



Metropolitan Coal Mine



Appendix F Aboriginal Cultural Heritage Assessment



Peabody



Metropolitan Coal Longwalls 317 & 318 Modification

Aboriginal Cultural Heritage Assessment

Prepared for Metropolitan Coal Pty Ltd | 20 June 2025



Acknowledgement of Country

Niche is committed to reconciliation and acknowledges the Traditional Custodians of Country throughout Australia and their connections to land, sea, and community. Niche would like to pay our respect to and acknowledge the Traditional Custodians of the land on which this project takes place. Niche recognises the contributions of the Aboriginal people who are participating in this Project and would like to pay our respects to the Elders past, present, and emerging of the Dharawal people on whose land this Aboriginal Cultural Heritage Assessment was undertaken and acknowledge their continuing connection to the land and care for Country.

Please be advised that this report may include the names and details of people who have passed since the start of this project.

Disclaimer and warning: Please note that this report references invasion violence and draws on historical sources that have embedded racial biases. Aboriginal and Torres Strait Islander readers are advised that the report may contain images and names of people deceased.





Metropolitan Coal Longwalls 317 & 318 Modification

Document control

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Executive summary

Modification outline

The Metropolitan Colliery (Metropolitan Coal Mine) is an existing underground coal mining operation located approximately 30 kilometres north of Wollongong in New South Wales (NSW), within the Water NSW Woronora Special Area. The Metropolitan Coal Mine is operated by Metropolitan Collieries Pty Ltd (Metropolitan Coal), a wholly owned subsidiary of Peabody Energy Australia Pty Ltd.

Metropolitan Coal was granted approval for the Metropolitan Coal Project by the Minister for Planning under section 75J of the NSW *Environmental Planning and Assessment Act 1979* on 22 June 2009, which included the continuation, upgrade and extension of underground coal mining operations (Longwalls 20 27 and Longwalls 301-317) and surface facilities at the Metropolitan Coal Mine.

Metropolitan Coal is currently seeking to modify the Metropolitan Coal Mine Project Approval (PA 08_0149) to allow for the optimisation and continued operations at the Metropolitan Coal Mine (hereafter called 'the Modification').

The Modification is being sought under section 4.55 (2) of the NSW *Environmental Planning and Assessment Act 1979*.

Niche Environment and Heritage Pty Ltd (Niche) have been commissioned by Metropolitan Coal to prepare an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed Modification to identify Aboriginal heritage cultural values and assess the potential impacts of the Modification on any Aboriginal cultural heritage sites and values.

This report presents the ACHA for the Modification. The ACHA Subject Area is located within the Illawarra Local Aboriginal Land Council (LALC) on the traditional lands of the Dharawal people and covers an area of approximately 455 hectares (ha) and includes the surface area that is likely to be affected by the proposed Modification, comprising the following sub-areas:

- Modification Mining Area - the area associated with the extended/additional longwalls that is likely to be affected by subsidence.
- Relocated Ventilation Shaft 4 Area - the surface disturbance area associated with the relocation of Ventilation Shaft 4.

The extent of the area likely to be impacted by subsidence has been calculated by Mine Subsidence Engineering Consultants Pty Ltd (MSEC) (2025) and combines the areas bounded by the 35 degree angle of draw line and the predicted vertical limit of subsidence, taken as the 20 millimetre (mm) subsidence contour. The relocated Ventilation Shaft 4 would be located adjacent to Fire Trail No 9E and is approximately 3.8 ha.

Consultation

Aboriginal community consultation for this ACHA was undertaken with 26 Registered Aboriginal Parties (RAPs) in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (hereafter referred to as 'the Consultation Requirements').

All comments received have been considered in the ACHA.



Objectives

This ACHA has been prepared in accordance with the *Guide to investigating, assessing, and reporting on Aboriginal cultural heritage in NSW* (NSW Office of Environment and Heritage, 2011). This ACHA forms part of the Modification Report and is designed to manage and mitigate harm to Aboriginal objects and cultural heritage values within the Subject Area.

As part of this ACHA, an Aboriginal cultural heritage survey program was completed within the Subject Area by Niche and representatives of the RAPs in compliance with the requirements of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (NSW Department of Environment, Climate Change and Water, 2010a). The results of the archaeological survey are presented in Section 5 of this report and have been considered in this ACHA when assessing the likely harm of the Modification on Aboriginal cultural heritage objects within the Subject area.

Summary of results

Extensive searches of the Aboriginal Heritage Information Management System (AHIMS) register were undertaken on 28 January 2025 (AHIMS Client# 969315, 969324 and 969328) covering the Subject Area and surrounding landscape to determine the presence of recorded Aboriginal sites and Aboriginal places.

The cultural heritage survey was conducted on 30 and 31 January, and 1 and 2 February 2024, where two Archaeologists and three RAPs participated in the survey. An additional survey was also conducted on 25 September 2024, involving two archaeologists and one RAP as part of the survey. As per the recommendations from RAPs, a mixture of male and female consultant representatives was arranged, with two Archaeologists and at least three RAPs as part of the survey team. The survey effort targeted sensitive areas along drainage lines, ridges and crests with 50 metre intervals between team members.

Approximately 3% (13.4 ha) of the Subject Area has been subject to previous archaeological survey as part of previous investigations and baseline recording programs by Niche. The survey coverage for this ACHA added an additional 6% (26.7 ha) of survey effort to the Subject Area. As such, approximately 9% (40.2 ha) of the Subject Area has been subject to surveys which have informed this ACHA.

Site recording included photography of Aboriginal objects, sites, landscape features and disturbance, Global Positioning System (GPS) recording of site boundaries, concise written details of site features, size, position in the landscape, and condition, as well as documentation of any knowledge about the places, objects, or stories provided by the RAPs. Additionally, a cultural perspective for each site was recorded. These cultural perspectives were added to previously recorded and newly recorded Aboriginal cultural heritage sites. Many previously recorded sites have historically been recorded from solely a scientific perspective by organisations with no or minimal Aboriginal cultural knowledge.

Surveys identified that there was very limited visibility across the majority of the Subject Area due to dense low grasses. Therefore, the primary focus points of the survey were previously recorded sites, relevant landforms and areas of exposure where ground visibility was present.

A total of 29 Aboriginal cultural heritage sites have been identified within the Subject Area, including 26 previously recorded sites (which were ground-truthed during surveys for the ACHA) and three (3) newly identified Aboriginal cultural heritage sites (Table 1).

The majority of known Aboriginal cultural heritage sites within the Subject Area (86 percent [%]; n=25) have been assessed as being of low scientific (archaeological) significance. Four (4) Aboriginal cultural heritage sites have been assessed as being of moderate scientific (archaeological) significance. There are no Aboriginal cultural heritage sites of high scientific (archaeological) significance within the Subject Area.

The RAPs have advised during previous assessments for the Metropolitan Coal Mine that Aboriginal cultural heritage sites should be considered holistically and that all Aboriginal cultural heritage sites have a high cultural significance (Kayandel Archaeological Services, 2008).



Table 1: Aboriginal cultural heritage sites assessed within the Subject Area

Site Type	Scientific (archaeological) Significance Rating	Impact	No. of Sites
Grinding Grooves	Low	Indirect	11
Shelter with Art	Low	Indirect	1
	Moderate	Indirect	1
Shelter with Art and Artefact(s)	Low	Indirect	1
Shelter with Artefact(s)	Low	Indirect	1
Shelter with Art, Grinding Groove(s)	Low	Indirect	1
Shelter with Art and PAD	Low	Indirect	4
	Moderate	Indirect	1
Shelter with Art, Artefact(s) and PAD	Low	Indirect	5
Grinding Groove(s), Water Hole/Well	Moderate	Indirect	2
Grinding Grooves, Rock Engraving	Moderate	Indirect	1
Total			29



Summary of potential impacts

The potential impacts for the Aboriginal cultural heritage sites from the Modification are similar to or less than those predicted from the approved Metropolitan Coal Mine layout (MSEC, 2025).

Potential fracturing of the exposed sandstone at grinding groove sites is expected to be isolated and of a minor nature, due to the relatively low magnitudes of the predicted strains and the relatively high depth of cover. The potential for fracturing to occur at the grinding grooves would, therefore, be considered low.

Overhang sites can potentially be impacted by the fracturing of sandstone and rock falls. The artwork at some overhang sites can be affected by water seepage through joints. The likelihood of any significant impacts on the overhang sites, due to mining the proposed longwalls, is low. Potential rock falls could occur near sites that are located close to existing cliffs, overhangs or ledges.

The magnitudes of predicted tilt and curvature for the majority of the Aboriginal cultural heritage sites are small due to the location above narrow geometry and solid coal (MSEC, 2025). Potential impacts above the Modification layout, including fracturing of bedrock, rockfalls and shear of bedding planes within shelters is expected to be minor and isolated, consistent with the impacts observed above the previously extracted longwalls at Metropolitan Coal Mine (MSEC, 2025). The likelihood of fracturing impacting the Aboriginal cultural heritage sites located above the Modification layout is considered to be low (MSEC, 2025). Impacts to the sites located above solid coal are considered unlikely (MSEC, 2025). While surface fracturing of the bedrock can occur outside the longwall layouts, such fracturing is minor and isolated and the likelihood of fracturing impacting the Aboriginal cultural heritage sites outside the longwall layouts is considered to be low (MSEC, 2025).

The Modification, taken within the context of known Aboriginal heritage sites across the Metropolitan Coal Mine and the Modification and with incorporation of appropriate management and mitigation measures would not result in a significant increase in cumulative impacts to Aboriginal cultural heritage.

The Metropolitan Coal Mine Project Approval (08_0149) includes a performance measure that states:

Less than 10% of Aboriginal heritage sites within the mining area are affected by subsidence impacts.

Further, Aboriginal heritage sites are considered to be “affected by subsidence impacts” if they exhibit one or more of the following consequences that cannot be attributed to natural weathering or deterioration:

- overhang collapse;
- cracking of sandstone that coincides with Aboriginal art or grinding grooves; and/or
- rock fall that damages Aboriginal art.

There are 25 of the 29 confirmed Aboriginal heritage sites located within the Modification area which could experience subsidence induced ground movement which may cause subsidence impacts resulting in a partial loss of value (Table 1). While the Modification has the potential to indirectly impact Aboriginal heritage sites, the impact is unlikely at all 25 Aboriginal heritage sites. Based on the subsidence predictions the anticipated risk of impact to these sites is low or negligible. The sites NT9, NT21 and MET11 are located within deeper and more incised valley profiles and could therefore experience greater valley closure movements. Sites NT9 and NT21 are at greatest risk of cracking due to valley closure, which have a relatively higher likelihood of impact that may adversely affect Aboriginal cultural heritage values, however, this is still considered unlikely.

Following amendments to the Modification mine layout, three Aboriginal heritage sites (NT3, NT18, NT25 and NT80) are located in an area to the east and north of the Subject Area that is predicted to experience less than 20 mm of additional subsidence compared to the approved Metropolitan Coal Mine this area and therefore would no longer experience any additional subsidence impacts as a result of the Modification.



Monitoring programs have documented subsidence changes at 13 of the 144 sites within the mining area. The cumulative percentage of Aboriginal heritage sites affected by subsidence impacts at Metropolitan Coal Mine is less than 2% (Niche 2019a), as 2 of the sites have experienced cracks to stencils and motifs.

When this predicted impact is assessed within the wider context of the 147 known Aboriginal heritage sites across the Metropolitan Coal Mine and the Modification (144 previously identified and 3 new sites [MET9, MET10, and MET11] identified during the ACHA surveys) and when the incorporation of appropriate management and mitigation measures are considered, the Modification would not result in a significant increase in cumulative impacts to scientific values of Aboriginal cultural heritage. The incorporation of the Modification by Metropolitan Coal Mine is expected to comply with performance measures under the Metropolitan Coal Mine Project Approval (08_0149).

Collaboration with Indigenous groups and knowledge holders is essential to effectively identify valued environmental and social components within the project area and assess intangible cumulative impacts. All comments received to date from RAPs via the consultation process have been considered in the ACHA.

Conclusion and declaration

Niche have registered newly recorded sites MET9 (AHIMS ID# 52-2-5116), MET10 (AHIMS ID# 52-2-5118), and MET11 (AHIMS ID# 52-2-5117) and have updated site cards for Blue Gum Forest Northern Trail (R) 49 (AHIMS ID# 52-2-0368), Blue Gum Forest Northern Trail (R) 50 (AHIMS ID# 52-2-0369), Blue Gum Forest Northern Trail (R) 51 (AHIMS ID# 52-2-0370), and Woronora Reservoir; Northern Trail 13; (AHIMS ID# 52-2-0754) to update their AHIMS status from not a site to valid.

The following recommendations have been made by Niche in consultation with RAPs:

Recommendations	
General	
1.	Metropolitan Coal should continue to consult with the RAPs for the life of the Project in accordance with the Consultation Requirements and Metropolitan Coal's commitments in the Longwall 311-316 Extraction Plan Heritage Management Plan (HMP), which would be updated for the Modification.
2.	If approved, the Longwall 311-316 Extraction Plan HMP should be updated for the Modification. The HMP should be reviewed within 3 months of approval of this Modification and if necessary, revised.
3.	Baseline recording for each site should be completed prior to any longwall mining.
4.	A subsidence monitoring plan should be implemented per Section 9 of the Longwalls 311-316 Extraction Plan HMP to monitor subsidence impacts and environmental consequences of Project related subsidence on Aboriginal heritage sites located within the 35 degree angle of draw and/or predicted 20 mm subsidence contour.
5.	Metropolitan Coal should continue to include a cultural awareness program as part of inductions aimed at minimising the potential for accidental damage to Aboriginal heritage, consistent with the Longwall 311-316 Extraction Plan HMP, which would be updated for the Modification.



Recommendations

- | | |
|----|---|
| 6. | In the event that unexpected Aboriginal objects are discovered at any time during operations, the surface disturbance protocol as outlined in Section 10.3 of the Longwalls 311-316 Extraction Plan HMP must be followed. |
| 7. | In the unlikely event that suspected human remains (skeletal material) are discovered at any time during operations, the protocol for the discovery of human skeletal material as outlined in Section 10.4 of the Longwalls 311-316 Extraction Plan HMP must be followed. |



Glossary and list of abbreviations

Term or abbreviation	Definition
Aboriginal cultural heritage	The tangible (objects) and intangible (dreaming stories, legends and places) cultural practices and traditions associated with past and present-day Aboriginal communities.
ACHA	Aboriginal Cultural Heritage Assessment.
Aboriginal object(s)	The legal definition for material Aboriginal cultural heritage under the NSW <i>National Parks and Wildlife Act 1974</i> .
Aboriginal stakeholders	Members of a local Aboriginal land council, registered holders of Native Title, Aboriginal groups or other Aboriginal people who may have an interest in the Project.
AHIMS	Aboriginal Heritage Information Management System.
Angle of draw	This is a subsidence engineering term used to define the limits of the subsidence movements in a landscape caused by mine workings, that leads to vertical displacement on the surface. The angle of draw is determined through a series of geometric parameters in which the angle between two lines is drawn from the edge of the mine workings. One being a vertical line, and the other a line to the limit of vertical displacement on the surface. Because surface movements can also be caused by natural effects such as seasonal variations or drought leading to swelling or shrinkage of near-surface soil and sediment, it can be very difficult to identify where vertical movement due to mining ceases. Therefore, it is standard practice to specify a limiting value for vertical displacement which might be attributable to mining. In New South Wales, this value is usually 20 mm of vertical subsidence. It should be noted that, in some environments, up to 50 mm or more of vertical movement may occur due to seasonal climatic changes.
Archaeology	The scientific study of material traces of human history, particularly the relics and cultural remains of past human activities.
Archaeological deposit	A layer of soil material containing archaeological objects and/or human remains.
Archaeological investigation	The process of assessing the archaeological potential of an impact area by a qualified archaeologist.



Term or abbreviation	Definition
Archaeological site	An area that contains surface or sub-surface material evidence of past human activity in which material evidence (artefacts) of past activity is preserved.
Artefact	An object made by human agency (e.g. stone artefacts).
Assemblage	A group of artefacts found in close association with one another. Any group of items designated for analysis that exist in spatial and/or vertical context - without any assumptions of chronological or spatial relatedness.
Avoidance	A management strategy which protects Aboriginal sites within an impact area by avoiding them totally in development.
Code of Practice	<i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales.</i>
Cumulative impacts	Combination of individual effects of the same kind due to multiple actions from various sources over time.
DECCW	The NSW Department of Environment, Climate Change and Water, now the Heritage and Environment group within NSW Department of Climate Change, Energy, the Environment and Water.
DPE	NSW Department of Planning and Environment, now known as the NSW Department of Planning, Housing and Infrastructure.
Drainage	Natural or artificial means for the interception and removal of surface or subsurface water.
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (New South Wales).</i>
Flake	A piece of stone detached from a core, displaying a bulb of percussion and striking platform.
Harm	With regard to Aboriginal objects this has the same meaning as the NSW <i>National Parks and Wildlife Act 1974</i> .
Heritage NSW	Aboriginal cultural heritage regulator within the NSW Department of Climate Change, Energy, the Environment and Water. Responsible for the management of Aboriginal Cultural Heritage regulation functions under the <i>National Parks and Wildlife Act 1974</i> (New South Wales). Formerly BCD of Department of Planning, Industry and Environment.
Impact	Influence or effect exerted by a project or other activity on the natural, built and community environment.



Term or abbreviation	Definition
Impact area	An area that requires archaeological investigation and management assessment.
In situ	Latin words meaning 'on the spot, undisturbed'.
Isolated artefact / find	A single artefact found in an isolated context.
km	Kilometre.
LALC	Local Aboriginal Land Council
Landscape character	The aggregate of built, natural and cultural aspects that make up an area and provide a sense of place. Includes all aspects of a tract of land – built, planted and natural topographical and ecological features.
Landform	Any one of the various features that make up the surface of the earth.
LEP	Local Environmental Plan.
LGA	Local Government Area.
Management plans	Conservation plans which identify short- and long-term management strategies for all known sites recorded within a (usually approved) Subject Area.
Methodology	The procedures used to undertake an archaeological investigation.
Mitigation	To address the problem of conflict between land use and site conservation.
ML	Mining Lease.
Modification	The proposal to modify the Project Approval under s4.55(2) of the EP&A Act as described in section 1.2.
NPW Act	National Parks and Wildlife Act 1974.
Open camp site	An archaeological site situated within an open space (e.g. archaeological material located on a creek bank, in a forest, on a hill, etc.).
PAD	Potential Archaeological Deposit. A location considered to have a potential for subsurface archaeological material.
PPR	Preferred Project Report.



Term or abbreviation	Definition
Project Approval	Project Approval (08_0149) for the Metropolitan Coal Mine was granted on 22 June 2009 by the Minister for Planning under section 75J of the NSW <i>Environmental Planning and Assessment Act 1979</i> (EP&A Act). The Secretary of the DPE approved the revised first workings in accordance with Condition 5, Schedule 3 of the Project Approval (08_0149) in April 2015.
RAP	Registered Aboriginal Party.
ROM	Run-of-mine.
Statutory controls	control or regulation provided for by legislation.
Site recording	The systematic process of collecting archaeological data for an archaeological investigation.
Site	A place where past human activity is identifiable.
Survey coverage	A graphic and statistical representation of how much of an impact area was surveyed and therefore assessed.



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1 Introduction

1.1 Background to the Modification

The Metropolitan Colliery (Metropolitan Coal Mine) is an existing underground coal mining operation located approximately 30 kilometres (km) north of Wollongong in New South Wales (NSW), within the Water NSW Woronora Special Area. The Metropolitan Coal Mine is operated by Metropolitan Collieries Pty Ltd (Metropolitan Coal), a wholly owned subsidiary of Peabody Energy Australia Pty Ltd.

The potential environmental impacts of the existing Metropolitan Coal Mine were assessed in the Metropolitan Coal Project Environmental Assessment (Helensburgh Coal Pty Ltd [HCPL], 2009). A Preferred Project Report (PPR) was submitted to the then Department of Planning in April 2009.

Metropolitan Coal was granted approval for the Metropolitan Coal Project by the Minister for Planning under section 75J of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act) on 22 June 2009. The Metropolitan Coal Project included the continuation, upgrade, and extension of underground coal mining operations (Longwalls 20-27 and Longwalls 301-317) and surface facilities at the Metropolitan Coal Mine.

In April 2015, the Secretary of the then NSW Department of Planning & Environment approved the revised first workings of Longwalls 301-317 in accordance with Condition 5, Schedule 3 of the Project Approval (08_0149), such that the first workings of Longwalls 301-317 were rotated to be square with 300 mains to allow for significant operation efficiencies and consequently significant economic benefit. This reorientation of the 300-series longwall panels resulted in the shortening of Longwall 317 compared to that presented in the PPR.

Metropolitan Coal is proposing to modify Project Approval (08_0149) to allow for the optimisation and continued operations at the Metropolitan Coal Mine (hereafter referred to as the 'Modification') (Figure 1). The Modification longwall panels would be located more than 500 metres (m) from the Woronora Reservoir full supply level.

The Metropolitan Coal Mine is managed in accordance with the approved Longwalls 311-316 Extraction Plan Heritage Management Plan (HMP) (Metropolitan Coal, 2024). The HMP assists Metropolitan Coal to mitigate the impacts of its operations on Aboriginal cultural heritage, complies with the requirements of the *National Parks and Wildlife Act 1974* (NPW Act) and the EP&A Act and undertakes the consultation required with the Aboriginal community.

This Aboriginal Cultural Heritage Assessment (ACHA) forms part of a Modification Report which has been prepared to support the Modification Application under section 4.55(2) of the EP&A Act.

An overview of the Modification is provided below in Section 1.2.



1.2 Modification description

As mining operations have progressed at the Metropolitan Coal Mine, the 300-series longwall layout has been revised to reflect geological and geotechnical constraints which affect the ability to mine the coal resource. To maintain safe and efficient operations, a reduced underground mine layout has been implemented for the northern area of the 300-series longwalls. In addition, longwalls have been shortened to reduce subsidence effects on watercourses. This has resulted in a reduction in run-of-mine (ROM) coal extraction compared to the approved underground mine layout.

The reduced underground mine layout incorporates shortened commencing (i.e. northern) and finishing (i.e. southern) ends of Longwalls 301-316 as well as shortening of the commencing end of Longwall 26 compared to the approved underground mine layout. Underground mining operations are therefore expected to be completed in 2029, which is approximately three years earlier than the approved mine life (i.e. until June 2032).

Exploration data indicates that the Bulli Seam to the west of the approved underground mining area can be economically extracted via longwall mining methods. Consistent with the approved mine, the Bulli Seam coal can be processed to produce a high quality metallurgical coal that is used for steelmaking. As a result, Metropolitan Coal is proposing a modification to maximise efficient coal extraction and allow for the continuation of underground mining operations at the Metropolitan Coal Mine until approximately 30 June 2031. Coal processing and off-site transportation activities would continue until approximately 31 December 2031. Underground roadway development associated with the Modification would commence in 2027.

In summary, the Modification would provide for the continued employment of the existing 400-strong operational workforce for a further two years and comprise the following key components:

- extension of the approved Longwall 317 to the north;
- addition of Longwall 318 to the west of the approved longwalls;
- extension of the approved 300-series Mains to the west;
- extraction of an additional 3.2 million tonnes (Mt) of ROM coal;
- relinquishment of 14 Mt of approved ROM coal;
- relocation of the approved (but not yet constructed) Ventilation Shaft 4;
- continued transportation of coal rejects off-site for the life of the mine via a combination of rail and road; and
- relinquishment of approved surface development and underground mining areas.

The relocated Ventilation Shaft 4 would be located adjacent to Fire Trail No 9E, immediately south of Longwall 316 and requires a maximum development area during construction of approximately 3.8 hectares (ha). Upon completion of construction, the relocated Ventilation Shaft 4 development area would be less than 0.1 ha.

The Modification would also include the establishment of an access track within the approved disturbance area to reinstate rock-armouring along a section of the embankment toe at the Surface Facilities area near Camp Gully Creek.

No other changes to the approved Metropolitan Coal Mine (including the existing surface facilities and infrastructure at the pit top) would be required for the Modification.

A detailed description of the Modification is included in Section 3 of the Modification Report.



1.3 ACHA scope and objectives

Niche Environment and Heritage Pty Ltd (Niche) has been commissioned by Metropolitan Coal to prepare an ACHA for the Modification. This ACHA has been prepared in accordance with:

- *National Parks and Wildlife Regulation 2019*.
- *Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (the Code of Practice) (NSW Department of Environment, Climate Change and Water [DECCW], 2010a).
- *Aboriginal cultural heritage consultation requirements for proponents 2010* (the Consultation Requirements) (DECCW, 2010b).
- *Guide to investigating, assessing and reporting Aboriginal cultural heritage in NSW* (NSW Office of Environment and Heritage [OEH], 2011).
- *NSW Minerals Industry Due Diligence Code of Practice for the Protection of Aboriginal Objects* NSW Minerals Council Ltd, 2010).
- *The Burra Charter: The Australia International Council on Monuments and Sites (ICOMOS) Charter for Places of Cultural Significance* (the Burra Charter) (Australia ICOMOS, 2013).

The objectives for the ACHA, as outlined in the *Guide to investigating, assessing and reporting Aboriginal cultural heritage in NSW* (OEH, 2011), are provided in Table 2 below.

Table 2: Assessment requirements and objectives

Objectives:	Addressed in:
Identify whether Aboriginal objects could be present within the Subject Area.	Sections 2 and 4, Appendix A: Aboriginal community consultation and Appendix C: AHIMS searches
Undertake further investigation within areas identified as having high archaeological potential.	Sections 6, 7 and Appendix A: Aboriginal community consultation
Provide a description of the Aboriginal objects and declared Aboriginal places located within the area of the proposed activity.	Section 4, Appendix C: AHIMS searches; Appendix D: Site cards; Appendix E: New site descriptions and Appendix F: Previously recorded site descriptions
Provide a description of the cultural heritage values, including the significance of the Aboriginal objects and any declared Aboriginal places, that exist across the whole area that will be affected by the proposed activity and the significance of these values for the Aboriginal people who have a cultural association with the land.	Section 6



Demonstrate how the requirements for consultation with Aboriginal people have been met (as specified in clause 80c of the <i>National Parks and Wildlife Regulation 2019</i>).	Section 3, Appendix A: Aboriginal community consultation and Appendix B: Supporting Aboriginal community consultation documents
Present the views of those Aboriginal people regarding the likely impact of the proposed activity on their cultural heritage (if any submissions have been received as a part of the consultation requirements, the report must include a copy of each submission and response).	Sections 3 and 6, Appendix A: Aboriginal community consultation and Appendix B: Supporting Aboriginal community consultation documents
Provide an assessment of actual or likely harm posed to the Aboriginal objects or declared Aboriginal places from the proposed activity, with reference to the cultural heritage values identified.	Section 7
Provide any practical measures that may be taken to protect and conserve those Aboriginal objects or declared Aboriginal places and any practical measures that may be taken to avoid or mitigate any actual or likely harm, alternatives to harm or, if this is not possible, to manage (minimise) harm.	Sections 8 and 9, Appendix E: New site descriptions and Appendix F: Previously recorded site descriptions

1.4 Statutory and regulatory framework

Metropolitan Coal was granted approval for the Metropolitan Coal Project (the Project) by the Minister for Planning under section 4.55(2) of the EP&A Act on 22 June 2009 and currently operates under Project Approval (08_0149).

This section provides a summary of relevant legislation and associated planning instruments designed to protect and conserve significant heritage items and their values.

1.4.1 Commonwealth and national legislation

1.4.1.1 *Environment Protection and Biodiversity Conservation Act 1999*

The Commonwealth EPBC Act is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places, amongst other 'Matters of National Environmental Significance'. Under the EPBC Act, protected heritage items of significance are listed on the National Heritage List (NHL) or the Commonwealth Heritage List (CHL). The NHL provides protection to places of cultural significance to the nation of Australia, while the CHL comprises natural, Aboriginal, and historic heritage places owned and controlled by the Commonwealth.



1.4.1.2 Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999* outlines the statutory obligations that apply to, and the department's expectations of, proponents engaging with First Nations people and communities under the (Commonwealth Department of Climate Change, Energy, the Environment and Water [Cth DCCEEW], 2023) The interim guidance updates the department's *Engage early: Guidance for proponents on best practice Indigenous engagement for environmental assessments under the EPBC Act* (2016). This guidance applies to proponents undertaking referral, assessment and approval processes under Chapter 4 of the EPBC Act.



1.4.1.3 Native Title Legislation

The Commonwealth *Native Title Act 1993* provides a legislative framework:

- (a) to provide for the recognition and protection of native title.*
- (b) to establish ways in which future dealings affecting native title may proceed and to set standards for those dealings.*
- (c) to establish a mechanism for determining claims to native title.*
- (d) to provide for, or permit, the validation of past acts, and intermediate period acts invalidated because of the existence of native title.*

The *Native Title (New South Wales) Act 1994* was introduced to make sure the laws of NSW are consistent with the Commonwealth's *Native Title Act 1993* on future dealings. It validates past and intermediate acts that may otherwise have been invalid because of the existence of native title.

1.4.2 NSW state legislation

1.4.2.1 NSW *Environmental Planning and Assessment Act 1979*

The EP&A Act establishes the framework for cultural heritage values to be formally assessed in the land use planning process in NSW. The EP&A Act also requires local governments to prepare planning instruments, such as Local Environmental Plans (LEP) which identify heritage items with statutory protections under the EP&A Act.

Wollongong Local Environmental Plan 2009

Each Local Government Area (LGA) is required to create and maintain a Development Control Plan which regulates what development is allowed within the LGA, and an LEP that identifies, and conserves Aboriginal objects and historical items. These items are protected under the EP&A Act. Heritage items within each LGA are listed in Schedule 5 of an LEP and are subject to the planning controls and provisions set out in Clause 5.10 (Heritage Conservation) of an LEP.

Part E, Chapter E10: Aboriginal Heritage provides a brief outline of the requirements for any development proposal upon a known or potential Aboriginal site containing Aboriginal objects or a place of Aboriginal cultural heritage significance.

The ACHA assessment should be completed for all known sites containing either Aboriginal objects and/or places of Aboriginal cultural heritage significance.

1.4.2.2 *National Parks and Wildlife Act 1974*

Aboriginal objects and places are protected under the NPW Act. Under section 85 of the NPW Act, the Secretary of the NSW Department of Planning, Housing and Infrastructure is responsible for the protection of Aboriginal objects and places in NSW. In particular, the Secretary is responsible for the preservation and protection of any objects or places on land reserved under the NPW Act, and for the proper restoration of any such land that has been disturbed or excavated in accordance with an approval. Part 6 of the NPW Act provides specific protection for Aboriginal objects and places by making it an offence to harm or desecrate them. Harm means any act or omission that destroys, defaces, or damages an object or place or, in relation to an object, moves the object from the land on which it had been situated (Section 5 of the NPW Act).



A development consent under Division 4.7 for State Significant Development removes the requirement for:

(d) an Aboriginal heritage impact permit under section 90 of the National Parks and Wildlife Act 1974

(2) Division 8 of Part 6 of the Heritage Act 1977 does not apply to prevent or interfere with the carrying out of State significant development that is authorised by a development consent granted after the commencement of this Division.

1.4.2.3 Heritage Act 1977

The NSW *Heritage Act 1977* (Heritage Act) provides statutory protection to those items identified as having heritage significance and which form part of the NSW heritage record. The Heritage Act defines a heritage item as a place, building, work, relic, moveable object, or precinct (Section 4 of the Heritage Act). Items that are assessed as having State heritage significance are listed on the NSW State Heritage Register (SHR) and can include items with Aboriginal heritage values. Proposals to alter, damage, move or destroy heritage items listed on the SHR (or protected by an Interim Heritage Order), require approval under Section 60 of the Heritage Act.

Archaeological features and deposits are afforded statutory protection by the 'relics provision' of the Heritage Act. A relic is defined as any deposit, artefact, object, or material evidence that relates to the settlement of the area that comprises NSW, not being Aboriginal settlement, and is of State or local heritage significance (Section 4 of the Heritage Act). Land disturbance or excavation that will or is likely to result in a relic being discovered, exposed, moved, damaged, or destroyed is prohibited under the provisions of the Heritage Act unless carried out in accordance with a permit issued under Section 140 or Section 139 of the Heritage Act.

1.4.2.4 Aboriginal Land Rights Act 1983

The NSW *Aboriginal Land Rights Act 1983* (ALR Act), establishes the NSW Aboriginal Land Council (NSWALC) and Local Aboriginal Land Councils (LALCs). The Act requires these bodies to:

- a) to take action to protect the culture and heritage of Aboriginal persons in the Council's area, subject to any other law,*
- b) to promote awareness in the community of the culture and heritage of Aboriginal persons in the Council's area.*

These requirements recognise and acknowledge the statutory role and responsibility of the NSWALC and LALCs.

The ALR Act also establishes the Registrar whose functions include, but are not limited to, maintaining the Register of Aboriginal Land Claims and the Register of Aboriginal Owners. Under the ALR Act, the Registrar is to give priority to the entry in the register of the names of Aboriginal persons who have a cultural association with:

- a) Lands listed in Schedule 14 to the NPW Act, and*
- b) Lands to which section 36A (of the ALR Act) applies.*

Section 3.1 of this report provides details on Stage 1 of the consultation requirements (DECCW, 2010a) completed for this ACHA.

1.5 Authorship and acknowledgements

A list of Niche personnel who contributed to the preparation of this ACHA report is listed in Table 3.

Original data sourced from Kayandel Archaeological Services (Kayandel Archaeological Services, 2008) and the Illawarra Prehistory Group systematic surveys of the Woronora Plateau (Illawarra Prehistory Group, 2007) contributed to the outcomes of this assessment.

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Table 3: List of Niche contributors to the ACHA report

Contributor	Contribution	Qualification
Deirdre Lewis-Cook	Project Manager, Aboriginal community consultation, report writing, survey	MA (Hons), BA
Rebecca Chalker	Report writing, survey	BA
Chelsea Freeman	Aboriginal community consultation, report writing, survey	BA
Olivier Rochecouste	Aboriginal community consultation, report writing, survey	PhD, MRes (Distinction), BA
Caitlin McManus	Report writing	BA, Grad Cert MA, Grad Cert Proj.M.
Isabel Parnell	Survey	BA (Hons), MH (Heritage Management)
Chelsea Jones	Technical and quality review	BA (Hons)
Andrea Sward	GIS, Mapping	BEnv (Hons)



2 Site location and Subject Area

2.1 Description of land where Aboriginal cultural heritage sites are located for the Modification

Metropolitan Coal Mine is an existing underground coal mine located in the Southern Coalfield of NSW and within Consolidated Coal Lease (CCL) 703, Mining Lease (ML) 1610 and ML 1702.

The ACHA Subject Area covers an area of approximately 455 ha and includes the surface area that is likely to be affected by the proposed Modification, comprising the following sub-areas:

- Modification Mining Area - the area associated with the extended/additional longwalls that is likely to be affected by subsidence.
- Relocated Ventilation Shaft 4 Area - the surface disturbance area associated with the relocation of Ventilation Shaft 4.

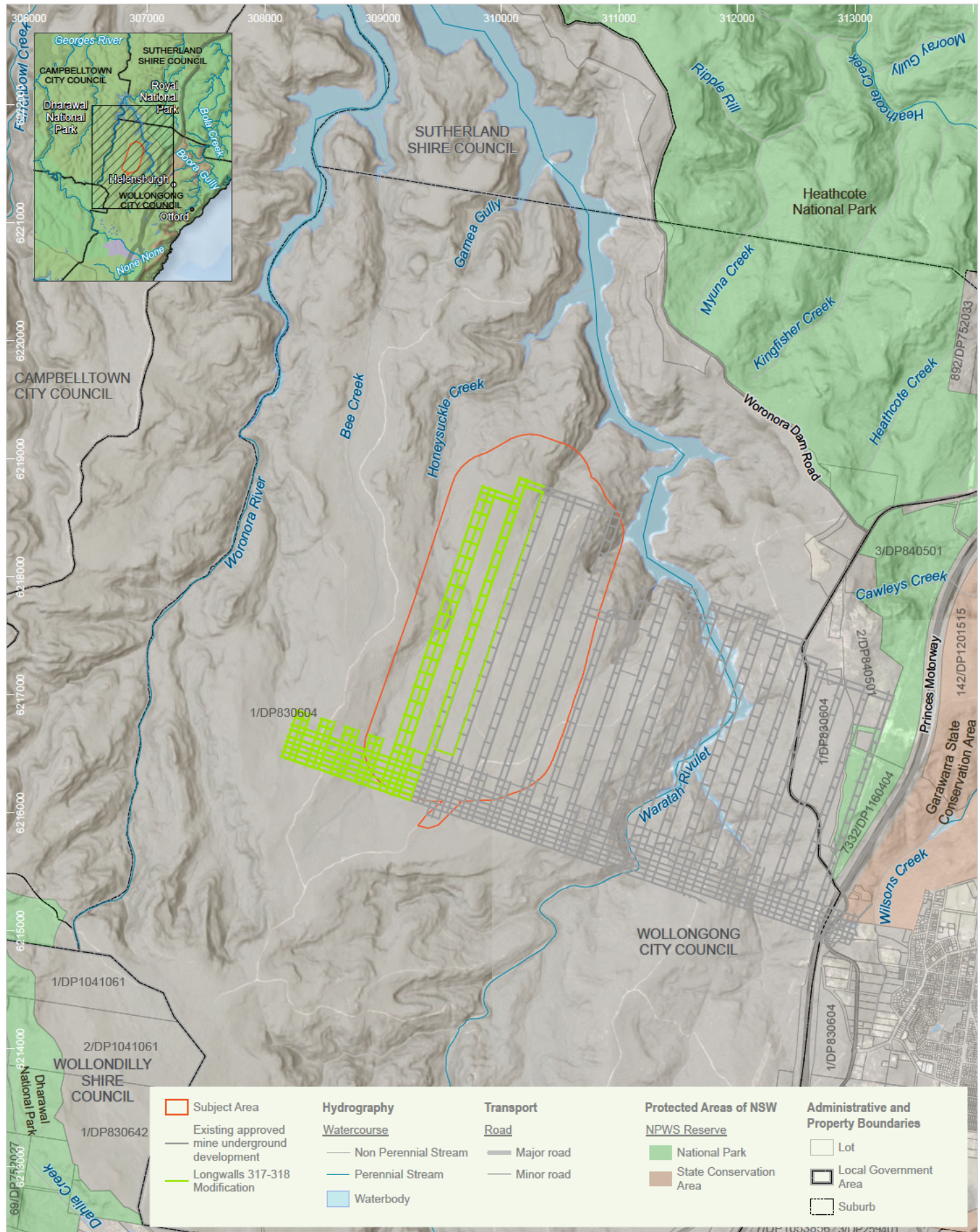
The extent of the area likely to be impacted by subsidence has been calculated by Mine Subsidence Engineering Consultants Pty Ltd (MSEC) (2025) and combines the areas bounded by the 35 degree angle of draw line and the predicted vertical limit of subsidence, taken as the 20 millimetres (mm) subsidence contour. The relocated Ventilation Shaft 4 would be located adjacent to Fire Trail No 9E and is approximately 3.8 ha.

The Subject Area is located partially within and directly west of the Metropolitan Coal Mine, within the Wollongong LGA and Parish of Camden on the Woronora Plateau. The Subject Area is approximately 30 km north of Wollongong and 38 km southwest of Sydney CBD (Figure 2 and Figure 3).

The Subject Area encompasses 455.28 ha area within Lot 1/DP 830604 to the south of Woronora Reservoir and to the east and south of the previously approved and extracted, areas of Longwall 301-316.

The entirety of the Subject Area is located within the Woronora Special Area in Water NSW's managed Sydney Metropolitan Water Catchment Area, resulting in restricted access. Historically, disturbance to the area has occurred through the clearing of vegetation for infrastructure such as roads and powerline easements while portions of the Subject Area has been disturbed by longwall mining subsidence movements (Kayandel Archaeological Services, 2008). The Modification Longwalls would be greater than 500 m away from the Woronora Reservoir.

The Modification is located within the boundaries of the Illawarra LALC.



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Figure 4: Location of AHIMS sites (source: DPE and Niche)

Not included in this version



2.2 Environmental context

Understanding the past and present environmental contexts of an area is a requisite in any Aboriginal archaeological and cultural heritage investigation (DECCW, 2010b). The nature and distribution of Aboriginal archaeological sites are closely related to the environmental context. This provides information about the landscape including topography, hydrology, geology, soils, and fauna and flora, all of which are important factors relating to Aboriginal resource exploitation and Aboriginal site distribution.

The following sections provide details of the environmental characteristics of the Subject Area. The section concludes by considering how the environmental character of the Subject Area affects the way in which the area would have been occupied by Aboriginal people in the past, and how Aboriginal cultural heritage sites are predicted to be distributed across the landscape. It is important to note that the environmental context for inhabitants of the Illawarra region in times past is different to current climates. The major impact of this change in climate was a change in sea level on the coast which would have had ramifications for the inland river systems.

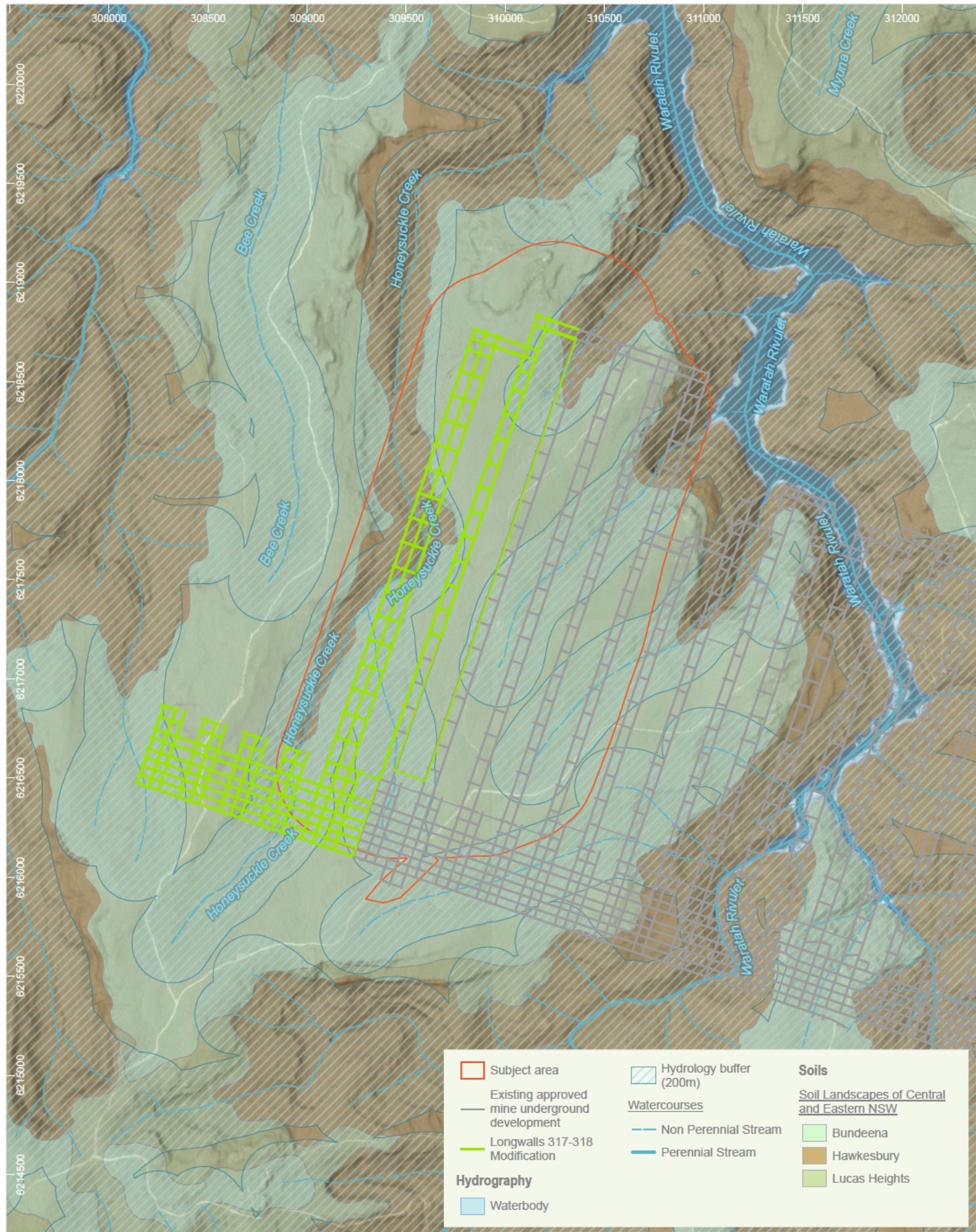
2.2.1 Topography and hydrology

Broadly, the Subject Area is located on the Woronora Plateau, on the south-eastern edge of the Cumberland plain between the major metropolitan areas of Sydney and Wollongong (Figure 2) within the Woronora Catchment area. A portion of Honeysuckle Creek intersects with the Subject Area and other first-order tributaries of the Waratah Rivulet. Valley slopes that surround these water bodies are generally narrow and steep and frequently cliff-lined (Plate 1 and Plate 2). The terrain of the Subject Area is characterised by Middle Triassic Hawkesbury Sandstone that comprises overlapping beds of quartz-rich sandstone in an eroding landscape that is highly vulnerable to natural weathering and granular loss. Active erosion has led to the development and collapse of sandstone overhangs and shelter formations with sandy deposits.

2.2.2 Geology, soils and geomorphology

The Subject Area is located within the southern portion of the Permo-Triassic Sydney Basin. The terrain of the Subject Area is characterised by Hawkesbury Sandstone, which is comprised of overlapping beds of quartz-rich sandstone. Under the sandstone formations, the substrates comprise deep Permian Coal Measures that consist of shale sandstone, conglomerates, tuff, chert, and coal (Branagan and Packham, 2000). These materials have archaeological significance as they may be suitable for the manufacture of stone tools. These formations are divided into colluvial and residual landscapes.

In colluvial landscapes, the dominant form of landscape formation is mass movement (rock fall) hazard with steep sloped, rock outcrops with shallow stony high permeable soil (Hazelton and Tille, 1990, p. 45). The Subject Area is characterised by two soil landscapes: the Hawkesbury soil landscape and the Bundeena soil landscape (Figure 5). A summary of the characteristics of these soil landscapes is provided below.



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Plate 1: An example of the valley slopes within the Subject Area.

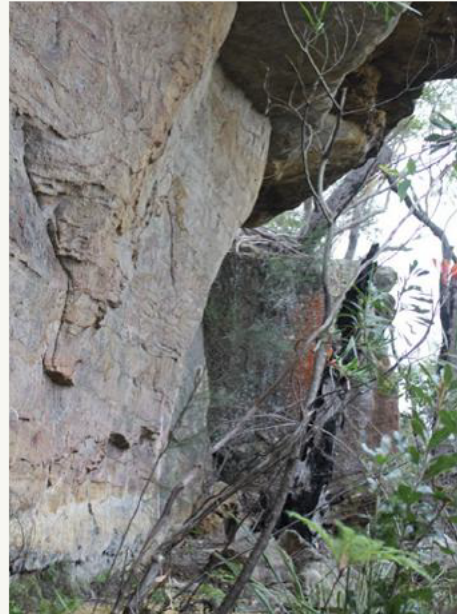


Plate 2: An example of the sandstone formations within the Subject Area.

Hawkesbury soil landscape

The Hawkesbury soil landscape ranges from rolling and rugged hills to very steep sandstone escarpment and ridges. Within this landscape, sandstone outcrops are very common and often occur as horizontal benches and broken scarps up to 10 m high. Rock outcrops and surface boulders and cobbles make up half of the ground surface (Hazelton and Tille, 1990, pp. 45–46). This outcropping is evident around Honeysuckle Creek and Woronora Dam within the local area. This sandstone outcropping on escarpments and ridges can provide sandstone overhangs that may be utilised as shelters. Furthermore, the elevation of the ridges may provide viewpoints and lookouts over the area. The soils comprise shallow sandy lenses; up to 30 centimetres (cm) deep. The topsoil of colluvial landscapes has low erodibility, consisting of permeable, loose, coarse sands and organic matter. The Hawkesbury soil landscape is highly susceptible to concentrated flow erosion. Due to the colonial nature and coarse sands of the soil landscape post-deposition superimposition may occur.

This landscape has the most archaeological potential within the Subject Area, as the blocks and weathered scarps provide suitable overhangs to be used for shelter. Within these overhangs, there are often suitable surfaces for Art, as well as floor space for the accumulation of archaeological deposits. There is, however, limited space for a deep accumulation of stratified subsurface deposits due to the size of many of the overhangs, as evidenced by the number of shelter sites recorded. The distribution of Aboriginal cultural heritage sites within the Subject Area is associated with landforms suitable for overhangs for shelter and art surfaces.



Bundeena soil landscape

The Bundeena soil landscape consists of low rolling rises on coastal headlands with local relief ranging from 40 to 80 m. The rolling slopes are gently inclined with gradients of 5 – 20%, characterised by Yellow Earths on the mid slopes, Gleyed Podzolic soils on the lower slope, and occasional narrow benches, characterised by siliceous sands and earthy sands. Approximately 30 – 50% of the Bundeena soil landscape's land surface is covered by rock outcrops. As stated in the Hawkesbury soil landscape, rock outcrops have the highest archaeological potential, with the potential to contain overhangs often with suitable surfaces for Art, as well as floor space for the accumulation of archaeological deposits. The Bundeena soil landscape is susceptible to moderate erosion, consisting of well drained coarse sands, most aggregates in the Bundeena soil landscape are stable.

2.2.3 Ecology

Disturbance and clearing associated with past land use has been minimal within the Subject Area owing, in part, to restricted access.

Prior to the arrival of early settlers much of the Subject Area would likely have been vegetated with the same woodlands, open forest, and scrublands in the area today. Water resources in the area would have supported a variety of flora and faunal resources exploited by the local Aboriginal population. It is likely that vegetation such as those detailed in Table 4 would have been gathered and processed within the lower reaches of the creek lines, including Honeysuckle Creek. Areas such as these would have been able to support longer-term occupation sites. The exploitation and resource strategies employed by Aboriginal occupants in the Subject Area would have been dictated by the locality and seasonal availability of these resources.

The vegetation of the Hawkesbury soil landscape comprises woodland and open forest with some areas of tall open forest, and rainforest within the sheltered gullies. On the open crests and ridges, woodland and open forest contain Red Bloodwood (*Corymbia gummifera*), White Stringybark (*Eucalyptus globoidea*), Scribbly Gum (*Eucalyptus racemosa*), Blue Mountains Mallee (*Eucalyptus stricta*), Old Man Banksia (*Banksia serrata*). Sheltered side slopes of the landscape are characterised by open forest containing Sydney Peppermint (*Eucalyptus piperita*), Smooth-Barked Apple (*Angophora costata*) and Black She-Oak (*Allocasuarina littoralis*) with an understorey of *Epacridaceae spp.*, *Myrtaceae spp.*, *Fabaceae spp.* and *Proteaceae spp.* (Hazelton and Tille, 1990, p. 46). These communities supported a range of resources that would have been utilised by Aboriginal peoples along with those coastal resources that would have been available, both for food as well as to fulfil social and cultural needs.

The vegetation of the Bundeena soil landscape comprises open-heath, closed-heath and shrub with areas of woodland. Shrubs dominate the soil landscape, with She-oak (*Allocasuarina spp.*) and Heath Banksia (*Banksia ericifolia*) being the most dominant. The shrub Spiky Hakea (*Hakea sericea*) dominates areas of seepage or prolonged saturation in the soil landscape, whereas shrubs such as Dagger Hakea (*Hakea teretifolia*) are dominant in areas of impeded drainage. Other shrub species in the soil landscape include spider flowers (*Cleome hassleriana*), eggs and bacon (*Eutaxia obovate*), tea-tree (*Camellia sinensis*) and native health. Isolated occurrences of eucalypts in the woodland areas are evident with scrub understorey. Common Eucalypt in these woodland areas consists of Red Bloodwood (*Corymbia gummifera*), Yellow-top Ash (*Eucalyptus luehmanniana*) and Scribbly Gum (*Eucalyptus racemose*).



Table 4: Woodland species identified within the Subject Area

Resource species	Traditional uses
Eucalypts species (<i>Eucalyptus</i>)	The fragrant oil-bearing leaves can be used to relieve colds, headaches, backaches, and fevers. Certain of species of Eucalypts may be eaten through their seeds, bark from young roots, nectar, galls, wild honey, water, and manna. Wood may also be utilised to crease tools and other implements such as dishes and bowls and the bark used for shelters, canoes or fashioned into fishing lines, fish nets and baskets.
Red Bloodwood (<i>Corymbia gummifera</i>)	The sap from this tree can be used for toothache medicine and mouth wash, or used for mixing with paints to stain artefacts and rock art. It is also used to tan fishing ropes and nets.
Grey Ironbark (<i>Eucalyptus paniculata</i>)	The bark is mixed with Bloodwood Gum to tan fishing nets.
White Stringybark (<i>Eucalyptus globoidea</i>)	Bark was removed using various tool types, such as ground edge axes, and was used for a range of purposes such as coolamons, canoes, and shields.
Yellow Stringybark (<i>Eucalyptus muellerana</i>)	Bark was removed using various tool types, such as ground edge axes, and was used for a range of purposes such as coolamons, canoes, and shields.
Banksia species (<i>proteaceae</i>)	Sweet nectar can be sucked out of the flowers or shaken onto hand and licked off. The flower spikes can also be soaked in water for a 'sweet tea.' Banksias were also used to carry fire as the smouldering cones could be carried long distances.
Grass Tree (<i>Xanthorrhoea</i>)	Roots are edible and flower stem is nectar rich which can be extracted to make a sweet drink or can be used as a hunting tool to attract birds. The tree sap can be used for resin.

2.2.4 Climate

It is important to note that the environmental context for inhabitants of the Illawarra region in times past is different to current climates. The major impact of this change in climate was a change in sea level on the coast which would have had ramifications for the inland river systems, vegetation, fauna, and people.

The recent climate within the suburb of Helensburgh consists of mild summers and cold, wet winters. Recorded rainfall readings indicate an average annual rainfall of 1,500 mm between 1991 and 2020 and 1000 mm between 1911 and 1940 (Bureau of Meteorology, 2023). During the Last Glacial Maximum (LGM) (approximately 20,000 years ago), the climate was much colder and drier. Over the last 5,000 years especially, the climate has been becoming increasingly warm and wet.



2.2.5 Land use history

The Subject Area has been subject to limited impacts over time, owing to the landscape being part of the WaterNSW Woronora Special Area and being located between Heathcote National Park and the Dharawal Nature Reserve.

Access within the Woronora Special Area is limited to the public and is restricted by WaterNSW. Land use impacts include:

- Creation of the Woronora Dam.
- Installation of services (power lines, pipes, roads).
- Exploration drilling and seismic activities.
- Longwall mining within the Metropolitan Coal Mine.

Each of the aforementioned land uses and activities have an effect on the preservation and visibility of the archaeological record in the Woronora Special Area. Consequently, the majority of the Subject Area has experienced minimal modification and disturbance, as is apparent from the historical aerial images of the Subject Area (Figure 6a to 6d).

2.2.6 Summary

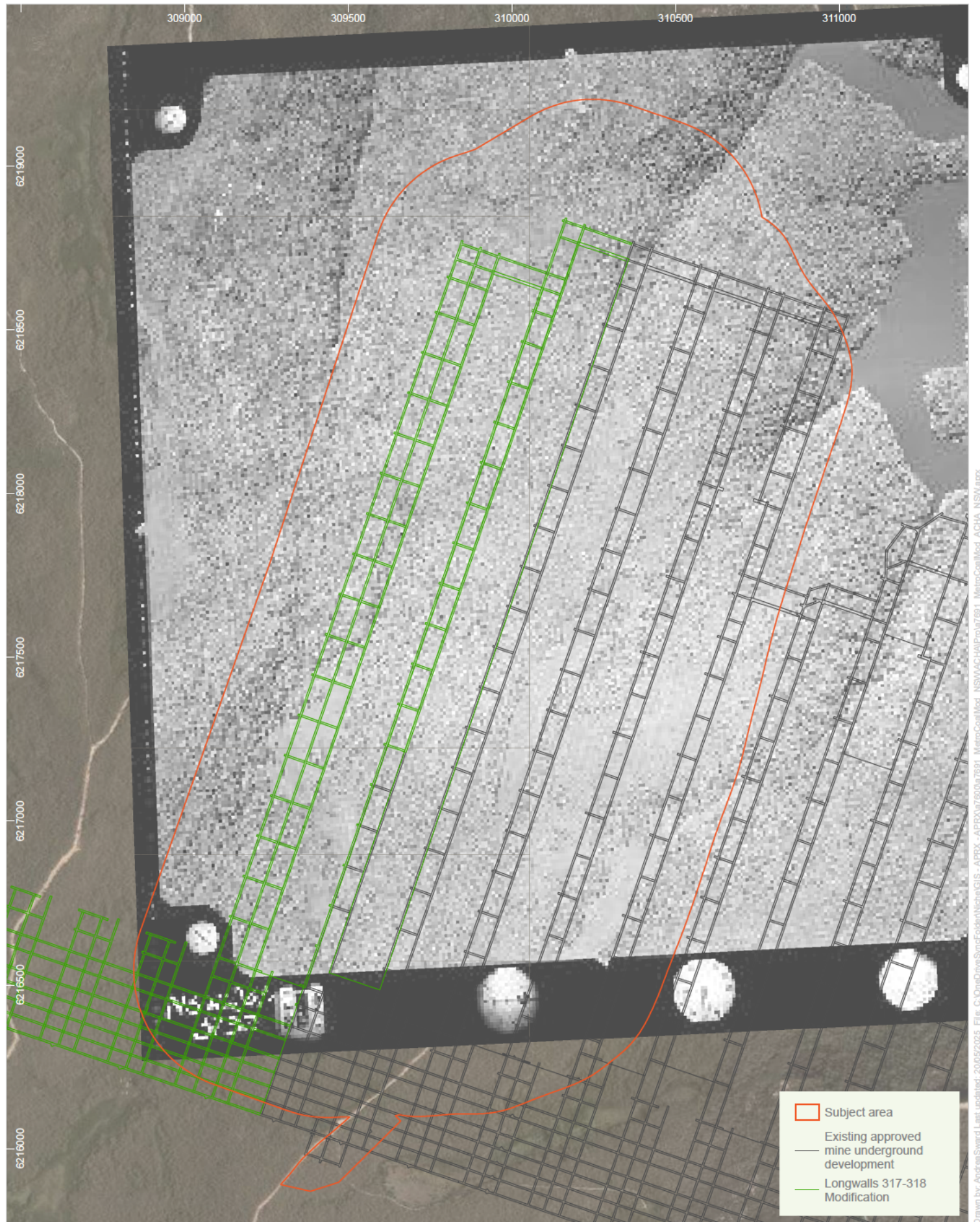
Though the landscape is marginally disturbed, the environmental setting of the Subject Area would have been conducive to occupation by past local groups. The Hawkesbury and Bundeena soil landscape consists of sandstone outcrops, scarps, and overhangs, often suitable as shelters and occupation sites, supported by previously identified shelters containing art, grinding grooves and floor space within the landscapes and the Subject Area. The landscapes provide steep rolling hills, steep escarpments, low and gentle rolling rises, to plateaus and ridges, providing an abundance of occupations locations in outcrops, ridges, and plateaus, with access to resources such as various vegetative species, fauna, and waterways and tributaries.

The Waratah Rivulet, Honeysuckle Creek and associated tributaries are scattered throughout the Subject Area, providing freshwater resources. The open woodlands and forests of the Hawkesbury provide a range of Eucalyptus species and Red Bloodwood, traditionally used as medicine, food resource, tool manufacture and shelter. Identification of tool manufacture is likely as chert is located within this landscape and is commonly utilised for the manufacture of stone tools. The resources would have been utilised by Aboriginal peoples along with the coastal resources that would have been available, both for food as well as to fulfil social and cultural needs.

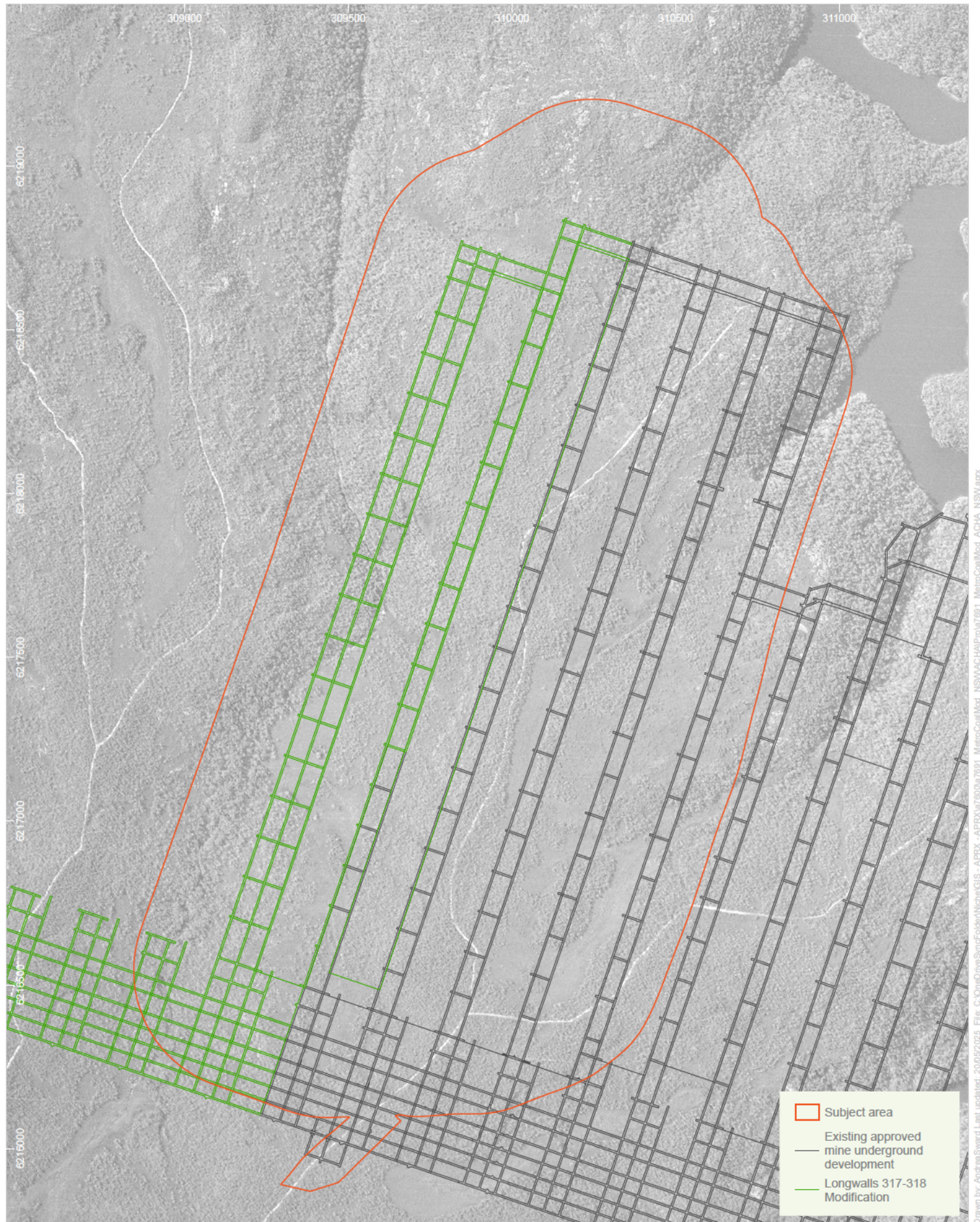
Disturbance through the clearing of vegetation for the development of infrastructure and the previous longwall mining subsidence disturbance has disturbed existing heritage sites.

2.3 Ethnography and history

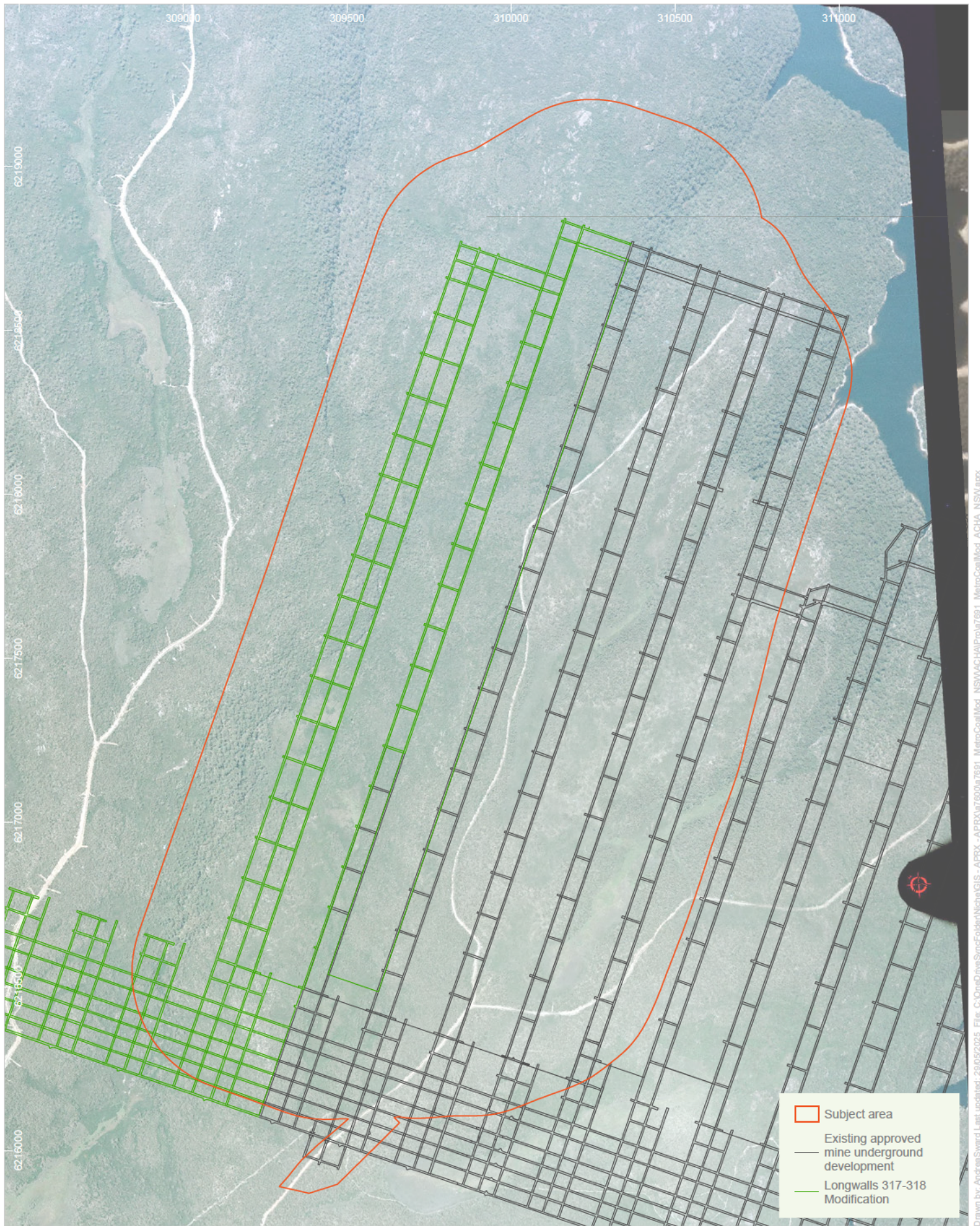
The Subject Area lies within the traditional country of the Dharawal freshwater and saltwater people. Tindale (1974) has identified the Dharawal boundaries extend from the south side of Botany Bay to the north of the Shoalhaven River to the south, running inland to the Campbelltown and Camden area (Attenbrow, 2010, p. 34). Attenbrow points out that such boundary mapping, undertaken as it was in the 19th Century is indicative at best, however, there appears to be reasonably strong agreement between those who have mapped language boundaries that the area is Dharawal country (Attenbrow, 2010, p. 35). The Wodi Wodi were also Dharawal dialect speakers, and they inhabited the coastal plains and escarpment around Wollongong. Dharawal people distinguished themselves as Fresh Water, Bitter Water or Saltwater depending on where in the wider language boundary their traditional lands were – the inland hills and valleys, the plateaus, and swamps or the coastal plain respectively (Wesson, 2009, p. 6).



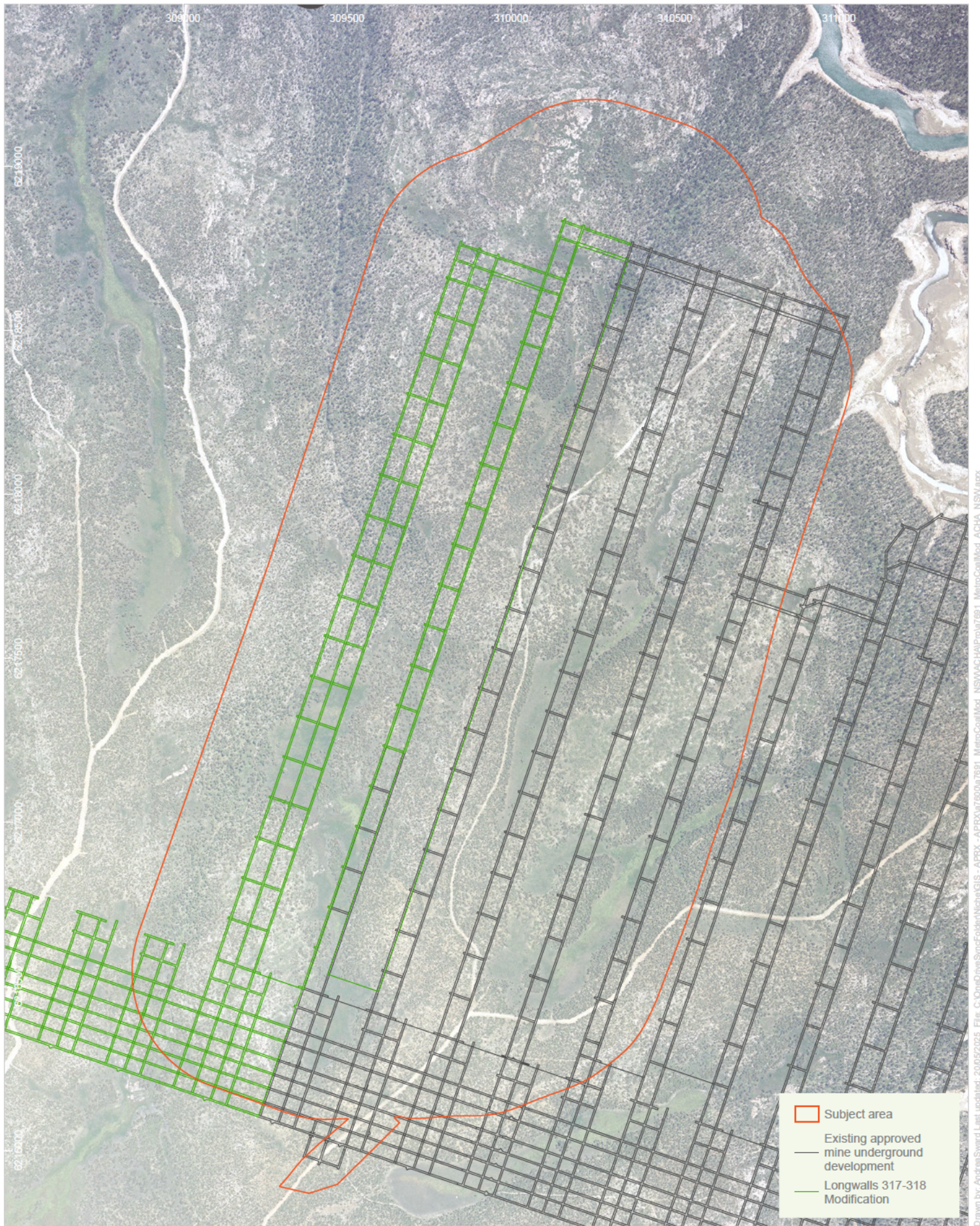
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- Subject area
- Existing approved mine underground development
- Longwalls 317-318 Modification



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The records and histories of the Dharawal and their Country at the time of contact with Europeans are subject to bias and are generally fragmented, providing misunderstood accounts of the way Aboriginal people were living prior to European interference. Nevertheless, it is understood that the Dharawal regularly communicated, moved, traded, and participated in ceremonies between their Country and neighbouring areas. It is most likely family or tribal groups would 'intermingle and interact along both physical and social boundaries' rather than be strictly confined to the 'tribal' borders that were to be artificially imposed by European anthropologists (Organ, 1990, p. xliii).

It is generally accepted that Aboriginal occupation of Australia dates back at least 50,000 years (Allen and O'Connell, 2003). As a result of the extensive and continued occupation of the Sydney Basin of which the Woronora Plateau is a part of, vast evidence of sustained Aboriginal occupation of the region is known archaeologically. Regionally, the oldest known occupation site has been identified at Bass Point in Shellharbour. This site was occupied 20,000 years ago, indicating a great antiquity of Aboriginal occupation in the region (Attenbrow, 2010, p. 153; Flood 1995, p. 112). The site of Bass Point at Shellharbour has been dated to 17,101 +/- BP (Flood, 1999). Within closer proximity to the current Subject Area on the Woronora Plateau, the oldest date for Aboriginal occupation is at Curracurrang 1 Sandstone Shelter at 7,450 +/- 180 BP (Dibden, 2019, p. 38). Previous assessments (Brayshaw McDonald Pty Ltd, 1994, p. 348) consider that a dramatic population density occurred at approximately 3,000 BP and that this and associated social pressures provided the impetus for the development of 'social mechanisms to control interaction and to make such interaction less stressful'. Others have noted that population growth within this period is not easily demonstrated using qualitative evidence (Hiscock, 2008, p. 158). The oldest date generally considered to be reliable for the earliest occupation around the region comes from excavations at Parramatta where archaeological material has been dated to 30,735 +/- 407 BP (Jo McDonald Cultural Heritage Management, 2005).

The arrival of the First Fleet in Sydney Cove in 1788 was followed the next year by a smallpox epidemic, which spread to the neighbouring regions and, although the exact effects are not known, killed over half the Aboriginal population of the areas affected (Organ, 1990, p. 5).

Up until 1880, the majority of the Upper Nepean Area was alienated crownland, avoided by graziers due to the rugged terrain and sterile soils. Historical records do not clearly suggest that Aboriginal use of this land continued during the early colonial period. However, Dibden (2019) suggest that there is evidence that indicates Aboriginal people did retreat to the Woronora Plateau to recover from introduced disease. The presence of permanent water sources in the forms of major rivers, and upland swamps (also known as dells) had the potential to be resourced as a long-term water source during drought periods (Young, 2017). The presence of water availability in the Upper Nepean region would have acted as a favourable landscape to host the occupation of Aboriginal people.

As land grants were passed out graziers and farmers started to occupy areas of Appin. Clashes between the local Aboriginal people and colonisers became frequent. Several attacks were recorded in the area, such as the Appin massacre in 1816 (Karskens, 2009).

Despite the massive changes that were so quickly brought to the Aboriginal people of the region, they maintained a sense of community, traditional customs and practices, and cultural knowledge and continued to care for significant sites and the land in general. Today there are many thousands of Aboriginal people living in the Wollongong and Wollondilly LGA's surrounding the upper Nepean Catchment. They continue to be custodians of the land, whilst traditional owners maintain cultural knowledge (Wesson, 2009).



3 The consultation process

In administering its statutory functions under Part 6 of the NPW Act, Heritage NSW requires that proponents consult with Aboriginal people about the Aboriginal cultural heritage values (cultural significance) of Aboriginal objects and/or places within any given development area, in accordance with Clause 60 of *NSW National Parks and Wildlife Regulation 2019*.

Heritage NSW maintains that the objective of consultation with Aboriginal communities about the cultural heritage values of Aboriginal objects and places is to ensure that Aboriginal people have the opportunity to improve ACHA outcomes (DECCW, 2010b). This is ensured by:

- Providing relevant information about the cultural significance and values of Aboriginal objects and /or places.
- Informing the design of the methodology to assess the cultural significance of Aboriginal objects and/or places.
- Actively contributing to the development of cultural heritage management options and recommendations for any Aboriginal objects and/or places within the proposed Subject Area.
- Commenting on draft assessment reports before they are submitted by the Proponent to the DCCEEW.

Consultation is a formal requirement in cases where a proponent is aware that their development activity has the potential to harm Aboriginal objects or places. Heritage NSW also recommends that these requirements be used when the certainty of harm is not yet established but a proponent has, through some formal development mechanism, been required to undertake a cultural heritage assessment to establish the potential harm their proposal may have on Aboriginal objects and/or Places.

The Consultation Requirements outline a four-stage consultation process that includes detailed step-by-step guidance as to the aim of the stage, how it should proceed, and what actions are necessary for it to be considered successfully completed. The four stages are:

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

The Consultation Requirements also outline the roles and responsibilities of Heritage NSW, Registered Aboriginal Parties (RAPs) including Local and State Aboriginal Land Councils, and proponents throughout the consultation process.

To meet the requirements of consultation it is expected that the Proponent will:

- Bring the RAPs (or their nominated representatives) together and be responsible for ensuring appropriate administration and management of the consultation process.
- Consider the cultural perspectives, views, knowledge, and advice of the RAPs involved in the consultation process when they assess the cultural significance and work together to develop any heritage management outcomes for Aboriginal object(s) and/or Place(s).
- Provide evidence to Heritage NSW of consultation by including information such as cultural perspectives, views, knowledge, and advice provided by the RAPs.
- Accurately record and clearly articulate all consultation findings in the final cultural heritage assessment report; and
- Provide copies of their final ACHA report to the RAPs who have been consulted.



The consultation process undertaken to seek active involvement from appropriate Aboriginal representatives for the project followed the current NSW statutory guidelines – the Consultation Requirements. Section 1.3 of the Consultation Requirements describes the guiding principles of the document, which have been derived directly from the principles section of the Australian Heritage Commission's *Ask First: A guide to respecting Indigenous heritage places and values* (Australian Heritage Commission, 2002). Both documents share the aim of creating a system where advice can be sought from the Aboriginal community.

The following sections outline the process and results of the consultation conducted during this assessment to ascertain and reflect the Aboriginal cultural heritage values of the Subject Area. Further detail regarding the Aboriginal community consultation process is presented in Appendix A.

3.1 Stage 1 – Notification of the Modification and registration of interest

3.1.1 Notification of agencies

Stage 1 of the consultation process is used to identify, notify and register any Aboriginal people or groups who may have cultural interest in and/or possess cultural knowledge relevant to determining the cultural significance of Aboriginal objects of places within the Subject Area.

Notifications were sent on 10 May 2023 to the following organisations (a copy of the notification letter is provided in Appendix A):

- Wollongong City Council
- NTS Corp Pty (NTS Corp)
- Illawarra LALC
- Native Title Tribunal
- Office of the Registrar
- South East Local Land Services
- Heritage NSW

Responses to the Modification notifications were received from the following organisations between 10 May 2023 and 23 May 2023, Wollongong City Council, NTS Corp, Illawarra LALC, Native Title Tribunal, South East Local Land Services and Heritage NSW.

3.1.2 Advertisement

In accordance with Section 4.1.3 of the Consultation Requirements, a newspaper advertisement was placed in the Illawarra Mercury on 25 May 2023 with a close date of 5:00 pm on 23 June 2023 (29 days) to provide additional opportunity for Aboriginal people who may be interested or who hold cultural knowledge relevant to determining cultural heritage significance of Aboriginal object(s) and/or place/s in the Subject Area to come forward. A copy of the advertisement is included in Appendix A.



3.1.3 Notification of potential stakeholders

As a result of the responses received, 75 individuals and organisations were identified as potential knowledge holders for the Subject Area. A list of potential cultural knowledge holders was compiled from submissions and information collected during the notification and registration periods.

A copy of the notification letter that was sent to the above organisations and individuals on 25 May 2023 with a close date of 5 pm 23 June 2023 (29 days) is included in Appendix A.

3.1.3.1 Registered Aboriginal Parties

As a result of the Stage 1 enquiries, a total of 26 organisations and/or individuals have registered as RAPs for the Modification (Table 5). A consultation log of all correspondence is included in Appendix A.

Table 5: RAP organisations and contacts

Name of Organisation and/or Individual	Contact
A&K Cultural Heritage	[REDACTED]
Barraby Cultural Services	[REDACTED]
Coomaditchie United Aboriginal Corporation	[REDACTED]
Cubbitch Barta	[REDACTED]
Dharramalin	[REDACTED]
Eora Heritage Group	[REDACTED]
[REDACTED]	[REDACTED]
Guntawang Aboriginal Resources Incorporated*	[REDACTED]
Guunamaa Dreamin Sites and Surveying	[REDACTED]
Illawarra Local Aboriginal Land Council	[REDACTED]
Kamilaroi Yankuntjatjara Working Group	[REDACTED]
Konanggo Aboriginal Cultural Heritage Services	[REDACTED]
Korewal Elouera Jerrungurah Tribal Elders Corporation	[REDACTED]
La Perouse Botany Bay Aboriginal Corporation	[REDACTED]



Mundawari Heritage Consultants	[REDACTED]
Mura Indigenous Corporation (icn:8991)	[REDACTED]
Murra Bidgee Mullangari Aboriginal Corporation	[REDACTED]
RAW Cultural Healing	[REDACTED]
South coast people	[REDACTED]
Tharawal Local Aboriginal Land Council	[REDACTED]
The Wadi Wadi Coomaditchie Aboriginal Corporation	[REDACTED]
[REDACTED]	[REDACTED]
Wodi Wodi Dharawal/Yuin Traditional Owner	[REDACTED]
Wori Woilywa	[REDACTED]
Woronora Plateau Gundungara Elders Council	[REDACTED]
Yurrandaali	[REDACTED]

**Individuals/organisation who were potential Aboriginal stakeholders and registered late, nonetheless were included as a RAP for this Modification.*

3.1.4 Notification of Heritage NSW and LALC

Notification of RAPs to Heritage NSW, Illawarra LALC and Tharawal LALC, as per Section 4.1.6 of the Consultation Requirements was sent via email on 21 July 2023.

3.2 Stage 2 and 3 – Presentation of project information, assessment methodology and gathering information about the cultural significance of the Subject Area

3.2.1 Assessment methodology

The RAPs identified in Stage 1 of the consultation process were provided with a letter outlining information about the Modification and an assessment methodology in accordance with the Consultation Requirements and the Code of Practice, on 25 September 2023.



The purpose of the provided documents was to:

- Describe the project, and outline the project scope, timeframe and proposed works.
- Describe the environment of the Subject Area and information relevant to the ACHA process.
- Provide an opportunity for the RAPs to understand the process and comment on the proposed methodology.
- Set a time frame for providing feedback and comments on the methodology and project information.

The draft methodology was provided to the RAPs on 25 September 2023 and the closing date for comments was at 5 pm, 31 October 2023 (36 days). A copy of the cover letter and methodology is included in Appendix A.

An information session (in-person and online) was held on 26 October 2023 with RAPs.

At the information session, a representative of Metropolitan Coal provided a presentation of the nature and scale of the Modification, an overview of the impact assessment process, critical timelines and milestones for the completion of Modification activities and delivery of reports, a discussion of roles, functions and responsibilities of participants and protocols for the management of any sensitive cultural heritage information. The information session also gave the RAPs an opportunity to raise any cultural issues or comments/perspectives and Modification requirements (if any) regarding the Proposed Methodology.

Six RAPs provided feedback on the project information and assessment methodology via email. All six (6) RAPs accepted the proposed methodology, and copies of all submissions made are included in Appendix A. Further feedback was received from RAPs during the information session held on 26 October 2023. A summary of the key points of feedback received during this session is listed below.

Additionally, the following key issues with regard to the draft methodology were discussed and outcomes agreed upon during the information session:

- A RAP representative stated a preference for both male and female consultants and RAP representatives to undertake the field surveys. Niche confirmed that both male and female consultant representatives for the field surveys would be arranged. Niche incorporated this suggestion into the survey methodology (see Section 5.2 for additional details).
- A RAP representative suggested the implementation of a Cultural Protocol should a male or female representative not be present where a significant site particular to males or females is surveyed. Niche advised this would be considered and incorporated into the field surveys and Final ACHA Methodology.
- A RAP representative identified that the AHIMS site cards may not have been recorded with cultural knowledge and that it is important to survey the sites to obtain a cultural perspective. Niche advised the field surveys would include visiting each known Aboriginal heritage site and ground truthing the site.
- A RAP representative highlighted the potential for contingency days to allow sufficient time to undertake the surveys within the Subject Area. Niche advised that 3 to 4 days would be sufficient however, there is a contingency for further surveys at a later date if required.

The finalised version of the assessment methodology was sent to RAPs on 22 December 2023.

3.2.2 Cultural heritage survey

The four-day site inspection was conducted on 30 and 31 January, and 1 and 2 February 2024, where two Archaeologists and three RAPs participated in the survey. An additional survey was also conducted on 25 September 2024, involving two Archaeologists and one RAP as part of the survey. Those who participated are provided in Table 6. A copy of the site inspection notice is included in Appendix A.

No feedback regarding the cultural values of the Subject Area was given by any of the RAPs during the survey.



Table 6: Cultural heritage survey participants

Organisation	Participant	Attendance
Kamilaroi Yankuntjatjara Working Group	[REDACTED]	30 January 2024
Guntawang Aboriginal Resources Incorporated	[REDACTED]	30 and 31 January 2024
Konanggo Aboriginal Cultural Heritage Services	[REDACTED]	30 January 2024
Illawarra Local Aboriginal Land Council	[REDACTED]	31 January and 1 February 2024
Cubbitch Barta	[REDACTED]	1 February 2024
Coomaditchie United Aboriginal Corporation	[REDACTED]	1 and 2 February 2024
Cubbitch Barta	[REDACTED]	2 February 2024 and 25 September 2024

3.3 Stage 4 – review of draft Aboriginal cultural heritage assessment report

A draft of this report was provided to the RAPs on 24 April 2025 for their review and comment in accordance with the Consultation Requirements (DECCW, 2010b). The closing date for comments was 5 pm, 25 May 2025 (31 days). A copy of the cover letter and methodology is included in Appendix A.

3.3.1 Draft ACHA information session (May 2025)

An information session (online) was held on 13 May 2025 with RAPs (Table 7), Niche consultants, and Metropolitan Coal representatives to discuss the Modification and the draft ACHA report. The information session also gave the RAPs an opportunity to raise any cultural issues or comments/perspectives regarding the draft ACHA report.

Table 7: ACHA information session May 2025 attendees*

RAP representative	Organisation
[REDACTED]	Gundawang
[REDACTED]	Illawarra LALC

* An additional RAP representative [REDACTED] from Woronora Plateau Gundangara Elders Council briefly joined via phone at the start of the meeting while on fieldwork. Due to limited availability, the representative was unable to stay. Isabel Parnell followed-up post-meeting to discuss the ACHA.



3.3.2 Comments received on the draft ACHA

Comments on the draft ACHA during the review period were received from the Illawarra LALC. Copies of all submissions are included in Appendix A. Responses to the submissions provided by the Illawarra Local Aboriginal Land Council on the draft ACHA are provided in Table 8.



Table 8: RAP comments received

Comments	Niche response
Letter received from Illawarra LALC 27 May 2025	
<i>The Illawarra Local Aboriginal Land Council (ILALC) provides this response to the Draft Aboriginal Cultural Heritage Assessment (ACHA) prepared by Niche Environment and Heritage Pty Ltd on behalf of Metropolitan Coal Pty Ltd for the proposed modifications to Longwalls 317 and 318. ILALC objects in the strongest possible terms to the continuation and expansion of mining operations within this highly significant cultural landscape.</i>	Niche thanks [REDACTED] for submitting a response on behalf of ILALC. All comments received have been considered in this ACHA.



Comments	Niche response
<i>Fundamental Objection: Damage to Country</i> <i>Our opposition extends beyond the documented harm to identified Aboriginal cultural heritage sites. This proposal represents continued, irreversible damage to Country itself. For Aboriginal people, harm to Country is not just physical or material: it is spiritual, cultural, and intergenerational. The continuation of extractive industrial operations in this landscape constitutes a cultural violation. No form of subsidence monitoring or mitigation offsets the desecration caused by coal extraction beneath a living cultural landscape.</i>	The Metropolitan Coal Mine Project Approval (08_0149) includes a performance measure that states: <i>Less than 10% of Aboriginal heritage sites within the mining area are affected by subsidence impacts...</i> To date, less than 2% of Aboriginal cultural heritage sites in the mining area have been impacted by subsidence at the Metropolitan Coal Mine. The Modification is situated at greater depth and narrower long walls - both mean greatly reduced potential for surface impact compared to the initial operations. Based on the subsidence predictions the anticipated risk of impact to these sites is low or negligible. When the incorporation of appropriate management and mitigation measures are considered, the Modification would not result in a significant increase in cumulative impacts to scientific values of Aboriginal cultural heritage. In addition, as part of the Modification, Metropolitan Coal would relinquish approximately 253 ha of longwall mining areas associated with the approved Metropolitan Coal Mine. The relinquishment of these approved development areas would avoid or reduce impacts to Aboriginal heritage sites approved by the Project Approval (08_0149). Further detail regarding the relinquished longwall mining areas is provided in the Modification Report.



Comments	Niche response
<i>Inadequate Recognition of Cultural Significance</i> <i>The ACHA fails to meaningfully engage with the cultural complexity and landscape-scale values of the area. Notably, it does not reference or consider the Sydney Cultural Crescent Rock Art (Place ID 106369), which is currently under assessment for inclusion on the National Heritage List. Although not yet formally listed, the nomination recognises the outstanding cultural significance of this extensive rock art landscape, which encompasses the Subject Area. The report neglects the implications of this recognition and fails to consider the holistic and interconnected values of rock art, occupation sites, and cultural narratives that define this region. This omission undermines the assessment's capacity to reflect both contemporary archaeological understandings and Aboriginal cultural frameworks of significance.</i>	It is acknowledged that all Aboriginal heritage sites and Country are considered to have high cultural value to the RAPs. When completing the archaeological significance assessment, each site was considered in the context of the local area and the wider region (refer to Section 6.6 of this ACHA). The Sydney Cultural Crescent Rock Art listing was not included in the ACHA significance assessment because the nomination is being considered by the Australian Heritage Council and has yet to be determined. The potential listing has not been considered further in this assessment as there is limited available information and determination has not been reached. Niche has, nevertheless, updated the ACHA to include Section 4.2.2 to address the potential determination of this National listing.



Comments	Niche response
<i>Although 29 sites have been identified within the Subject Area, and 105 within the broader AHIMS search, the assessment applies a reductive site-by-site significance model, ignoring the cumulative and regional heritage significance of the rock shelters, grinding grooves, and PADs as part of a broader cultural system. The scientific significance ratings—where 86% of sites are deemed “low”—are misaligned with both Aboriginal cultural assessments and contemporary archaeological best practice, which stress landscape context, relational values, and cumulative cultural meaning.</i>	A Statement of Significance which incorporates the social, cultural, aesthetic, historic and scientific values outlined in the Burra Charter is provided in Section 6 of this ACHA. Section 6.5.1 of this ACHA outlines the process followed for grading scientific significance/values and acknowledges that this procedure stems from compliance with the current heritage guidelines (i.e. <i>Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW</i> [OEH, 2011]). The guide outlines two main themes in the overall Aboriginal cultural heritage significance assessment process namely, the identification of the cultural/social significance of Aboriginal objects and/or places to Aboriginal people and the identification of the scientific (archaeological) significance to the scientific/research community. It is acknowledged that grading of heritage values, scientific or otherwise, is a process which does not have support from the RAPs as it can emphasise the values of individual components of a landscape rather than the cultural landscape as a whole. A significance assessment of each Aboriginal heritage sites was undertaken following a site inspection and consultation with RAPs. Niche acknowledges that this assessment in no way diminishes the recognition or significance of Aboriginal peoples’ connection to the land and its resources within and in the vicinity of the Subject Area.



Comments	Niche response
<i>Predictive Modelling and Survey Limitations</i> <i>The ACHA acknowledges that much of the Subject Area was characterised by extremely low ground surface visibility due to dense vegetation and leaf litter. Despite this, the survey methodology relied predominantly on opportunistic, non-systematic sampling, with limited coverage of the full range of landforms present. Areas with the highest predicted likelihood for cultural sites—particularly sandstone overhangs along steep slopes and ridgelines—were not systematically investigated. Notably, a central western landform that looks like it would have potential for rock shelters or overhangs (see Figure 1) remains unsurveyed.</i> <i>Despite the acknowledged limitations in ground surface visibility, the ACHA presents confident conclusions regarding site density and predicted impact, as though the current dataset is comprehensive. This is problematic given that predictive modelling indicates a high likelihood of unrecorded Aboriginal sites across the landscape—particularly in landforms known to contain rock shelters and overhangs, such as ridgelines and steep slopes.</i>	The predictive model developed for the Subject Area included consideration of previous archaeological surveys and assessments undertaken within the Subject Area and the local and wider surrounds, the distribution and patterning of known sites within the Subject Area and surrounds, the landform units and landscape context of the Subject Area, and the previous known land uses within and surrounding the Subject Area. The primary focus of surveys undertaken for this ACHA were to inspect the previously recorded sites and survey targeted landforms and areas of exposure where highly obtrusive and typical of the sandstone environment Aboriginal heritage sites were located: rock shelters and rock platforms. The results of the field survey correlate with the existing predictive model. The portion of the Subject Area identified (i.e. 'central western landform') was not surveyed due to the steep terrain. The region highlighted contains very steep slopes between 18 and 45 degrees which was deemed not suitable for surveys and is so steep that it is also unlikely to contain shelters and areas suitable for past Aboriginal land use. The safety of visitors, personnel and contractors to Metropolitan Coal is a key consideration for all works undertaken at the Metropolitan Coal Mine. As such, the safety of RAPs and Niche archaeologists undertaking field surveys is an important factor that has been considered and implemented during all field survey works to date at the Metropolitan Coal Mine. As noted above, the terrain within the Subject Area is steep and contains dense vegetation coverage which can be unsuitable for field surveys. In accordance with the approved HMP, any previously unrecorded Aboriginal heritage sites identified during ongoing fieldwork (e.g. baseline recording, supplementary fieldwork, pre-clearance surveys, monitoring, follow-up inspections to assess the effectiveness of mitigation/management/remediation measures, etc.) would be recorded and subject to archaeological and cultural significance assessment, in consultation with RAPs.



Comments	Niche response
<i>ILALC does not support the use of test excavation in this context, due to the potential for unnecessary disturbance to cultural materials. However, it is essential that the assessment acknowledges the likelihood that the known sites represent only a portion of those actually present. The limited surface visibility and incomplete survey coverage—especially of a central western landform identified as having high site potential—suggest that the number of Aboriginal cultural heritage sites in the area is being underreported.</i> <i>Failure to account for this likelihood contributes to an incomplete and potentially misleading assessment of cultural heritage impacts. A more cautious and transparent approach is required—one that recognises the limitations of the dataset and the probable presence of additional unrecorded sites.</i>	ILALC's comments regarding test excavation are noted. Test excavation is not proposed or recommended for any Aboriginal heritage sites within the Subject Area for the Modification. Targeted and representative field surveys were undertaken for the Project ACHA in accordance with the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW</i>. The survey work undertaken is considered to provide an adequate characterisation of the archaeological potential of the Subject Area and has confirmed the predictive model.



Comments	Niche response
<i>Subsidence Risks Downplayed</i> <i>Despite previous monitoring programs having documented subsidence-related damage at 13 Aboriginal heritage sites within the broader mine area, the ACHA concludes—with no clear rationale—that all 29 sites within the new longwall impact zone face a "low" or "negligible" risk. This is not credible. Even the report admits that sites NT9 and NT21 are at heightened risk due to valley closure effects. Further, it openly acknowledges that the only reliable way to avoid subsidence-related impacts is not to mine. It is unacceptable that this clear risk is effectively dismissed on the basis of corporate convenience.</i> <i>The mitigation measures proposed are minimal and reactive. Monitoring and the use of Trigger Action Response Plans (TARPs) do not prevent harm; they simply document it after the fact. This is not mitigation. It is managed destruction.</i>	To date, the cumulative percentage of sites affected by subsidence impacts at the Metropolitan Coal Mine is less than 2%. The Modification is located at cover of depths deeper than previous operations such that impacts are anticipated to be less than those observed. The Subject Area for the Modification overlaps the Metropolitan Coal Mine approved mining area, and as a result a number of Aboriginal heritage sites are already approved to experience subsidence impacts. On this basis, the Modification would only result in an incremental increase or no change in subsidence parameters for these sites and the impact assessments do not change as a result of the Modification. Furthermore, the main design principles of the Modification mine plan is to reduce impacts on surface features by implementing narrow panel widths. This is the key measure that has been successfully used during historical mining at the Metropolitan Coal Mine to reduce subsidence impacts on Aboriginal heritage sites. The predicted subsidence parameters in the Subject Area are similar to or less than those predicted for the approved Metropolitan Coal Mine and therefore the potential impacts to Aboriginal heritage sites would be similar or less (MSEC, 2025). The incorporation of the Modification by Metropolitan Coal Mine is expected to comply with performance measures under the Metropolitan Coal Mine Project Approval (08_0149). As part of the Modification, Metropolitan Coal would relinquish approximately 253 ha of approved development and longwall mining areas, to further avoid or reduce impacts to Aboriginal heritage sites approved by Project Approval 08_0149.



Comments	Niche response
<i>Failure to Respect Aboriginal Cultural Values</i> <i>The ACHA includes statements from Registered Aboriginal Parties (RAPs) that all Aboriginal heritage sites possess high cultural significance and must be assessed holistically. These perspectives are not reflected in the significance assessments or in the impact evaluation framework. Instead, the report reverts to outdated archaeological typologies and prioritises geological modelling over cultural input. This is contrary to the intent of the National Parks and Wildlife Act 1974 and the principles of the Burra Charter, which require genuine engagement with Aboriginal knowledge systems.</i> <i>Furthermore, the document does not reflect any meaningful Aboriginal-led cultural values assessment. The process described is consultation in name only. There is no evidence that RAP views shaped the impact assessment, mitigation hierarchy, or significance ratings. This undermines the legitimacy of the assessment and fails the standard of free, prior and informed consent.</i>	RAPs have been consulted on the nature and extent of Aboriginal cultural heritage at the Metropolitan Coal Mine on a number of occasions, including during the community consultation processes undertaken for previous cultural heritage assessments and investigations as well as for this ACHA. The RAPs maintain a strong relationship with their traditional lands and have stated that all Aboriginal heritage sites, known or otherwise, and Country are considered to have high cultural and social value by the RAPs. When completing the archaeological significance assessment, each site was considered in the context of the wider region. Section 6.8 of this ACHA includes a <i>Statement of cultural significance for the Subject Area as a whole</i>, which has been developed in consideration of feedback from RAPs during the consultation period for the draft ACHA. The nomination of the Sydney Cultural Crescent Rock Art for inclusion on the National Heritage List has yet to be determined. Any future development application associated with the Metropolitan Coal Mine would consider undertaking a Cultural Values Assessment for the Woronora Plateau if the National Heritage listing is determined. Refer to Section 4.2.2 for further detail.



Comments	Niche response
<i>Cumulative Impacts and the Broader Landscape</i> <i>The cumulative impact of multiple longwall operations in this area cannot be understated. Incremental approvals, like this proposed modification, collectively erode Country, damage waterways, destroy rock shelters, and fragment spiritual and ancestral connections. The document's dismissal of cumulative cultural impacts as negligible is fundamentally flawed and culturally disrespectful.</i>	Less than 2% of Aboriginal cultural heritage sites in the mining area have been impacted by subsidence at the Metropolitan Coal Mine to date. The incorporation of the Modification by Metropolitan Coal Mine is expected to comply with performance measures under the Metropolitan Coal Mine Project Approval (08_0149). The Subject Area for the Modification overlaps the Metropolitan Coal Mine approved mining area, and as a result a number of Aboriginal heritage sites are already approved to experience subsidence impacts. On this basis, the Modification would only result in an incremental increase or no change in subsidence parameters for these sites and the impact assessments do not change as a result of the Modification. In addition, as part of the Modification, Metropolitan Coal would relinquish approximately 253 ha of longwall mining areas associated with the approved Metropolitan Coal Mine. The relinquishment of these approved development areas would avoid or reduce impacts to Aboriginal heritage sites approved by the Project Approval (08_0149). Considering the proposed management and mitigation measures (refer to Section 9 of this ACHA), the Modification would not result in a significant increase in cumulative impacts to scientific values of Aboriginal cultural heritage.



Comments	Niche response
<i>Conclusion</i> <i>No damage to Country should be deemed acceptable. Aboriginal heritage cannot be traded for short-term economic benefit. The fact that monitoring has already confirmed damage to heritage sites from prior longwall operations should be cause for immediate cessation, not justification for expansion.</i> <i>The ILALC demands that:</i> <i>- This Modification Application be rejected on cultural and heritage protection grounds.</i> <i>- A full Aboriginal-led Cultural Values Assessment be undertaken for the entire Woronora Plateau landscape.</i> <i>- The area be considered for nomination to the National Heritage List under the Sydney Cultural Crescent Rock Art precinct.</i> <i>- Future development proposals in this region be subject to full consent, not simply consultation.</i> <i>Please don't hesitate to contact me should you require clarification on any points raised in regards to the mine expansion.</i>	Metropolitan Coal is committed to ongoing consultation with RAPs, and the existing Heritage Management Plan would be updated to incorporate the Modification. Responses to comments regarding Cultural Values Assessments, potential listing of the Sydney Cultural Crescent Rock Art, significance assessment methodology and predicted impacts are provided above and have been considered in this ACHA, where relevant.



4 Archaeological context

4.1 Aboriginal Heritage Impact Management System (AHIMS) register

On the 28 January 2025, 3 AHIMS searches (AHIMS Client# 969315, 969324 and 969328) were undertaken to determine the presence of recorded Aboriginal sites and Aboriginal places within 500 m of the Subject Area. A total of 105 registered Aboriginal Cultural Heritage sites were identified in the searches, of which 28 were within the Subject Area (Figure 4). There were no Aboriginal Places identified. A copy of the AHIMS extensive search results is provided in Appendix C: AHIMS searches.

The frequencies of site types within the search area are consistent with regional trends identified during previous studies that encompass the wider region (Biosis Pty Ltd (Biosis), 2016, 2015, 2009a, 2009b, 2007a, 2007b; Department of Environment and Conservation [DEC], 2004; DECCW, 2005; Dibden, 2019; Navin Officer, 2000; Niche Environment and Heritage, 2020, 2019b, 2019c, 2018, 2014, 2011; Sefton, 1997, 1994, 1990). Sandstone outcropped ridgelines and deeply incised creek lines landforms dominate the Subject Area which as shaped occupation within the region over time. Ridgetops act as vantage points and sandstone ridgelines and outcropping in proximity to creeks and swamps are noteworthy locations for shelter sites, which Aboriginal archaeological objects and occupation and resource sites are identified within the regional area.

The majority of the Aboriginal cultural heritage sites within the Subject Area were originally recorded by the Illawarra Prehistory Group (IPG), between 1980 and 1990 during their systematic surveys of the Cordeaux, Woronora and Avon catchment areas, which included Honeysuckle Creek, Waratah Rivulet and their associated tributaries, and by ASRSYS.

The most common Aboriginal cultural heritage site type is Grinding Groove(s) (n=38), with the next most common being Shelter with Art (n=26) (Table 9). This summary provides an indication of known registered AHIMS Aboriginal cultural heritage sites within the regional context of the Subject Area. A copy of the AHIMS extensive search results is provided in Appendix C: AHIMS searches and a summary of the AHIMS Aboriginal cultural heritage sites within the Subject Area are provided in Table 10. A detailed description of registered AHIMS Aboriginal cultural heritage sites is provided in Table 10 and Section 1.1.

Relevant site card records are provided in Appendix C: AHIMS searches.

4.1.1 AHIMS limitations

There are several limitations to the AHIMS dataset. These limitations include the following:

- The status of the registered sites, whereby the status of the current site does not match the AHIMS database.
- Some datum and locational errors within the AHIMS dataset – particularly of sites with loci.
- Sites are presented as point data, not polygons, so site extents of PADs and large scatters are not conveyed.
- Sites that have not been registered in AHIMS.
- Sites registered in AHIMS are an indication of previous survey areas.



Table 9: Summary of AHIMS site features identified within the search area

Site type	Count	Percentage of total (%)*
Grinding Groove(s)	38	36
Shelter with Art	26	25
Shelter with Art and Artefact(s)	6	6
Shelter with Art and PAD	6	6
Shelter with PAD	6	6
Shelter with Art, Artefact(s) and PAD	5	5
Shelter with Artefact(s)	5	5
Isolated Find	3	3
Grinding Groove(s), Rock Engraving	2	2
Grinding Groove(s), Water Hole/Well	2	2
Grinding Groove(s) and Open Camp Site	1	<1
Artefact(s)	1	<1
Shelter with Deposit	1	<1
Open Camp Site	1	<1
Grinding Groove(s), Shelter with Art and PAD	1	<1
Rock Engraving	1	<1
Total	105	100

* Totals are rounded and may not equal 100%



Table 10: AHIMS Search Results within the Subject Area

AHIMS ID	Site name	Site type
52-2-0368	Blue Gum Forest Northern Trail (R) 49	Grinding Groove(s)
52-2-0369	Blue Gum Forest Northern Trail (R) 50	Grinding Groove(s)
52-2-0370	Blue Gum Forest Northern Trail (R) 51	Grinding Groove(s)
52-2-0371	Blue Gum Forest; NT(R) 53;	Grinding Groove(s)
52-2-0374	Blue Gum Forest; NT(R) 54;	Shelter with Art and PAD
52-2-0618	Woronora Reservoir Northern Trail 3	Shelter with Art and PAD
52-2-0619	Woronora Reservoir Northern Trail 4	Shelter with Art and PAD
52-2-0620	Woronora Reservoir Northern Trail 5	Shelter with Art
52-2-0621	Woronora Reservoir Northern Trail 6	Shelter with Art and Artefact(s)
52-2-0622	Woronora Reservoir Northern Trail 7	Grinding Groove(s)
52-2-0623	Woronora Reservoir Northern Trail 8	Grinding Groove(s), Rock Engraving
52-2-0624	Woronora Reservoir Northern Trail 9	Shelter with Art and PAD
52-2-0625	Northern Trail 10	Shelter with Art, Artefact(s) and PAD
52-2-0629	Woronora Reservoir Northern Trail 17	Grinding Groove(s), Water Hole/Well
52-2-0630	Woronora Reservoir Northern Trail 21	Grinding Groove(s)
52-2-0631	Woronora Reservoir Northern Trail 23	Shelter with Art, Artefact(s), and PAD
52-2-0633	Woronora Reservoir Northern Trail 25	Shelter with Art, Artefact(s) and PAD
52-2-0637	Woronora Reservoir; Northern Trail 30;	Grinding Groove(s)
52-2-0652	Northern Trail;52;	Grinding Groove(s), Water Hole/Well
52-2-0749	Woronora Reservoir; Northern Trail 20	Grinding Groove(s)



AHIMS ID	Site name	Site type
52-2-0751	Woronora Reservoir; Northern Trail 18;	Shelter with Art
52-2-0752	Woronora Reservoir; Northern Trail 14;	Grinding Groove(s)
52-2-0753	Woronora Reservoir; Northern Trail 12;	Grinding Groove(s)
52-2-0754	Woronora Reservoir; Northern Trail 13;	Shelter with Art and PAD
52-2-0755	Woronora Reservoir; Northern Trail 46;	Grinding Groove(s)
52-2-0758	Woronora Reservoir; Northern Trail 22;	Shelter with Art, Artefact(s) and PAD
52-2-3442	Northern Trail 80	Shelter with Art, Artefact(s) and PAD
52-2-3855	Northern Trail 87	Shelter with Artefact(s)

4.2 Other registers

Searches of the Australian World Heritage Database, the CHL, the NHL, the SHR, the State Heritage Inventory, the Wollongong City LEP (2009) and the Wollongong City and Development Control Plan's (2009) were conducted on the 6 April 2023 and 17 May 2024 (Table 11).

4.2.1 National Heritage Places

The Modification was referred to the Commonwealth Minister for the Environment and Water in January 2025 (EPBC 2025/10103) (the proposed action). A delegate of the Commonwealth Minister determined on 22 April 2025 that the proposed action is a "controlled action" and therefore, the action requires approval under the EPBC Act, including an assessment of potential impacts on National Heritage Places. The delegate considered National Heritage Places to be a controlling provision, prompting further assessment.

There are no listed National Heritage Places within the Subject Area for the Modification or its immediate vicinity. The nearest listed National Heritage Places are the Royal National Park and Garawarra State Conservation Area located east of the Princes Motorway, approximately 3 km from the Modification. As such, the Royal National Park and Garawarra State Conservation Area are not anticipated to experience any subsidence effects due to the Modification and there would be no impacts to Aboriginal heritage within the Royal National Park and Garawarra State Conservation Area.

4.2.1 Nominated National Heritage Site

The Sydney Cultural Crescent Rock Art has been nominated for inclusion on the NHL. The Sydney Cultural Crescent Rock Art is considered to have potential outstanding heritage value to the nation due the place's significant density of rock art over area of approximately 2 million hectares of eastern NSW. The proposed boundary would encompass the Subject Area

The nomination is being considered by the Australian Heritage Council and has yet to be determined. The potential listing has not been considered further in this assessment as there is limited available information and determination has not been reached.



Table 11: Listed heritage items in proximity to the Subject Area

Heritage register	Items within the Subject Area	Items within close proximity to the Subject Area
Australian World Heritage Database	None	None
CHL	None	None
NHL	None	None
SHR	Woronora Dam (SHR #01378)	
State Heritage Inventory	Woronora Dam is listed under the SHR register (SHR #01378)	– Lake Toolooma Dam pumping station (A4007) – Lake Toolooma Dam (A4006) – Pair of semi-detached houses (4001) – Community cottage (A4004) – Watertank (A4005) – Waterfall General (Garrawarra) Cemetery (61028) – Garrawarra Hospital—including Gates, Gatehouse, admin Bldg, kitchen, store Block, staff Cafe, nurses Hostel & Res Houses (6486) – Brownsville—Hore Street, Prince Edward Drive and Brownsville Avenue
State Heritage and Conservation (section 170)	None	None
Schedule 5 of the Wollongong LEP	None	– Waterfall General (Garrawarra) Cemetery (61028) – Garrawarra Hospital—including Gates, Gatehouse, admin Bldg, kitchen, store Block, staff Cafe, nurses Hostel & Res Houses (6486) – Brownsville—Hore Street, Prince Edward Drive and Brownsville Avenue
Development Control Plan - Wollongong City	None	None



4.2.2 Woronora Dam (SHR #01378)

The Code of Practice requires searching the State Heritage Inventory as part of Requirement 1b. This is because Aboriginal cultural heritage is ongoing and not limited to a specific timeframe. Our examination of supplementary registers reveals that Woronora Dam is listed in the SHR and is partially situated in the northeast section of the Subject Area. The boundary of the Woronora Dam includes the Dam wall and reservoir. The current scope of this ACHA does not involve assessing the impact of the proposed works on this heritage-listed items as the listing values have no Aboriginal cultural significance.

4.3 Previous archaeological assessments of the Subject Area

Due to the environmental and cultural significance and ongoing mining activity within the Subject Area and immediate surroundings, several heritage assessments have been previously undertaken. This has resulted in a collection of reports on the Aboriginal cultural heritage values of the Subject Area (IPG, 2010; Kayandel Archaeological Services, 2008; Niche, 2024, 2020b, 2020c, 2019a, 2018b, 2017, 2016) and is detailed in Table 12 below.

The studies below have been reviewed because they are near to and/or within the Subject Area and located within the same and/or similar landforms and/or environments to the Modification. Reviewing previous archaeological reports and assessments assists in the consideration of various aspects of harm, avoidance and mitigation to Aboriginal heritage site within the Subject Area.

Table 12: Previous archaeological assessments within and near the Subject Area

Author and year	Distance from Subject Area (approximate km)	Title and description
Niche (2024)	0 km	Longwalls 311 to 316 Metropolitan Colliery - Aboriginal Heritage Baseline Recording This report presents the baseline recording of 36 Aboriginal heritage sites undertaken by Niche for sites located within 600 m of Longwalls 311 to 316. These sites were previously reported on in the ACHA prepared by Kayandel Archaeological Services (2008) to support the Metropolitan Coal Project Environmental Assessment.
Niche (2020b)	1 km	Baseline Recording Longwalls 310 to 312 Metropolitan Colliery This report presents the baseline recording of 13 Aboriginal heritage sites by Niche in September 2018 for Longwalls 310 to 312 and surrounds. In accordance with Condition 7, Schedule 3 of the Project Approval (08_0149), and as required by the Metropolitan Coal Longwall 304 Heritage Management Plan, these sites have been subject to baseline recording. In accordance with Condition 2, Schedule 7 of Project Approval (08_0149), the baseline data will inform the Metropolitan Coal Heritage Management Plans prepared in relation to Longwalls 308 on.



Author and year	Distance from Subject Area (approximate km)	Title and description
Niche (2020c)	2.4 km	Monitoring of Aboriginal Cultural Heritage Sites Longwall 304 Metropolitan Coal Mine This report details the results of the Longwalls 304 Aboriginal heritage sites monitoring survey following the completion of Longwall 304 at the Metropolitan Coal Mine, conducted in accordance with the Metropolitan Coal Longwall 304 HMP. Aboriginal cultural heritage site monitoring for Longwalls 304 included 6 sites and found that site FRC 76 did not show any further mining impacts from those observed during Longwalls 301-303 monitoring survey. The Art Panels at this site have not been affected by subsidence impacts. And there were no observable impacts from mining induced subsidence at sites FRC 77, FRC 78, FRC 86, FRC 90 and FRC 309.
Niche (2019a)	2.6 km	Metropolitan Coal Longwall 301-303: Monitoring of Aboriginal Heritage Sites This report details the results of the Longwalls 301-303 Aboriginal heritage sites monitoring survey following the completion of Longwall 303 at the Metropolitan Coal Mine, conducted in accordance with the Metropolitan Coal Longwall 304 HMP. The Aboriginal cultural heritage monitoring for Longwalls 301-303 included 8 sites, and found previously recorded changes due to mining induced subsidence at sites FRC 28, FRC 29, FRC 34, FRC 60, FRC 117 and FRC 176 was observed, however no further changes from the extraction of Longwalls 301-303 were observed. New changes due to mining induced subsidence were recorded at site FRC 76, however these changes have not affected Art Panels this site (i.e. site FRC 76 has not been affected by subsidence impacts).
Niche (2018b)	2 km	Longwalls 304 to 306 Metropolitan Coal Mine Baseline Recording This report presents the baseline recording of 22 Aboriginal heritage sites by Niche in September 2018 for Longwalls 304 to 306 and surrounds. In accordance with Condition 7, Schedule 3 of the Project Approval (08_0149), and as required by the Metropolitan Coal Longwalls 301-303 HMP, these sites have been subject to baseline recording prior to secondary extraction of Longwall 304 at the Metropolitan Coal Mine, located near Helensburgh, NSW.



Author and year	Distance from Subject Area (approximate km)	Title and description
Niche (2017)	0.8 km	Metropolitan Coal Longwalls 23-27 Round 5 Monitoring of Aboriginal Heritage Sites This report details the fifth round (Round 5) of the Longwalls 23-27 Aboriginal heritage sites monitoring following the completion of Longwall 27 at the Metropolitan Coal Mine. The monitoring was conducted in accordance with the Metropolitan Coal Longwalls 23-27 HMP. Round 5 heritage site monitoring for Longwalls 23-27 included 52 sites, and found there were changes due to mining noted at FRC 28, FRC 29 and FRC 60 during this round of monitoring, however these changes have not affected the art at each of the sites. Changes due to mining noted at FRC 34 have affected a hand stencil at the site. Further changes due to mining at sites were noted during previous monitoring rounds.
Niche (2016)	0.8 km	Metropolitan Coal Longwalls 23-27 Round 2 Monitoring of Aboriginal Heritage Sites This report details the second round (Round 2) of the Longwalls 23-27 Aboriginal heritage sites monitoring following the completion of Longwall 24 at the Metropolitan Coal Mine. The monitoring was conducted in accordance with the Metropolitan Coal Longwalls 23-27 HMP. Round 2 heritage site monitoring for Longwalls 23-27 included 35 sites, and found that there were changes not due to mining at FRC 24.1 during this monitoring and no further changes due to mining at sites noted during previous monitoring rounds.
Illawarra Prehistory Group (2010)	0 km	Archaeological survey of the western catchment of Waratah Rivulet from Fire Road 10B to the junction with the Woronora River The Illawarra Prehistory Group undertook a survey of the Woronora Catchment between September 2006 and December 2007. This report presents the results of this survey and compares the results with a survey undertaken in the 1970's by the IPG. The report also includes areas surveyed by Caryll Sefton for professional reasons. This report focuses on the western drainage of Waratah Rivulet bounded by the northern drainage into Waratah Rivulet from Fire Road 9H to the junction with the Woronora River. The survey identified 100 sites in an area of approximately 18 square kms, resulting in a density average of 6 sites per square km.



Author and year	Distance from Subject Area (approximate km)	Title and description
Kayandel (2008)	0 km	Aboriginal Cultural Heritage Assessment Metropolitan Coal Project, Metropolitan Colliery, Helensburgh, NSW Kayandel completed an ACHA for the Metropolitan Coal Project including the continuation and expansion of the Metropolitan Colliery. Kayandel was commissioned by HCPL, a wholly owned subsidiary of Peabody Pacific Pty Ltd, for this assessment as part of an Environmental Assessment of the project under Part 3A of the EP&A Act. This assessment focused on Longwalls 14 – 17 and Longwalls 18 – 19A. The ACHA identified 188 Aboriginal heritage sites within its study area, including 142 sandstone overhangs and 46 open sites. Based on the identification of these 188 Aboriginal heritage sites it was recommended by Kayandel that an Aboriginal Cultural Heritage Management Plan be developed in consultation with representatives of the Aboriginal community,

The Subject Area has been the focus of many intensive archaeological surveys over the last two decades (Biosis, 2009a, 2007a, 2004; IPG, 2010; Kayandel Archaeological Services, 2008; Niche, 2022a, 2022b, 2021a, 2021b, 2021c, 2021d, 2019d). The main issues dealt with by these studies have been questions of the presence or absence of sites, the broad characterisation of where sites occur in the landscape, and the monitoring of sites for subsidence.

4.4 Previous heritage assessments of the wider region

The broader region of the Woronora Plateau would have been a relatively rich and diverse resource area for Aboriginal people in the past, but modifications such as farming and residential developments are likely to have disturbed large areas containing archaeological materials. The preservation of the Upper Nepean catchment areas for water storage has conserved the natural environment from major modification, resulting in the preservation of many Aboriginal cultural heritage sites.

A description of past archaeological assessments within the wider surrounds (Biosis, 2016, 2015, 2009a, 2009b, 2007a, 2007b; DEC, 2004; DECCW, 2005; Dibden, 2019; Navin Officer, 2000; Niche, 2020a, 2019b, 2019c, 2018a, 2014, 2011; Sefton, 1997, 1994, 1990) is provided in Table 13. The Aboriginal occupation in the region is demonstrated through several archaeological excavations that have been undertaken in the region surrounding the Subject Area.



Table 13: Regional heritage assessments

Author and year	Title and description of relevance to the Subject Area
Sefton (1990)	1989-1990 Archaeological Survey of the Cordeaux River and Woronora River by the IPG An assessment of the Cordeaux and Woronora Rivers was completed with a grant received from the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS). Sefton (1990) provided useful statistical data about the site types and art techniques within the Upper Nepean region. A total of 87 Aboriginal cultural heritage sites were located during this assessment, including previously recorded and newly identified sites. The most common site types were shelters (n= 58) and grinding grooves (n= 29). The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
Sefton (1994)	1993-1994 Archaeological Survey of the Avon River by the IPG An assessment of the Avon River in the Avon Catchment Area was completed with a grant received from the AIATSIS. -The surveys focused on sandstone outcrops and located shelters (n= 53), grinding grooves (n= 13), stone arrangements (n= 2) and an engraving (n= 1). The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
Sefton (1997)	1996-1997 Archaeological Survey of the Avon River by the IPG An assessment of the western section of the Avon River between the Illawarra Escarpment and the confluence with the Nepean River was completed with a grant received from the AIATSIS. The surveys located shelters (n= 104), grinding grooves (n= 19), stone arrangements (n= 6) and engravings (n= 2). Of the 104 shelters, 82 contained art and 50 contained stone tools. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.



Author and year	Title and description of relevance to the Subject Area
Navin Officer (2000)	Dendrobium Coal Project: Cultural Heritage Assessment Assessments of Longwall Areas 1-3, Nebo Colliery, Kemira Colliery and West Cliff Colliery were undertaken for the Dendrobium Coal Project. The surveys focused on areas that were considered to have the highest archaeological significance within the impact area. The surveys located previously recorded sites (n= 19) and newly identified sites (n= 11). The sites surveyed included shelters with art, shelters with art and artefacts, shelters with art and artefacts and PAD, artefact scatters, stone arrangements and an isolated find. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
DEC (2004)	Aboriginal Women's Heritage: Wollongong This resource is a collection of Dharawal Women's oral history from local Elders that have recalled lore, cultural practices, resource gathering and a struggle for land and civil rights within the Illawarra. This resource supports archaeological finds and can be used as a basis for predictive modelling. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
DEC (2005)	A History of Aboriginal People of the Illawarra 1770 to 1970 This document references archaeological and ethnographic sources for the Illawarra region. This resource provides information on tribal boundaries, language, and occupation of Aboriginal people within the Illawarra prior to and post-colonisation. It also describes local tools and land use activities that have been identified in the archaeological record. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
Biosis (2007a)	West Cliff Colliery Stage 3 Coal Wash Emplacement Archaeological and Cultural Heritage Assessment An assessment was undertaken by Biosis as part of the proposed Stage 3 West Cliff Colliery Coal Wash Emplacement works. A two-week systematic block survey of the emplacement area and sample transects of other locations within the colliery was completed. All previously recorded sites within the surveyed areas were revisited and five new sites were identified. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.



Author and year	Title and description of relevance to the Subject Area
Biosis (2007b)	Dendrobium Area 3 Archaeological and Cultural Heritage Assessment An assessment of Dendrobium Areas 3A, 3B and 3C mining areas was undertaken and located 65 sites, of which, 18 were located within the 3C domain (the current Subject Area). The sites located within the 3C domain include shelters with art (n= 12), shelters with artefacts/deposits (n= 2), grinding grooves (n = 2), artefact sites (n = 1) and a stone arrangement (n = 1). The survey indicated that the most suitable sandstone overhangs occur within the steep scarps and gorges of the Hawkesbury land system, usually associated with Wongawilli Creek and its immediate tributaries. Sites were plotted against their slope class to assess the relationship between slope, and archaeological site distribution. Moderate to steep slopes (20 – 35 degrees slope gradients) where suitable overhangs for occupation occur, were most heavily utilised while very steep slopes and lower gradients were utilised less. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
Biosis (2009a)	Bulli Seam Operations Aboriginal Cultural Heritage Assessment Biosis was commissioned by BHP Group Limited Billiton-Illawarra Coal to conduct an ACHA for the proposed Bulli Seam Operations Project. During this assessment a total of 632 previously recorded and 44 newly identified sites were surveyed. Previously recorded sites included grinding grooves/engravings (n= 173), sandstone shelters with art/ grinding grooves/engraving/deposit (n= 240), sandstone shelters with deposit only (n= 33), artefact sites (n= 100), scarred trees (n= 8) and PADS (n= 78). Newly identified sites included grinding grooves/engravings (n= 11), sandstone shelters with art/grinding grooves/engraving/deposit (n= 19), sandstone shelters with deposit only (n= 2) and artefact sites (n= 12). The survey methodology for this assessment included a targeted survey of previously recorded AHIMS sites and associated ridgelines. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
Biosis (2009b)	Cultural Heritage Assessment: Proposed Exploration Program Dendrobium Area 3A and 3C – Survey 6 This assessment was completed as part of a Review of Environmental Factors (REF) for a proposed exploration program in Dendrobium Areas 3A and 3C. The entire lengths of the seismic lines and a 30 m radius around proposed borehole locations were surveyed. No new sites were identified; however, areas of Aboriginal archaeological sensitivity at sandstone overhangs and rocky outcrops were reported. Poor ground surface visibility due to thick vegetation cover was noted as inhibiting the identification of open stone artefact sites. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.



Author and year	Title and description of relevance to the Subject Area
Niche (2014)	Longwall 9 End of Panel Monitoring Assessment A site assessment and review were undertaken on the predicted and observed impacts of coal extraction at sites and their associated values in Longwall 9, Dendrobium Area 3B. It was concluded that minor cracking occurred at Dendrobium 1 (AHIMS ID# 52-2-2208) as a result of subsidence-related movements. The four other sites in the area had not been impacted by subsidence-related movements. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
Biosis (2015)	Longwall 10 End of Panel Monitoring Assessment An assessment of Longwall 10 was undertaken, including an inspection of shelters with deposits (n= 2). Visual Inspections for Dendrobium 1 (AHIMS ID# 52-2-2208) and DM2 (AHIMS ID# 52-2-3878) concluded that no changes had occurred to DM2 (AHIMS ID# 52-2-3878), however, Dendrobium 1 (AHIMS ID# 52-2-2208) had minor expansion and extension of vertical cracking in horizontal bedding plane. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
Biosis (2016)	Longwall 11 End of Panel Monitoring Assessment An impact assessment within 400 m of Longwall 11 was undertaken, including a visual inspection of Browns Road Site 12 (AHIMS ID# 52-2-1627) and Dendrobium 2 (AHIMS ID# 52-2-2209) to determine any subsidence impacts as a result of the longwall extraction. No impacts were observed for any Aboriginal cultural heritage sites. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
Niche (2011-2020b)	Dendrobium Exploration REF: Aboriginal Cultural Heritage Due Diligence Assessments. On behalf of IMC Mining Pty Ltd, Niche has completed several exploration REFs. These exploration works comprise seismic lines and exploration borehole works. These assessments have been carried out within Dendrobium Mine Areas. The assessment for these works included assessing all ridgelines and creek beds within proximity to the proposed works and relocating works within 100 m of AHIMS-registered Aboriginal sites. Throughout these investigations, there have been not previously unregistered AHIMS sites identified. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.



Author and year	Title and description of relevance to the Subject Area
Niche (2018a)	Dendrobium Colliery Longwall 13 End of Panel Report - Aboriginal Heritage Assessment A site assessment and review were undertaken of the predicted and observed impacts on Aboriginal cultural heritage sites and their associated values resulting from the extraction of coal at Longwall 13 at Dendrobium Colliery. It was concluded that none of the five Aboriginal cultural heritage sites were impacted by subsidence-related movements. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
Niche (2019b)	Dendrobium Colliery Longwall 14 End of Panel Report - Aboriginal Heritage Assessment A site assessment and review were undertaken of the predicted and observed impacts on Aboriginal cultural heritage sites and their associated values resulting from the extraction of coal at Longwall 14 at Dendrobium Colliery. This assessment concluded that Browns Road Site 11 (AHIMS ID# 52-2-1626) and Site 1 DB 1 (AHIMS ID# 52-2-2229) had been impacted by subsidence-related movements caused by mining. Three other Aboriginal cultural heritage sites located within the area of assessment had not been impacted. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
Niche (2019c)	ACHA: Dendrobium Mine - Plan for the Future: Coal for Steelmaking An assessment was undertaken for proposed underground mine extensions in Dendrobium Mine Area 5 and 6 domains. A total of 58 Aboriginal cultural heritage sites were identified within the areas, including 6 newly identified sites and 32 previously recorded sites. The locations of three sites identified on AHIMS could not be confirmed during the assessment. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.



Author and year	Title and description of relevance to the Subject Area
Dibden (2019)	Drawing in the land: Rock Art of the Upper Nepean, Sydney Basin New South Wales Dibden's study offers an analysis of rock art in the Nepean region. The text examines the landscape in connection with the material archaeology and insight into the philosophy in an attempt to understand the habitual mode that has led to the shelter with art site type dominating the archaeological record. Dibden examined two sets of data: one referencing 110 rock shelters and one referencing 700 open context and rock shelter sites. The data revealed that almost half the grinding groove sites and 54% of grooves recorded in the Upper Nepean are in the Cataract catchment. Engraved rock art is associated with some of these sites and includes the only engraved macropod and emu motifs in the Upper Nepean catchment. There are 160 shelters with art sites in the Cataract. There are 114 shelters with art in the Cordeaux, 140 in the Avon and 95 in the Nepean. Further statistics on the motifs, techniques and spatial distribution are provided in the study. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.
Niche (2020a)	Dendrobium Colliery Longwall 15 End of Panel Report - Aboriginal Heritage Assessment A site assessment and review were undertaken of the predicted and observed impacts on Aboriginal cultural heritage sites and their associated values resulting from the extraction of coal at Longwall 15 at Dendrobium Colliery Area 3B. This assessment concluded that DM 21 (AHIMS ID# 52-2-2229) had been impacted by subsidence-related movements caused by mining and Browns Road Site 11 (AHIMS ID# 52-2-1626) experienced further impacts from those identified during the Longwall 14 monitoring. The results of this study are of relevance to the current Subject Area as they contribute to the archaeological record of the region and assist in establishing a predictive model for the nature and distribution of Aboriginal sites.



4.5 Predictive model

A predictive model which encompasses the Subject Area has been developed (Biosis, 2007b, 2009b). The purpose of archaeological models is to assist in the prediction of what Aboriginal cultural heritage sites may be present in the landscape and where they might be located. The predictive model developed for the Subject Area included consideration of previous archaeological surveys and assessments undertaken within the Subject Area and the local and wider surrounds, the distribution and patterning of known sites within the Subject Area and surrounds, the landform units and landscape context of the Subject Area, and the previous known land uses within and surrounding the Subject Area. Due to the rugged nature of the Hawkesbury Sandstone landscape, many of the sites suitable for Aboriginal occupation and transient use comprise sandstone overhangs.

A summary of the known Aboriginal cultural heritage sites listed in the AHIMS database is provided in Section 5.4 and the complete AHIMS search results are listed in Appendix C: AHIMS searches of the ACHA.

Based on the AHIMS results and Biosis' predictive model, the following sites are likely to occur within the Subject Area:

- Sandstone shelters or rock overhangs with archaeological deposits, art, and/or artefacts are the most common site type within the region and are the most likely to occur within the Subject Area.
- Sandstone shelters and rock overhangs are associated with steep slopes and ridgelines present along reservoirs, creeks, and associated tributaries.
 - Art mediums will most likely consist of charcoal with red and white ochre being less common likely due to restrictions of the resource.
 - Art motifs are likely to reflect a representation of the utilisation of inland resources, such as eels, fish, and macropods.
- Grinding groove sites represent another common site type in the region and there is high potential they also occur within the Subject Area:
 - Grinding grooves will most likely occur on sandstone outcrops associated with drainage lines, swamps, creek lines and riverbeds.
 - The bulk of grinding groove sites will contain fewer than 50 grinding grooves.
 - Grooves will generally be between 25 cm and 50 cm in length, 5 cm to 8 cm in width and between 2 cm and 5 cm in depth and represent the sharpening or preparing of ground-edge hatchets or fire-hardened points.
- Stone arrangements, although rare, may be located within the Subject Area. This type of site can include mounds of rocks for burial, markers, mythological sites, or areas of spiritual connection. There is one stone arrangement, Sandy Creek Road 1 Stone Arrangement (AHIMS ID# 52-2-0535), which has been previously identified within the wider landscape, at least 27 km southwest of the Subject Area.
- Stone tools, including artefact scatters and isolated artefacts, although rare, may be located within the Subject Area. This type of site can range from isolated stone tool artefacts to sparse low-density scatters. There are 4 open artefact sites that were previously identified within the wider landscape.
- Scar trees, although rare, may be located within the Subject Area. This type of site involves the cultural modification of trees for various tools and resources, including but not limited to sap collection for tanning material, native honey collection, and bark removal to create coolamons, canoes, and shields. There are no scar trees identified within proximity to the Subject Area.

Further discussion regarding the most common site types in the region (shelters and grinding grooves) is provided below.



4.5.1 Shelter sites

Thirty-nine of the registered AHIMS sites identified within the AHIMS search results (i.e. within 500 m of the Subject Area) comprise sandstone shelter sites that have either one or a combination of PAD and/or art. The Hawkesbury sandstone of the Subject Area lends itself to this site type to be used by past Aboriginal peoples for artistic expression, occupation, and transient use. These site types are significant to the local Aboriginal community as they evidence the past occupation of the area and can be used as an educational tool for younger generations.

A total of 20 shelters with Art sites were identified within the AHIMS search results (i.e. within 500 m of the Subject Area). As identified in previous assessments, the most common type of expression is charcoal outline/infill (Biosis, 2007b, 2009b). Such sites have previously been identified within the areas surrounding Dendrobium Area 3B (Biosis, 2007b) and Helensburgh (Kayandel Archaeological Services, 2008). Analysis of each Aboriginal cultural heritage site located within the Subject Area has been further discussed in Section 5.6 of this report.

Whilst the Subject Area is not large enough to detect major trends in motif types, several of the motif types have previously been observed during assessment within the landscape. Sefton suggests that in the area surrounding Avon and Cordeaux Dams, human motifs are relatively more frequent than in the remainder of the region (Sefton, 2000, 1998, 1997, 1994, 1990; Sefton and Group, 1991). This trend is representative of the sample reflected in the Subject Area.

There are 8 Shelter with PAD sites identified within the AHIMS search area (i.e. within 500 m of the Subject Area). A Shelter with PAD describes a naturally formed sandstone overhang with stone artefacts located within the rock ledges or shallow sandy floor deposit areas. Stone artefacts are commonly found within the Upper Nepean catchment and are reflective of the available stone resources such as quartz, petrified wood and other materials traded from distant locations such as chert and silcrete.

4.5.2 Grinding groove(s) sites

At least 45 Grinding Groove(s) sites are located within the AHIMS search results (i.e. within 500 m of the Subject Area) and are a common site type within the broader region of the Woronora Plateau. This can be attributed to the landforms within the Hawkesbury Sandstone landscape that commonly feature large areas of sandstone plateau and large rivers and creeks with sandstone beds suitable for use for the making and sharpening of stone tools through the process of grinding. These sites are typically associated with water beds and rock platforms on creeks, but not always. These sites hold significance to the local Aboriginal community as evidence of past occupation and use of the Subject Area as well as an educational tool for younger generations.

4.5.1 Slope analysis

The following slope model was created using local geographic data across the Subject Area (Table 14). Aboriginal cultural heritage sites were overlaid onto this slope model and the following site distribution model across slopes was able to be generated.

The slope types used in Figure 7 and the respective gradient ranges are outlined below in Table 14.



Figure 7: Landforms (Source: Peabody, DPE and Niche)

Not included in this version



Table 14: Slope types

Type	Slope (degrees)
Level	0 - 0.35
Very gently inclined	0.35 - 1.45
Gently inclined	1.45 - 5.45
Moderately inclined	5.45 - 18
Steep	18 - 30
Very steep	30 - 45
Precipitous	45 - 72
Cliffed	72 - 90

Of the sites located within the area covered by the slope model, the same frequency model that was presented by Biosis can be identified (Biosis, 2007b). Majority of the sites are located on slopes between 5.45-30 degrees (Figure 7).

This predictive model accounts for the lower density of sites located above Longwalls 317-318, which is characterised predominantly by slopes between approx. 1-20 degrees. Most of the sites within the Modification Subject Area are concentrated along the steep slopes of the main ridgeline and gully areas which surround Honeysuckle Creek (Figure 7).



5 Field survey

5.1 Survey strategy

The purpose of the field survey was to assist in the identification of cultural heritage values and to record a representative sample of the material traces and evidence of Aboriginal land use in accordance with the Code of Practice. This includes evidence that is visible at or on the ground surface, exposed in sections or visible as features, and to identify those areas where it can be inferred that, although not visible, material traces or evidence of Aboriginal land use have a likelihood of being present under the ground surface (PADs) (DECCW 2010b).

The aim of the survey was to:

- inspect the Subject Area for the presence of any new Aboriginal cultural heritage sites.
- ground truth previously recorded Aboriginal cultural heritage sites within the Subject Area.
- collect further information on the Aboriginal cultural heritage values of the Subject Area.

The landscape and environment of the Subject Area consists of exposed plateau surfaces, convex ridges and very low rolling rises on exposed Hawksbury Sandstone coastal headlands and rolling and rugged hills to very steep sandstone escarpments. A targeted survey strategy was developed in consideration of the predictive model to focus survey effort on landforms within the Subject Area with higher archaeological potential, including open depressions, drainage lines, slopes, ridges, and adjacent slopes (Section 4.5).

The survey strategy involved inspecting the steep slopes off the main ridgeline and gully areas which surround Honeysuckle Creek and other drainage lines within the Subject Area. This included sandstone features such as scarps, boulders, overhangs, shelters and benches. All areas of outcropping sandstone features that were deemed to be greater than one metre in area or volume were inspected, especially those above escarpment areas and ridge or crest areas. Table 15 below describes each of the landform elements within the Subject Area.

5.2 Survey methodology

The Subject Area was inspected on foot from 30 January – 2 February and 25 September 2024. The list of fieldwork participants is provided in Section 3.2.2. As per the recommendations from RAPs, a mixture of male and female consultant representatives was arranged, with two Archaeologists and at least three RAPs as part of the survey team (Section 3). The survey targeted sensitive areas along drainage lines, ridges and crests with 5 m – 10 m intervals between team members depending on terrain and vegetation, meaning the average survey transect width was approximately 50 m. As noted above the survey was focused on discovering and assessing Aboriginal cultural heritage features associated with sandstone geology, such as rock shelters and rock platforms with grinding grooves. These features are highly obtrusive parts of the landscape, which results in overall effect survey coverage compared to open sites containing stone artefacts.

Site recording included photography of Aboriginal objects, sites, landscape features and disturbance, Global Positioning System (GPS) recording of site boundaries, concise written details of site features, size, position in the landscape, and condition, as well as documentation of any knowledge about the places, objects, or stories provided by the RAPs. Additionally, a cultural perspective for each site was recorded. These cultural perspectives were added to previously recorded and newly recorded Aboriginal cultural heritage sites. Many previously recorded sites have historically been recorded from solely a scientific perspective by organisations with no or minimal Aboriginal cultural knowledge.



Table 15: Definition of landforms withing the Subject Area

Survey unit	Landform element (based on morphology)		Definition (Speight, 2009)
Niche Survey 2024 for the Modification	Flat		A planar landform element that is neither a crest nor a depression and is level or very gently inclined (<3% tangent approximately).
	Slopes	Lower slope	A waning slope, below a mid-slope and adjacent above a flat or depression.
		Mid-slope	A slope element that is not adjacent below a crest or flat and not adjacent above a flat or depression. Hence it is mid-way between the lowest point in the landscape and the highest point in the landscape.
		Upper slope	A slope element adjacent below a crest or flat but not adjacent above a flat or depression.
	Drainage line		The channel of a creek/watercourse.
	Ridge or crest		A compound landform element that stands above all, or almost all, points in the adjacent terrain comprising a narrow crest and short adjoining slopes, the crest length being greater than the width of the landform element.

The site inspection program involved the following:

- Recording relevant information including landform type, existing environment, and level of disturbance throughout the Subject Area, particularly in relation to any identified Aboriginal places or objects.
- A detailed photographic record of each of the Aboriginal cultural heritage sites.
- Recording the location of artefacts and features using a hand non-differential GPS unit.
- Detailed scaled plans of each site including physical characteristics and features.
- Detailed information regarding the dimensions, composition, and features of the site.
- A discussion of site conditions with RAPs and a record made of all comments and recommendations provided by RAPs during the site inspection with reference to individual sites.
- Justification for who and how many representatives participate in the field survey is the decision of the Proponent. The number of participants will be commensurate with the scope of the Modification.
- Any feedback regarding the cultural values of the Subject Area during the survey is presented in Section 3.2.2.



5.2.1 Sensitive cultural information management protocol

During the consultation process, Niche provided the opportunity for RAPs to provide cultural information, including a statement of value to identified sites and other matters. The input points for this information however were accepted at any point during the Modification or prior to the finalisation of the ACHA report.

Niche sought cultural information and supporting evidence regarding matters of cultural value. If a RAP has sensitive or restricted public access information, it is proposed that Niche managed this information (if provided by the Aboriginal community) in accordance with a sensitive cultural information management protocol. It is anticipated that the protocol will include making note of and managing the material in accordance with the following key limitations and as advised by Aboriginal people at the time of the information being provided. Considerations in reference to sensitive cultural information may include:

- Any restrictions on access to places or information, particularly in relation to gender-specific area access.
- Any restrictions on the communication of cultural information provided by the RAPs. If desired, this information can be incorporated into the project design and recommendations to the client regarding necessary areas of avoidance without specific written or verbal provision of the culturally sensitive information.
- Any restrictions on the storage or dissemination of cultural and/or personal information.
- Any cultural recommendations on handling the material.
- Any names and contact details of persons authorised within the relevant Aboriginal group to make decisions concerning the Aboriginal material and degree of authorisation.
- Any details of any consent given in accordance with customary law.

5.3 Survey results

5.3.1 Survey conditions

The survey sampled a range of landforms present within the Subject Area, including open depressions, drainage lines, slopes, ridges, and adjacent slopes in line with the intended sampling strategy and methodology presented in Section 5.1. The survey inspected all areas of ground surface exposure that were encountered, as these areas are most likely to reveal any Aboriginal stone objects that may be present.

Ground Surface Visibility (GSV) was generally low (10-20%), due to overgrown and dense trees, as well as low-lying vegetation, with areas of exposure from rock outcrops along the terrain, near drainage lines and fire trails (Plate 3 – Plate 8). However, GSV and Ground Surface Exposures (GSE) increased in areas along existing fire trail access roads and along rock outcrops along rivers, slopes, and ridges in the Subject Area.

Overall, GSV and GSE were typically very low across the Subject Area (<10%), with GSE limited to areas associated with the existing fire trail access roads and along rock outcrops along rivers, slopes, and ridges. Drainage lines were surveyed and exposed stone was inspected for grinding grooves.

5.3.2 Survey limitations

The majority of the Subject Area possessed very low visibility (Plate 3-Plate 8), as it is covered by dense woodland and open forest with some areas of tall open forest, and rainforest within the sheltered gullies. The dense vegetation that is present within the Subject Area caused limitations with tracking any new sites apart from along drainage lines in the Subject Area. Despite the limited archaeological visibility within the Subject Area during the survey works, 29 Aboriginal cultural heritage sites (comprising 26 existing known sites and 3 new sites), were identified across the landscape, particularly in areas in which exposure and higher visibility occurred (Figure 8).



5.3.1 Survey coverage

Previous surveys of the area (Kayandel Archaeological Services, 2008; Niche, 2024) involved a targeted survey of landforms with the highest archaeological potential and a transect survey of predetermined areas. The Code of Practice specifies requirements for recording survey coverage data during archaeological assessments. Previous studies in the Woronora area have not typically relied on these requirements, and rather, as with the survey methods, focus instead on the investigation of rock shelters, which are an obtrusive component of the record. For this reason, measures of archaeological visibility and exposure aimed at understanding surface and sub-surface stone artefact distribution are typically not informative in the Woronora landscape. The visibility and site obtrusiveness on the Woronora Plateau and Illawarra Escarpment need to be considered when determining the locations of sandstone rock shelters and overhang sites. Since those areas are characterised by heavily vegetated areas, such sites are likely to be detected and inspected during the survey (Biosis, 2007b, p. 60; Navin Officer, 2000, pp. 49-50).

As a result of previous archaeological surveys, the survey unit coverage was defined by the Subject Area boundary and landform boundary, as per Requirement 5c of the Code of Practice.

Characteristically the steep terrain of the Subject Area contains numerous Aboriginal cultural heritage sites that have been identified within specific areas by previous survey efforts (IPG, 2010; Kayandel Archaeological Services, 2008; Niche, 2024, 2020a, 2020b, 2019a, 2018a, 2017, 2016). This provides confidence that the nature and character of the archaeological record and potential of the Subject Area has been adequately characterised. Approximately 3% (13.4 ha) of the Subject Area has been subject to previous archaeological survey as part of previous investigations and baseline recording programs by Niche (refer to Section 4.3 and 4.4). The survey coverage for this ACHA added an additional 6% (26.7 ha) of survey effort to the Subject Area. As such, approximately 9% (40.2 ha) of the Subject Area has been subject to surveys which have informed this ACHA. It is important to note that previous survey coverage from other archaeological surveys in the area is unknown and could potentially increase the survey coverage if known.

The survey coverage within the Subject Area is shown in Figure 8. It should be noted that survey tracks represent one of the Niche heritage consultants in attendance on each day. The Aboriginal heritage sites located within the area subject to previous surveys as part of the Longwalls 311-316 baseline recording were not revisited as part of the ACHA surveys; however, 15 Aboriginal cultural heritage sites within this area were revisited during a separate survey of the area during a program of baseline recording in 2023 (Niche, 2024).

The ACHA survey was completed over 4 days, from 30 January to 2 February 2024 and 25 September 2024. Surveys identified that there was very limited visibility to detect stone artefact sites across the majority of the Subject Area due to dense low grasses. However, the primary focus of the survey were previously recorded sites, and targeted landforms and areas of exposure where highly obtrusive and typical of the sandstone environment Aboriginal heritage sites were located: rock shelters and rock platforms. From the point of view of these typical and highly obtrusive sites the survey coverage, combined with the previous survey efforts, was effective.

A summary of the survey coverage across the survey units is provided in Table 16.



Figure 8: Survey Results (Source: Peabody, DPE and Niche)

Not included in this version



Plate 3: Example of low visibility and isolated exposures from rock outcrops on a sloped landform, facing West.



Plate 4: Example of low visibility due to dense vegetation within the Subject Area, facing North.



Plate 5: View of Honeysuckle Creek (within Northern Trail 50 [AHIMS ID# 52-2-0369]). Looking South.



Plate 6: General landscape shot of upland swamp terrain causing low visibility and low exposures during the survey, facing North.



Plate 7: General landscape shot of open woodland areas encountered during the survey. Looking Southeast.



Plate 8: General landscape shot of exposed Fire trail surfaces (Fire trail 9e) encountered during the survey. Looking Southwest.



Table 16: Survey coverage

Survey unit	Landform	Survey unit area (ha)	Visibility (%)	Exposure (%)	Effective Survey Area (ha)	Actual surveyed area (ha)			Actual survey coverage (%)	Number of Aboriginal sites
						ACHA surveys	Previous surveys	Total		
Survey Unit 1	Drainage lines	142.1	10	10	1.4	12.9	3.1	16.0	11.2	29 Aboriginal cultural heritage sites
Survey Unit 2	Ridgeline	69.6	10	10	0.7	2.0	2.3	4.3	6.2	None
Survey Unit 3	Crest	8.0	10	10	0.1	1.0	0.4	1.3	16.9	None
Survey Unit 4	Flat	26.0	10	10	0.3	3.1	0.4	3.5	13.5	None
Survey Unit 5	Sandstone slope	209.6	10	10	2.1	7.8	7.3	15.1	7.2	None
Total		455.3	-	-	4.6	26.7	13.4	40.2	8.8	



5.3.2 Survey results summary

As a result of the surveys completed as per this ACHA, the locations of 11 previously recorded sites were confirmed and three (3) new Aboriginal cultural heritage sites were identified. Previous assessments undertaken at the Metropolitan Coal Mine have confirmed the locations of 15 other previously recorded sites. Therefore, a total of 29 Aboriginal cultural heritage sites have been identified across the Subject Area, especially within drainage line landforms. A summary of the sites within the Subject Area are detailed in Table 17.

While completing the surveys for the Modification, the following two (2) Aboriginal cultural heritage sites, could not be identified despite extensive efforts:

- Woronora Reservoir; Northern Trail 20 (AHIMS ID# 52-2-0749).
- Woronora Reservoir; Northern Trail 14 (AHIMS ID# 52-2-0752).

As the above sites could not be re-identified during the surveys or previous works conducted by Niche, the sites are not considered further in this ACHA.

Table 17: Summary of Aboriginal cultural heritage sites identified within the Subject Area

Site type	Previously Recorded Sites	Newly Recorded Sites	Total
Grinding Groove(s)	9	2	11
Grinding Groove(s), Rock Engraving	1	N/A	1
Grinding Groove(s), Water Hole/Well	2	N/A	2
Shelter with Art	2	N/A	2
Shelter with Art and Artefact(s)	1	N/A	1
Shelter with Art and PAD	5	N/A	5
Shelter with Art, Artefact(s) and PAD	5	N/A	5
Shelter with Art, Grinding Groove(s)	N/A	1	1
Shelter with Artefact(s)	1	N/A	1
Total	26	3	29



5.4 Description of sites

5.4.1 Newly recorded sites

During the cultural heritage survey, there were three newly recorded sites identified within the Subject Area, MET9, MET10 and MET 11. These are detailed in Table 18 and Appendix E.

Table 18: New Aboriginal cultural heritage sites situated within the Subject Area

AHIMS ID	Site name	Site features
52-2-5116	MET9	Grinding Groove(s)
52-2-5118	MET10	Shelter with Art, Grinding Groove(s)
52-2-5117	MET11	Grinding Groove(s)

5.4.2 Previously recorded sites

A total of 26 Aboriginal cultural heritage sites have been previously recorded within the Subject Area, and were re-identified and validated either during the field surveys completed for this ACHA as well as baseline recording undertaken for Longwalls 311-316, as detailed in Table 19. Site descriptions for each of these sites are provided in Appendix F.

Table 19: Previously recorded Aboriginal cultural heritage sites identified within the Subject Area

AHIMS ID	Site name	Site Type	Survey Program where Site was Validated
52-2-0368	Blue Gum Forest Northern Trail (R) 49	Grinding Groove(s)	ACHA Survey
52-2-0369	Blue Gum Forest Northern Trail (R) 50	Grinding Groove(s)	ACHA Survey
52-2-0370	Blue Gum Forest Northern Trail (R) 51	Grinding Groove(s)	ACHA Survey
52-2-0371	Blue Gum Forest; NT(R) 53;	Grinding Groove(s)	ACHA Survey
52-2-0374	Blue Gum Forest; NT(R) 54;	Shelter with Art and PAD	ACHA Survey



AHIMS ID	Site name	Site Type	Survey Program where Site was Validated
52-2-0618	Woronora Reservoir Northern Trail 3	Shelter with Art and PAD	Longwalls 311-316 Baseline Recording Survey
52-2-0619	Woronora Reservoir Northern Trail 4	Shelter with Art and PAD	Longwalls 311-316 Baseline Recording Survey
52-2-0620	Woronora Reservoir Northern Trail 5	Shelter with Art	Longwalls 311-316 Baseline Recording Survey
52-2-0621	Woronora Reservoir Northern Trail 6	Shelter with Art and Artefact(s)	Longwalls 311-316 Baseline Recording Survey
52-2-0622	Woronora Reservoir Northern Trail 7	Grinding Groove(s)	Longwalls 311-316 Baseline Recording Survey
52-2-0623	Woronora Reservoir Northern Trail 8	Grinding Groove(s), Rock Engraving	Longwalls 311-316 Baseline Recording Survey
52-2-0624	Woronora Reservoir Northern Trail 9	Shelter with Art and PAD	Longwalls 311-316 Baseline Recording Survey
52-2-0625	Northern Trail 10	Shelter with Art, Artefact(s) and PAD	Longwalls 311-316 Baseline Recording Survey
52-2-0629	Woronora Reservoir Northern Trail 17	Grinding Groove(s), Water Hole/Well	Longwalls 311-316 Baseline Recording Survey
52-2-0630	Woronora Reservoir Northern Trail 21	Grinding Groove(s)	Longwalls 311-316 Baseline Recording Survey
52-2-0631	Woronora Reservoir Northern Trail 23	Shelter with Art, Artefact(s) and PAD	Longwalls 311-316 Baseline Recording Survey
52-2-0633	Woronora Reservoir Northern Trail 25	Shelter with Art, Artefact(s) and PAD	ACHA Survey
52-2-0637	Woronora Reservoir; Northern Trail 30;	Grinding Groove(s)	ACHA Survey



AHIMS ID	Site name	Site Type	Survey Program where Site was Validated
52-2-0652	Northern Trail;52;	Grinding Groove(s), Water Hole/Well	ACHA Survey
52-2-0751	Woronora Reservoir; Northern Trail 18;	Shelter with Art	ACHA Survey
52-2-0753	Woronora Reservoir; Northern Trail 12;	Grinding Groove(s)	Longwalls 311-316 Baseline Recording Survey
52-2-0754	Woronora Reservoir; Northern Trail 13;	Shelter with Art and PAD	ACHA Survey
52-2-0755	Woronora Reservoir; Northern Trail 46;	Grinding Groove(s)	Longwalls 311-316 Baseline Recording Survey
52-2-0758	Woronora Reservoir; Northern Trail 22;	Shelter with Art, Artefact(s) and PAD	Longwalls 311-316 Baseline Recording Survey
52-2-3442	Northern Trail 80	Shelter with Art, Artefact(s), and PAD	Longwalls 311-316 Baseline Recording Survey
52-2-3855	Northern Trail 87	Shelter with Artefact(s)	ACHA Survey



5.5 Summary and analysis of the predictive model

The survey identified that Aboriginal cultural heritage sites located within the Subject Area consist of sandstone shelters and grinding grooves. The survey was conducted by pedestrian survey, following the methodology identified in Section 5.1. The survey for this ACHA confirmed the locations of 11 previously recorded sites and identified 3 new sites. Previous survey efforts via the Longwalls 311-316 Baseline Recording campaign also confirmed the locations of 15 other previously recorded sites. Therefore, a total of 29 Aboriginal cultural heritage sites were identified within the Subject Area for this ACHA, especially within drainage line landforms.

While completing the surveys for the Modification, two (2) Aboriginal cultural heritage sites, could not be identified despite extensive efforts, as detailed in Section 5.3.2. As the sites could not be re-identified during the surveys or previous works conducted by Niche, they are not considered further in this ACHA except in the recommendations.

The predictive model developed (Biosis, 2007b, 2009b) for the Subject Area, as outlined in Section 4.5 was reviewed as part of the ACHA process. The re-identification of the registered AHIMS sites (for ground truthing GPS and site data) and the identification of three additional sites indicate the following conclusions:

- Sandstone shelters or rock overhangs with archaeological deposits, art, and/or artefacts are the most common sites within the Subject Area. Shelters are located along ridgelines and/or steep slopes adjacent or within proximity to creeks and associated tributaries.
- Art was identified in 11 of the 15 shelter sites within the Subject Area, consisting of charcoal, with less red and white ochre less common. Art motifs reflect a representation of the utilisation of inland resources, such as eels, fish, and macropods.
- Grinding groove sites occur on sandstone outcrops, within proximity to creeks, associated tributaries, and swamps. All 14 grinding groove sites identified within the Subject Area were found within proximity to creeks and associated tributaries.
- Additional site types (e.g. stone arrangements, isolated artefacts and artefact scatters, and scar trees) were not identified within the Subject Area during the surveys (noting potential for identification was limited due to very low GSV during the survey).

The results of the field survey correlate with this existing predictive model.



6 Cultural heritage values and statements of archaeological significance

6.1 Assessment framework

The Burra Charter (Australia ICOMOS, 2013) defines the basic principles and procedures to be observed in the conservation of places of importance. It provides the primary framework within which decisions about the management of heritage sites in Australia should be made.

The NSW Aboriginal cultural heritage regulatory framework supports the significance assessment of Aboriginal archaeological sites and provides guidelines for this ACHA within the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011). The guide outlines two main themes in the overall Aboriginal cultural heritage significance assessment process namely, the identification of the cultural/social significance of Aboriginal objects and/or places to Aboriginal people and the identification of the scientific (archaeological) significance to the scientific/research community. These themes encapsulate those aspects of the Burra Charter that are relevant to Aboriginal objects and places.

6.2 Methods for assessing archaeological significance

Heritage significance is assessed by considering each cultural, or archaeological site, against the significance criteria set out in the *Guide to investigating, assessing, and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011).

In all cases, the assessment of significance detailed below is informed by the Aboriginal community, which is documented in this report. To date there have been no culturally sensitive values identified during this assessment, should any be identified, they would be dealt with as per sensitive information protocols outlined in Section 5.1.1 of Appendix A.

6.3 Identifying values

The information collected during the background review of this assessment can be used to identify social, historical, scientific, and aesthetic values. The review of background information and consultation with RAPs provides an understanding of past events. These include how the landscape was used and why the identified Aboriginal objects are in this location, along with contemporary uses of the land.

Information gaps are not uncommon and should be acknowledged. They may require further investigation to adequately identify the values present across the Subject Area. It may be helpful to prepare a preliminary values map that identifies, to the extent of information available the:

- known places of social spiritual, cultural value, including natural resources of significance;
- known historic places;
- known Aboriginal objects and/or declared Aboriginal places; and
- potential places/areas of social, spiritual, cultural value, including natural resources, historic or archaeological significance.

Places of potential value that are not fully identified or defined should be included as 'sensitive' areas to target further investigation.



6.3.1 Significance as defined by the Burra Charter

The Burra Charter (Australia ICOMOS, 2013) defines the basic principles and procedures to be observed in the conservation of important places. It provides the primary framework within which decisions about the management of heritage sites in Australia should be made. The Burra Charter defines cultural significance as being derived from aesthetic, historic, social, and scientific values. The aesthetic, historic, and social values are considered part of the broader ACHA and only the scientific values are discussed below. The scientific values, as outlined by the Burra Charter, are detailed in Table 20.

Table 20: Values from which cultural significance is derived

Value type	Description
Aesthetic value	Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use.
Historic value	Historic value encompasses the history of aesthetics, science, and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, a historic figure, event, phase, or activity. It may also have historic value as the site of an important event. For any given place, the significance will be greater where evidence of the association or event survives in situ, or where the setting is substantially intact, rather 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 subsequent treatment.
Scientific value	The scientific or research value of a place will depend upon the importance of the data involved, its rarity, quality, or representativeness (conservation value), and the degree to which the place may contribute further substantial information.
Social value	Social or cultural value refers to the spiritual, traditional, historical, or contemporary associations and attachments the place or area has for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them. Places of social or cultural value have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods, or events. Communities and individuals can experience a sense of loss should a place of social or cultural value be damaged or destroyed.



6.4 Assessing values and significance

This stage is used to assess and discuss the cultural significance of the values identified during the assessment of cultural significance by consulting with Aboriginal people and preparing a statement of significance. The assessment of values is a discussion of what is significant and why. An assessment of values is more than simply restating the evidence collected during the background review and identification of this information within various stages of the project. Rather, the assessment should lead to a statement of significance that sets out succinct and salient values that have been identified.

The assessment and justification in the statement of significance must discuss whether any value meets the following criteria:

- Does the Subject Area have a strong or special association with a particular community or cultural group or social, cultural, or spiritual reasons? (Social Value).
- Is the Subject Area important to the cultural or natural history of the local area and/ or region and/ or state? (Historic Value).
- Does the Subject Area have potential to yield information that would contribute to an understanding of the cultural or natural history of the local area and/or region and/ or state? (Scientific [archaeological] Value).
- Is the Subject Area important in demonstrating aesthetic characteristic in the local area and/or region and/ or state? (Aesthetic Value).

6.5 Other approaches

The categorisation into aesthetic, historic, scientific, and social values is one approach to understanding the concept of cultural significance. However, more precise categories may be developed as understanding of a particular place increase.

The NSW DECCW guidelines for the significance assessment of Aboriginal archaeological sites are contained within the *Aboriginal Cultural Heritage: Standards & Guidelines Kit* (the Kit) (National Parks and Wildlife Service, 1997). The Kit identifies with two main streams in the overall significance assessment process:

- the assessment of cultural/social significance to Aboriginal people; and
- the assessment of scientific significance to archaeologists.

This approach encapsulates those aspects of the Burra Charter that are relevant to Aboriginal archaeological sites. The guidelines specify the following criteria for archaeological significance, as paraphrased in Table 20.

6.5.1 Grading scientific (Archaeological) values

The following gradations, where a site or zone satisfies at least one criterion, have been applied to provide a measure of the values/significance for Aboriginal cultural heritage sites identified within the Subject Area, and to provide an overall assessment of the significance of each of the zones used that define the Subject Area are included in Table 21 below.



Table 21: Criteria specified for archaeological significance

Criteria	Description
Research potential	It is the potential to elucidate past behaviour which gives significance under this criterion rather than the potential to yield collections of artefacts. Matters considered under this criterion include – the intactness of a site, the potential for the site to build a chronology and the connectedness of the site to other sites in the archaeological landscape.
Representativeness	As a criterion, representativeness is only meaningful in relation to a conservation objective. Presumably, all sites are representative of those in their class, or they would not be in that class. What is at issue is the extent to which a class of sites is conserved and whether the particular site being assessed should be conserved in order to ensure that we retain a representative sample of the archaeological record as a whole. The conservation objective which underwrites the ‘representativeness’ criteria is that such a sample should be conserved.
Rarity	This criterion cannot easily be separated from that of representativeness. If a site is ‘distinctive’ then it will, by definition, be part of the variability which a representative sample would represent. The criteria might best be approached as one which exists within the criteria of representativeness, giving a particular weighting to certain classes of site. The main requirement for being able to assess rarity will be to know what is common and what is unusual in the site record but also the way that archaeology confers prestige on certain sites because of their ability to provide certain information. The criterion of rarity may be assessed at a range of levels: local, regional, state, national, and global.
Educational Potential	Heritage sites and areas should be conserved and managed in relation to their value to people. It is assumed that archaeologists have the ability to speak of the value of sites to members of their own profession. Where archaeologists or others carrying out assessments are speaking for the educational value of sites to the public, the onus is on them to go to the public for an assessment of this value, or to reputable studies which have canvassed public demand for education. The danger, otherwise, is that archaeologists would be projecting their values onto a public which is itself given no voice on the matter.
Aesthetics	Archaeologists are not expected to include an assessment of aesthetic significance along with their assessment of scientific significance. In relation to heritage places, aesthetic significance is generally taken to mean the visual beauty of the place. Aesthetic value is not inherent in a place but arises in the sensory response people have to it. Although the guidelines provide no expectation for archaeologists to consider aesthetic values it is often the case that a site’s or a landscape’s aesthetic is a significant contributory value to significance. Examples of archaeological sites that may have high aesthetic values would be rock art sites, or sites located in environments that evoke strong sensory responses. For this reason, we consider it appropriate to include aesthetic values as part of the significance assessments for the sites identified during this assessment.



Table 22: Criteria for grading scientific values

Gradation	Description
Low	The site or object contains only a single or limited number of features and has no potential to meaningfully inform our understanding of the past beyond what it contributes through its current recording (i.e. no or low research potential). The site or object is a representative but unexceptional example of the most common class of sites or objects in the region. Many more similar examples can be confidently predicted to occur within the Subject Area, and in the region.
Moderate	The site or object derives value because it contains features, both archaeological and contextual, which through further investigation may contribute to our understanding of the past. These features include but are not limited to the relationship with landscape features or other Aboriginal cultural heritage sites or areas of identified heritage importance; diagnostic archaeological or landscape features that inform a chronology. The presence of a diverse assemblage of archaeological features, connectedness with landscape and other notable values provides relatively higher representative and rarity values than sites of low significance.
High	The site or object has value because it contains archaeological and/or contextual features which through further investigation may significantly contribute to our understanding of the past, both locally and on a regional scale. These features include but are not limited to: Aboriginal ancestral remains; the site's relationship with landscape features or other Aboriginal archaeological sites or areas of identified heritage importance; diagnostic archaeological or landscape features that inform a chronology; and a very large assemblage of stone artefacts associated with other features such as oven remains or shell midden. Such sites will be relatively rare and will be representative of a limited number of similar sites that make up this class; hence they derive high representative and rarity values.

6.6 Archaeological significance assessment

The Subject Area contains 29 Aboriginal cultural heritage sites. Table 23 provides an overview of the archaeological significance ratings for the Aboriginal heritage sites within the Subject Area.

The RAPs for the Metropolitan Coal Mine have been consulted on the nature and extent of Aboriginal cultural heritage at the Metropolitan Coal Mine on a number of occasions, including during the community consultation processes undertaken for previous cultural heritage assessments and investigations.

The RAPs maintain a strong relationship with their traditional lands and have stated that all Aboriginal heritage sites, known or otherwise, and Country are considered to have high cultural and social value by the RAPs.

The Subject Area and the Metropolitan Coal Mine has social and cultural value to the RAPs.

Table 24 provides an assessment of archaeological significance for individual Aboriginal cultural heritage sites within the Subject Area against significance principles outlined in the NSW DECCW guidelines for the significance assessment of Aboriginal archaeological sites (National Parks and wildlife Service 1997). Aboriginal cultural heritage sites within the Woronora Plateau remain in a relatively undisturbed environment with a relatively high density of sites, many being a highly visual cultural resource that creates a strong sense of place and cultural identity. Additional notes regarding scientific (archaeological) significance have also been noted in Table 25.



The archaeological significance of 18 Aboriginal cultural heritage sites located within the Subject Area has already been assessed by (Kayandel Archaeological Services, 2008). The archaeological significance of these sites has been reviewed and confirmed as part of this ACHA and is provided in Table 24.

Table 23: Archaeological Significance Ratings for Aboriginal Heritage Sites within the Subject Area

Archaeological Significance	Previously recorded Aboriginal cultural heritage site	Newly identified Aboriginal cultural heritage site	Total Number of Sites
Low	Blue Gum Forest Northern Trail (R) 49 Blue Gum Forest Northern Trail (R) 50 Blue Gum Forest Northern Trail (R) 51 Blue Gum Forest; NT(R) 53; Blue Gum Forest; NT(R) 54; Woronora Reservoir Northern Trail 3 Woronora Reservoir Northern Trail 6 Woronora Reservoir Northern Trail 7 Woronora Reservoir Northern Trail 9 Northern Trail 10 Woronora Reservoir Northern Trail 21 Woronora Reservoir Northern Trail 23 Woronora Reservoir Northern Trail 25 Woronora Reservoir; Northern Trail 30; Woronora Reservoir; Northern Trail 18; Woronora Reservoir; Northern Trail 12; Woronora Reservoir; Northern Trail 13; Woronora Reservoir; Northern Trail 46; Woronora Reservoir; Northern Trail 22; Northern Trail 80 Northern Trail 87	MET9 MET10 MET11	24
Moderate	Woronora Reservoir Northern Trail 5 Woronora Reservoir Northern Trail 8 Woronora Reservoir Northern Trail 17 Woronora Reservoir Northern Trail 4 Northern Trail;52;	None	5
Total			29



Table 24: Archaeological significance

AHIMS ID#	Site name	Site type	Description	Rarity	Representativeness	Scientific (archaeological) value/Research Potential	Educational potential	Scientific Significance Rating
52-2-0368	Blue Gum Forest Northern Trail (R) 49	Grinding groove(s)	The site is located on an exposed rock platform along the Honeysuckle Creek. The site contains 10 visible grinding grooves.	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the grinding groove sites located within the landscape, this site is an example of a common outcrop with grinding grooves and is not representative of a grinding groove site that should be conserved in order to ensure that we retain a representative sample of the archaeological record as a whole. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further	The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	All sites hold spiritual and cultural significance to the Aboriginal community and in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is low potential value for an opportunity for the sharing of cultural and spiritual knowledge at grinding groove sites with the younger generations due to the superficial nature of the site type. Additional community consultation would be	Low



					preserved in their natural environment.		required to confirm any educational potential.	
52-2-0369	Blue Gum Forest Northern Trail (R) 50	Grinding groove(s)	The site is located on an exposed rock platform along the Honeysuckle Creek. The site measures 4 m long x 4.3 m wide and consists of a group of at least one grinding groove. The grooves were found in a wet and good condition.	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the grinding groove sites located within the landscape, this site is an example of a common outcrop with grinding grooves and is not representative of a grinding groove site that should be conserved in order to ensure that we retain a representative sample of the archaeological record as a whole. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	All sites hold spiritual and cultural significance to the Aboriginal community and in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is low potential value for an opportunity for the sharing of cultural and spiritual knowledge at grinding groove sites with the younger generations due to the superficial nature of the site type. Additional community consultation would be required to confirm any educational potential.	Low
52-2-0370	Blue Gum Forest	Grinding groove(s)	This grinding groove site is located around	This site is representative of a typical class of	Of the grinding groove sites located across within the landscape, this	The site is unlikely to significantly	All sites hold spiritual and cultural significance to the Aboriginal	Low



	Northern Trail (R) 51		20 m south of Blue Gum Forest Northern Trail (R) 50 (AHIMS ID# 52-2-0369) on an exposed rock platform beside a large pool of water along Honeysuckle Creek. The site measures 11 m long x 5 m wide. Six grinding grooves were originally found, but only two grinding grooves were found at a more recent visit. The grooves were found in a wet and poor condition.	Aboriginal site in the local area and wider region.	site is an example of a common outcrop with grinding grooves and is not representative of a grinding groove site that should be conserved to ensure that we retain a representative sample of the archaeological record as a whole. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	community and in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is low potential value for an opportunity for the sharing of cultural and spiritual knowledge at grinding groove sites with the younger generations due to the superficial nature of the site type. Additional community consultation would be required to confirm any educational potential.	
52-2-0371	Blue Gum Forest; NT(R) 53;	Grinding groove(s)	This site consists of grinding grooves located	This site is representative of a typical class of	Of the grinding groove sites located within the landscape, this site is an	The site is unlikely to significantly	All sites hold spiritual and cultural significance to the Aboriginal	Low



			on a flat rock outcrop measuring 15 m long and 3 m wide and is located 810 m downstream from site NT 51 (AHIMS ID# 52-2-0371). The grooves are described as being well defined due to the fine-grained and hard nature of the rock.	Aboriginal site in the local area and wider region.	example of a common outcrop with grinding grooves and is not representative of a grinding groove site that should be conserved in order to ensure that we retain a representative sample of the archaeological record as a whole. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	community and in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is low potential value for an opportunity for the sharing of cultural and spiritual knowledge at grinding groove sites with the younger generations due to the superficial nature of the site type. Additional community consultation would be required to confirm any educational potential.	
52-2-0374	Blue Gum Forest; NT(R) 54;	Shelter with Art and PAD	The site is located on a creek bend ridge landform, 5 m north of Honeysuckle Creek, at 251 m altitude. There is a large swamp opposite the	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the shelter with art sites located within the landscape, this site is an example of a common type of motif in Shelter with art site types in the region. The site's poor condition detracts from	The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years.	Low



			creek and shelter. No artefacts were reidentified, but two art panels and six motifs were located. These were found to be weathered and in very poor condition. This small, continuous shelter has been affected by block fall, and chemical and cavernous weathering. This shelter is fragile and is at risk of collapse and/or further block fall.		its representativeness of a shelter with art site. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	current recording.	Because of the poor conditions of the site, there is low potential value for any opportunity for the sharing of cultural and spiritual knowledge. Additional community consultation would be required to confirm any educational potential.	
52-2-0618	Woronora Reservoir	Shelter with Art and PAD	The site is located at 260 metres Australian	This site is representative of a typical class of Aboriginal site in	Of the shelter with art sites located within the landscape, this site is an example of a common	This site is representative of a typical class of	This site holds spiritual and cultural significance to the Aboriginal community, as in most	Low



	Northern Trail 3		Height Datum (m AHD), 60 m northeast of fire trail 9D under the first small cliff overhang. The shelters are formed out of Hawkesbury sandstone by cavernous weathering. additional art was identified during this recording. Shelter #2 contains visible surface artefacts and a grey sandy loam floor with a potential artefact deposit.	the local area and wider region.	type of motif in shelter with art site types in the region, being of charcoal animal and human figures and is not representative of a grinding groove site that should be conserved in order to ensure that we retain a representative sample of the archaeological record as a whole. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	Aboriginal site in the local area. The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording; however, the presence of deposit indicates a possibility that subsurface archaeological material will be present, including dateable material. If archaeological test excavations are conducted at this site, definitive scientific value	cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is potential value for any opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	
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						will be able to be ascertained.		
52-2-0619	Woronora Reservoir Northern Trail 4	Shelter with Art and PAD	This site is located 300 m southwest of the end of Fire Road 9D under the second ledge down from the road. The shelter contains art and was previously recorded to contain 17 charcoal indeterminate drawings, white ochre hand stencils and red and white ochre drawings on the roof and walls.	This site contains evidence of more intensive and/or frequent use when compared to other site in the local area and wider region. Unfortunately, the site is in poor condition and the art panels, consisting of charcoal scratching and white ochre art, are barely visible.	Of the shelter with art sites located within the landscape, this site is an example of a common type of motif in Shelter with art site types in the region, being of charcoal animal and human figures and is not representative of this site type that should be conserved in order to ensure that we retain a representative sample of the archaeological record as a whole. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The shelter has previously been recorded to contain midden material including artefacts of quartz and shell portions of Sydney cockle and a freshwater pipi 2 cm long, however, only two artefacts were reidentified. The shelter floor consists of brown loamy sand in good condition. The presence of deposit indicates a possibility that subsurface archaeological material will be present, including	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	Moderate



						dateable material. The diversity of the archaeological assemblage (stone and marine shell species) is unusual, and adds moderate significance under this criterion. . If archaeological test excavations are conducted at this site, definitive scientific value will be able to be ascertained.		
52-2-0620	Woronora Reservoir Northern Trail 5	Shelter with Art	The shelter is located 30 m west of an unnamed creek tributary.	This site is representative of a typical class of Aboriginal site in the local area and wider region The original recording identified 16	The art is mostly in excellent condition the mix of motifs represent a type/combination of motif/s considered to be high in rarity and is representative of a shelter with art site that should be conserved to	The art at this site depicts figures of emus, humans, hands, flying foxes, kangaroos, eels, mythical figures, and indeterminate figures.	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years.	Moderate



				panels with some art in excellent condition and others in poor/obliterated condition. This recording identified 6 panels with 41 motifs.	ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The shelter contains a sandy loamy floor with a depth of 25 cm. The presence of deposit indicates a possibility that subsurface archaeological material will be present, including dateable material. If archaeological test excavations are conducted at this site, definitive scientific value will be able to be ascertained.	There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	
52-2-0621	Woronora Reservoir Northern Trail 6	Shelter with Art and Artefact(s)	This site is located within an upper valley slope at 260 m elevation and 230 m south east of fire trail 9D. The site	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the shelter with art sites located within the landscape, this site is an example of a common type of motif in shelter with art site types in the region. The sites poor condition detracts from	The art has become more faded since the last recording and is in poor condition from salt build up. Additional	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to	Low



			consists of 5 previously recorded artefacts and art.		its representativeness of an art site. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	indeterminate charcoal art was recorded on the shelter roof. The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	see this site in 150 years. Because of the poor conditions of the site, there is low potential value for any opportunity for the sharing of cultural and spiritual knowledge. Additional community consultation would be required to confirm any educational potential.	
52-2-0622	Woronora Reservoir Northern Trail 7	Grinding groove	This site is situated on a creek line on a rock platform. It has been subjected to organic erosion and includes some unusual crossover grooves,	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the grinding groove sites located within the landscape, this grinding groove site is an example of a common outcrop with grinding grooves and is not representative of a grinding groove site that should be conserved to ensure that we retain a representative sample of	The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	All sites hold spiritual and cultural significance to the Aboriginal community and in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is low potential value for an opportunity for the sharing of	Low



			possibly part of a petroglyph		the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.		cultural and spiritual knowledge at grinding groove sites with the younger generations due to the superficial nature of the site type. Additional community consultation would be required to confirm any educational potential.	
52-2-0623	Woronora Reservoir Northern Trail 8	Grinding Groove(s), Rock Engraving	This site is situated upon a creek line landform that moves into a stored water area.	This site has evidence of more intensive and/or frequent use when compared to other site in the local area and wider region. The original recording identified 6 petroglyphs and 52 grinding grooves in a stable condition; however, some impacts are evident such as	The petroglyphs and grooves are mostly in a stable condition. The presence of petroglyphs at the grinding groove site represents a type/combination considered to be high in rarity and is representative of a site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is	The art at this site, in the form of petroglyphs, depicts mythical figures, potential animal figures, and indeterminate figures not seen at any of the shelter with art sites.	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be	Moderate



				organic matter and environmental degradation and erosion.	currently predicted, is extremely low. These sites will continue to be preserved within the natural environment, rendering any conservation objective inconsequential.		required to confirm any educational potential.	
52-2-0624	Woronora Reservoir Northern Trail 9	Shelter with Art and PAD	This shelter is a continuous sandstone ridgeline that has been subject to active, chemical weathering and block fall. The shelter is located under a waterfall at 239 m elevation. One weathered, partial charcoal macropod was recorded. No artefacts were visible.	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the shelter with art sites located across within the landscape, this site is an example of a common type of motif in Shelter with art site types in the region, being of a charcoal animal and is not representative of an art site that should be conserved to ensure that we retain a representative sample of the archaeological record as a whole. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further	The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is low potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	Low



					preserved in their natural environment.			
52-2-0625	Northern Trail 10	Shelter with Art, Artefact(s) and PAD	This site is located on a hillside landform on a gentle slope at 270 m elevation, 150 m west of Honeysuckle Creek. The site consists of a sandy loam deposit approximately 15 cm deep with numerous artefacts of chert, quartz, petrified wood, and jasper recorded. The art recorded in the shelter consists of semicircular charcoal lines.	This site is representative of a typical class of Aboriginal site in the local area and wider region. The site is in poor condition with evidence of rock fall and weathering.	Of the shelter with art sites located across within the landscape, this site is an example of a common type of motif in shelter with art site types in the region, being of charcoal lines and is not representative of a grinding groove site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The art at this site consists of a partial and weathered indeterminate charcoal drawing. The shelter contains a sandy loamy floor with a depth of 15 cm. The presence of artefacts and deposit indicates a possibility that subsurface archaeological material will be present, including dateable material. If archaeological test excavations are conducted at this site, definitive scientific value	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	Low



						will be able to be ascertained.		
52-2-0629	Woronora Reservoir Northern Trail 17	Grinding Groove(s), Water Hole/Well	This site consists of a sandstone outcrop in the bed of an unnamed creek, parallel to Honeysuckle Creek, with 53 grinding grooves, 1 petroglyph, and a water channel around the upstream side of a pothole, created to divert water from the pothole. The site is situated in an upland shrub swamp.	This site has evidence of more intensive and/or frequent use when compared to other site in the local area and wider region. The large number of grinding grooves and presence of a water channel suggests the site played a crucial role in water management, playing a vital role in the survival and cultural practices of Dharawal people.	The petroglyph, grinding grooves and water channel grooves are in a stable condition. The presence of petroglyphs, water channel and high volume of grooves at the site represents a type/combination considered to be high in rarity and is representative of a site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The features at this site are rare and may provide information on Aboriginal water management practices within the Illawarra.	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	Moderate



52-2-0630	Woronora Reservoir Northern Trail 21	Grinding groove(s)	This site is located on a gentle creek slope along an unnamed creek. consists of 10 axe-grinding grooves on a sandstone outcrop approximately 15 m above a pool.	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the grinding groove sites located within the landscape, this grinding groove site is an example of a common outcrop with grinding grooves and is not representative of a grinding groove site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	All sites hold spiritual and cultural significance to the Aboriginal community and in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is low potential value for an opportunity for the sharing of cultural and spiritual knowledge at grinding groove sites with the younger generations due to the superficial nature of the site type. Additional community consultation would be required to confirm any educational potential.	Low
52-2-0631	Woronora Reservoir Northern Trail 23	Shelter with Art, Artefact(s), and PAD	The site is located on a ridgeline north of a large swamp approximately	This site is representative of a typical class of Aboriginal site in the local area and wider region but	Of the shelter with art sites located within the landscape, this site is an example of a common type of motif in Shelter with art site types in the	The art at this site consists of spalling and weathered indeterminate charcoal drawing	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have	Low



			40 m northwest of NT22 at an elevation of 268 m.	does contain some motifs less common, such as ochre hand stencils; however, the condition of the art is weathered and spalling.	region, being of charcoal animals and ochre handprints and is not representative of a site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	and ochre hand prints. The shelter contains a sandy loamy floor with a depth of approx. 60 cm. The presence of artefacts and deposit indicates a possibility that subsurface archaeological material will be present, including dateable material. If archaeological test excavations are conducted at this site, definitive scientific value will be able to be ascertained.	had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	
52-2-0633	Woronora Reservoir	Shelter with Art,	The site is located under a knoll above Honeysuckle	This site is representative of a typical class of Aboriginal site in	Of the shelter with art sites located across within the landscape, this site is an example of a	The art at this site consists of spalling and weathered	This site holds spiritual and cultural significance to the Aboriginal community, as in most	Low



	Northern Trail 25	Artefact(s) and PAD	Creek on the eastern side of the creek and north of Fire Trail 9D. It is 50 m north of NT 24.	the local area and wider region but does contain some motifs less common, such as charcoal indeterminate motifs; however, the condition of the art is case-hardened, flaking and water damaged.	common type of motif in shelter with art site types in the region, being of charcoal animals, human figures and is not representative of a site that should be conserved in order to ensure that we retain a representative sample of the archaeological record as a whole. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	indeterminate charcoal motifs, human figures, and a charcoal kangaroo. The shelter contains a sandy loamy floor with a depth of approx. 50 cm. The presence of artefacts and deposit indicates a possibility that subsurface archaeological material will be present, including dateable material. If archaeological test excavations are conducted at this site, definitive scientific value will be able to be ascertained.	cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	
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52-2-0637	Woronora Reservoir; Northern Trail 30;	Grinding groove(s)	This site is located 20 m above a waterfall. This site consists of two grinding grooves on a flat sandstone outcrop in the creek bed just below a swamp where the water flows from. The outcrop measures 3 m by 5 m in size.	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the grinding groove sites located within the landscape, this grinding groove site is an example of a common outcrop with grinding grooves and is not representative of a grinding groove site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	All sites hold spiritual and cultural significance to the Aboriginal community and in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is low potential value for an opportunity for the sharing of cultural and spiritual knowledge at grinding groove sites with the younger generations due to the superficial nature of the site type. Additional community consultation would be required to confirm any educational potential.	Low
52-2-0652	Northern Trail;52;	Grinding Groove(s), Water Hole/Well	The site consists of 34 grinding grooves in groups around potholes over an area	This site consists of 34 grinding grooves in groups around potholes.	This site shows evidence of more strategic use when compared to other site in the local area and wider region.	The grinding grooves and potholes are in good condition with some affected by	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have	Moderate



			measuring 25 m by 20 m on a sandstone outcrop. The grooves consist of a variety of shapes and sizes and are well-defined.		The large number of grinding grooves and use of potholes as part of a water management system suggests strategic use of water. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	rock-popping. The presence of potholes at the site represents a type/combination considered to be moderate in rarity. The features at this site may provide information on Aboriginal water management practices within the Illawarra. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will continue to be preserved within the natural environment, rendering any conservation	had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	
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						objective inconsequential.		
52-2-0751	Woronora Reservoir; Northern Trail 18;	Shelter with Art	This site is located within a hill/ridgeline landform area near closed woodland and consists of seven charcoal drawings, determined to depict a flying fox, fish and other indeterminate shapes.	This site is representative of a typical class of Aboriginal site in the local area and wider region; however, the types of animals represented may differ from other sites.	This site is representative of a typical class of Aboriginal site in the local area and wider region The original recording of 8 art motifs across 4 panels are in poor condition, showing evidence of weathering and water wash. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The art is mostly in poor condition and is not representative of a shelter with art site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will continue to be preserved within the natural environment, rendering any conservation	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	Low



						objective inconsequential.		
52-2-0753	Woronora Reservoir; Northern Trail 12;	Grinding Groove(s)	This site is located within a sandstone outcrop landform and exhibits impacts of rock popping. It is situated 150 m east of Honeysuckle Creek and contains 44 grinding grooves.	This site consists of 44 grinding grooves, some of which appear to form a singular grooved dish, potentially used for water storage. Most of the grooves are in good condition.	This site shows evidence of more strategic use when compared to other site in the local area and wider region. The large number of grinding grooves and use of grinding grooves to form grooved dishes as part of a water management system suggests strategic use of water. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The grinding grooves are in good condition with some affected by rock-popping. The presence of potholes at the site represents a type/combination considered to be moderate in rarity. The features at this site may provide information on Aboriginal water management practices within the Illawarra. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low.	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	Low



						These sites will continue to be preserved within the natural environment, rendering any conservation objective inconsequential.		
52-2-0754	Woronora Reservoir; Northern Trail 13;	Shelter with Art and PAD	This site is located mid-slope approximately 185 m west of Honeysuckle Creek and consists of a motif of an eel.	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the shelter with art sites located within the landscape, this site is an example of a common type of motif in shelter with art site types in the region. The sites' poor condition detracts from its representativeness of a shelter with art site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These	The motif is no longer visible since the initial site recording. The shelter contains a sandy loamy floor with a depth of approx. 60 cm. The presence of artefacts and deposit indicates a possibility that subsurface archaeological material will be present, including dateable material. If	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. Because of the poor conditions of the site, there is low potential value for any opportunity for the sharing of cultural and spiritual knowledge. Additional community consultation would be	Low



					sites will be further preserved in their natural environment.	archaeological test excavations are conducted at this site, definitive scientific value will be able to be ascertained.	required to confirm any educational potential.	
52-2-0755	Woronora Reservoir; Northern Trail 46;	Grinding groove(s)	This site is in a swamp area on a sandstone ridge and is situated on an unnamed creek in the swamp. Sixteen grinding grooves were located at the site. The site and some grooves have been subjected to erosion and weathering.	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the grinding groove sites located within the landscape, this grinding groove site is an example of a common outcrop with grinding grooves and is not representative of a grinding groove site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	All sites hold spiritual and cultural significance to the Aboriginal community and in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is low potential value for an opportunity for the sharing of cultural and spiritual knowledge at grinding groove sites with the younger generations due to the superficial nature of the site type. Additional community consultation would be	Low



							required to confirm any educational potential.	
52-2-0758	Woronora Reservoir; Northern Trail 22;	Shelter with Art, Artefact(s), and PAD	The site is located north of a large swamp under the ledge of a sandstone platform approx. 450 m east of Honeysuckle Creek at an elevation of 267 m.	This site is representative of a typical class of Aboriginal site in the local area and wider region. The site consists of one charcoal indeterminate in fair condition.	Of the shelter with art sites located within the landscape, this site is an example of a common type of motif in Shelter with art site types in the region, being of charcoal indeterminate and is not representative of an art site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The motif, a charcoal indeterminate, is not rare. The shelter contains a sandy loamy floor with a depth of approx. 50 cm. The presence of artefacts and deposit indicates a possibility that subsurface archaeological material will be present, including dateable material. If archaeological test excavations are conducted at this site, definitive scientific value will be able to be ascertained.	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm any educational potential.	Low



52-2-3442	Northern Trail 80	Shelter with Art, Artefact(s) and PAD	It is located on a mid-slope landform at 210 m altitude from stored water, below the end of fire trail 9D. The mid lower valley slope is near Waratah Rivulet.	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the shelter with art sites located within the landscape, this site is an example of a common type of shelter with art site types in the region. The site is not representative of a shelter with artefacts site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The shelter contains an orangey loamy sand floor with a depth of approx. 35 cm. The presence of artefacts and deposit indicates a possibility that subsurface archaeological material will be present, including dateable material. If archaeological test excavations are conducted at this site, definitive scientific value will be able to be ascertained.	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. The artefacts could not be reidentified and despite their being deposit, there is potential value for any opportunity for the sharing of cultural and spiritual knowledge. Additional community consultation would be required to confirm any educational potential.	Low
52-2-3855	Northern Trail 87	Shelter with Artefact(s)	This site is located approx. 150 m east of Honeysuckle	This site is representative of a typical class of Aboriginal site in	Of the shelter with artefact sites located within the landscape, this site is an example of a common site type in the	The shelter contains a sandy loamy floor with a depth of approx. 50 cm. The	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time	Low



			Creek under a small cliff line.	the local area and wider region. The site consists of 5 artefacts that were not visible during the last site visit.	region and is not representative of a site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	presence of artefacts and deposit indicates a possibility that subsurface archaeological material will be present, including dateable material. If archaeological test excavations are conducted at this site, definitive scientific value will be able to be ascertained.	Aboriginal people have had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be required to confirm educational potential.	
52-2-5116	MET9	Grinding groove(s)	This grinding groove site was found on a rock platform, located at least 17 m southeast of Honeysuckle Creek. All the grooves were found in a	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the grinding groove sites located within the landscape, this site is an example of a common outcrop with grinding grooves and is not representative of a grinding groove site that should be conserved to ensure that we retain a representative sample of	The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its	All sites hold spiritual and cultural significance to the Aboriginal community and in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is low potential value for an opportunity	Low



			dry and good condition.		the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	current recording.	for the sharing of cultural and spiritual knowledge at grinding groove sites with the younger generations due to the superficial nature of the site type. Additional community consultation would be required to confirm any educational potential.	
52-2-5118	MET10	Shelter with Art , Grinding Groove(s)	This shelter is located at least 20 m east of Honeysuckle Creek. This shelter has a small floor space but was found to have a potential partial rock engraving on its roof.	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the shelter sites located within the landscape, this site is not representative of a site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	This site holds spiritual and cultural significance to the Aboriginal community, as in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is potential value for an opportunity for the sharing of cultural and spiritual knowledge at these sites with the younger generations. Additional community consultation would be	Low



							required to confirm educational potential.	
52-2-5117	MET11	Grinding groove(s)	This grinding groove site was found at a large rock platform to the northwest of a small waterfall beside it, along the Honeysuckle Creek.	This site is representative of a typical class of Aboriginal site in the local area and wider region.	Of the grinding groove sites located within the landscape, this grinding groove site is an example of a common outcrop with grinding grooves and is not representative of a grinding groove site that should be conserved to ensure that we retain a representative sample of the archaeological record. The rate of attrition of these sites, both historically and what is currently predicted, is extremely low. These sites will be further preserved in their natural environment.	The site is unlikely to significantly contribute to an understanding of the area and/or region and/or state's natural and cultural history beyond its current recording.	All sites hold spiritual and cultural significance to the Aboriginal community and in most cases, it is the first time Aboriginal people have had the opportunity to see this site in 150 years. There is low potential value for an opportunity for the sharing of cultural and spiritual knowledge. Additional community consultation would be required to confirm any educational potential.	Low



6.7 Statement of archaeological significance for the Subject Area as a whole

Statements of significance for the Subject Area are presented in the following sub-sections. These statements of significance have been prepared in consideration of comments received from the RAPs during the consultation process including those related to the cultural significance of the Subject Area and the interrelationships between the cultural and spiritual values with the natural landscape.

6.7.1 Social value

The Subject Area holds high cultural significance to the local Aboriginal community, with all Aboriginal cultural heritage sites in the Subject Area considered to be of cultural significance. Aboriginal cultural heritage sites within the Woronora Plateau remain in a relatively undisturbed environment with a relatively high density of sites, many being a highly visual cultural resource that creates a strong sense of place and cultural identity.

6.7.2 Aesthetic value

The Subject Area has high aesthetic significance owing to the location of the Subject Area in the Woronora Plateau, an area that has been subjected to relatively minimal environmental disturbance owing to its reservation as a Catchment Area. This has resulted in a relatively undisturbed environment in a bushland setting with the majority of recorded archaeological sites recorded being shelters (Biosis, 2007b).

6.7.3 Historic value

The Subject Area has low historic value however the broader region has high historical value due to the many sites recorded and the detailed record of Aboriginal use prior to European arrival in the Woronora Plateau and Illawarra Escarpment.

6.7.4 Scientific (archaeological) value

The Subject Area has moderate scientific significance owing to the general intactness of sites, the connectedness of sites recorded within the Subject Area to the number of sites recorded in the larger cultural landscape of the Woronora Plateau and Illawarra Escarpment.

6.8 Statement of cultural significance for the Subject Area as a whole

The statement of significance and significance assessments have been prepared in consideration of comments received from the RAPs during the consultation process and the interrelationships between the cultural and spiritual values with the natural landscape.

The Subject Area holds high cultural significance to the local Aboriginal community, with all Aboriginal cultural heritage sites in the Subject Areas considered to be of cultural significance. Aboriginal cultural heritage sites within the Woronora Plateau remain in a relatively undisturbed environment with a relatively high density of sites, many being a highly visual cultural resource which creates a strong sense of place and cultural identity.

The Subject Area has high aesthetic significance owing to the location of the Subject Area in the Woronora Plateau, an area that has been subjected to relatively minimal environmental disturbance owing to its reservation as a Catchment Area. This has resulted in a relatively undisturbed environment in a bushland setting with the majority of recorded archaeological sites recorded being shelters.

The Subject Area has low historic value however the broader region has high historical value due to the many sites recorded and the detailed record of aboriginal use prior to European arrival in the Woronora Plateau and Illawarra Escarpment.



The Subject Area has moderate scientific significance owing to the general intactness of sites, the connectedness of sites recorded within the Subject Area to the number of sites recorded in the larger cultural landscape of the Woronora Plateau and Illawarra Escarpment.



7 The proposed activity and impact assessment

7.1 Proposed activity, staging and timeline

Metropolitan Coal is currently seeking to modify the Metropolitan Coal Mine Project Approval (08_0149) to allow the extension of Longwall 317 and the addition of Longwall 318.

The surface area that is likely to be affected by the proposed Modification includes the proposed Longwalls 317 and 318 mining areas that is likely to be affected by subsidence and the relocated Ventilation Shaft 4 disturbance footprint.

The Modification area covers an area of approximately 455 ha and the relocated Ventilation Shaft 4 would be located adjacent to Fire Trail No 9E and is approximately 3.8 ha in extent.

Secondary extraction of Longwall 317 would commence in 2028.

The activity that has the potential to harm Aboriginal cultural heritage sites is the extraction of coal approximately between 510 to 550 m below the ground surface, using longwall mining methods which will result in mining-induced ground movements (subsidence) at the surface.

7.2 Potential for harm

7.2.1 Subsidence movements

Longwall mining involves removing rectangular sections of coal from between supported underground roadways by cutting a wide, continuously retreating panel of the coal (the longwall). The roof of the mine is held up by hydraulic jacks, which are moved behind the retreating face where coal is cut. Once moved the jacks no longer support the roof and the roof collapses into the void left behind. This process can result in the subsidence of the ground surface above the mine (NSW Minerals Council, 2013).

Subsidence impacts are caused by the compression and extension of localised rock strata that may result in cracking of rock mass and buckling of strata (outlined in Plate 10), which can result in harm to Aboriginal cultural heritage sites through the forms of rockfalls and roof collapse, surface cracking and exfoliation and changes in seepage patterns (Department of Planning, 2008). The extent of subsidence movements is dependent on factors such as degree of movement and geology and structure of subsurface rock strata.

A portion of Longwalls 317 and Longwall 318 overlie Honeysuckle Creek. Waratah Rivulet and its first order streams are located to the east of the Subject Area, with Woronora Reservoir situated to the north of the Subject Area. The valleys associated with the Honeysuckle Creek and Waratah Rivulet will result in closure and downslope movements in these areas. Twenty-five (25) Aboriginal cultural heritage sites are predicted to be in the 35 degree angle of draw and/or 20 mm subsidence contour and could experience subsidence related impacts (MSEC, 2025). An impact assessment for these sites is provided in Table 25.

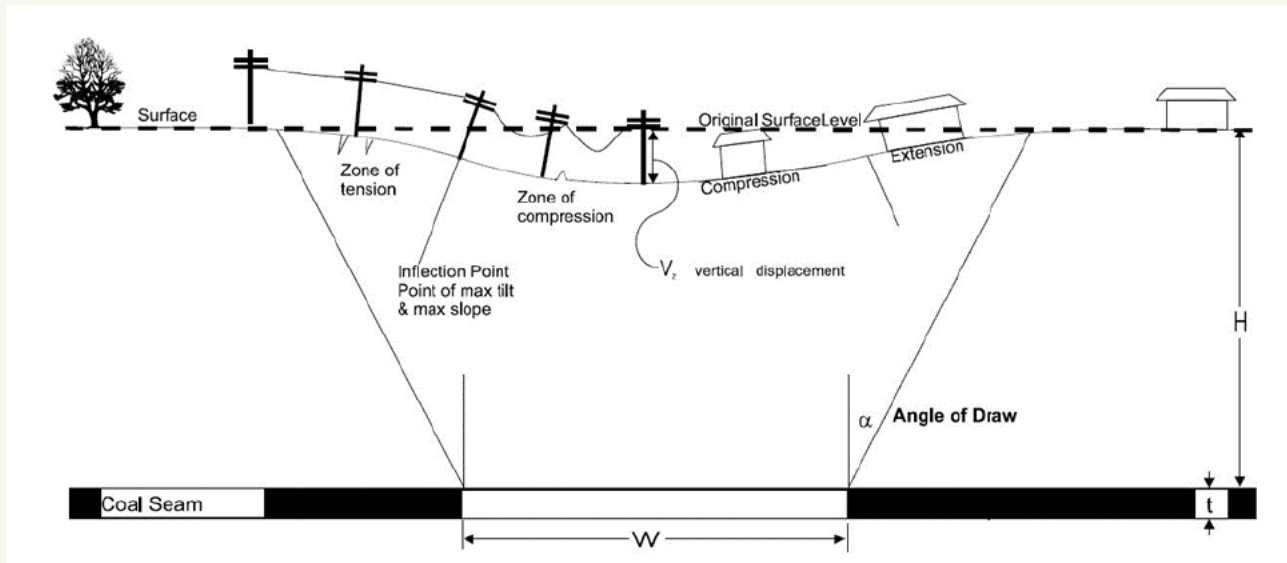


Plate 9: Diagram representation of surface subsidence components in flat topography (Department of Planning, 2008).

Grinding grooves

Grinding grooves can potentially be impacted by the fracturing of sandstone and can be caused by two mechanisms as a result of mine subsidence: tensile or compressive strains. This is due largely to the systematic movements and compressive strains to valley closure movements from mine subsidence.

The maximum predicted total systematic tensile and compressive strains at the open sites, resulting from the extraction of the proposed longwalls, are 1.5 millimetres per metre (mm/m) and 1.0 mm/m, respectively (MSEC, 2025).

The maximum predicted systematic and valley-related movements, resulting from the extraction of the proposed longwalls, could result in some fracturing of the exposed sandstone at these open archaeological sites. Some open sites are located in or close to drainage lines and therefore have a higher risk of fracturing at the site. Potential fracturing of the exposed sandstone is expected to be isolated and of a minor nature, due to the relatively low magnitudes of the predicted strains and the relatively high depth of cover. The potential for fracturing to occur at the grinding grooves would, therefore, be considered low (MSEC, 2025).

Rock shelters

Overhang sites can potentially be impacted by the fracturing of sandstone and rock falls. The artwork at some overhang sites can be affected by water seepage through joints. Overhang sites located over goaf areas are more susceptible to potential impact than those over solid coal (MSEC, 2025). The main mechanisms that can potentially result in impacts are the systematic strains and curvatures. The maximum predicted total tensile and compressive strains at the shelter sites, resulting from the extraction of the proposed longwalls, are 1.5 mm/m and <0.5 mm/m, respectively. Tensile strains greater than 0.5 mm/m may be of sufficient magnitude to result in the fracturing of sandstone. It is possible, therefore, that the maximum predicted systematic tensile strain, resulting from the extraction of the proposed longwalls, could result in the fracturing of sandstone. Where fracturing is coincident with an overhang, it is possible that there could be an isolated rock fall as the result of mining, or in extreme cases, collapse. Where the overhangs are located in valleys, they would also be subjected to valley-related subsidence and closure movements (MSEC, 2025).



7.2.2 Assessment of Potential Impacts

The *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) requires that both direct and indirect harm to Aboriginal objects and Aboriginal places be considered. Generally, direct harm refers to occasions where an activity physically impacts a site or objects and therefore affects the heritage values possessed by the site or objects. Indirect harm is usually taken to mean harm stemming from secondary consequences of the activity and may affect sites or objects as an indirect consequence of the activity. Examples of such indirect harm are increased visitors to a site, or increased erosion in an area as a result of an activity.

No Aboriginal cultural heritage sites were identified within the relocated Ventilation Shaft 4 disturbance footprint and therefore, no Aboriginal cultural heritage sites identified to experience direct impacts as a result of the Modification.

Subsidence predictions for the Subject Area (including specific predictions for Aboriginal heritage sites) have been provided by MSEC (2025). The subsidence predictions are informed by subsidence modelling, previous experience of underground mining in the region as well as an understanding of the geological formations in the Subject Area.

The potential for mine subsidence-induced ground movements to harm Aboriginal objects or areas of Aboriginal cultural value is dependent on many factors, including the nature of the Aboriginal cultural heritage sites or areas of cultural value themselves. MSEC describes how longwall mining can result in fracturing buckling and stepping at the ground surface (MSEC, 2025). The magnitude of these effects is largely dictated by factors such as the mine's geometry, the depth of cover (how deep the coal is below the ground surface), the extracted seam thickness, the geology above the mine, and the presence of geological features such as joints or faults, especially near the ground surface (MSEC, 2025).

In the case of Aboriginal cultural heritage, the nature of the heritage sites and features is also a very important consideration in the potential effects of subsidence-induced ground movements. Whether a site is a sandstone shelter site or a culturally significant area, all tangible and intangible cultural heritage values must be considered in determining the likely impact, if any.

For sandstone shelter sites, the types of changes would be similar or identical to those that would be expected due to natural weathering processes but exacerbated by subsidence. For example, a naturally weathering block that would have detached and fallen at some point in time may be detached and fall sooner due to differential movements of the rock strata induced by subsidence (Biosis 2007b).

For sites which occur on bedrock platforms, or in areas where the landscape is comprised of rock formations (such as sandstone and rock outcrops) the risks of harm to the sites are greater than for open sites on soil landscapes. These sites are mostly grinding groove platforms. When observed as surface effects, bedrock or rock formations would behave differently than soil to the strains and pressures associated with subsidence induced ground movements. For rock shelters the types of changes can include cracking, delamination of surface rock, exfoliation, block fall and in some cases overhang collapse (although adverse impacts have never been documented within the Metropolitan Coal Mine area) or slumping of rock.

Monitoring of the effects of subsidence-induced ground movements on Aboriginal cultural heritage sites has been conducted since the 1990s (Sefton, 2000; Biosis 2007b, 2009b, Kayandel, 2008; Niche, 2024). Subsidence movements may cause harm in the form of block fall, exfoliation, cracking, opening and/or closing of existing faults and fissures (Biosis, 2009b).



Preventative management measures can be implemented in some circumstances, but for the most part the management of Aboriginal cultural heritage sites relies on monitoring of the sites and implementing pre-arranged management responses should they be triggered by harm. For most Aboriginal heritage sites there are often no suitable remediation measures as these can often be more intrusive and harmful to heritage value than the effects of the subsidence, which as described above is usually an extension or acceleration of pre-existing natural weathering processes. As an example, the process of accessing a site and cutting stress relief slots, which requires heavy drilling or sawing machinery, in close proximity to a grinding groove platform would be likely to be more damaging to the site and its cultural context than the subsidence induced cracking or shearing of surface strata.

For the Modification, the consideration of potential harm to Aboriginal cultural heritage sites from subsidence can be divided into two distinct categories:

- Sites susceptible to harm from subsidence induced ground movements resulting in physical impacts to Aboriginal cultural heritage sites, and the monitoring and management of these impacts.
- Intrinsic heritage values of Aboriginal cultural heritage sites that are connected through a cultural landscape. Although these sites may not be directly affected through subsidence, the harm of surrounding sites impacts interconnected cultural values of the landscape.

The Subject Area for the Modification overlaps the Metropolitan Coal Mine approved mining area, and as a result a number of Aboriginal heritage sites are already approved to experience subsidence impacts. On this basis, the Modification would only result in an incremental increase or no change in subsidence parameters for these sites and the impact assessments do not change as a result of the Modification.

The predicted subsidence parameters in the Subject Area are similar to or less than those predicted for the approved Metropolitan Coal Mine and therefore the potential impacts to Aboriginal heritage sites would be similar or less (MSEC, 2025).

Table 25 presents the impact summary based on the subsidence predictions for each of the Aboriginal cultural heritage sites located within the Subject Area that have been used to inform sites that would potentially be harmed by the extraction of Longwall 317 and Longwall 318.

The Metropolitan Coal Mine Project Approval (08_0149) includes a performance measure that states:

Less than 10% of Aboriginal heritage sites within the mining area are affected by subsidence impacts...

Aboriginal heritage sites are considered to be “affected by subsidence impacts” if they exhibit one or more of the following consequences that cannot be attributed to natural weathering or deterioration:

- overhang collapse;
- cracking of sandstone that coincides with Aboriginal art or grinding grooves; and/or
- rock fall that damages Aboriginal art.

The potential impacts for the Aboriginal cultural heritage sites from the Modification are similar to or less than those predicted from the approved Metropolitan Coal Mine layout (MSEC, 2025). The incorporation of the Modification by Metropolitan Coal Mine is expected to comply with performance measures under the Metropolitan Coal Mine Project Approval (08_0149).

Potential fracturing of the exposed sandstone at grinding groove sites is expected to be isolated and of a minor nature, due to the relatively low magnitudes of the predicted strains and the relatively high depth of cover. The potential for fracturing to occur at the grinding grooves would, therefore, be considered low.

Overhang sites can potentially be impacted by the fracturing of sandstone and rock falls. The artwork at some overhang sites can be affected by water seepage through joints. The likelihood of any significant impacts on the overhang sites, due to mining the proposed longwalls, is low. Potential rock falls could occur near sites that are located close to existing cliffs, overhangs or ledges.



The magnitudes of predicted tilt and curvature for the majority of the Aboriginal cultural heritage sites are small due to the location above narrow geometry and solid coal (MSEC, 2025). Potential impacts above the Modification layout, including fracturing of bedrock, rockfalls and shear of bedding planes within shelters is expected to be minor and isolated, consistent with the impacts observed above the previously extracted longwalls at Metropolitan Coal Mine (MSEC, 2025). The likelihood of fracturing impacting the Aboriginal cultural heritage sites located above the Modification layout is considered to be low (MSEC, 2025). Impacts to the sites located above solid coal are considered unlikely (MSEC, 2025). While surface fracturing of the bedrock can occur outside the longwall layouts, such fracturing is minor and isolated and the likelihood of fracturing impacting the Aboriginal cultural heritage sites outside the longwall layouts is considered to be low (MSEC, 2025).

The Modification, taken within the context of known Aboriginal heritage sites across the Metropolitan Coal Mine and the Modification and with incorporation of appropriate management and mitigation measures would not result in a significant increase in cumulative impacts to Aboriginal cultural heritage.

There are 25 of the 29 confirmed Aboriginal heritage sites located within the Modification area which could experience subsidence induced ground movement which may cause subsidence impacts resulting in a partial loss of value. While the Modification has the potential to indirectly impact Aboriginal heritage sites, the impact is unlikely at all 25 Aboriginal heritage sites. Based on the subsidence predictions the anticipated risk of impact to these sites is low or negligible. Some sites are located close to or at the base of tributaries and could therefore experience valley related movements (MSEC, 2025). The sites most likely to experience valley related movements include NT7 to NT9, NT17, NT21, NT29, NT46, NT49 to NT53, MET9 and MET11. With the exception of NT9, NT21 and MET11, the sites are located in shallow valley profiles and are not expected to experience any significant valley closure. NT9, NT21 and MET11 are located within deeper and more incised valley profiles and could experience valley closure of up to 250 mm, 350 mm, and 50 mm respectively (MSEC, 2025). Potential impacts resulting from valley closure includes potential cracking in the bedrock along base of the tributaries and fracturing and dilation of the underlying strata above and immediately adjacent to the proposed longwalls (MSEC, 2025).

Of the 14 grinding groove locations within the extent of the 35 degree angle of draw and/or 20 mm subsidence contour, sites NT9 and NT21 are at greatest risk of cracking due to valley closure, which have a relatively higher likelihood of impact that may adversely affect Aboriginal cultural heritage values; however, this is still considered unlikely. Additionally, impacts to grinding grooves have not been observed to date at Metropolitan Coal Mine (MSEC, 2025).

Following ongoing review and refinement of the Modification mine layout, an area to the east and north of the Subject Area is predicted to experience less than 20 mm of additional subsidence compared to the approved Metropolitan Coal Mine (See the 'Less than 20 mm Subsidence Area' in Figure 8). Four Aboriginal heritage sites (NT3, NT18, NT25 and NT80) are located in this area and therefore would no longer experience any additional subsidence impacts as a result of the Modification. Despite the revised subsidence predictions, these sites are considered in this ACHA.

Subsidence effects can have impacts on the landscape which, when they occur in proximity to, or at an Aboriginal cultural heritage site can have adverse effects on the cultural heritage values of the site. As discussed in MSEC (2025) impacts that can adversely affect the cultural heritage values of a site include differential movement. See Table 25 for a summarised impact assessment of the Modification.

Recommended management and mitigation measures are provided in detail in Section 8 and Table 26 of this ACHA.



Table 25: Impact assessment summary

AHIMS ID#	Site name	Site type	Potential Impact Mechanism	Likelihood of Harm	Type of harm (Direct/Indirect/None)	Degree of harm (Total/Partial/None)	Consequence of harm
52-2-0368	Blue Gum Forest Northern Trail (R) 49	Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0369	Blue Gum Forest Northern Trail (R) 50	Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0370	Blue Gum Forest Northern Trail (R) 51	Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.



52-2-0371	Blue Gum Forest; NT(R) 53;	Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0374	Blue Gum Forest; NT(R) 54;	Shelter with Art and PAD	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0618	Woronora Reservoir Northern Trail 3	Shelter with Art and PAD	Subsidence (less than 20mm)	Highly unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0619	Woronora Reservoir Northern Trail 4	Shelter with Art and PAD	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.



52-2-0620	Woronora Reservoir Northern Trail 5	Shelter with Art	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0621	Woronora Reservoir Northern Trail 6	Shelter with Art and Artefact(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0622	Woronora Reservoir Northern Trail 7	Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0623	Woronora Reservoir Northern Trail 8	Grinding Groove(s), Rock Engraving	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.



52-2-0624	Woronora Reservoir Northern Trail 9	Shelter with Art and PAD	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0625	Northern Trail 10	Shelter with Art, Artefact(s) and PAD	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0629	Woronora Reservoir Northern Trail 17	Grinding Groove(s), Water Hole/Well	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0630	Woronora Reservoir Northern Trail 21	Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.



52-2-0631	Woronora Reservoir Northern Trail 23	Shelter with Art, Artefact(s) and PAD	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0633	Woronora Reservoir Northern Trail 25	Shelter with Art, Artefact(s) and PAD	Subsidence (less than 20mm)	Highly Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0637	Woronora Reservoir; Northern Trail 30;	Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0652	Northern Trail;52;	Grinding Groove(s), Water Hole/Well	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.



52-2-0751	Woronora Reservoir; Northern Trail 18;	Shelter with Art	Subsidence (less than 20mm)	Highly unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0753	Woronora Reservoir; Northern Trail 12;	Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0754	Woronora Reservoir; Northern Trail 13;	Shelter with Art and PAD	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-0755	Woronora Reservoir; Northern Trail 46;	Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.



52-2-0758	Woronora Reservoir; Northern Trail 22;	Shelter with Art, Artefact(s), and PAD	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-3442	Northern Trail 80	Shelter with Art, Artefact(s) and PAD	Subsidence (less than 20mm)	Highly unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-3855	Northern Trail 87	Shelter with Artefact(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-5116	MET9	Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.



52-2-5118	MET10	Shelter with Art, Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.
52-2-5117	MET11	Grinding Groove(s)	Subsidence	Unlikely	Indirect. There is potential for subsidence to affect the site with respect to the performance measure (damage to art or grinding grooves).	Partial. The proposed activities have low potential to impact the site. The activities do not have the potential to impact a whole site, or all features at a site.	Partial loss of value.



8 Avoiding and/or mitigating harm

8.1 Conservation principles and management framework

The two (2) founding principles behind the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011, p. 12) are ecologically sustainable development and intergenerational equity. These principles hold that “the present generation should make every effort to ensure the health, diversity and productivity of the environment – which includes cultural heritage – is available for the benefit of future generations”.

The strong emphasis, as in the Burra Charter, is to quantify and understand the heritage values of a place, a site, or an object and exhaust avenues of avoiding harm to those values. If harm cannot be avoided, then there must be consideration and implementation of strategies to minimise harm (OEH, 2011, p. 13).

It follows that the hierarchy for consideration in regard to management strategies available for surface stone artefacts and subsurface stone artefacts and areas of archaeological potential, fall into four general categories, in order of preference from a conservation perspective:

- avoidance and in-situ conservation;
- partial avoidance and partial in-situ conservation (includes partial harm);
- harm caused with mitigating circumstances such as collection or salvage; and
- unmitigated harm.

The four (4) general categories (described above) have been considered in the following subsections regarding both direct impacts (e.g. surface disturbance) and indirect impacts (e.g. monitoring activities).

The management and mitigation measures have been prepared in consideration of comments received from the RAPs during the consultation process. These comments include those related to cultural considerations surrounding salvage works and the handling of artefactual materials, as well as the cultural significance of all sites. All comments received from the RAPs are considered in Section 3.1.

Where possible, harm to sites would be avoided and sites would be retained in situ. All Aboriginal cultural heritage sites would be retained in-situ. Aboriginal cultural heritage sites located within the Subject Area must be monitored as per any future HMP.

8.2 Designing to avoid

As part of the Modification, Metropolitan Coal would not develop components of the approved Metropolitan Coal Mine including approved longwall mining areas. The relinquishment of these approved development areas would avoid or reduce impacts to Aboriginal heritage sites approved by Project Approval 08_0149. The total area of longwall mining that would be relinquished is approximately 253 ha. Further detail regarding the relinquished longwall mining areas is provided in the Modification Report.

The surface infrastructure proposed for the relocated Ventilation Shaft 4 would avoid all known Aboriginal cultural heritage sites.

Given the scatter of archaeological sites across the Subject Area subject to subsidence, avoidance of subsidence impacts is not considered feasible.



The longwall panel geometry adopted at the Metropolitan Coal Mine (i.e. using narrower panel voids and wider chain pillars), which would also be used for the Modification, significantly reduces subsidence impacts and reduces the potential for harm to the Aboriginal heritage sites. This is the key measure that has been successfully used during historical mining at the Metropolitan Coal Mine to reduce subsidence impacts on Aboriginal heritage sites.

8.3 Mitigating harm

Management measures are warranted to mitigate the loss of value to Aboriginal cultural heritage sites and values that would result from the proposed activity in the Subject Area. Management and mitigation measures are also warranted to ensure continued compliance with the approved HMP (Metropolitan Coal, 2024) and Project Approval (08_0149).

For the Modification, harm would be mitigated using the principles established and outlined in the approved HMP (Metropolitan Coal, 2024), which has been developed in consultation with the RAPs. In summary this would see a process of:

- Following the consultation protocol outlined in the HMP (Section 5 of the HMP).
- Pre-clearance surveys to be undertaken prior to surface disturbance to avoid accidental damage to Aboriginal heritage sites in close proximity to surface disturbance works (Section 8.2 and 10.3 of the HMP).
- Following the monitoring program outlined in the HMP (Section 9 of the HMP).
- Undertaking baseline surveys of the underground mining area prior (Section 12 of the HMP).
- Following the Human Skeletal Material Protocol (Section 10.4 of the HMP).
- Ensuring Cultural Awareness Program is implemented as part of inductions (Section 10.5 of the HMP).
- Management of recording and registering new Aboriginal cultural heritage sites (Section 8.3 of the HMP).

Consistent with the approved HMP (Metropolitan Coal, 2024), examples of potential management and remediation measures for the Modification are provided in Table 26 below. Development and implementation of these measures will be assessed on a case-by-case basis and will acknowledge that whilst the measures may reduce the risk of impact and consequence, they can also have the potential to cause substantial damage to Aboriginal heritage sites and their settings.

Preventative management measures

Consideration has been given to avoiding and minimising impacts on known archaeological sites. Very large stand-off distances between archaeological sites and mining activity would be required to avoid impacts due to subsidence. In other words, not mining the proposed longwalls would be the only way to completely avoid impacts on archaeological sites.

Preventative management measures can be implemented in some circumstances, but for the most part, the management of Aboriginal cultural heritage sites relies on monitoring the sites and implementing pre-arranged management responses should they be triggered by harm. For most Aboriginal heritage sites there are often no suitable remediation measures as these can often be more intrusive and harmful to heritage value than the effects of the subsidence, which as described above is usually an extension or acceleration of pre-existing natural weathering processes. As an example, the process of accessing a site and cutting stress relief slots, which requires heavy drilling or sawing machinery, in close proximity to a grinding groove platform would be likely to be more damaging to the site and its cultural context than the subsidence induced cracking or shearing of surface strata.



Table 26: Potential Management and Remediation Measures (Metropolitan Coal, 2024)

Consequence*	Potential Management and Remediation Measures	
	Measure	Description
Increased seepage with the potential to impact art	Seepage control techniques.	— Installation of an artificial dripline (e.g. silicone dripline) to direct increased moisture/water seepage away from art panels.
Reduction in the stability of a sandstone overhang due to substantial cracking or block fall.	Stabilisation techniques.	— Installation of artificial rock support (e.g. rock bolts, cable bolts, cement sprays [e.g. shotcrete], injection of a binding agent [Polyurethane Reactive or similar]). — Installation of standing supports (e.g. timber props, timber cogs, sandbags and metal [hydraulic] props). — Scaling/dislodgement/removal of remaining loose rock.
	Salvage.	— Salvage of artefacts for safekeeping and storage and/or display at a suitable location in consultation with the Aboriginal community.
Impacts on aesthetic values due to cracking.	Restoration of aesthetic values.	— Use of cosmetic treatments (e.g. in the form of coloured grout or similar) to restore aesthetic values.
Cracking of sandstone at open sites, threatening grinding grooves or engraved art.	Strain reduction techniques.	— Installation of a stress relief slot or stress focus notch.

* Consequences could also include the loss of site amenity and cultural and archaeological value to the community

8.4 Consideration of cumulative impacts

Cumulative impacts, as applied to the current assessment, are defined as the successive, incremental, and combined impacts of mining that is a direct result of impacts from the past, present, and future (Franks et.al. 2013).

The concentration of mining developments has not previously been considered significant enough to cause tangible cumulative impacts (National Parks and Wildlife Service, 1997). No specific methodology has been developed to adequately consider and assess cumulative impacts beyond environmental impacts on tangible cultural heritage sites within the resources sector in the Australian landscape.

A recent literature review, undertaken by Holcombe (2022), concluded that cumulative impact assessments focus on impacts to tangible cultural heritage, rarely considering the intangible impacts on Indigenous people as a direct result of harm to Country. This ACHA will consider both intangible and tangible cumulative impacts of the Modification.



8.4.1 Intangible cumulative impact assessment

All Aboriginal heritage sites and Country are considered to have high cultural value to the RAPs.

Cumulative impact assessments and their application to Aboriginal cultural heritage, is a relatively new area of consideration (Holcombe, 2022) and should be an important part of Aboriginal cultural heritage assessments; the outcomes of which often depend on whether client community engagement is undertaken between Indigenous Land Use Agreements (ILUAs) or state-based cultural heritage regulatory regimes.

Collaboration with Indigenous groups and knowledge holders is essential to effectively identify valued environmental and social components within the project area and assess intangible cumulative impacts. Additional collaboration and consultation with RAPs assigned to this project and the broader communities they represent, including Dharawal traditional knowledge holders was undertaken during an information session in addition to Stage 4 of the consultation process (refer to section 3 for additional detail). Collaboration with Indigenous groups and knowledge holders will continue beyond this project via long term consultation initiatives by Peabody associated with Metropolitan Coal.

8.4.2 Tangible cumulative impact assessment

It is important to note that mining within the Southern Coalfields is moving further west and away from culturally sensitive landforms such as ridgelines, meaning that potential subsidence impacts will reduce over time (Regal and Reeves, 2017). The Special Water Catchment Areas of the Woronora Plateau, along with adjacent National Parks and State Conservation Areas provide a region within which there has been little development, affording conservation to thousands of Aboriginal cultural heritage sites that are representative of the landscape, culture and traditions of the region.

To date, the cumulative percentage of sites affected by subsidence impacts at the Metropolitan Coal Mine is less than 2% (Niche, 2017, 2019a, 2020b, 2021a, 2023). Impacts have been recorded at 13 sites out of 144 identified sites (141 identified in the Project Environmental Assessment, one new site [MET 4] identified during Round 2 monitoring for Longwalls 20-22 and two new sites [NEW-RS-01 and NEW-ST-01] identified during baseline recording for Longwalls 311-316) due to mining induced subsidence when considering the whole of Metropolitan Coal works to date, with two resulting in impacts to Aboriginal heritage features, both being cracks through motifs and hand stencils.

There are 25 of the 29 confirmed Aboriginal heritage sites located within the Modification area which could experience subsidence induced ground movement which may cause subsidence impacts resulting in a partial loss of value. While the Modification has the potential to indirectly impact Aboriginal heritage sites, the impact is unlikely at all 25 Aboriginal heritage sites. Based on the subsidence predictions the anticipated risk of impact to these sites is low or negligible. The sites NT9, NT21 and MET11 are located within deeper and more incised valley profiles and could therefore experience greater valley closure movements. Sites NT9 and NT21 are at greatest risk of cracking due to valley closure, which have a relatively higher likelihood of impact that may adversely affect Aboriginal cultural heritage values, however, this is still considered unlikely.

When this predicted impact is assessed within the wider context of the 147 known Aboriginal heritage sites across the Metropolitan Coal Mine and the Modification (144 previously identified and 3 new sites [MET9, MET10, and MET11] identified during the ACHA surveys) and when the incorporation of appropriate management and mitigation measures are considered, the Modification would not result in a significant increase in cumulative impacts to scientific values of Aboriginal cultural heritage.

In addition, as part of the Modification, Metropolitan Coal would relinquish approximately 253 ha of longwall mining areas associated with the approved Metropolitan Coal Mine. The relinquishment of these approved development areas would avoid or reduce impacts to Aboriginal heritage sites approved by the Project Approval (08_0149). Further detail regarding the relinquished longwall mining areas is provided in the Modification Report.



8.5 Consideration of ecological sustainable development

Section 5(vii) of the EP&A Act requires proponents to consider the key principles of Ecologically Sustainable Development (ESD) in the design of their projects. The principles of ESD are defined within the *Protection of the Environment Administration Act 1991*. This Act defines the precautionary principle and the principles of inter-generational equity, conservation of biological diversity and ecological integrity. The precautionary principle is defined as:

"If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation".

Australia's *National Strategy for Ecologically Sustainable Development* (1992) defines ecologically sustainable development as 'using, conserving and enhancing the communities' resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.' Aboriginal heritage programs which seek to address indigenous concerns in relation to land, heritage, economic and cultural development include the Commonwealth Indigenous Protected Areas Initiative, Land Acquisition and Maintenance, Heritage Protection Programs, the Victorian Aboriginal Capital Projects, Aboriginal Cultural Heritage Programs, and the South Australian Aboriginal Tourism Strategy (Australian Government 1992, p.22).

ESD for the abovementioned Aboriginal cultural heritage sites should consider intergenerational equity, which is fundamental to Aboriginal culture and identity in the future. Aboriginal cultural heritage sites within the Subject Area are significant sites to the Aboriginal community, the other identified values of these sites are representative but unexceptional examples of the common features of Aboriginal cultural heritage sites in the region. Many more valuable examples occur within the Subject Area, and in the wider region.

Table 27 considers the key principles of ESD with respect to the results of the literature review, Aboriginal heritage survey results and scientific (archaeological) significance assessment contained within this report.

Table 27: Assessment of ESD

Principles of the Environmental Impact Assessment and ESD guidelines	ESD assessment
A fundamental consideration for conservation of biological diversity and ecological integrity	Metropolitan Coal has undertaken an ACHA in consultation with the RAPs and determined that there are two sites (Table 25) present within the Subject Area with the potential to be indirectly harmed due to subsidence, which may also affect biological diversity ecological integrity and generational equity to the local Aboriginal community.
Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment	
Consideration of intergenerational equity	
Where a risk of serious or irreversible harm and lack of scientific knowledge of the nature of environmental harm combine, the precautionary principle applies.	This assessment has considered a review of all Aboriginal heritage items, and their associated scientific reports identified in heritage searches as being located within the Subject Area.
Where there is a risk of serious or irreversible harm, it is necessary to establish whether there is adequate scientific knowledge of the subject to evaluate the perceived threat.	All sites have been assessed to have a low or moderate archaeological significance. The assessment identified no Aboriginal cultural heritage sites with values of high cultural significance.



	Aboriginal community consultation has identified that the Subject Area and surrounds are a cultural landscape of high value. Within this landscape Aboriginal heritage items and their connection with water, plants, animals and sites as a whole are being impacted by ongoing operations. The Subject Area has been the focus of many intensive archaeological surveys over the last two decades, including baseline recordings overlying the Metropolitan Coal Mine which has provided significance archaeological and scientific knowledge of the area (Biosis, 2009b, 2007b, 2004; IPG, 2010; Kayandel Archaeological Services, 2008; Niche, 2022a, 2022b, 2021a, 2021b, 2021c, 2021d, 2019d). To date, the cumulative percentage of sites affected by subsidence impacts at the Metropolitan Coal Mine is less than 2% (Niche, 2017, 2019a, 2020c, 2023). Impacts have been recorded at 13 out of 144 identified sites (141 identified in the Project Environmental Assessment, one new site [MET 4] identified during Round 2 monitoring for Longwalls 20-22 and two new sites [NEW-RS-01 and NEW-ST-01] identified during baseline recording for Longwalls 311-316) due to mining induced subsidence when considering the whole of Metropolitan Coal works to date, with two resulting in impacts to Aboriginal heritage features, both being cracks through motifs and hand stencils. The numbers of sites impacted at Metropolitan Coal Mine are reflective of the overall results observed in the Southern Coalfield over the last 30 years of monitoring and remain within the predicted parameters and performance measures that are expected.
An assessment of the risk-weighted consequences of various options	Consideration of mitigation strategies is provided in Section 8.3. There are no direct impacts considered for any Aboriginal heritage sites as the mine design limits the potential for subsidence.



9 Recommendations

The approved HMP (Metropolitan Coal, 2024) anticipates the type of harm described in this assessment, and as such provides a robust framework within which to manage both the impacts and avoidance of harm to Aboriginal cultural heritage sites and values. While the management measures recommended herein are consistent with the currently approved HMP, management should be undertaken consistent with the contemporary management plan that exists at the time of the works.

Niche have registered newly recorded sites MET9 (AHIMS ID# 52-2-5116), MET10 (AHIMS ID# 52-2-5118), and MET11 (AHIMS ID# 52-2-5117) and have updated site cards for Blue Gum Forest Northern Trail (R) 49 (AHIMS ID# 52-2-0368), Blue Gum Forest Northern Trail (R) 50 (AHIMS ID# 52-2-0369), Blue Gum Forest Northern Trail (R) 51 (AHIMS ID# 52-2-0370), and Woronora Reservoir; Northern Trail 13; (AHIMS ID# 52-2-0754) to update their AHIMS status from *not a site* to *valid*.

There are a range of methodologies that can be implemented to address Indigenous-specific interests, including proactive Aboriginal community consultation, beyond what is legislated, during an Aboriginal cultural heritage assessment. Involving members of the Aboriginal community to undertake land care management at known Aboriginal cultural heritage sites would also provide an opportunity to practice traditional practices, share cultural knowledge and provide access to Country.

The recommendations in Table 28 have been made in consultations with RAPs.

Table 28: Recommendations

Recommendations	
General	
1.	Metropolitan Coal should continue to consult with the RAPs for the life of the Project in accordance with the Consultation Requirements and Metropolitan Coal's commitments in the Longwall 311-316 Extraction HMP, which would be updated for the Modification.
2.	If approved, the Longwall 311-316 Extraction Plan HMP should be updated for the Modification. The HMP should be reviewed within 3 months of approval of this Modification and if necessary, revised.
3.	Baseline recording for each site should be completed prior to any longwall mining.
4.	A subsidence monitoring plan should be implemented per Section 9 of the Longwalls 311-316 Extraction Plan HMP to monitor subsidence impacts and environmental consequences of Project related subsidence on Aboriginal heritage sites located within the 35 degree angle of draw and/or predicted 20 mm subsidence contour.
5.	Metropolitan Coal should continue to include a cultural awareness program as part of inductions aimed at minimising the potential for accidental damage to Aboriginal heritage, consistent with the Longwall 311-316 Extraction Plan HMP, which would be updated for the Modification.



Recommendations

- | | |
|----|---|
| 6. | In the event that unexpected Aboriginal objects are discovered at any time during operations, the surface disturbance protocol as outlined in Section 10.3 of the Longwalls 311-316 Extraction Plan HMP must be followed. |
| 7. | In the unlikely event that suspected human remains (skeletal material) are discovered at any time during operations, the protocol for the discovery of human skeletal material as outlined in Section 10.4 of the Longwalls 311-316 Extraction Plan HMP must be followed. |



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Appendix A: Aboriginal community consultation

Not included in this version



Appendix B: Supporting Aboriginal community consultation documents

Not included in this version



Appendix C: AHIMS searches

Not included in this version



Appendix D: Site cards

Not included in this version



Appendix E: New site descriptions



MET9 (AHIMS ID# 52-2-5116)

This grinding groove site was found on a rock platform, located at least 17 m southeast of Honeysuckle Creek. The site measures 8.75 m long x 8.63 m wide. It consists of a group of at least 3 grinding grooves, with the largest of the group (Groove 2) measuring 80 cm long x 60 cm wide x 4 cm deep. All the grooves were found in a dry and good condition. An overview of the site is provided in Table 29 below while Plate 10 – Plate 16 provides overview photos of the site.

Table 29: Site details for MET9 (AHIMS ID# 52-2-5116)

Overview					
Site type	Grinding Groove(s)				
Recording	New recording: Olivier Rochecouste (Niche), Rebecca Chalker (Niche), (Kamilaroi Yankuntjatjara Working Group), Brad Maybury Aboriginal Resources Incorporated), and (Konanggo Aboriginal Cultural Heritage Services)	Date	30 January 2024		
Location description					
Landform	Sandstone outcrop.		Slope (deg)	Slight.	
Vegetation	Angophora / Banksia.		Land use	Conservation/mining.	
Disturbance	Rock popping / erosion.		Aggrading/stable/eroding	Eroding.	
Impacts	Rock popping / erosion.		Proximity to water	17 m southeast of Honeysuckle Creek.	
Visibility (%)	Organic buildup on edges		Exposure (%)	N/A	
Site context					
Site dimensions	At least 3 grooves were found as part of 1 group on top of a rock platform adjacent to Honeysuckle Creek. The site extent measures 8.75 m long x 8.63 m wide				



Context	Open
Site condition	All the grooves were found in good and dry condition.
Site description	
Total number of rock engravings	N/A
Total number of grooves	3 grinding grooves
Type, groove profile	Long, oval, and partially symmetrical.
Function	Grinding
Condition	Visible
Orientation	E-W



Plate 10: View of site extent for MET9 (AHIMS ID# 52-2-5116). Looking South.



Plate 11: Groove 1 at MET9 (AHIMS ID# 52-2-5116). Looking North.



Plate 12: Groove 1 in context at MET9 (AHIMS ID# 52-2-5116). Looking East.



Plate 13: Groove 2 at MET9 (AHIMS ID# 52-2-5116). Looking North.



Plate 14: Groove 2 in context at MET9 (AHIMS ID# 52-2-5116). Looking East.



Plate 15: Groove 3 at MET9 (AHIMS ID# 52-2-5116). Looking East.



Plate 16: Groove 3 in context at MET9 (AHIMS ID# 52-2-5116). Looking East.



MET10 (AHIMS ID# 52-2-5118)

This shelter is located at least 20 m east of Honeysuckle Creek. This shelter had a small floor space but was found to have a rock engraving on its roof. No artefacts or deposits were found on this site.

An overview of the site is provided in Table 30 below while Plate 17 – Plate 20 provides overview photos of the site.

Table 30: Site details for MET10 (AHIMS ID# 52-2-5118)

Overview					
Site type	Shelter with Art , Grinding Groove(s)				
Recording	New recording: Olivier Rochecouste (Niche), Rebecca Chalker (Niche),  (Kamilaroi Yankuntjatjara Working Group),  (Guntawang Aboriginal Resources Incorporated), and  (Konanggo Aboriginal Cultural Heritage Services)	Date	30 January 2024		
Site details					
Width	5 m	Depth	2 m	Height	2 m
Orientation	West	Floor area	3 m ²	Floor condition	Stable
Location in landscape	Located on mid-hillside on a gentle slope.				
Shelter exterior/formation	Block fall/weathering.				
Shelter interior	Sandy-loam floor with organics. Block fall and weathering present.				
Distance to water	20 m east of Honeysuckle Creek	Landform	Hillside.		
Setting	Isolated.				



Archaeological Deposit					
Deposit	No	Describe			
Visible artefacts?	No	Where?		How many?	
Art					
Art surfaces	Indeterminate rock engraving on the roof.				
Art condition	Poor				
Art overview	N/A				
Damage/threats					
Water wash	No.	Graffiti	No.	Macro vegetals	-
Animals	Small.	Salt/granular loss	On spalling most recent	Fissuring	None. Active, Yes.
Insects	Yes.	Spalling/exfoliation	Yes - back wall and roof.	Other	N/A
Fire	No	Block fall	Ancient.		



Plate 17: General shot of MET10 (AHIMS ID# 52-2-5118). Looking North.



Plate 18: General shot of MET10 (AHIMS ID# 52-2-5118). Looking South.



Plate 19: Engraving in shelter roof of MET10 (AHIMS ID# 52-2-5118), looking East.



Plate 20: Engraving in shelter roof of MET10 (AHIMS ID# 52-2-5118), looking East.

MET11 (AHIMS ID# 52-2-5117)

This grinding groove site was found at a large rock platform to the north west of a small waterfall beside it, along the Honeysuckle Creek. These grooves are facing south on the edge of a water pool with some water present, some grooves are submerged. To the east of these grooves, two deliberate channels have been observed leading water to where these grooves are. These grooves were found underneath organic material and may have been missed before. The site measures 3 m long x 1 m wide. It consists of a group of at least 8 grinding grooves, with the largest of the group measuring 40 cm long x 1.2 cm wide x 6 cm deep. All the grooves were found in a wet and eroded condition.

An overview of the site is provided in Table 31 below while Plate 21 – Plate 27 provides overview photos of the site.



Table 31: Site details for MET11 (AHIMS ID# 52-2-5117)

Overview					
Site type	Grinding Groove	██████ ██████ ██████	██████	██████████ ██████████	██████
Recording	New recording: Olivier Rochecouste (Niche), Rebecca Chalker (Niche), ██████ (Illawarra Local Aboriginal Land Council), ██████ (Coomaditchie United Aboriginal Corporation) and ██████ (Cubbitch Barta Native Title Claimants Aboriginal Corporation)	Date	1 February 2024		
Location description					
Landform	Sandstone platform	Slope (deg)	Slight.		
Vegetation	Angophora / Banksia.	Land use	Conservation/mining.		
Disturbance	Rock popping / erosion.	Aggrading/ stable/erod ing	Eroding.		
Impacts	Rock popping / erosion.	Proximity to water	5 m west of Honeysuckle Creek.		
Visibility (%)	Organic build-up on edges	Exposure (%)	N/A		
Site context					
Site dimensions	At least 8 grooves were found as part of 1 group on top of a rock platform adjacent to Honeysuckle Creek. Site extent measures 3 m long x 1 m wide				
Context	Open				
Site condition	All the grooves were found partially submerged.				



Site description	
Total number of rock engravings	N/A
Total number of grooves	8 grinding grooves
Type, groove profile	Long, oval and partially symmetrical.
Function	Grinding
Condition	Fairly visible. Found underneath organic material.
Orientation	Please see the directions specified below.



Plate 21: View of site extent for MET11 (AHIMS ID# 52-2-5117). Looking Southeast.



Plate 22: View of site extent for MET11 (AHIMS ID# 52-2-5117). Looking Southeast.





Plate 23: Close-up of grooves at MET11 (AHIMS ID# 52-2-5117). Looking East.



Plate 24: View of site extent for MET11 (AHIMS ID# 52-2-5117). Looking Northwest.



Plate 25: Close-up of grooves at MET11 (AHIMS ID# 52-2-5117). Looking Northwest.



Plate 26: Close-up of deliberate channels at MET11 (AHIMS ID# 52-2-5117). Looking Northwest.

Plate 27: Close-up of deliberate channels at MET11 (AHIMS ID# 52-2-5117). Looking West.



Appendix F: Previously recorded site descriptions



Blue Gum Forest;NT(R) 53; (AHIMS ID# 52-2-0371)

This site consists of axe-grinding grooves located on a flat rock outcrop measuring 15 m long and 3 m wide and is located 810 m downstream from site NT 51 (AHIMS ID# 52-2-0371). The grooves are described as being well-defined due to the fine-grained and hard nature of the rock. The grooves were marked with an aluminium tag at the time of recording.

This site has been revisited and updated as part of the ACHA survey. An overview of the site is provided in Table 32 below while Plate 28 - Plate 32 provides overview photos of the site.

Table 32: Site details for Blue Gum Forest;NT(R) 53; (AHIMS ID# 52-2-0371)

Overview					
Site type	Open site with Grinding Groove	██████████ ██████████	██████████	██████████ ██████████	6217055
Previous recording	Fred Wright	Date	1977		
Location description					
Landform	Creek		Slope (deg)	Slight.	
Vegetation	Angophora / Banksia		Land use	Conservation/mining.	
Disturbance	Rock popping / erosion.		Aggrading/stable/eroding	Eroding.	
Impacts	Rock popping / erosion.		Proximity to water	On Honeysuckle Creek.	
Visibility (%)	Wet organic build-up on edges		Exposure (%)	N/A	
Site context					
Site dimensions	15 m long, 3 m wide on flat rock in a creek bed				
Context	Open.				
Site condition	Only 1 grinding groove was found towards the south of the site. It is visible and exposed on open rock beside the water current to the east. The old site card mentions at least more than 2 grooves were recorded, but only 1 found in a wet and eroding condition. A very small waterfall is located just 10 m to the south of this site, upstream.				



Site description	
Total number of rock engravings	N/A
Total number of grooves	1 grinding groove
Type, groove profile	Long, oval and partially symmetrical.
Function	Grinding
Condition	Visible
Orientation	N-S



Plate 28: View of Blue Gum Forest;NT(R) 53; (AHIMS ID# 52-2-0371) site from Kayandel (2008). Looking South.



Plate 29: Present View of Blue Gum Forest;NT(R) 53; (AHIMS ID# 52-2-0371). Looking South.



Plate 30: Context of the single grinding groove at Blue Gum Forest;NT(R) 53; (AHIMS ID# 52-2-0371) in the background. Looking South.



Plate 31: Context of the single grinding groove at Blue Gum Forest;NT(R) 53; (AHIMS ID# 52-2-0371) in background. Looking South.



Plate 32: Close-up of single grinding groove at Blue Gum Forest;NT(R) 53; (AHIMS ID# 52-2-0371) in background. Looking West.



Blue Gum Forest;NT(R) 54; (AHIMS ID# 52-2-0374)

This small, continuous shelter has been affected by block fall, and chemical and cavernous weathering. It is located on a creek bend ridge landform, 5 m north of Honeysuckle Creek, at 251 m altitude. There is a large swamp opposite the creek and shelter. No artefacts were reidentified, but two art panels and six motifs were located. These were found to be weathered and in very poor condition. This shelter is fragile and is at risk of collapse and/or further block fall.

This site has been revisited and updated as part of the ACHA survey. An overview of the site is provided in Table 33 below while Plate 33 - Plate 35 provides overview photos of the site.

Table 33: Site details for Blue Gum Forest;NT(R) 54; (AHIMS ID# 52-2-0374)

Overview					
Site type	Shelter with Art and PAD				
Previous recording	F. Wright	Date	1977 (found date).		
Site details					
Width	14 m	Depth	3 m	Height	2.25 m
Orientation	53° S	Floor area	7 m ²	Floor condition	Mostly rock bed – 7 m ² living area.
Location in Landscape	251 m altitude – large swamp opposite creek and shelter.				
Shelter exterior/formation	Block fall – sheet wash weathering				
Shelter interior	Block fall – chemical/cavernous weathering				
Distance to water	5 m north of Honeysuckle Creek (west side).	Landform	Creek verge/creek bend ridge		
Setting	Small continuous				
Archaeological deposit					
Deposit	Sandy	Describe	The original recording identified 1x black chert artefact.		



Visible artefacts?	None reidentified	Where?	N/A	How many?	N/A
Art					
Art surfaces	2 x panels, 6 x motifs (see art log sheet) – charcoal indeterminates and red ochre figure (indeterminate).				
Art condition	Weathered – very poor condition.				
Art overview	-				
Damage/threats					
Water wash	Yes – back wall centre	Graffiti	-	Macro vegetals	Yes
Animals	Yes	Salt/granular loss	Yes	Fissuring	Yes
Insects	Yes	Spalling/exfoliation	Yes – on the art panel.	Other	The shelter has several vertical roof and back wall cracks. The shelter is fragile before mining commences. Very fragile roof – susceptible to further block fall/shelter collapse.
Fire	Yes	Block fall	Yes		



Plate 33: View of shelter floor for Blue Gum Forest;NT(R) 54; (AHIMS ID# 52-2-0374). Looking West.



Plate 34: View of shelter floor for Blue Gum Forest;NT(R) 54; (AHIMS ID# 52-2-0374). Looking East.



Plate 35: View of thick stick-like figure in red ochre at Blue Gum Forest;NT(R) 54; (AHIMS ID# 52-2-0374). Looking Northwest.

Woronora Reservoir Northern Trail 3 (AHIMS ID# 52-2-0618)

Woronora Reservoir Northern Trail 3 consists of two continuous sandstone shelters, forming one site. The site is located at 260 m AHD, 60 m NE of fire trail 9D under the first small cliff overhang. The shelters are formed out of Hawkesbury sandstone by cavernous weathering. Shelter #1 is located directly south-east of Shelter #2 along the same contour line. Both shelters have previously been recorded to contain art and artefacts; however, only Shelter #2 has had art and artefacts reidentified. The art located in Shelter #2 consists of fifteen (15) art motifs, mostly of charcoal and ochre indeterminate line drawings and etchings along the back wall. The art is in poor condition and has faded since the last recording, however, additional art was identified during this recording. Shelter #2 contains visible surface artefacts and a grey sandy loam floor with a potential artefact deposit.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche Environment and Heritage, 2024). The information below relies on a recent baseline recording conducted by Niche in 2023 (Niche, 2024). An overview of the site is provided in Table 34 below while Plate 36 – Plate 37 provides overview photos of the site.



Table 34: Woronora Reservoir Northern Trail 3 (Shelter #1) (AHIMS ID# 52-2-0618)

Overview					
Site type	Shelter with Art and PAD	██████████ ██████████	██████████	GDA 94 Zone 56 Northing	██████████
Previous recording	Illawarra Prehistory Group	Date	1977; 2002		
Site details					
Width	14.6 m	Depth	3.8 m	Height	1.4 m
Orientation	NE	Floor area	24 m ²	Floor condition	Eroding at dripline; inside stable.
Location in Landscape	Below the upper ridge line.				
Shelter exterior/format ion	Block fall.				
Shelter interior	Active weathering - Cavernous - Spalling Vertical cracking every 30 cm to 1 m along the entire back wall.				
Distance to water	390 m of Waratah Rivulet.	Landform	Top ridge line - just below Slope - gentle		
Setting	Continuous overhang.				
Archaeological deposit					
Deposit	Sandy.	Describe	N/A		
Visible artefacts?	Not able to relocate.	Where?	N/A	How many?	N/A
Art					
Art surfaces	See the original site card. No art was reidentified (visible) during this baseline recording.				
Art condition	N/A				
Art overview	N/A				



Damage/threats					
Water wash	No.	Graffiti	No.	Macro vegetals	Black algae on the roof.
Animals	Yes – Small animals and wombats.	Salt/granular loss	Yes – Ceiling.	Fissuring	Green algae on the base of the back wall.
Insects	Yes.	Spalling/exfoliation	Yes – Back wall and ceiling.	Other	None.
Fire	No.	Block fall	Ancient.		N/A

*Site was located during surveys undertaken by Niche in 2023. The updated coordinates have been included.



Plate 36: Shelter #1 overview, SE aspect – Woronora Reservoir Northern Trail 3 (AHIMS ID# 52-2-0618).



Plate 37: Overview of Shelter #2, SE aspect – Woronora Reservoir Northern Trail 3 (AHIMS ID# 52-2-0618).

Woronora Reservoir Northern Trail 4 (AHIMS ID# 52-2-0619)

Woronora Reservoir Northern Trail 4 consists of a sandstone shelter formed from cavernous weathering. Woronora Reservoir Northern Trail 4 is located 300 m southwest of the end of Fire Road 9D under the second ledge down from the road. The shelter has previously been recorded to contain midden material including artefacts of quartz and shell portions of Sydney cockle and a freshwater pippi 2 cm long, however, only two artefacts were re-identified. The shelter floor consists of brown loamy sand in good condition. The shelter contains art and was previously recorded to contain 17 charcoal indeterminate drawings, white ochre hand stencils and red and white ochre drawings on the roof and walls. Only two indeterminate charcoal drawings were identified, with the remaining being in very poor condition and heavily faded. Active erosion is present in the site where both the walls and roof are smoke-blackened, and art is located in areas where this blackening has flaked off.



This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche Environment and Heritage, 2024). The information below relies on a recent baseline recording conducted by Niche in 2023 (Niche, 2024) that is outlined below. An overview of the site is provided in Table 35 below while Plate 38 - Plate 39 provides overview photos of the site.

Table 35: Woronora Reservoir Northern Trail 4 (AHIMS ID# 52-2-0619)

Overview					
Site type	Shelter with Art and PAD	██████████ ██████	██████	██████████ ██████████	██████████
Previous recording	Illawarra Prehistory Group	Date	1981		
Site details					
Width	13 m	Depth	3 m	Height	1.65 m
Orientation	West	Floor area		Floor condition	Littered with leaves - good deposit
Location in landscape	Located 300 m south-west of the end of Fire Road 9D under the second ledge down from the road.				
Shelter exterior/formation	Sandstone overhang formed by cavernous weathering.				
Shelter interior	Blackened walls from smoke. Blackening is flaking off in sections, potentially taking art with it.				
Distance to water	30 m south	Landform	The upper slope of the gully		
Setting	Isolated				
Archaeological deposit					
Deposit	Sandy loam	Describe	Brown sandy loam		
Visible artefacts?	Yes	Where?	Dripline	How many?	3



Art					
Art surfaces	The original site recording notes traces of art - 17 charcoal indeterminate drawings, white ochre hand stencils and red and white ochre drawings, however, this art is not visible.				
Art Condition	Poor - barely visibly.				
Art Overview	Indeterminate figures (including possible left-hand print). Charcoal scratching.				
Damage/threats					
Water wash	Yes - back wall centre	Graffiti	No	Macro vegetals	Yes
Animals	Yes	Salt/granular loss	Yes	Fissuring	Yes
Insects	Yes	Spalling/exfoliation	Yes	Other	
Fire	-	Block fall	Yes		

*Site was located during surveys undertaken by Niche in 2023. The updated coordinates have been included.



Plate 38: External context image of Woronora Reservoir Northern Trail 4 (AHIMS ID# 52-2-0619). View from North of shelter, facing South.



Plate 39: Interior context image of Woronora Reservoir Northern Trail 4 (AHIMS ID# 52-2-0619), facing North.



Woronora Reservoir Northern Trail 5 (AHIMS ID# 52-2-0620)

This shelter with art consists of a north-west facing sandstone overhang measuring 15 m in length, 3 m wide and 4 m in height. The shelter is located 30 m west of a creek. The shelter contains a sandy loamy floor with a depth of 25 cm. The art in the shelter is located along the rear wall and depicts figures of emus, humans, hands, flying foxes, kangaroos, eels, mythical figures, and indeterminate figures.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche, 2024), details of which are provided in Table 36 below while Plate 40 – Plate 43 provides overview photos of the site.

Table 36: Site details for Woronora Reservoir Northern Trail 5 (NT 5; AHIMS# 52-2-0620)

Overview					
Site type	Shelter with Art				
Previous Recording	Illawarra Prehistory Group: C. Sefton	Date	1981		
Site details					
Width	14 m	Depth	4 m	Height	3 m
Orientation	NNW 330°	Floor area	20 m ²	Floor condition	Stable
Location in landscape	Located approximately 350 m west of Fire Road 9D, 236 m elevation, and 50 m south of the creek tributary.				
Shelter exterior/formation	Sandstone block fall.				
Shelter interior	Block fall and chemical weathering / cavernous. The floor slopes from the south end to the north end.				
Distance to water	50 m	Landform	Hillside southeast of the creek. Mid-slope.		
Setting	Isolated.				
Archaeological deposit					
Deposit	N/A	Describe	None reidentified (organic build-up in dripline).		
Visible artefacts?	N/A	Where?	N/A	How many?	N/A
Art					
Art surfaces	Located on the back wall. The original recording identified 16 panels with some art in excellent condition and others in poor/obliterated condition. This recording identified 6 panels with 41 motifs.				



Art condition	Good - poor condition, with some art no longer identifiable. The first recording fits the description. Previous water wash has ceased with dry art panels visible, which may not have been visible during the first recording.				
Art overview	See the art form below for details.				
Damage/threats					
Water wash	Yes. Slight in the east corner.	Graffiti	No.	Macro vegetals	Yes - algae.
Animals	Yes - wombat	Salt/granular loss	Yes - roof and back wall.	Fissuring	No.
Insects	Yes.	Spalling/exfoliation	Yes - roof and back wall.	Other	N/A
Fire	Yes- roof.	Block fall	Ancient.		

*Site was located during surveys undertaken by Niche in 2023. The updated coordinates have been included.



Plate 40: View of shelter floor for Woronora Reservoir Northern Trail 5 (AHIMS ID# 52-2-0620). Looking West.



Plate 41: View of shelter for Woronora Reservoir Northern Trail 5 (AHIMS ID# 52-2-0620). Looking East.



Plate 42: Overview shot of Woronora Reservoir Northern Trail 5 (AHIMS ID# 52-2-0620) art panel 4, consisting of several small, cavernous holes with art.



Plate 43: Overview shot of Woronora Reservoir Northern Trail 5 (AHIMS ID# 52-2-0620) art panel 1.



Woronora Reservoir Northern Trail 6 (AHIMS ID# 52-2-0621)

This shelter has been formed by cavernous weathering and rockfall, located within an upper valley slope at 260 m elevation and 230 m south-east of fire trail 9D. There is evidence of water wash, with waterlines and salt build-up on the lower wall. Five previously recorded artefacts were located during the survey at the front of the shelter under the dripline. The art re-located at this shelter has become more faded since the last recording (especially along the bottom wall) and is in poor condition from salt build up. Additional indeterminate charcoal art was recorded on the shelter roof.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche Environment and Heritage, 2024). The information below relies on a recent baseline recording conducted by Niche in 2023 (Niche, 2024) that is outlined below. An overview of the site is provided in Table 36 below while Plate 44 – Plate 45 provide overview photos of the site.

Table 37: Site details for Woronora Reservoir Northern Trail 6 (AHIMS ID# 52-2-0621)

Overview					
Site type	Shelter with Art and Artefact(s)	██████ ██████ ██████	██████	██████████ ██████████	██████
Previous recording	Illawarra Prehistory Group: Caryll Sefton	Date	1981; 2007		
Site details					
Width	30 m	Depth	2.8 m	Height	2 m
Orientation	East	Floor area	3 m ²	Floor condition	Poor
Location in landscape	Upper valley slope, 260 m altitude, under small cliff line 230 m south-east of fire trail 9D.				
Shelter exterior/formation	Shelter formed by cavernous weathering, rockfall present on the shelter floor. Low shelter with extensive weathering from water/spalling.				
Shelter interior	Shelter wall and roof natural erosion, evidence of water wash/spalling. Waterlines and salt build-up on the lower wall. Little floor deposit <10 cm, extensive vegetation within/under the dripline.				
Distance to water	150 m Side Creek.	Landform	Upper valley slope.		
Setting	Continuous overhang.				
Archaeological deposit					
Deposit	Yes	Describe	Cream sand, vegetation, roots and charcoal are present.		



Visible artefacts?	Yes - x 5 artefacts previously recorded. None were identified during this recording.	Where?	Under the dripline, in front of the shelter.	How many?	5
Art					
Art surfaces	Previously recorded x 10 indeterminate charcoal drawings on the shelter wall and roof at the south end of the shelter (see the previous recording on-site card). Art has become more faded (especially along the bottom wall) due to art within the water line and salt built-up.				
Art condition	Faded, poor from salt build up over art.				
Art overview	See previous recording.				
Damage/threats					
Water wash	Yes - over art	Graffiti	No	Macro vegetals	Yes - lower shelter wall/floor
Animals	No	Salt/granular loss	Yes	Fissuring	No
Insects	No	Spalling/exfoliation	Yes	Other	N/A
Fire	Yes - smoke on walls	Block fall	Yes		



Plate 44: External context image of Woronora Reservoir Northern Trail 6 (AHIMS ID# 52-2-0621), facing North.



Plate 45: Internal context image of Woronora Reservoir Northern Trail 6 (AHIMS ID# 52-2-0621), facing South.



Woronora Reservoir Northern Trail 7 (AHIMS ID# 52-2-0622)

This site is situated on a creek line on a rock platform. It has been subjected to organic erosion and includes some unusual crossover grooves, possibly part of a petroglyph.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche Environment and Heritage, 2024). The information below relies on a recent baseline recording conducted by Niche in 2023 (Niche, 2024) that is outlined below. An overview of the site is provided in Table 38 below while Plate 46 and Plate 47 provide overview photos of the site.

Table 38: Site details for Woronora Reservoir Northern Trail 7 (AHIMS ID# 52-2-0622)

Overview					
Site type	Open site with Grinding Groove	██████████ ██████████	██████████	██████████████████ ██████████	██████████
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	1981; 2007		
Location description					
Landform	Creek line/swamp.		Slope (deg)	Gentle.	
Vegetation	Hakea/Bottlebrush.		Land use	Conservation/mining.	
Disturbance	Organic erosion.		Aggrading/S table/Eroding g	Eroding.	
Impacts	Organic erosion.		Proximity to water	On the creek line.	
Visibility (%)	-		Exposure (%)	-	
Site context					
Site dimensions	15x8 m				
Context	Open.				
Site condition	Organic erosion is present.				



Site description	
Total number of rock engravings	-
Total number of grooves	33
Type, groove profile	Long oval symmetrical shaped grooves. Some grooves cross over.
Function	Axe grinding grooves.
Condition	Visible.
Orientation	See the dimensions below.

*Site was located during surveys undertaken by Niche in 2023. The updated coordinates have been included.



Plate 46: Site photo – Woronora Reservoir Northern Trail 7 (AHIMS ID# 52-2-0622), facing South.



Plate 47: Groove #32 – Woronora Reservoir Northern Trail 7 (AHIMS ID# 52-2-0622), facing North.

Woronora Reservoir Northern Trail 8 (AHIMS ID# 52-2-0623)

This site is situated upon a creek line landform, that moves into a stored water area. Features include two platforms with six petroglyphs and 52 grinding grooves. These are in a stable condition; however, some impacts are evident such as organic matter and environmental degradation and erosion.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche Environment and Heritage, 2024). The information below relies on a recent baseline recording conducted by Niche in 2023 (Niche, 2024) that is outlined below. An overview of the site is provided in Table 39 below while Plate 48 – Plate 51 provide overview photos of the site.



Table 39: Site details for Woronora Reservoir Northern Trail 8 (AHIMS ID# 52-2-0623)

Overview					
Site type	Grinding Groove(s), Rock Engraving	██████████ ██████████	██████████	██████████ ██████████	██████████
Previous Recording	Illawarra Prehistory Group: C. Sefton	Date	1981; 2006		
Location description					
Landform	Creekline		Slope (deg)	N/A	
Vegetation	Hakea / Bottlebrush		Land use	Conservation/mining	
Disturbance	-		Aggrading/stable /eroding	Eroding	
Impacts	Organic matter, environmental degradation.		Proximity to water	Located in creekline, moving into stored water.	
Visibility (%)	-		Exposure (%)	-	
Site context					
Site dimensions	42x20 m				
Site dimensions	See site card. Site distinguished as Platforms 1 and 2. Platform 1 (Upper stream): - 3 x Petroglyphs (#1 - 3) - 19 x Grinding Grooves (#1-19) Platform 2 (Downstream): - 3 x Petroglyphs (#4-6) - 33 x grinding grooves (#20-52)				
Context	Open				
Site condition	Platforms are stable with no visible cracking or signs of block-breaking or eroding. A large build-up of organic matter over grooves and petroglyphs - edges.				
Site description					



Total number of rock engravings	6 petroglyphs – extremely degraded with parts not visible since the last recording.
Total number of grooves	(Previously recorded 6 engravings)
Type, groove profile	52 grinding grooves
Function	(Previously recorded 41 grinding grooves)
Condition	Long oval symmetrical shaped grooves.
Orientation	Axe grinding grooves



Plate 48: Overview of grinding grooves (Platform 1) – Woronora Reservoir Northern Trail 8 (AHIMS ID# 52-2-0623), facing West.



Plate 49: Overview of Petroglyphs 1-3 (Platform 1), Woronora Reservoir Northern Trail 8 (AHIMS ID# 52-2-0623), facing Northeast.



Plate 50: Overview of Petroglyphs 4-6 (Platform 2), Woronora Reservoir Northern Trail 8 (AHIMS ID# 52-2-0623), facing South.



Plate 51: Close overview of grinding grooves (Platform 2), Woronora Reservoir Northern Trail 8 (AHIMS ID# 52-2-0623), facing South.



Woronora Reservoir Northern Trail 9 (AHIMS ID# 52-2-0624)

This shelter is a continuous sandstone ridgeline that has been subject to active, chemical weathering and block fall. The shelter is located under a waterfall at 239 m elevation and measures 60 m x 6 m x 4.2 m. One weathered, partial charcoal macropod was recorded. No artefacts were reidentified .

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche Environment and Heritage, 2024). The information below relies on a recent baseline recording conducted by Niche in 2023 (Niche, 2024) that is outlined below. An overview of the site is provided in Table 40 below while Plate 52 and Plate 53 provide overview photos of the site.

Table 40: Site details for Woronora Reservoir Northern Trail 9 (AHIMS ID# 52-2-0624)

Overview					
Site type	Shelter with Art and PAD	██████████ ██████	██████	██████████ ██████████	██████████
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	1981; 2007		
Site details					
Width	60 m	Depth	6 m	Height	4.2 m
Orientation	North	Floor area	10 m²	Floor condition	Eroding
Location in landscape	Under waterfall - Upper mid-slope - 239 m elevation. There are shelters on top of each other and appear to be at the same location.				
Shelter exterior/formation	Continuous sandstone ridgeline.				
Shelter interior	Block fall - chemical weathering - active weathering.				
Distance to water	On Creek	Landform	Ridgeline below the waterfall.		
Setting	Continuous				
Archaeological deposit					
Deposit	Sandy	Describe	The original recording consisted of 4x flaked artefacts. No artefacts were reidentified.		
Visible artefacts?	No	Where?	N/A	How many?	N/A
Art					



Art surfaces	1 panel = 1 motif				
Art condition	Weathered				
Art overview	1 charcoal macropod - partial				
Damage/threats					
Water wash	Yes.	Graffiti	No.	Macro vegetals	Yes.
Animals	Yes.	Salt/granular loss	Yes.	Fissuring	No.
Insects	Yes.	Spalling/exfoliation	Yes.	Other	N/A
Fire	-	Block fall	Yes.		

*Site was located during surveys undertaken by Niche in 2023. The updated coordinates have been included.



Plate 52: Overview of the eastern end of the shelter, from centre – Woronora Reservoir Northern Trail 9 (AHIMS ID# 52-2-0624).



Plate 53: Overview of the western end of the shelter, from the centre – Woronora Reservoir Northern Trail 9 (AHIMS ID# 52-2-0624).

Northern Trail 10 (AHIMS ID# 52-2-0625)

This shelter with art and deposit consists of a west-facing sandstone overhang measuring 17 m in length, 3.5 m wide and 2.2 m in height. The floor of the shelter consists of a sandy loam deposit approximately 15 cm deep with numerous artefacts of chert, quartz, petrified wood, and jasper recorded. The art recorded in the shelter consists of semicircular charcoal lines.

This shelter is formed from weathering and block fall. It is located on a hillside landform on a gentle slope at 270 m elevation, 150 m west of Honeysuckle Creek. Findings include a charcoal indeterminate partial drawing in weathered condition. Some artefacts were also located.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche Environment and Heritage, 2024). An overview of the site is provided in Table 41 below while Plate 54 and Plate



55 provides overview photos of the site, the details for which have been taken from the most recent baseline recording data (Niche, 2024).

Table 41: Site details for Northern Trail 10 (AHIMS ID# 52-2-0625)

Overview					
Site type	Shelter with Art, Artefact(s) and PAD				
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	1981		
Site details					
Width	21.5 m	Depth	3 m	Height	2.4 m
Orientation	West 251°	Floor area	40 m²	Floor condition	Stable
Location in landscape	Elevation at 270 m AHD. Located on mid-hillside on a gentle slope.				
Shelter exterior/formation	Block fall/weathering.				
Shelter interior	Sandy-loam floor with organics. Block fall and weathering present.				
Distance to water	150 m west to Honeysuckle Creek	Landform	Hillside.		
Setting	Isolated.				
Archaeological deposit					
Deposit	PAD	Describe			
Visible artefacts?	Yes	Where?		How many?	
Art					
Art surfaces	1 panel = 1 motif				
Art condition	Charcoal indeterminate partial drawing at 18.6 m on baseline.				
Art overview	Weathered				



Damage/threats					
Water wash	No.	Graffiti	No.	Macro vegetals	-
Animals	Small.	Salt/granular loss	On spalling most recent	Fissuring	None. Active, Yes.
Insects	Yes.	Spalling/exfoliation	Yes - back wall and roof.	Other	N/A
Fire	Yes - roof.	Block fall	Ancient.		

*Site was located during surveys undertaken by Niche in 2023. The updated coordinates have been included.



Plate 54: View of shelter floor for Northern Trail 10 (AHIMS ID# 52-2-0625). Looking Northwest.



Plate 55: View of shelter floor for Northern Trail 10 (AHIMS ID# 52-2-0625). Looking Southeast.

Woronora Reservoir Northern Trail 17 (AHIMS ID# 52-2-0629)

This site consists of a sandstone outcrop in the bed of a small creek with 50 axe-grinding grooves and a water channel around the upstream side of a pothole, created to divert water from the pothole. The site is situated in an upland shrub swamp.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche Environment and Heritage, 2024). The information below relies on a recent baseline recording conducted by Niche in 2023 (Niche, 2024) that is outlined below. An overview of the site is provided in Table 42 below while Plate 56 and Plate 57 provide overview photos of the site.



Table 42: Woronora Reservoir Northern Trail 17 (AHIMS ID# 52-2-0629)

Overview					
Site type	Grinding Groove(s), Water Hole/Well	██████████ ██████	██████	██████████ ██████████	██████
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	1981		
Location description					
Landform	Creek upper swamp.		Slope (deg)	Gentle to the north.	
Vegetation	Swamp - Teatree - Hakea - Banks		Land use	Conservation / Mining	
Disturbance	Organic build-up erosion		Aggrading/stabl e/eroding	Stable	
Impacts	Mining - Below - Organic growth.		Proximity to water	On an unnamed creek. Parallel between Honeysuckle Creek and Firetrail 9D.	
Visibility (%)	Organic build-up		Exposure (%)	N/A	
Site context					
Site Dimensions	See site card. Elevation 251 m AHD. The site is situated on the upper area of an unnamed creek on a sandstone platform in the centre of the upland swamp area. 250 m west of 9D, entry opposite 120 m from the end of Firetrail 9D.				
Context	Open				
Site Condition	Stable				
Site description					
Total number of rock engravings	1 x Petroglyph				
Total number of grooves	53 x Grinding grooves.				
Type, Groove Profile					
Function	Axe grinding grooves				



Condition	Visible
Orientation	Please see the directions specified below.
Notes	Evidence of burning and heat damage. There are no clear indications of natural cracking or bedding plane movement on the platform.



Plate 56: Overview of Woronora Reservoir Northern Trail 17 (AHIMS ID# 52-2-0629). Looking North.



Plate 57: Close-up of grinding grooves at Woronora Reservoir Northern Trail 17 (AHIMS ID# 52-2-0629). Looking West.

Woronora Reservoir Northern Trail 21 (AHIMS ID# 52-2-0630)

This site consists of 10 axe-grinding grooves on a sandstone outcrop approximately 15 m above a pool. The outcrop covers an area of approximately 15 x 4 m.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche Environment and Heritage, 2024). The information below relies on a recent baseline recording conducted by Niche in 2023 (Niche, 2024) that is outlined below. An overview of the site is provided in Table 42 below while Plate 58 and Plate 59 provides overview photos of the site.



Table 43: Woronora Reservoir Northern Trail 21 (AHIMS ID# 52-2-0630)

Overview					
Site type	Open Site with Grinding Groove	██████████ ██████████	██████████	██████████ ██████████	██████████
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	1981		
Location description					
Landform	Creek line – sandstone platform.		Slope (deg)	Gentle creek slope – N.	
Vegetation	Eucalypt/ Christmas bush and Gymea lilly dominated		Land use	Conservation/mining.	
Disturbance	Organic build-up		Aggrading/stable/eroding	Stable	
Impacts	Organic and water erosion		Proximity to water	On the water – unnamed creek.	
Visibility (%)	NA		Exposure (%)	NA	
Site context					
Site Dimensions	15 m x 4 m				
Context	Open				
Site Condition	Stable				
Site description					
Total number of rock engravings	N/A				
Total number of grooves	Six grinding grooves reidentified from the original 10 recorded in 1976.				
Type, Groove Profile	Long, oval-shaped.				
Function	Axe grooves- possible ground dishes near grinding grooves.				
Condition	Visible – is susceptible to organic (chemical) weathering from covering and uncovering during different flows in the creek line.				
Orientation	NW, SW, and W				



Plate 58: View of site extent at Woronora Reservoir Northern Trail 21 (AHIMS ID# 52-2-0630). Looking North.



Plate 59: View of grinding grooves at Woronora Reservoir Northern Trail 21 (AHIMS ID# 52-2-0630). Looking South.

Woronora Reservoir Northern Trail 23 (AHIMS ID# 52-2-0631)

This shelter with art and deposit consists of a sandstone overhang measuring 4 m in length, 4 m wide and 4 m in height. The floor of the shelter consists of a sandy loam deposit that is approximately 60 cm deep. Numerous artefacts are evident in the shelter. The wall of the shelter contains four charcoal kangaroos near the floor of the shelter on the rear wall.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche Environment and Heritage, 2024). The information below relies on a recent baseline recording conducted by Niche in 2023 (Niche, 2024) that is outlined below. An overview of the site is provided in Table 44 below while Plate 60 – Plate 63 provides overview photos of the site.

Table 44: Woronora Reservoir Northern Trail 23 (AHIMS ID# 52-2-0631)

Overview					
Site type	Shelter with Art, Artefact(s), and PAD				
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	1981		
Site details					
Width	20 m	Depth	5.8 m	Height	4 m
Orientation	196° S	Floor area	20 m ²	Floor condition	Stable



Location in landscape	268 m elevation, under the top ridgeline. North of a large swamp. 40 m NW of NT22.				
Shelter exterior/formation	Block fall				
Shelter interior	Block fall, cavernous and chemical weathering				
Distance to water	410 m SE of Honeysuckle Creek	Landform	Ridgeline		
Setting	-				
Archaeological deposit					
Deposit	Sandy	Describe	Unspecified		
Visible artefacts?	Yes	Where?	Inner dripline	How many?	>20
Art					
Art surfaces	3 x panels (see art form), 8 x motifs (5 x charcoal (indeterminate – previously identified as kangaroos; 2 x indeterminate red ochre stencils; 1 x partial left hand stencil – red ochre).				
Art condition	Weathered and spalling (particularly the red ochre stencils).				
Art overview	-				
Damage/threats					
Water wash	Yes	Graffiti	No	Macro vegetals	Yes – in water wash and between bedding (separation plane).
Animals	Small	Salt/granular loss	Yes	Fissuring	No
Insects	Small	Spalling/exfoliation	Yes – affecting artwork	Other	Active weathering – recent small block fall
Fire	Yes	Block fall	Yes - ancient and recent.		

*Site was located during surveys undertaken by Niche in 2023. The updated coordinates have been included.



Plate 60: Overview of Woronora Reservoir Northern Trail 23 (AHIMS ID# 52-2-0631), Northwest end of shelter.



Plate 61: Overview of Woronora Reservoir Northern Trail 23 (AHIMS ID# 52-2-0631), East end of shelter.



Plate 62: Art panel 1 overview, Woronora Reservoir Northern Trail 23 (AHIMS ID# 52-2-0631).



Plate 63: Location of artefacts at Woronora Reservoir Northern Trail 23 (AHIMS ID# 52-2-0631).

Woronora Reservoir Northern Trail 25 (AHIMS ID# 52-2-0633)

This shelter with art site consists of a sandstone overhang measuring 9 m in length, 2.8 m wide and 2.4 m in height. The floor of the shelter consists of a sandy loam deposit that is approximately 50 cm deep. Numerous artefacts are evident in the shelter. The rear wall of the shelter conveys nine charcoal indeterminate drawings, two charcoal outlines and infill frontal human figures. On the lower front wall, one charcoal outline kangaroo was recorded.

This site was attempted to be reidentified during the Niche 2024 survey but was not found in its recorded location. An overview of the site is provided in Table 45 below while Plate 64 – Plate 67 provides overview photos of the site from the original site card.



Table 45: Site details for Woronora Reservoir Northern Trail 25 (AHIMS ID# 52-2-0633)

Overview					
Site type	Shelter with Art, Artefact(s) and PAD	██████████ ██████	██████	██████████ ██████████	██████████
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	2006	Updated recording	
Site details					
Width	9 m	Depth	2.8 m	Height	2.4 m
Orientation	SW	Floor area	6 m²	Floor condition	Stable
Location in Landscape	The site is under the knoll above Honeysuckle Creek on the eastern side of the creek and North of Fire Trail 9D. It is 50 m N of NT 24.				
Shelter exterior/formation	Block fall				
Shelter interior	Block fall, cavernous and chemical weathering				
Distance to water	300 m East of Honeysuckle Creek	Landform	Slope		
Setting	-				
Archaeological deposit					
Deposit	Sandy	Describe	Unspecified		
Visible artefacts?	No	Where?	Inner dripline	How many?	>20
Art					
Art surfaces	The rear wall of the shelter contains 4 x charcoal indeterminate drawings, 2 x charcoal outlines and infill frontal human figures. On the lower front wall, a 1 x charcoal outline kangaroo was recorded.				
Art condition	Poor – case hardened, flaking and water damage.				
Art overview	-				



Damage/threats					
Water wash	Yes	Graffiti	-	Macro vegetals	-
Animals	Small	Salt/granular loss	-	Fissuring	-
Insects	Small	Spalling/exfoliation	Yes - affecting artwork	Other	-
Fire	Yes	Block fall	Yes		



Plate 64: Overview of Woronora Reservoir Northern Trail 25 (AHIMS ID# 52-2-0633).



Plate 65: Overview of charcoal indeterminate drawings for Woronora Reservoir Northern Trail 25 (AHIMS ID# 52-2-0633).



Plate 66: Art panel overview, 1 x charcoal outline kangaroo at Woronora Reservoir Northern Trail 25 (AHIMS ID# 52-2-0633).



Plate 67: Close-up of charcoal indeterminate drawings for Woronora Reservoir Northern Trail 25 (AHIMS ID# 52-2-0633).



Woronora Reservoir;Northern Trail 30; (AHIMS ID# 52-2-0637)

This site consists of two axe-grinding grooves on a flat sandstone outcrop in the creek bed just below a swamp where the water flows from. The outcrop measures 3 m by 5 m in size.

This site was attempted to be reidentified during the Niche 2024 survey but was not found in its recorded location. An overview of the site is provided in Table 46 below while Plate 68 – Plate 69 provides overview photos of the site from Kayandel's report (Kayandel Archaeological Services, 2008).

Table 46: Woronora Reservoir;Northern Trail 30; (AHIMS ID# 52-2-0637)

Overview					
Site type	Open site with Grinding Groove	██████ ██████ ██████	██████	██████████ ██████	██████
Previous recording	Illawarra Prehistory Group: C. Sefton.	Date	1981	Date of updated recording	
Location description					
Landform	Sandstone outcrop in creek bed		Slope (deg)		
Vegetation	Thick shrub swamp		Land use	Conservation/mining	
Disturbance			Aggrading/Stable/ Eroding		
Impacts			Proximity to water	Within creek	
Visibility (%)			Exposure (%)		
Site context					
Site dimensions	3 m x 5 m				
Context	Open				
Site condition	The site is 20 m above a waterfall, in 1981 the creek was not flowing over the site.				
Site description					
Total number of rock engravings	N/A				



Total number of grooves	2 grinding grooves
Type, Groove Profile	Long, oval and partially symmetrical
Function	Grinding
Condition	
Orientation	



Plate 68: View of Woronora Reservoir;Northern Trail 30; (AHIMS ID# 52-2-0637) site from Kayandel (2008).



Plate 69: View of Woronora Reservoir;Northern Trail 30; (AHIMS ID# 52-2-0637) site from Kayandel (2008).

Northern Trail;52; (AHIMS ID# 52-2-0652)

The site consists of 34 axe-grinding grooves in groups around potholes over an area measuring 25 m by 20 m on a sandstone outcrop. The grooves consist of a variety of shapes and sizes and are well-defined.

This site was revisited as part of the survey for this ACHA. An overview of the site is provided in Table 47 below while Plate 70 – Plate 74 provides overview photos of the site.



Table 47: Site details for Northern Trail;52; (AHIMS ID# 52-2-0652)

Overview					
Site type	Open site with Grinding Groove				
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	1977		
Location description					
Landform	Sandstone outcrop.		Slope (deg)	Slight.	
Vegetation	Angophora / Banksia.		Land use	Conservation/mining.	
Disturbance	Rock popping / erosion.		Aggrading/ Stable/Ero ding	Eroding.	
Impacts	Rock popping / erosion.		Proximity to water	On Honeysuckle Creek.	
Visibility (%)	Organic build up in on edges		Exposure (%)	N/A	
Site context					
Site dimensions	34 axe grinding grooves in groups around potholes throughout an area, measuring 25 m long x 20 m wide on a sandstone outcrop.				
Context	Open				
Site condition	Most of the grooves are in good condition with some affected by rock-popping.				
Site description					
Total number of rock engravings	N/A				
Total number of grooves	34 grinding grooves				
Type, groove profile	Long, oval and symmetrical. There is a variety of shapes and sizes of grooves, most are well-defined.				
Function	Grinding				
Condition	Visible				
Orientation	Please see the directions specified below.				

*Site was located during surveys undertaken by Niche in 2023. The updated coordinates have been included.



Plate 70: View of Northern Trail;52; (AHIMS ID# 52-2-0652). Looking Northwest.



Plate 71: Examples of grinding grooves at Northern Trail;52; (AHIMS ID# 52-2-0652). Looking Northwest.



Plate 72: Examples of grinding grooves at Northern Trail;52; (AHIMS ID# 52-2-0652). Looking Northwest.



Plate 73: General context shot of grinding groove at Northern Trail;52; (AHIMS ID# 52-2-0652). Looking West.



Plate 74: General context shot of grinding groove at Northern Trail;52; (AHIMS ID# 52-2-0652). Looking Northwest.



Woronora Reservoir; Northern Trail 18; (AHIMS ID# 52-2-0751)

This shelter with art consists of a sandstone overhang facing northwest, measuring 22 m in length, 4 m wide and 4 m in height. It contains a stone floor base with some loam and clay soil. The art in the shelter consists of seven charcoal drawings, determined to depict a flying fox, fish and other indeterminate shapes. This shelter is formed out of sandstone by cavernous and chemical weathering. It is located within a hill/ridgeline landform area near closed woodland. The art located at this shelter is in very poor condition from water wash and weathering. No archaeological deposit was located during the survey.

This site was revisited as part of the survey for this ACHA. An overview of the site is provided in Table 48 below while Plate 75 – Plate 76 provides overview photos of the site.

Table 48: Woronora Reservoir; Northern Trail 18; (AHIMS ID# 52-2-0751)

Overview					
Site type	Shelter with Art				
Previous recording	Illawarra Prehistory Group: C. Sefton; and Niche Environment and Heritage	Date	1981 and 2023		
Site details					
Width	17.8 m	Depth	4.5 m	Height	3.755 m
Orientation	330° NNW	Floor area	-	Floor condition	-
Location in Landscape	217 m				
Shelter exterior/formation	Sandstone block fall. Bottlebrush - Christmas Bush - Geebungs - Bluegums				
Shelter interior	Sandstone block fall, and cavernous and chemical weathering.				
Distance to water	60 m NE	Landform	Hills / ridgelines - closed woodland		
Setting	Continuous				
Archaeological deposit					
Deposit	Shallow sandy loam	Describe	No archaeological deposit found		



Visible artefacts?	N/A	Where?	N/A	How many?	N/A
Art					
Art surfaces	4 x panels and 8 x motifs (see art form)				
Art condition	Poor, weathered, water wash				
Art overview	Unspecified				
Damage/threats					
Water wash	None recent/active – some old (Panel 2 and 4)	Graffiti	No	Macro vegetals	Yes – back wall crack
Animals	Small	Salt/granular loss	Yes – back wall 0-3m	Fissuring	Yes – horizontal bedding plane cracks floor to wall, along back walls (entire length of shelter).
Insects	Yes	Spalling/exfoliation	Yes – current and continuous	Other	N/A
Fire	Smoke – old	Block fall	Ancient		



Plate 75: Overview of Woronora Reservoir; Northern Trail 18; (AHIMS ID# 52-2-0751). Looking East.



Plate 76: Overview of Woronora Reservoir; Northern Trail 18; (AHIMS ID# 52-2-0751). Looking West.



Woronora Reservoir;Northern Trail 12; (AHIMS ID# 52-2-0753)

This site is located within a sandstone outcrop landform and exhibits impacts of rock popping and erosion. It is situated 150 m east of Honeysuckle Creek and contains 44 grinding grooves. Some of these grooves appear to form a singular grooved dish, potentially used for water storage. Most of the grooves are in good condition.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche, 2024). An overview of the site is provided in Table 49 below while Plate 77 and Plate 78 provide overview photos of the site.

Table 49: Site details for Woronora Reservoir;Northern Trail 12; (AHIMS ID# 52-2-0753)

Overview					
Site type	Grinding Groove(s)				
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	1981		
Location description					
Landform	Sandstone outcrop.		Slope (deg)	Slight.	
Vegetation	Angophora / Banksia.		Land use	Conservation/mining.	
Disturbance	Rock popping / erosion.		Aggrading/Stable/Eroding	Eroding.	
Impacts	Rock popping / erosion.		Proximity to water	150 m east of Honeysuckle Creek.	
Visibility (%)	Organic build up in on edges		Exposure (%)	N/A	
Site context					
Site dimensions	See site card. 44 grinding grooves, including 2 deep-grooved dishes (#37 and #40). Grooves #37 and #40 are possibly a series of grooves deepened over time to become a larger, one-grooved dish to hold water or other resources (water is still present in waterhole and grooves #37 and #40). Groove #32 is boomerang-shaped. Grooves vary in length and depth.				
Context	Open				
Site condition	Grooves #1-4 are impacted by rock-popping – southern ends of grooves are popped off, with groove #4 popped, but the rock remains in place (possible management needed). Other grooves are in good condition.				
Site description					



Total number of rock engravings	N/A
Total number of grooves	44 grinding grooves
Type, groove profile	Long, oval and symmetrical, except grooves #7 and #40 (larger, curved shape) and grooves #32 (boomerang shape).
Function	Grinding – possible water reservoir for #37 and #40.
Condition	Visible
Orientation	Please see the directions specified below.



Plate 77: View of site extent for Woronora Reservoir; Northern Trail 12; (AHIMS ID# 52-2-0753). Looking South.



Plate 78: View of site extent for Woronora Reservoir; Northern Trail 12; (AHIMS ID# 52-2-0753). Looking North.

Woronora Reservoir; Northern Trail 46; (AHIMS ID# 52-2-0755)

This site is located in a swamp area on a sandstone ridge and is situated on a creek line in the swamp. Sixteen grinding grooves were located at the site. The site and some grooves have been subjected to erosion and weathering.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche, 2024) that is outlined below. An overview of the site is provided in Table 50 below while Plate 79 and Plate 80 provide overview photos of the site.



Table 50: Site details for Woronora Reservoir;Northern Trail 46; (AHIMS ID# 52-2-0755)

t					
Site type	Open site with Grinding Groove	██████████ ██████████	██████	██████████ ██████████	██████
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	1981; 2007		
Location description					
Landform	Sandstone ridge – swamp		Slope (deg)	Gentle	
Vegetation	Hakea/bottlebrush		Land use	Conservation/mining	
Disturbance	Overgrown vegetation		Aggrading/stable/eroding	Eroding	
Impacts	Eroding grooves		Proximity to water	On creek line – natural spring in a swamp.	
Visibility (%)	-		Exposure (%)	-	
Site context					
Site dimensions	15 m x 20 m				
Context	Open – western side of Waratah Rivulet off the 9D trail.				
Site condition	-				
Site description					
Total number of rock engravings	-				
Total number of grooves	16				
Type, groove profile	-				
Function	-				
Condition	Eroding				
Orientation	See the groove recording table.				



Plate 79: Overview of site, Northeast aspect – Woronora Reservoir;Northern Trail 46; (AHIMS ID# 52-2-0755).



Plate 80: Groove #3 – Woronora Reservoir;Northern Trail 46; (AHIMS ID# 52-2-0755).

Woronora Reservoir;Northern Trail 22; (AHIMS ID# 52-2-0758)

This shelter with deposit consists of a sandstone overhang measuring 12 m in length, 3.43 m deep and 4.12 m in height and faces south-west. The floor of the shelter consists of a sandy deposit approximately 50 cm deep. Artefacts are evident in the shelter including a large quartzite core.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche, 2024). An overview of the site is provided in Table 49 below while Plate 81 and Plate 82 provide overview photos of the site.



Table 51: Site Details for Woronora Reservoir;Northern Trail 22; (AHIMS ID# 52-2-0758)

Overview					
Site type	Shelter with Art, Artefact(s), and PAD	██████████ ██████	██████	██████████ ██████████	██████
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	1981		
Site details					
Width	12 m	Depth	3.43 m	Height	4.12 m
Orientation	SW 212°	Floor area	12 m²	Floor condition	Stable
Location in landscape	267 m altitude - north of a large swamp under the ledge of a sandstone platform.				
Shelter exterior/formation	Uplift/weathering				
Shelter interior	Cavernous and chemical weathering, ancient block fall.				
Distance to water	450 m east of Honeysuckle Creek	Landform	Ridgeline		
Setting	Continuous				
Archaeological deposit					
Deposit	Sandy loam with ash	Describe	Possible subsurface deposit		
Visible artefacts?	Yes – quartzite core	Where?	Centre of floor area	How many?	1
Art					
Art surfaces	Charcoal indeterminate, 45 cm from the ground at 6 m.				
Art condition	-				
Art overview	No distinct monitoring points.				



Damage/threats					
Water wash	Yes – not active	Graffiti	No	Macro vegetals	Yes
Animals	Small	Salt/granular loss	Yes	Fissuring	Yes
Insects	Small	Spalling/exfoliation	Yes – back wall	Other	N/A
Fire	Yes – ash and smoke present	Block fall	Yes – ancient		



Plate 81: Overview of shelter, Woronora Reservoir; Northern Trail 22; (AHIMS ID# 52-2-0758). Looking North.



Plate 82: Quartzite core located at Woronora Reservoir; Northern Trail 22; (AHIMS ID# 52-2-0758).

Northern Trail 80 (AHIMS ID# 52-2-3442)

This site is identified in AHIMS as an open campsite; however, the site card identifies the site as a shelter with deposit. This site is located at a shelter approximately 150 m east of Honeysuckle Creek under a small cliff line. The site consists of a south-facing shelter measuring 10 m in length, 3 m in width and 2 m in height. The deposit is made from orange sandy loam and measures 50 cm in depth. The deposit contains five artefacts, including two chert flakes, two quartz flakes and one quartzite flake.

This isolated, non-continuous sandstone shelter has been affected by block fall and cavernous weathering. It is located on a mid-slope landform at 210 m altitude from stored water, below the end of fire trail 9D. The mid-lower valley slope is near Waratah Rivulet.

This site was reidentified during the baseline survey in 2023 and not revisited during the ACHA surveys (Niche, 2024) that is outlined below. No artefacts or art surfaces were reidentified during that survey. An overview of the site is provided in Table 52 below while Plate 83 and Plate 84 provides overview photos of the site.



Table 52: Site details for Northern Trail 80 (AHIMS ID# 52-2-3442)

Overview					
Site type	Shelter with Art, Artefact(s) and PAD.	██████████ ██████	██████	██████████ ██████████	██████████
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	2007		
Site details					
Width	17 m	Depth	4 m	Height	1.8 m
Orientation	65° NE	Floor area	5 m ²	Floor condition	Good - some animal disturbance/ wash.
Location in landscape	On mid-slope, 210 m altitude from stored water (western side), at/below end of fire trail 9E.				
Shelter exterior/formation	Shelter formed from cavernous weathering and block falls on either side, non-continuous, located at 210 m contour.				
Shelter interior	The shelter floor deposit is an orange, loamy sand, eroded from the shelter. Deposit depth at least 35 cm, with some exposed sandstone block fall present.				
Distance to water	120 m of Waratah Rivulet.	Landform	Mid-lower valley slope to Waratah Rivulet		
Setting	Non-continuous overhang - isolated.				
Archaeological deposit					
Deposit	Yes	Describe	35 cm orange, loamy sand - artefacts present in the dripline (likely wash down). 2 x artefacts recorded previously in dripline - unable to relocate.		
Visible artefacts?	No - unable to relocate.	Where?	N/A	How many?	N/A
Art					
Art surfaces	Nil				



Art condition	N/A				
Art overview	N/A				
Damage/threats					
Water wash	Yes	Graffiti	No	Macro vegetals	Yes - lichen
Animals	Yes - wombats and others.	Salt/granular loss	Yes - along water lines.	Fissuring	No
Insects	Minor	Spalling/exfoliation	Yes - along the back wall/roof	Other	N/A
Fire	No	Block fall	Yes - on the sides of the shelter.		Yes - lichen

*Site was located during surveys undertaken by Niche in 2023. The updated coordinates have been included.



Plate 83: Northern Trail 80 (AHIMS ID# 52-2-3442) shelter overview, South aspect.



Plate 84: Northern Trail 80 (AHIMS ID# 52-2-3442) shelter overview, North aspect.

Northern Trail 87 (AHIMS ID# 52-2-3855)

This site is identified in AHIMS as an open campsite; however, the site card identifies the site as a shelter with a deposit. This site is located at a shelter approximately 150 m east of Honeysuckle Creek under a small cliff line. The site consists of a south-facing shelter measuring 10 m in length, 3 m in width and 2 m in height. The deposit is made from orange sandy loam and measures 50 cm in depth. The deposit contains five artefacts, including two chert flakes, two quartz flakes and one quartzite flake. This site was revisited as part of the ACHA survey; however, no artefacts were reidentified at the site.



An overview of the site is provided in Table 53 below while Plate 85 and Plate 86 provide overview photos of the site.

Table 53: Site details for Northern Trail 87 (AHIMS ID# 52-2-3855)

Overview					
Site type	Shelter with Artefact(s)	██████████ ██████████	██████████	██████████ ██████████	██████████
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	N/A		
Site details					
Width	10 m	Depth	3 m	Height	2 m
Orientation	South	Floor area	7 m²	Floor condition	Orange sandy loam deposit
Location in landscape	150 m east of Honeysuckle Creek under a small cliff line. 1.3 km WSW of the end of Fire Road 9D.				
Shelter exterior/formation	Cavernous weathering and block fall				
Shelter interior	The shelter floor deposit is an orange, sandy loam. The deposit depth is 50 cm.				
Distance to water	150 m east of Honeysuckle Creek	Landform	Under a small cliff line		
Setting	-				
Archaeological deposit					
Deposit	Yes	Describe	Orange, sandy loam 50 cm in depth. 5 x artefacts were previously located in the drip line – 2 x chert, 2 x quartz, and 1 x quartzite. Unable to relocate.		
Visible artefacts?	No - unable to relocate.	Where?	In dripline	How many?	5



Art					
Art surfaces	Nil				
Art condition	N/A				
Art overview	N/A				
Damage/threats					
Water wash	Yes	Graffiti	No	Macro vegetals	Yes – lichen
Animals	Yes – wombat hole	Salt/granular loss	Yes – along water lines.	Fissuring	No
Insects	Minor	Spalling/exfoliation	Yes – along the back wall/roof	Other	N/A
Fire	No	Block fall	Yes – on the sides of the shelter.		



Plate 85: Overview of shelter, Northern Trail 87 (AHIMS ID# 52-2-3855). Looking West.



Plate 86: Interior and deposit at Northern Trail 87 (AHIMS ID# 52-2-3855). Looking East.



Blue Gum Forest Northern Trail (R) 49 (AHIMS ID# 52-2-0368)

This grinding groove site was found on an exposed rock platform along the Honeysuckle Creek. The site measures 10 m long x 1.5 m wide. It consists of a group of at least 7 grinding grooves. All the grooves were found in a wet and good condition. It may be that this site is the location of Blue Gum Forest Northern Trail (R) 49 (AHIMS ID# 52-2-0368) where 10 grinding grooves were sighted according to the original site card. It may be that the other 3 are missing under the surrounding overgrowth.

This site is listed as "Not a Site" in AHIMS; however, the current survey was able to re-identify the Aboriginal cultural heritage site and confirm its status as a site. An overview of the site is provided in Table 54 below while Plate 87 – Plate 90 provides overview photos of the site.

Table 54: Site details for Blue Gum Forest Northern Trail (R) 49 (AHIMS ID# 52-2-0368)

Overview					
Site type	Open site with Grinding Groove	██████████ ██████████	██████████	██████████ ██████████	██████████
Previous recording		Date	1977		
Location description					
Landform	Sandstone outcrop.		Slope (deg)	Slight.	
Vegetation	Angophora / Banksia.		Land use	Conservation/mining.	
Disturbance	Rock popping / erosion.		Aggrading/stable/eroding	Eroding.	
Impacts	Rock popping / erosion.		Proximity to water	On Honeysuckle Creek.	
Visibility (%)	Wet organic build-up on edges		Exposure (%)	N/A	
Site context					
Site dimensions	At least 7 grooves were found as part of 1 group on top of a wet rock platform along Honeysuckle Creek. The site extent measures 10 m long x 1.5 m wide				
Context	Open				
Site condition	Seven of the grooves were found in good and wet condition. At least 3 other grooves are missing according to the original site card.				
Site description					
Total number of rock engravings	N/A				



Total number of grooves	7 grinding grooves
Type, groove profile	Long, oval and partially symmetrical.
Function	Grinding
Condition	Visible
Orientation	SW-NE



Plate 87: View of site extent for Blue Gum Forest Northern Trail (R) 49 (AHIMS ID# 52-2-0368). Looking South.



Plate 88: View of site extent for Blue Gum Forest Northern Trail (R) 49 (AHIMS ID# 52-2-0368). Looking North.



Plate 89: All 7 grooves at Blue Gum Forest Northern Trail (R) 49 (AHIMS ID# 52-2-0368). Looking Southwest.



Plate 90: All 7 grooves at Blue Gum Forest Northern Trail (R) 49 (AHIMS ID# 52-2-0368). Looking South.



Blue Gum Forest Northern Trail (R) 50 (AHIMS ID# 52-2-0369)

This grinding groove site was found on an exposed rock platform along the Honeysuckle Creek. The site measures 4 m long x 4.3 m wide. It consists of a group of at least one grinding groove. The grooves were found in a wet and good condition. It may be that this site is the location of Blue Gum Forest Northern Trail (R) 50 (AHIMS ID# 52-2-0369) where one grinding groove was sighted according to the original site card.

This site is listed as "Not a Site" in AHIMS; however, the current survey was able to re-identify the Aboriginal cultural heritage site and confirm its status as a site. An overview of the site is provided in Table 55 below while Plate 91 – Plate 93 provides overview photos of the site.

Table 55: Site details for Blue Gum Forest Northern Trail (R) 50 (AHIMS ID# 52-2-0369)

Overview					
Site type	Open site with Grinding Groove	██████████ ██████████	██████████	██████████ ██████████	██████████
Previous recording	Fred Wright	Date	1977		
Location description					
Landform	Sandstone outcrop.		Slope (deg)	Slight.	
Vegetation	Angophora / Banksia.		Land use	Conservation/mining.	
Disturbance	Rock popping / erosion.		Aggrading/Sta ble/Eroding	Eroding.	
Impacts	Rock popping / erosion.		Proximity to water	On Honeysuckle Creek.	
Visibility (%)	Organic build-up on edges		Exposure (%)	N/A	
Site context					
Site dimensions	At least 1 groove was found on a rock platform along Honeysuckle Creek. Site extent measures 4 m long x 4.3 m wide				
Context	Open				
Site condition	The groove was found in a good and wet condition.				
Site description					
Total number of rock engravings	N/A				
Total number of grooves	1 grinding groove				



Type, groove profile	Long, oval and partially symmetrical.
Function	Grinding
Condition	Visible
Orientation	Please see the directions specified below.



Plate 91: View of site extent for Northern Trail (R) 50 (AHIMS ID# 52-2-0369). Looking South.



Plate 92: Groove 1 at Northern Trail (R) 50 (AHIMS ID# 52-2-0369). Looking West.



Plate 93: Groove 1 in context at Northern Trail (R) 50 (AHIMS ID# 52-2-0369). Looking South.



Blue Gum Forest Northern Trail (R) 51 (AHIMS ID# 52-2-0370)

This grinding groove site was found around 20 m south of Blue Gum Forest Northern Trail (R) 50 (AHIMS ID# 52-2-0369) on an exposed rock platform beside a large pool of water along Honeysuckle Creek. The site measures 11 m long x 5 m wide. According to the original site card, 6 grinding grooves were originally found, but only two grinding grooves were found at this site. The grooves were found in a wet and poor condition.

This site is listed as "Not a Site" in AHIMS; however, the current survey was able to re-identify the Aboriginal cultural heritage site and confirm its status as a site. An overview of the site is provided in Table 56 below while Plate 94 – Plate 97 provides overview photos of the site.

Table 56: Site details for Blue Gum Forest Northern Trail (R) 51 (AHIMS ID# 52-2-0370)

Overview					
Site type	Open site with Grinding Groove				
Previous recording	Cedric Rutledge	Date	1977		
Location description					
Landform	Sandstone outcrop.		Slope (deg)	Slight.	
Vegetation	Angophora / Banksia.		Land use	Conservation/mining.	
Disturbance	Rock popping / erosion.		Aggrading/Stable/Eroding	Eroding.	
Impacts	Rock popping / erosion.		Proximity to water	On Honeysuckle Creek.	
Visibility (%)	Organic build-up on edges		Exposure (%)	N/A	
Site context					
Site dimensions	At least 2 grooves were found on a rock platform beside a pool of water along Honeysuckle Creek. Site extent measures 11 m long x 5 m wide				
Context	Open				
Site condition	Two of the grooves were found in good and wet condition. At least 4 other grooves are missing according to the original site card.				
Site description					
Total number of rock engravings	N/A				



Total number of grooves	2 grinding grooves
Type, groove profile	Long, oval and partially symmetrical.
Function	Grinding
Condition	Visible
Orientation	N-S

*Site was located during surveys undertaken by Niche in 2024. The updated coordinates have been included.



Plate 94: View of site extent for Blue Gum Forest Northern Trail (R) 51 (AHIMS ID# 52-2-0370). Looking North.



Plate 95: Groove 1 at Blue Gum Forest Northern Trail (R) 51 (AHIMS ID# 52-2-0370). Looking North.



Plate 96: Groove 1 in context at Blue Gum Forest Northern Trail (R) 51 (AHIMS ID# 52-2-0370). Looking Northeast.



Plate 97: View of site extent for Blue Gum Forest Northern Trail (R) 51 (AHIMS ID# 52-2-0370). Looking South.



Woronora Reservoir; Northern Trail 13; (AHIMS ID# 52-2-0754)

This site consists of a sandstone overhang measuring 16 m in length, 2 m wide and 3 m in height. The floor of the shelter consists of sandy loam deposit that is approximately 20 cm deep. The original site card mentioned that one scratched figure resembling an eel was found on the roof, but this was not found. No artefacts were found at this site.

This site is listed as "Not a Site" in AHIMS; however, the current survey was able to re-identify the Aboriginal cultural heritage site and confirm its status as a site. An overview of the site is provided in Table 56 below while Plate 98 – Plate 101 provides overview photos of the site.

Table 57: Site details for Woronora Reservoir; Northern Trail 13; (AHIMS ID# 52-2-0754)

Overview					
Site type	Shelter with Art and PAD				
Previous recording	Illawarra Prehistory Group: C. Sefton	Date	1981	Date of updated recording	30 January 2024
Site details					
Width	16 m	Depth	2 m	Height	3 m
Orientation	West	Floor area	6 m ²	Floor condition	Stable
Location in landscape	Located on mid-slope.				
Shelter exterior/formation	Weathering.				
Shelter interior	Sandy-loam floor with organics.				
Distance to water	185 m east to Honeysuckle Creek	Landform	Slope.		
Setting	Isolated.				
Archaeological deposit					
Deposit	PAD	Describe	Sandy loam		
Visible artefacts?	No	Where?	-	How many?	-
Art					



Art surfaces	The original site card mentioned that one scratched figure resembling an eel was found on the roof, but this was not found.				
Art Condition	-				
Art Overview					
Damage/threats					
Water wash	Yes.	Graffiti	No.	Macro vegetals	Yes – Lichen growth near the drip line.
Animals	Small.	Salt/granular loss	On spalling most recent	Fissuring	Yes.
Insects	Yes.	Spalling/exfoliation	Yes – back wall and roof.	Other	N/A
Fire	No.	Block fall	No.		



Plate 98: Context shot of Woronora Reservoir; Northern Trail 13; (AHIMS ID# 52-2-0754). External view of shelter. Looking North.



Plate 99: Internal view of Woronora Reservoir; Northern Trail 13; (AHIMS ID# 52-2-0754). Looking North.



Plate 100: Internal view of Woronora Reservoir; Northern Trail 13; (AHIMS ID# 52-2-0754). Looking South.



Plate 101: Area of PAD within Woronora Reservoir; Northern Trail 13; (AHIMS ID# 52-2-0754). Looking North.



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