform

- ☐ Mountainous
- ☑ Plain
- ☐ Rolling hills
- ☐ Steep hills
- ☐ Undulating plain

Landform Unit

- ☐ Beach
- ☐ Coastal rock platform
- ☐ Dune
- ☐ Intertidal flat
- ☐ Lagoon
- ☐ Tidal Creek
- ☐ Tidal Flat
- ☐ Cliff
- ☐ Crest
- ☑ Flat
- ☑ Lower slope
- ☐ Mid slope
- ☐ Upper slope
- ☐ Plain
- ☐ Ridge
- ☐ Tor
- ☐ Valley flat
- ☐ Levy
- ☐ Stream bank
- ☐ Stream channel
- ☐ Swamp
- ☐ Terrace
- ☐ Terrace flat

Slope

5 degrees

Vegetation

- ☐ Closed forest
- ☑ Grasslands
- ☐ Isolated clumps of trees
- ☐ Open forest
- ☑ Open woodland
- ☑ Scrub
- ☐ Woodland
- ☐ Cleared
- ☐ Revegetated
- ☐ N/A

Land use

- ☐ Conservation
- ☐ Established urban
- ☐ Farming-intensive
- ☐ Farming-low intensity
- ☐ Forestry
- ☐ Industrial
- ☑ Mining
- ☐ Pastoral/grazing
- ☐ Recreation
- ☐ Semi-rural
- ☐ Service corridor
- ☐ Transport corridor
- ☐ Urban expansion
- ☐ Residential

Water

Distance to permanent water source	51.3	metres
Distance to temporary water source	51.3	metres
Name of nearest permanent water source	Pipers Flat	
Name of nearest temporary water	Pipers Flat	

Directions for Relocation

Drive along Brays Lane and walk into the Survey unit where a dirt access track exists.

Site Location Map

NW N NE

W E

SW S SE

N

Current Land Tenure

- ☑ Public
- ☐ Private

National Park / other Government Dept.

Primary report **I.D.** (I.D. Office Use only)

General Site Information

Closed Site

Shelter/Cave Formation
- [ ] Boulder
- [ ] Wind erosion
- [ ] Water erosion
- [ ] Rock collapse

Rock Surface Condition
- [ ] Boulder
- [ ] Sandstone platform
- [ ] Silica gloss
- [ ] Tessellated
- [ ] Weathered
- [ ] Other platform

Condition of Ceiling
- [ ] Boulder
- [ ] Sandstone platform
- [ ] Silica gloss
- [ ] Tessellated
- [ ] Weathered
- [ ] Other platform

Shelter Aspect
- [ ] North
- [ ] North East
- [ ] East
- [ ] South East
- [ ] South
- [ ] South West
- [ ] West
- [ ] North West

Open Site

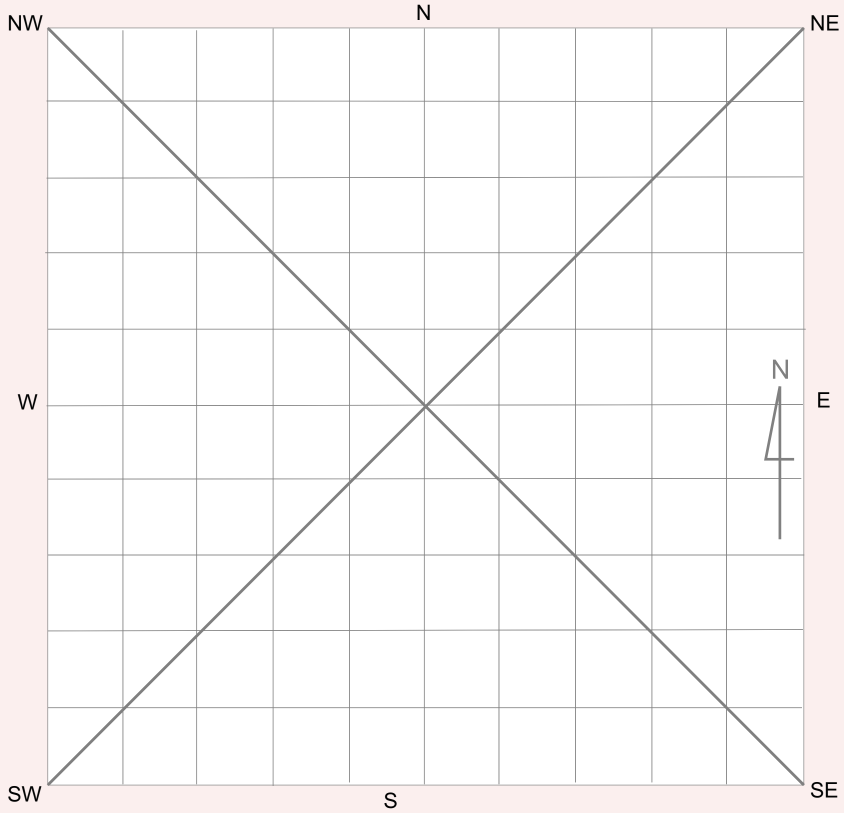
Site Orientation
- [ ] N-S
- [ ] NE-SW
- [x] E-W
- [ ] SE-NW
- [ ] N/A

Features

- [ ] 1. Aboriginal Ceremony & Dreaming
- [ ] 2. Aboriginal Resource & Gathering
- [ ] 3. Art
- [x] 4. Artefact
- [ ] 5. Burial
- [ ] 6. Ceremonial Ring
- [ ] 7. Conflict
- [ ] 8. Earth Mound
- [ ] 9. Fish Trap
- [ ] 10. Grinding Groove
- [ ] 11. Habitation Structure
- [ ] 12. Hearth
- [ ] 13. Non Human Bone & Organic Material
- [ ] 14. Ochre quarry
- [ ] 15. Potential Archaeological Deposit
- [ ] 16. Stone Quarry
- [ ] 17. Shell
- [ ] 18. Stone Arrangement
- [ ] 19. Modified Tree
- [ ] 20. Water Hole

Site Plan

Indicate scale, boundaries of site, features



Site Dimensions

Closed Site Dimensions (m)

	Internal length
	Internal width
	Shelter height
	Shelter floor area

Open Site Dimensions (m)

120m	Total length of visible site
20m	Average width of visible site
2141sqm	Estimated area of visible site
120m	Length of assessed site area

Aboriginal Community Interpretation and Management Recommendations

Preliminary Site Assessment

Site Cultural & Scientific Analysis and Preliminary Management Recommendations

Artefact scatter SU1a-A5 is an artefact scatter located in a clearing on a dirt track towards the western extend of the Survey Unit. The nearest water source is a small tributary that spurs off Piper's Flat Creek approximately 51.3 m north – east of the site. A total of 19 artefacts were located in an area measuring 120 m (east-west) by 20 m (north-south) with a ground surface area of approximately 2,141 m². The majority of artefacts consisted of complete flakes (n=11 pieces) and transversely broken flake fragments (n=4 pieces). Only two pieces of debris and two multi-platform cores were recorded. A range of raw material types were exploited for artefact manufacture with the most common material exploited being quartz (n=12; 63%). Silcrete (n=4; 21%), chalcedony (n=2; 10%) and mudstone (n=1; 5%) occurred less frequently. The majority of the artefacts were the product of secondary core reduction, displaying 1 – 2 negative flake scars on the dorsal surface.

This section should only be filled in by the Endorsees

Endorsed by: ☐ Knowledge Holder ☐ Nominated Trustee ☐ Native Title Holder ☐ Community Consensus

Title | Surname | First Name | Initials

Organisation

Address

Phone number | Fax

Attachments (No.)

- ☐ A4 location map
- ☐ B/W photographs
- ☑ Colour photographs
- ☐ Slides
- ☐ Aerial photographs
- ☐ Site plans, drawings
- ☐ Recording tables
- ☐ Other
- ☐ Feature inserts-No. ☐

Comments

NPWS FEATURE RECORDING FORM - ARTEFACT

Site I.D.:

Site Name: SU1a-A5

First recorded date: 12/1/2012

Importance: Cannot be presently determined

No. of instances: 19

Recorded by: CY Loo

	Yes No
Stone artefacts only	Yes
Artefacts collected	No
Permit issued	No

Percentage of Non-stone Artefacts to Percentage of Stone Artefacts

0-9% 10-19% 20-29% 30-39% 40-49% 50-59% 60-69% 70-79% 80-89% 90-100%

0-9%

Feature Context & Condition

Scatter No. 1

Easting 2 2 7 5 8 5

Northing 6 3 0 0 8 3 7

Density (Artefact count per square metre) 4-5

Dimensions 120 Length (m) 20 Width (m) Depth (m)

	Yes No
In situ	No
Stratified	No

Feature Condition

- [ ] Very good
- [x] Good
- [ ] Poor

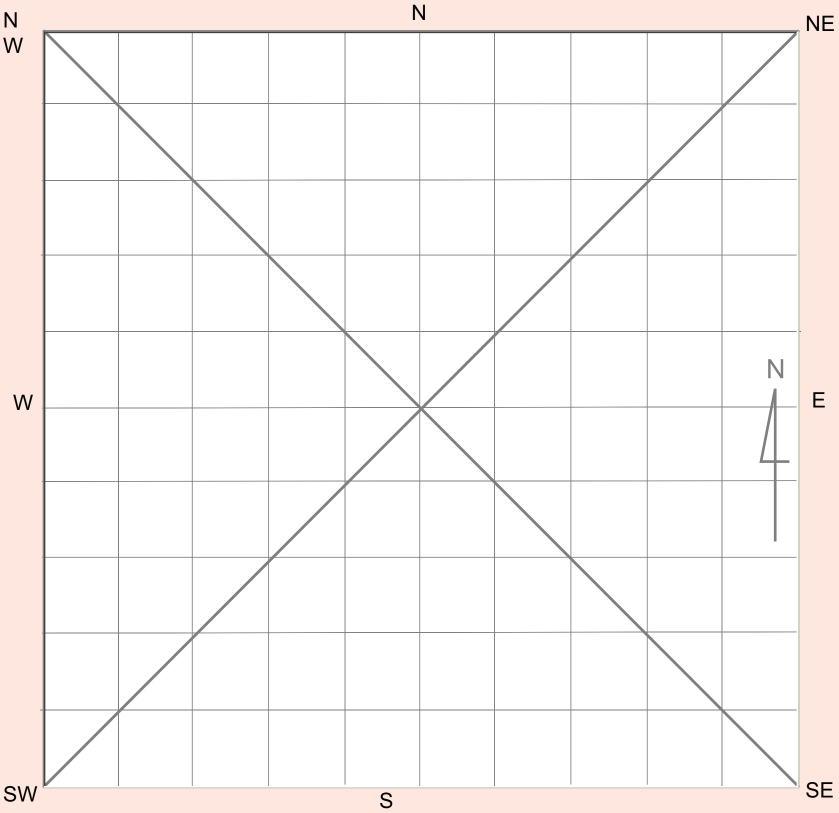
General Condition

- [x] Weathered
- [ ] Vehicle damage
- [ ] Surface water wash
- [ ] Fire damage
- [ ] Erosion
- [ ] Stock damage
- [ ] Exposed archaeological material

Recommended Action

- [ ] Boardwalk
- [ ] Fencing
- [ ] Closure to public
- [ ] Continued inspection
- [ ] Fire hazard reduction
- [ ] Expert assessment
- [ ] Meeting with land manager
- [ ] Revegetation
- [ ] Signage
- [ ] Soil erosion control
- [ ] Track closure/re-routing
- [ ] Additional recording

Feature Plan (Indicate scale, location of instances)



Feature Environment

(Complete when *feature* environment differs to *site* environment, use attributes from cover card, p. 2)

Land form	Plain
Land form unit	Lower Slope
Slope	
Vegetation	Open Forest
Land use	Transport Corridor

Water

Distance to permanent water source 51.3 metres

Distance to temporary water source 51.3 metres

Name of nearest permanent water source: Pipers Flat

Name of nearest temporary water: Pipers Flat

NPWS FEATURE RECORDING TABLE - ARTEFACT

Stone Artefact

Instance No.	Recording Date	Artefact Material	Artefact Type	Platform Surface	Platform Type	Termination	Cross Section	Length (mm)	Width (mm)	Thickness (mm)
see	attachmen									

Other Artefact Type

Instance No.	Recording Date	Artefact Material	Artefact Type	Description	Length (mm)	Width (mm)	Thickness (mm)

Material

Basalt
Chert
Fine grained siliceous
Granite
Quartz
Quartzite
Sandstone
Silcrete
Green glass
Amber glass
Amethyst glass
Clear glass
Ceramic
Porcelain
Tin can
Wire
Nail
Button
Shell
Bone
Wood
Resin

Artefact Description

Adze
Anvil
Axe
Backed blade
Blade
Core
Core tool
Cyclon
Distal fragment
Eloura
Flake
Flake tool
Flaked piece
Hammerstone
Manuport
Milling slab
Mortar
Muller
Nuclear tool
Pirri
Proximal fragment
Tula
Other diagnostic type
Modified
Unworked

Platform Surface

Cortex
Flake scar
More than one flake scar
Faceted
Ground
Indeterminate
Bipolar

Platform Type

W
Focal
Shattered
Indeterminate
Bipolar

Termination

Feather
Hinge
Step
Outrepasse
Bipolar

Cross Section

High/strong
High/weak
Low/weak
Irregular

Comments:

Please see attached information

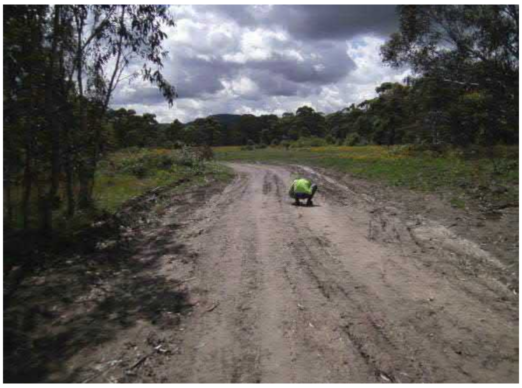


Plate 1: View of site due south

Plate 2: View of site due south

Plate 3: View of artefacts (batch 1)-ventral surface

Plate 4: View of artefacts (batch 1)-dorsal surface

Plate 5: View of artefacts (batch 2)-ventral surface

Plate 6: View of artefacts (batch 2)- dorsal surface

Plate 7: View of artefacts (batch 3)- dorsal surface

Plate 8: View of artefacts (batch 3)-ventral surface

Plate 9: View of artefact (batch 4)-ventral surface

Plate 10: View of artefact (batch 4) – dorsal surface

Lidsdale Siding Survey Unit 1a (SU1a)

Site Name	Central GPS Co-ords		Artefact Type	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Platform Type		Platform Type	Colour	No. Dorsal Scars	Comments
	Eastings	Northings						Length (mm)	Width (mm)				
SU 1a-A5	227585	6300837	Debris	Quartz	16	5	5	N/A	N/A	N/A	White	N/A	
			Proximal Fragment	Quartz	19	19	5	20	6	Cortical	White	1	
			CF	Quartz	23	26	9	15	9	Cortical	White	2	
			CF	Silcrete	15	19	4	15	5	Flat	Cream	2	
			CF	Silcrete	25	29	9	25	6	Cortical	Crema	3	10T
			CF	Silcrete	27	16	4	11	5	Flat	Cream	1	10T
			CF	Silcrete	26	19	6	14	5	Flat	Cream	2	Retouch (L) 25mm
			CF	Chalcedony	22	14	12	10	6	Cortical	N/A	2	
			MPC	Chalcedony	30	19	15	14	18	2 Platforms		7	
								13	10				
								10	15				
								11	13				
			CF	Quartz	25	19	6	6	4	Cortical	White	1	Retouch (R) 20 mm
			Distal Fragment	Quartz	25	20	9					1	10T
			Proximal Fragment	Quartz	10	15	3	N/A	N/A	N/A	N/A	2	
			CF	Quartz	16	16	4	6	2	Flat	White	2	5T
			CF	Quartz	25	9	4	7	3	Flat	White	2	
			Distal Fragment	Quartz	16	7	4	N/A	N/A	N/A	White	2	
			CF	Quartz	12	13	5	9	4	Flat	White	2	
			CF	Quartz	20	7	6	9	5	Flat	White	1	30T
			Debris	Quartz	22	14	6	N/A	N/A	N/A	White	1	

Lidsdale Siding Survey Unit 1a (SU1a)...Continue

Site Name	Central GPS Co-ords		Artefact Type	Raw Material	Length (mm)	Width (mm)	Thickness (mm)	Platform Type		Platform Type	Colour	No. Dorsal Scars	Comments
	Eastings	Northings						Length (mm)	Width (mm)				
			MPC	Mudstone	32	26	6	16	22	2 Platforms	Orange		
								21	26				
								20	7				

[✓] New recording [ ] Additional Info

National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444

Standard Site Recording Form Revised 5/88

45-1-0247

1:250,000 map sheet: SYDNEY NPWS Code 1451

AMG Grid reference (Full reference - please include leading digits): 228240 mE 6300510 mN

Scale of map used for grid reference (Please use largest scale available): [✓] 25K, 50K (preferred) [ ] 100K [ ] 250K

1:25K, 50K, 100K map name: LITHGOW

HEAD OFFICE USE ONLY:

NPWS Site no: 45-1-247

Site types: Open Camp Site

Accessioned by: MV Date: 12·6·97

Data entered by: KE Date: 12·11·97

Owner/Manager: c/- Mick Jensen

Address: Wallerawang Power Station

Site name: Wallerawang Schoolhouse

Locality/property name: Wallerawang Power Station

NPWS District:

Region:

Reason for investigation

Monitoring of drainage works at historic site

Portion no: 168

Parish: Lidsdale County: Cook

Photos taken? YES

How many attached? see report

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff. (Draw diagram on separate sheet.)

On the north side of Main Street, Wallerawang; entrance almost opposite the entrance to Wallerawang Power Station. (Map attached)

Other sites in locality? Yes

Site Types include: Open sites

Are sites in NPWS Register? Yes

Have artefacts been removed from site? Yes

When? July 1996

By whom? Beth White

Deposited where? with historic material, Pacific Power Bldg

Is site important to local Aborigines?

Give contact(s) name(s) + address(es)

Contacted for this recording? No - Only 2 flakes of certain Aboriginal origin were recovered

(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report).

White, E[?] + Lavelle, S 1996 Archaeological monitoring of drainage works, Wallerawang Schoolhouse

NPWS Report Catalogue # C-3818

Checklist: surface visibility, damage/disturbance/ threat to site

Condition of site: Disturbed, probably by land clearing + construction + use of historic site from c. 1860.

Recommendations for management & protection (attach separate sheet if necessary):

Any excavation works should be monitored by an archaeologist, with relevant permits from NPWS + HC, + with involvement of local Aboriginal persons.

Site recorded by: Beth White

Date: July 1996

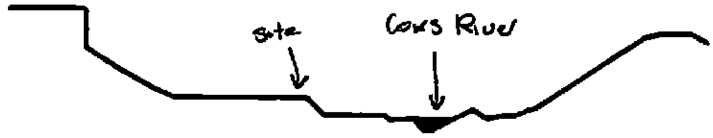
Address/institution: Pacific Power
Cnr Park + Elizabeth Sts
Sydney

SITE POSITION & ENVIRONMENT

OFFICE USE ONLY: NPWS site no:

1. Land form a. beach/hill slope/ridge top, etc: rise above flat   b. site aspect: –   c. slope: gentle

d. mark on diagram provided *or* on your own sketch the position of the site: e. Describe briefly:



f. Local rock type: Berry formation   g. Land use/effect: historic property

2. Distance from drinking water: c. 180m   Source: Cox's River

3. Resource Zone associated with site (estuarine, riverine, forest etc): Woodland or forest?

4. Vegetation: now cleared grassland

5. Edible plants noted:

6. Faunal resources (include shellfish):

7. Other exploitable resources (river pebbles, ochre, etc):

Site type:

Open site

DESCRIPTION OF SITE & CONTENTS.
Note state of preservation of site & contents. Do NOT dig, disturb, damage site or contents.

One quartz flake 2-2.5cm, wider than long, broad platform, was recovered from spoil ~~from~~ excavated from trenches dug for drainage works. One quartzite flake 5-5.5cm in size, wider than long, was recovered from the trench wall at ~~a~~ 19.5m along Trench A and at a depth of 30cm

0 ← dark brown moist loose silty loam

14 - - - (bottle piece at 14cm depth)

← mixed orange-brown loam

30 — (quartzite flake at 30cm depth)

← Orange silty loam

50

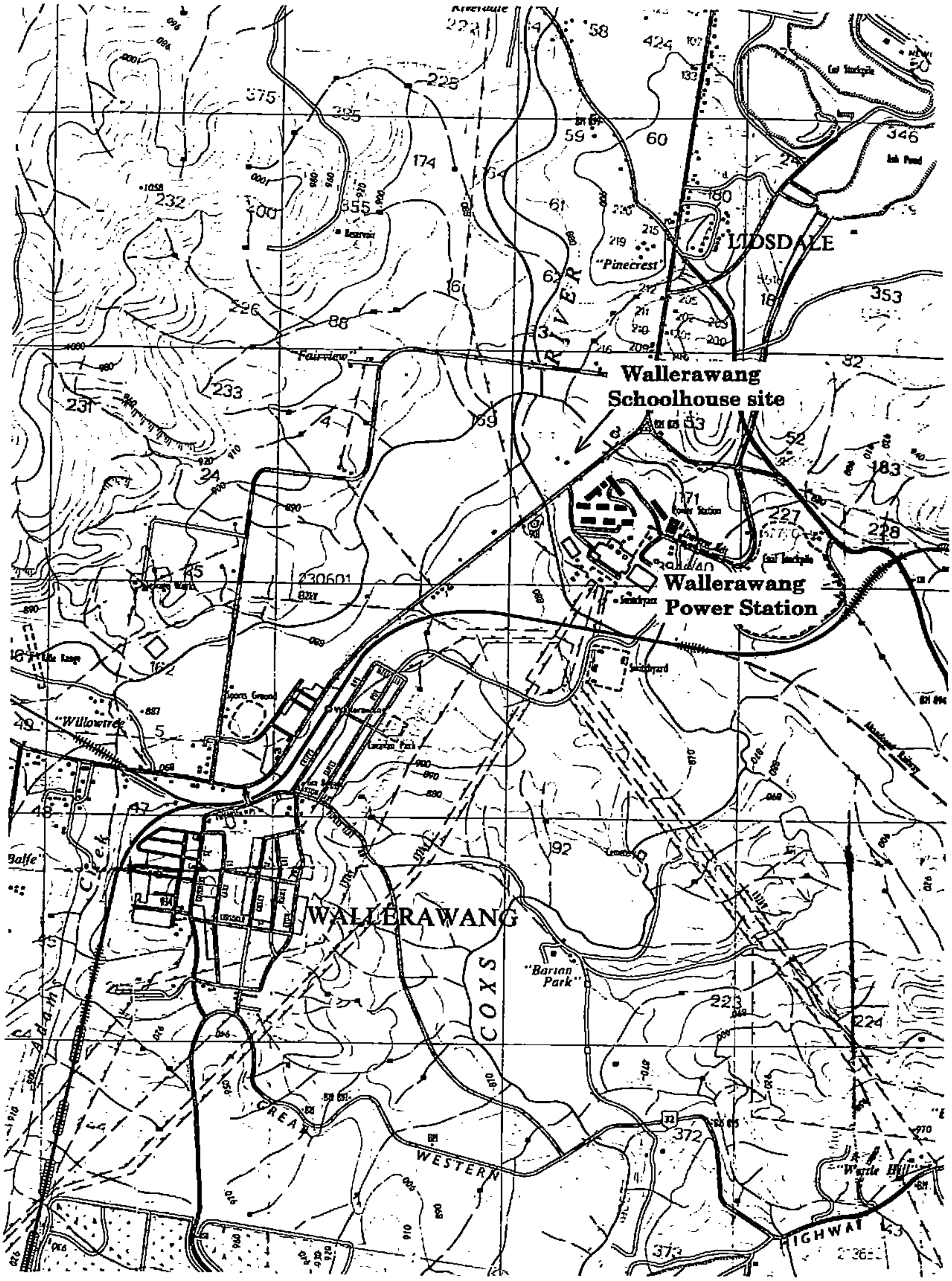
not excavated

Ten other pieces of quartz, of less certain Aboriginal origin were also recovered.

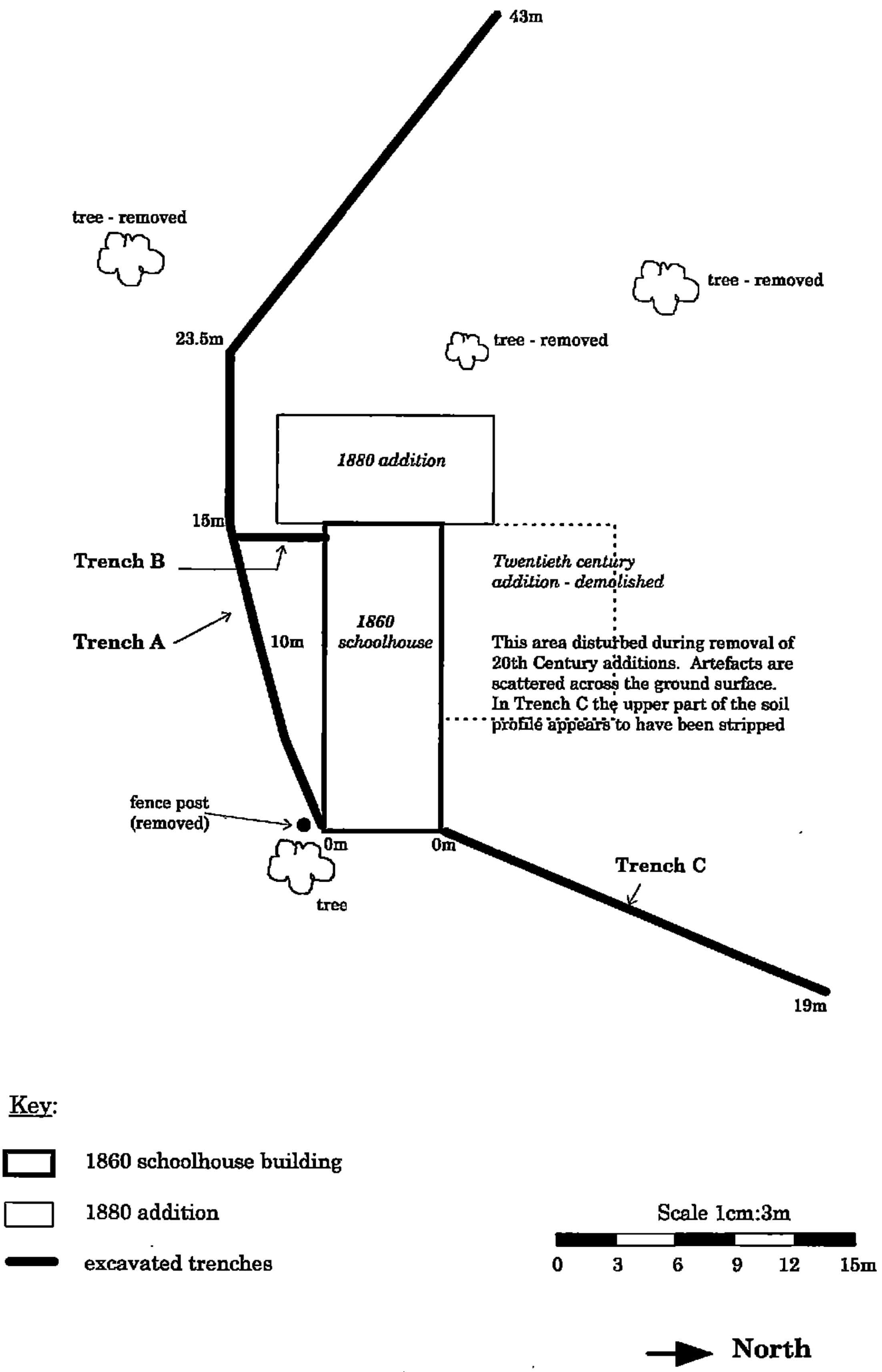
CHECKLIST TO HELP: length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock.
DEPOSIT: colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types.
ART: area of surface decorated, motifs, colours, wet, dry pigment, technique of engraving, no. of figures, sizes, patination.
BURIALS: number & condition of bone, position, age, sex, associated artefacts.
TREES: number, alive, dead, likely age, scar shape, position, size, patterns, axe marks, regrowth.
QUARRIES. rock type, debris, recognisable artefacts, percentage quarried.
OTHER SITES EG. structures (fish traps, stone arrangements, bora rings, mia mias), mythological sites, rock holes, engraved groove channels, contact sites (missions massacres cemeteries) as appropriate

Attach sketches etc. eg. plan & section of shelter, show relation between site contents, indicate north, show scale.
Attach annotated photos (stereo where useful) showing scale, particularly for art sites.

Map 1: Location of Wallerawang Schoolhouse
(from Lithgow 1:25,000 scale topographic sheet)



Map 2: Drainage trenches



Wallerawang Schoolhouse Aboriginal site -
additional site notes, taken from the archaeological monitoring report

Methods

The excavation works were undertaken on 24th July 1996 and were monitored by Elizabeth White. Three trenches were excavated by backhoe (Map 2), and were approximately 50cm wide. Trenches A and C were up to 50cm deep, while Trench B was 20cm deep near the wall of the building and about 40cm deep near its intersection with Trench A. The soil was removed in bulk (Plates 1-4). A tape measure was laid out along the trenches and the spoil and walls of the trenches were inspected for artefacts. Artefacts seen were collected in 1m intervals along the trenches (eg. Trench A 14-15m). In addition, about 2 hours were spent trowelling through spoil from trench A between 10m and 25m.

Soils

The soil profile generally consisted of an upper dark brown moist loam (A_1 horizon) over an orange-coloured silty loam (A_2 horizon). Smooth cobbles and pebbles were seen occarionally amongst the spoil. No evidence of pits or other features were seen in the trench walls, except for an area of looser deposit between 13 and 14m along Trench A which was probably associated with the installation of cables in that area.

Along Trench A at 19.5m the dark brown loam was about 14cm thick, over a mixed orange-brown loam to 30cm depth, over an apparently less disturbed orange silty loam which continued to the bottom of the trench (50cm depth). At 36m (Trench A) the soil profile consisted of a mottled brown to brown-orange loam to 35cm depth, over the orange silty loam which continued to 50cm depth (base of trench).

Along Trench B the soil was more damp (adjacent to south-east wall of building). It consisted of a thin (1-5cm) dark brown loam lying directly on the orange silty loam. The upper part of the soil profile appeared to have been stripped from this part of the site.
Along Trench C the soil profile consisted of a mixed orange-brown loam about 10cm thick (occasionally reaching 20cm thick) over orange silty loam. Artefacts were scattered across the ground surface in this area but few were recovered from the trench. It is likely that artefact-bearing deposit (perhaps 20-30cm compared with Trench A) had been largely stripped away when the twentieth-century additions were removed.

Artefact record

Location	No. of Items	Material	Description	Object	Condition	Comments
A12-13	1	Quartz	Good quality	Flake fragment?	Broken	1.5-2cm
A12-13	1	Quartz	Good quality	Flaked piece?	Broken	2-2.5cm
A13-14	1	Quartz	Yellow-white	Flake fragment?	Broken	Pebble cortex, 2.5-3cm
A15-16	1	Quartz	White	Flake	Whole	Wider than long, 2-2.5cm
A16-17	1	Quartz		Broken flake?	Broken	Possibly a proximal end, 1-1.5cm
A17-18	1	Quartz	White, good quality	Broken flake?	Broken	Possibly proximal end of a broken flake with broad platform, 1-1.5cm
A18-19	1	Quartz	Flawed with chrystals	Flaked piece?	Broken	3.5-4cm, chunky piece
A19-20	1	Quartzite		Flake	Whole	Wider than long, 5-5.5cm; From section at 19.5m
A22-23	1	Quartz	White, flawed	Flaked piece?	Whole	Pebble cortex, 2.5-3cm
A22-23	1	Quartz	White	Flaked piece?	Fragment	1-1.5cm
A35-36	1	Quartz	White	Flake fragment?	Broken	Possibly a piece of a broken flake 2.5-3cm
B3-4	1	Quartz	White	Flaked piece?	Broken?	3.5-4cm

0

[✓] New recording [ ] Additional Info

National Parks and Wildlife Service

Box 1967, Hurstville NSW 2220. Tel: (02) 585 6444

Standard Site Recording Form ~~xxxxxxxxx~~ Revised 12/92

45-1-0237

NPWS Code

1:250,000 map sheet: ______

AMG Grid reference (Full reference - please include leading digits): 228000 mE 6301000 mN

Scale of map used for grid reference (Please use largest scale available): [✓] 25K, 50K (preferred) [ ] 100K [ ] 250K

1:25K, 50K, 100K map name: Lithgow

HEAD OFFICE USE ONLY:

NPWS Site no: 45-1-237

Site types: open Campsite

Accessioned by: 31 Aug 93 Date:

Data entered by: ______ Date: ______

Owner/Manager: Owner: Mr Alf Whalen Lidsdale

Address: occupier: Springvale Coal Wallerawang NSW

Site name:

Locality/property name: Lidsdale

NPWS District: Bathurst

Region: Central

Reason for investigation: Springvale Coal Project - Mt Piper Coal Conveyor.

Portion no: 63

Parish: Lidsdale

Photos taken? Yes.

How many attached?

How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff. (Draw diagram on separate sheet.)

Travel west along Duncan Street, cross over bridge over Cox's River Deviation, then over railway line. The site is located between the Railway line & the natural Cox's River.

Other sites in locality? Yes

Site Types include: artefact scatters, burial

Are sites in NPWS Register? Yes.

Have artefacts been removed from site? Yes

When? August 93.

By whom? S McIntyre

Deposited where? Pacific Power for analysis

Is site important to local Aborigines? No.

Give contact(s) name(s) + address(es): Mr Kevin Williams. c/- the Greater Lithgow Aboriginal & Torres Strait Islander Corporation P.O Box 143 PORTLAND NSW

Contacted for this recording? Yes. Ms Enid Boney - Co-ordinator Windradyne Local Aboriginal Land Council P.O Box 1610 Bathurst 2795

(Attach additional information separately) If not, why not?

Verbal/written reference sources (including full title of accompanying report).

NPWS Report Catalogue #

Springvale Coal Project: An Investigation to determine the Likelihood of Aboriginal Skeletal Material Occurring in the Area to be affected by the Springvale - Mt Piper Coal conveyor at the Cox's River, Lidsdale.

Checklist: surface visibility, damage/disturbance/ threat to site

Condition of site: The site has been cleared of trees. It has been subject to flooding & erosion in the past. Disturbance is currently due to rabbits & Cattle. Site will be partially affected by Springvale - Mt Piper Coal conveyor.

Recommendations for management & protection (attach separate sheet if necessary):

Recommend partial consent to destroy see report.

Site recorded by: S M Intyre.

Date: 23/8/93

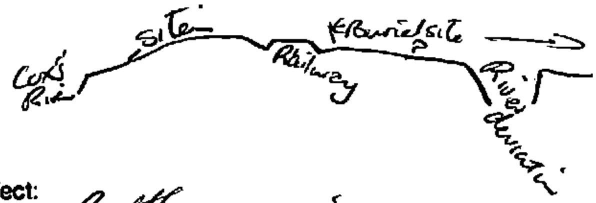
Address/Institution: c/- Pacific Power P.O Box 5257 SYDNEY 2001

SITE POSITION & ENVIRONMENT

OFFICE USE ONLY: NPWS site no:

1. Land form a. beach/hill slope/ridge top, etc: Riverbank. b. site aspect: open. c. slope:

d. mark on diagram provided *or* on your own sketch the position of the site: e. Describe briefly: located on river bank Cox's River.



f. Local rock type: Alluvium. g. Land use/effect: Cattle grazing.

2. Distance from drinking water: Nil. Source: Cox's River.

3. Resource Zone associated with site (estuarine, riverine, forest etc): riverine.

4. Vegetation: cleared.

5. Edible plants noted: Nil

6. Faunal resources (include shellfish): Nil.

7. Other exploitable resources (river pebbles, ochre, etc): River pebbles are available from river.

Site type:	DESCRIPTION OF SITE & CONTENTS.
open composite	Note state of preservation of site & contents. Do **NOT** dig, disturb, damage site or contents. Site is subsurface. A total of c50 artefacts were located including debitage. A possible hearth was located and has been submitted for C14 dating however info not yet available. The site appears to be disturbed. Disturbance includes rabbit, cattle & flooding. Artefacts appear to be moving vertically through sand deposits on top of raised area. They may also be moving down the slope with erosion & rainwash. Test Excavation permit #PRP521 issued to S. McIntyre.
CHECKLIST TO HELP: length, width, depth, height of site, shelter, deposit, structure, element eg. tree scar, grooves in rock. **DEPOSIT:** colour, texture, estimated depth, stratigraphy, contents-shell, bone, stone, charcoal, density & distribution of these, stone types, artefact types. **ART:** area of surface decorated, motifs, colours, wet, dry pigment, technique of engraving, no. of figures, sizes, patination. **BURIALS:** number & condition of bone, position, age, sex, associated artefacts. **TREES:** number, alive, dead, likely age, scar shape, position, size, patterns, axe marks, regrowth. **QUARRIES:** rock type, debris, recognisable artefacts, percentage quarried. **OTHER SITES EG.** structures (fish traps, stone arrangements, bora rings, mia mias), mythological sites, rock holes, engraved groove channels, contact sites (missions massacres cemeteries) as appropriate	Attach sketches etc. eg. plan & section of shelter, show relation between site contents, indicate north, show scale. Attach annotated photos (stereo where useful) showing scale, particularly for art sites.

CONSENT #: 542

NATIONAL PARKS AND WILDLIFE ACT 1974
SECTION 90

CONSENT

CONSENT TO CARRY OUT THE DESTRUCTION OF AN ABORIGINAL RELIC/PLACE

WHEREAS the Aboriginal relics described in Schedule "A" are situated upon the land described in Schedule "B", and which constitute relics within the meaning of Section 90 of the National Parks and Wildlife Act 1974, and WHEREAS application has been made by Howie, Herring and Forsyth on behalf of Springvale Coal, Level 6, 200 Pacific Highway, Crows Nest, NSW, 2065,

FOR CONSENT to destroy those relics in the course of:

Construction of a coal conveyor

NOW I, Neil Craig Shepherd, Director-General of National Parks and Wildlife, in pursuance of Section 90 of the said Act, and subject to the Conditions hereunder set out DO HEREBY CONSENT to the destruction of the said relics by the said applicant.

TERMS AND CONDITIONS OF THIS CONSENT

This Consent is issued subject to General Terms and Conditions covering all archaeological Permits and Consents, as well as the Specific Terms and Conditions pertaining to Consents to destroy Aboriginal relics all of which conditions are detailed in the attached pages.

DATED at Sydney this 31st day of August, 1993

H Clemens

for Director-General of National Parks and Wildlife

0

SCHEDULE A: Disturbed occupation site with approximately fifty stone artifacts.
NPWS Site # 45-1-0237

SCHEDULE B: Located at Lidsdale, beside the Cox's River at grid reference 228000 630100 on the route of the Springvale to Mt Piper Coal Conveyor.

SPECIAL CONDITIONS

1. This consent applies only to that part of the site indicated on the attached plan in blue highlighter, this being the area delimited in the field by yellow flagging.

2. This consent is issued subject to provision of a report on analysis and interpretation of the stone artifacts recovered from the site during the excavation (under the PRP issued to Sue McIntyre) being provided within three months of the signing of this consent.

SPECIFIC CONDITIONS APPLYING TO CONSENTS TO DESTROY ABORIGINAL RELICS

1 The Consent covers only those relics described in the instrument of Consent and in any Schedules thereto.

2 In the case of Consents granted to cover development activities, the Consent is granted to cover only those circumstances described in the Schedules, and subject to there not being discovered in the course of further operations, in the progress of that development requiring the Consent, any other relics which will be damaged or destroyed by the continuation of the operation. (Destruction of such relics would require the granting of a separate Consent).

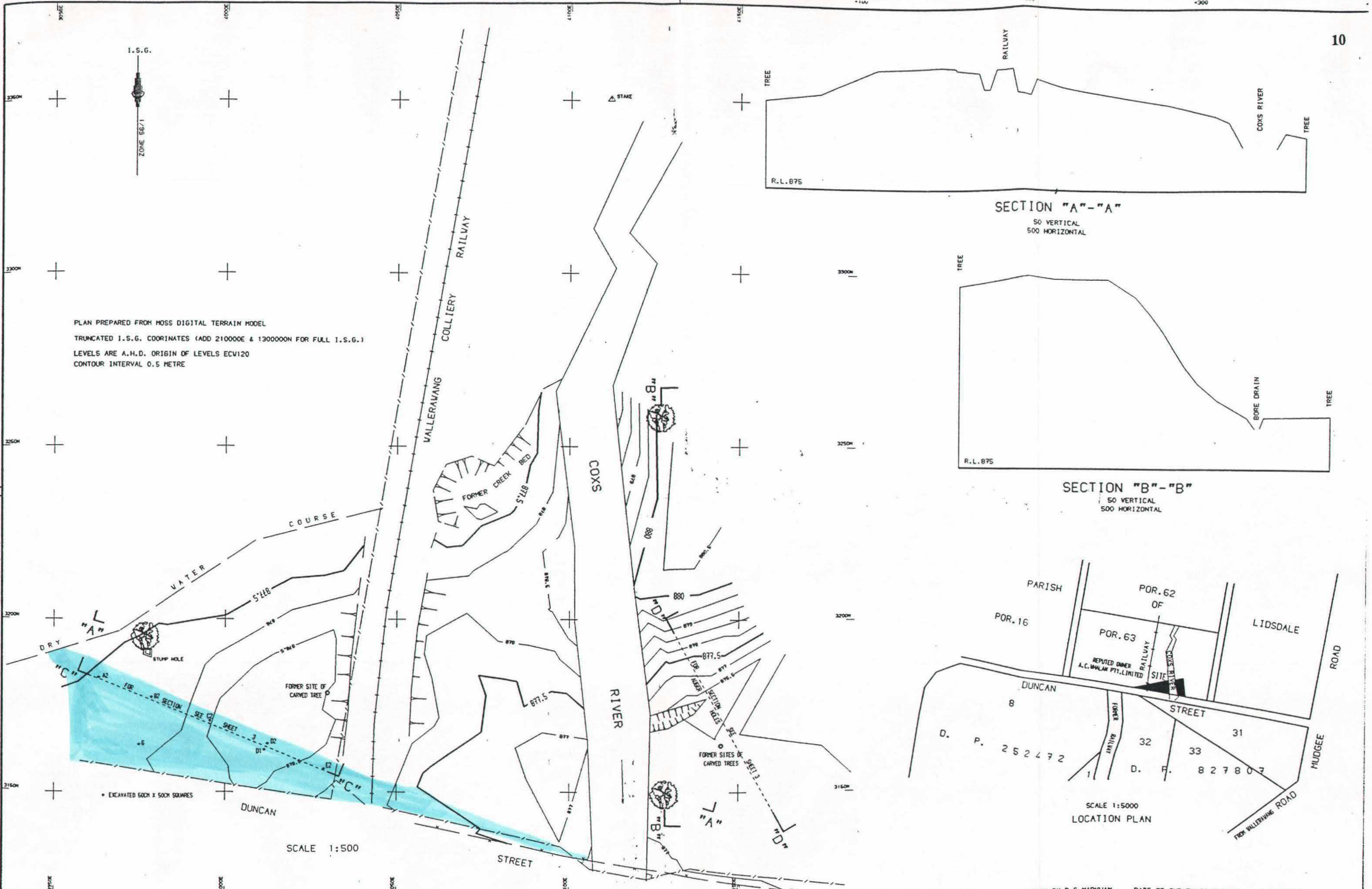
3 The Consent is conditional upon all relevant development approvals having been obtained.

4 Should the relics listed in Schedule 'A' above remain in existence two (2) years from the date of this document, the Consent shall be deemed to be void, and any further damage to the relics will require the preparation of a new Consent document.

5 (i) In the case of Consents granted in conjunction with Permits to excavate or record the Consent covers only material from the site(s) covered by the Permit to excavate.

(ii) A Consent so granted as in (i) above is valid for two years or until such date as excavated material must be lodged with The Australian Museum under the terms of the Permit.

(iii) The holder of the Consent granted as in (i) above shall furnish the National Parks and Wildlife Service with a report on the activities carried out under the Consent, which report shall be part of the final report to the Service (as per Condition 3, Specific Terms and Conditions for Salvage Permits).



AMENDMENTS			
01	ADDITIONAL SECTIONS ADDED & CREATION OF SHEET 3		
	DRN	SG	
	CKD	SG	
DATE	24-AUG-93		

SURVEY BY R.C.MARKHAM DATE OF SURVEY 23/6/1993 S.1.93/133

KKS CODING U

D.C.VILLIS per BAC
ACTING PRINCIPAL SURVEYOR 20-JUL-1993

DRAWN SG · DESIGN · CHECKED DO SG · ENG · PASSED BAC

TENTATIVE

PACIFIC POWER
SURVEYING SERVICES
SITE PLAN
VALLERAVANG POWER STATION
ABORIGINAL BURIAL SITE
ENGINEERING SURVEY

cad DO NOT AMEND MANUALLY

SCALE AS SHOWN

A1 SUR628602/2 01

REFERENCE DRAWINGS

PACIFIC POWER SERVICES

Figure 4: Site Plan

Section of site for which consent to destroy is approved.

Appendix L

Lithic attribute data (survey)

Site	Type	Raw material	L (mm)	W (mm)	Th (mm)	Cortex (Yes/No)	Plat-form type	Dorsal Cortex (%)	Core Cortex (%)	Flake scars (*N*)	Comment
GWB-STQ1-21	Angular Shatter	Quartz	22.1	-	-	Yes	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	20.8	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	24.1	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	19.2	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	29.4	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	19.5	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartzite	16.7	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	19.9	-	-	No	-	-	-	-	-
GWB-STQ1-21	Complete flake	Quartz	28.3	17.6	6.7	No	Crushed	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	38.1	28.9	8.9	No	Multiple	None	-	-	-
GWB-STQ1-21	Complete flake	Quartz	18.8	20.1	8.9	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	31.7	33.8	8	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	28.3	23.4	4.8	No	Faceted	None	-	-	-
GWB-STQ1-21	Redirecting flake	S.tuff	36.9	9.8	5.6	No	Multiple	None	-	-	-
GWB-STQ1-21	Complete flake	Quartzite	39.4	29	13	Yes	Single	26-50	-	-	-
GWB-STQ1-21	Complete flake	Quartz	26.2	14.6	6.8	No	Crushed	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	14.5	24.2	3.3	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	29.8	22.9	4.4	No	Multiple	None	-	-	-
GWB-STQ1-21	Complete flake	Quartz	27.2	23	7.4	No	Crushed	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	27	19.8	6.3	No	Faceted	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	35.9	36	9.9	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	Quartz	16.9	9.9	5.3	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	31.2	32	4.3	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	Quartz	37	26	11.1	No	Single	None	-	-	-

Site	Type	Raw material	L (mm)	W (mm)	Th (mm)	Cortex (Yes/No)	Plat-form type	Dorsal Cortex (%)	Core Cortex (%)	Flake scars (*N*)	Comment
GWB-STQ1-21	Complete flake	Quartz	33.9	20.5	8.3	No	Single	None	-	-	-
GWB-STQ1-21	Core (Multi)	Quartz	91.2	81.9	62.2	No	-	-	None	5	3 platforms
GWB-STQ1-21	Core (Multi)	Quartz	118	90.3	81.9	Yes	-	-	76-100	4	2 platforms
GWB-STQ1-21	Core (Bifacial)	Quartz	47.5	42.8	34.5	Yes	-	-	1-25	5	-
GWB-STQ1-21	Core (Multi)	Quartz	26.5	23.4	16.6	Yes	-	-	26-50	2	2 platforms
GWB-STQ1-21	Core (Multi)	Quartz	81.3	61.2	44.2	No	-	-	None	4	3 platforms
GWB-STQ1-21	Core (Multi)	Quartz	97.8	84	66	Yes	-	-	76-100	3	2 platforms
GWB-STQ1-21	Core (Multi)	Quartz	36.8	25.2	24.5	No	-	-	None	6	2 platforms
GWB-STQ1-21	Core (Multi)	Quartz	66.5	58.4	42.1	Yes	-	-	26-50	2	3 platforms
GWB-STQ1-21	Core (Multi)	Quartz	63.4	59.5	42.2	Yes	-	-	26-50	6	3 platforms
GWB-STQ1-21	Core (Uni)	Quartz	55.8	39	28	Yes	-	-	76-100	2	-
GWB-STQ1-21	Core (Uni)	Quartz	30.5	24.7	13.1	No	-	-	None	2	Made on flake
GWB-STQ1-21	Core Frag	Quartzite	44	26	18.9	Yes	-	-	26-50	1	-
GWB-STQ1-21	Flake Shatter	Quartz	13.3	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	Quartz	19.8	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	Quartz	23.6	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	Quartz	33.7	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	Quartz	22.9	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	S.tuff	25.9	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	Quartz	16.5	-	-	No	-	-	-	-	-
GWB-STQ1-21	Backed artefact	S.tuff	17.4	14.7	2.4	No	-	-	-	-	Near-complete Geometric microlith.
GWB-STQ1-21	Proximal flake	Quartz	33.8	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	19.4	-	-	No	Single	-	-	-	-

Site	Type	Raw material	L (mm)	W (mm)	Th (mm)	Cortex (Yes/No)	Plat-form type	Dorsal Cortex (%)	Core Cortex (%)	Flake scars (*N*)	Comment
GWB-STQ1-21	Proximal flake	Quartz	23.4	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	33.6	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	24	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	29.5	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	24.8	-	-	No	Crushe d	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	18.2	-	-	Yes	Cortical	-	-	-	-
GWB-STQ1-21	Proximal flake	S.tuff	35.9	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	23.3	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	25.2	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Hammersto ne	Quartzite?	97	66	42	Yes	-	-	-	-	Pitting on one end
GWB-STQ1-21	Backed artefact	S.tuff	21.2	13.7	5.3	No	-	-	-	-	Complete Bondi point
SU1a-A5	Complete flake	Quartzite	46.8	37.2	21.1	Yes	Cortical	None	-	-	-
SU1a-A5	Core (Multi)	Quartz	43.5	36.7	35.1	Yes	-	-	1-25	3	2 platforms
SU1a-A5	Core (Uni)	S.tuff	46	32.5	19.1	No	-	-	None	2	Made on flake
SU1a-A5	Flake Shatter	Quartz	28.1	-	-	No	-	-	-	-	-
SU1a-A5	Flake Shatter	Quartz	32.1	-	-	No	-	-	-	-	-
SU1a-A5	Flake Shatter	Quartz	17.3	-	-	No	-	-	-	-	-
SU1a-A5	Flake Shatter	S.tuff	25.6	-	-	No	-	-	-	-	-
SU1a-A5	Proximal flake	Quartz	29.2	-	-	No	Single	-	-	-	-
SU1a-A5	Split flake	Quartz	30.1	-	-	No	-	-	-	-	-
SU1a-A5	Proximal flake	Quartz	21.6	-	-	No	Single	-	-	-	-

Site	Type	Raw material	Length (mm)	Width (mm)	Thickness (mm)	Cortex (Yes/No)	Platform type	Dorsal Cortex (%)	Core Cortex (%)	Flake scars (*N*)	Comment
GWB-STQ1-21	Angular Shatter	Quartz	22.1	-	-	Yes	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	20.8	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	24.1	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	19.2	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	29.4	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	19.5	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartzite	16.7	-	-	No	-	-	-	-	-
GWB-STQ1-21	Angular Shatter	Quartz	19.9	-	-	No	-	-	-	-	-
GWB-STQ1-21	Complete flake	Quartz	28.3	17.6	6.7	No	Crushed	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	38.1	28.9	8.9	No	Multiple	None	-	-	-
GWB-STQ1-21	Complete flake	Quartz	18.8	20.1	8.9	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	31.7	33.8	8	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	28.3	23.4	4.8	No	Faceted	None	-	-	-
GWB-STQ1-21	Redirecting flake	S.tuff	36.9	9.8	5.6	No	Multiple	None	-	-	-
GWB-STQ1-21	Complete flake	Quartzite	39.4	29	13	Yes	Single	26-50	-	-	-
GWB-STQ1-21	Complete flake	Quartz	26.2	14.6	6.8	No	Crushed	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	14.5	24.2	3.3	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	29.8	22.9	4.4	No	Multiple	None	-	-	-
GWB-STQ1-21	Complete flake	Quartz	27.2	23	7.4	No	Crushed	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	27	19.8	6.3	No	Faceted	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	35.9	36	9.9	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	Quartz	16.9	9.9	5.3	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	S.tuff	31.2	32	4.3	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	Quartz	37	26	11.1	No	Single	None	-	-	-
GWB-STQ1-21	Complete flake	Quartz	33.9	20.5	8.3	No	Single	None	-	-	-
GWB-STQ1-21	Core (Multi)	Quartz	91.2	81.9	62.2	No	-	-	None	5	3 platforms
GWB-STQ1-21	Core (Multi)	Quartz	118	90.3	81.9	Yes	-	-	76-100	4	2 platforms
GWB-STQ1-21	Core (Bifacial)	Quartz	47.5	42.8	34.5	Yes	-	-	1-25	5	-
GWB-STQ1-21	Core (Multi)	Quartz	26.5	23.4	16.6	Yes	-	-	26-50	2	2 platforms
GWB-STQ1-21	Core (Multi)	Quartz	81.3	61.2	44.2	No	-	-	None	4	3 platforms
GWB-STQ1-21	Core (Multi)	Quartz	97.8	84	66	Yes	-	-	76-100	3	2 platforms
GWB-STQ1-21	Core (Multi)	Quartz	36.8	25.2	24.5	No	-	-	None	6	2 platforms
GWB-STQ1-21	Core (Multi)	Quartz	66.5	58.4	42.1	Yes	-	-	26-50	2	3 platforms
GWB-STQ1-21	Core (Multi)	Quartz	63.4	59.5	42.2	Yes	-	-	26-50	6	3 platforms
GWB-STQ1-21	Core (Uni)	Quartz	55.8	39	28	Yes	-	-	76-100	2	-

GWB-STQ1-21	Core (Uni)	Quartz	30.5	24.7	13.1	No	-	-	None	2	Made on flake
GWB-STQ1-21	Core Frag	Quartzite	44	26	18.9	Yes	-	-	26-50	1	-
GWB-STQ1-21	Flake Shatter	Quartz	13.3	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	Quartz	19.8	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	Quartz	23.6	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	Quartz	33.7	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	Quartz	22.9	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	S.tuff	25.9	-	-	No	-	-	-	-	-
GWB-STQ1-21	Flake Shatter	Quartz	16.5	-	-	No	-	-	-	-	-
GWB-STQ1-21	Backed artefact	S.tuff	17.4	14.7	2.4	No	-	-	-	-	Near-complete Geometric microlith.
GWB-STQ1-21	Proximal flake	Quartz	33.8	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	19.4	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	23.4	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	33.6	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	24	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	29.5	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	24.8	-	-	No	Crushed	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	18.2	-	-	Yes	Cortical	-	-	-	-
GWB-STQ1-21	Proximal flake	S.tuff	35.9	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	23.3	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Proximal flake	Quartz	25.2	-	-	No	Single	-	-	-	-
GWB-STQ1-21	Hammerstone	Quartzite	97	66	42	Yes	-	-	-	-	Pitting on one end
GWB-STQ1-21	Backed artefact	S.tuff	21.2	13.7	5.3	No	-	-	-	-	Complete Bondi point
SU1a-A5	Complete flake	Quartzite	46.8	37.2	21.1	Yes	Cortical	None	-	-	-
SU1a-A5	Core (Multi)	Quartz	43.5	36.7	35.1	Yes	-	-	1-25	3	2 platforms
SU1a-A5	Core (Uni)	S.tuff	46	32.5	19.1	No	-	-	None	2	Made on flake
SU1a-A5	Flake Shatter	Quartz	28.1	-	-	No	-	-	-	-	-
SU1a-A5	Flake Shatter	Quartz	32.1	-	-	No	-	-	-	-	-
SU1a-A5	Flake Shatter	Quartz	17.3	-	-	No	-	-	-	-	-
SU1a-A5	Flake Shatter	S.tuff	25.6	-	-	No	-	-	-	-	-
SU1a-A5	Proximal flake	Quartz	29.2	-	-	No	Single	-	-	-	-
SU1a-A5	Split flake	Quartz	30.1	-	-	No	-	-	-	-	-

SU1a-A5	Proximal flake	Quartz	21.6	-	-	No	Single	-	-	-	-

Appendix M

GWB-STQ1-21 - Salvage Methodology

1.0 Introduction

This salvage methodology has been prepared to guide the archaeological salvage program recommended for surface and subsurface stone quarry site GWB-STQ1-21. The objectives and methods of the salvage program are outlined as are proposed post-excavation analyses and care and control measures for recovered Aboriginal objects.

2.0 Objectives

The objectives of the GWB-STQ1-21 salvage program are as follows:

1) To record and collect all visible surface artefacts within the site
2) To salvage a statistically viable subsurface assemblage of flaked stone artefacts from the site
3) To describe the range of quarrying/reduction processes evident within the site
4) To examine variability in the location of activity areas across the site
5) To contextualise the subsurface lithic assemblage recovered from GWB-STQ1-21 via a comparative regional analysis of assemblage size and composition
6) To establish a chronological framework for Aboriginal occupation of the Site
7) To investigate the effects of geomorphic processes on the nature and integrity of the archaeological deposits across GWB-STQ1-21
8) To investigate the nature of the gravel deposits quarried within GWB-STQ1-21
9) To improve our understanding of the environmental history of the Site

3.0 Methodology

A three phase archaeological salvage program is proposed for GWB-STQ1-21, as follows:

Phase 1: surface collection of all Aboriginal objects located within the site

Phase 2: completion of three manual open area salvage excavations within the site

Phase 3: a geomorphological assessment of extant soil profiles and materials across GWB-STQ1-21

Further detail on each phase of the salvage program is provided in the sections below.

3.1 Phase 1 - surface collection

Phase 1 will involve the surface collection of all Aboriginal objects located within GWB-STQ1-21. The field methodology for this task will be as follows:

1. All land within the boundary of the site will be visually inspected for surface Aboriginal objects, with particular attention paid to areas of hillslope erosion therein
2. Aboriginal objects identified during the visual inspection will be flagged using high-visibility pin markers
3. Upon completion of flagging, all collection areas will be comprehensively photographed
4. Individual artefact locations will be captured via differential GPS
5. Artefacts will be collected and bagged individually, with each artefact assigned a Unique Reference Number (URN) for accessioning and data analysis purposes.

3.2 Phase 2 - open area salvage excavations

In Phase 2, a total of three open area salvage excavations not collectively exceeding 100 m^2 will be completed within GWB-STQ1-21. Open area excavations will be placed in both the ‘upper’ and ‘lower’ portions of the low gradient ridgeline associated with GWB-STQ1-21, with indicative locations shown on **Figure M1** below. In all open area excavations, excavation extent will be driven by observed lithic yields and the presence/absence of archaeological features such as hearths and heat treatment pits. Excavation within any single open area excavation will cease if 25 m^2 of excavation reveals uniformly low (i.e. ≤20 artefacts/m^2) lithic densities. The following standard excavation methodology is proposed for each open area excavation:

- All excavation will be carried out manually using trowels, shovels and mattocks
- Excavation will proceed in 1 m² units, each of which will be assigned an alpha-numeric identifier
- All excavation units will be excavated in bulk to the base of identified Aboriginal object bearing units
- Test pit stratigraphy for each excavation unit will be recorded on pro-forma recording sheets using standard sedimentological terms and criteria
- Should a feature, such as a possible hearth, ground oven or heat treatment pit be identified, the surface of the feature will initially be cleared by hand to define its extent. Excavation of surrounding units will be undertaken as required to achieve this. The surface of the feature will be planned and photographed to record the upper cut and then half-sectioned to more accurately assess its origin, with excavation proceeding stratigraphically. All definite and suspected archaeological features will be photographed in cross-section. Cross-sections will also be drawn to scale. Upon completion of cross-section excavation and recording, features will be excavated in their entirety. All associated cultural materials will be retained for additional analysis (eg, radiometric dating, lipid/pollen analysis)
- Should suspected human remains be identified, the relevant provisions of the Unexpected Aboriginal Heritage Find Procedure (UAHFP) detailed in the Project ACHMP will apply
- If encountered, charcoal and/or other organic materials deemed suitable for radiocarbon dating will be collected using best practice guidelines (e.g. Burke and Smith 2004: 154)
- Soil samples from all identified soil horizons will be retained for pH testing and other laboratory-based analyses (e.g. Particle Size Analysis (PSA), loss on ignition, magnetic susceptibility)
- Soil samples for OSL dating will be collected from selected strata using best practice guidelines (e.g. United States Geological Survey 2015)
- Soil samples for pollen analysis, if required, will be collected using best practice guidelines (e.g. English Heritage, 2011)
- All excavated soils will be wet-sieved on-site through 3 mm gauge sieves
- Artefacts recovered from sieving will be retained in plastic zip-lock bags and labelled with appropriate provenance data
- Representative and otherwise notable soil profiles will be photographed and drawn to scale as the excavation progresses
- Once complete, a photographic record of the excavation will be made. All excavations will be left open for mechanical reinstatement.

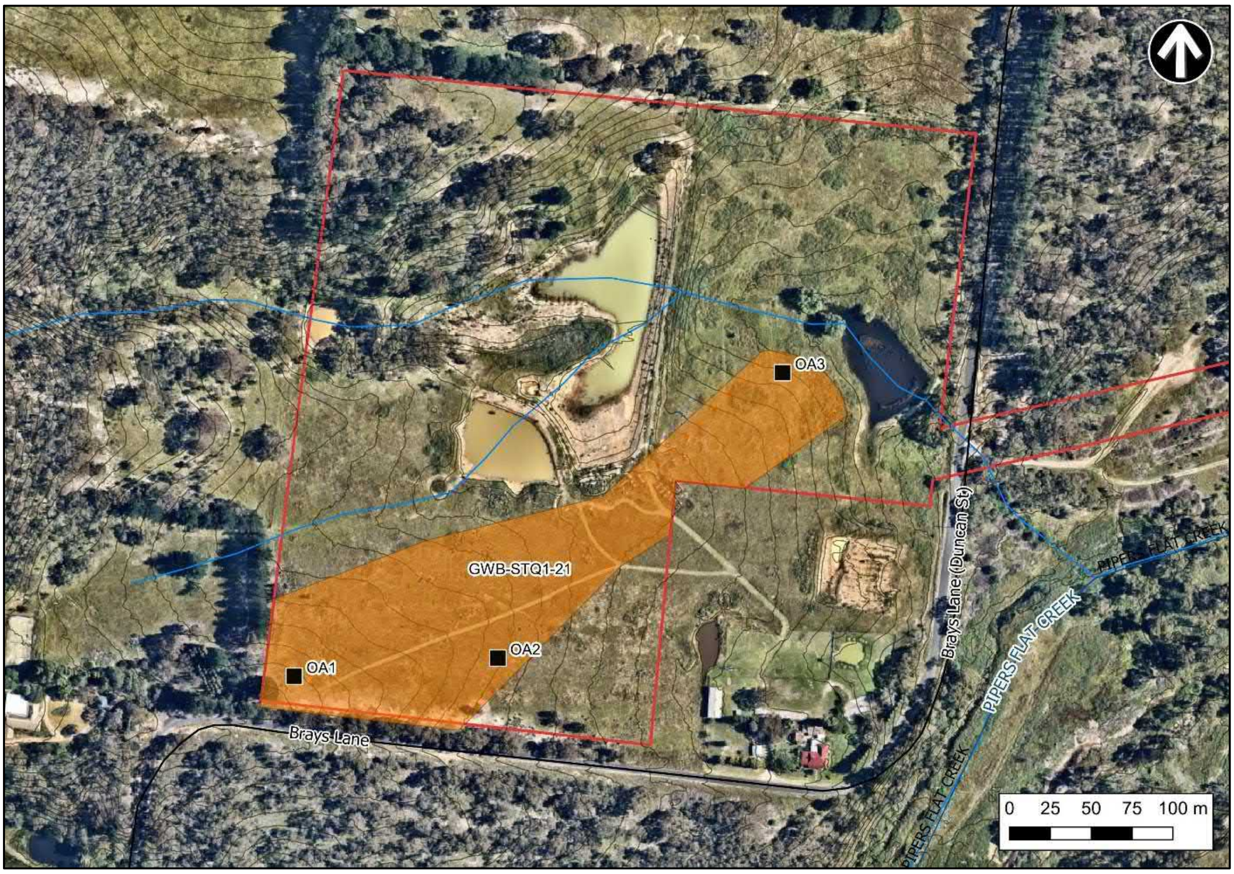


Figure M1: Map showing indicative locations of Phase 2 open area salvage excavations within GWB-STQ1-21

3.3 Phase 3 – geomorphological assessment

The final phase of salvage works will comprise a geomorphological assessment of exposed soil profiles and materials within each open area excavation. The assessment will be undertaken by a qualified geomorphologist or geoarchaeologist and will involve the following:

- A desktop review of existing environmental data and historical aerials for the Site
- A visual inspection of exposed soil profiles in all Phase 2 open area excavations
- A series of backhoe trenches across GWB-STQ1-21, the final number and placement of which will be determined by the project geomorphologist/geoarchaeologist in consultation with the lead archaeologist and Neoen

The principal aims of the assessment will be to:

1. Record and describe extant soils and soil profiles using standard sedimentological techniques and terminology
2. To provide an interpretation of the geomorphic history of the low gradient ridgeline associated with GWB-STQ1-21
3. To provide an interpretation of the implications of observed soil units and historical land use practices for the spatial integrity and chronology of recovered artefactual materials.

Soil sampling for the purposes of radiometric dating and other laboratory-based analyses (e.g. Loss on Ignition, magnetic susceptibility and pollen analysis) will be at the discretion of the project geomorphologist/archaeologist.

The engaged geomorphologist/geoarchaeologist will provide a standalone report detailing the results of their assessment.

3.0 Post-excavation analyses and reporting

All stone artefacts recovered during the salvage program will be subject to detailed technological analysis by a qualified lithic specialist. Artefacts will be analysed to a level comparable to that achieved in previous analyses of excavated lithic assemblages from the Central Tablelands of NSW so as to facilitate a meaningful comparative analysis of regional assemblage size and composition. Microscopic use-wear and/or residue analysis of a sample of finished tools and other items will also be undertaken for the purposes of determining individual task associations and functions.

Any soil/stone/organic samples selected for radiometric dating will be submitted to appropriate commercial dating facilities for processing. All resulting analytical outputs/reports will be attached to the main archaeological salvage report as standalone appendices.

Any soil samples selected for PSA and/or soil chemistry analysis will be submitted to an appropriate commercial soil testing facility for analysis. All resulting analytical outputs/reports will be attached to the main archaeological salvage report as a standalone appendix.

Any soil samples selected for pollen/lipid analysis will be submitted to an appropriate specialist for analysis. All resulting analytical outputs/reports will be attached to the main archaeological salvage report as a standalone appendix.

An Archaeological Salvage Report (ASR) detailing the results of the archaeological salvage program carried out for the proposal (including the results of any post-excavation analyses) will be completed within two years of the completion of fieldwork. Reporting will be consistent with the best practice guidelines suggested by the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) and the *Aboriginal Cultural Heritage Standards & Guidelines Kit* (NSW NPWS 1997). Copies of the geomorphological assessment and geophysical survey reports will be attached to the ASR as standalone appendices.

Copies of the final ASR will be provided to all RAPs and Heritage NSW within one month of finalisation.

4.0 Care and control of recovered Aboriginal objects

All Aboriginal objects recovered as a result of the GWB-STQ1-21 salvage program would be stored temporarily at the head office of Neoen's appointed cultural heritage consultant while post-excavation analyses are being carried out. Upon completion of post-excavation analyses, RAPs would be consulted regarding the appropriate long term management of these items, with options including:

- On-site reburial in a non-impact area
- Off-site reburial in a location jointly agreed by Neoen and RAPs
- Placement in a dedicated keeping place under a NPW Act Care Agreement.

Artefacts recovered from the study area as a result of the test excavation program detailed in this ACHAR would be managed in accordance with those recovered as part of the GWB-STQ1-21 salvage program.

Appendix N

RAP Responses to Draft ACHAR

From: jesse johnson <muragadi@yahoo.com.au>
Sent: Monday, 1 November 2021 3:42 PM
To: Zickar, Jessica <Jessica.Zickar@aecom.com>
Subject: [EXTERNAL] Re: Great Western Battery Project (SSD-12346552) Draft ACHAR

Hi Jessica,
I have read the draft ACHAR for the above project, I agree with the recommendations made.
Kind regards
Jesse Johnson
0418970389

From: Corrroboree Aboriginal Corporation <corroboreecorp@bigpond.com>
Sent: Saturday, 6 November 2021 3:06 PM
To: Zickar, Jessica <Jessica.Zickar@aecom.com>; McLaren, Andrew <Andrew.McLaren@aecom.com>
Subject: [EXTERNAL] Re: Great Western Battery Project (SSD-12346552) Draft ACHAR (small file size)

Hi All
We agree with draft

Kind regards
Marilyn Carroll-Johnson
Director
Corroboree Aboriginal Corporation
Mob: 0415911159
Ph: 0288244324
E: corroboreecorp@bigpond.com
Address: PO Box 3340
ROUSE HILL NSW 2155

From: Ryan Johnson <murrabidgeemullangari@yahoo.com.au>
Sent: Thursday, 11 November 2021 4:30 PM
To: Zickar, Jessica <Jessica.Zickar@aecom.com>
Subject: [EXTERNAL] Re: Great Western Battery Project (SSD-12346552) Draft ACHAR

Hi Jessica
I have read the project information and draft ACHAR for the above project, I endorse the recommendations made.
Thanks
Ryan johnson

McLaren, Andrew

From: Lilly Carroll <didgengunawalclan@yahoo.com.au>
Sent: Tuesday, 23 November 2021 9:48 AM
To: McLaren, Andrew

Subject: [EXTERNAL] Re: Draft ACHAR - Wallerawang battery project

Hi Andrew

Yes DNC is happy wth the report

Kind regards DNC
Paul Boyd
0426823944

Sent from myMail for iOS

McLaren, Andrew

From: Shaun Carroll <Merrigarn@hotmail.com>
Sent: Tuesday, 23 November 2021 5:24 PM
To: McLaren, Andrew
Subject: [EXTERNAL] RE: Draft ACHAR - Wallerawang battery project

Hi Andrew,
I have read the project information and draft ACHAR for the above project, I agree with the recommendations made.
Thanks
Shaun Carroll

Sent from Mail for Windows

McLaren, Andrew

From:	Martin de Launey <mudyi@bigpond.com>
Sent:	Tuesday, 23 November 2021 10:36 PM
To:	Zickar, Jessica
Cc:	McLaren, Andrew
Subject:	[EXTERNAL] RE: Great Western Battery Project (SSD-12346552) Draft ACHAR (small file size)

Hi Andrew and Jessica

In continuing my response to the Great Western Battery proposal and previous correspondence, I have a few comments on the Draft ACHMP, because I am agreed on the Anthropological assessment and Aboriginal Cultural Heritage evidence at hand (in that, the timeline and land use occupation pre European impact is accepted as accurate). As such, this reinforces my own conclusion after having done some substantial study over the whole region (and into the eastern escarpment side and connecting easting waterways of the Great Dividing Range), there was a holistic network of interacting Clans connected over a huge range – even to the point of having elderly and youngsters being more permanent to an area for more than one season. This can be evidenced by the large Cox's Creek site, remnant "Blackfellows Hands" – and similar sites - as well as the Lidsdale Burial Ground.

The main disappointment I have, is that archaeologists tend to determine a site of "Minor" importance because it may sit in an area of a largely destroyed terrain, or, is even expected to be severely impacted (eg. The borrow - pit site of Sta1-21) although being categorically assessed as "Moderate"; to my mind, even a flake is a "site" which has Historic and Aesthetic value and has consequence when accorded impact.

Overall, I am happy with the UAHFP proposal (Unexpected Aboriginal Heritage Finds Procedure) of 11.1.3. I also consider the rest of the mitigation measures (apart from sta1-21 as I've stated) appropriate in context of the ACHMP. Thanking you,

Martin de Launey

Appendix O

Lithic Attribute Data (Test Excavation)

URN	ASAS	Square	Landform unit	Spit	Phase	Tech. Type	Raw Mat.	Cortex	Colour	Flaw	Ther. Dam.	Weight (g)	MLD (mm)
1	1	1	Crest	0-10	1	Complete flake	Quartz	No	White	No	No	0.6	
2	1	2	Crest	0-10	1	Multidirectional core	Quartz	No	White	Yes	No	9.1	
3	1	2	Slope	10-20	1	Bidirectional core	Quartz	No	White	Yes	No	4.7	
4	1	4	Crest	10-20	1	Multidirectional core	Quartz	Yes	White	Yes	No	63.9	
5	1	11	Crest	0-10	1	Core fragment	Quartz	No	White	Yes	No	3.8	
6	1	12	Slope	0-10	1	Core fragment	Quartz	No	White	Yes	No	11.45	42.2
7	1	12	Slope	0-10	1	Complete flake	S.tuff	No	Beige	No	No	2.6	
8	1	12	Crest	0-10	1	Complete flake	Quartz	No	Pink	Yes	No	1.8	
9	1	12	Crest	0-10	1	Flake shatter	Quartz	No	White	Yes	No	2	23.8
10	1	12	Crest	0-10	1	Flake shatter	Quartz	No	White	Yes	No	0.1	9.8
11	1	19	Slope	0-10	1	Complete flake	Quartz	No	White	No	No	0.2	12.4
12	1	19	Slope	0-10	1	Complete flake	Quartz	No	White	No	No	0.5	
13	1	21	Crest	10-20	1	Flake shatter	Quartz	No	White	Yes	No	1.2	18.8
14	1	21	Crest	10-20	1	Flake shatter	Quartz	No	White	No	No	0.3	12.9
15	1	21	Slope	0-10	1	Flake shatter	Quartz	No	White	Yes	No	0.6	17.1
16	1	21	Slope	0-10	1	Complete flake	Quartz	No	White	Yes	No	0.1	
17	1	21	Crest	0-10	1	Proximal flake	Quartz	No	White	Yes	No	2.1	
18	1	21	Crest	0-10	1	Split flake	Quartz	No	White	Yes	No	5.8	29.6
19	1	21	Crest	0-10	1	Split flake	Quartz	No	White	Yes	No	5.1	25.8
20	1	23	Slope	0-10	1	Complete flake	Quartz	No	White	No	No	2.9	
21	1	23	Slope	0-10	1	Flake shatter	Quartz	No	White	No	No	0.3	13.4
22	1	25	Crest	10-20	1	Complete flake	Quartz	No	White	No	No	1.6	
23	1	25	Crest	0-10	1	Angular shatter	Quartz	No	White	Yes	No	2.8	21.4
24	1	26	Slope	0-10	1	Angular shatter	Quartz	No	White	Yes	No	1.8	17.8
25	1	26	Crest	0-10	1	Angular shatter	Quartz	No	White	No	No	0.9	15.4
26	1	28	Crest	0-10	1	Proximal flake	Quartz	No	White	No	No	1.8	21.2
27	1	28	Crest	0-10	1	Complete flake	Quartz	No	White	Yes	No	1.6	
28	1	32	Crest	0-10	1	Complete flake	Quartz	No	White	Yes	No	0.5	
29	1	32	Crest	0-10	1	Redirecting flake	Quartz	No	White	Yes	No	4.8	
30	1	32	Crest	0-10	1	Complete flake	S.tuff	No	Yellow	No	No	0.1	
31	1	32	Crest	0-10	1	Proximal flake	Quartz	No	White	No	No	0.1	10.3
32	1	36	Slope	0-10	1	Angular shatter	S.tuff	No	Brown	No	Yes	1.6	29.1
33	1	37	Crest	0-10	1	Complete flake	FGS	No	Grey	No	No	8.7	
34	1	38	Crest	0-10	1	Complete flake	Quartz	No	White	No	No	0.1	
35	1	38	Slope	0-10	1	Split flake	Quartz	No	White	No	No	0.1	11.6
36	1	38	Crest	0-10	1	Flake shatter	Quartz	No	White	No	No	0.1	8.2
37	1	38	Crest	0-10	1	Flake shatter	Quartz	No	White	Yes	No	1.3	20.7
38	1	38	Crest	10-20	1	Proximal flake	Quartz	No	White	No	No	1.5	20.6

39	1	40	Crest	0-10	1	Complete flake	Quartz	Yes	White	Yes	No	7.9	
40	2	41	Slope	20-30	1	Complete flake	Quartz	No	White	No	No	0.2	10.7
41	2	42	Floodplain	20-30	1	Flake shatter	Quartz	No	White	Yes	No	0.1	11.5
42	2	42	Floodplain	20-30	1	Flake shatter	Quartz	No	White	No	No	0.1	9.8
43	2	42	Floodplain	20-30	1	Complete flake	Quartz	No	White	No	No	0.1	8.8
44	2	42	Floodplain	10-20	1	Flake shatter	S.tuff	No	Beige	No	No	0.7	16.2
45	2	43	Floodplain	10-20	1	Flake shatter	FGS	No	Pink-grey	Yes	No	1.8	21
46	2	45	Floodplain	20-30	1	Unidirectional core	Quartz	Yes	White	Yes	No	17.7	35.9
47	2	47	Floodplain	30-40	1	Complete flake	Quartz	No	White	Yes	No	7.6	29.4
48	2	49	Floodplain	10-20	1	Flake shatter	Quartz	No	White	No	No	0.2	9.9
49	2	49	Floodplain	0-10	1	Backed arefact	Quartz	No	White	No	No	0.4	14.3
50	2	52	Floodplain	20-30	1	Bipolar core	Quartz	No	White	No	No	1.5	18
51	2	52	Floodplain	20-30	1	Complete flake	S.tuff	No	Yellow	No	No	1.8	30.5
52	2	52	Floodplain	0-10	1	Complete flake	S.tuff	No	ellow-brown	No	No	0.8	18.8
53	2	52	Floodplain	0-10	1	Bipolar core	Quartz	No	White	No	No	1	16.6
54	1	12D	Slope	10-20	2	Flake shatter	Quartz	No	White	Yes	No	1.9	
55	1	12D	Slope	10-20	2	Proximal flake	Quartz	No	White	Yes	No	13.7	33.6
56	1	21B	Slope	10-20	2	Complete flake	Quartz	No	White	Yes	No	2.4	
57	1	21B	Slope	10-20	2	Split flake	Quartz	No	White	Yes	No	0.9	19.8
58	1	21B	Slope	10-20	2	Angula shatter	Quartz	No	White	Yes	No	4.2	25.1
59	1	21B	Slope	0-10	2	Complete flake	Quartz	No	White	Yes	No	0.8	
60	1	21B	Slope	0-10	2	Flake shatter	Quartz	No	White	Yes	No	2.5	
61	1	21C	Slope	0-10	2	Proximal flake	Quartz	No	White	Yes	No	2.9	
62	1	21C	Slope	0-10	2	Proximal flake	Quartz	No	White	Yes	No	3.6	
63	1	21C	Slope	0-10	2	Proximal flake	Quartz	No	White	Yes	No	5.3	
64	1	21C	Slope	0-10	2	Split flake	Quartz	No	White	No	No	0.7	19.2
65	1	21C	Slope	0-10	2	Angular shatter	Quartz	No	White	No	No	1.2	14.8
66	1	21C	Slope	10-20	2	Proximal flake	Quartz	No	Pink	Yes	No	6.9	25.9
67	1	21C	Slope	10-20	2	Flake shatter	Quartz	No	White	No	No	12.2	8
68	1	21C	Slope	10-20	2	Flake shatter	Quartz	No	White	No	No	9.6	0.2
69	1	21D	Slope	0-10	2	Split flake	Quartz	No	White	Yes	No	2.5	27.5
70	1	21D	Slope	0-10	2	Complete flake	Quartz	No	White	Yes	No	0.3	
71	1	21D	Slope	0-10	2	Angular shatter	Quartz	No	White	No	No		9.2

URN	Flk. lngth (r	Flk. wdth (r	Flk. thk (mr	Plat. Type	Overhang	wdth (mm)	at. thk (mm)	Dorsal Cort	DFSO	Terminatior	Core state	White Typ.	Core lngth (	Core wdth (
1	13.9	13.1	3.7	Crushed	No			None	Ind	Feather				
2											Complete	Unifacial	29.1	24.4
3											Complete	Unifacial	23	21.7
4											Complete	Unifacial	53	44
5											Broken	Asy alt; Unif	20.6	15.1
6											Broken	Unifacial	42	21
7	27.4	16.3	5.6	Single	No	6.8	3.2	None	Uni	Feather				
8	22.6	15.5	5.1	Crushed				1-25	Uni	Feather				
9														
10														
11	9.7	10.1	2.3	Multiple	No	4.8	1.8	None	Irregular	Feather				
12	13.8	9.3	3.5	Multiple	No	7.2	3	None	Ind	Feather				
13														
14														
15														
16	9.8	8.7	1.3	Single	No	5.8	1.3	None	Uni	Feather				
17				Single	No	7.8	3.8							
18														
19														
20	18.6	20.1	6.2	Single	No	11.6	4.5	None	Ind	Axial				
21														
22	32	9.4	5.6	Single	No	8.8	5.2	None	Uni	Feather				
23														
24														
25														
26				Multiple	No	11.3	4.3							
27	17.2	19.3	4.9	Single	No	11.1	5.1	None	Ind	Feather				
28	12.9	14.4	3.5	Crushed				None	Ind	Feather				
29	25.5	18.6	12.4	Single	No	8.6	5.7	None	Multi	Feather				
30	8.4	10.9	1.4	Single	No	5.3	1.4	None	Uni	Feather				
31				Single	No	5.1	1.3							
32														
33	24.3	35.2	10.4	Single	No	27	10.7	None	Multi	Feather				
34	8.9	12.1	1.7	Single	No	6.2	1.7	None	Ind	Feather				
35														
36														
37														
38														

39	32.9	24.1	9.9	Cortical	No	21.9	9.3	None	Uni	Step				
40	5.4	10.7	2.8	Crushed	No			None	Ind	Feather				
41														
42														
43	8.8	7.6	2.3	Single	No	6.3	2.3	None	Ind	Feather				
44														
45														
46											Complete	Unifacial	35.9	26
47	29.4	30.3	9.1	Single	No	17	6.6	None	Uni	Feather				
48														
49														
50											Complete	Bipolar	18	10.7
51	17.3	30.5	4.8	Single	Yes	21.6	5.3	None	Multi	Feather				
52	14.3	18.9	3.7	Single	Yes	12.7	2.8	None	Uni	Feather				
53											Complete	Bipolar	16.6	10.1
54														
55				Crushed	No									
56	26.7	11.4	6.6	Single	No	8.9	4.4	None	Ind	Feather				
57														
58														
59	18.9	10.7	4.8	Single	No	10.2	4.3	None	Uni	Feather				
60														
61				Single	No	9.3	3.7							
62				Single	No	8.6	3.8							
63				Crushed	No									
64														
65														
66				Single	No	18.4	9.5							
67														
68														
69														
70	10.6	7.6	2.6	Single	No	3.2	2.3	None	Ind	Feather				
71														

URN	Core thk (m	Core blank	Cortex	Strik. Plt. C	Scar count	Aberrant te	Scr1	Scr1	Scr2	Scr2	Scr3	Scr3	Scr4	Scr4
1														
2	11.9	Ind	None	2	4	Yes	15.1	14.4	13	5.8	17.9	12.8	9.4	7.8
3	7.3	Ind	None	2	3	No	18	10.1	18.4	16.7				
4	23.4	Cobble	26-50	2	3	Yes	33	12.8	35	19	19	16		
5	12.4	Ind	None											
6	14.6	Ind	None											
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
31														
32														
33														
34														
35														
36														
37														
38														

39														
40														
41														
42														
43														
44														
45														
46	17	Cobble	26-25	1	1	No	22	14						
47														
48														
49														
50	6.6	Ind	None	n/a	2	No	16.5	5.3	16.9	5				
51														
52														
53	6.1	Ind	None	n./a	2	No	14.9	5.7						
54														
55														
56														
57														
58														
59														
60														
61														
62														
63														
64														
65														
66														
67														
68														
69														
70														
71														

URN	Lnth.Long	Quality	Backed typ	State	Blank	Completene	Length (mn	Width (mm)	Thickness (	Platform Ty	Platform W	Platform Th	Backing Di	Chord Leng
1														
2	17.9	Good												
3	18.4	Good												
4	35	Poor												
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														
26														
27														
28														
29														
30														
31														
32														
33														
34														
35														
36														
37														
38														

39														
40														
41														
42														
43														
44														
45														
46	22	Poor												
47														
48														
49			Indeterminat	Broken	Flake	Medial	12.8	10.7	2.7	na	na	na	na	na
50	16.9	Good												
51														
52														
53	14.9	Good												
54														
55														
56														
57														
58														
59														
60														
61														
62														
63														
64														
65														
66														
67														
68														
69														
70														
71														

URN	EA1	EA2	EA3	REA1	REA2	REA3	Edge Dama	Extent of B	Retouch Or	Comments
1										
2										
3										
4										
5										Crystal quartz
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
32										
33										
34										
35										
36										
37										
38										

39										
40										
41										
42										
43										
44										
45										
46										Made on split pebble. Single removal. Tested piece.
47										
48										
49	21	20	21	87	88	86	None	Ind	RLM	
50										
51										
52										
53										
54										
55										Broken rediredticng flake
56										
57										
58										
59										
60										
61										
62										
63										
64										
65										
66										
67										
68										
69										
70										
71										