



MAXWELL UNDERGROUND MINE PROJECT

APPENDIX E

Aboriginal Cultural Heritage Assessment



Maxwell Underground Mine Project

Modification 2

Aboriginal Cultural Heritage Assessment

28-June-2022

Muswellbrook Local Government Area

Near Jerrys Plains, Upper Hunter Valley

Author: Geordie Oakes (AECOM Principal Heritage Specialist)

Aboriginal and Torres Strait Islanders are warned that this publication may contain names and images of deceased people

Maxwell Underground Mine Project – Modification 2

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Executive Summary

AECOM Australia Pty Ltd (AECOM) was commissioned by Malabar Resources Limited (Malabar) to complete an Aboriginal Cultural Heritage Assessment (ACHA) for a modification to the Maxwell Underground Mine Project (the Project), an approved underground coal mining project located east-southeast of Denman and south-southwest of Muswellbrook, within the Muswellbrook Shire Local Government Area (LGA), New South Wales (NSW).

As part of its acquisition of Exploration Licence (EL) 5460, Malabar committed to developing the Maxwell Project solely as an underground mining operation rather than an open cut operation which has resulted in significantly fewer environmental impacts, including impacts to Aboriginal heritage values. The Project will also use the substantial existing Maxwell Infrastructure, which reduces the additional infrastructure required to support the underground mining operation.

Malabar previously sought to modify Development Consent SSD 9526 under section 4.55(1A) of the EP&A Act for a minor extension to the mine entry area (MEA) (Modification 1). Modification 1 was subsequently approved on 19 November 2021 and EPBC 2018/8287 was varied on 14 December 2021.

Modification 2 is located wholly within the approved Development Application Area and would comprise the following components:

- re-orientation of the longwall panels in the Woodlands Hill, Arrowfield and Bowfield Seams resulting in a minor increase in the approved underground mining extent;
- reduction in the width of some of the longwall panels in the Woodlands Hill Seam;
- repositioning of the upcast ventilation shaft site and associated infrastructure; and
- other minor works and ancillary infrastructure components (e.g. access track and ancillary water management infrastructure for the repositioned ventilation shaft site).

The location and orientation of the longwall panels as well the repositioning of the ventilation shaft and associated infrastructure were selected with consideration of:

- the location of known Aboriginal heritage sites (i.e. avoiding direct impact to known artefacts where possible);
- avoidance of undermining part of Aboriginal stone quarry site SC-QS-2 (37-2-1954) in order to reduce potential subsidence related impacts (i.e., the site is not expected to experience measurable tilts, curvatures or strains); and
- consideration of historical site disturbances (i.e. utilisation of existing access tracks).

Moreover, the longwall panel layout was designed to avoid direct subsidence impacts on the Hunter River alluvium and Saddlers Creek, both of which are culturally significant landscape features. This has also reduced impacts to Aboriginal sites by being located mostly in areas of low archaeological sensitivity and avoiding areas with higher potential for subsurface archaeological deposit (i.e., creek flats and lower slopes).

This ACHA documents the results of AECOM's assessment and has been compiled with reference to various relevant guidelines, including Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a), *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) and *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011). This ACHA builds upon the findings of the ACHAs that were completed for the approved Project, including the Mine Entry Area Modification (AECOM 2019, 2021).

The Modification Study Area incorporates:

- the existing approved Underground Development Area, a roughly circular shaped 2,134 hectare (ha) area located south of Saddlers Creek and north of the Hunter River; and
- a small triangular shaped 27 ha (or approximately 1.3%) northern extension to the approved Underground Development Area located near Saddlers Creek (referred to as the 'Modification Underground Extension Area').

Combined, the approved Underground Development Area and the Modification Extension Area produce a Modification Study Area of c. 2,145 ha. The 'Additional Surface Development Area' required for the repositioned ventilation shaft is located wholly within the Modification Study Area. Land within the Project area has been historically used for grazing, both sheep and cattle, and is currently utilised for cattle grazing and some minor mine related activities¹.

Three Aboriginal sites within the Modification Study Area will be directly impacted by the proposed Modification, including two open artefact scatter sites that will be wholly impacted (37-2-4294 and 37-2-4358) and one artefact scatter site will be partially impacted (37-2-0415). There is one Aboriginal site located within the Modification Underground Extension Area that would potentially be indirectly impacted by subsidence – open artefact scatter site "DS AS60 11" (37-2-4284). The remaining sites that would potentially be indirectly impacted from subsidence within the Modification Study Area were previously approved for indirect impacts under the existing Development Consent (SSD 9526).

A management strategy to address the impacts of the Project on the known Aboriginal archaeological resource of the study area is provided in Section 10.0. It is recommended the Project's existing Aboriginal Cultural Heritage Management Plan (ACHMP) (Appendix G) be updated to include this strategy, as required. Key components of the existing ACHMP that would continue to apply to the Project (as modified) include the following.

- an archaeological salvage program;
- subsidence monitoring;
- conservation of non-impacted sites;
- the procedure for managing previously unrecorded Aboriginal archaeological evidence;
- management of potential human remains;
- completion of Aboriginal Heritage Information Management System (AHIMS) site cards; and
- management of an Aboriginal site database.

¹ Minor mine related activities include environmental monitoring and management, geotechnical and exploration activities as well as early works undertaken in preparation for construction and operation of the approved Project.

1.0 Introduction & Background

1.1 Introduction

AECOM Australia Pty Ltd (AECOM) was commissioned by Malabar Resources Limited (Malabar) to complete an Aboriginal Cultural Heritage Assessment (ACHA) for a modification to the approved Maxwell Underground Mine Project (the Project), an approved underground coal mining project, located east-southeast of Denman and south-southwest of Muswellbrook, within the Muswellbrook Shire Local Government Area (LGA), New South Wales (NSW) (Figure 1).

'Modification 2' is located wholly within the approved Development Application Area and would comprise the following components (Figure 2):

- re-orientation of the longwall panels in the Woodlands Hill, Arrowfield and Bowfield Seams resulting in a minor increase in the approved underground mining extent;
- reduction in the width of some of the longwall panels in the Woodlands Hill Seam;
- repositioning of the upcast ventilation shaft site and associated infrastructure; and
- other minor works and ancillary infrastructure components (e.g. access track and ancillary water management infrastructure for the repositioned ventilation shaft site).

This ACHA forms part of a Modification Report that is being prepared to accompany Malabar's application to modify Development Consent for State Significant Development (SSD 9526) under section 4.55(2) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

This ACHA documents the results of AECOM's assessment and has been compiled with reference to Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a), *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) and *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011).

1.2 Maxwell Underground Mine Project Overview

The approved Project is in the Upper Hunter Valley of NSW, east-southeast of Denman and south-southwest of Muswellbrook (Figure 1). Development Consent SSD 9526 for the Project was granted by the Independent Planning Commission (IPC) on 22 December 2020. The Project was subsequently approved under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 10 March 2021 (EPBC 2018/8287). The Project is an underground mining operation that is approved to operate for 26 years (until 2047). The Project involves extraction of run-of-mine (ROM) coal from four seams within the Wittingham Coal Measures, using the following underground mining methods:

- underground bord and pillar mining with partial pillar extraction in the Whynot Seam; and
- underground longwall extraction in the Woodlands Hill Seam, Arrowfield Seam and Bowfield Seam.

The substantial existing Maxwell Infrastructure is approved for handling, processing and transportation of coal for the life of the Project. The Maxwell Infrastructure includes existing coal handling and preparation plant (CHPP), train load-out facilities and other infrastructure and services (including water management infrastructure, administration buildings, workshops and services).

The Project comprises the following main domains:

- Maxwell Underground – comprising the approved area of underground mining operations and the Mine Entry Area (MEA) within Mining Lease (ML) 1822.
- Maxwell Infrastructure – within Coal Lease (CL) 229, ML 1531 and CL 395 comprising the substantial existing infrastructure (including the CHPP) and previous mining areas.

- The transport and services corridor between the Maxwell Underground and Maxwell Infrastructure –within CL 229, ML 1820 and ML 1822 comprising the proposed site access road, a covered, overland conveyor, power supply and other ancillary infrastructure and services.
- The realignment of a section of Edderton Road.

Malabar previously sought to modify Development Consent SSD 9526 under section 4.55(1A) of the EP&A Act for a minor extension to the mine entry area (MEA) (Modification 1). Modification 1 was subsequently approved on 19 November 2021 and EPBC 2018/8287 was varied on 14 December 2021. AECOM also prepared an ACHA for Modification 1.

1.3 Modification

As stated in Section 1.1, this Modification includes the following components (Figure 2):

- re-orientation of the longwall panels in the Woodlands Hill, Arrowfield and Bowfield Seams resulting in a minor increase in the approved underground mining extent;
- reduction in the width of some of the longwall panels in the Woodlands Hill Seam;
- repositioning of the upcast ventilation shaft site and associated infrastructure; and
- other minor works and ancillary infrastructure components (e.g. access track and ancillary water management infrastructure for the repositioned ventilation shaft site).

Subsequent to the distribution of the draft ACHA to Registered Aboriginal Parties (Section 3.4), Malabar made a very small adjustment to the ventilation shaft pad to avoid disturbance of riparian woodland vegetation to the north (reduction in footprint of 0.06 hectares). This change has been reflected on Figure 2 but the remainder of the figures and discussion in this report have remained unchanged for consistency with the version of the report provided to the Registered Aboriginal Parties. This very small reduction in footprint would not affect the outcomes of this ACHA.

1.4 Modification Study Area

The Modification Study Area, as shown on Figure 3, incorporates:

- the existing approved Underground Development Area, a roughly circular shaped 2,134 hectare (ha) area located south of Saddlers Creek and north of the Hunter River; and
- a small triangular shaped 11 ha (or approximately 0.6 percent) northern extension to the approved Underground Development Area located near Saddlers Creek (referred to as the 'Modification Underground Extension Area').

Combined, the approved Underground Development Area and the extension produce a Modification Study Area of c. 2,145 ha. The 'Additional Surface Development Area' required for the repositioned ventilation shaft and associated access track is located wholly within the Modification Study Area. The Additional Surface Development Area is 12 ha.

Land within the Project area has been historically used for grazing, both sheep and cattle, and is currently utilised for cattle grazing and some minor mine related activities.

Reference to the Geographical Name Register (GNR) of NSW indicates that the Modification Study Area falls wholly within the boundaries of the Muswellbrook Shire Council LGA and are situated within the Parishes of Wynn and Savoy in the County of Durham. Surrounding suburbs include Edderton to the north, Jerrys Plains to the south, Howick to the east and Denman to the west.

1.5 Proponent and Planning Approval Process

Approval for the Modification is being sought under section 4.55(2) of the EP&A Act. A Modification Report and supporting appendices are being prepared to accompany the application to modify Development Consent SSD 9526.

On 3 February 2022, Malabar provided a letter to the Department of Planning and Environment (DPE) regarding the Modification, proposed approval pathway and the proposed scope of the environmental

assessment, including the scope of this ACHA. DPE subsequently provided a response to Malabar on 10 February 2022, confirming that DPE agreed with the proposed approval pathway and outlined the environmental assessment matters to be considered as part of the Modification, including the preparation of this ACHA.

1.6 Assessment Objectives

The overarching objectives of this ACHA are as follows:

- to identify the Aboriginal cultural heritage values of the Modification Study Area by way of background research and consultation with Registered Aboriginal Parties (RAPs);
- to assess the potential impact of the Modification on the identified Aboriginal cultural heritage values;
- to provide an appropriate management strategy for avoiding or minimising potential harm to the identified Aboriginal cultural heritage values of the Modification Study Area; and
- to compile an ACHA that will assist the DPE in their assessment of Malabar's Modification Application.

1.7 Scope of Current Assessment

This assessment has been undertaken in accordance with the environmental assessment matters outlined in the letter provided by DPE, clause 60 of the NSW *National Parks and Wildlife Regulation 2019* (NPW Regulation) and with reference to the following guidelines:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011);
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a);
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b);
- *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia International Council on Monuments and Sites [ICOMOS] (2013);
- *Ask First: A Guide to Respecting Indigenous Heritage Places and Values* (Australian Heritage Commission 2002); and
- *Engage Early: Guidance for proponents on best practice Indigenous Engagement for environmental assessments under the Environmental Protection and Biodiversity Conservation Act 1997 (EPBC Act)* (Australian Government Department of the Environment 2016).

As such, its key requirements have been:

- to conduct a search of Heritage NSW's Aboriginal Heritage Information Management System (AHIMS);
- to review the landscape context of the Modification Study Area, with specific consideration to its implications for past Aboriginal land use;
- to review relevant archaeological and ethnohistoric information for the Modification Study Area and its environs;
- to prepare a predictive model for the Aboriginal archaeological record of the Modification Study Area;
- to review previous field investigations across the Modification Study Area and surrounds;
- to identify, notify and register Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Modification Study Area;

- to provide RAPs with information about the scope of the proposed works and Aboriginal heritage assessment process;
- to facilitate a process whereby RAPs can:
 - contribute culturally appropriate information to the proposed assessment methodology;
 - provide information that will enable the cultural significance of Aboriginal objects and/or places within the Modification Study Area to be determined;
 - have input into the development of cultural heritage management options; and
- to prepare and finalise an ACHA with input from RAPs.

This assessment considers the findings and conclusions from various previous archaeological investigations within the Modification Study Area and surrounds (Section 6.2.2).

1.8 Project Team

Geordie Oakes (Principal Heritage Specialist, AECOM) managed all aspects of the Aboriginal heritage assessment process and was the primary author of this ACHA. Dr Andrew McLaren (Principal Heritage Specialist, AECOM) provided technical review of this ACHA.

Geordie holds a Bachelor of Arts (Honours) degree in historic and prehistoric Archaeology from Sydney University and a Graduate Certificate in Paleo-anthropology from the University of New England. Geordie has over 14 years of Australian Aboriginal cultural heritage management experience.

Andrew holds a Bachelor of Arts (Honours) degree from the University of Queensland, a Masters of Cultural Heritage from Deakin University, and a PhD from the University of Cambridge in England and has over 10 years of Australian Aboriginal cultural heritage management experience.

1.9 Report Structure

This report contains twelve sections. This section, **Section 1.0**, has provided background information on the Project, the Modification and assessment undertaken. The remainder of this ACHA is structured as follows:

- **Section 2.0** outlines the statutory framework within which this assessment has been undertaken;
- **Section 3.0** details the Aboriginal community consultation program undertaken for this assessment;
- **Section 4.0** describes the existing environment of the Modification Study Area and its associated archaeological implications;
- **Section 5.0** summarises relevant ethnohistoric information for the Modification Study Area;
- **Section 6.0** describes the archaeological context of the Modification Study Area on a regional and local scale. Predictions regarding the nature of the Aboriginal archaeological records within the Modification Study Area are also provided;
- **Section 7.0** describes the results of previous archaeological surveys within the Modification Study Area and surrounds;
- **Section 8.0** assesses the archaeological (scientific) and cultural significance of Aboriginal sites within the Modification Study Area;
- **Section 9.0** provides an assessment of the potential impacts of the Modification on identified Aboriginal heritage values;
- **Section 10.0** provides details on the design of the Modification and strategies to avoid and minimise harm to Aboriginal heritage values;
- **Section 11.0** details an appropriate management strategy for the identified Aboriginal heritage values within the Modification Study Area; and
- **Section 12.0** lists the references cited in-text.

Figure 1 Regional context

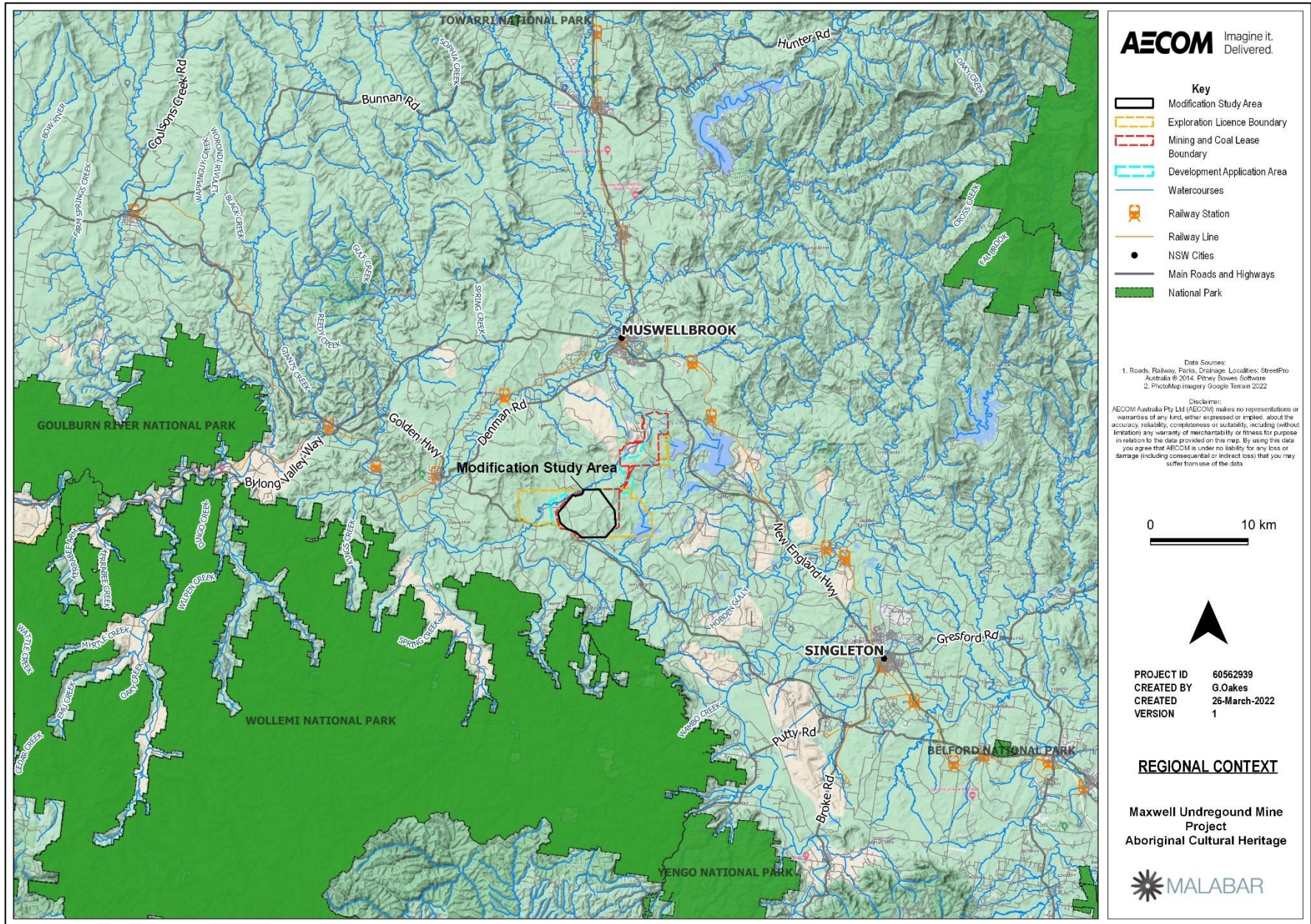


Figure 2 Project general arrangement (Source: Malabar 2022)

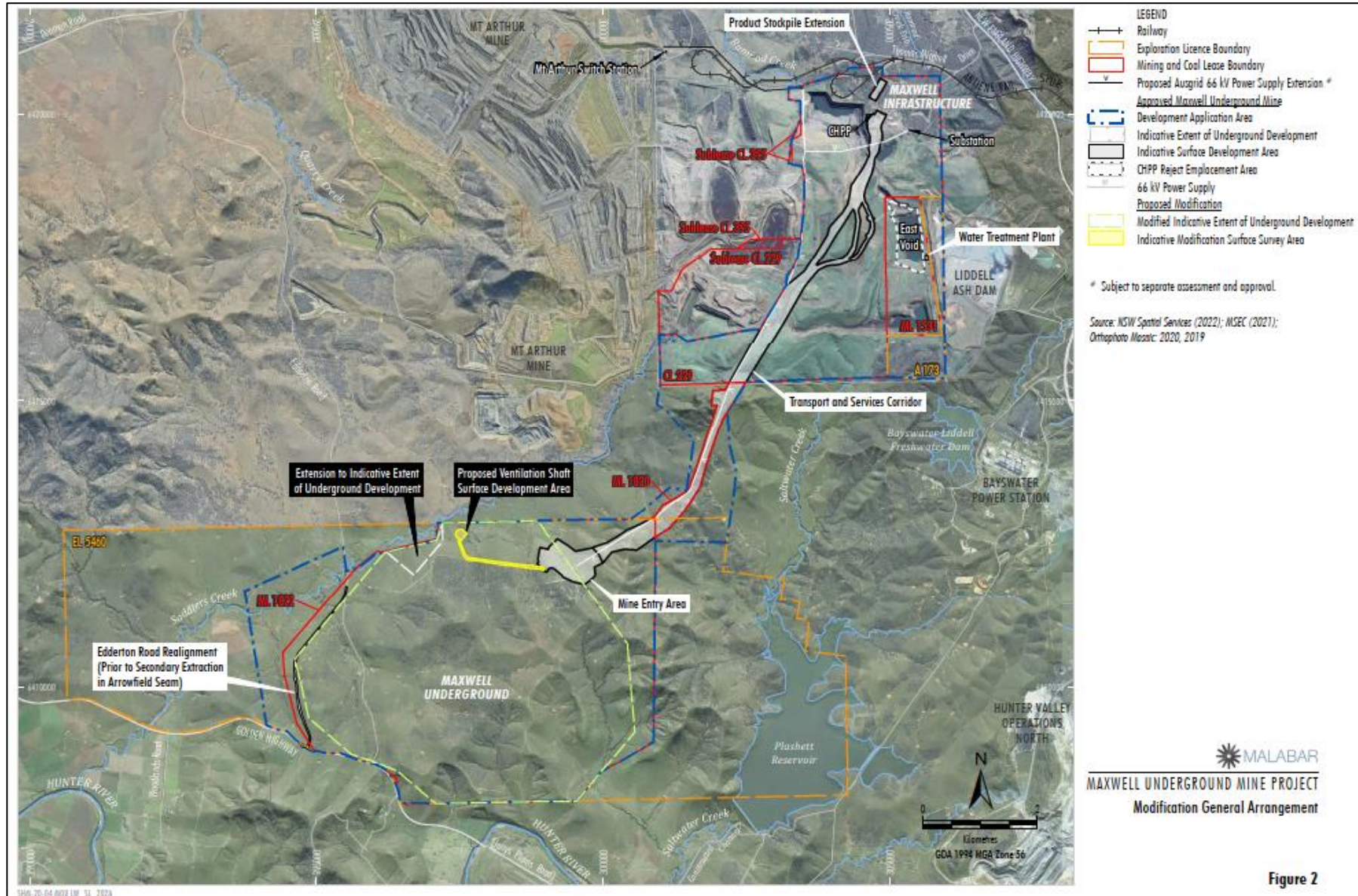
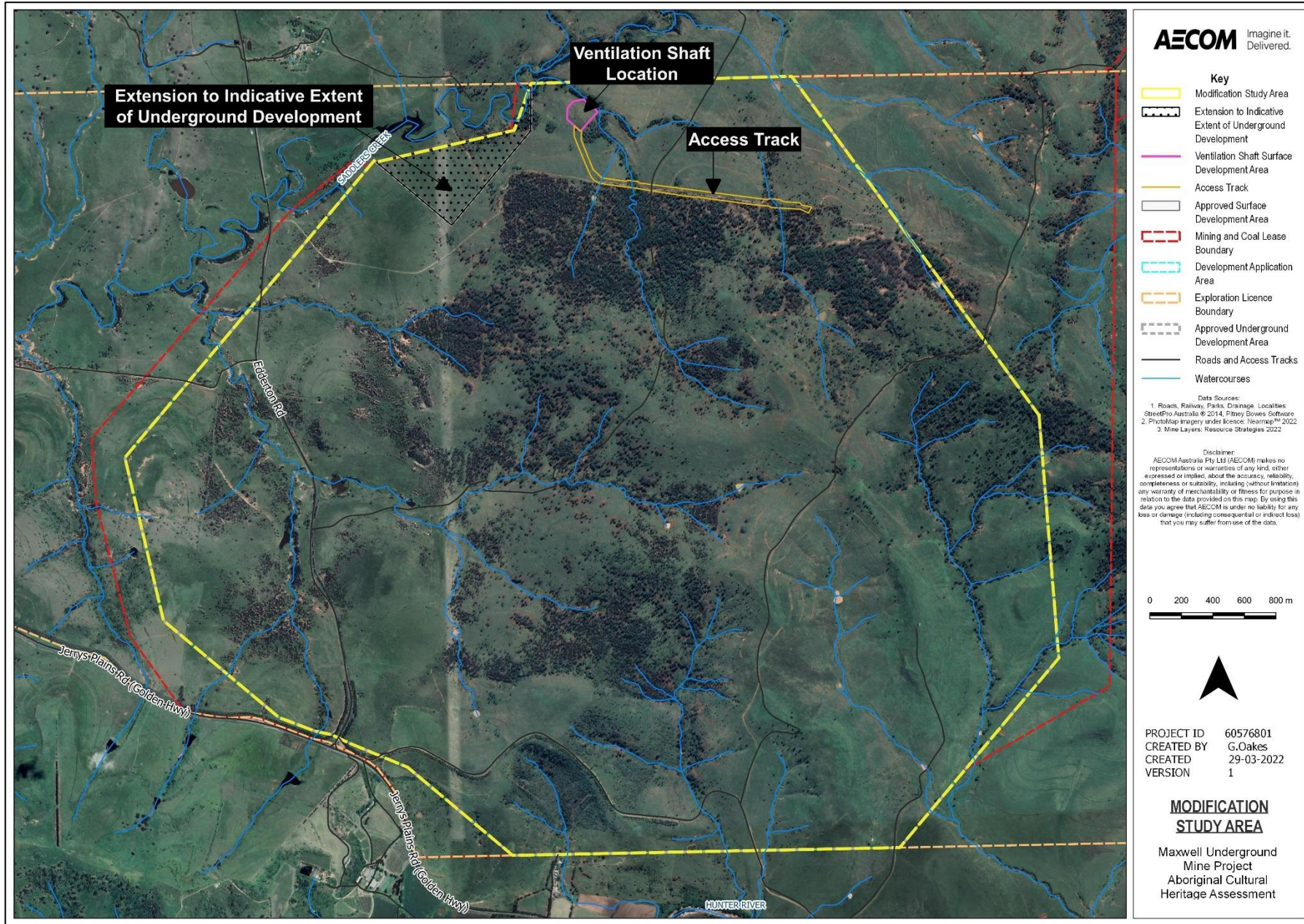


Figure 3 Modification Study Area



2.0 Applicable Policy & Legislation

2.1 Commonwealth Legislation

2.1.1 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

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

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

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

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

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

No declarations relevant to the Modification Study Area have been made under the ATSIHP Act.

2.1.1.1 Native Title Act 1993

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

Searches of the *Schedule of Applications (unregistered claimant applications)*, *Register of Native Title Claims*, *National Native Title Register*, *Register of Indigenous Land Use Agreements* and *Notified Indigenous Land Use Agreements* were undertaken in March 2022. One Native Title Registration Claim was identified within the Modification Study Area – the Plains Clans of the Wonnarua People (PCWP) (Claim ID number: NC2022/001) which was lodged on 1 February 2022. The Modification Study Area remains wholly within existing Mining Leases.

2.1.2 Environment Protection and Biodiversity Act 1999

Under Part 9 of the EPBC Act, any action that is likely to have a significant impact on a matter of National Environmental Significance may only progress with approval of the Commonwealth Minister for the Environment (or delegate). An action is defined as a project, development, undertaking, activity, series of activities, or alteration. An action will also require approval if:

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

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

Searches of the National Heritage List, Commonwealth Heritage List and Register of the National Estate were undertaken in March 2022, with no relevant listings identified for the Modification Study Area.

2.2 State Legislation

2.2.1 Environmental Planning and Assessment Act 1979

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

In accordance with Section 4.41 of the EP&A Act, Aboriginal Heritage Impact Permits (AHIPs) are not required for projects classified as SSD and approved under Part 4 of the EP&A Act (i.e. the Project). As the Project was granted approval under Part 4 of the EP&A Act, impacts to Aboriginal heritage values are managed under the approved Aboriginal Cultural Heritage Management Plan (ACHMP) required under the conditions of the Development Consent SSD 9526. The approved ACHMP is statutorily binding.

2.2.2 Aboriginal Land Rights Act 1983

The *Aboriginal Land Rights Act 1983* (ALR Act) was established to return land in NSW to Aboriginal peoples through a process of lodging claims for certain Crown lands. The ALR Act, administered by the Special Minister of State, Minister for the Public Service and Employee Relations, Aboriginal Affairs, and the Arts, is a compensatory regime which recognises that land is of spiritual, social, cultural and economic importance to Aboriginal people. The ALR Act established the NSW Aboriginal Land Council (NSWALC) and a network of over 120 autonomous Local Aboriginal Land Councils (LALCs) and requires these bodies to:

- a. take action to protect the culture and heritage of Aboriginal persons in the LALC’s area, subject to any other law; and
- b. promote awareness in the community of the culture and heritage of Aboriginal persons in the LALC’s area.

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

Consultation with the Registrar of the ALR Act in March 2022 has indicated that the Modification Study Area does not have any Registered Aboriginal Owners pursuant to Division 3 of the ALR Act.

2.2.3 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act), administered by the Minister for Energy and Environment and the Special Minister of State, Minister for the Public Service and Employee Relations, Aboriginal Affairs, and the Arts, is the primary legislation for the protection of Aboriginal cultural heritage in NSW. The NPW Act gives Heritage NSW and DPE the joint responsibility for the proper care, preservation and protection of 'Aboriginal objects' and 'Aboriginal places', defined under the Act as follows:

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

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

An AHIP issued under section 90 of the NPW Act is required if impacts to Aboriginal objects and/or places cannot be avoided. An AHIP is a defence to a prosecution for harming Aboriginal objects and places if the harm was authorised by the AHIP and the conditions of that AHIP were not contravened. Applications for an AHIP must be accompanied by assessment reports compiled in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b). Applications must also provide evidence of consultation with the Aboriginal communities. Consultation is required under Part 5 of the NPW Regulation and is to be conducted in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010a). AHIPs may be issued in relation to a specified Aboriginal object, Aboriginal place, land, activity or person or specified types or classes of Aboriginal objects, Aboriginal places, land, activities or persons.

As indicated in Section 2.2.1, pursuant to section 4.41 of the EP&A Act, AHIPs are not required for projects classified as SSD and approved under Part 4 of the EP&A Act, with impacts managed under ACHMPs required under the conditions of the consent.

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

2.3 Local Government

2.3.1 Muswellbrook Local Environmental Plan 2009

Clause 5.10 of the *Muswellbrook Local Environmental Plan 2009* (Muswellbrook LEP) provides specific provisions for the protection of heritage items, heritage conservation areas, archaeological sites, Aboriginal objects and Aboriginal places of heritage significance within the Muswellbrook LGA.

Under subsection 2 of clause 5.10 of the Muswellbrook LEP, development consent is required for any of the following:

- a. *demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance):*
 - (i) *a heritage item,*
 - (ii) *an Aboriginal object,*
 - (iii) *a building, work, relic or tree within a heritage conservation area,*
- b. *altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,*
- c. *disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed,*
- d. *disturbing or excavating an Aboriginal place of heritage significance,*
- e. *erecting a building on land:*
 - (i) *on which a heritage item is located or that is within a heritage conservation area, or*
 - (ii) *on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,*
- f. *subdividing land:*
 - (i) *on which a heritage item is located or that is within a heritage conservation area, or*
 - (ii) *on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.*

In relation to Aboriginal heritage, subsection 8 of clause 5.10 of the Muswellbrook LEP states the consent authority must, before granting consent under this clause to the carrying out of development in an Aboriginal place of heritage significance:

- a. *consider the effect of the proposed development on the heritage significance of the place and any Aboriginal object known or reasonably likely to be located at the place by means of an adequate investigation and assessment (which may involve consideration of a heritage impact statement), and*
- b. *notify the local Aboriginal communities, in writing or in such other manner as may be appropriate, about the application and take into consideration any response received within 28 days after the notice is sent.*

Schedule 5 of the Muswellbrook LEP provides a list of heritage items, conservation areas and archaeological sites within the Muswellbrook LGA. A review of the list indicates there are no Aboriginal objects or places of heritage significance located within the Modification Study Area.

The consent authority is required to comply with relevant requirements of clause 5.10 of the Muswellbrook LEP for the Modification.

3.0 Aboriginal Community Consultation

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

Aboriginal community consultation for the current assessment was undertaken in accordance with Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a) (referred to as the Consultation Requirements in this Section) and clause 60 of the NPW Regulation. The results of the consultation process undertaken for the current assessment are detailed below.

Stage 1 of the Consultation Requirements, related to identifying the relevant parties to consult with, was completed as part of the broader Maxwell Project ACHA in 2018 and Malabar has maintained ongoing consultation and engagement with these groups since their individual expressions of interest (including during development of the approved ACHMP). A description of Stage 1 of the Consultation Requirements completed for broader Maxwell Project ACHA is provided in Section 3.1. Consultation with these same RAPs is considered appropriate for this Modification assessment.

3.1 Stage 1 - Notification and Registration

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

3.1.1 Consultation with Regulatory Agencies

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

- a. *the relevant regional office of the Heritage NSW;*
- b. *the relevant LALCs;*
- c. *the Registrar, ALR Act for a list of Aboriginal owners;*
- d. *the National Native Title Tribunal for a list of registered native title claimants, native title holders and registered Indigenous Land Use Agreements;*
- e. *NTSCORP Limited;*
- f. *the relevant local council(s); and*
- g. *the relevant catchment management authorities for contact details of any established Aboriginal reference group (now Local Land Services).*

In accordance with this requirement, the following agencies were contacted via letter or email on 31 May 2018 for the Maxwell Project ACHA requesting information on relevant Aboriginal persons and organisations:

- *Heritage NSW;*
- *Wanaruah Local Aboriginal Land Council (WLALC);*
- *Office of the Registrar, ALR Act (NSW);*
- *National Native Title Tribunal;*
- *NTSCORP Limited;*

- *Muswellbrook Shire Council;*
- *Singleton Council; and*
- *Hunter Local Land Services (HLLS).*

Responses were received from four agencies for the Maxwell Project ACHA, including:

- *Singleton Council responded on 5 June 2018 indicating the WLALC was the peak body representing Aboriginal people in the area;*
- *Office of Registrar responded on 6 June 2018 stating the Project does not have Registered Aboriginal Owners pursuant to Division 3 of the ALR Act and suggesting AECOM contact the WLALC;*
- *The National Native Title Tribunal responded on 13 June 2018 indicating that one Native Title Claimant was registered within the Modification Study Area - Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People²;*
- *Muswellbrook Shire Council responded on 15 June 2018 providing the names of two Aboriginal stakeholder groups - WLALC and Hunter Valley Aboriginal Corporation (Manager Ross Pahuru); and*
- *Heritage NSW responded on 15 June 2018 providing the contact details for 50 groups and individuals that may have an interest in the development.*

In addition to the above, in July 2021 AECOM completed a search of the National Native Title Tribunal's online database (Native Title Vision) which holds a list of Native Title Registrations, Claims and Determinations and Indigenous Land Use Agreements. None of the above were mapped within the study area.

An updated letter the Office of Register was also mailed out in July 2021.

3.1.2 Public Notification

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

In accordance with this requirement, a public notice was placed in the Hunter Valley News on 20 June 2018 for the Maxwell Project ACHA. The closing date for registration via this notice was 4 July 2018, which provided the necessary minimum 14-day period for expressions of interest.

No responses were provided to the newspaper advertisement.

3.1.3 Invitations for Expressions of Interest

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

In accordance with this requirement, on 15 June 2018, a letter inviting expressions of interest and containing summary information on the project was sent to all Aboriginal persons and organisations identified by the regulatory agencies for the Maxwell Project ACHA. A total of 50 Aboriginal stakeholders were invited to register an interest in being consulted. The closing date for registrations was 4 July 2018 allowing the necessary minimum 14-day period for expressions of interest.

A total of 28 Aboriginal organisations registered an interest in the Maxwell Project ACHA. Summary information on all RAPs, including registration dates, is provided in Table 1.

² It is understood that at the time of writing this report, this Native Title Application has been withdrawn.

Table 1 Registered Aboriginal Parties

| Organisation | Registration Date | Method | Contact Person |
|--|--------------------------|---------------|---------------------------------|
| DNC | 19-Jun-18 | Email | Paul Boyd |
| WLALC | 20-Jun-18 | Email | Jamie-Lee |
| Aboriginal Native Title Elders Consultants | 20-Jun-18 | Phone | John Mathews |
| Divine Diggers | 20-Jun-18 | Phone | n/a |
| Wallagan Cultural Services | 20-Jun-18 | Phone | Maree Waugh |
| Culturally Aware | 20-Jun-18 | Phone | Tracey Skene |
| ELM Corp | 21-Jun-18 | Email | Des Hickey |
| Wattaka Wonnarua Cultural Consultancy Services | 21-Jun-18 | Email | Des Hickey |
| Ungooroo Aboriginal Corporation | 21-Jun-18 | Email | Allen Paget |
| Tocomwall Pty Ltd/ Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People (PCWP) | 21-Jun-18 | Email | Scott Franks |
| AGA Services | 24-Jun-18 | Email | Ashley Sampson |
| Cacatua | 24-Jun-18 | Email | George Sampson |
| Hunter Valley Aboriginal Corporation | 27-Jun-18 | Email | Ross Pahuru |
| Lower Hunter Wonnarua Cultural Services | 28-Jun-18 | Email | n/a |
| Murra Bidgee Mullangari | 28-Jun-18 | Email | Ryan Johnson |
| Ungooroo culture & community service | 28-Jun-18 | Email | Rhonda Ward |
| Gidawaa Walang Cultural Heritage Consultancy | 29-Jun-18 | Email | Craig Horne |
| Yinarr Cultural Services | 29-Jun-18 | Email | Kathie Steward Kinchela |
| Merrigarn | 02-Jul-18 | Email | Shaun Carrol |
| Muragadi | 03-Jul-18 | Email | Jessie Carrol-Johnson |
| Wailwan Aboriginal Digging Group | 04-Jul-18 | Phone | Phil Boney |
| Amanda Hickey Cultural Services | 04-Jul-18 | Email | Amanda Hickey |
| A1 Indigenous Services | 04-Jul-18 | Email | Carolyn Hickey |
| Widescope | 03-Jul-18 | Email | Steven Hickey |
| Kauwul Wonn1 | 8-Jul-18 | Email | Suzie Worth for Arthur Fletcher |
| Gomeroy Cultural Consultants | 18-Jul-18 | Email | Dave Horten |
| Aliera French Trading | 20-Aug-18 | Email | Aliera French |
| Wonnarua Elders Council | 2020 | Phone | Richard Edwards |

3.1.4 Notification of Registered Aboriginal Parties (RAPs)

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

In accordance with these requirements, on 20 September 2018, a list of all RAPs that had not requested their details be withheld was forwarded to the relevant Heritage NSW regional office and the WLALC. A copy of the EOI letter and the newspaper advertisement was included in this correspondence.

3.2 Stage 2 - Presentation of Information about Project

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

For the current assessment, presentation of information about the Modification Study Area and proposed development was provided to RAPs as part of the consultation requirements for the draft assessment methodology. The draft assessment methodology was sent to all RAPs on 4 February 2022 and a RAP information session was held at the Maxwell Infrastructure site office on Wednesday 2 March 2022. All RAPs were invited to the information session with Allen Paget (Ungooroo Aboriginal Corporation) attending on the day. A copy of the presentation is provided as Appendix A.

3.3 Stage 3 – Gathering Information about Cultural Significance

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

- a. contribute to culturally appropriate information gathering and the assessment methodology;
- b. provide information that will enable the cultural significance of Aboriginal objects and/or places within the Modification Study Area to be determined; and
- c. provide input into the development of any cultural heritage management measures.

AECOM (2019b) also completed a cultural values report for the Maxwell Project ACHA which encompassed the current Modification Study Area, which was informed by consultation with the RAPs identified in Stage 1.

For the current assessment, consultation with RAPs regarding the cultural heritage values of the Modification Study Area included:

- a request with the draft assessment methodology for any initial comments regarding the Aboriginal cultural heritage values of the Modification Study Area;
- a request during the information session held on 4 February 2022 for any information regarding the Aboriginal cultural heritage values of the Modification Study Area;
- discussion of cultural heritage values during AECOM's 2012/2018 field surveys;
- offers made to RAPs for private interviews, in case the information is considered culturally sensitive; and
- provision of the draft ACHA to all RAPs for comment prior to finalisation.

Existing publicly available information from previous studies in the Modification Study Area, as well as the surrounds, was also reviewed for information regarding the Aboriginal cultural heritage values of the Modification Study Area. This included review of the *Aboriginal Archaeological and Cultural Heritage Impact Assessment* (AECOM 2012, 2015) completed for the Drayton South Coal Project, which encompassed the current Modification Study Area.

3.3.1 Draft Assessment Methodology

Sections 4.3.1 and 4.3.2 of the Consultation Requirements require that the proponent present and/or provide the proposed draft ACHA methodology (Appendix A) for the cultural heritage assessment to RAPs. It also requires the RAPs be given a minimum of 28 days to review and provide feedback on this methodology.

All RAPs for this ACHA were provided the proposed draft ACHA methodology on 4 February 2022 (either by email or mail). RAPs were given a minimum of 28 days to review and provide feedback on this methodology with the closing date for comments on 5 March 2022.

Four responses were received from RAPs relating to the proposed draft ACHA methodology. The responses are summarised in Table 2, with written responses attached in Appendix B. No specific cultural heritage values relating to the Modification Study Area were identified by RAPs that provided responses.

Table 2 RAP responses to draft methodology

| Registered Aboriginal Party | Date | Method | Summary of response | AECOM Response |
|-----------------------------|------------|--------|--|----------------|
| Wallagan Cultural Services | 06/02/2022 | Email | "I am happy with the methodology" | None required |
| Muragadi | 06/02/2022 | Email | "I agree with the recommendations made" | None required |
| A1 Indigenous Services | 21/02/2022 | Email | "I have read the project information and methodology for the above project, I endorse the recommendations made." | None required |
| Murra Bidgee Mullangari | 28/02/2022 | Email | "I have reviewed the document and support the Information and Methodology" | None required |

3.4 Stage 4 - Review of Draft Assessment Report

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

In accordance with Section 4.4.2 of the Consultation Requirements, all RAPs were sent a draft of this ACHA on 1 May 2022 for review and comment (either by email or mail) with the closing date for comments noted as 30 May 2022. RAP responses are summarised in Table 3 with written and verbal responses attached as Appendix C. A total of two responses were received.

Table 3 RAP responses to draft ACHA Report

| Registered Aboriginal Party | Date | Method | Summary of response | AECOM response |
|-----------------------------|------------|--------|---|----------------|
| DNC | 01/05/2022 | Email | "Where all good from our end Geordie" | None required |
| Merrigarn | 31/05/2022 | Email | "I have read the project information and draft ACHA for the above project, I agree with the recommendations made" | None required |

A consultation log is provided as Appendix D.

4.0 Landscape Context

This section reviews the landscape context of the Modification Study Area as a basis for predicting the character of past Aboriginal occupation within it and its associated archaeological record. Consideration of the landscape context of the Modification Study Area is predicated on the now well established proposition that the nature and distribution of Aboriginal archaeological materials are closely connected to the environments in which they occur. Environmental variables such as topography, geology, hydrology and the composition of local floral and faunal communities will have played an important role in influencing how Aboriginal people moved within and utilised their respective Country. Amongst other things, these variables will have affected the availability of suitable campsites, drinking water, economic³ plant and animal resources, and raw materials for the production of stone and organic implements. At the same time, an assessment of historical and contemporary land use activities, as well as geomorphic processes such as soil erosion and aggradation, is critical to understanding the formation and integrity of archaeological deposits, as well as any assessments of Aboriginal archaeological sensitivity.

4.1 Physical Setting

Land within the Modification Study Area has been historically used for grazing, both sheep and cattle, and is currently utilised for cattle grazing and minor mine related activities.

Reference to the GNR of NSW indicates that the Modification Study Area falls wholly within the boundaries of the Muswellbrook Shire Council LGA and are situated within the Parishes of Wynn and Savoy in the County of Durham. Surrounding suburbs include Edderton to the north, Jerrys Plains to the south, Howick to the east and Denman to the west.

4.2 Topography

The Modification Study Area is located approximately 10 kilometre (km) south of the town of Muswellbrook within Central Lowlands of the Hunter Valley (Story, Galloway, van de Graaf, & Tweedie 1963). Its topography consists principally of flats interspersed with low undulating to steeply sloped hills, ridges and crests over open farmland which is typical of the region. Slopes range from level and very gently inclined on alluvial flats that generally border Saddlers, to steeper slopes on hills in the central and southern eastern portions of the Modification Study Area.

Elevations across the Modification Study Area from approximately 100 metres (m) Australian Height Datum (AHD) associated with a feeder creek near the Hunter River to 250 m AHD on a crest in the eastern Modification Study Area, providing a total local relief of 150 m (Figures 4 and 5). Following Speight (2009), a breakdown of the relative representation of morphological landform units within the Modification Study Area is provided in Table 4. Identified landform units, meanwhile, are shown on Figure 6.

Table 4 Morphological landform units within the Modification Study Area

| Landform unit | Area (ha) | % |
|---------------|-----------|------|
| Crest | 286.0 | 13.3 |
| Disturbed | 19.5 | 0.9 |
| Flat | 220.7 | 10.3 |
| Lower | 712.6 | 33.2 |
| Middle | 617.5 | 28.8 |
| Upper | 288.7 | 13.5 |

³i.e., edible and/or otherwise useful (e.g., medicine, clothing).

| Landform unit | Area (ha) | % |
|---------------|-----------|-----|
| Total | 2145 | 100 |

4.3 Hydrology

The principal watercourse associated with the Modification Study Area is Saddlers Creek which is located directly adjacent to its northern boundary. This creek is a 4th order channel to the north of the Underground Mining Area and 5th order downstream of Edderton Road. Saddlers Creek is fed by a number of small ephemeral creeks and drainage lines that traverse the central and northern portions of the Modification Study Area. These creeks and drainage lines form complex drainage networks that comprise the central reaches of the Saddlers Creek catchment area. Dry for much of the year, these watercourses commonly flow after large rain events, and as a result, will flood Saddlers Creek. The watercourses vary in width from less than a metre at their headwaters to instances of greater than 20 m where they meet Saddlers Creek. Many of the watercourses, including Saddlers Creek, show evidence of heavy erosion associated with historic native vegetation clearance activities, particularly along their mid and lower reaches.

In the eastern portion of the Modification Study Area, another series of ephemeral creeks and drainage lines drain moderately to steep sloped hills before feeding into Saltwater Creek, a 5th order creekline located outside the Modification Study Area and immediately upstream of the Hunter River. Similar to watercourses feeding Saddlers Creek, these feeder creeks are mostly dry, running only during rain and flood events. Heavy erosion is likewise a feature, particularly along the middle to lower reaches, with transported soils draining to the Saltwater Creek floodplain. Plashett Reservoir, constructed to supply water to the nearby Bayswater Power Station and the Jerrys Plains township, occupies a large portion of the original alignment of Saltwater Creek. Both Plashett Reservoir and Bayswater Power Station are outside the eastern extent of the Modification Study Area.

4.4 Geology

Reference to the Singleton 1:250,000 geological mapsheet (Singleton 1:250,000 Geological Series Sheet SI 56-1) indicates that the surface geology of the Modification Study Area comprises two distinct formations: Quaternary alluvial deposits and Permian coal measures, of which the Singleton Supergroup (formerly known as the Singleton Coal Measures) comprises the overwhelming majority (Figure 7). Quaternary alluvial deposit located within the Modification Study Area comprises a small area in the north associated with Saddlers Creek and comprise gravels, sand, silt and clays derived from Permian shales and sandstones. The Singleton Supergroup incorporates several geological sub-groups including the Newcastle Coal Measures, Tomago Coal Measures, Watts Sandstone and the Wittingham Coal Measures. Lithic materials associated with the Singleton Supergroup include coal seams, claystone, siltstone, sandstone, conglomerate, tuff, and shale.

Two geological features of note are associated with the Modification Study Area and are likely to have had a direct bearing on the nature and composition of any Aboriginal stone assemblages found within it: the Hunter River Gravels, and two identified sources of silcrete and tuff cobbles (one within and one west of the Modification Study Area). The Hunter River Gravels are a well-known source of indurated mudstone, often referred to as tuff (see Hughes et al. 2011 for a discussion), silcrete, and quartz raw material that was utilised by Aboriginal people in the manufacture of stone tools in the Central Lowlands. The gravels are exposed at numerous locations along the Hunter River, both as active gravel bars within the creek channel and on former terraces. Gravel locations have been noted at Muswellbrook, Denman, Jerrys Plains and Singleton (Dean-Jones & Mitchell 1993). However, as Esteves (1999) has suggested, when discussing the location of these gravels it is important to note that the Hunter River's alignment is considerably different today than it was prior to European settlement. This is due to channel modifications, land management practices, and natural processes, the implication being that the Hunter River gravels may be located adjacent to old channelisation at a considerable distance from its current channel. In addition, current gravel exposures may not necessarily have been accessible to Aboriginal people in the past.

In an assessment of several Hunter River gravel bars MacDonald & Davidson (1998a;1998b) found that the bars consist primarily of local materials, reflecting the River's underlying geology, and smaller deposits of non-local material transported from other parts of the system. Both indurated mudstone/tuff

and silcrete are considered locally derived; indurated mudstone/tuff being part of the Singleton Supergroup, and silcrete being derived from Tertiary fluvial sands and gravels. Surveys undertaken by Esteves (1999) along the Hunter River concluded that while these raw materials are present throughout the Hunter River gravel bars, there is spatial variability in their availability.

Naturally occurring outcrops of silcrete cobbles have been identified at two confirmed locations in the local area, one within the Modification Study Area and another 2.7 km to the west. Both these natural outcrops of silcrete show evidence of exploitation and would have been a source of raw material for stone tool production and are an important factor in characterising the local archaeology.

4.5 Soils

Reference to the 1:250,000 Singleton Soil Landscape Series Sheet (SI 56-1) (Kovac & Lawrie 1991) indicates that soils within the Modification Study Area form part of the Brays Hill, Bayswater and Liddell soil landscapes. The Brays Hill soil landscape is characterised by red clays (*Vertosols*) on the mid-slopes, black earths on steeper slopes and grey and brown clays (*Vertosols*) with linear gilgai (small ephemeral water bodies) and yellow solodic soils (soils with a strong texture contrast between the A and B horizon and a bleached A2 horizon) (*Sodosols*) on some lower slopes (Figure 8). The crests and upper slopes are characterised by red-brown earths (*Chromosols and Dermosols*) and alluvial soils are present in drainage lines. Soil erodibility varies from low to moderate throughout the soil landscape, although Alluvial subsoils have a high level of erodibility (Environmental Earth Sciences NSW 2012). Soils on cleared hillslopes are susceptible to minor sheet erosion and drainage lines may have moderate gullying. Potential for mass movement of soils is moderate to low (Kovac & Lawrie 1991). Both erosion and mass movement of soils are factors that potentially contribute to disturbance of archaeological sites.

The Bayswater soil landscape is characterised by yellow solodic soils (*Sodosols*) on slopes with alluvial soils in drainage lines. Within this landscape grouping, yellow solodic soils and red-brown earth (*Chromosols and Dermosols*) intergrades also occur. Brown and yellow earths and prairie soils (a soil type occurring in temperate areas formerly under prairie grasses and characterised by a black A horizon) are present in some drainage lines. Soils on slopes also comprise yellow and brown podzolic soils (*Chromosols*) (Environmental Earth Sciences NSW 2012). Moderate sheet and gully erosion is common on slopes (Kovac & Lawrie 1991). As a result, archaeological sites present on slopes may have been subject to varying degrees of disturbance.

The Liddell landscape grouping is generally duplex in character with varying degrees of change between A and B horizons (Kovac & Lawrie, 1991). Lower-slopes are comprised of Yellow Solodic Soils, which consist of weakly structured dark brown loam A₁ horizons over bleached orange clay loam A₂ horizons. Below these, a clearly changed soil profile of blocky bright reddish-brown light clay, becoming more yellow at depth is located. Mid-slopes are comprised of Earthy/Siliceous Sands, which consist of brown sand/loamy sand to brown sandy loams, gradually changing to dull yellow-brown sandy loam or bright brown loamy sand in the B horizon. Upper-slopes are comprised of Yellow Soloths, which consist of Brown loamy sand to sandy loam over a bleached light grey/yellow orange sandy loam or sandy clay loam, clearly changing to bright brown/dull orange sandy clay in the B horizon (Environmental Earth Sciences NSW 2012). Soils on the lower and upper-slopes (Soloths and Solodics) are susceptible to moderate to high erosion, particularly sheet, gully and, to a lesser extent, rill erosion. Soils on the mid-slopes (sands) have a low potential for erosion. Mass movement hazard is low throughout the soil landscape (Kovac & Lawrie 1991). In these contexts, archaeological sites may be well preserved.

A large number of archaeological sites within the Hunter Valley occur within texture contrast (duplex) soils (Hughes 1984, Koettig & Hughes 1985). Texture contrast soils, as defined by Hughes (1984), consist of an A horizon of massive, sandy to silty material overlaying a B horizon of clayey material with a blocky structure. These soils are prevalent in the Central Lowlands and mantle the undulating to hilly landscapes on Permian and Carboniferous rocks and the older alluvial terraces and valley fills (Hughes 1984). Archaeological excavations in the Hunter Valley have consistently shown Bondaiian assemblages, dated to the late Holocene, associated with the A soil horizon. This result has led Hughes and others to conclude that soil materials that make up the A horizon are sedimentary in origin and have accumulated over the last 5,000 years (Hughes 1984).

Texture contrast soils (particularly the A horizon, due to its loose sandy and silty material) are prone to extensive erosion resulting in the exposure and subsequent disturbance of subsurface archaeological deposit in its original context. During excavations in the Modification Study Area in the mid-1980s, Hughes (1984) noted that sheet erosion was the dominant erosional process in the area, resulting in the partial stripping of A horizon soils, with only a little deep riling and gulying of the underlying B unit.

As in other parts of the Hunter Valley, existing archaeological, environmental and historic reference materials for the Modification Study Area suggest that a range of geomorphic processes are likely to have affected the Aboriginal archaeological record of the site. Potentially significant phenomena from an archaeological perspective include bioturbation, erosion, alluvial/colluvial aggradation and aeolian processes. Possible effects of these processes include:

- increased archaeological site visibility in eroded areas;
- reduced archaeological site visibility in areas of sediment deposition;
- horizontal and vertical translocation of artefacts;
- stratigraphic mixing;
- truncation of archaeological deposits; and
- creation of thicker (potentially stratified) archaeological deposits in floodplain, slope base and fluvial/aeolian sand deposit contexts.

4.6 Flora & Fauna

Native vegetation within the Modification Study Area has been significantly modified as a result of historic European land use practices with the current vegetation providing insight into the pre-European settlement floral regime of the site. In general, the Modification Study Area supports a diverse range of natural vegetation communities, with different communities occupying different landscape positions.

Current vegetation across the Modification Study Area comprises patches of Dry Sclerophyll Forest, Forested Wetlands, Grassy Woodlands and native derived grassland (Hunter Eco 2019) with forest and woodland typically found in gully and riparian areas that have historically been difficult to farm. These vegetated areas are large enough to provide reasonable interior habitat for native fauna and flora and these areas support a diversity of species in the understorey.

The flora assessment completed by Hunter Eco (2019) for the Maxwell Project indicates that Dry Sclerophyll Forest in the Modification Study Area is dominated by White Box, Narrow-leaved Ironbark, Blakely's Red Gum shrubby open forest commonly found in the central and upper Hunter Valley. Slaty Box and Grey Gum shrubby woodland are also present, to a lesser extent, in the western portion of the Modification Study Area. Forested Wetland comprising Swamp Oak Forest is also mapped in small patches in the western portion of the Modification Study Area.

Native derived grassland in the Modification Study Area, typically located between patches of forest and woodland, is largely dominated by a variety of native perennial grass and forb species but many exotic species are also present as is typical of grazing lands (Cumberland Ecology 2012). A total of 201 fauna species were recorded in the Modification Study Area during the surveys comprising 10 amphibian, 22 reptile, 131 bird and 38 mammal species (Future Ecology 2019) suggesting a diverse range of faunal resources were available for exploitation by Aboriginal people. A suite of bird species, and to a lesser extent, bats, dominates the faunal assemblage within the Modification Study Area. Arboreal mammals were restricted to common and disturbance-adapted species such as possums. Small ground dwelling native fauna (mammals, reptiles and amphibians) are not as well represented within the Modification Study Area. These trends may reflect the high degree of modification to the understorey habitat and general lack of forage and shelter, as well as the fragmented nature of woodland that may restrict movement.

Although available historical records provide only limited insight into Aboriginal exploitation of plants within the Hunter Valley (Brayshaw 1987: 74), it can be confidently asserted that the original vegetation communities of the Modification Study Area will have supplied Aboriginal people camping within, and passing through the site, with an extensive array of edible and otherwise useful plant species. Recorded native vegetation communities and locally occurring wetland will likewise have supported a large and diverse range of economic⁴ terrestrial, aquatic and avian fauna. Historical evidence for the Aboriginal exploitation of faunal and floral resources within the Hunter Valley is discussed in further detail in Section 5.3.

4.7 Historical Context

The Hunter region was initially identified as an area of rich resources in 1797 when Lieutenant John Shortland found coal at the mouth of the Hunter's River, as it was then known. A convict settlement was established at the mouth of the River in 1801 to gather coal and timber and burn shells for lime (Hunter 2010: 6).

The 1810s saw increased pressure on land around Sydney, especially following several years of drought. The farmers on the Hawkesbury River around Windsor petitioned Governor Macquarie to allow exploration inland. In 1819, Macquarie authorised men to find an overland route into what is now the Hunter Valley. The leader of this party, Windsor chief constable John Howe, exclaimed it was the best pasture he had seen since leaving England. Confirmation of the overland route was undertaken in 1820 (Hunter 2010:7). Macquarie rewarded the men in this second party with land grants around the area now known as Singleton.

Land was quickly surveyed and by 1823 grants along rivers and creeks had been issued. Settlement, however, seems to have been made at a slower pace. A traveller in 1827 said that the area was inhabited by single shepherds with their flocks (Hunter 2010:8).

In 1829, Jerrys Plains was surveyed as a town, although it had been a campsite for travellers for some years previous. The town was not proclaimed until 1840 and official grants were not given until several years later. Despite the absence of official land ownership, development of the town continued.

Muswellbrook was proclaimed in 1833, although again, there had been earlier settlement in the vicinity. The surrounding area was largely used for grazing and cropping, with an increasing focus on dairying. Coal mining began in the 1890s but did not become prolific until more recently.

Reference to Nineteenth Century parish maps for Wynn indicates that the eastern portion of the Modification Study Area was originally part of the Plashett Estate, first granted to James Robertson. Plashett was granted to James Robertson, of Renfrew, Scotland, in 1827. Robertson had arrived in the colony in 1822 accompanied by his wife, Anna Maria and six children. In London, Robertson had been a watch and mathematical instrument maker for Grimaldi and Johnson of The Strand. In this capacity, Robertson had made friends with Thomas Brisbane, who was a keen astronomer. When Brisbane was appointed Governor of NSW he encouraged Robertson to immigrate to the colony.

A map of the Hunter River Land Grants produced in October 1829, shows the Robertson 1,000 acres with a house built on it. This house is thought to be the slab cottage which remained standing until 1993, when it was reportedly demolished. On 15 September 1854, Plashett was advertised for sale in the Maitland Mercury, and was described as being "*an excellent Stone House, not finished inside, which was located near to where the old homestead stood.*" Plashett was purchased from Robertson in November 1854 by Joseph Pearse, who in turn transferred ownership to his son William Pearse in 1864. William Pearse married Catherine Langley in 1866. By the 1890s, the property was supplying sheep and cattle for both Sydney and Hunter Valley abattoirs. Cattle were sent to the Hunter from the Pearse properties in Queensland to be fattened up for the Sydney market. Corn, horse breeding, and shearing also took place at the property. By 1910, Plashett was producing milk from a herd of approximately 100 cows for the Jerrys Plains butter factory.

When William Pearse died in 1927, a probate valuation describes the property as pastoral, with 18 grazing paddocks, three for cultivation, and a few others as well. Timber had been left in the paddocks to provide shade for the cattle, and this included kurrajong and box species.

⁴i.e., edible and/or otherwise useful (e.g., medicine, clothing).

Plashett remained in the Pearse family for 117 years, until 1971, when a portion of the property was transferred to Caroon Pty Ltd. In 1982, this portion was transferred to the Electricity Commission of New South Wales (Pacific Power). In that same year, Lot 2 DP 616024, which comprised half of the land owned by Pacific Power, was transferred to Mount Arthur Coal Pty Ltd. In 2000 the property was purchased by Anglo American plc. Plashett remains a pastoral property, now managed on behalf of Malabar.

The Wynn parish map indicates that the western portion of the Modification Study Area was originally part of a 2,560 acre land grant to George Bowman and was part of the historic Arrowfield estate. The property was subsequently purchased by a Mr Ryder, and Edderton Homestead was then built in 1908. Ryder named the property after the Edderton Meat Works in Brisbane, one of his business interests. It was then acquired by a Mr Osborne.

The property was acquired by the McDonald family c. 1910 and increased in acreage. It was purchased by Hector Cameron McDonald and then passed on to his son Douglas. When first purchased by McDonald, the property was approximately 4,000 acres. Over a period of 25 years, McDonald consolidated Edderton with other lands into a large pastoral property, increasing it to about 13,000 acres. Originally, McDonald ran about 16,000 sheep and today a six stand galvanised iron shearing shed remains, together with the old shearers' quarters. After some time, sheep were replaced by cattle as a result of the damage caused to the land. The homestead was extended by the McDonalds from its original four rooms. The building is of quite unusual detail and is in excellent condition. Following WWII, the Edderton property steadily became less economically viable and was gradually broken up. Edderton has since been acquired by Mount Arthur Coal Pty Ltd, a subsidiary of BHP, and is currently leased as a working pastoral property primarily for cattle grazing.

4.8 Land Use

The current dominant land uses within the study area is cattle/sheep grazing and limited cropping as well as mining in the north. Since European settlement of the area in the 1820s, the flora and fauna, hydrology regimes and general landform have been subject to considerable modification as a result of European agricultural activities

Together with available documentary sources and field observations, historical aerial photographs provide a framework for assessing the nature and extent of previous land disturbance across the Modification Study Area. Examination of aerial photographs from 1958 (Figure 9), 1967 (Figure 10), 1974 (Figure 11), 1989 (Figure 12), 1998 (Figure 13), and 2009 (Figure 14) provided below, attest to a range of land use activities and associated ground surface impacts across the site including:

- extensive native vegetation clearance (prior to 1958);
- pastoral activities including livestock grazing, fencing, the construction of multiple farm dams and contour banks for erosion control;
- fluvial erosion activity, particularly along creeklines and on cleared hillslopes;
- construction of residential dwellings and associated structures, driveways and access tracks; and
- construction of the existing Maxwell Infrastructure complex and associated coal mining activities in the mining lease areas and minor excavation for exploratory drilling activities in the exploration licence area.

To varying degrees, all the above-cited land use activities and associated ground impacts are relevant to the survival, integrity and identification of Aboriginal archaeological evidence within the study area. Key implications for the current assessment include:

- the likely destruction, in areas of grossly modified terrain, of any pre-existing sites and deposit(s);
- the disturbance of pre-existing archaeological deposits through both direct (e.g., ploughing, bulldozing) and indirect (e.g., erosion) means, resulting in a loss of archaeological integrity;
- the likely removal of any culturally scarred trees that once existed within the study area; and
- an increase, in areas affected by erosion, of archaeological site visibility.

A disturbance map combining these various ground surface impacts is provided as Figure 15. Levels of disturbance are defined as:

- **High** - Severe disturbance to natural soil profiles including complete-to-near complete topsoil loss through erosion, earthworks, buildings, vehicle tracks and dams; and
- **Low** - Cleared and/or grazed at some time.

4.9 Key Observations

Key observations to be drawn from a review of the existing environment of the Modification Study Area are as follows:

- Topography within the Modification Study Area consists principally of flats interspersed with low undulating to steeply sloped hills, ridges and crests over open farmland which is typical of the region.
- The principal watercourse associated with the Modification Study Area is Saddlers Creek which is located directly adjacent to its northern boundary. This creek is a 4th order channel to the north of the Underground Mining Area and 5th order downstream of Edderton Road. Saddlers Creek is fed by a number of small ephemeral creeks and drainage lines that traverse the central and northern portions of the Modification Study Area.
- Reference to the Singleton 1:250,000 geological mapsheet indicates that the surface geology of the Modification Study Area comprises two distinct formations: Quaternary alluvial deposits and Permian coal measures, of which the Singleton Supergroup (formerly known as the Singleton Coal Measures) comprises the overwhelming majority.
- Two geological features of note are associated with the Modification Study Area and are likely to have had a direct bearing on the nature and composition of any Aboriginal stone assemblages found within it: the Hunter River Gravels, and two identified sources of silcrete and tuff cobbles (one within and one west of the Modification Study Area).
- Prior to European settlement, the floral and faunal resources of the Modification Study Area and environs would have been sufficient to facilitate intensive and/or repeated occupation by Aboriginal people.
- Examination of historical aerial imagery for the Modification Study Area indicates a range of historical land use activities and associated ground surface impacts. Major activities/impacts include native vegetation clearance, the construction of farm dams and erosion. However, the majority of land within the Modification Study Area retains moderate integrity.

Figure 4 Slope

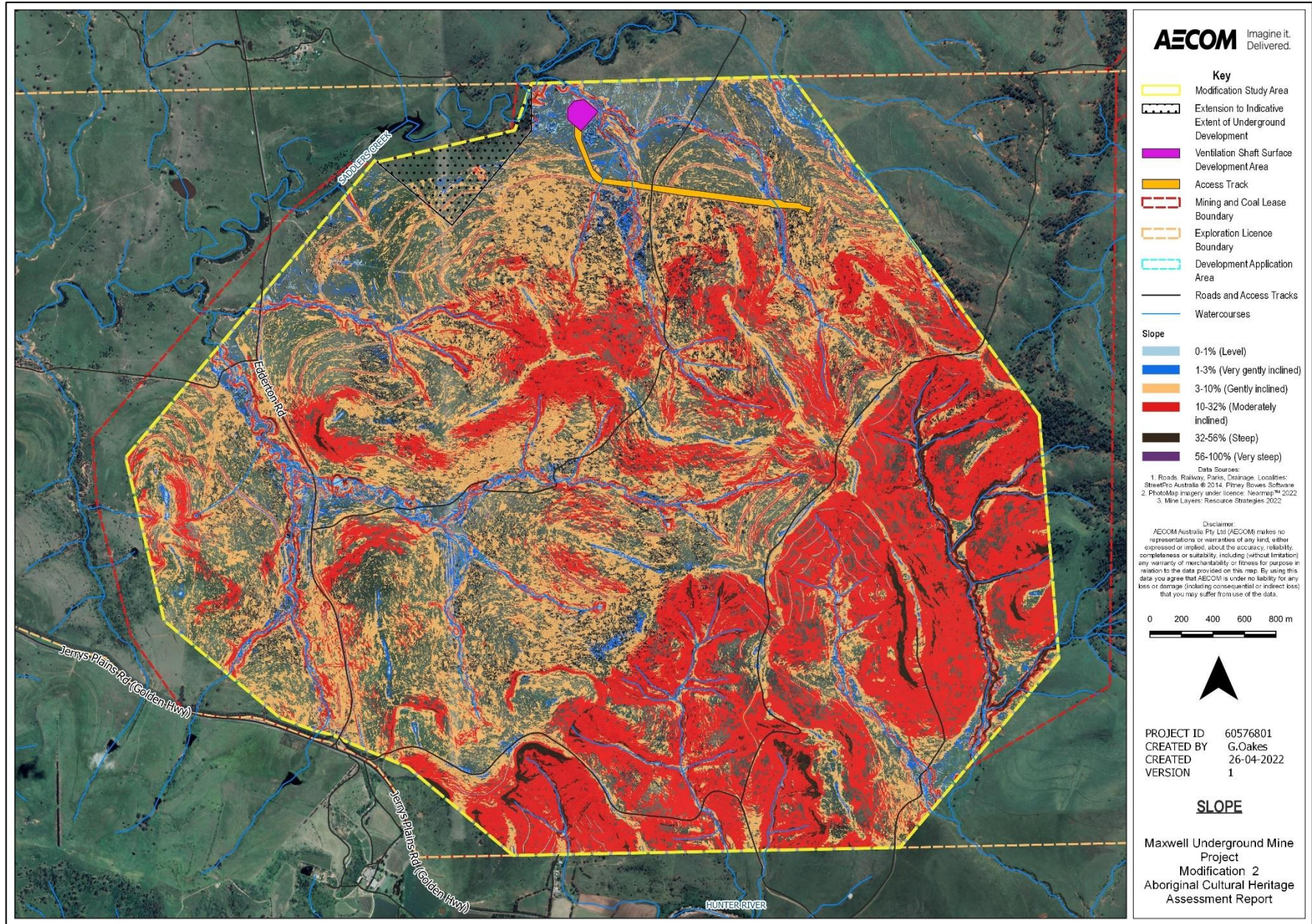


Figure 5 Elevation

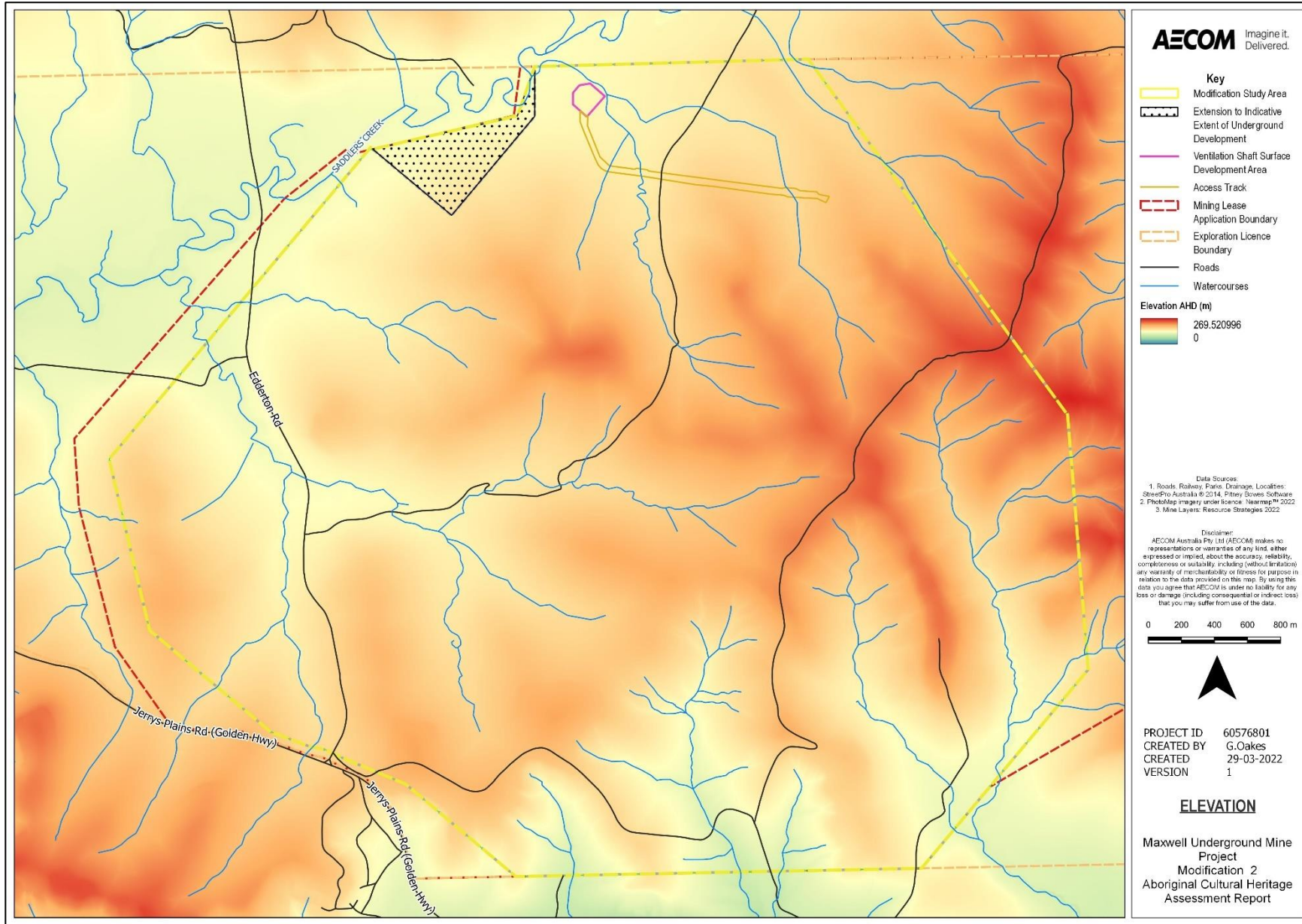


Figure 6 Landform

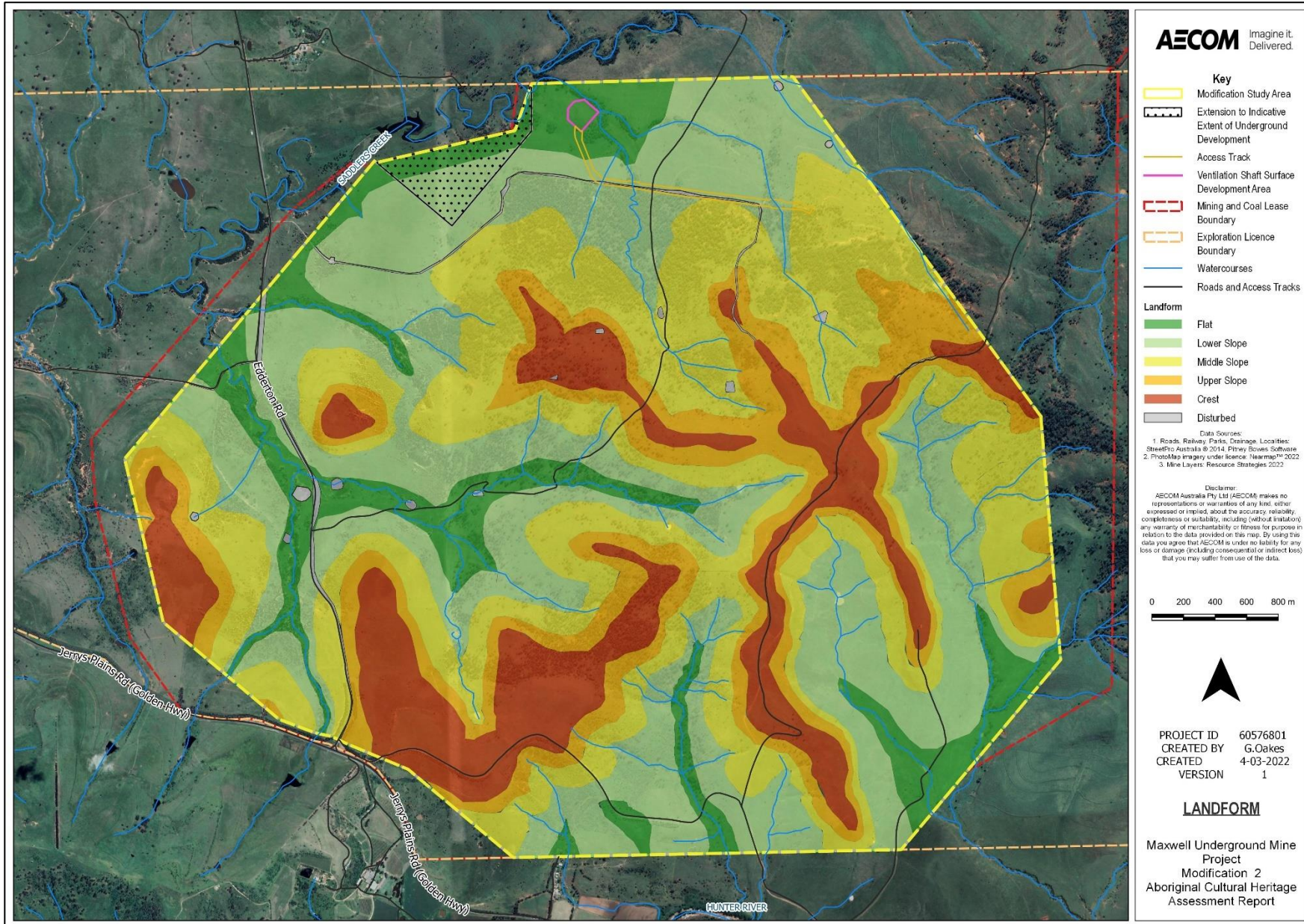


Figure 7 Surface geology

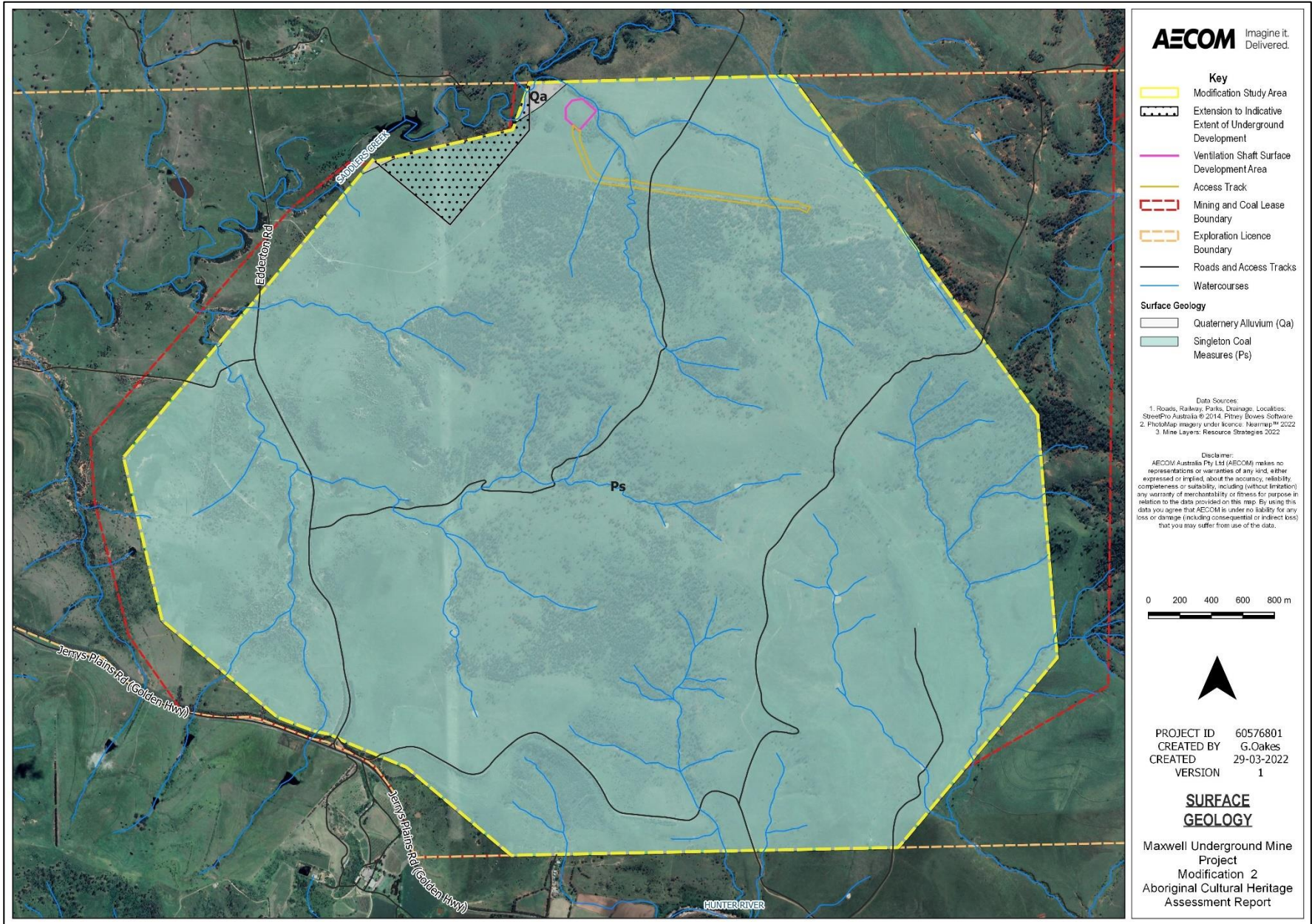


Figure 8 Soil landscapes

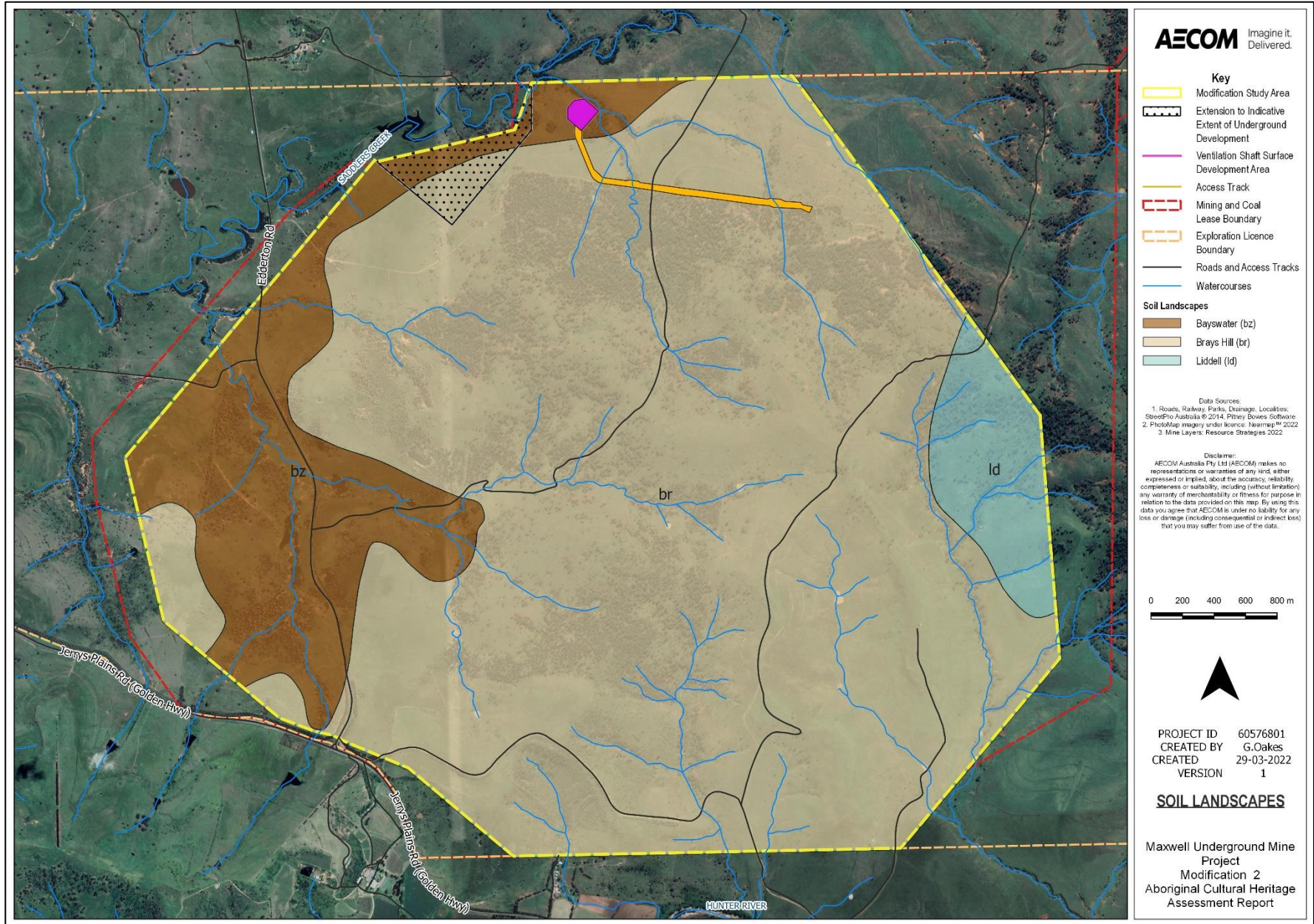


Figure 9 1958 aerial photograph of the Modification Study Area (Source: Land & Property Information NSW)

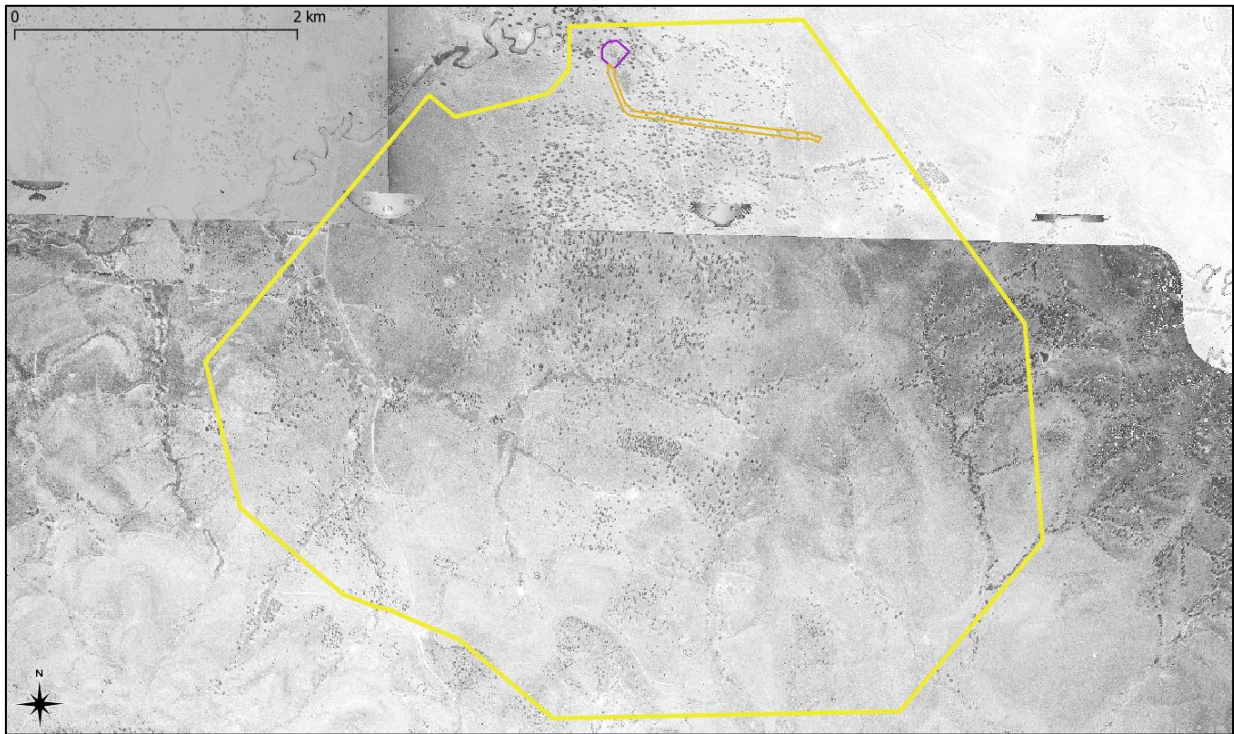


Figure 10 1967 aerial photograph of the Modification Study Area (Source: Land & Property Information NSW)



Figure 11 1974 aerial photograph of the Modification Study Area (Source: Land & Property Information NSW)

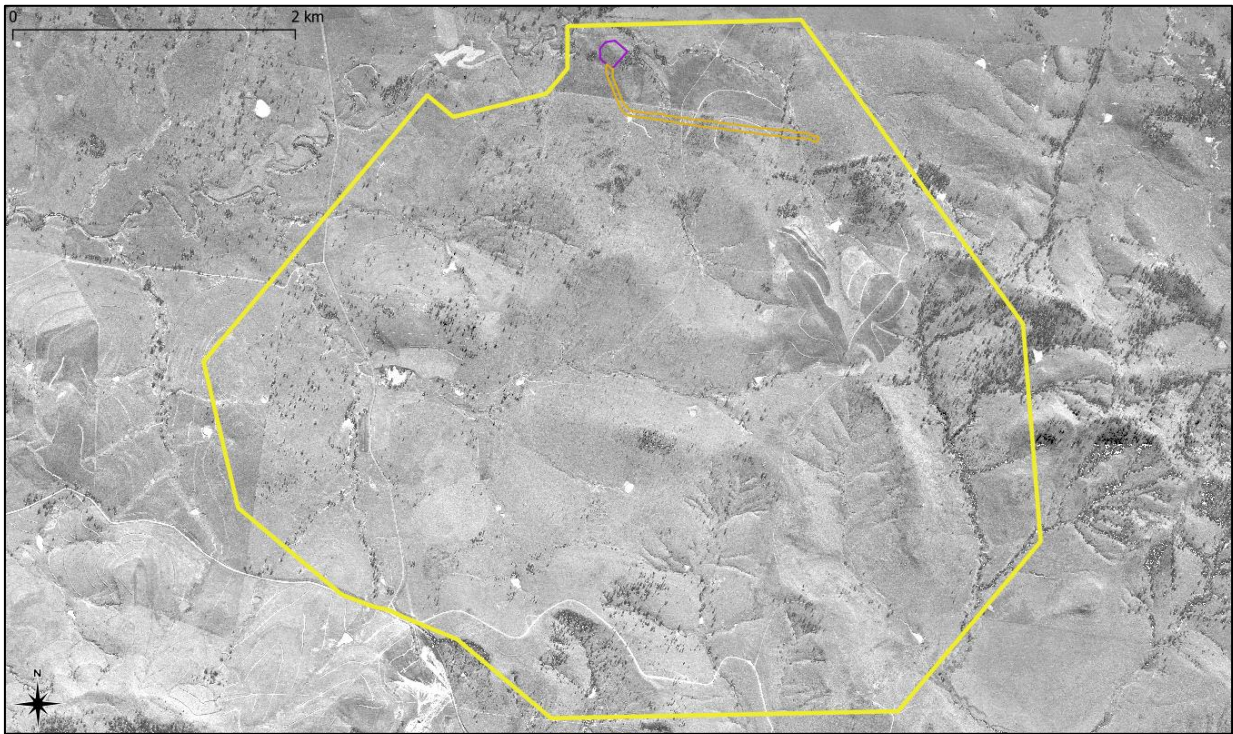


Figure 12 1989 aerial photograph of the Modification Study Area (Source: Land & Property Information NSW)

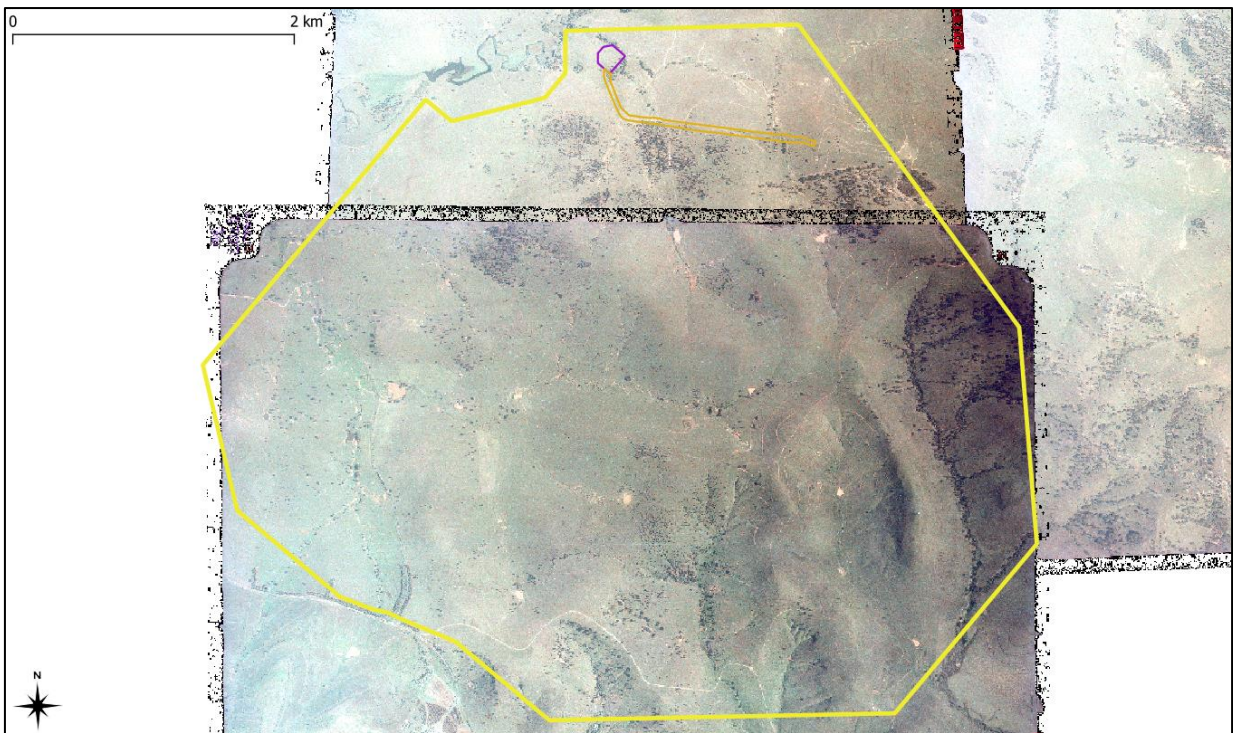


Figure 13 1998 aerial photograph of the Modification Study Area (Source: Land & Property Information NSW)



Figure 14 2009 aerial photograph of the Modification Study Area (Source: Land & Property Information NSW)

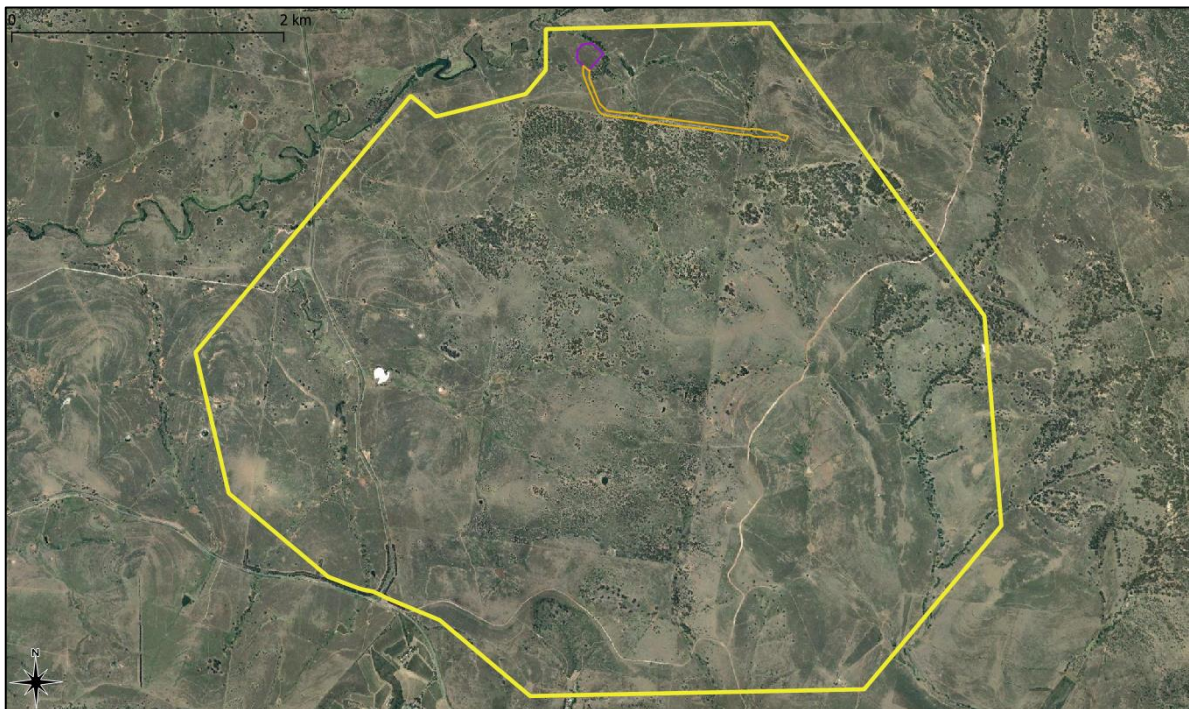
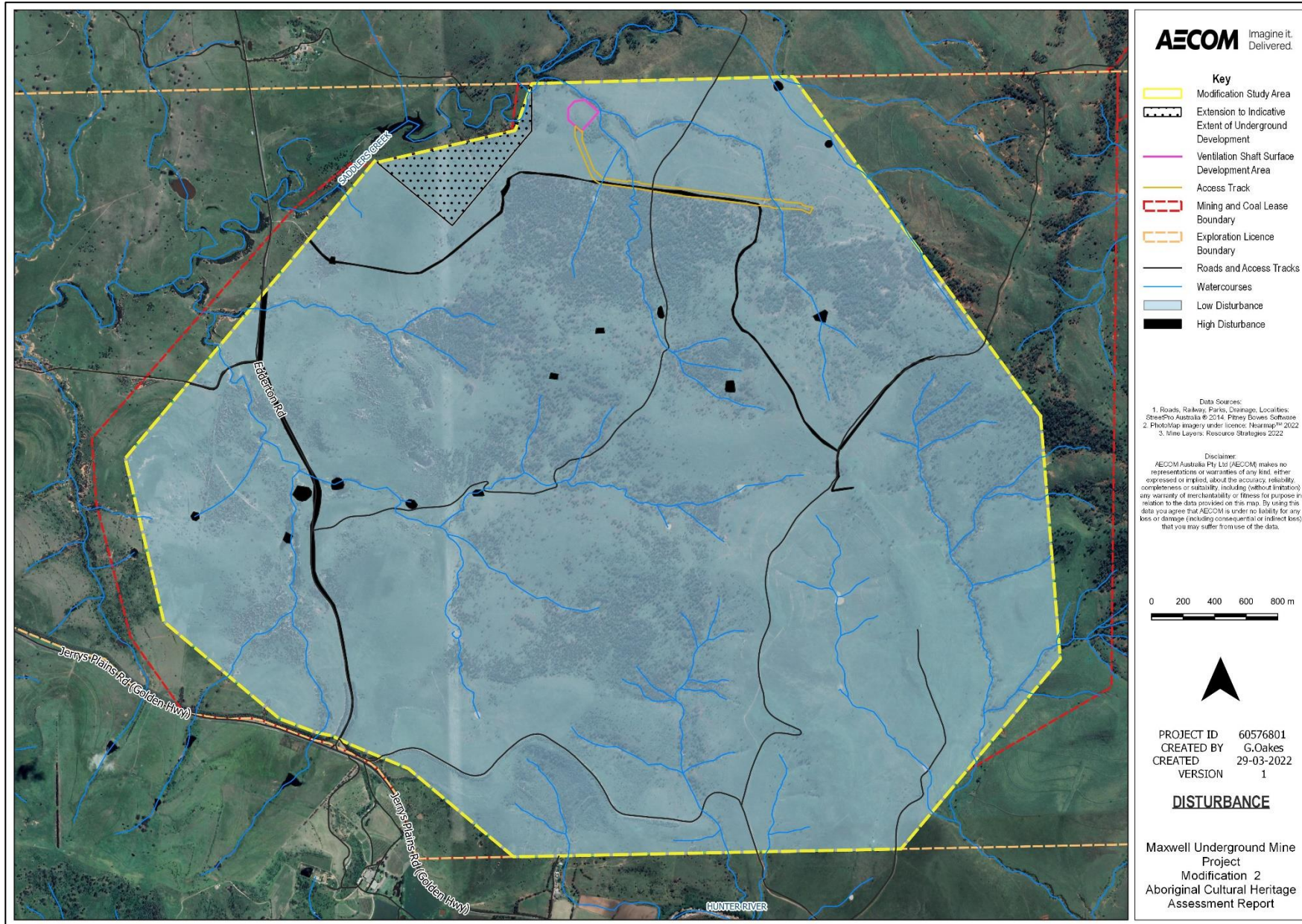


Figure 15 Disturbance



5.0 Ethnohistoric Context

5.1 Introduction

Information regarding the ways in which Aboriginal people likely used pre-contact landscapes is available to archaeologists through two primary sources: archaeological (i.e., survey and excavation) data and historical records. Section 6.0 summarises the Aboriginal archaeological context of the Modification Study Area on both a regional and local scale. This section builds on this foundation by summarising relevant ethnohistoric information for the Modification Study Area and environs.

As in other parts of NSW and Australia more broadly, non-Aboriginal people occupying the Upper Hunter Valley began to document Aboriginal culture from first contact, with explorers, missionaries, settlers and the like recording their observations of Aboriginal people and/or their material culture in letters, journals and official reports. Many of these accounts are overtly Eurocentric in tone and the content and veracity of some is, at best, questionable. Nonetheless, taken together, they form an important source of information on Aboriginal lifeways at the time of British colonisation and can, in conjunction with available archaeological data, be used to generate working predictive models of prehistoric Aboriginal land use.

Key sources, both primary and secondary, for the post-contact languages and lifeways of the Aboriginal people occupying the Hunter Valley at the time of contact include: Backhouse (1843), Barrallier (1802), Brayshaw (1987), Caswell (1841), Capell (1970), Dawson (1830), Ebsworth (1826), Enright (1900, 1901, 1932, 1933, 1936, 1937), Elkin (1932), Fawcett (1898a, 1898b), Ford (2010), Gunson (1974), Hale (1846), Fraser (1892), Haslam et al. (1984), Larmer (1898), Lissarrague (2006), Matthews (1898, 1903), Miller (1887), McKiernan (1911), Threlkeld (1827, 1834, 1836, 1850), Scott (1929) and Sokoloff (1980). Although a detailed review of these sources is beyond the scope of this report, information of particular relevance to the current assessment is summarised below.

5.1.1 Language Groups and Boundaries

As highlighted by Brayshaw (1987) and a number of other researchers (e.g., ERM 2004; Kuskie 2000a), reconstructing the social and territorial organisation of the Aboriginal groups occupying the Hunter Valley at contact is extremely difficult given the enormous social upheaval that preceded any formal investigations into their languages and lifeways. The sometimes contradictory nature of primary historical records has likewise complicated the situation as has the tendency of early observers to describe all named groups of Aboriginal people, regardless of size and/or composition, as ‘tribes’ (Brayshaw 1987: 36).

According to Tindale’s (1974) oft-cited tribal map, the current Modification Study Area is located within Wonnarua territory, close to the boundary with the Geawegal (Figure 15). Tindale (1974) describes the territory of the Wonnarua as a 5,200 square kilometres (km²) area stretching from “a few miles” north of Maitland west to the Dividing Range and south to the divide north of Wollombi. To the south of the Wonnarua, Tindale (1974) places the Darkinjung, whose tribal territory is described as a 4,700 km² area extending south of the Hunter River watershed, from “well south” of Jerrys Plains, east toward Wollombi and Cessnock, south to Wisemans Ferry on the Hawkesbury River, and west to the divide east of Rylstone. To the west of the Wonnarua were the Wiradjuri, one of the largest groups in NSW occupying an area of 97,100 km² extending from the Lachlan River to Rylstone and Mudgee. To the east of the Wonnarua were the Worimi and Awabakal. The Worimi, according to Tindale (1974), occupied a 3,900 km² area extending from the Hunter River to Forster, near Cape Hawke, inland to near Gresford and south to Maitland, while he describes the Awabakal as occupying a 1,800 km² area centred on Lake Macquarie, south of Newcastle. Finally, to the north of the Wonnarua, Tindale (1974) places the Geawegal tribe, who are described as occupying the northern tributaries of the Hunter River to Murrurundi and being present at Muswellbrook, Aberdeen, Scone and the Mount Royal Range.

Although widely cited, it should be noted that Tindale's boundaries for the Awabakal 'tribe' do not accord with those provided by the missionary Reverend Lancelot Threlkeld, who established an Aboriginal mission at Belmont on Lake Macquarie in 1826⁵ (the 'Bahtahbah' mission) and is widely regarded as one of the pioneers of Aboriginal studies in NSW owing to his detailed recordings, with the assistance of influential Awabakal leader Biraban (aka John McGill), of the language and lifeways of the Aboriginal people occupying the Hunter River Estuary.

Writing in 1828, for example, Threlkeld described the territory of the Awabakal as consisting of:

"The land bounded (to the South) by Reid's Mistake the entrance to Lake Macquarie, (to the North) by Newcastle & Hunter's River, (to the West) by five islands on the head of Lake Macquarie 10 miles west of our station. This boundary, about 14 miles N and S by 13 E and W, is considered as their own land" (Threlkeld 1828 in Ford 2010: 339) (Figure 16)

Tindale's (1974) and Threlkeld's (1828) contradictory accounts notwithstanding, what is clear from available historical records is that the former's oft-cited division of the Awabakal and Wonnarua into two separate 'tribes' does not adequately capture what was at contact a complex system of social and territorial organisation involving numerous local descent groups (i.e., clans) and bands who, critically, spoke the same language. As Lissarrague (2006: 7) has recently observed, "the evidence from archival sources suggests that the language described by Threlkeld as 'The language of the Hunter River and Lake Macquarie' was spoken by people now known as Awabakal, Kuringgai and Wonnarua". Lissarrague (2006), for her part, has named this language the Hunter River and Lake Macquarie language (HRLM language) and notes that it may also have been spoken by Tindale's (1974) Geawegal 'tribe'.



Figure 16 Excerpt from Tindale's (1974) tribal map (Tindale, 1974)

⁵ Subsequently relocated to Toronto in 1831 and named 'Ebenezer' mission

Critical to current interpretations of the boundaries of the HRLM language are the observations of Reverend Threlkeld. Threlkeld’s own account of the boundaries of this language, which comes from his 1838 report to the then NSW Legislative Council’s Committee on the Aborigines Question, is reproduced below:

“The native languages throughout New South Wales, are, I feel persuaded, based upon the same origin; but I have found the dialects of various tribes differ from those which occupy the country around Lake Macquarie; that is to say, of those tribes occupying the limits bounded by North Head of Port Jackson, on the south, and Hunter’s River on the north, and extending inland about sixty miles, all of which speak the same dialect.

The native of Port Stephen’s use a dialect a little different, but not so much so as to prevent our understanding one another’ but at Patrick’s Plains the difference is so great, that we cannot communicate with each other; there are blacks who speak both dialects” (Threlkeld 1838 in Ford 2010).

Threlkeld’s (1825 in Ford 2010: 328) earlier observation that “the natives here [i.e., at Lake Macquarie] are connected in a kind of circle extending to the Hawkesbury and Port Stephens” is also worthy of note here.

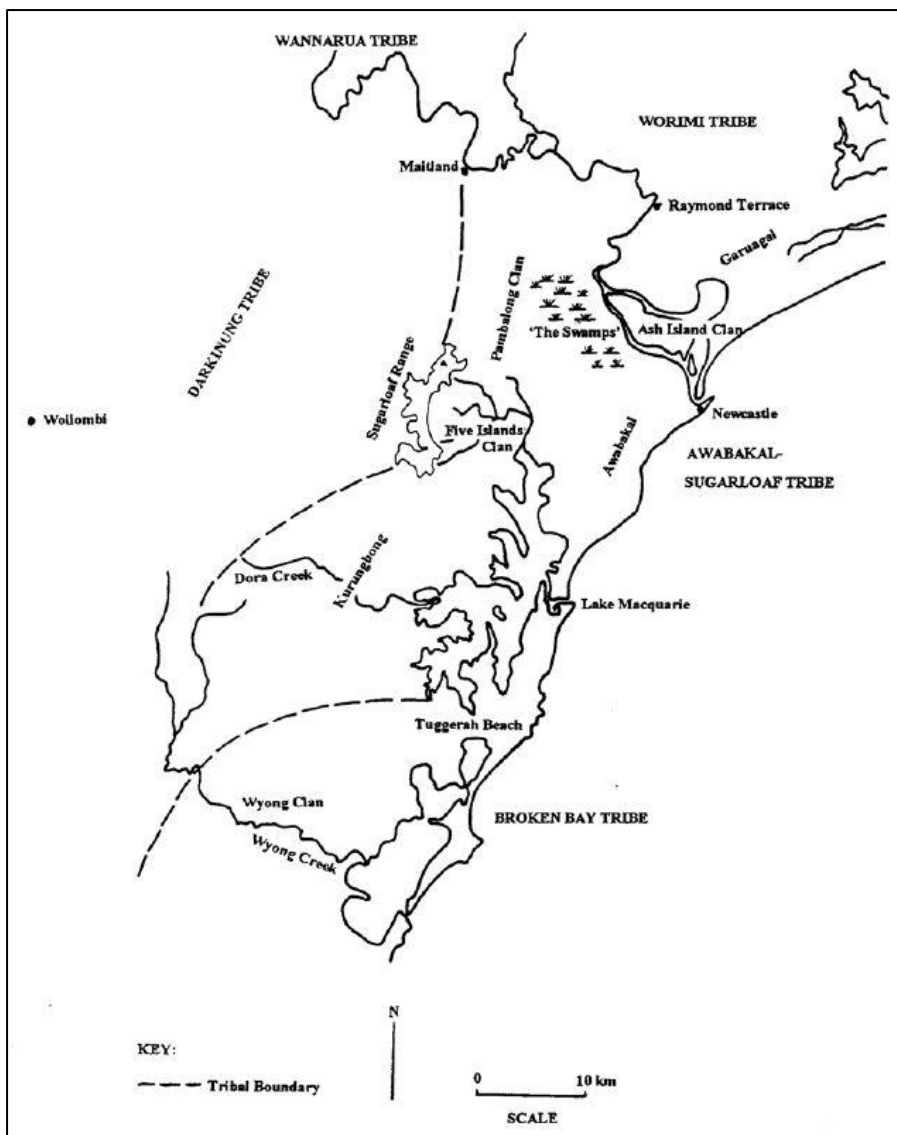


Figure 17 Gunson’s (1974) tribal map for the lower Hunter Valley, based on the observations of Reverend Lancelot Threlkeld (from Kuskie, 2012): 39, Fig. 8, after Gunson, 1974)

Threlkeld's observations provide strong *primary* evidence for the existence of a single shared language for Tindale's (1974) Awabakal and Wonnarua 'tribes'. At the same time, they suggest that this language differed from that spoken by the Worimi around Port Stephens, being the Kutthung or Kattang language described by Enright (1900, 1901), and those spoken by Aboriginal groups occupying the Middle and Upper Hunter Valley, namely Darkinjung and Kamilaroi (Brayshaw 1987; Ford 2010). Although Threlkeld's proposed southern extent for the HRLM language does not accord with the observations of other early sources, principally R.H. Matthews, his suggestion of a single shared language for the Aboriginal groups occupying the catchments between the Hawkesbury River estuary of Broken Bay and the estuarine areas of the Lower Hunter River is well supported by available historical records and associated linguistic research (see, in particular, Capell 1970; Ford 2010).

Ford's (2010) recently completed historiographic analysis provides further insight into the social and territorial organisation of the Aboriginal groups occupying the Hunter Valley at contact. Based on his own detailed review of available historical records, Ford (2010) has argued that the actual 'tribal' and/or language name for the HRLM-speaking Aboriginal groups occupying the estuarine areas of the lower Hunter River at contact was *Wannungine* and not Awabakal, with the latter term coined, alongside *Guringai* (now *Kuringgai*), by Scottish ex-school teacher and Maitland resident John Fraser in 1892 (Fraser 1892).

The term *Wannungine*, Ford (2010: 343) notes, was the term that celebrated surveyor and self-taught anthropologist R.H. Matthews recorded as the language or tribal name for Aboriginal peoples occupying the coastline southward from the Hunter River estuary to 'Lane Cove', but not extending to the north shore of Port Jackson, and east to the coastal range⁶. Matthews also identified the term *Wannerawa*, applying it to the southern part of the identified Wannungine area (i.e., around Broken Bay) (Ford 2010: 344).

Thus, although correctly identified by Matthews, it is Ford's contention that Miller's (1887) misapplication of the term *Wannerawa*, as *Wonnarua*, to the Middle and Upper Hunter Valley, an error subsequently reinforced through the publications of disgraced journalist J.W. Fawcett (1898a, 1898b), that has resulted in the historical anomaly of the *Wannerawa* (Miller's (1887) 'Wonnarua') being placed in the Middle and Upper Hunter. Miller's (1887: 352) reference to the principal ornament of the Wonnarua being a "nautilus shell cut into an oval shape and suspended from the neck" is cited as further evidence that Miller should actually have meant the Wonnarua to be coastal people (Ford, 2010: 354). Contrary to Miller's (1887) and Fawcett's (1898a, 1898b) widely cited accounts, Ford's research suggests that at the time of first European settlement, the mid Hunter was, in fact, occupied by Darkinjung-speaking peoples, whose territory encompassed the ranges bounded by the Hawkesbury River floodplain to the south and the Hunter River floodplain to the north and was bordered to the east-northeast by the coastal *Wannungine* (aka *Wannerawa*) (Ford 2010: 10). Bordering the Darkinjung to the west/northwest, in the Upper Hunter, were Kamilaroi-speaking peoples, who Ford (2010: 467) suggests had penetrated over the Liverpool Range and were occupying the Hunter Valley as early as 1819.

As to the name of the group occupying the Modification Study Area at the time of contact, available sources are unclear. Reference to historic documents suggest four named groups occupied the area referred to as Patricks Plains, an area surrounding Singleton, including the 'Plains clan', the Bulcara, the Micarrawillang, and the Kinkigyne (or Hungary Hill) (Colonial Secretary Letters 1829 [4/2045]). The Return of Aboriginal Natives dated 2nd June 1834 (4/22191.1, Reel 3706, Slide 0186) indicates that the Kinkigyne occupied the Fal Brook area near Singleton. It is unclear what part of Patricks Plains the remaining groups occupied. Further west it is noted that Edward Ogilvie of the Merton property (near Denman) suggested four groups occupied this area including the Marawancal, the Tooloom-pikilal, the Gundical and the Panin-pikilal (Wood 1972). Returning to the Modification Study Area, it's possible that this area occupied an interface between the Patricks Plains district groups and the Merton district groups. Further discussion is provided in the CVR prepared for the Maxwell Project ACHA (AECOM 2019).

⁶ From north to south: the Sugarloaf Range, the Watagan Range and Peats Ridge.

5.2 Social Organisation

In common with other regions of NSW (e.g., Attenbrow 2010) and Australia more broadly (Peterson 1976), available historical records suggest that the primary units of social organisation amongst the Aboriginal language groups present in the Hunter Valley at contact were the clan and band. Although these terms are often used interchangeably (e.g., Kohen 1993), following Attenbrow (2010), a distinction can, in fact, be drawn between the two, with clans comprising local descent groups and bands, land-using groups who, though not necessarily all of the same clan⁷, camped together and cooperated daily in hunting, fishing and gathering activities. Individual bands will have habitually occupied and exploited the resources of particular tracts of land within the overall territory of their clan. However, the territorial boundaries of each band will have been permeable or elastic in the sense of complex kinship ties facilitating inter-band territorial movements and the reciprocal use and/or exchange of resources (Brayshaw 1987: 36).

The size of the individual bands occupying the Hunter Valley at contact appears to have varied considerably and was no doubt activity and season dependent (Brayshaw 1987). However, an upper limit of around 70 individuals, consisting of several families, is suggested by available historical records (see, in particular, Table B in Brayshaw 1987). Individual band sizes notwithstanding, much larger groups of Aboriginal people, numbering in the hundreds, are known to have come together for events such as corroborees, ritual combats and feasts (e.g., Anon 1877a; Scott 1929: 32; Threlkeld in Gunson 1974: 55).

Fawcett (1898b) notes the existence of four exogamous clans amongst the Wonnarua, with different clan names for men and women:

“The Wonnah-ruah tribe, like most other tribes, was divided into four classes or clans, and the laws of consanguinity, which existed in this tribe, as other tribes, effectually barred a man’s marriage with the women of his own class or clan and also with the class or clan of his mother. Every man in the Wonnah-ruah tribe was either an Ippye (Ipai), a Kumbo, a Murree (Murri), or a Kubbee (Kubbi); and every women an Ippatha (Ipatha), a Butha, a Matha or a Kubbeetha (Kubbitha)” (Fawcett, 1898b: 180).

5.3 Settlement and Subsistence

Available historical records attest to exploitation, for food and other resources (e.g., skins for clothing), of a large and diverse range of terrestrial, avian and aquatic fauna by Aboriginal peoples occupying the Hunter Valley at contact. A broad economic division between ‘coastal’ and ‘inland’ groups is also evidenced, with the subsistence regimes of those living along the coast geared principally towards the exploitation of marine foods and those of inland groups based chiefly on the exploitation of land mammals (e.g., Ebsworth 1826: 80).

The diet of inland Aboriginal groups occupying the Hunter Valley at contact consisted of a variety of freshwater animal foods, with kangaroos, wallabies, bandicoots, echidnas, possums, flying foxes, kangaroo-rats, koalas, dingos, lizards, goannas and snakes variously reported as having been hunted and/or eaten (see Brayshaw 1987; Haslam et al. 1984 and Sokoloff 1980 for primary references). Various species of freshwater and estuarine fish, eels and mussels were also consumed, as were turtles (e.g., Anon 1877b; Cunningham 1828: 151; Grant 1803: 61). Possums appear to have been a favoured food, particularly in inland areas, with a number of early accounts detailing their method of capture and remarking on the tree climbing skills of the Aboriginal people involved (e.g., Dawson 1830: 238; Scott 1929: 21). Flying foxes, too, appear to have been actively sought out by groups in both areas (e.g., Anon 1877a; Scott 1929: 23), though not by the Awabakal at Lake Macquarie who held the animal in high esteem (Threlkeld in Gunson 1974: 206). Macropods were sometimes stalked and speared by individual huntsmen (Dawson 1830: 216; Threlkeld in Gunson 1974: 190). However, their capture was more commonly a communal exercise (Dawson 1830: 182; Scott 1929: 20; Threlkeld in Gunson 1974: 191). Threlkeld (in Gunson 1974: 206) and Fawcett (1898a: 153) report the burning off of particular tracts of land to promote new growth and attract kangaroos and wallabies.

⁷ Some individuals may have been related through marriage.

References to the hunting and consumption of a variety of birds, including the emu, are also present in the writings of a number of early observers (e.g., Fawcett 1898a; Scott 1929: 23; Threlkeld in Gunson 1974: 55, 65). Fawcett (1898a: 153) reports the use of nets to trap emus and use of returning boomerangs to bring down “ducks and other birds”. Larvae, namely ‘Cabra’ or shipworm (*Teredo navalis*) and other tree dwelling grubs, appear to have been a popular foodstuff in both coastal and inland areas (Anon 1877b; Scott 1929: 21-22). Honey collected from the hives of native bees was both eaten directly and mixed with water to form a sweetened drink (Breton 1833: 195; Dawson 1830: 60; Scott 1929: 34-35; Threlkeld in Gunson 1974: 67, 124).

Compared with their faunal counterparts, the plant food resources of coastal and inland groups are poorly represented in the writings of early colonial observers. Nonetheless, available descriptions do suggest that plants formed a regular part of the diets of groups in both areas. Fern roots, likely those of the bracken fern (*Pteridium esculentum*) and various water ferns (*Blenchum spp.*), appear to have played an important role in the diets of those Aboriginal people occupying the estuarine reaches of the Hunter River (Barrallier 1802: 81-82; Dawson 1830: 92; Ebsworth 1826: 71; Threlkeld in Gunson 1974: 19). Other plant foods mentioned in the writings of early observers include yams, macrozamia seeds, various fruits and the stems of the water lily (Backhouse 1843: 380; Caswell 1841; Scott 1929: 41; Threlkeld in Gunson 1974: 74). Nectar obtained from the blossoms of the grass tree (*Xanthorrhoea spp.*) and flower spikes of the dwarf banksia was also consumed (Dawson 1830: 244).

Regarding levels of residential mobility, available records suggest that this was generally quite high. Fawcett (1898a), for example, notes of the Wonnarua that: “they had no permanent settlements, but roamed about from place to place within their tribal district, in pursuit of game and fish, which was their chief sustenance, making use periodically of the same camping grounds, generation after generation, unless some special cause operated to induce them to abandon them”. Dawson’s (1830: 172) observation that “they [being the Aboriginal people of the Port Stephens area] seldom...stay more than a few days at these places [their camps], frequently not more than one night” is similarly suggestive, as is the 1877 observation, by an anonymous long-term resident of Maitland, that the Aboriginal people with whom he was familiar in the Maitland area “appeared to lead a very restless kind of life, constantly on the move, shifting their camps from one place to another, seldom remaining more than three or four days in one camp” (Anonymous, 1877d). Along the coast, Sokoloff (1980: 8) has suggested seasonal differences in settlement duration, noting that “the relative abundance of marine sources of food in summer tended to make the natives more sedentary at this time”.

As for the selection of campsites, we are limited to Fawcett’s (1898a: 152) observation that “in choosing the site, proximity to freshwater was one essential, some food supply a second, while a vantage ground in case of attack from an enemy was a third important item”.

5.4 Material Culture

Aboriginal material culture is explicitly linked to the natural environment and resource availability. For the Hunter Valley, available historical records identify an extensive array of hunting and gathering ‘gear’ and provide detailed insight into associated materials and manufacturing processes. The form and construction of everyday domestic structures are likewise well documented. Brayshaw (1987), in particular, provides a useful synthesis of both forms of material culture and highlights regional variability in raw material acquisition and utilisation between coastal and inland groups.

Campsites and domestic structures are well-represented in the accounts of early observers and were often the subject of illustration (Plate 1 and Plate 2). Huts, commonly referred to as “gunyers” or “gunyahs”, were of timber and bark construction. Fawcett (1898a: 152) describes the form and construction of huts as follows:

“A couple, or three, forked sticks, a few straight ones, and some sheets of bark, stripped from trees growing nearby, supplied the requisites for the construction of their home. The forked sticks were thrust into the ground and the straight ones placed horizontally in the forks. The sheets of bark were then set up against the horizontal poles in a slanting position, the bark of the structure being toward the windy point of the compass. The sides were frequently enclosed for further shelter, but the front was generally open. Before each one was a small fire, which was seldom allowed to go out, and which was used for warmth, or to cook by”.

Similar hut forms and construction methods can be found in the accounts of several other early observers, for example, Scott (1929: 13), Dawson (1830: 171-72), Caswell (1841) and Threlkeld (in Gunson 1974: 45).

Alongside its use in hut manufacture, tree bark also served as the primary construction medium for canoes, an integral component of the material culture repertoire of Aboriginal peoples occupying the Hunter Valley at contact. Available descriptions indicate that canoes were manufactured by bending, with the assistance of fire, a suitable sheet of bark into shape and securing the ends with bark cord or other 'wild vines' (Ebsworth 1826: 82; Dawson 1830: 79; Fawcett 1898a; Mrs Ellen Bundock in Brayshaw 1987: 60; Scott 1929: 38-39; Threlkeld in Gunson 1974;). Scott (1929: 39) reports that the gaps between the cord bindings at either end of the canoe were plugged with clay. Clay hearths were also added for warmth and cooking (Threlkeld in Gunson 1974; Scott 1929: 39). At Lake Macquarie, leaking canoes were repaired by sewing patches of tea tree bark over damaged areas and sealing them with melted grass tree resin (Threlkeld in Gunson 1974: 54).

Spears, which feature prominently in the literature, were an important component of men's 'gear' and were used in hunting, fishing, combat and ceremony (Scott 1929: 35; Threlkeld in Gunson 1974: 67-68). Spears for all purposes, Brayshaw (1987: 65) notes, were of composite manufacture and alongside sea shells, iron tomahawks and pieces of bottle glass, were important trade items, with significant numbers traded inland for possum skin rugs and fur cord (Dawson 1830: 135-136; Threlkeld in Gunson 1974: 65). Various hard woods and grass tree stems served as primary spear shafts and were shaped using shell scrapers and pieces of glass (Dawson 1830: 67, 135; Scott 1929: 35; Threlkeld in Gunson 1974: 67-68).



Plate 1 Joseph Lycett's '*Aborigines resting by camp fire, near the mouth of the Hunter River*', c.1820 (Source: National Library of Australia)



Plate 2 Augustus Earle's 'A Native Camp of Australian Savages near Port Stevens, New South Wales', 1826 (Source: National Library of Australia)

Threlkeld (in Gunson 1974: 67) describes the manufacture and use of three different types of spears in the Lake Macquarie area, namely the fishing spear, the hunting spear and the battle spear. Primary shafts, in all three instances, comprised grass tree stems. However, differing types of points were added according to function. For the fishing spear, Threlkeld (in Gunson 1974) describes the affixing of bone barbs onto three or four 'shorter spears' of fire-hardened wood, themselves fastened to the main spear shaft with bark thread and grass-tree gum, while the hunting spear is described as being equipped with a single hard wood point. The battle spear, Threlkeld (in Gunson 1974: 67) reports, also had a single hard wood point but differed from its hunting counterpart in having "pieces of sharp quartz stuck along the hard wood joint on one side so as to resemble the teeth of a saw" (Threlkeld in Gunson 1974: 66). The substitution of glass for quartz on battle spears is also known to have occurred. In common with the Lake Macquarie area, Scott (1929: 35) notes the use, around Port Stephens, of different types of spears for hunting, fishing and combat. Differing functions aside, spears of all varieties were launched using spearthrowers or woomeras, also of composite manufacture (Brayshaw 1987: 66).

Hatchets, like spears, were an important component of men's 'gear' and were used for variety of tasks including bark and wood removal, animal butchery, cutting toeholds in trees to facilitate climbing and extracting game and honey from logs and trees (Anon 1877a; Dawson 1830: 202; Scott 1929: 41; Threlkeld in Gunson 1974: 67). Known as *mogo*, hatchets were composite implements consisting of an edge-ground stone hatchet head and withe or flat, hardwood handle, the former secured to the latter using grass tree resin and cord (Dawson 1830: 202; Fawcett 1898a: 153; Scott 1929: 40). Hatchets, Scott (1929: 5) notes, were carried by men in belts worn around the waist. Post-contact, stone hatchets appear to have been rapidly replaced by iron substitutes (Brayshaw 1987: 66; Dawson 1830: 16).

Other notable items of men's gear described in the accounts of early observers include several types of hard wood clubs, two types of shield (one broad and one narrow) and returning and non-returning hard wood boomerangs (Anon 1877b; Scott 1929: 36-38; Threlkeld in Gunson 1974: 41, 68). Threlkeld (in Gunson 1974: 68) also describes the use of a "wooden sword" similar to a boomerang but with "a handle at one end with a bend contrary to the blade".

As for women's gear, Brayshaw (1987: 65) notes that, in addition to their daily use in gathering activities, digging sticks, also known as yamsticks, were status symbols that were sometimes used during altercations. These implements, up to 2 m long and around 4 centimetres (cm) in diameter, were manufactured out of hardwoods, were fire-hardened and typically not decorated (Brayshaw 1987: 65). Cord used in the manufacture of fishing lines and nets was made by women using the bark of various trees (e.g., the Cabbage-tree (*Livistona australis*) and the Kurrajong (*Brachychiton populneus*)) and is reported as having been extremely strong and durable (Ebsworth 1826: 79; Dawson 1830: 67; Scott 1929: 17). Dilly-bags were used by women for carrying small items such as fish-hooks, prepared bark cord, lumps of grass tree resin and food (e.g., fish and shellfish) and were worn slung around the head and draped down the back (Ebsworth 1826: 79-80).

Fish-hooks were reportedly manufactured out of oyster and pearl shell (Caswell 1841; Dawson 1830: 66, 308; Ebsworth 1826: 79; Threlkeld in Gunson 1974: 54). Threlkeld (in Gunson 1974: 54) reports that a suitable shell was simply "ground down on a stone until it became the shape they wished". However, Dyll's (2004) analysis of excavated examples from the Birubi Point midden complex suggests a more complex, multi-stage production process. Pieces of fine sandstone, shale and quartzite were used for filing down the hooks (Sokoloff 1980: 23).

Awls or 'needles' manufactured out of kangaroo bone were used in the repair of canoes and the sewing of skin cloaks (Fawcett 1898a; Threlkeld in Gunson 1974: 54). Items of clothing, where worn, included spun possum-fur belts, worn only by men, possum fur headbands and cloaks or rugs made from sewn kangaroo and possum skins (Dawson 1830: 15-16; Scott 1929: 5). Cloaks were worn by both men and women.

Alongside women's dilly bags, early accounts indicate the production and use of a variety of other containers, with tea tree bark a common construction material. Threlkeld (in Gunson 1974: 67, 156), for example, refers to tea-tree bark 'cups' and wooden 'bowls' "formed from some large protuberance of a growing tree" while Dawson (1830: 250) refers to "small baskets" made from tea tree bark.

Notably, references to the production and/or use of flaked stone artefacts are virtually absent from the historical record. Excluding hatchets, Threlkeld's (in Gunson 1974: 67) reference to the use of "pieces of sharp quartz" for barbing battle spears remains the only known primary reference in this respect. Brayshaw (1987: 68), for her part, has proposed that effective absence of flaked stone artefacts from the historical record may be a product of the fact that such artefacts were not being used at the time of European settlement, having been replaced with other materials (e.g., shell, glass, wood and bone)⁸. However, she also acknowledges that their use may simply have escaped the notice or interest of early observers.

5.5 Ceremony and Ritual

Evidence for ceremonial or ritual behaviour amongst the Aboriginal groups occupying the Hunter Valley at contact can be found in the accounts of a number of early observers (e.g., Anon 1877c; Dawson 1830; Enright 1936; Fawcett 1898a, 1898b; Scott 1929; Threlkeld in Gunson 1974), with documented 'ceremonial' activities including corroborees, male initiation ceremonies, marriage, ritual combat and various burial, body adornment and modification practices. Although limited in number, references to spiritual beliefs of the Aboriginal groups occupying the region are also present and attest to regional variability in belief systems.

⁸ Historic references (e.g., Dawson 1830: 67, 135; Scott 1929: 35) to the use of shell scrapers and/or fragments of bottle glass for the shaping/sharpening of wooden spears provide some support for this suggestion.

Male initiation ceremonies, in which boys were “initiated into the privileges of manhood” (Fawcett 1898a: 153), are described by Enright (1936), Fawcett (1898a), Scott (1929) and Threlkeld (in Gunson 1974). Amongst the Wonnarua, Fawcett (1898a: 152) notes that the male initiation ceremony was known as *Boorool*. Enright (1936: 86), writing on the Worimi people, refers to the ceremony as the *Keeparra* while Scott (1929: 29) cites the terms *poombit* and *bora* in his recollections, noting that the latter was a colloquial term for the former. Initiation grounds, referred to by Scott (1929: 29) as ‘poombit grounds’, were elaborately prepared and consisted of one or two⁹ cleared circles in secluded areas of bushland. Images of animals and other designs were carved into surrounding trees and, in some cases, “figures of raised earth were created on the ground” (Brayshaw 1987: 83). Threlkeld (in Gunson 1974: 50-51, 63-65) describes attending, in November 1825, a ceremony “prepatrotry [sic] to removing the front tooth of several young men who would then be capable of marrying a wife”. The site of this ceremony, Threlkeld (in Gunson 1974) reports, was known as the “Mystic Ring, or “Porrobung” and consisted of a circle “thirty-eight feet in diameter” with a small hillock at its centre. Trees near the ring were marked with “representations of locusts, serpents &c on the bark chopped with an axe”.

As for the ceremonies themselves, Enright (1936: 87) reports that the *Keeparra*, in which “candidates learnt all those laws which governed his future life”, lasted approximately one month but was “only a prelude to a long system of instruction which lasted some five years”. Fawcett (1898a: 154), meanwhile, describes a ceremony involving tests of skill and endurance, the teaching of tribal laws, “emblematical dances” and the restricted involvement of women. Scott (1929: 28-34), too, describes the restricted involvement of women and dancing in the *poombit* or *bora* ceremonies of the Port Stephens area. Alongside their other important roles, medicine men or native doctors, known as *Karaji* (also spelt *Karadjys*), appear to have played an active role in initiation ceremonies and, together with group elders, were responsible for overseeing initiates’ observance of instructed laws (Enright 1936; Fawcett 1898a).

Alongside its use in the initiation ceremonies described above, body painting with animal fat and/or ochre was undertaken as part of corroborees and for the purposes of ritual combat. For men, tooth avulsion, body scarification and septum piercing appear to have been undertaken in ceremonies subsequent to that associated with initiation (Fawcett 1898b; Scott 1929). Regarding items of personal adornment, Miller (1887: 3543) notes that the “principal ornament” of the Wonnarua was a “nautilus shell cut into an oval shape and suspended from the neck” while Fawcett (1898a: 153), also writing on the Wonnarua, reports that “the girls often adorned themselves with flowers, bone or reed ornaments, and shell necklaces”. References to the dressing of men’s hair in a conical form with tufts of grass attached are present in Dawson (1830) and Anon (1877c).

Available historical records suggest that burial in the earth was the most common form of burial practised by Aboriginal groups occupying the Hunter Valley at contact, with tea tree bark widely used as a burial shroud (Fawcett 1898b: 180; McKiernan 1911: 889; Miller 1887: 354; Scott 1929: 3; Threlkeld in Gunson 1974: 47, 89, 100). Grave goods consisted of items of personal gear such as spear and hatchets (McKiernan 1911: 889; Threlkeld in Gunson 1974: 47, 89, 100). Cremation is also known to have been practiced but is poorly represented in the historical record (Threlkeld in Gunson 1974: 99).

Regarding inter-group conflict, Haslam et al. (1984) have noted of the Hunter Valley as a whole that, although skirmishes were common, major clashes were infrequent. Ritual combat appears to have been linked principally to unsanctioned territorial incursions and the abduction of women (Fawcett 1898b).

Gunson (1974) notes a distinct difference between the spiritual beliefs of the Aboriginal groups occupying the inland and coastal portions of the Hunter Valley at contact. In contrast to the Awabakal of Lake Macquarie¹⁰, for example, whose supreme spiritual entity was known as *Koun* (pronounced cone), the inland Wonnarua and Kamilaroi are believed to have venerated the prominent sky cult hero *Biame*.

⁹ Where two circles were used, these were separated by a distance of up to 400 m.

¹⁰ Dawson’s (1830: 153, 158, 163, 219, 220, 322) multiple references to an “evil spirit of woods” known as “Coen” suggest that the Worimi of the Port Stephens area, like the Awabakal, venerated *Koun* as opposed to *Biame*.

5.6 Post-contact History

As in other parts of NSW and Australia more generally, the early post-contact history of the Aboriginal people of the Hunter Valley is primarily one of dispossession and loss, with traditional hunting and camping grounds rapidly claimed and settled by Europeans and populations decimated by introduced diseases. However, active resistance and friendly relations are also attested in available records.

As highlighted by Brayshaw (1987), the introduction of European diseases had a devastating impact on the Aboriginal population of the Hunter Valley, with diseases such as smallpox, typhoid, influenza, scarlet fever, measles, diphtheria, whooping cough and croup causing or contributing to the deaths of large numbers of Aboriginal people. Major small pox epidemics between April and May 1789 and from 1829 to 1831 are known to have had a particularly deleterious impact on the valley's Aboriginal population (Butlin 1983).

The loss of traditional hunting grounds and a decline in the abundance of game that populated these areas have also been identified as factors relevant to the marked population decline that accompanied European settlement of the Hunter Valley, as has the sexual violence perpetrated by non-Aboriginal men against Aboriginal women (Turner & Blyton 1995). The destruction, over time, of the complex systems of social and territorial organisation that existed prior to contact has likewise been attributed to such factors, as has the collapse of traditional settlement and subsistence regimes. The effects of alcohol was also felt with alcoholism becoming a major contributor, alongside disease, to depopulation (Wilton, 1846).

Relations between Aboriginal people and the earliest European settlers of the Hunter Valley appear to have been relatively peaceful, with the *Sydney Gazette* reporting no incidents of conflict between 1822 and 1825 (Miller, 1985: 33). As Miller (1985) notes, the apparent absence of evidence for conflict during these early years of settlement is of particular note given both the rapidity of European settlement at this time and well documented racial conflict occurring in the Bathurst area to the west of the valley. Conflict, however, soon arose, with tensions over access to traditional camping and hunting/fishing grounds, the breaking of traditional laws and the abuse of Aboriginal women precipitating what Miller (1985) has referred to as the 'Wonnarua Uprising of 1826'. Retaliatory actions by groups of Aboriginal people at this time involved the plundering of crops, the killing or wounding of wrong-doers and a single abduction (Miller, 1985: 36). In September 1826, a troop of the 40th regiment under the command of Lieutenant Nathaniel Lowe was sent to the Hunter Valley to suppress the uprising, with a number of atrocities occurring as a result. Subsequent decades would see Aboriginal-settler conflict in the Valley decrease in frequency and magnitude, with Aboriginal people increasingly dependent upon European settlers and town's people for old clothing and would work at inns or farms for money or rations (Wilton, 1846). However, "spasmodic outbreaks of violence" were still a feature of relations between the two parties (Miller, 1985: 42).

By the late 1800s, growing concerns over the plight of Aboriginal people across NSW led to a series of Governmental initiatives aimed at both 'protecting' and 'civilising' the state's Aboriginal population. In 1881, the Aborigines Protection Association was formed, with George Thornton appointed as 'Protector of the Aborigines' in the same year. Thornton was charged with investigating the status of Aboriginal people across NSW and to make recommendations for further action. Shortly thereafter, in 1883, the NSW Government established the Aborigines Protection Board (APB), which operated without any statutory power until the passing of the *Aborigines Protection Act* in 1909. The *Aborigines Protection Act* provided the board with extensive legal powers to control the lives of Aboriginal people, including powers to dictate where people lived and to remove children from their families. George Thornton, the APB's founding chairman, was a strong advocate for the creation of Aboriginal reserves across the colony, arguing that such reserves would "enable them [Aboriginal people] to form homesteads, to cultivate grain, vegetables, fruit etc, etc, for their own support and comfort". The reserves, Thornton proposed, would also "provide a powerful means of domesticating, civilizing and making them comfortable" (Thornton, 1881 in Goodall, 2008: 105).

Blyton et al. (2004), in their history of Aboriginal and European contact in the upper Hunter Valley, note that by the turn of nineteenth century “there were few outward signs that aspects of traditional Aboriginal society had survived in the Hunter Valley”. In July 1890, the APB designated a 58 acre (23 ha) parcel of land at Carrowbrook, north of Singleton, as an Aboriginal reserve, with a community of Aboriginal people having lived in this area since at least the 1850s (Miller, 1985: 107). Three years later, in 1893, Reverend James S. White established the St Clair Mission here, with the APB increasing the original reserve by 24 acres (10 ha) (Miller, 1985: 107). Aboriginal people whose traditional Country encompassed the Hunter Valley comprised a significant proportion of the mission’s population, with Wonnarua, Awabakal, Worimi and Darkinjung peoples represented. Occupants farmed the land, successfully growing and harvesting a variety of vegetables, but also engaged in traditional subsistence practices (Blyton et al., 2004: 57; Gray, 2018). In 1905, the mission came under the control of the Aborigines’ Inland Mission (AIM), an evangelical organisation founded by Baptist Missionary Retta Long (nee Dixon) and responsible, amongst other initiatives, for the establishment of the Singleton Girls’ Home (later Singleton Aboriginal Children’s Home) at ‘Glasgow Place’, on George Street in Singleton. The St Clair Mission operated under the control of the AIM until 1916 when control was taken over by the APB. The APB appointed a station manager to control the mission and its occupants and renamed it ‘Mount Olive Reserve’. Aboriginal people living at the Mount Olive Reserve, Blyton et al. (2004: 58-59) note, were subjected to the “absolute control of the manager”, with a significant number expelled for failing to adhere to strict regulations. In 1923, the reserve was closed to Aboriginal people.

The mid-to-late 1800s saw communities of Aboriginal people living on Reverend J S White’s property at Gowrie, as well as at Redbourneberry (Miller, 1985: 106-108). Those at Redbourneberry camped principally on the Redbourneberry Hill common, with the flood-free site comprising a traditional camping area and offering easy access town (Miller, 1985: 107-108). Court records indicate that Aboriginal people were living in this location from at least 1862, with many later records citing Redbourneberry as the place of residence for Aboriginal witnesses and defendants (Miller, 1985: 107). The APB’s Register of Reserves indicates that a portion of land to the south of Redbourneberry Bridge, around 3 km east of Singleton’s Central Business District (CBD), was designated as an Aboriginal reserve in July 1896. In the late 1930s, the construction of a large army camp outside Singleton saw a number of Aboriginal families evicted from their rented accommodation in town, with Miller (1985: 157) reporting their relocation to Redbourneberry Hill and the construction of make-shift houses from old kerosene tins and hessian bags.

Today, modern Wonnarua people retain strong cultural connections to the Hunter Valley and are actively involved in the protection and promotion of their culture for future generations.

6.0 Archaeological Context

This section describes the archaeological context of the Modification Study Area on a regional and local scale. Archaeological data of relevance to this area, including the results of previous archaeological investigations within and surrounding the Modification Study Area, are reviewed in order to contextualise the results of the current assessment.

6.1 Regional Context - The Hunter Valley

6.1.1 Introduction

Scientific interest in the Aboriginal archaeological record of the Hunter Valley can be traced to the late 19th century, with surveyor and self-taught anthropologist R.H Matthews' 1892 investigation of Aboriginal rock art at two rockshelter sites in the Bulga-Milbrodale area comprising one of the earliest investigations of its kind in the state (Matthews 1893). Amongst others (e.g., W.W.Thorpe), Matthews' interest in the Aboriginal prehistory of the Valley was shared by pioneering Australian archaeologist Fred McCarthy who undertook an archaeological reconnaissance of the Hunter and Wollombi Valleys in 1939 (Moore 1970: 29). McCarthy's subsequent investigation, with F.A. Davidson, of an extensive open artefact site on Gowrie terrace, near Singleton, is widely regarded as the first serious archaeological study of stone artefacts in the Hunter Valley proper (McCarthy & Davidson 1943). More detailed investigation of the Valley's Aboriginal archaeological record commenced in the mid-to-late 1960s, with McCarthy's successor at the Australian Museum, David Moore, initiating a wide ranging archaeological research project into the Aboriginal prehistory of the Valley (Moore 1969, 1970, 1981). Moore's archaeological survey of the Hunter Valley, completed in two phases, would ultimately involve archaeological surveys and site excavations in both the Hunter and McDonald river catchments.

Intensive development activities since this time have secured the Hunter Valley's place as one of the most intensively investigated archaeological regions in Australia, with thousands of Aboriginal archaeological investigations involving survey and/or excavation having now been carried out, the majority as part of environmental impact assessments associated with coal mining projects. Not surprisingly, these investigations have varied significantly in scale and scope, ranging from targeted small-scale surveys to complex, multi-phase survey and excavation projects over large areas. Nonetheless, together, they have generated a large and diverse body of evidence for past Aboriginal occupation. Key research themes are detailed in brief in the following sections.

6.1.2 Open Artefact Sites: Distribution, Contents and Definition

Surface and subsurface distributions of stone artefacts, variously referred to as open artefact sites, artefact scatters and open camp sites, are the most common and widely distributed form of Aboriginal archaeological site in the Hunter Valley. Other site types, such as scarred trees, shell middens, quarries, grinding grooves, burials and rock shelters with deposit and/or art or potential archaeological deposit (PAD), have also been identified but are comparatively rare. Accordingly, open artefact sites remain the most intensively investigated component of the Aboriginal archaeological record of the Hunter Valley, with site chronology, distribution, structure and the technology of backed artefact manufacture, in particular, comprising key research topics (Baker 1992a, 1992b, 1992c; Hiscock 1986a, 1986b, 1993a; Hughes et al, 2014; Koettig 1992, 1994; Moore 1997, 2000; White 1997, 1999, 2012).

As highlighted by Hughes (1984) and reiterated by numerous other researchers (e.g., ERM 2004; Hiscock & Koettig 1985; Koettig & Hughes 1983; Koettig 1990, 1992, 1994; Kuskie & Clarke 2004; Kuskie & Kamminga 2000; Rich 1992), existing archaeological survey data for the Hunter Valley indicate a strong trend for the presence of open artefact sites along watercourses, specifically, on creek banks and 'flats' (i.e., flood/drainage plains), terraces and bordering slopes. Although this distribution pattern can be attributed in part to geomorphic dynamics and archaeological sampling bias, with extensive fluvial erosion activity along watercourses resulting in higher levels of surface visibility and, by extension, concentrated survey effort, an occupational emphasis on watercourses is supported by the results of several large scale subsurface testing and salvage projects (e.g., Koettig 1992, 1994; Kuskie & Clarke 2004; Kuskie & Kamminga 2000; MacDonald & Davidson 1998; OzArk 2013; Rich 1992; Umwelt 2006). Collectively, these projects have also shown that assemblage size and complexity tend to vary significantly in relation to both landform and stream order, with larger, more complex assemblages concentrated on elevated, low gradient landform elements adjacent to higher order streams.

In the lower Hunter region, a similar pattern has been identified for the permanent to semi-permanent wetlands of the Hunter 'delta' (e.g., Kuskie 1994; Kuskie & Kamminga 2000; Umwelt 2006, in prep). Outside of these contexts, surface and subsurface artefact distributions have typically been found to be sparse and discontinuous and are often referred to as 'background scatter' or 'background discard' (Brayshaw McDonald 1993; Kuskie & Kamminga 2000).

Flaked stone artefacts dominate archaeological finds assemblages from investigated open artefact sites across the Hunter Valley, with heat shatters also well represented (Hiscock, 1986). Other stone artefacts, such as complete and broken grindstones, anvils, hammerstones and edge-ground hatchet heads¹¹ have also been recorded, though comparatively infrequently, as have artefacts manufactured out of bottle glass. Faunal remains have likewise proven elusive. Associated archaeological features, meanwhile, have included 'knapping floors', hearths, heat treatment pits and ground "ovens", with identified hearths and ovens taking the form of surface or subsurface concentrations of burnt clay and/or charcoal or heat retainers (e.g., see Brayshaw 1986; Dallas & McDonald 1986; Kuskie & Kamminga 2000; Koettig 1992).

Defined in slightly different ways by different researchers, knapping floors can be broadly defined as spatially-discrete activity areas in which one or more stone packages was reduced (White 1999:152). Recorded knapping floors in the Hunter Valley have varied considerably in size and complexity, with some of the largest and most complex examples identified through excavation as opposed to survey (White 1997). Backed artefacts are a common feature of knapping floors and most of these features were likely specifically associated with their production. At Narama, near Ravensworth, a detailed analysis of the contents of knapping floor and non-knapping floor assemblages revealed significant differences between the two, including variation in the frequency of backed artefacts, other retouched and/or utilised tools and cores, and the application of different reduction strategies (Rich, 1992). Together with differences in the spatial distribution of the two forms of assemblage, this evidence was used to suggest that backed artefact production within the Narama landscape was a highly structured activity, and that knapping floors assemblages were the product of a more restricted range of behaviours than more generalised scatters. Although limited to a single landscape, evidence from other parts of the Valley (e.g., Hiscock 1986; Koettig 1992, 1994) provides further support for the suggestion that backed artefact manufacture in the Hunter Valley was a highly structured activity.

Although relevant to a variety of site types, geomorphic processes such as soil erosion and fluvial aggradation are of particular relevance to the identification and definition of open artefact sites. As in other archaeological contexts (e.g., Attenbrow, 2010; Fanning & Holdaway, 2004; Fanning *et al*, 2009; Holdaway *et al*, 2000), it is now widely accepted by archaeologists working in the Hunter Valley that the archaeological visibility and distribution of open artefact sites across the region are, for the most part at least, products of contemporary and historical geomorphic processes which have variously exposed and obscured them. As demonstrated by numerous large scale archaeological salvage projects within the Valley (e.g., Koettig 1992, 1994; Kuskie & Clarke 2004; Kuskie & Kamminga 2000; MacDonald & Davidson 1998; OzArk 2013; Rich 1992; Umwelt 2006) surface artefacts frequently represent only a fraction of the total number of artefacts present within recorded surface open artefact sites, with the majority occurring in subsurface contexts. Artefact exposure, unsurprisingly, is highest on erosional surfaces and lowest on depositional ones. At the same time, in many areas, surface artefacts have been shown through large-scale subsurface testing to form part of more-or-less continuous subsurface distributions of artefacts, albeit with highly variable artefact densities linked to environmental variables such as distance to water, stream order and landform. The presence or absence of surface artefacts, therefore, is not a reliable indicator of Aboriginal archaeological sensitivity in the Hunter Valley.

¹¹ Note that some hatchet-heads were manufactured on unifacially or bifacially-flaked blanks

6.1.3 Flaked Stone Artefact Technology

Flaked stone artefacts are a ubiquitous element of the Aboriginal archaeological record of the Hunter Valley and, as such, have assumed a preeminent role in archaeological reconstructions of past Aboriginal land use across the region. To date, hundreds, if not thousands, of surface-collected and excavated flaked stone assemblages from the Valley have been analysed, with individual assemblage sizes, research questions, aims, analytical methodologies and terminological schemes varying significantly between researchers and projects. Studies to date have ranged from basic descriptive accounts of assemblage composition in typological terms to detailed reconstructions of specialised knapping techniques through rigorous technological analyses (including conjoining) and experimental research. Particularly informative analyses in the context of the Hunter Valley include those undertaken by Hiscock (1986a, 1986b, 1993a), Koettig (1992, 1994), Moore (1997, 2000), White (1999, 2012) and Baker (1992a, 1992b, 1992c).

As highlighted by Koettig (1994) and others (e.g., Hiscock 1986a; Hughes 1984; Hughes *et al.* 2014), available technological and typological data for surface collected and excavated flaked stone artefact assemblages from the Hunter Valley suggest that the majority of these assemblages belong to what is known as the ‘Australian small-tool tradition’, a term coined by Gould (1969) to describe what was then thought to be first the first appearance, in the mid- Holocene¹², of a new suite of flaked stone tool forms in the Aboriginal archaeological record of Australia, including Bondi points, geometric microliths, adzes and points (both unifacially and bifacially flaked). Complex, hierarchically-organised reduction sequences associated with the production of these tools contrast markedly with the simple sequences of earlier periods (Moore 2000). Tools of the Australian small-tool tradition, it has been suggested, formed part of a portable, standardised and multifunctional tool kit aimed specifically at risk reduction (Hiscock 1994, 2006). Stone artefact assemblages from late Pleistocene and early Holocene contexts, in contrast, are described by archaeologists as belonging to the ‘Australian core tool and scraper tradition’, a term first used by Bowler *et al.* (1970) to describe the Pleistocene assemblages recovered from Lake Mungo in western New South Wales. Bowler *et al.* (1970) saw the main components of these assemblages - core tools, steep-edged scrapers and flat scrapers - as characteristic of early Australian Aboriginal assemblages and as being of a distinctly different character to those associated with small-tool tradition.

In south-eastern Australia, including the Hunter Valley, the Australian small-tool and core tool and scraper traditions are most commonly described in terms of McCarthy’s (1967) Eastern Regional Sequence (ERS) of stone artefact assemblages (Table 5). Based on appreciable changes in the composition of chipped stone artefact assemblages over time, the ERS hypothesises a three phase sequence of ‘Capertian’ (earliest), ‘Bondaian’ and ‘Eloueran’ (most recent) assemblages and was developed on the basis of McCarthy’s (1948, 1964) pioneering analyses of stratified chipped stone assemblages from Lapstone Creek rockshelter, on the lower slopes of the Blue Mountains eastern escarpment, and Capertee 3 rockshelter in the Capertee Valley north of Lithgow. At present, the most widely cited characterisation of the ERS is that of a four-phase sequence beginning with the *Pre-Bondaian* (McCarthy’s *Capertian*) and moving successively through the Early, Middle and Late phases of the *Bondaian*, the last of which equates to McCarthy’s (1967) *Eloueran* phase. The tripartite division of the *Bondaian* is based principally on the presence/absence and relative abundance of backed artefacts (Attenbrow, 2010: 101). However, other factors, such as changes in the abundance of bipolar artefacts and different stone materials, as well as the presence/absence of edge-ground hatchet-heads are also relevant.

¹² Note that more recent research into the chronology of backed artefacts and points in Australia (eg, Hiscock & Attenbrow, 1998, 2004; Hiscock, 1993b) has demonstrated a long history of production and use for these implement types. Backed artefacts, in particular, are now known to have been produced in the early Holocene and late Pleistocene periods.

Table 5 McCarthy's ERS of Stone Artefact Assemblages, as proposed by McDonald (2008) for the Sydney Region

| Current phasing | McCarthy's (1967) Phasing | Approximate Date Range | Backed Artefact Frequency | Bipolar Artefacts | Edge-Ground Hatchet Heads |
|-----------------|---------------------------|------------------------------|---------------------------|---------------------|---------------------------|
| Pre-Bondaian | Capertian | 30,000-8,000 BP | Absent | Rare | Absent |
| Early Bondaian | Bondaian | 8,000-4,000 BP | Very low | Rare | Absent |
| Middle Bondaian | | 4,000-1,000 BP | Very high | Increasingly common | Present |
| Late Bondaian | Eloueran | 1,000 BP to European contact | Very low | Very common | Present |

Existing assemblage data indicate that Aboriginal knappers within the Hunter Valley utilised a diverse range of lithic raw materials for flaked stone artefact manufacture (Hughes 1984). However, two rock types - silcrete and silicified tuff (also known as mudstone) - overwhelmingly dominate the region's existing stone artefact record and appear to have been routinely selected for this task, likely due to both basic raw material abundance and their desirable flaking qualities (Hiscock, 1986a). Alongside other, less-commonly exploited raw materials, such as quartz, quartzite, chalcedony, chert, petrified wood and various fine-grained volcanics, both are available in alluvial gravel deposits associated with the Hunter River. These deposits occur along and adjacent to the river in the form of gravel banks and elevated palaeochannel remnants. Available data suggest that these gravels functioned as the primary source of lithic raw materials for Aboriginal flaked stone tool manufacture in the Hunter Valley proper (Hiscock 1986a; Moore 2000). However, the use of materials imported from outside of the central lowlands (e.g., porcellanite) is also attested (Hughes 1984).

As highlighted by Moore (2000), both 'on-source' and 'off-source' reduction were practiced by Aboriginal knappers within the Hunter Valley, with the former taking place in both gravel bank and Tertiary terrace contexts (see Hiscock 1986a; Moore 2000; White 1998) (Figure 18). To date, very few Aboriginal stone quarries have been recorded in the Hunter Valley, with White's (1998) investigation of the B10 quarry site at Bengalla, in the upper Hunter Valley, comprising the only detailed study of an Aboriginal stone quarry in the region. First identified and recorded in 1993 (Rich 1993), White's (1998) subsequent salvage investigation at this site demonstrated Aboriginal exploitation of a high level Tertiary gravel deposit. Together with in-field observations, White's (1998) analysis of the cultural lithic assemblages recovered from two spatially discrete open area excavations within the B10 quarry site indicated that a range of stone working activities were undertaken at this site including (but not limited to) the *in-situ* flaking of embedded sub-angular silcrete boulders for the purposes of removing flakes and blocks for subsequent on-site reduction and the heating of silcrete blanks to improve their flaking quality (White 1998: 52). Interestingly, no evidence for backed artefact manufacture was identified in either of the areas excavated by White (1998). Notable differences in the composition of the assemblages recovered from the two excavation areas were interpreted as a product of spatial variability in stone working and associated settlement-subsistence activities (White 1998: 52). At the same time, they were used to suggest that the then available technological data for the B10 quarry site should not be considered representative (White 1998).

In the Hunter Valley, asymmetrical and symmetrical backed artefacts dominate the retouched components of surface collected/recorded and excavated flaked stone assemblages¹³. Accordingly, the technology of backed artefact manufacture has been a particular focus of research (e.g., Baker 1992a; Hiscock 1993a; Koettig 1992, 1994; Moore 2000). Studies by Hiscock (1993a), Moore (2000) and others (e.g., Baker 1992a; Koettig 1992, 1994; White 1999, 2012) have demonstrated that backed artefact manufacture in the Hunter Valley was a highly structured activity involving a complex system of raw material procurement, transportation, preparation and reduction. Differences in the technological character of recovered cores and conjoin sets across the Valley indicate a significant degree of variability in the strategies used by Aboriginal knappers to produce blanks for backed artefact manufacture. Heat treatment, notably, appears to have been an integral component of the backed artefact manufacturing process, with evidence for the thermal alteration of stone packages throughout the reduction process both abundant and widespread. As Hiscock (1993:66) has observed, “the thermal alteration of Hunter Valley silcrete drastically improves flaking qualities and increases the lustre and smoothness of the fracture surface”. Compared with silcrete, evidence for the thermal alteration of silicified tuff blanks is rare (e.g., Koettig 1992) and likely reflects the generally higher ‘raw’ flaking quality of this material.

Alongside backed artefact technology, chronological changes in Bondaian lithic technology have also received considerable analytical and interpretive attention (e.g., Baker 1992c; Haglund 1989; Hiscock 1986a, 1986b), with Hiscock’s (1986a) pioneering attribute analysis of a sample of unretouched mudstone flakes recovered from the Sandy Hollow 1 (SH1) rockshelter excavated by Moore (1970) of particular significance in this regard. This analysis sought to test a tripartite division of the SH1 assemblage made on the basis of chronological changes in the frequency of backed artefacts. Three phases were recognised: the *Pre-Bondaian*, with no backed artefacts, the *Phase I Bondaian*, with numerous backed artefacts and the *Phase II Bondaian*, with few backed artefacts (Table 6). Attribute analysis of a sample of 742 complete mudstone flakes from Square AA within SH1 revealed technological changes consistent with this division, including, but not limited to, changes in the relative frequency of platform preparation and overhang removal as well as flake shape and platform size.

Hiscock applied the same attribute analysis to a series (n = 15) of flaked stone assemblages recovered from open artefact sites on the Mount Arthur North and Mount Arthur South coal leases and found that individual assemblages could be assigned to one of the three Bondaian phases recognised at SH1, leading him to propose that the attribute analysis employed at SH1 could serve as a relative dating system for open sites in the Hunter Valley. Given the ubiquity of open artefact sites within the region, this argument was particularly ground-breaking and has prompted several archaeologists to apply Hiscock’s analysis to assemblages from other sites and areas, albeit with mixed success (e.g., Dean-Jones 1992; Baker 1992c; Haglund 1989; Rich 1991). Difficulties in replicating Hiscock’s results, Holdaway (1993:29) has suggested, likely stems from spatial variability in the methods used by Aboriginal knappers to reduce stone, with said variability linked to factors such as raw material type and accessibility, site function and stylistic differences between Aboriginal groups.

¹³ Residue and use-wear analyses of backed artefacts recovered from archaeological contexts outside of the Hunter Valley (e.g., Fullagar et al., 2009; McDonald et al., 2007; Robertson et al., 2009; Robertson, 2011) suggest that these implements typically served as elements in flexible, multi-functional composite tools used variously for cutting, incising and drilling plant and animal materials, as well as projectile use.

Table 6 Hiscock's (1986a) relative dating scheme for the Sandy Hollow 1 flaked stone assemblage (after Hiscock 1986a: 100)

| Phase | Date Range | Flake Type | Knapping Practices Employed for Flake Production | Backed Artefact Frequency |
|-------------------|------------------|---|--|---------------------------|
| Pre-Bondaian | >1300 BP | Medium-sized, relatively squat flakes with very large platforms | <ul style="list-style-type: none"> • Large amounts of force applied with little control; • Mostly normal or inward directions of force application; • Imprecise blow application; • Use of relatively low platform angles on cores; • Very little platform preparation of any kind; • Many blows delivered to cortical surfaces; • No platform faceting; • Infrequent overhang removal; and • Low to moderate amounts of core rotation. | Absent |
| Phase I Bondaian | 1300-800 BP | Larger and more elongate flakes with medium sized platforms | <ul style="list-style-type: none"> • Relatively high amounts of force; • Mostly normal or inward directions of force application; • Imprecise blow applications; • High platform angles; • Large amounts of platform preparation (principally faceting and larger platform flaking); • Infrequent overhang removal; and • High amounts of core rotation. | Numerous |
| Phase II Bondaian | 800 BP - Contact | Relatively small and squat flakes with small platforms | <ul style="list-style-type: none"> • Low to moderate amounts of force; • Outward directions of force application; • Precise application of force; • High platform angles; • Moderate amounts of platform preparation (flaking onto platform but no faceting) • Frequent overhang removal; and • Moderate to low amounts of core rotation. | Few |

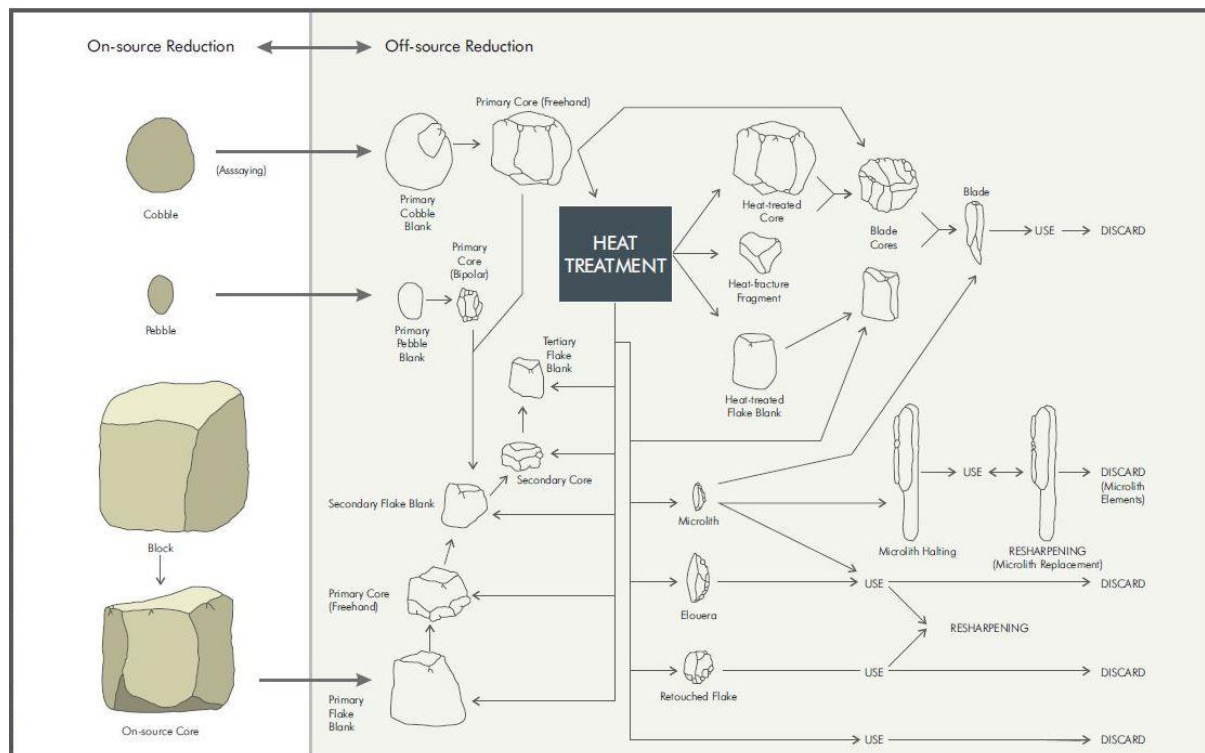


Figure 18 Moore's (2000) reduction model for the technology of Hunter Valley microlith assemblage (after Moore 2000)

6.1.4 Chronology of Occupation

Evidence for late Pleistocene/early Holocene Aboriginal occupation of the Hunter Valley is rare, with dated and undated evidence from these periods obtained from only a handful of sites, two of which (i.e., Moffats Swamp Dune & Galloping Swamp) are located on the region's coastal plain (AMBS 2002; Baker 1994; Hughes & Hiscock 2000; Koettig 1986; Kuskie 2001; Rich 1993; Scarp Archaeology 2009). For the central lowlands of the Valley, this paucity of evidence has been attributed to long-term geomorphic and soil formation processes, with Hughes et al. (2014) arguing that such processes will have acted to completely remove or widely disperse older occupation deposits. This observation notwithstanding, geomorphic contexts shown to have the potential to contain recognisable older archaeological materials include late Pleistocene windblown sand dunes/sheets (e.g., Scarp Archaeology, 2009), stream terraces (e.g., Kuskie 2001) and late Pleistocene/early Holocene colluvial deposits (e.g., Hughes & Hiscock 2000).

Studies by Koettig (1990), Baker (1994) and Kuskie (2001) indicate that the flaked stone technology employed by Aboriginal knappers occupying the Hunter Valley during the terminal Pleistocene/early Holocene was focused on the opportunistic or non-specific reduction of 'primary' blanks (*sensu* Moore, 2000) - some of which were very large. Core reduction appears to have geared towards the production of robust flakes for immediate use or retouch into simple scrapers, with no evidence for the complex, hierarchically-organised reduction sequences typical of the mid-to-late Holocene. Tool edges, Moore (2000:36) notes, were refurbished by unifacial retouching. A preference for volcanic materials over silcrete and mudstone has also been noted (Baker 1994; Koettig 1990, 1992:5), though available evidence points to intra-regional variation in raw material preferences (see, for example, Hughes et al. 2014: 39-40). There is also a dearth of evidence for deliberate heat treatment in early assemblages (Moore 2000).

In contrast to the late Pleistocene/early Holocene, evidence for mid-to-late Holocene Aboriginal occupation of the Hunter Valley abounds, with hundreds of excavated sites producing flaked stone artefact assemblages that can be confidently ascribed to these periods on the basis of radiometric dates and/or their technological/typological profiles. In keeping with broader Australian developments (e.g., Allen and O'Connell 1995; Beaton 1985; Brumm and Moore 2005; Attenbrow et al 2009; Lourandos 1983, 1997; Lourandos and Ross 1994), the social and economic systems of Aboriginal groups living in the Hunter Valley in the mid-to-late Holocene appear to have become increasingly complex, with researchers pointing to various structural changes in the archaeological record as evidence of this 'complexity'. Well documented examples include substantial increases in artefact accumulation rates at various sites and the emergence and/or proliferation of complex fishing and stoneworking technologies (e.g., hook and line fishing, backed artefacts). On a broader scale, dramatic mid-to-late Holocene increases in implement and sediment accumulation rates at various sites across south-eastern Australia have been linked by some researchers to population increase (e.g., Hughes & Lampert 1982; Lampert & Hughes 1974). However, the probable influence of other factors, such as changes in stone artefact technologies, differential site preservation and shifting subsistence and mobility patterns, has also been noted (e.g., Hiscock 1981; Attenbrow 2006; Hiscock 2008).

Critical to any discussion concerning the antiquity of Aboriginal occupation in the Hunter Valley are the well-documented difficulties surrounding the dating of open artefact sites with active 'biomantles' (*sensu* Paton et al 1995; see Dean-Jones & Mitchell 1993; Balek 2002; Hofman 1986; Johnson et al. 2005; Johnson 1989; Paton et al. 1995; Peacock & Fant 2002; Stein 1983). In the Hunter Valley, the term biomantle is typically used as a collective descriptor for the 'A' soil horizons of the region's dominant texture contrast or duplex soil profiles¹⁴, which tend to be relatively thin (<30 centimetres), and exhibit extensive evidence of bioturbation in the form of roots, open/infilled burrows, live insects and/or earthworms and stone lines¹⁵. As highlighted by Dean-Jones & Mitchell (1993) and others (e.g., Balek 2002; Johnson 1989), excavated finds assemblages from archaeological sites with active biomantles are subject to a range of interpretive constraints, with intact depositional stratigraphy unlikely to be preserved and inset archaeological features (e.g., hearths and heat treatment pits) representing the only reliable means of dating (with any specificity) intercepted archaeological events (Mitchell 2009: 4). Any stone artefacts discarded on the surface in landscapes with active biomantles are likely, over time, to have been incorporated into the soil profile through bioturbation, with depth of artefact burial ultimately corresponding to the base of major biological activity (i.e., the base of the biomantle). Where biomantles remain relatively undisturbed, patterns of artefact discard may be preserved. However, in heavily disturbed contexts, the preservation of such patterning is unlikely (Mitchell 2009: 4).

For archaeologists working in the Hunter Valley, the analytical and interpretive constraints posed by intensive bioturbation have, in combination with a general paucity of dateable features, led to a reliance on the dating of excavated archaeological finds assemblages through relative means, specifically, through consideration of the typological and technological composition of associated flaked stone artefact assemblages and reference to a modified version of McCarthy's (1967) ERS, the broad temporal parameters of which are now well established. While offering a useful chronological framework within which to assess diachronic changes in the stone artefact technologies and raw material use, the largely undated and palimpsest character of the Valley's lithic record represents a significant analytical and interpretive obstacle for period-specific reconstructions of Aboriginal mobility regimes (cf. Cowan 1999).

¹⁴ Such profiles are characterised by loamy topsoils and silty clay to clay subsoils, with boundaries between these two units typically clear to abrupt. Clayey subsoils have formed by *in situ* weathering of the parent material, while topsoils are derived from a combination of *in situ* weathering and the deposition of colluvially and/or fluvially transported materials.

¹⁵ Stone lines, where present, typically occur at the interface between the A and B horizons.

More broadly, Dean Jones and Mitchell (1993: 63-64) have highlighted a series of geomorphic contexts within the Hunter Valley that they believe represent favourable locations for the preservation of Pleistocene and/or early Holocene archaeological evidence. These include:

- rock shelters and large middens;
- Aeolian sand deposits (e.g., source bordering dunes);
- the distal portions of low angle alluvial fans;
- stream junctions where each tributary has a different rate of sediment supply; and
- colluvial deposits at the base of steeply inclined surfaces.

6.1.5 Aboriginal Stone Quarrying: Australia & the Hunter Valley

Investigations of Aboriginal stone quarry sites in Australia began more than a century ago (Helms 1895; Noetling 1907, 1908). From the late 19th Century to the mid-20th Century these investigations largely comprised simple descriptive accounts of quarry sites and their contents, focusing on artefact typologies, types of activities undertaken and site ownership (Doleman 2008). During the 1970's, reflecting broader changes to archaeological theory and development of processual methodologies (Binford 1980; Binford & Binford 1968), quarry sites were incorporated into studies of settlement system organisation and their role in such systems explored.

However, despite the long history, comparatively few quarry sites in Australia have been subject to detailed investigations, particularly on mainland Australia in comparison to Tasmania (Reid 1998).

In their evaluation of previous work on stone quarries in Australia, Hiscock et al. (1993:78-80) recognised four major areas of research involving quarries including:

1. Manufacturing technology;
2. Organisation of production;
3. Organisation of stone distribution; and
4. Logistical and settlement patterns.

A fifth area of research, the focus of Doleman's (2008) BAR Series, is the study of technical organisation, that is, studies that link artefact patterning and variability to technological strategies used by hunter-gatherers to adapt to their particular environment. Combined, these studies have produced a wealth of information about how stone was procured and reduced at quarry sites alongside the organisation of behaviour and distribution of material across the landscape. However, as noted by Hiscock & Mitchell (1993) despite the potential for quarries to reveal important information about past societies, overall our knowledge of quarries is "diminutive and patchy".

As to the definition of what constitutes a quarry, definitions have varied amongst researchers ranging from simply a source of stone artefact raw material in the form of pebbles, cobbles and/or boulders (utilised or not) through to sites where only particular types of reduction activities were taking place (e.g., tool manufacture). In search of a definition that was inclusive of the full range of activities linked to stone procurement, Hiscock & Mitchell (1993) proposed the definition – "the location of an exploited stone source" as this incorporates both mines and non-mines, alongside quarries where visible manifestations of use are not available. On the basis of this broad definition, three attributes might reasonably be expected at quarry sites. Firstly, there must be a source of raw material suitable for the production of stone tools. Secondly, there may be either evidence of modification of this raw material (artefacts) or thirdly evidence of procurement in the form of excavation and/or gathering. Evidence of modification/procurement will vary according to the type of quarry e.g., underground or surface, hardstone or ochre. For surface hardstone quarries, Hiscock & Mitchell (1993:61) suggest the main indications of quarrying will be a source of stone with an associated reduction activity, petrological distinctiveness of material and debris created from breaking stone too large to transport, or evidence of rock removal i.e., impact scars, use of wedges or fires to shatter rock.

In terms of reduction activities associated with raw material sources, Moore (2000:29) divides these into on-source reduction activities and off-source reduction, and notes that both were practiced by Hunter Valley knappers, with procurement generally focused on Hunter River gravels. Researchers in the Hunter Valley have contended that evidence of quarrying at gravel sources will tend to produce a low density background scatter of flakes and flaked cobbles that are the results of assaying (and cobble rejection) through to high densities associated with systematic reduction activities (i.e., flaking and heat shattering of stone) (Jones & White 1988; White 1998; Moore 2000). Moreover, on-source reduction is argued to produce flake blanks considerably larger than those produced off-source, with the blanks considered to be early stages in the reduction sequence (Hiscock & Mitchell 1993; Moore 2000). Heating may also have also been utilised to split boulders into more manageable packages (White 1998). Moore (1997) suggests that raw material procurement and on-site reduction may have been undertaken during logistical forays or 'embedded' during the carrying out of subsistence tasks.

As discussed in Section 6.1.3, existing artefact assemblage data for the Hunter Valley indicate that Aboriginal people utilised a diverse range of lithic raw materials for flaked stone artefact manufacture albeit with a focus on silcrete and silicified tuff. Other, less-commonly exploited raw materials, such as quartz, quartzite, chalcedony, chert, petrified wood and various fine-grained volcanics have also been identified. Accordingly, quarry sites in the Hunter Valley would be expected to contain exploitable clasts of these materials with higher frequencies of silcrete and silicified tuff. Previous studies have suggested that the Hunter River Gravels are the most well-known source of silicified tuff, silcrete, and quartz raw materials in the Hunter Valley (Dean-Jones & Mitchell 1993; Moore 2000). Exposed at numerous locations in the valley, both as active gravel bars and elevated terrace/palaeochannel remnants, they have been recorded at Muswellbrook, Denman, Jerrys Plains and Singleton (Dean-Jones & Mitchell 1993). Raw materials, including silicified tuff and silcrete, are thought to be locally derived, reflecting the Hunter River's underlying geology, and smaller deposits of non-local material transported from other parts of the system (MacDonald and Davidson 1998).

In context of the Hunter Valley, Aboriginal stone quarry sites are a comparatively rare component of the archaeological record, with only eight instances recorded on the AHIMS database (search completed in 2012) of which two are recorded as potential raw material sources without associated evidence of exploitation. The remaining known six sites vary in relation to raw materials present, intensity of use and their topographical locations. A review of available site cards for the sites indicates that exposed silcrete cobbles of varying sizes were an almost universally present raw material, being recorded at five of the six locations and exclusively at three locations. Cobbles of silicified tuff (i.e., mudstone, chert) were recorded, alongside silcrete at three sites, and quartzite/quartz at three locations. Estimates of the total number of artefacts were recorded on only four site cards with artefacts numbers ranging from five to several hundred. In three instances, initial stages of reduction were noted, including shattered cobbles, large flakes and minimally modified cores. In almost all cases, quarry sites were recorded within 1 km of the Hunter River or its major tributaries, amongst alluvial and colluvial gravel deposits. Despite the presence of quarry sites in both the Upper and Lower Hunter Regions, only one has been excavated and subject to detailed investigation - the B10 quarry site (White 1998).

Nonetheless, Moore (2000:29) noted, during an inspection of riverbed gravels near Jerrys Plains and a gravel quarry south of Maison Dieu Road, a number of silcrete and tuff cores thought to represent on-source reduction. No detailed recording was made of these finds. In addition, Hughes and Lance (in Hiscock 1986:14-16) identified 22 Aboriginal mudstone cores within a 1,200 metres squared (m²) section of large gravel bar (80 m wide and 1.5 km long) at the mouth of the Goulburn River near Denman.

6.1.6 Chronology and Texture-Contrast Soils

Evidence for late Pleistocene and/or early Holocene Aboriginal occupation of the Hunter Valley is rare, with dated and undated evidence from these periods obtained from only a handful of sites, two of which (i.e., Moffats Swamp Dune & Galloping Swamp) are located on the Valley's coastal plain (AMBS 2002; Baker 1994; Hughes & Hiscock 2000; Koettig 1986; Kuskie in prep.; Rich 1993; Scarp Archaeology 2009). As recently discussed by Hughes et al. (2014), the dearth of early sites in the central lowlands of the Hunter Valley can be attributed to long term geomorphic and soil formation processes which have acted to either remove completely or widely disperse older archaeological materials.

Studies by Koettig (1990), Baker (1994) and Kuskie (2001) suggest that the flaked stone technology employed by Aboriginal knappers occupying the Hunter Valley during the terminal Pleistocene/early Holocene was focused on the opportunistic or non-specific reduction of early reduction cores (*sensu* Moore 2000) - some of which were very large. Core reduction appears to have been geared towards the production of robust flakes for immediate use or retouching into simple scrapers, with no evidence for the complex, hierarchically-organised reduction sequences typical of the mid-to-late Holocene. Tool edges, Moore (2000: 36) notes, were refurbished by unifacial retouching. A preference for volcanic materials over silcrete and mudstone has also been noted (Baker 1994; Koettig 1990, 1992:5), as has the paucity of evidence for deliberate heat treatment (Moore 2000).

In contrast to the late Pleistocene/early Holocene, evidence for mid-to-late Holocene Aboriginal occupation of the Hunter Valley abounds, with numerous excavated sites producing assemblages that can be confidently ascribed to these periods on the basis of radiometric dates and/or their typological/technological profiles. Taken at face value, available radiocarbon determinations suggest a progressive increase in the Aboriginal population of the Hunter Valley over the course of the Holocene (Attenbrow 2006). However, as argued by Hiscock (2008) on a national scale, it seems likely that the directional population growth suggested by such data is, to a certain extent at least, a product of differential site preservation, with younger sites better preserved than older ones. Other factors, such as the burial of older sites through sediment deposition and aeolian processes and bias in the location of archaeological surveys and excavations, may also be relevant.

Critical to any discussion concerning the antiquity of Aboriginal occupation within the Hunter Valley are the well-documented difficulties surrounding the dating of open artefact sites with active 'biomantles' (*sensu* Paton et al. 1995; see Dean-Jones & Mitchell 1993; Balek 2002; Hofman 1986; Johnson et al. 2005; Johnson 1989; Paton et al. 1995; Peacock & Fant 2002; Stein 1983). In the Hunter Valley, the term biomantle is typically used as a collective descriptor for the 'A' soil horizons of the Valley's dominant texture contrast or duplex soil profiles¹⁶, which tend to be relatively thin (<30 cm), and exhibit extensive evidence of bioturbation in the form of roots, open/infilled burrows, live insects and/or earthworms and stone lines¹⁷. As highlighted by Dean-Jones and Mitchell (1993) and others (e.g., Balek 2002; Johnson 1989), excavated finds assemblages from archaeological sites with active biomantles are subject to a range of interpretive constraints, with intact depositional stratigraphy unlikely to be preserved and inset archaeological features (e.g., hearths and heat treatment pits) representing the only reliable means of dating (with any specificity) intercepted archaeological events (Mitchell 2009: 4). Any stone artefacts discarded at the surface in landscapes with active biomantles are likely, over time, to have been incorporated into the soil profile through bioturbation, with depth of artefact burial ultimately corresponding to the base of major biological activity (i.e., the base of the biomantle). Where biomantles remain relatively undisturbed, patterns of artefact discard may be preserved. However, in heavily disturbed contexts, the preservation of such patterning is unlikely (Mitchell 2009: 4).

For archaeologists working in the Hunter Valley, the analytical and interpretive constraints posed by intensive bioturbation have, in combination with a real paucity of dateable features, led to a reliance on the dating of excavated archaeological finds assemblages through relative means, specifically, through consideration of the typological and technological composition of associated flaked stone artefact assemblages and reference to a modified version of McCarthy's (1967) ERS (Table 5). While offering a useful chronological framework within which to assess diachronic changes in the stone artefact technologies and raw material use, the largely undated and palimpsest character of the Valley's lithic record represents a significant analytical and interpretive obstacle for period-specific reconstructions of Aboriginal mobility regimes (cf. Cowan 1999).

¹⁶ Such profiles are characterised by loamy topsoils and silty clay to clay subsoils, with boundaries between these two units typically clear to abrupt. Clayey subsoils have formed by *in situ* weathering of the parent material, while topsoils are derived from a combination of *in situ* weathering and the deposition of colluvially and/or fluvially transported materials.

¹⁷ Stone lines, where present, typically occur at the interface between the A and B horizons.

More broadly, Dean-Jones and Mitchell (1993: 63-64) have highlighted a series of geomorphic contexts within the Hunter Valley that they believe represent favourable locations for the preservation of Pleistocene and/or early Holocene archaeological evidence. These include:

- rock shelters and large middens;
- Aeolian sand deposits (e.g., source bordering dunes);
- the distal portions of low angle alluvial fans;
- stream junctions where each tributary has a different rate of sediment supply; and
- colluvial deposits at the base of steeply inclined surfaces.

To date, the two contexts that been shown to have the potential to contain recognisable older archaeological materials include late Pleistocene windblown sand dunes/sheets (e.g., AMBS 2002) and late Pleistocene/early Holocene colluvial deposits (e.g., Hughes & Hiscock 2000).

6.1.7 Occupation Models

Numerous occupation or land use models have been proposed for the Hunter Valley over the past four decades, with existing models based on varying combinations of archaeological, environmental and ethnohistoric data (e.g., Haglund 1992; Koettig 1992; Kuskie & Clarke 2004; Kuskie & Kamminga 2000).

Of the models currently available, Kuskie and Kamminga's (2000) general occupation model remains the most comprehensive. Developed with reference to Foley's (1981) home base model, as well as existing environmental and ethnohistoric data for the Hunter region, Kuskie and Kamminga's (2000) model identifies a series of occupation strategies/patterns and outlines their expected archaeological correlates. The environmental context of each strategy is also considered. A summary of the model is provided in Table 7.

Table 7 Kuskie and Kamminga's (2000) general occupation model for the Hunter region

| Occupation Strategy/Pattern | Behavioural Context | Environmental Context | Archaeological Expectations |
|--|--|---|---|
| Transitory movement | <ul style="list-style-type: none"> Individual or group of people moving between base camps, or from a campsite to resources or a ceremonial or other special purpose location. Duration less than a day. Most likely less than a few hours. Evidence may represent accidental discard, repair of hunting or gathering equipment, children's play or knapping activity. | <ul style="list-style-type: none"> All landscape zones but frequently on ridge and spur crests, along watercourses and across valley flats. Proximity to water not important. Proximity to food resources not important. | <ul style="list-style-type: none"> Assemblages of low density and diversity (i.e., 'background discard'). Evidence of tool maintenance and/or repair. |
| Hunting and/or gathering (without camping) | <ul style="list-style-type: none"> Individual or small group of closely related people engaging in hunting or gathering activities. Duration less than a day, with participants returning to camp to sleep. Evidence may represent accidental discard, loss during use, repair of hunting or gathering equipment, children's play or knapping activity. | <ul style="list-style-type: none"> All landscape zones. Proximity to water not important. Proximity to food resources important. | <ul style="list-style-type: none"> Assemblages of low density and diversity (i.e., 'background discard'). Evidence of tool loss or discard. |
| Camping by small hunting and/or gathering parties | <ul style="list-style-type: none"> Individual or small group of closely related people engaged in hunting or gathering activities camp overnight near the resource being exploited. Duration of one or several days. Evidence may represent accidental discard, repair of hunting or gathering equipment, children's play, knapping activity, food processing or temporary camp fires. | <ul style="list-style-type: none"> All landscape zones. Proximity to water important. Proximity to food resources important. | <ul style="list-style-type: none"> Assemblages of low-to-moderate density and diversity, distinguishable from 'background discard'. Reasonably broad range of artefact and stone types. No site furniture (i.e., grindstones). No heat treatment pits or ovens. |
| Nuclear family base camp | <ul style="list-style-type: none"> Single nuclear family or extended family camping together. Encampment area may consist of several small huts. Duration dependent on availability of food resources and potable water. Evidence may represent accidental discard, repair of hunting or gathering equipment, children's play, knapping activity, food processing, campfires, heat treatment and tool manufacture. | <ul style="list-style-type: none"> Level to very gently inclined land surfaces. Proximity to water important. Proximity to food resources important. | <ul style="list-style-type: none"> Assemblages of high density and diversity. Site furniture (i.e., grindstones). Common evidence for expedient stone reduction and tool production. Heat treatment pits and ovens possible. |

| Occupation Strategy/Pattern | Behavioural Context | Environmental Context | Archaeological Expectations |
|--------------------------------------|--|---|--|
| Community base camp | <ul style="list-style-type: none"> • Number of nuclear families camping together. • Encampment area may exceed 100 m² and consist of a number of individual groups and huts. • Duration dependent on availability of food resources and potable water. | <ul style="list-style-type: none"> • Level to very gently inclined land surfaces. • Proximity to water important. • Proximity to food resources important. | <ul style="list-style-type: none"> • Assemblages of high density and diversity. • Spatially discrete evidence of individual campsites (where sites not affected by disturbance or superimposition). • Site furniture (i.e., grindstones). • Common evidence for expedient stone reduction and tool production. • Heat treatment pits unlikely. • Ochre may be present. |
| Larger congregation of groups | <ul style="list-style-type: none"> • Special events (i.e., major ceremonies) or opportunistic food resource 'events' (e.g., migrating eels). • Short duration (<1-2 weeks). • Large encampment or multiple encampments. • Variable numbers but potentially >100 individuals. | <ul style="list-style-type: none"> • Level to very gently inclined land surfaces. • Proximity to water important. • Proximity to food resources important. | <ul style="list-style-type: none"> • Assemblages of high density and diversity (comparable to community base camp). • Spatially discrete evidence of individual campsites (where sites not affected by disturbance or superimposition). • Site furniture (i.e., grindstones). • Common evidence for expedient stone reduction and tool production. • Heat treatment pits unlikely. • Evidence for the processing of uncommon food resources. |

6.2 Local Archaeological Context

6.2.1 AHIMS Database

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

Searches of the AHIMS database were undertaken on 8 September 2021 for a 20 x 20 km area surrounding the Modification Study Area resulting in the identification of 2,294 Aboriginal sites, comprising 2,257 open artefact sites (i.e., isolated artefacts and artefact scatters) (30 of which have associated areas of PAD), 13 modified trees (two with associated artefacts), nine areas of PAD, five grinding groove sites, four stone quarries, two stone arrangements, one midden and one resource and gathering site, one hearth and one burial (Table 8).

Consideration of the location of previously recorded Aboriginal sites indicates that 238 are located wholly or partially within the Modification Study Area comprising 236 open artefact sites (i.e., artefact scatter and isolated artefacts) and two stone quarries. From these sites, it is noted that stone quarry site 'SC-QS-1/Quarry' (AHIMS# 37-2-1955) recorded by Mills (2000) within the Modification Study Area was not located during AECOM's (2012; 2018) surveys. In addition, two open artefact sites within the Modification Study Area have been subject to surface collection. Accounting for the above, a total of 235 Aboriginal sites comprising 234 open artefact sites and one stone quarry are recognised as being located wholly or partially within the Modification Study Area. A list of these site is provided in Table 10.

Table 8 Site search results (20 x 20 km area)

| Site Type | Count | % |
|---|--------------|--------------|
| Open artefact site (i.e., isolated artefacts and artefact scatters) | 2,227 | 97.08 |
| Open artefact site with PAD | 30 | 1.31 |
| Modified tree | 13 | 0.57 |
| PAD | 9 | 0.39 |
| Grinding groove | 5 | 0.22 |
| Stone quarries | 4 | 0.17 |
| Stone arrangements | 2 | 0.09 |
| Midden | 1 | 0.04 |
| Hearth | 1 | 0.04 |
| Resource and gathering | 1 | 0.04 |
| Burial | 1 | 0.04 |
| Total | 2,294 | 99.99 |

6.2.2 Previous Archaeological Investigations within the Study Area and Surrounds

Existing AHIMS data indicates that numerous Aboriginal archaeological investigations incorporating surveys and/or test excavations have been undertaken within or directly adjacent to the Modification Study Area since the 1980s. Investigations undertaken include targeted surveys by Dyall (1980), Mills (2000), HLA Envirosiences (2002), Archaeological Risk Assessment Services (2006), and AECOM (2012b; 2019a). Two test excavation programs have been completed within or within close proximity to the Modification Study Area including one by Koettig & Hughes (1985) and one by Archaeological Risk Assessment Services (2010). Summaries of these assessments are provided below:

- Dyall (1980) undertook a survey of an area immediately south of the Bayswater Colliery and north of the Modification Study Area associated with the Maxwell Underground. Three sites, all artefact scatters, were recorded on the banks of Saddlers Creek. The sites contained flakes, cores and backed blades of chert, rhyolite (tuff) and quartz.
- Koettig & Hughes (1985) undertook an archaeological survey of three separate development areas in the Hunter Valley. The areas included the Plashett Reservoir site and water storage area on Saltwater Creek; a coal mine development on Mount Arthur North; and a coal mine development on Mount Arthur South. Within the Plashett Reservoir area, a total of 86 open campsites consisting of stone artefact scatters were recorded. The sites were concentrated along creeklines, especially Saltwater Creek, with artefacts recorded on bare, eroded exposures. Six of these sites were excavated. Within the Mount Arthur South Modification Study Area, a total of 136 archaeological sites were located and recorded. These comprised 135 open campsites with stone artefact scatters and one site consisting of grinding grooves. The survey focused on areas adjacent to Saddlers Creek. Artefact scatters were the most common site type identified during the survey and were identified eroding out of the A soil horizon. The general pattern of site distribution was one of higher numbers of sites along major creeklines, i.e., Saltwater Creek, with numbers decreasing along tributaries. Artefact densities along the whole of Saddlers Creek were typified by sites of high average densities, with a marked increase in the lower section of the creek. Indurated mudstone/tuff and silcrete were the most frequently recorded raw material. Survey of the Mount Arthur North area resulted in the locating of 93 open campsites consisting of stone artefact scatters. A programme of excavation and collection was carried out. The survey focused on areas adjacent to Whites Creek. Koettig and Hughes (1985) noted that sites tended to correspond in area to the surface exposures in which they were identified. Very few sites were recorded on hill slopes, ridges or along the upper portions of some creeklines where there were large areas of eroded ground.
- Mills (2000) undertook an archaeological survey to identify Aboriginal sites, and areas of potential archaeological sensitivity within the proposed mine and haul road areas for the Saddlers Creek Mine. The focus of the survey was Saddlers Creek; however, a number of its tributaries were also surveyed. Forty Aboriginal sites were identified, including seven isolated artefacts, 29 artefact scatters (nine with PAD), two quarry sites, and two scarred trees. The majority of artefact scatters and isolated finds were identified along ephemeral feeder creeks of Saddlers Creek. Mills (2000) found that evidence of Aboriginal activity was associated with the full length of these creeklines from their headwaters to the floodplain. In addition, at least two sites were identified on ridges and eight sites were identified at least 200 m from creeklines. A total of 238 artefacts were recorded, including 127 (53%) flakes, 41 (17%) block fracture fragments, 28 (12%) cores, 19 (8%) flake fragments, 7 (3%) scrapers, 5 (2%) manuports, 4 (2%) hammerstones, 3 (1%) backed blades, 1 sharpening stone, 1 millstone, 1 anvil and 1 pebble axe. Indurated mudstone/tuff was the dominant material (48%), followed by silcrete (32%), quartzite (5%), chert (5%), quartz (3%), porcellanite (2%), siltstone (2%), sandstone (1%), basalt (1%), fossilised wood (0.5%), and glass (0.5%).
- HLA Envirosiences (2002) completed an archaeological survey for the Drayton Mine Extension. A total of 14 artefact scatters were located during survey. Indurated mudstone/tuff was the dominant material (51%), followed by silcrete (39%), quartz (5%) and porcellanite (5%). Artefacts comprised flakes (49%), flaked pieces (41%), cores (9%), and backed blades (1%). All sites were located along creeklines, ridgetines or crests.

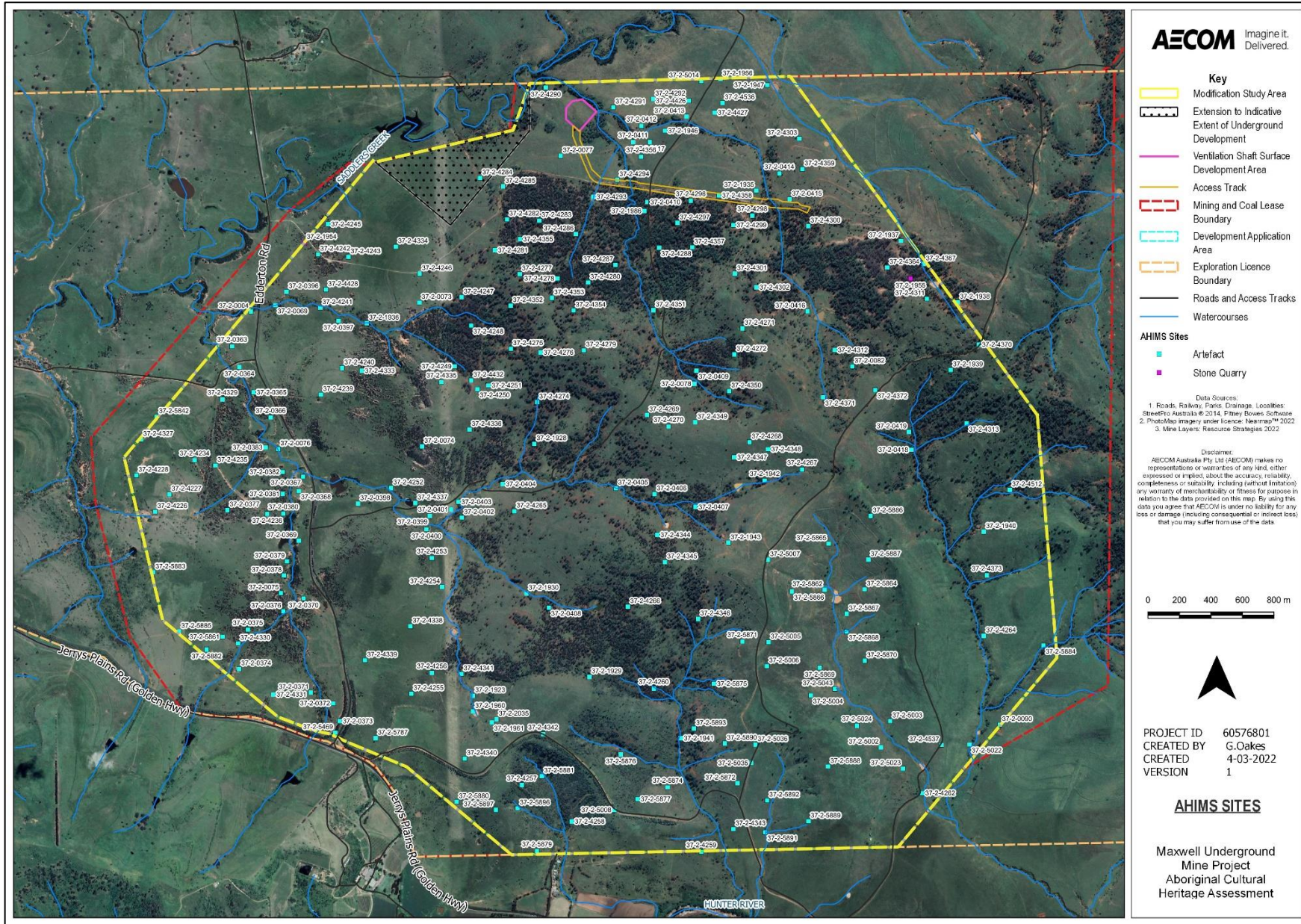
- ARAS (2006) undertook an assessment for the Drayton Mine Extension. A total of 480 stone artefacts were recorded from 39 sites that were identified, comprising of 22 artefact scatters and 17 isolated finds. A large proportion of the sites contained fewer than 10 artefacts, though five sites had over 50 artefacts and were associated with drainage lines or gullies. Of the 480 artefacts identified, 38% were complete flakes, 31% broken flakes, 26% flaked pieces and 5% cores. A majority of artefacts were of indurated mudstone/tuff (55%), followed by silcrete (25%), porcellanite (14%) and quartz (4.6%).
- ARAS (2010) undertook a program of salvage excavation for 26 Aboriginal sites for the Drayton Mine Extension. The salvage included surface collection of artefacts at 22 sites, mechanical grader scrapes at 11 locations and hand excavation at three locations. A total of 8,505 artefacts were recovered as part of the works. Of these, 7,500 artefacts were recovered from three distinct knapping locations at Ramrod Creek, identifying the creek as archaeologically sensitive. OSL (optically stimulated luminescence) dating of deposits at Ramrod Creek and Delpah returned dates of 3-1.4 thousand years ago, placing them in the Late Holocene. Raw materials utilised included porcellanite, silcrete, tuff and chert. At Ramrod Creek, porcellanite was the dominant raw material, while at Delpah, silcrete and tuff were dominant. ARAS (2010) proposed that two main site types, reflecting two differing site functions, were present within the Modification Study Area: fringe sites representing short-term occupation, and sites principally focused on the manufacture of backed artefacts. On the basis of site size (i.e., number of artefacts) and the ratio of discarded tools to waste material, ARAS (2010) proposed that sites adjacent to ridgelines and overlooking ephemeral water systems were the result of 'short term settlement". Conversely, ARAS (2010) found that sites associated with Ramrod Creek were specific to stone tool manufacturing activities, with particular emphasis on producing Bondi points from porcellanite.
- In 2012, AECOM completed an archaeological survey of the Drayton South Coal Project area, which overlapped with the Modification Study Area. A total of 205 discrete sites were identified during the assessment, including both the existing AHIMS sites and newly recorded sites. Sites comprised 143 artefact scatters, eight of which have associated areas of PAD, 59 isolated artefact sites and three stone quarries (Figure 19). High significance was attributed to four sites, based on their rarity and research potential. Moderate significance was attributed to 18 sites and low significance to 183 sites. Complete flakes dominated the assemblage, accounting for 50% of the combined survey assemblage, followed by broken flakes and flake shatter fragments. Raw material most commonly associated with both complete flakes and flake debitage consisted of indurated mudstone/tuff.
- In 2015, AECOM were engaged to undertake an updated archaeological survey for the Drayton South Coal Project with the Modification Study Area comprising the original area assessed as part of the previous Drayton South Coal Project application.
- In 2019, AECOM prepared the Maxwell Project ACHA. The surface development areas for the Project partially overlapped with the survey area completed for the Drayton South Coal Project in 2012 so only the areas not previously surveyed were subject to survey. During the survey, a total of 47 new Aboriginal archaeological sites, comprising artefact scatters and isolated artefacts, were identified. Combined, a total of 275 Aboriginal archaeological sites, comprising 274 open artefact sites and one stone quarry were identified within the Modification Study Area. A total of 545 individual stone surface artefacts (that form the open artefact sites) were recorded during the archaeological survey. In addition, a Cultural Values Report (CVR) was prepared. For the CVR, RAPs indicated that the Project area sits within a broader cultural landscape that has cultural significance for Aboriginal people. Forming part of this cultural landscape were important landscape features such as Mount Arthur, the Hunter River, and Saddlers Creek which as well as the Aboriginal objects (i.e., stone artefacts) identified during the archaeological survey for the Project.

6.3 Archaeological Predictions and Observations

A review of the existing archaeological and environmental context of the Modification Study Area suggests that material evidence of past Aboriginal activity within the area is likely to be restricted to flaked stone artefacts in surface and subsurface contexts. Accordingly, key predictions for the Modification Study Area's Aboriginal archaeological record are as follows:

- open artefact sites (i.e., artefact scatters and isolated artefacts) will be the dominant site type;
- site types unlikely to occur include scarred trees, stone arrangements and burials;
- most, if not all, of the Aboriginal archaeological materials present within the Modification Study Area will be of mid-to-late Holocene antiquity;
- Quaternary alluvial deposits on the Hunter River's contemporary floodplain and its more recent terraces retain the greatest potential for the preservation of early (i.e., late Pleistocene/early Holocene) occupation evidence;
- the dominant raw material for flaked stone artefact production within the Modification Study Area will be silicified tuff, with silcrete the second most common material;
- flaked stone assemblages will be dominated by flake debitage items (*sensu* Andrefsky 2005), with formed objects (i.e., cores and retouched flakes) comparatively poorly represented;
- the majority of silcrete artefacts will exhibit evidence of thermal alteration;
- knapping floors, if present, will exhibit evidence indicative of systematic backed artefact manufacture;
- complete and/or fragmentary backed artefacts will dominate the retouched components of recorded flaked stone artefact assemblages; and
- tool types of demonstrated temporal significance, if present, will be limited to edge-ground hatchet heads and backed artefacts.

Figure 19 AHIMS Sites



7.0 Archaeological Survey

7.1 Aim and Objectives

Archaeological survey of the Modification Study Area was undertaken by AECOM in 2012 and 2018 by a combined field team of AECOM Archaeologists and RAP field representatives. The overarching aim of the archaeological surveys undertaken for the assessments was to identify and record any existing surface evidence of past Aboriginal occupation within the associated study areas. Specific, nested objectives, meanwhile, were as follows:

- To comprehensively survey, by pedestrian transects, land within the study areas;
- To ground-truth the locations of previously recorded Aboriginal sites within the study areas;
- To identify and record Aboriginal archaeological objects within the study areas; and
- To provide data that will assist with the development of an appropriate management strategy for the known and potential Aboriginal archaeological values of the study areas.

7.2 Methodology

During AECOM's 2012/2018 surveys, AECOM employed a "full coverage" survey strategy with survey transects completed across the entire study areas, including the current Modification Study Area. All survey was conducted on foot, with the entire Modification Study Area subject to archaeological survey. Participants (on average eight participants per day) were spaced at 10 m intervals during the survey. The location of each transect completed during the survey, including start and end points, was recorded using one of two handheld differential GPS units, with associated transect data (e.g., Ground Surface Visibility [GSV] and Ground Integrity [GI] ratings) entered directly into the same unit upon the completion of each transect.

7.3 Site Definition

The definition, in spatial terms, of Aboriginal archaeological sites is a topic of considerable importance to modern cultural heritage management and one that has generated significant discussion in Australian archaeology (e.g., Doleman 2008; Holdaway, 1993; Holdaway et al. 1998, 2000; MacDonald & Davidson 1998; McNiven 1992; Robins 1997; Shiner 2008). Aboriginal archaeological sites can be broadly defined as places in the landscape that retain physical evidence of past Aboriginal activity. Such evidence can assume a range of forms, depending on the nature of the activity or activities that produced it, and can vary dramatically in quantity and extent. Some Aboriginal archaeological sites are, by their very nature, easy to define in spatial terms, with scarred trees and rockshelters, for example, readily distinguishable from their surrounding landscapes. Difficulties arise, however, for sites whose present-day physical extent is, more often than not, a product of geomorphic processes, as opposed to the actions of Aboriginal people in the past.

Although relevant to a variety of site types, geomorphic processes such as soil erosion and deposition, are of particular relevance to identification and definition of surface scatters of stone artefacts, commonly referred to as 'open camp sites' or 'artefact scatters'. It is, for example, now widely accepted that the archaeological visibility of such sites is, in most instances at least, entirely dependent on the variable operation of such processes, which will have acted variously to expose, conceal or remove completely associated archaeological materials (Dean-Jones & Mitchell 1993; Fanning et al. 2008, 2009; Shiner 2008). As demonstrated by countless large-scale excavations projects in south-eastern Australia, including Sydney's Cumberland Plain (e.g., Jo McDonald CHM [2001, 2005a], surface artefacts invariably represent only a fraction of the total number of artefacts present within these sites, with the majority occurring in subsurface contexts. Artefact exposure, unsurprisingly, is highest on erosional surfaces and lowest on depositional ones. At the same time, in many areas, surface artefacts have been shown to form part of more-or-less continuous subsurface distributions of artefacts, albeit with highly variable artefact densities linked to environmental variables such as stream order and landform.

Such evidence poses a significant analytical and interpretive dilemma. Defining sites on the basis of surface artefacts alone is clearly problematic, with modern site boundaries invariably reflecting the size and distribution of surface exposures as opposed to the actions of Aboriginal people in the past. Nonetheless, for pragmatic reasons, this is the most commonly used approach, with ‘distance’ and ‘density-based’ definitions dominating. In NSW, two of the most commonly employed distance-definitions are ‘*two artefacts within 50m of each other*’ and ‘*two artefacts within 100 m of each other*’. Neither definition is derived from a particular theoretical approach or body of empirical research - they are simply pragmatic devices for site definition. Definitions based on artefact density also vary in their particulars. However, one of most commonly used definitions is that which isolates, within an arbitrarily defined ‘background scatter’ of one artefact per 100 m², higher density clusters that are subsequently defined as ‘sites’.

Non-site or distributional archaeology offers an alternative approach to distance and density-based site definitions (Ebert 1992; Foley 1981), with individual artefacts, not sites, treated as the basic units of analysis (for published Australian examples see Doelman 2008; Holdaway et al. 2000; McNiven 1992; Robins 1997; Shiner 2008). While recognising the interpretive potential of non-site approaches with respect to data analysis and discussion, their implementation in the context of cultural heritage management studies is difficult. Here, the identification of ‘sites’ is required for reasons of recording (i.e., their entry into site databases such as AHIMS) as well as ease of relocation, protection, and ongoing management. The identification of spatially-discrete ‘sites’, therefore, offers the most pragmatic approach to Aboriginal heritage management in impact assessment contexts (but see McDonald 1996 for a different approach). For this assessment, the *two artefacts within 100 m of each other* definition has been adopted.

7.4 Survey Results

7.4.1 Survey Coverage and Effective Coverage

As indicated in Section 7.2 and shown on Figure 20, the majority of Modification Study Area was subject to archaeological survey with pedestrian transects completed over accessible (some steeper slopes were deemed inappropriate for survey). Reference to AECOM’s 2012/2018 assessments indicates that survey coverage across the current Modification Study Area was excellent with the majority of the Modification Study Area surveyed from the 46 transects undertaken in 2012 and the 17 transects completed in 2018. When combined, these two surveys result in a survey coverage of approximately 1,870 ha of the total Modification Study Area of 2,145 ha (i.e., 87%) was achieved.

Effective coverage is an estimate of the area in which archaeological materials are ‘detectable’ and is determined through estimating the visibility and exposure of each transect to calculate an effective coverage percentage. Visibility and exposure rates for transects completed as part of the 2012/2018 surveys ranged between 0-90% with the varied rates a result of vegetation cover in some areas and areas of exposure from erosion and contour drains in others. Effective coverage estimates for transects completed during the 2012 survey was good with 15.9% coverage achieved. Effective coverage for the 2018 survey was likewise good with 11.1% achieved.

7.4.2 Surface Artefacts

A total of 4028 individual stone artefacts were recorded during AECOM’s (2012/2018) archaeological surveys within the Modification Study Area. The recorded assemblage was dominated by flake debitage items comprising complete flakes, flake shatter fragments, proximal flakes and split flakes (n=8, 1.5%). Non-flake debitage items (i.e., angular shatter) were also present in large numbers. Formed objects (i.e. tools, cores) were also common with retouched flakes, complete and broken cores, axes and choppers present but less common. The most common raw material recorded was silicified tuff followed by silcrete, quartz, porcellanite, basalt, FGS other, quartzite and volcanics. The locations of individual artefacts area shown on Figure 21.

7.4.3 Sites

As noted in Section 6.2.1, 235 Aboriginal sites are located wholly within or partially within the Modification Study Area, comprising 234 open artefact sites (i.e., isolated artefacts and artefact scatters) and one stone quarry. Table 10 provides a list of Aboriginal sites located within the Modification Study Area with their locations shown on Figure 22.

7.4.4 Archaeological Sensitivity: Subsurface Archaeological Potential

Subsurface archaeological potential is addressed in the context of this assessment by the concept of 'archaeological sensitivity'. Figure 23 provides archaeological sensitivity mapping based on four key factors including the nature and extent of visible surface artefacts across the Modification Study Area, a review of the findings of previous archaeological investigations in analogous landforms in the surrounding area, on-site observations of post-depositional processes and historic ground surface disturbances. Using these variables, the level of archaeological sensitivity has been graded into three categories: nil, low and high. These ratings have then been applied to the Modification Study Area to assess levels of potential subsurface deposit.

As shown on Figure 23, much of the Modification Study Area has been assessed as being of low archaeological sensitivity. Areas of low sensitivity have been associated with areas of middle and upper slope within the Modification Study Area and areas of higher gradient with fewer artefacts identified within these areas. Areas of high archaeological sensitivity have been linked to low gradient flats, lower slopes, crests and creeklines, and areas where surface artefacts have been identified in quantities considered greater than 'background scatter' and the potential for subsurface archaeological is present. Areas of nil archaeological sensitivity are associated with areas of gross disturbance. The Additional Surface Development Area associated with the Modification is comprised primarily of land classified as highly archaeologically sensitive.

Relative to areas of low sensitivity, it is predicted that subsurface archaeological deposits located within areas of high sensitivity will exhibit higher mean artefact counts, densities and assemblage richness values (i.e., with respect to the representation of technological types and raw materials). Archaeological features such as knapping floors and hearths are also more likely to occur in these areas.

Areas of 'nil' archaeological sensitivity within the study area comprise those that have been grossly disturbed by modern and/or historic European land use practices. Aboriginal archaeological materials are unlikely to survive in these areas.

Regarding the validity or accuracy of the sensitivity ratings, it should be noted that sensitivity mapping has been undertaken on a broad-scale and significant variation in artefact densities/complexity within areas of identified archaeological sensitivity is considered likely. Sensitivity mapping is provided to guide management of the Modification Study Area's archaeological resource.

Figure 20 Survey transects

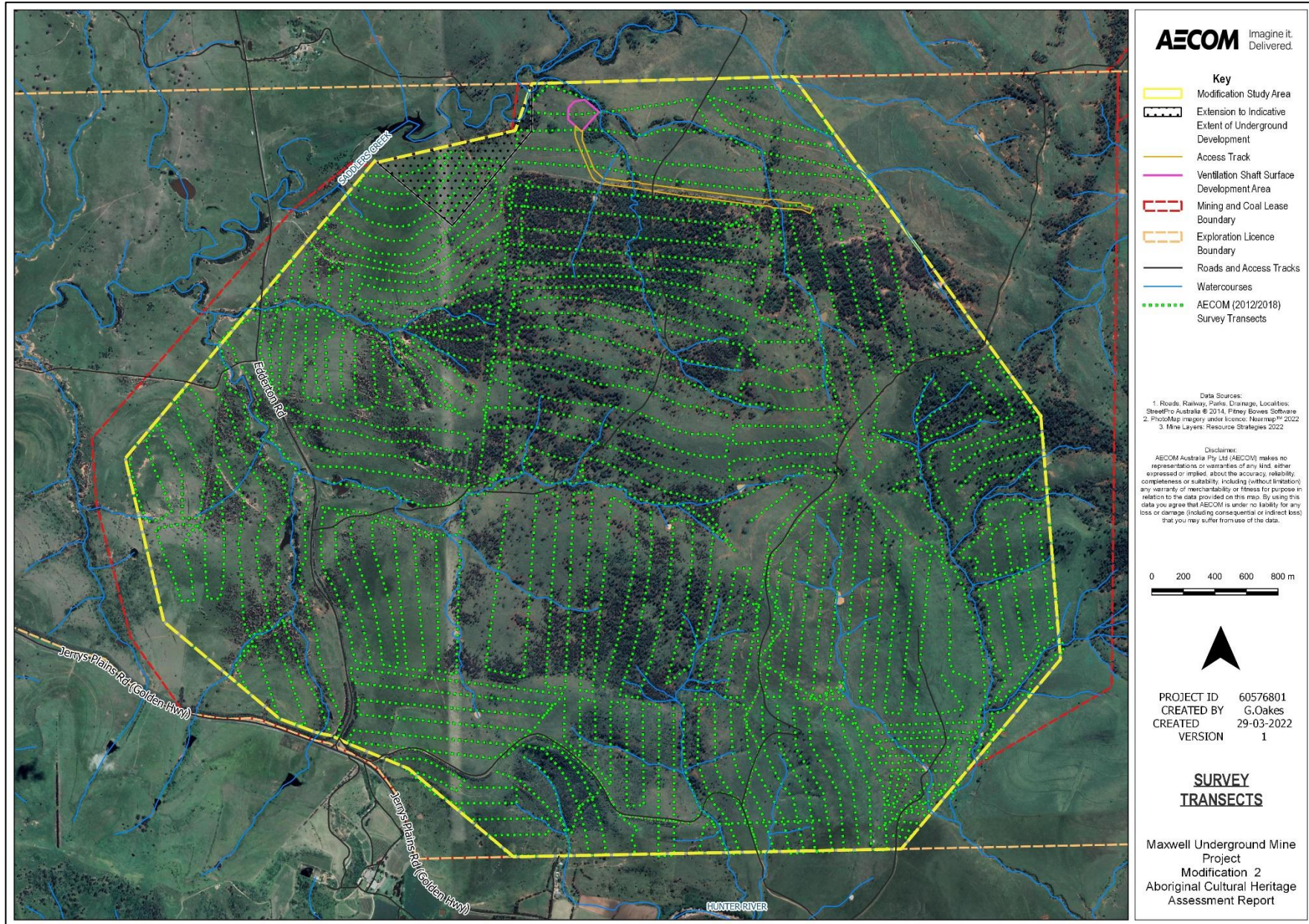


Figure 21 Surface artefacts

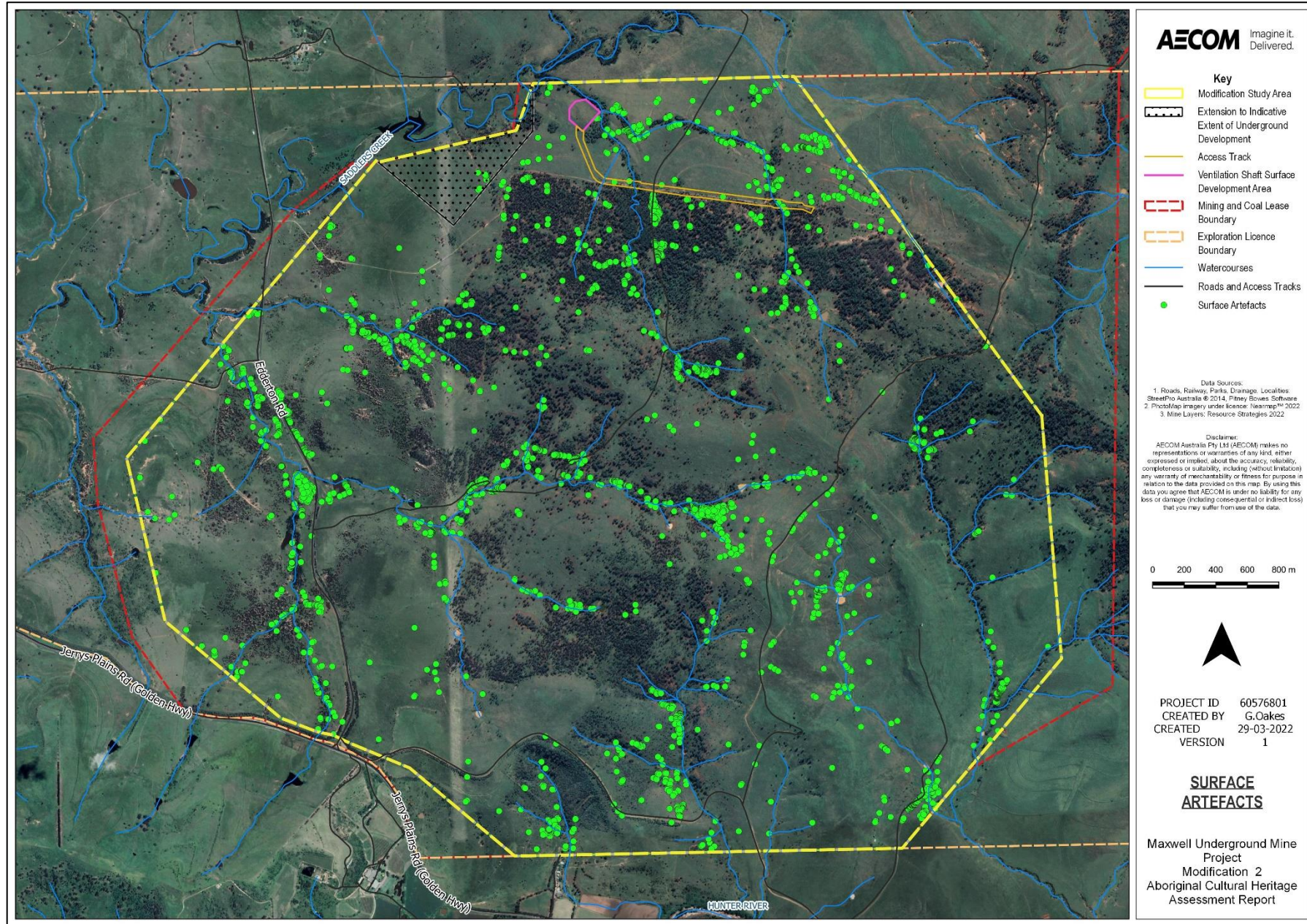


Figure 22 All Aboriginal sites

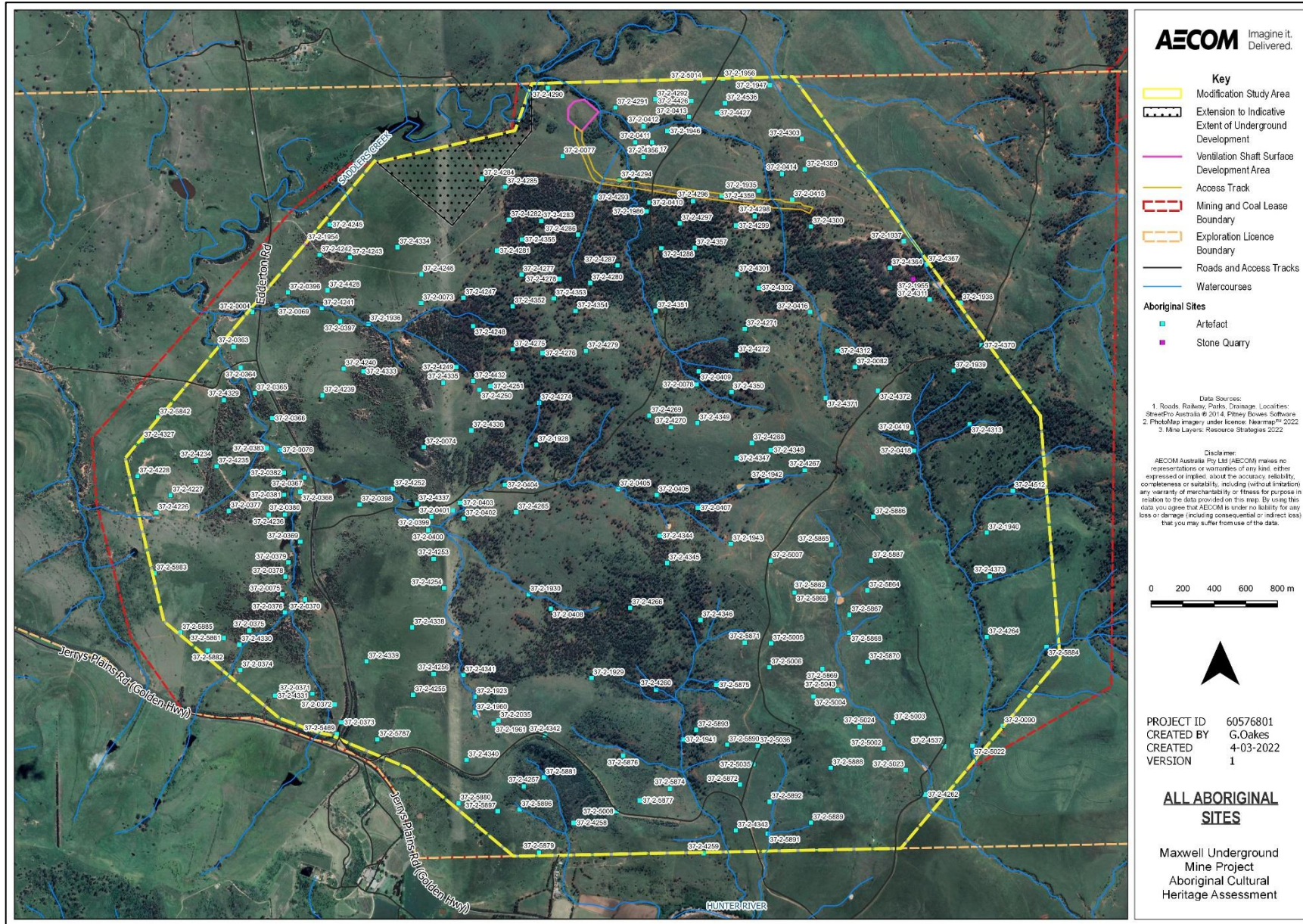
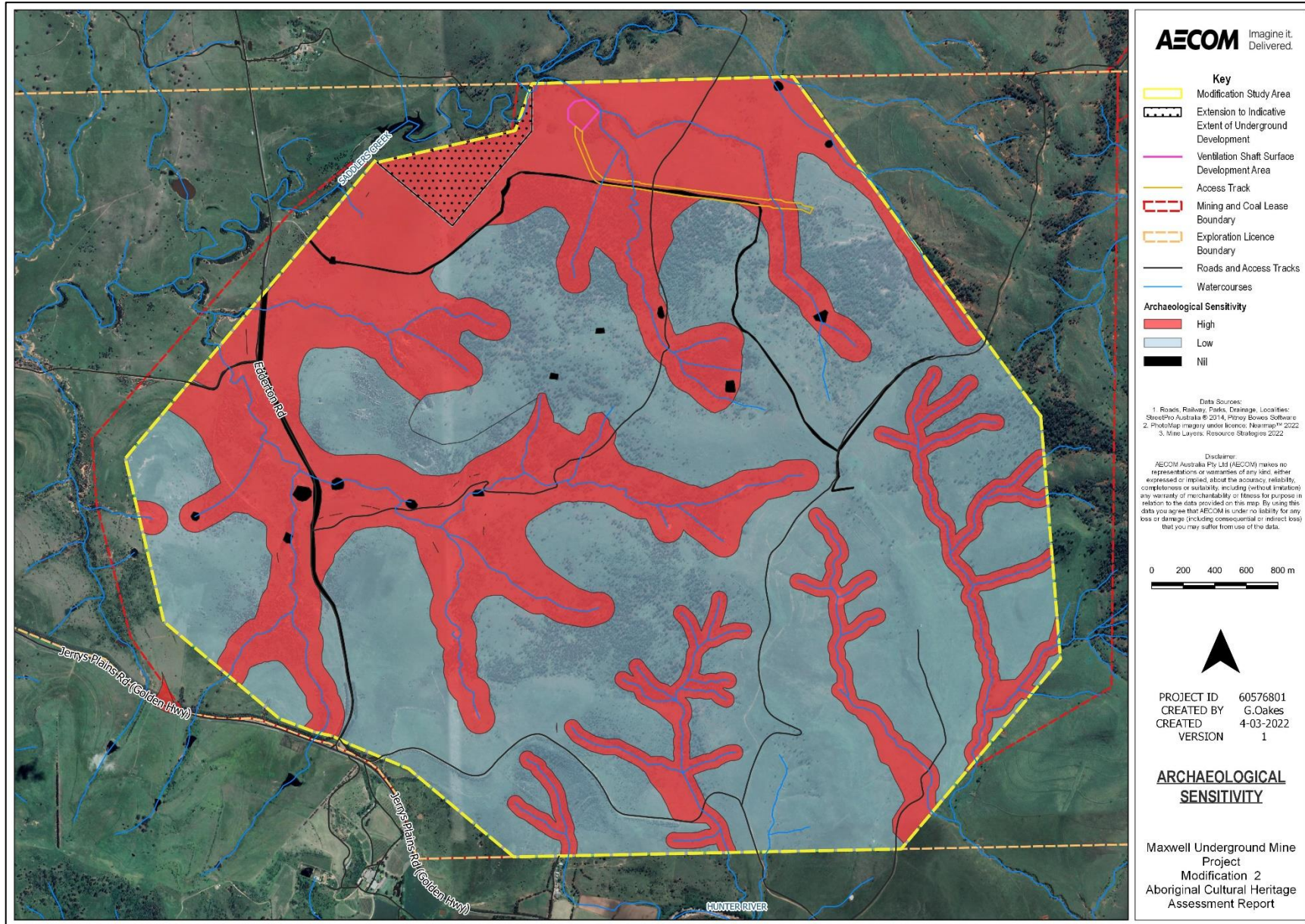


Figure 23 Archaeological sensitivity



8.0 Significance Assessment

8.1 Principles of Assessment

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

In Australia, the primary guide to the assessment of cultural significance is the *Australian ICOMOS Charter for Places of Cultural Significance* (2013), informally known as *The Burra Charter*, which defines cultural significance as the “aesthetic, historic, scientific, social or spiritual value for past, present or future generations” of a site or place (ICOMOS 2013: 2). Under the Burra Charter model, the cultural significance of a heritage site or place is assessed in terms of its aesthetic, historic, scientific and social values, none of which are mutually exclusive (Table 9). Establishing cultural significance under the Burra Charter model involves assessing all information relevant to an understanding of the site and its fabric (i.e., its *physical* make-up). The assessment of cultural significance and the preparation of a statement of cultural significance are critical prerequisites to making decisions about the management of any heritage site or place (ICOMOS 2013: 2).

With respect to Aboriginal heritage, it is possible to identify two major streams in the overall significance assessment process: the assessment of *scientific value(s)* by archaeologists and the assessment of *social (or cultural) value(s)* by Aboriginal people. Each is considered separately below.

Table 9 Values relevant to determining cultural significance, as defined by The Burra Charter (ICOMOS 2013)

| Value | Definition |
|------------|---|
| Aesthetic | “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” (ICOMOS 2013). |
| Historic | “Historic value encompasses the history of aesthetics, science and society...[a] place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may have historic value as the site of an important event” (ICOMOS 2013). |
| Scientific | “The scientific or research value of a place will depend on the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information” (ICOMOS 2013). |
| Social | “Social value embraces the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group” (ICOMOS 2013). |

8.2 Scientific Value

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

8.2.1 Rarity and Representativeness

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

In common with *rarity*, assessments of *representativeness* within a region are dependent on the state of current knowledge concerning the number and type of archaeological sites present within that region¹⁸. This is a critical point, for as suggested by Kuskie (2000) and others (e.g., Bowdler 1981; Godwin 2011; Pearson & Sullivan 1995), the absence across most of Australia of regional-scale quantitative data for Aboriginal sites and places represents a major constraint in assessments of *representativeness* and *rarity*. As stressed by Bowdler (1981) some 30 years ago, detailed regional-scale assessments of the Aboriginal archaeological record of Australia are required to address this issue.

8.2.2 Research Potential

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

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

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

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

¹⁸ There is, of course, a temporal fluidity to this criterion (i.e., as knowledge of the Aboriginal archaeology of a region increases, assessed levels of representativeness may change, a point of equal relevance to rarity).

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

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

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

8.2.3 Identification Process for Current Assessment

For the current assessment, information on the scientific values of the Modification Study Area has been obtained through a review of existing environmental and archaeological data as detailed in Sections 4.0 and archaeological surveys completed across the Modification Study Area by AECOM in 2012/2018 described in Section 7.4.

8.2.4 Assessment of Scientific Significance

An assessment of the scientific significance of sites within the Modification Study Area is presented in Table 10 below and shown on Figure 24. The significance rating of "scientific significance" is offered on the basis of the assessed research potential, rarity, representativeness, PAD, complexity and integrity and assigned low (L), moderate (M) and high (H) values.

Table 10 Scientific significance assessment

| Site | Type | Rarity | Representative-ness | Integrity | Complexity | PAD | Research potential | Overall Significance |
|-----------|------------------------|--------|---------------------|-----------|------------|-----|--------------------|----------------------|
| 37-2-0004 | Artefact scatter + PAD | M | M | M | M | H | H | Moderate |
| 37-2-0069 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0073 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0074 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0075 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0076 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0077 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0078 | Artefact scatter + PAD | L | L | M | L | M | M | Moderate |
| 37-2-0082 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0090 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0363 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0364 | Artefact scatter + PAD | L | L | L | L | M | M | Low |
| 37-2-0365 | Artefact scatter + PAD | L | L | L | L | M | M | Low |
| 37-2-0366 | Artefact scatter + PAD | L | L | L | L | M | M | Low |
| 37-2-0367 | Artefact scatter + PAD | L | L | L | L | M | M | Low |
| 37-2-0368 | Artefact scatter + PAD | L | L | L | M | M | M | Moderate |
| 37-2-0369 | Artefact scatter + PAD | L | L | L | L | M | M | Low |
| 37-2-0370 | Artefact scatter + PAD | L | L | L | M | M | M | Moderate |
| 37-2-0371 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0372 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0373 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0374 | Artefact scatter + PAD | L | L | L | M | M | L | Low |
| 37-2-0375 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0376 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0377 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0378 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0379 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0380 | Artefact scatter + PAD | L | L | L | L | M | M | Low |

| Site | Type | Rarity | Representative-ness | Integrity | Complexity | PAD | Research potential | Overall Significance |
|-----------|------------------------|--------|---------------------|-----------|------------|-----|--------------------|----------------------|
| 37-2-0381 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0382 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0383 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0396 | Artefact scatter | L | L | L | M | L | L | Low |
| 37-2-0397 | Artefact scatter + PAD | L | L | L | L | M | M | Low |
| 37-2-0398 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0399 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0400 | Artefact scatter + PAD | L | L | L | L | M | M | Low |
| 37-2-0401 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0402 | Artefact scatter + PAD | L | L | L | M | M | L | Low |
| 37-2-0403 | Artefact scatter + PAD | L | L | L | M | M | M | Moderate |
| 37-2-0404 | Artefact scatter + PAD | L | L | L | M | M | M | Moderate |
| 37-2-0405 | Artefact scatter + PAD | L | L | L | M | M | M | Moderate |
| 37-2-0406 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0407 | Artefact scatter + PAD | L | L | L | M | M | M | Moderate |
| 37-2-0408 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0409 | Artefact scatter + PAD | L | L | L | M | M | M | Moderate |
| 37-2-0410 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0411 | Artefact scatter + PAD | L | L | L | M | M | M | Moderate |
| 37-2-0412 | Artefact scatter + PAD | L | L | L | L | M | M | Low |
| 37-2-0413 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0414 | Artefact scatter + PAD | L | L | L | L | M | M | Low |
| 37-2-0415 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-0416 | Artefact scatter + PAD | L | L | L | M | M | L | Low |
| 37-2-0417 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0418 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-0419 | Artefact scatter + PAD | L | L | M | M | M | M | Moderate |
| 37-2-1923 | Artefact scatter | L | L | L | L | L | L | Low |

| Site | Type | Rarity | Representative-ness | Integrity | Complexity | PAD | Research potential | Overall Significance |
|-----------|------------------------|--------|---------------------|-----------|------------|-----|--------------------|----------------------|
| 37-2-1928 | Artefact scatter + PAD | M | L | L | M | M | M | Moderate |
| 37-2-1929 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-1930 | Artefact scatter + PAD | M | L | L | L | M | M | Moderate |
| 37-2-1935 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-1936 | Artefact scatter + PAD | L | L | L | M | M | M | Moderate |
| 37-2-1937 | Artefact scatter | L | L | L | M | L | L | Low |
| 37-2-1938 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-1939 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-1940 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-1941 | Artefact scatter + PAD | M | L | L | M | M | M | Moderate |
| 37-2-1942 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-1943 | Artefact scatter + PAD | L | L | L | L | M | M | Low |
| 37-2-1946 | Artefact scatter + PAD | L | L | L | M | M | L | Low |
| 37-2-1947 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-1954 | Quarry | H | H | M | M | M | M | High |
| 37-2-1956 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-1960 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-1961 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-1986 | Artefact scatter + PAD | L | L | L | M | M | M | Moderate |
| 37-2-2035 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4226 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4227 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4228 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4234 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4235 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4236 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4239 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4240 | Artefact scatter | L | L | L | L | L | L | Low |

| Site | Type | Rarity | Representative-ness | Integrity | Complexity | PAD | Research potential | Overall Significance |
|-----------|------------------------|--------|---------------------|-----------|------------|-----|--------------------|----------------------|
| 37-2-4241 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-4242 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4243 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4245 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4246 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4247 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4248 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4249 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-4250 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4251 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4252 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-4253 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4254 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4255 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4256 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4257 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4258 | Artefact scatter + PAD | L | L | L | M | M | M | Moderate |
| 37-2-4259 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4260 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-4262 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-4264 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4265 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4266 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4267 | Artefact scatter + PAD | M | L | L | L | M | L | Low |
| 37-2-4268 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4269 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4270 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4271 | Artefact scatter | L | L | L | L | L | L | Low |

| Site | Type | Rarity | Representative-ness | Integrity | Complexity | PAD | Research potential | Overall Significance |
|-----------|------------------------|--------|---------------------|-----------|------------|-----|--------------------|----------------------|
| 37-2-4272 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4274 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4275 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4276 | Artefact scatter | M | L | L | L | L | L | Low |
| 37-2-4277 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4278 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4279 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4280 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4281 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4282 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4283 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4284 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4285 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4286 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4287 | Artefact scatter + PAD | L | L | L | M | M | L | Low |
| 37-2-4288 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4290 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4291 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4292 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4293 | Artefact scatter | M | L | L | L | L | L | Low |
| 37-2-4294 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4296 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4297 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4298 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4299 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4300 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4301 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4302 | Artefact scatter | L | L | L | L | L | L | Low |

| Site | Type | Rarity | Representative-ness | Integrity | Complexity | PAD | Research potential | Overall Significance |
|-----------|------------------------|--------|---------------------|-----------|------------|-----|--------------------|----------------------|
| 37-2-4303 | Artefact scatter + PAD | M | L | L | M | M | M | Moderate |
| 37-2-4311 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4312 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4313 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4327 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4329 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4330 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4331 | Artefact scatter | M | L | L | L | L | L | Low |
| 37-2-4333 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4334 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4335 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4336 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4337 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4338 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4339 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4340 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4341 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4342 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4343 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4344 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4345 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4346 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4347 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4348 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4349 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4350 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4351 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4352 | Artefact scatter | L | L | L | L | L | L | Low |

| Site | Type | Rarity | Representative-ness | Integrity | Complexity | PAD | Research potential | Overall Significance |
|-----------|------------------------|--------|---------------------|-----------|------------|-----|--------------------|----------------------|
| 37-2-4353 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4354 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4355 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4356 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4357 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4358 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4364 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4367 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4370 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4371 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4372 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4373 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4426 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4427 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4428 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4432 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4512 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4536 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-4537 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5002 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-5003 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-5004 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5005 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5006 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5007 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5008 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5014 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5022 | Artefact scatter | L | L | L | L | M | L | Low |

| Site | Type | Rarity | Representative-ness | Integrity | Complexity | PAD | Research potential | Overall Significance |
|-----------|------------------------|--------|---------------------|-----------|------------|-----|--------------------|----------------------|
| 37-2-5023 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5024 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5035 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5036 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5043 | Artefact scatter + PAD | L | L | L | M | M | L | Low |
| 37-2-5469 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-5787 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5861 | Isolated artefact | M | L | L | L | L | L | Low |
| 37-2-5862 | Artefact scatter + PAD | M | L | L | M | M | M | Moderate |
| 37-2-5864 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5865 | Artefact scatter + PAD | L | L | L | M | M | L | Low |
| 37-2-5866 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5867 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5868 | Isolated artefact | L | L | L | L | L | L | Low |
| 37-2-5869 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5870 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5871 | Artefact scatter | M | L | L | L | L | L | Low |
| 37-2-5872 | Artefact scatter | M | L | L | L | L | L | Low |
| 37-2-5874 | Artefact scatter | M | L | L | L | L | L | Low |
| 37-2-5875 | Artefact scatter + PAD | L | L | L | L | M | L | Low |
| 37-2-5876 | Artefact scatter + PAD | M | L | L | L | M | L | Low |
| 37-2-5877 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5879 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5880 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5881 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5882 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5883 | Isolated artefact | L | L | L | L | L | L | Low |
| 37-2-5884 | Isolated artefact | L | L | L | L | L | L | Low |

| Site | Type | Rarity | Representative-ness | Integrity | Complexity | PAD | Research potential | Overall Significance |
|-----------|-------------------|--------|---------------------|-----------|------------|-----|--------------------|----------------------|
| 37-2-5885 | Artefact scatter | L | L | L | L | L | L | Low |
| 37-2-5886 | Isolated artefact | L | L | L | L | L | L | Low |
| 37-2-5887 | Isolated artefact | L | L | L | L | L | L | Low |
| 37-2-5888 | Isolated artefact | L | L | L | L | L | L | Low |
| 37-2-5889 | Isolated artefact | L | L | L | L | L | L | Low |
| 37-2-5890 | Isolated artefact | M | L | L | L | L | L | Low |
| 37-2-5891 | Isolated artefact | L | L | L | L | L | L | Low |
| 37-2-5892 | Isolated artefact | L | L | L | L | L | L | Low |
| 37-2-5893 | Isolated artefact | L | L | L | L | L | L | Low |
| 37-2-5896 | Isolated artefact | L | L | L | L | L | L | Low |
| 37-2-5897 | Isolated artefact | L | L | L | L | L | L | Low |

8.3 Social (Cultural) Value

Social or cultural value refers to the spiritual, traditional, historic and contemporary associations and attachments a place or area has for Aboriginal people and can only be identified through consultation with Aboriginal people (OEH 2011: 8). A summary of key cultural values identified by RAPs participating in the AECOM (2012b; 2019b) assessments is provided below.

8.3.1 Cultural Landscape

RAPs indicated that the Modification Study Area sits within a broad cultural landscape that has high cultural significance for Aboriginal people. Forming part of this cultural landscape locally are important landscape features, such as Mount Arthur, the Hunter River, and Saddlers Creek which all surround the Modification Study Area, as well as the Aboriginal objects (i.e., stone artefacts) identified during archaeological surveys within the Modification Study Area. Landscape features, as well as Aboriginal sites, are often associated with stories and form links along songlines or pathways. More broadly, the Modification Study Area forms part of larger collection of Aboriginal places including Mount Yengo, Biame Cave in Milbrodale, the Lizard Rock at Laguna and Burning Mountain at Wingen.

8.3.2 Landscape Features

RAPs who participated in the AECOM (2012b, 2019b) assessments highlighted Mount Arthur, located 4.5 km north of the Modification Study Area, the Hunter River located to the south and Saddlers Creek located to the north of the Modification Study Area as culturally important features in the local landscape. Mount Arthur is the dominant landscape feature in the local area and has been identified by RAPs as a significant landscape feature both spiritually and as a visual landmark. One of the first references to the importance of Mount Arthur to the local Aboriginal community was from Dyal (1977) during the archaeological assessment, *Environmental Studies - Mt Arthur Project (Hunter Valley): Full Report on Aboriginal Relics* (Dyall 1977). Dyall (1977) noted that during his enquiry with local residents there were 'suggestions that Mount Arthur itself was of special significance' to the Aboriginal people (Dyall 1977: p1). Since that time, several archaeological and cultural heritage assessments have reported on the significance of Mount Arthur to Aboriginal people. Umwelt (2006) noted the significance of Mount Arthur as the dominant topographic feature of the region and additionally identifies the prominent ridgeline that radiates southeast of the mountain towards Saddlers Creek. As a visual landscape feature, Mount Arthur would have formed a landscape point (or node) within an Aboriginal pathway linking with other points or features and drawing together the broader cultural landscape. In addition, RAPs have identified Mount Arthur as the location of a potential massacre site. The identification of an Aboriginal burial site on the Mt Arthur Mine Coal Lease in 2001 likewise forms an important contribution to the significance of Mount Arthur to local Aboriginal people.

The presence of the Hunter River and its smaller counterpart Saddlers Creek, culturally significant landscape features, located adjacent to the Project area, not only would have formed important sources of resources for Aboriginal people in the region, but would have also formed pathways for Aboriginal people travelling through the Hunter Valley.

8.3.3 Aboriginal Dispossession and Resistance

RAPs indicated that conflict, including massacres of Aboriginal people, between Aboriginal people, local settlers and Mounted Police occurred in the region surrounding the Modification Study Area. In particular, Mount Arthur was noted as a massacre location. A review of oral histories recorded by Davidson & Lovell-Jones (1993) suggest a massacre of Aboriginal people by Mounted Police may have occurred immediately south of Mount Arthur in an area called "The Pocket" in the 1820s. While details varied across informants interviewed there was general consensus that a large number of Aboriginal people (approximately 300) were either camping or were driven into The Pocket by Mounted Police and shot to death. However, no physical evidence has been identified related to the massacre despite detailed archaeological survey of The Pocket having been completed (Davidson, James & Fife 1993).

8.3.4 Vegetation

RAPs suggested that prior to European settlement, the native vegetation communities of the Modification Study Area and surrounds would have contained a variety of edible and otherwise useful plant species. Cross-referencing the results of the flora surveys completed by Hunter Eco (2019) for the Project with material published on bush foods (see Cribb & Cribb 1974; Isaacs 2002; Lassak & McCarthy 2001; Stewart & Percival 1997; and Zola & Gott 1992) suggest a number of useful plant species utilised by Aboriginal people are located within the Modification Study Area including Acacia, Eucalypts, Spiny-headed Matrush, Cumbungi, Grass Tree, Common Reed, Small Vanilla Lily, Headache Vine, Wombat Berry, Pale Grass-Lily, Rough-Barked Apple, Greenhood Orchids, Native Geranium, Apple-berry, Kangaroo Grass, Tussock grass, Hairy Panic Grass.

8.3.5 Mount Arthur Burial

RAPs noted that a burial site was located north of the Modification Study Area at the Mt Arthur Mine. The burial was uncovered as part of salvage works completed by Kuskie and Clarke (2004) at the Mt Arthur Mine. It is understood that details surrounding the burial have not been publicised and remain restricted. However, AECOM understands that the burial was left *in-situ* but is located outside the Modification Study Area and would not be impacted.

8.4 Historic Value

Historic value refers to the associations that a place has with a historically important person, event, phase or activity in an Aboriginal community (OEH 2011: 9). Historic values can but will not necessarily be represented by physical evidence.

Although situated within a broader landscape of high historical significance for contemporary Aboriginal people, the Modification Study Area itself is assessed as having low historical significance. No evidence of post-contact Aboriginal occupation has been identified within the Modification Study Area, either during background historical research, archaeological field survey or consultation with RAPs. In addition, no historical records or oral histories specific to the use of the site by Aboriginal people have been identified as part of this assessment. However, it is noted that RAPs have identified that Aboriginal people are known to have been employed on farms in the greater Jerrys Plains/Edderton area.

8.5 Aesthetic Value

This refers to the sensory, scenic, architectural and creative aspects of the place. It is often closely linked with the social values. It may consider form, scale, colour, texture and material of the fabric or landscape, and the smell and sounds associated with the place and its use (Australian ICOMOS 2013).

With respect to Aboriginal heritage, key aesthetic cultural values associated with the Modification Study Area include Mount Arthur, the Hunter River and Saddlers Creek, all of which are located outside the Modification Study Area. Views of Mount Arthur, the Hunter River and Saddlers Creek area available from within the Modification Study Area

8.6 Statement of Significance

This assessment finds that the Aboriginal heritage values of the Modification Study Area rest principally with the archaeological sites identified within it but also are drawn from its place within the broader cultural landscape. Identified archaeological sites within the Modification Study Area attest to its past use by Aboriginal people with all these sites identified by RAPs as highly significant. The locations and densities of surface artefacts/sites across the Modification are suggestive of variability in use of the landscape with an emphasis on the utilisation of land adjacent to creeklines (i.e., creek flats and lower slopes) where more abundant and diverse food and plant resources were likely available. The majority of sites within the Modification Study Area have been assessed as of low scientific significance with site attributes consistent with “background scatter” and likely resulting from small-scale or limited episodes of lithic discard. A number of sites within the Modification Study Area have been assessed as of moderate scientific significance with flaked stone artefact assemblages from these locations interpreted as palimpsests¹⁹ of multiple, short term occupation episodes involving, amongst other activities, on-site core reduction and backed artefact manufacture or incorporating rarer or diagnostic artefact types (i.e., axes). One site within the Modification Study Area was assessed as of high scientific significance due to its rarity in the region – stone quarry site 37-2-1954 - consisting of a naturally occurring outcrop of silcrete cobbles with evidence of exploitation likely the result of short term visitation events.

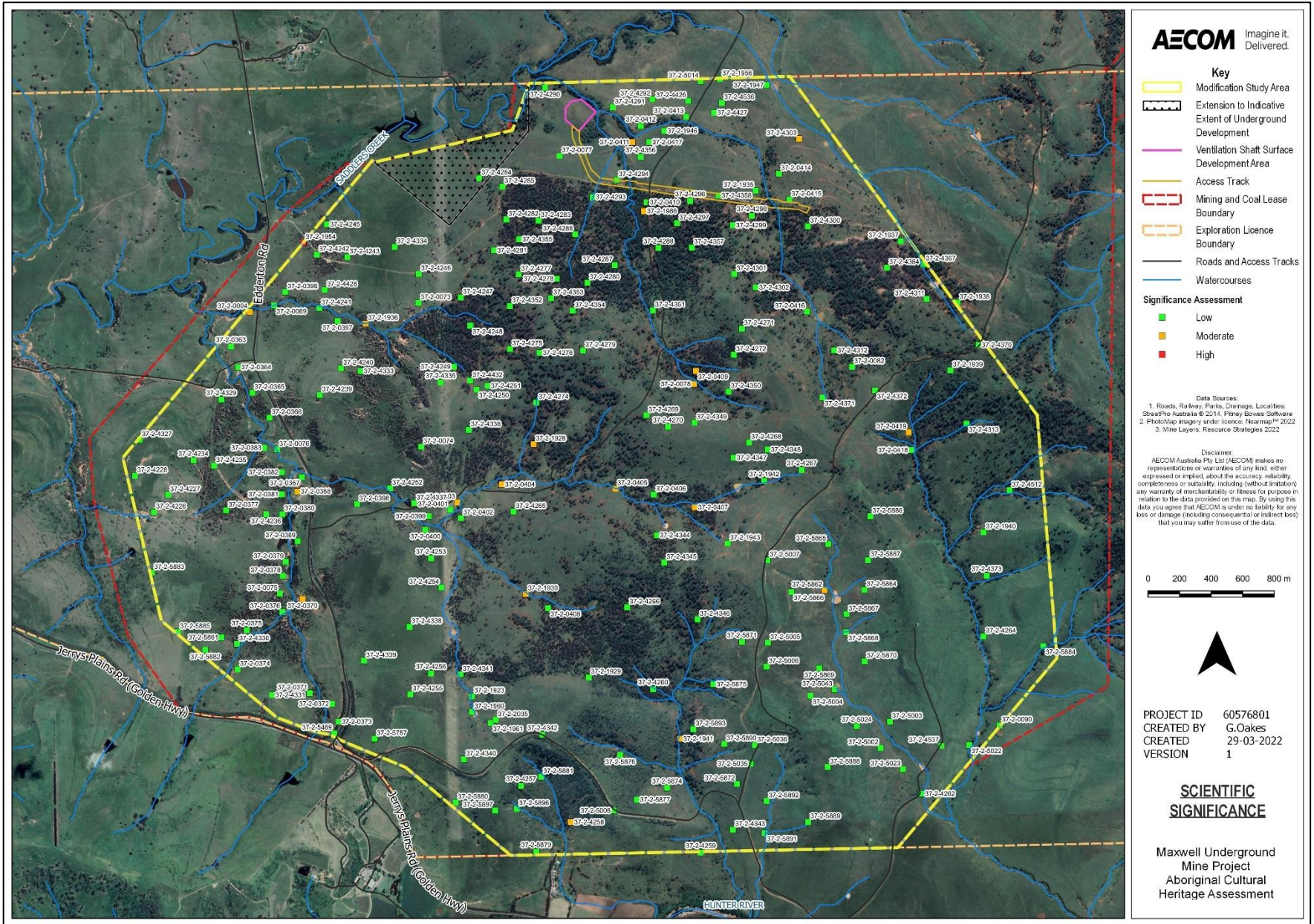
More broadly, the Modification Study Area forms part of a larger and highly significant cultural landscape for Aboriginal people in the Muswellbrook region with Mount Arthur, the Hunter River and Saddlers Creek being three culturally significant landscape features in the local area. The Modification Study Area was likely utilised by people travelling to and from Mount Arthur from the south and is visible from multiple locations within the Modification Study Area. Likewise, both the Hunter River and Saddlers Creek were likely accessed in places from within the Modification Study Area by Aboriginal people to exploit the diverse range of terrestrial, aquatic and avian resources associated with these watercourses. All three culturally significant landscape features are visible from specific sites/locations within the Modification Study Area and are considered to hold aesthetic significance.

Although situated within a broader landscape of high historical significance for contemporary Aboriginal people, the Modification Study Area itself is assessed as having low historical significance with no evidence of post-contact Aboriginal occupation identified within it. In addition, no historical records or

¹⁹ Palimpsests generally refer to deposits that lack clear stratigraphic relationships and or where the deposit is scrambled.

oral histories specific to the use of the site by Aboriginal people have been identified as part of this assessment.

Figure 24 Significance assessment



9.0 Impact Assessment

9.1 Summary of Proposed Impacts

As described in Section 1.3, the proposed Modification involves the re-orientation of the longwall panels within the approved underground mining area, with some a minor extension to the underground mining area, and the repositioning of the approved ventilation shaft site. Specifically, it includes the following:

- re-orientation of the longwall panels in the Woodlands Hill, Arrowfield and Bowfield Seams, resulting in a minor increase in the approved underground mining area extent;
- reduction in the width of some of the longwall panels in the Woodlands Hill Seam; and
- repositioning of the upcast ventilation shaft site and associated infrastructure.

9.2 Impacts to Identified Aboriginal Sites

9.2.1 Additional Surface Development Area

Surface impacts from the proposed Modification relate to construction of the upcast ventilation shaft and associated infrastructure (including an access track). Two artefact scatter sites would be wholly impacted (37-2-4294 and 37-2-4358) and one artefact scatter site will be partially impacted (37-2-0415), all from construction of the access track (Figure 25) (Table 11). AHIMS site cards for impacted sites are provided as Appendix E.

It is noted, that stone quarry site SC-QS-2 (37-2-1954) assessed as having high significance would not be directly impacted by the Project (as modified).

9.2.2 Modification Underground Extension Area

There is one Aboriginal site located within the Modification Underground Extension Area that would potentially be indirectly impacted by subsidence – open artefact scatter site “DS AS60 11” (37-2-4284). The remaining sites that would potentially be indirectly impacted by subsidence within the Modification Study Area were previously approved for indirect impacts under the existing Development Consent (SSD 9526) (Section 9.2.3).

9.2.3 Approved Underground Mining Area

235 Aboriginal sites are located wholly within or partially within the Modification Study Area, comprising 234 open artefact sites (i.e., isolated artefacts and artefact scatters) and one stone quarry. With the exception of open artefact scatter site DS AS60 11 (37-2-4284), all of these sites are located within the Approved Underground Mining Area and are therefore approved for indirect impacts under the existing Development Consent (SSD 9526).

Of the sites located within the Approved Underground Mining Area, three sites are located within the Additional Surface Development Area and as such would be directly impacted by the Modification (37-2-4294, 37-2-4358 and 37-2-0415) (Section 9.2.1).

Consistent with the findings of the Maxwell Project ACHA, Aboriginal sites located within underground mining areas may potentially be affected by cracking and heaving of the surface soils due to the effects of mining-induced subsidence. The subsidence assessment completed for the Modification (Mine Subsidence Engineering Consultants, 2022) indicates that the risk of surface cracking associated with the Modified mine plan remains largely the same as the approved layout.

Overall, impacts to Aboriginal sites from the reorientation of the longwall panels as compared to the approved EIS layout are considered largely the same with maximum predicted subsidence of up to 6400 mm for open artefact sites and < 20 mm for quarry site 37-2-1954.

Physical damage to individual artefacts is not expected as a result of subsidence. However, significant surface cracking within the boundary of an existing open artefact site ((including stone quarry sites) resulting from subsidence has the potential to displace soils, including archaeological deposits, and move Aboriginal objects, both of which are considered impacts. Moreover, if remediation of the surface

was required after mining, these works could potentially impact Aboriginal sites. As such, Sections 10.0 and 11.0 present management strategies for subsidence related impacts to Aboriginal sites. It is noted that the subsidence assessment specifically addresses potential subsidence related impacts to Aboriginal stone quarry site SC-QS-2 (37-2-1954) finding that this site was predicted to experience less than 20 mm of vertical subsidence and was not expected to experience measurable tilts, curvatures or strains on the basis that Malabar implemented specific measures to avoid harm to this site (Section 10.0).

Table 11 Impact Assessment

| AHIMS site information | | | | | | | | Proposed harm | | |
|--|------------------|---|----------------------------|---------|----------|-----------------------|------|------------------------------|--------------------------------|-------------------------------------|
| Portion of site (whole or part – include map reference if part) | AHIMS site ID | Site feature (there may be more than one site feature per site ID) | Site name | Easting | Northing | Datum (AGD or GDA) | Zone | Type of harm ¹ | Degree of harm ² | Consequence of harm ³ |
| Whole | 37-2-4294 | Artefact | DS AS70 11 | 297752 | 6412247 | GDA | 56 | Directly harmed | Whole | Total loss of value |
| Whole | 37-2-4358 | Artefact | DS IF33 11 | 298398 | 6412148 | GDA | 56 | Directly harmed | Whole | Total loss of value |
| Part | 37-2-0415 | Artefact | MAS 71;Mt Arthur South; | 298805 | 6412089 | GDA | 56 | Directly harmed | None | Total loss of value |

1 'Will not be harmed' / 'Movement (collection) only' / 'Excavation' / 'Community collection' / 'Directly harmed'

2 'Whole' / 'Partial' / 'None'

3 'Total loss of value' / 'Partial loss of value' / 'No loss of value'

9.3 Impacts to Cultural Values

Three culturally significant landscape features have been identified by RAPs as relevant to the Modification Study Area, including Mount Arthur, the Hunter River and Saddlers Creek. All three features are located outside the Modification Study Area and would not be directly impacted by the Project. However, views of the Mine Entry Area and ventilation shaft would be visible from both Mount Arthur and Saddlers Creek. Nonetheless, consideration of the minor nature of the proposed Modification suggests these visual impacts would be minor, particularly when considering the views of large open cut mines north of the Modification Study Area from both Mount Arthur and Saddlers Creek.

9.4 Cumulative Impact Assessment

9.4.1 Assessment of Ecologically Sustainable Development (ESD)

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

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

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

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

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

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

9.4.2 Intergenerational Equity - Cumulative Impact Assessment

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

1. a comparison, using the results of AHIMS searches, of the identified Aboriginal archaeological resource of the Project area with that of the surrounding region (study region), defined here as an arbitrary 20 x 20 km (400 km²) area roughly centred on the Project; and
2. the use of existing environmental data sources (e.g., digital land use data and topographic maps) to identify the potential open artefact resource of the study region as a whole.

9.4.3 Known Resource

Alongside sites identified within the Modification Study Area, existing open artefact sites in the study region offer opportunities for future research, conservation and education. Accordingly, it is necessary to quantify the impacts of the proposed development on this joint resource.

As indicated in Section 9.2, two previously identified open artefact sites will be wholly impacted and one open artefact site will be partially impacted directly from the Modification (Figure 25). AHIMS data obtained from the Heritage NSW on 8 September 2021 indicate that the three directly impacted sites represent 0.19% of the valid extant open artefact resource of the study region, with searches of the AHIMS database returning 1623 'Valid' open artefact sites for this search region. While acknowledging the limitations of the AHIMS database with respect to the validity of listed site statuses, on the basis of these data, it seems reasonable to conclude that the loss of these sites would not constitute a significant impact to the known open artefact resource of the region. Consideration of the character of these sites, all of which have been assessed as being of low scientific significance, alongside a consideration that the majority of land within this region has not been physically inspected for Aboriginal sites, suggests that impact of the Modification to archaeological resource of the region is not significant.

9.4.4 Potential Resource

AHIMS results only represent a fraction of the likely archaeological resource present within a region, as these results are only representative of land that has been subject to archaeological investigations. Accordingly, an assessment of the *potential* Aboriginal heritage resource of an approximate 20 x 20 km study region centred on the Project is also a useful guide. For the present analysis, land use data (dated 2017) obtained from the Land Assessment Unit at Heritage NSW was utilised (Table 12).

As a starting point, it is necessary to quantify the amount of land within the study region that has the *potential* to retain open artefact sites. A basic assumption here is that existing, grossly disturbed terrain is unlikely to retain such sites whereas non-grossly disturbed terrain does, both in surface and subsurface contexts. Analysis of available digital land use data for the study region is summarised in Table 12. This analysis indicates that grossly modified or disturbed terrain (e.g., mining and quarrying, urban and industrial areas) accounts for approximately 27.6% of land within the region. Outside of grossly disturbed areas, fully to semi-cleared grazing land is particularly well represented, accounting for approximately 63.7% of land within the region. Conservation area is likewise fairly well represented at 4.2%. Tree and shrub cover is moderately well represented at 2.7%. Cropping is poorly represented at 0.6% and horticulture land at 1%.

Table 12 Land use analysis for study region (20 x 20 km)

| Existing Land Use | Area (km ²) | Percent (%) | Archaeological Potential? |
|-----------------------------|-------------------------|-------------|---------------------------|
| Conservation Area | 16.7 | 4.2 | Yes |
| Cropping | 2.6 | 0.6 | Yes |
| Grazing | 254.9 | 63.7 | Yes |
| Horticulture | 4 | 1.0 | Yes |
| Intensive Animal Production | 23.9 | 6.0 | No |
| Mining & Quarrying | 67.5 | 16.9 | No |
| Power Generation | 2.6 | 0.6 | No |
| River & Drainage System | 13.3 | 3.3 | No |
| Transport & Other Corridors | 2.8 | 0.7 | No |
| Tree and Shrub Cover | 10.9 | 2.7 | Yes |
| Urban | 0.4 | 0.1 | No |
| Wetland | 0.5 | 0.1 | Yes |
| Total | 400.1 | 100 | |

Source: NSW Landuse Data 2017 obtained from Heritage NSW.

Viewed from an Aboriginal archaeological perspective, the results of the land use analysis presented in Table 12 suggest that approximately 72.4% of the study region (c.289.5 km²) can reasonably be considered to comprise a *potential open artefact resource*. As indicated, land upon which open artefact deposits are unlikely to survive accounts for just over 27.6% of land within the region. This figure increases to 92% if cropping and grazing land is included. However, as indicated by the results of numerous Aboriginal archaeological investigations, both within and outside of the study region, cropped and grazed areas can and frequently do retain significant surface and subsurface stone artefact records. It can, therefore, be concluded that around 72.4% of land within the study region has the potential to retain open artefact deposits in surface and subsurface contexts. While acknowledging the fact that the nature and distribution of such deposits will vary markedly in relation to environmental variables such as landform and the availability of potable water, analysis of available land use data does help to quantify the extent of the region's potential Aboriginal open artefact resource. Moreover, it provides a basis on which to assess the cumulative impact of the proposed development on this resource.

In order to quantify the impact of the modified Project on the potential open artefact resource of the study region it is necessary to compare the amount of land directly impacted by surface development, that is the vent shaft and access track (c. 0.0929 km²) with the potential for open artefact sites within the Modification Study Area with that available in the search area (approximately 289.5 km²). On this basis, it can be stated that impact to the Modification Study Area would result in an approximate 0.003% decline in the region's potential open artefact resource. As such, it can be concluded that the impact of the modified Project on the potential Aboriginal archaeological resource of the region would not be significant.

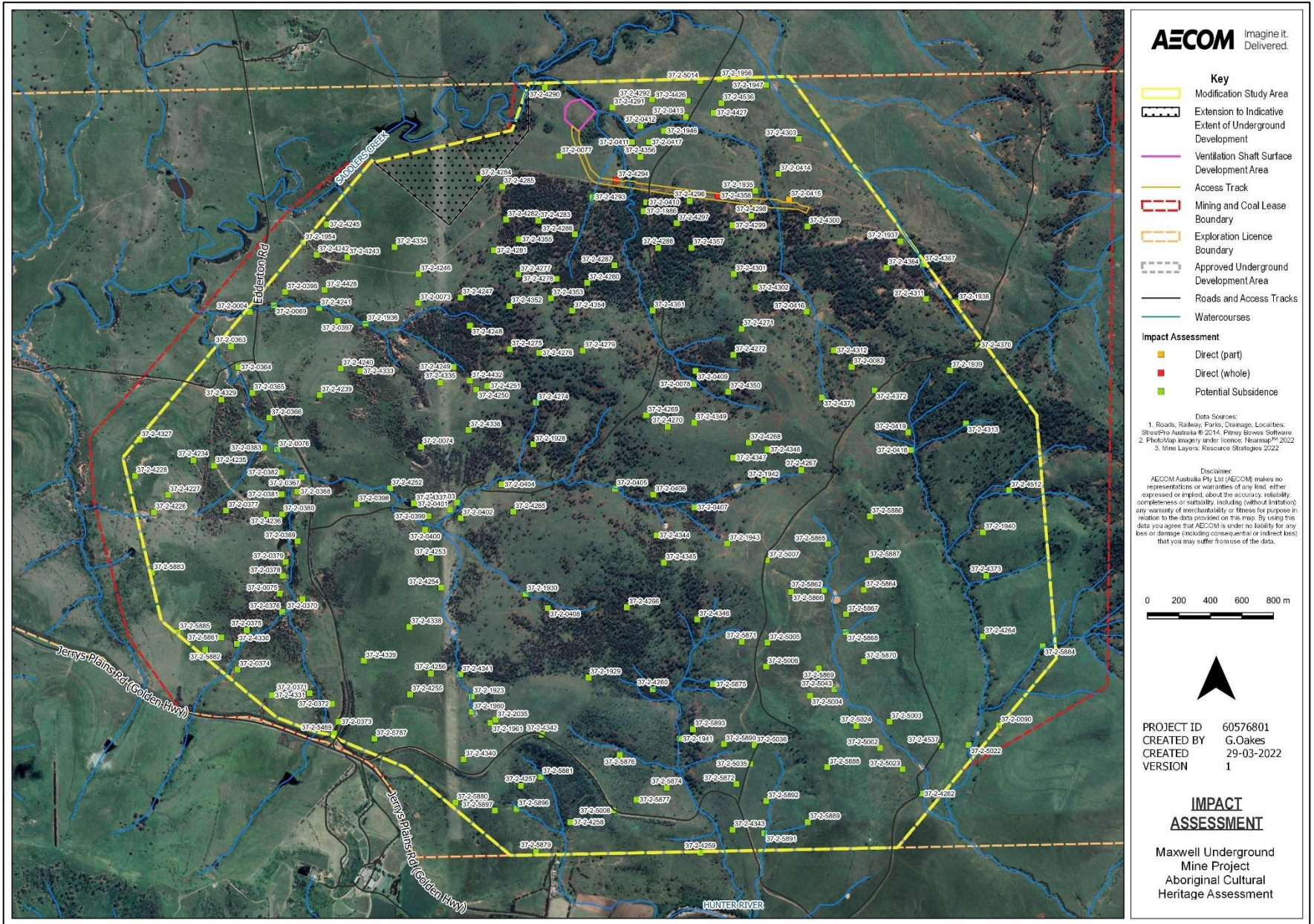
With regards to the existence, outside of the Modification Study Area, of environmental contexts that have the potential to contain sites comparable to those identified within it, an examination of relevant topographic maps for the study region indicates that many such contexts exist, including unmodified sections of Saddlers Creek, Saltwater Creek and other unnamed creeklines in the region. On the basis of this evidence, it can be confidently concluded that land outside of the Modification Study Area but within the wider region contains a significant, as yet unidentified, open artefact site resource.

9.4.5 The Precautionary Principle

As indicated in Section 9.4.1, the precautionary principle holds that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

In the context of the current assessment, it can be stated that AECOM has adopted a precautionary approach in our assessment of the impacts of the proposed development on the Aboriginal archaeological resource of the modified Project area and that this approach is reflected in our proposed management strategy.

Figure 25 Impact assessment



10.0 Avoiding and Minimising Harm

As part of its acquisition of Exploration Licence (EL) 5460, Malabar committed to developing the Maxwell Project solely as an underground mining operation rather than an open cut operation which has resulted in significantly fewer environmental impacts, including impacts to Aboriginal heritage values. The Project will also use the substantial existing Maxwell Infrastructure, which will avoid the need to develop additional infrastructure required to support an underground mining operation within EL 5460.

The location and orientation of the longwall panels as well as the repositioning of the ventilation shaft and associated infrastructure were selected with consideration of:

- the location of known Aboriginal heritage sites (i.e. avoiding direct impact to known artefacts where possible);
- avoidance of undermining part of Aboriginal stone quarry site SC-QS-2 (37-2-1954) in order to reduce potential subsidence related impacts (i.e., the site is not expected to experience measurable tilts, curvatures or strains); and
- consideration of historical site disturbances (i.e., utilisation of existing access tracks).

Moreover, the longwall panel layout was designed to avoid direct subsidence impacts on the Hunter River alluvium and Saddlers Creek, both of which are culturally significant landscape features. This has also reduced impacts to Aboriginal sites by being located mostly in areas of low archaeological sensitivity and avoiding areas with higher potential for subsurface archaeological deposit (i.e., creek flats and lower slopes).

Overall, impacts to Aboriginal sites from the reorientation of the longwall panels as compared to the approved EIS layout are considered largely similar. Direct impacts as a result of the Modification include two wholly impacted open artefact sites (37-2-4294 and 37-2-4358) and one partially impacted open artefact scatter site (37-2-0415).

Management strategies to further minimise harm to identified heritage values are detailed in Section 11.0.

11.0 Management Recommendations

The following management recommendations are made regarding the identified Aboriginal heritage values of the Modification Study Area, with recommendations made on the basis of:

- a review of previous archaeological investigations completed within and surrounding the Modification Study Area;
- the results of the archaeological investigation described in Section 7.0;
- the significance and impact assessments detailed in Sections 8.0 and 9.0; and
- consultation with RAPs.

Management recommendations detailed below will supplement the existing management measures included in the ACHMP (Appendix G).

11.1 Statutory Requirements

As indicated in Section 1.0, approval for the Modification is being sought under section 4.55(2) of the EP&A Act. A Modification Report and supporting appendices are being prepared to accompany the application to modify Development Consent SSD 9526.

This ACHA documents the results of AECOM's assessment and has been compiled with reference to the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (NSW Department of Environment Climate Change & Water, 2010a), *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (NSW Department of Environment Climate Change & Water, 2010b) and *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011).

11.2 Management Strategy

11.2.1 Impacts

This assessment has identified three Aboriginal sites within the Modification Study Area that will directly impacted by the proposed Modification including two open artefact scatter sites that will be wholly impacted (37-2-4294 and 37-2-4358) and one artefact scatter site will be partially impacted (37-2-0415). In addition, there is one Aboriginal site located within the Modification Underground Extension Area that has the potential to be indirectly impacted – open artefact scatter site “DS AS60 11” (37-2-4284). Lastly, land assessed as highly archaeologically sensitive will be impacted by construction of the ventilation shaft and from the access track.

Archaeological test excavation was not considered warranted for the assessment of sites directly impacted by the Modification as robust significance assessments and associated management strategies were deemed possible on surface evidence alone.

A management strategy to address the impacts of the Modification on the known Aboriginal heritage values of the Modification Study Area is provided below. It is recommended that Project's existing ACHMP be updated to include details of this strategy.

11.2.2 Archaeological Salvage

An archaeological salvage program should be completed for all Aboriginal sites impacted by surface development (i.e., the vent shaft and associated infrastructure) prior to the commencement of any ground disturbance associated with the Modification. The salvage program should incorporate the following components:

- Surface collection of all aboriginal objects/sites to be impacted by surface development including Aboriginal objects associated with open artefact scatter sites 37-2-4294 and 37-2-4358 as well as the portion of impacted open artefact site 37-2-0415. Surface collection is considered an appropriate and effective mitigation option for these sites given their content and level of scientific significance.

- A program of open area salvage excavation, as detailed in Appendix F, should be completed for the area of high archaeological sensitivity within the Additional Surface Development Area. The overarching objectives of the salvage program would be as follows:
 - to salvage a representative and statistically viable subsurface assemblage of stone artefacts from the surface impact area;
 - to undertake post-excavation analyses that will produce and conserve knowledge of past Aboriginal occupation of the area; and
 - to investigate the broader archaeological and cultural context of the Modification Study Area through comparative analyses of the results of the current salvage program with those conducted in the greater Upper Hunter region.

All archaeological salvage works should be undertaken by a qualified archaeologist and RAP field representatives.

11.2.3 Conservation of Non-impacted Sites

All Aboriginal sites not impacted by the Project (as modified) but within the Modification Study Area should be conserved *in-situ*. All relevant staff and contractors are to be made aware of the nature and locations of all sites as well as Malabar's legal obligations with respect to them. Protected sites will need to be identified on all relevant site plans. Details for the care of protected sites is outlined in the Project's approved ACHMP.

11.2.4 Subsidence Monitoring

As required in Section 3.2.5 of Project's approved ACHMP, subsidence monitoring would be conducted during mining and for a specified period post-mining, with a digital record of the nature, location and extent of all subsidence-related surface impacts within the Modification Study Area recorded. Where subsidence-related impacts such as surface cracking are identified within the boundary of an existing Aboriginal site of moderate (or high) scientific significance, or where remediation works are required to address subsidence impacts, the site would warrant an inspection by a qualified archaeologist to determine the nature and extent of impacts, and whether mitigation is required. Mitigation measures may include further monitoring, surface collection or open area salvage excavation.

11.2.5 Previously Unrecorded Aboriginal Objects and Place

In the event that previously recorded Aboriginal objects or places are identified during the Project, the procedures outlined in Section 3.2 of the Project's approved ACHMP should be followed.

11.2.6 Management of Potential Human Remains

In the event that potential human skeletal remains are identified at any point during the life of the development, the procedures outlined in Section 3.2 of the Project's approved ACHMP should be followed.

11.2.7 AHIMS Site Cards

AHIMS site cards have been completed and submitted to the Heritage NSW for all recorded sites within the Modification Study Area.

In the event that a previously unidentified Aboriginal site is discovered within the Modification Study Area at any point during the operational life of the Project, an AHIMS site card for that site should be submitted to the Heritage NSW as promptly as possible.

11.2.8 Aboriginal Site Database

Malabar maintains a comprehensive Aboriginal Site Database for the Modification Study Area and its immediate environs as per Section 5.3 of the Project's approved ACHMP.

11.3 Summary of Management Mitigation Measures

Table 13 presents a summary of management mitigation measures for identified Aboriginal sites within the Modification Study Area.

Table 13 Summary of mitigation measures

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-0004 | Artefact scatter + PAD | Moderate | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0069 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0073 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0074 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0075 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0076 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0077 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0078 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0082 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0090 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0363 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0364 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0365 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0366 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0367 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0368 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0369 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0370 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0371 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0372 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0373 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0374 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0375 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0376 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0377 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0378 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0379 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-0380 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0381 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0382 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0383 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0396 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0397 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0398 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0399 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0400 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0401 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0402 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0403 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0404 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0405 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0406 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0407 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0408 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0409 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0410 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0411 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0412 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0413 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0414 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0415 | Artefact scatter + PAD | Low | Direct (part) | Surface collection |
| 37-2-0416 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0417 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0418 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-0419 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-1923 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1928 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-1929 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1930 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-1935 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1936 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-1937 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1938 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1939 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1940 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1941 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-1942 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1943 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1946 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1947 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1954 | Quarry | High | Not measurable | Monitoring. If impacted, salvage excavation |
| 37-2-1956 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1960 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1961 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1986 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-2035 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4226 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4227 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4228 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4234 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4235 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4236 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4239 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4240 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4241 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-4242 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4243 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4245 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4246 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4247 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4248 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4249 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4250 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4251 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4252 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4253 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4254 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4255 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4256 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4257 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4258 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-4259 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4260 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4262 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4264 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4265 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4266 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4267 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4268 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4269 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4270 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4271 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4272 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4274 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4275 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4276 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4277 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4278 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4279 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-4280 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4281 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4282 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4283 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4284 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4285 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4286 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4287 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4288 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4290 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4291 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4292 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4293 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4294 | Artefact scatter | Low | Direct (whole) | Surface collection and salvage excavation |
| 37-2-4296 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4297 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4298 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4299 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4300 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4301 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4302 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4303 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-4311 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4312 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4313 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4327 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4329 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4330 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4331 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4333 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4334 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4335 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4336 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4337 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4338 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4339 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-4340 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4341 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4342 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4343 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4344 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4345 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4346 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4347 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4348 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4349 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4350 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4351 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4352 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4353 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4354 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4355 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4356 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4357 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4358 | Artefact scatter | Low | Direct (whole) | Surface collection |
| 37-2-4364 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4367 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4370 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4371 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4372 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4373 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4426 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4427 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4428 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4432 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4512 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4536 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4537 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5002 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5003 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5004 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5005 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-5006 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5007 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5008 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5014 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5022 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5023 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5024 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5035 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5036 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5043 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5469 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5787 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5861 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5862 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-5864 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5865 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5866 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5867 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5868 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5869 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5870 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5871 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5872 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5874 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5875 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5876 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5877 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5879 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5880 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5881 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5882 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5883 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5884 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5885 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|-------------------|--------------|----------------------|---|
| 37-2-5886 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5887 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5888 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5889 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5890 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5891 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5892 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5893 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5896 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5897 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |

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Appendix A

Assessment Methodology

Appendix A Assessment Methodology



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4 February 2022

Dear Registered Aboriginal Party,

RE: Modification to the Maxwell Underground Coal Mine Project - Proposed Aboriginal Cultural Heritage Assessment Methodology

AECOM Australia Pty Ltd (AECOM) is commissioned by Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Resources Limited (Malabar), to prepare an Aboriginal Cultural Heritage Assessment (ACHA) for a modification application under section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Maxwell Underground Coal Mine Project (Maxwell UG Project).

The Maxwell UG Project, State Significant Development (SSD) 9526, is located to the south-southwest of Muswellbrook, within the local government area of Muswellbrook, NSW. The Maxwell UG Project involves the development of an underground coal mine and the utilisation of the substantial facilities that already exist at the Maxwell Infrastructure site. It also includes a transport and services corridor between the mine entry area (MEA) and the Maxwell Infrastructure site.

This proposed modification involves re-orientation of the longwall panels within the approved underground mining area, with some minor extensions to the underground mining area, and the repositioning of approved ventilation shaft site (referred to as the Modification 2).

As a Registered Aboriginal Party (RAP) for the Maxwell UG Project, please find enclosed for your review the proposed Aboriginal Cultural Heritage Assessment Methodology for Modification. The proposed methodology details AECOM's proposed approach to the assessment and is being provided to all RAPs in accordance with Sections 4.3.1 and 4.3.2 of the Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a) and clause 60 of the *National Parks and Wildlife Regulation 2019*. A brief review of existing environmental and archaeological data for the study area is also provided for contextual purposes.

All comments on the proposed methodology must be received by 5 March 2022. Comments can be provided in writing or by phone. Comments on the cultural values of the study area can be provided along with your comments on the proposed methodology or at any stage up until the end of the draft ACHA review period.

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We look forward to your participation in the assessment.

Yours faithfully

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Modification to the Maxwell Underground Coal Mine Project - Proposed Aboriginal Cultural Heritage Assessment Methodology

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) is commissioned by Maxwell Ventures (Management) Pty Ltd, a wholly owned subsidiary of Malabar Resources Limited (Malabar), to prepare an Aboriginal Cultural Heritage Assessment (ACHA) for a modification application under section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Maxwell Underground Coal Mine Project (Maxwell UG Project).

The Maxwell UG Project, State Significant Development (SSD) 9526, is located to the south-southwest of Muswellbrook, within the local government area of Muswellbrook, NSW. The Maxwell UG Project involves the development of an underground coal mine and the utilisation of the substantial facilities that already exist at the Maxwell Infrastructure site. It also includes a transport and services corridor between the mine entry area (MEA) and the Maxwell Infrastructure site.

This proposed modification involves re-orientation of the longwall panels within the approved underground mining area, with some minor extensions to the underground mining area, and the repositioning of approved ventilation shaft site (referred to as the Modification 2).

The objectives of the ACHA are to identify the Aboriginal heritage values, both archaeological and cultural, of the study area and to determine appropriate mitigation and/or management measures. The assessment will involve background research, consultation with Registered Aboriginal Parties (RAPs) and the production of a draft ACHA report and finalisation of the draft report following further consultation with the RAPs.

In accordance with Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a) and clause 60 of the *National Parks and Wildlife Regulation 2019*, AECOM is providing for your review the draft proposed methodology for Modification 2.

All RAPs are invited to comment on this draft proposed methodology and to provide comments regarding the Aboriginal heritage cultural values of the study area.

2.0 Background to the Current Assessment

The Maxwell UG Project is an underground mining operation that has Development Consent to operate for 26 years (until 2047). As part of the Maxwell UG Project and previous project applications that included the study area (i.e., Drayton South and Saddlers Mine) full coverage archaeological survey has been completed over the study area with recorded sites and associated management measures included in AECOM's (2019) assessment. Both the sites and management recommendations will be included in an Aboriginal Cultural Heritage Management Plan (ACHMP) for the Maxwell UG Project. A brief review of AECOM's assessments is included below.

In 2012, AECOM completed an archaeological survey of the Drayton South study area. A total of 205 discrete sites were identified during the assessment, including both the existing Aboriginal Heritage Information Management System (AHIMS) sites and newly recorded sites. Sites comprised 143 artefact scatters, eight of which have associated areas of PAD, 59 isolated artefact sites and three stone quarries. High significance was attributed to four sites, based on their rarity and research potential. Moderate significance was attributed to 18 sites and low significance to 183 sites. Complete flakes dominated the assemblage, accounting for 50.2 per cent of the combined survey assemblage, followed by broken flakes and flake shatter fragments. Raw material most commonly associated with both complete flakes and flake debitage consisted of indurated mudstone/tuff.

In 2019, AECOM completed an ACHA for the Maxwell UG Project. The Maxwell UG Project area overlapped with the survey area completed for the Drayton South project in 2012 so only the areas not previously surveyed were subject to survey as part of the Project. During the survey, a total of 47 new Aboriginal archaeological sites, comprising artefact scatters and isolated artefacts, were identified. Combined, a total of 275 Aboriginal archaeological sites, comprising 274 open artefact sites and one stone quarry were identified within the study area.



A total of 545 individual stone surface artefacts were recorded during the archaeological survey. In addition, a Cultural Values Report (CVR) was prepared. For the CVR, RAPs indicated that the study area sits within a broader cultural landscape that has cultural significance for Aboriginal people. Forming part of this cultural landscape were important landscape features such as Mount Arthur, the Hunter River, and Saddlers Creek which as well as the Aboriginal objects (i.e., stone artefacts) identified during the archaeological survey for the Project.

In 2021, AECOM completed an ACHA for the Maxwell UG Project Mine Entry Area Modification (referred to as Modification 1). Consideration of previously recorded “valid” Aboriginal sites based on AHIMS site coordinates and associated site cards/reports indicated four AHIMS sites were located within or partially within the areas associated with Modification 1, with all four comprising open artefact sites (i.e., isolated artefacts and artefact scatters).

3.0 Modification Overview

Malabar proposes to commence preparation of an ACHA for a modification to the approved Maxwell Underground Coal Mine Project Development Consent SSD 9526 to allow for the re-orientation of the longwall panels within the approved underground mining area, with some minor extensions to the underground mining area, and the repositioning of approved ventilation shaft site within the ‘study area’ (Figure 1).

The study area conservatively covers the whole underground mining area and any surface development areas required for Modification 2 and would allow for infrastructure design to consider the results of the study and any Aboriginal heritage sites identified.

The approved Maxwell Underground Coal Mine Project area comprises the following (Figure 1):

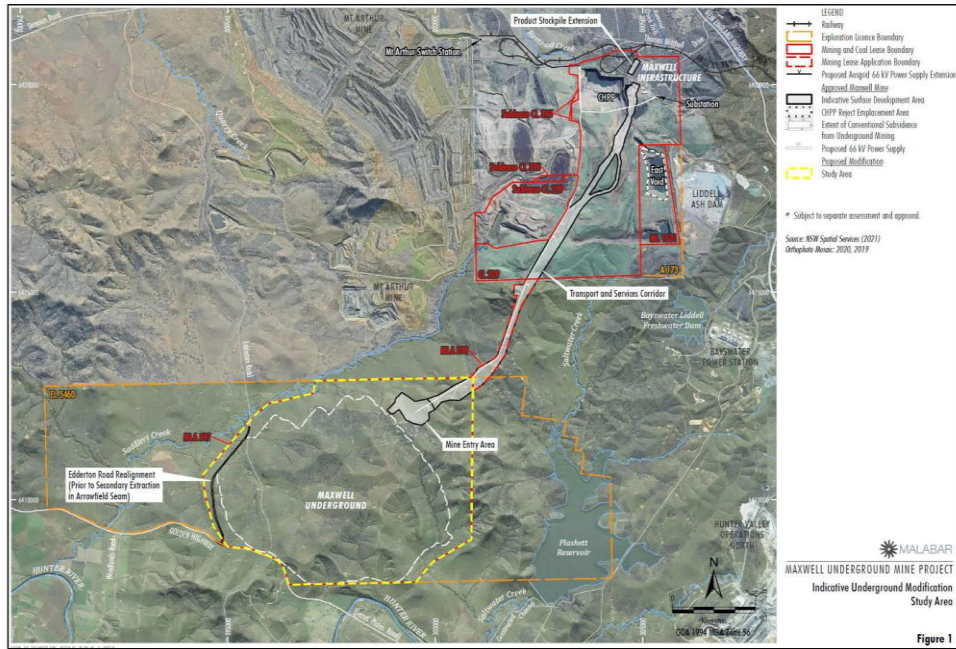
- Maxwell Underground – comprising the approved area of underground mining operations and the MEA within Mining Lease (ML) 1822.
- Maxwell Infrastructure – the area within Coal Lease (CL) 229, ML 1531 and CL 395 comprising the substantial existing infrastructure (including the coal handling and preparation plant) and previous mining areas.
- The transport and services corridor between the Maxwell Underground and Maxwell Infrastructure – the area within CL 229, ML 1820 and ML 1822 comprising the planned site access road, covered, overland conveyor, power supply and other ancillary infrastructure and services.
- The realignment of Edderton Road.

Modification 2 would include the following components:

- re-orientation of the longwall panels in the Woodlands Hill, Arrowfield and Bowfield Seams, resulting in a minor increase in the approved underground mining area extent;
- reduction in the width of some of the initial longwall panels in the Woodlands Hill Seam; and
- repositioning of the upcast ventilation shaft site and associated infrastructure.



Figure 1: Study area



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4.0 Study Area

The study area for Modification 2, as shown on Figure 1, comprises the Maxwell ML 1822 area which encompasses the re-orientation of the longwall panels within the approved underground mining area, with some minor extensions to the underground mining area, and the repositioning of approved ventilation shaft site. Land within the study area is currently approved for underground mining and associated infrastructure and has historically been used primarily for grazing.

Reference to the Geographical Name Register (GNR) of NSW indicates that the study area falls wholly within the boundaries of the Muswellbrook Shire Council LGA and is situated within the Parish of Wynn in the County of Durham. Surrounding suburbs include Edderton to the north, Jerrys Plains to the south, Howick to the east and Denman to the west.

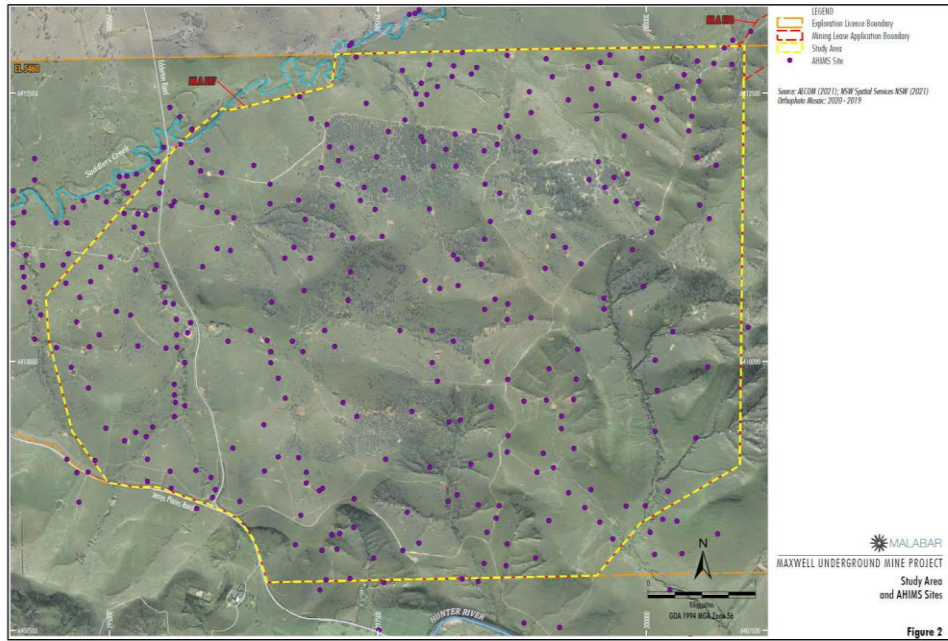
5.0 Archaeological Context

AHIMS Database

A search of the AHIMS database was undertaken on 8 September 2021 for the study area (Figure 2). Consideration of the location of previously recorded "valid" Aboriginal sites, including a review of associated site cards and assessment reports, indicates that 294 AHIMS sites are located wholly or partially within the study area comprising 292 open artefact sites (i.e., isolated artefacts and artefact scatters), and two quarry sites (one of which has not been located historically).



Figure 2 Study area and AHIMS sites



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6.0 Proposed Methodology

The approach that AECOM intends to adopt for undertaking the assessment includes the following key components:

1. Background research;
2. Utilisation of the results of previous surveys undertaken for the previous projects in 2012, 2015 and 2018 (i.e., as presented in AECOM [2012, 2015 and 2019]);
3. Consultation with RAPs in order to identify the Aboriginal cultural heritage values of the study area; and
4. Preparation of a draft ACHA for the study area detailing the results of the above. Potential impacts and management/mitigation measures for the identified Aboriginal heritage values of the study area will be provided in the draft ACHA. The following steps would be included during this stage:
 - a. Provision of the draft ACHA report to the RAPs for review and comment.
 - b. RAP provides comments on the draft ACHA report.
 - c. Finalisation of draft ACHA report in consideration of RAP comments.

The proposed methodologies for each of these components are detailed in the sections below. The roles, responsibilities and functions of the RAPs, AECOM (Proponent's representative) and Maxwell Ventures (Management) Pty Ltd (the Proponent) are outlined in Attachment 1.

6.1 Background Research

The following tasks will be undertaken for the background research component of the assessment:

- Updated search of Heritage NSW's AHIMS database;
- A review associated site cards and reports to clarify site contents, extents and statuses;
- A review of the landscape context of the study area, with a particular emphasis on its implications for the nature and distribution of Aboriginal archaeological materials;
- A review of relevant archaeological and ethnohistoric information for the study area and environs; and
- Preparation of a predictive model for the Aboriginal archaeological record of the study area.

6.2 Information Session

Malabar will hold an ACHA information session. The purpose of the meeting will be to provide RAPs with project information and discuss the proposed assessment methodology. To register your interest in attending the ACHA information session please contact Geordie Oakes via the contact details provided in the cover letter of this proposed methodology. Please note, attendance at the information session will not be paid.

6.3 Archaeological Survey

AECOM proposes to utilise the survey results from surveys completed by AECOM (2012, 2015 and 2019) as well as consultation with the RAPs to guide the assessment. It is noted that a 'full coverage' survey has been previously completed across the study area by AECOM and RAPs in 2012. However, if any areas are identified during the assessment process that have not been previously surveyed these would be subject to archaeological survey.



Should any archaeological survey be undertaken it would be completed by a combined field team of two AECOM archaeologists and appropriate number of RAP field representatives, as determined by AECOM and Malabar prior to survey. While vehicles may be used to transport the survey team between survey localities, all survey will be completed on foot. Linear transects of variable length and width, depending on ground conditions and occupational health and safety (OH&S) considerations are proposed. The location of all transects completed during survey, including their start and end points, will be recorded using one of two handheld differential GPS units, with associated transect data (e.g., levels of visibility and exposure, disturbance factors) entered directly into the same unit upon the completion of each transect.

All Aboriginal archaeological sites identified during the survey (if required) will be recorded to the standard required by the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010b)). For each site located or re-visited, individual artefact locations will be captured by differential GPS. As with that recorded for individual survey transects, attribute data for all identified flaked stone artefacts will be entered directly into a GPS unit using AECOM's standard digital open site recording form. All sites will be comprehensively photographed following artefact recording and registered on Heritage NSW's AHIMS database.

6.4 Cultural Values

RAP representatives are in the best position to provide information on the Aboriginal social/cultural heritage values of a given area. During the assessment process, AECOM archaeologists will consult with RAPs regarding the cultural heritage values of objects and places in the study area. This will include the discussion of cultural heritage values with RAPs throughout the process until the end of the draft ACHA review period and provision of the draft ACHA to all RAPs for comment prior to finalisation.

The identification of cultural values will include places of social, spiritual and cultural value, historic places with cultural significance, and potential places/areas of historic, social, spiritual and/or cultural significance.

As noted in Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a), some information obtained from registered Aboriginal parties may be sensitive or have restricted public access. AECOM, in consultation with relevant RAPs, will develop appropriate protocols for sensitive or restricted information, including:

1. Cultural restrictions on access to the material.
2. Cultural restrictions on communication of the material.
3. Cultural restrictions on the location of the material.
4. Cultural recommendations on handling the material.
5. Any other contextual information.
6. The names and contact details of persons authorised within the relevant Aboriginal group to make decisions concerning the Aboriginal material and the degree of authorisation.
7. Details of any consent given in accordance with customary law.
8. Level of confidentiality to be accorded to the material.
9. Access and use, by the registered Aboriginal parties, of the cultural information in the material.

It is also noted that the purpose of community consultation with Aboriginal people is to assist AECOM and Malabar in the preparation of an application for an Aboriginal Heritage Impact Permit (although such a permit is not expected to be necessary given the Maxwell UG Project is a SSD (DECCW, 2010a)).



6.5 Preparation of an ACHA

AECOM will prepare an ACHA for the Modification detailing the results of the above assessment and consultation with RAPs. The ACHA will provide appropriate management and mitigation measures for the study area's Aboriginal heritage values.

RAPs will be provided a copy of the draft ACHA report and will have the opportunity to comment on management and mitigation options proposed in the draft ACHA report.

The final ACHA report will incorporate any comments from the RAPs.

6.6 Impacts to Aboriginal Cultural Values

The study area falls within the area subject to management under the Maxwell Project's existing Aboriginal Cultural Heritage Management Plan. Accordingly, all impacts to Aboriginal archaeological sites from the Modification will be managed in accordance with this document. Management for impacted Aboriginal archaeological sites may include surface collection and salvage excavations that would be completed following determination of the Modification.

7.0 Modification Timeline

Current proposed timelines for the ACHA are:

- Collation of culturally significant information – ongoing throughout process until the end of the draft ACHA review period.
- RAP review of this draft proposed methodology – 4 February to 5 March 2022.
- Provision of a draft ACHA report to each RAP for review and comment – March/April 2022
- Period for comment on the draft ACHA report – a minimum of 28 days following provision of the draft report.
- Preparation of a final ACHA report in consideration of comments received.

The above timelines are preliminary only and are subject to change.

8.0 References

- AECOM Australia Pty Ltd. (2012). *Drayton South Coal Project: Aboriginal Archaeological and Cultural Heritage Impact Assessment*. Unpublished report for Hansen Bailey.
- AECOM Australia Pty Ltd. (2015). *Drayton South Coal Project Aboriginal Archaeological and Cultural Heritage Impact Assessment*. Unpublished report for Hansen Bailey.
- AECOM Australia Pty Ltd. (2019). *Maxwell Project: Aboriginal Cultural Heritage Assessment*. Sydney NSW: Unpublished report for Malabar Coal Limited.
- AECOM Australia Pty Ltd. (2021). *Maxwell Underground Mine Mine Entry Area Modification Project Aboriginal Cultural Heritage Assessment*. Unpublished report for Malabar Coal Limited.
- NSW Department of Environment Climate Change & Water. (2010a). *Aboriginal Cultural Heritage Consultation Requirements for Proponents*. Department of Environment, Climate Change and Water.
- NSW Department of Environment Climate Change & Water. (2010b). *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. Department of Environment, Climate Change and Water.

Attachment 1 – Roles, Responsibilities and Functions (NSW Department of Environment Climate Change & Water 2010a pp.15-17).

5 Roles, responsibilities and functions

For the consultation process to be effective, all parties must appreciate and respect each other's perspective and understand each other's interests, roles and responsibilities.

5.1 Department of Environment, Climate Change and Water

The Director General of DECCW is the decision-maker who decides whether to grant or refuse an AHIP application. If an AHIP is issued, conditions are usually attached and DECCW is responsible for ensuring the AHIP holder complies with those conditions. When considering an application under Part 6 of the NPW Act, the Director General will review the information provided by proponents in line with its internal policies and procedures to assess potential or actual harm to Aboriginal objects or places (DECCW, 2009).

The Environment Protection and Regulation Group (EPRG) of DECCW is responsible for administering the regulatory functions under Part 6 of the NPW Act. A map and list of DECCW EPRG regional offices is in Appendix A.

DECCW expects proponents and Aboriginal people should:

- be aware that Part 6 of the NPW Act establishes the Director General or delegate of DECCW as the decision-maker
- recognise that the Director General's (or delegates) decisions may not be consistent with the views of the Aboriginal community and/or the proponent. However, DECCW will take into account all relevant information it receives as part of its decision-making process.

Further information about the structure of DECCW, and the roles and responsibilities of various groups and the services provided, such as EPRG, Culture and Heritage Division (CHD), and Parks and Wildlife Group (PWG) can be found at: www.environment.nsw.gov.au/whoweare/planorgs.htm

5.2 Registered Aboriginal parties

The interests and obligations of Aboriginal people relate to the protection of Aboriginal cultural heritage. It is only Aboriginal people who can determine who is accepted by their community as being authorised to speak for Country and its associated cultural heritage. Where there is a dispute about who speaks for Country, it is appropriate for Aboriginal people, not DECCW or the proponent, to resolve this dispute in a timely manner to enable effective consultation to proceed.

It is expected that DECCW, proponents and service providers that act on their behalf should:

- display a meaningful appreciation, understanding and respect for the belief system, spiritual connection and sense of belonging that Aboriginal people have to their land, people and environment, which includes plants, animals, waterways, sacred sites and other places of cultural significance and importance
- uphold and respect the traditional rights, obligations and responsibilities of Aboriginal people who hold cultural knowledge in accordance with traditional lore and custom, particularly as these relate to the cultural business of men and women
- encourage active participation of culturally experienced and appropriate Aboriginal people who hold cultural knowledge in the consultation process
- encourage opportunities for the effective transfer of cultural knowledge from older to younger generations in accordance with traditional lore and custom through the consultation process
- have an awareness and understanding of how colonisation has impacted the Aboriginal people of Australia



- have an understanding and respect for the lore and customs, cultural practices, responsibilities and obligations that Aboriginal people have toward the continued care and conservation of Aboriginal objects and places.

Aboriginal people should:

- have an awareness and understanding of the commercial environment and constraints in which proponents operate
- develop and display an awareness and understanding of the opportunities to input into regulatory processes to contribute to decision making by proponents and government authorities.

5.2.1 NSW Aboriginal Land Council and Local Aboriginal Land Councils

The NSW Aboriginal Land Council (NSWALC) and Local Aboriginal Land Councils (LALCs) have statutory functions relevant to the protection of Aboriginal culture and heritage under the NSW *Aboriginal Land Rights Act 1983*. These requirements do not extend the role of NSWALC and LALCs in the significance assessment process. That is, these requirements do not provide NSWALC and/or LALCs any additional or specific decision-making role in the assessment of significance of Aboriginal object(s) and/or place(s) that are subject to an AHIP application under Part 6 of the NPW Act.

LALCs may choose to register an interest to be involved in the consultation process, or may assist registered Aboriginal parties to participate in the consultation process established by these requirements. In order to ensure effective consultation and the subsequent informed heritage assessment, LALCs are encouraged to identify and make contact with Aboriginal people who hold cultural knowledge in their area.

For further information on LALCs and the role they can play in these requirements, see DECCW's *Fact sheet 4: Local Aboriginal Land Councils*.

5.3 Proponents

Proponents operate within a commercial environment which includes:

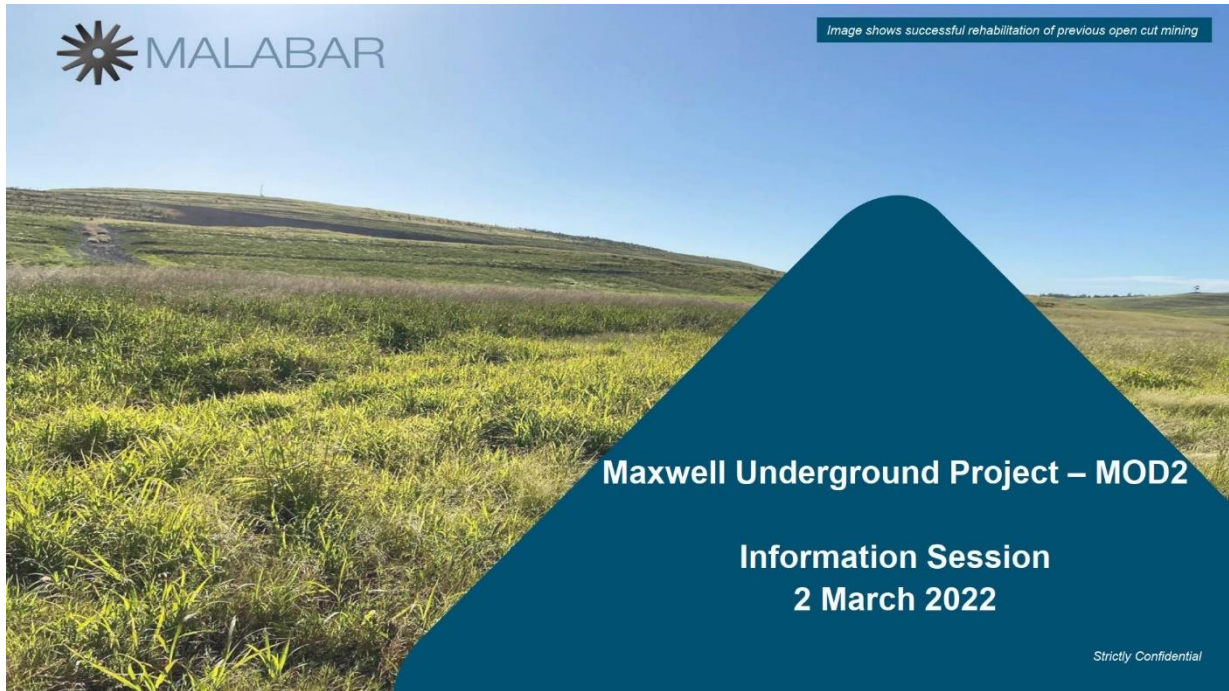
- financial and management issues, priorities and deadlines
- the need to obtain broad community support and acceptance in order to secure any necessary approval/consent/licence/permit to operate
- the desire for clearer processes and certainty of outcomes
- the need for suitable access to land for the purpose of their development project
- a need to work efficiently within the project's time, quality and cost planning and management parameters
- the need for culturally appropriate assessment findings relevant to their project.

Under these requirements, proponents should:

- bring the registered Aboriginal parties 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 registered Aboriginal parties involved in the consultation process in assessing cultural significance and developing any heritage management outcomes for Aboriginal object(s) and/or place(s)
- provide evidence to DECCW of consultation by including information relevant to the cultural perspectives, views, knowledge and advice provided by the registered Aboriginal parties
- accurately record and clearly articulate all consultation findings in the final cultural heritage assessment report



- provide copies of their cultural heritage assessment report to the registered Aboriginal parties who have been consulted
- submit an application to DECCW for an AHIP in a timely manner and with all required information.



Acknowledgement of Country

Malabar and AECOM would like to begin by acknowledging the Traditional Owners of the land on which we meet today. We would also like to pay our respects to Elders past, present and emerging.



Project Team

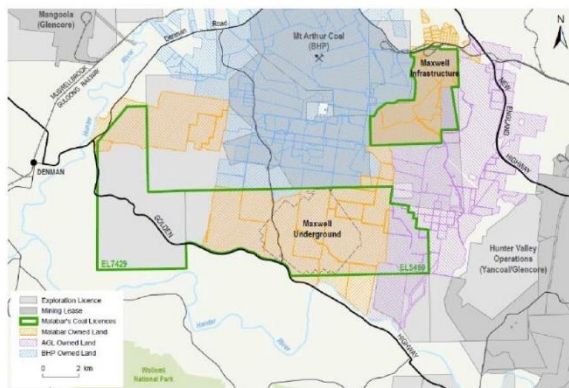
The project team consists of:

- Donna McLaughlin (Malabar Health, Safety, Environment and Community Manager)
- Teresa Coleman (Malabar Environment and Community Coordinator)
- Alex Newton (Malabar Environment and Approvals Coordinator)
- Geordie Oakes (AECOM Archaeologist)
- Andrew McLaren (AECOM Archaeologist)



Development of the Maxwell UG Project

Malabar is committed to developing the Project to co-exist with our neighbours and contribute positively to the local region and NSW.



- ✓ May 2017 – We announced we would develop the Project solely as an **underground mine**.
- ✓ December 2017 – EL5460 was renewed by the NSW Government after Malabar **voluntarily relinquished** that portion of the licence that was south of the Golden Hwy and **voluntarily** proposed conditions on the title to **prohibit open cut mining**.
- ✓ December 2017 – Malabar also publicly supported the NSW Government’s amendment to Mining SEPP to **prohibit open cut mining** in this location.
- ✓ 28 February 2018 – transfer of ownership occurred.
- ✓ March 2018 – **rehabilitation recommenced** at former Drayton Mine.
- ✓ 14 August 2019 – **EIS on exhibition**.
- ✓ 30 September 2020 – **NSW DPIE’s Assessment Report** states the project is approvable and refers it to the **Independent Planning Commission (IPC)**.
- ✓ 22 December 2020 – **IPC approves the Project**.
- ✓ 10 March 2021 – **Federal Minister approves the Project under EPBC Act**.



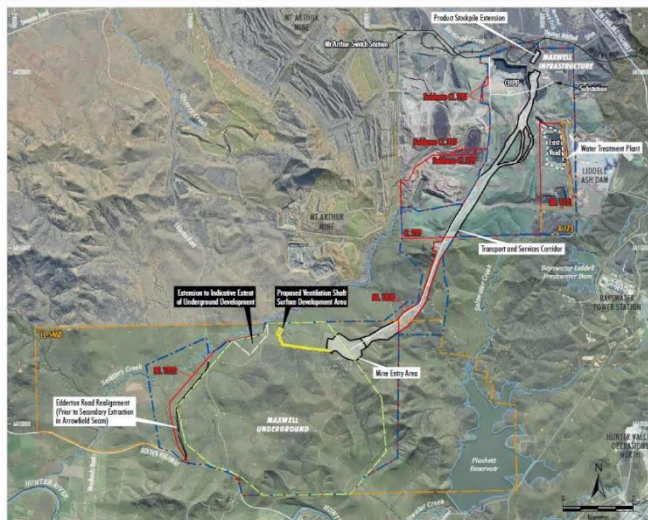
Introduction

- Malabar has continued to evaluate options to optimise the underground mining layout to improve efficiency and safety, including input from Malabar’s expanding technical and engineering team.
- An improved underground mine layout has been identified that achieves:
 - Safer working conditions
 - Lower capital cost to first production
 - Quicker ramp up to longwall mining (and associated economic and community benefits)
 - Minimal net incremental environmental impact relative to the approved underground mine layout.



5

MOD2 - Overview



- The proposed modification is wholly within Development Application Area.
- Key changes are:
 - Re-orientation of longwall panels to better align to geotechnical conditions
 - Commencing production in the Woodlands Hill seam initially with 145m wide longwall panels, and then increasing the longwall to 300m wide. (The EIS commences with a 300m wide longwall at the outset).
 - Relocation of the Woodlands Hill seam ventilation shaft to suit this revised mine layout.

- Approved Maxwell Underground Mine Development Application Area
- Indicative Extent of Underground Development
- Indicative Surface Development Area
- CHPP Reject Emplacement Area
- 66 kV Power Supply
- Proposed Modification
- Modified Indicative Extent of Underground Development
- Indicative Modification Surface Survey Area



6

MOD2 – revised longwall layout

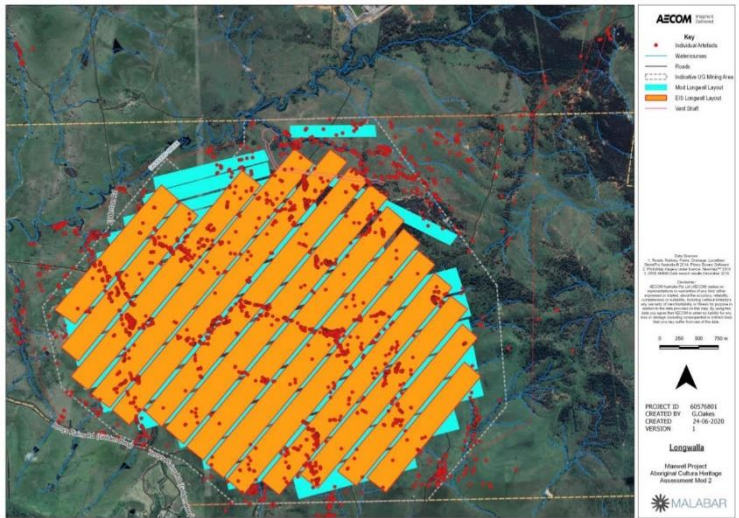


Archaeological Assessment

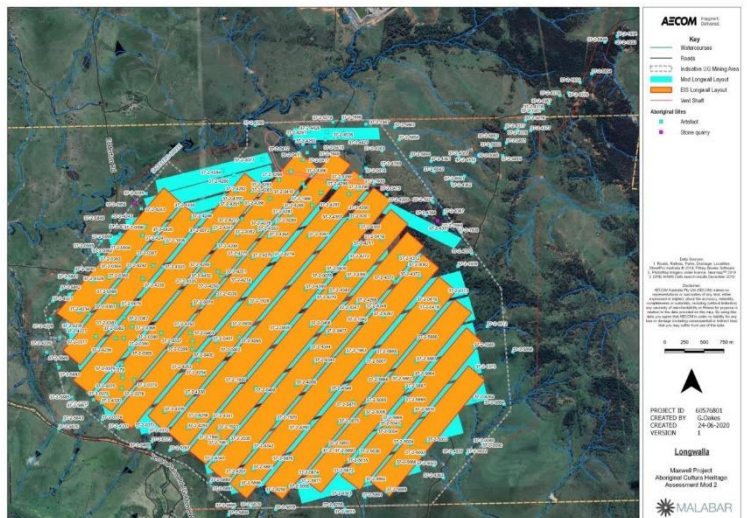
- The Longwall Modification is located across land previously surveyed by AECOM (2012, 2015, 2019) and RAPs for the Maxwell Project and former Drayton South Coal Project.
- A total of 238 Aboriginal archaeological sites, comprising 237 open artefact sites and one stone quarry were identified within proposed underground mining for the Maxwell Project.
- The ACHA study area for the Modification comprises an area encompassing the approved underground mining area.
- The ACHA study area for the Modification also includes the repositioning of approved ventilation shaft site.
- Both of these areas have been subject to previous detailed survey.



Archaeological Assessment



Archaeological Assessment



Methodology

1. Background research
2. Utilisation of the results of previous surveys undertaken for the previous projects in 2012, 2015 and 2018 (i.e., as presented in AECOM [2012, 2015 and 2019]).
3. Consultation with Registered Aboriginal Parties in order to identify the Aboriginal cultural heritage values of the study area.
4. Malabar has engaged a specialist to complete a subsidence assessment. AECOM will use the results of the subsidence assessment to guide the impact assessment in the ACHAR.
5. Preparation of a draft ACHA for the study area detailing the results of the above. Potential impacts and management/mitigation measures for the identified Aboriginal heritage values of the indicative study area will be provided in the draft ACHA. The following steps would be included during this stage:
 - a) Provision of the draft ACHA report to the Registered Aboriginal Parties for review and comment.
 - b) Registered Aboriginal Parties provide comments on the draft ACHA report.
 - c) Finalisation of draft ACHA report in consideration of Registered Aboriginal Party comments.



11

Cultural Values

During the assessment process, AECOM archaeologists will consult with Registered Aboriginal Parties regarding the cultural heritage values of objects and places in the study area.

- Cultural values can include:
 - Story sites
 - Pathways
 - Ancestral/mythological figures in the landscape
 - Traditional resource and camping areas
 - Historical living areas

Cultural Values process will include:

- Recording of any initial comments regarding the Aboriginal cultural heritage values of the study area at this meeting or through the engagement process.
- Discussion of cultural heritage values with Registered Aboriginal Parties throughout the process until the end of the draft ACHA review period.
- Provision of draft ACHA to all Registered Aboriginal Parties for comment prior to finalisation.
- Private meetings (as requested) with Registered Aboriginal Parties to discuss cultural values.
- Respect and protection of cultural information is central to the process. We'll develop appropriate protocols for sensitive or restricted information.



12

Management

- An Aboriginal Cultural Heritage Management Plan (ACHMP) has been prepared and approved for the Maxwell Project
- Any recommendations coming out of the ACHAR for Mod 2 will be included in an updated version of the ACHMP
- Currently the ACHMP contains the following recommendations in relation to subsidence:
 - Subsidence monitoring will be conducted during mining and for a specified period post-mining, with a digital record kept of the nature, location and extent of all subsidence-related surface impacts within the site.
 - Where subsidence-related impacts, such as surface cracking, are identified within the boundary of an existing Aboriginal object or place of moderate (or high) scientific significance, or where remediation works (i.e., reshaping, recontouring and revegetation of the land surface) are required to address subsidence impacts, the Aboriginal site or place would be inspected to determine the nature and extent of impacts, and whether mitigation is required.
 - Mitigation measures for subsidence may include further monitoring, surface collection or open area salvage excavation.



13

Questions/Discussion

*Thank you for your attendance
today.*



14

Appendix B

RAP Responses to Draft Methodology

Appendix B RAP Responses to Draft Methodology

Oakes, Geordie

From: jesse johnson <muragadi@yahoo.com.au>
Sent: Sunday, 6 February 2022 8:00 AM
To: Oakes, Geordie
Subject: [EXTERNAL] Re: Maxwell Underground Coal Mine Project - Modification Application (2) - ACHA Methodology
Attachments: Maxwell Methodology Longwall Mod_2022_02_04.pdf

Hi Geordie,
I have read the project information and methodology for the above project, I agree with the recommendations made. If you require further information please do not hesitate in contacting me further.
Kind regards
Jesse Johnson
0418970389

On Friday, 4 February 2022, 12:44:51 pm AEDT, Oakes, Geordie <geordie.oakes@aecom.com> wrote:

Dear RAP,

AECOM has been commissioned by Maxwell Ventures (Management) Pty Ltd to prepare an Aboriginal Cultural Heritage Assessment (ACHA) for a modification application under section 4.55(1A) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Maxwell Underground Coal Mine Project.

In accordance with Section 4.3.1 of Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010), please find attached for your review the proposed Aboriginal Cultural Heritage Assessment methodology for the modification.

If you have any comments on the proposed methodology these can be provided in writing or by phone. Please note that the closing date for comments is 5 March 2022.

All the best,

Geordie

Geordie Oakes
Principal Archaeologist and Heritage Specialist
M +61410513509
Geordie.Oakes@aecom.com

AECOM
Level 21, 420 George Street, Sydney, NSW 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8008 1700
www.aecom.com

Oakes, Geordie

From: Maree Waugh <wallangan@outlook.com>
Sent: Sunday, 6 February 2022 10:48 AM
To: Oakes, Geordie
Subject: [EXTERNAL] Re: Maxwell Underground Coal Mine Project - Modification Application (2) - ACHA Methodology

Hi Geordie,

I'm happy with the methodology for the Maxwell Underground coal project.

Maree Waugh

Sent from [Outlook Mobile](#)

From: Oakes, Geordie <Geordie.Oakes@aecom.com>
Sent: Friday, February 4, 2022 12:43:18 PM
To: Oakes, Geordie <Geordie.Oakes@aecom.com>
Subject: Maxwell Underground Coal Mine Project - Modification Application (2) - ACHA Methodology

Dear RAP,

AECOM has been commissioned by Maxwell Ventures (Management) Pty Ltd to prepare an Aboriginal Cultural Heritage Assessment (ACHA) for a modification application under section 4.55(1A) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Maxwell Underground Coal Mine Project.

In accordance with Section 4.3.1 of Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010), please find attached for your review the proposed Aboriginal Cultural Heritage Assessment methodology for the modification.

If you have any comments on the proposed methodology these can be provided in writing or by phone. Please note that the closing date for comments is 5 March 2022.

All the best,
Geordie

Geordie Oakes
Principal Archaeologist and Heritage Specialist
M +61410513509
Geordie.Oakes@aecom.com

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Please consider the environment before printing this email.

Oakes, Georgie

From: Carolyn .H <cazadirect@live.com>
Sent: Monday, 21 February 2022 3:28 PM
To: Oakes, Georgie
Subject: [EXTERNAL] Re: Maxwell Underground Coal Mine Project - Modification Application (2) - ACHA Methodology
Attachments: 2NSW Member Certificate 2022 - A1 INDIGENOUS SERVICES PTY LTD.pdf; A1.WC2022.pdf; A1.PL2023.pdf



Contact: Carolyn Hickey
Mobile: 0411650057
Email: Cazadirect@live.com
Address: 10 Marie Pitt Place, Glenmore Park, NSW 2745
ACN: 639 868 876
ABN: 31 639 868 876

Hi,

I have reviewed the document and support the Information and Methodology.

We would like the Proponent to consider including **A1's, Kawalkan youth and the Women's Circle Employees** for all future field work.

The Kawalkan Youth Program is a designed program created to employ young indigenous youths between the ages of (18-29) years of age.

The Women's Circle was created with the need to always have Experienced Indigenous Women present in all field work.

To aim for not only gender equality in the workplace but, to help identify and protect any women's sacred places.

Please feel free to contact me on details supplied

Kind Regards,
Carolyn Hickey
Managing Director

Oakes, Geordie

From: Darleen Johnson <murrabidgeemullangari@yahoo.com.au>
Sent: Monday, 28 February 2022 11:20 AM
To: Oakes, Geordie
Subject: [EXTERNAL] Re: Maxwell Underground Coal Mine Project - Modification Application (2) - ACHA Methodology
Attachments: Maxwell Methodology Longwall Mod_2022_02_04.pdf

Hi Geordie,
I have read the project information and methodology for the above project, I endorse the recommendations made.
Kind regards
Darleen Johnson
0490051102

On Friday, 4 February 2022, 12:44:50 pm AEDT, Oakes, Geordie <geordie.oakes@aecom.com> wrote:

Dear RAP,

AECOM has been commissioned by Maxwell Ventures (Management) Pty Ltd to prepare an Aboriginal Cultural Heritage Assessment (ACHA) for a modification application under section 4.55(1A) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the Maxwell Underground Coal Mine Project.

In accordance with Section 4.3.1 of Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010), please find attached for your review the proposed Aboriginal Cultural Heritage Assessment methodology for the modification.

If you have any comments on the proposed methodology these can be provided in writing or by phone. Please note that the closing date for comments is 5 March 2022.

All the best,

Geordie

Geordie Oakes
Principal Archaeologist and Heritage Specialist
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Geordie.Oakes@aecom.com

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Appendix C

RAP Responses to Draft
Report

Appendix C RAP Responses to Draft Report

Oakes, Geordie

From: lilly carroll <didgengunawalclan@yahoo.com.au>
Sent: Sunday, 1 May 2022 6:29 PM
To: Oakes, Geordie
Subject: [EXTERNAL] Re: Maxwell Underground Coal Mine Project - Modification Application (2) - Draft ACHA for Review

Where all good from our end Geordie

Sent from Yahoo Mail for iPhone

On Sunday, May 1, 2022, 12:37 pm, Oakes, Geordie <Geordie.Oakes@aecom.com> wrote:

Dear RAP,

In accordance with Section 4.4.2 of Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010), please find attached a draft of AECOM's Aboriginal Cultural Heritage Assessment (ACHA) for the Maxwell Underground Mine Project –Modification 2 for your review

Should you have any cultural values or comments you would like included in the ACHA please provide those by mail, e-mail or phone to Geordie Oakes via the contact details on this email. Please note that the closing date for comments is **30 May 2022**.

All the best,

Geordie

Geordie Oakes
Principal Archaeologist and Heritage Specialist
M +61410513509
Geordie.Oakes@aecom.com

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T +61 2 8008 1700
www.aecom.com

Please consider the environment before printing this email.

Oakes, Geordie

From: Shaun Carroll <Merrigarn@hotmail.com>
Sent: Tuesday, 31 May 2022 10:58 AM
To: Oakes, Geordie
Subject: [EXTERNAL] RE: Maxwell Underground Coal Mine Project - Modification Application (2) - Draft ACHA for Review

Hi Geordie,
I have read the project information and draft ACHA for the above project, I agree with the recommendations made.
Kind regards
Shaun Carroll

Sent from [Mail](#) for Windows

From: Oakes, Geordie <Geordie.Oakes@aecom.com>
Sent: Sunday, May 1, 2022 12:33:45 PM
To: Oakes, Geordie <Geordie.Oakes@aecom.com>
Subject: Maxwell Underground Coal Mine Project - Modification Application (2) - Draft ACHA for Review

Dear RAP,

In accordance with Section 4.4.2 of Heritage NSW's *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010), please find attached a draft of AECOM's Aboriginal Cultural Heritage Assessment (ACHA) for the Maxwell Underground Mine Project –Modification 2 for your review.

Should you have any cultural values or comments you would like included in the ACHA please provide those by mail, e-mail or phone to Geordie Oakes via the contact details on this email. Please note that the closing date for comments is **30 May 2022**.

All the best,
Geordie

Geordie Oakes
Principal Archaeologist and Heritage Specialist
M +61410513509
Geordie.Oakes@aecom.com

AECOM
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PO Box Q410, QVB PO, Sydney, NSW, 1230
T +61 2 8008 1700
www.aecom.com

Please consider the environment before printing this email.

Appendix D

Consultation Log


Appendix D Consultation Log

| Date | RAP | RAP Representative | Contact | Correspondence/Comments |
|-------------------|--|--------------------|---------|--|
| 4/02/2022 | Methodology for Modification Sent | | | |
| 6/02/2022 | Wallagan | Maree Waugh | Email | "I am happy with the methodology" |
| 6/02/2022 | Muragadi | Jesse Johnson | Email | "I agree with the recommendations made" |
| 28/02/2022 | Muragadi | Jesse Johnson | Email | "I have read the project information and methodology for the above project, I agree with the recommendations made" |
| 28/02/2022 | Murra Bidgee Mullangari | Ryan Johnson | Email | "I have read the project information and methodology for the above project, I endorse the recommendations made." |
| 21/02/2022 | A1 Indigenous | Carolyn Hickey | Email | "I have reviewed the document and support the Information and Methodology" |
| 12/02/2022 | Invitation to attend Information Session sent to RAPs | | | |
| 2/03/2022 | Information Session held at Maxwell Site | | | |
| 1/05/2022 | ACHAR Sent Out | | | |
| 1/05/2022 | DNC | Lilly Carroll | Email | "Where all good from our end Geordie" |
| 31/05/2022 | Merrigarn | Shaun Carrol | Email | "I have read the project information and draft ACHA for the above project, I agree with the recommendations made" |

Appendix E


AHIMS Site Cards for
Impacted Sites

Appendix E AHIMS Site Cards for Impacted Sites



National Parks and Wildlife Service

Standard Site Recording Form



37-2-0415

REGISTER COPY

| MAPNAME | EDITION | SCALE | REFERENCE | HEAD OFFICE USE ONLY: |
|--|-----------------------|---|---|--|
| Singleton SI56-1 | 1st | 1:250,000 | 3850 9925 | NWPS site no: 37-2-415 |
| Jerrys Plains 9033-II-S | 1st | 1:25,000 | <i>2/987/19</i> | Site types: Open Site (Artefacts) |
| Site name: MAS 71 | | | | File nos: |
| SITE DESTROYED | | | | Report filed with site no: |
| | | | | Classification: Site status: C-D |
| Local post office: Jerrys Plains 2330 | | | | Filed by: <i>RA</i> |
| Locality/property name: Mount Arthur South Lease Area | | | | Date: 28/10/85 |
| NPWS District: Upper Hunter | | Region: Central | | |
| Reason for investigation (give H.O. instruction no. or full title of accompanying report where applicable): Koettig, M. & Hughes, P.J. 1985 AN ARCHAEOLOGICAL SURVEY OF THE PLASHETT DAM AND THE MOUNT ARTHUR NORTH AND MOUNT ARTHUR SOUTH COAL MINING PROJECT AREAS, HUNTER VALLEY, NSW. A report to ELCOM NSW and MOUNT ARTHUR SOUTH COAL PTY LTD. | | | | |
| Portion no: | Other land category: | | Plan/sketch/section of site attached? Yes/No. | |
| Parish: Wynburn | County: Durham | | How many? | |
| Air photo refs. (for stereo pair) | | | Annotated photos attached? Yes/No | |
| | | | How many? | |
| Condition of site: | | Causes of damage/disturbance/threat to site: (Fill in separate management/protection recommendations sheet if necessary) | | |
| How to get to the site (refer to permanent features, give best approach to site eg. from above, below, along cliff. Draw diagram on separate sheet if necessary). | | | | |
| See Report | | | | |
| Other sites in locality? Yes/ <input checked="" type="checkbox"/> | | Site Types include: Surface scatter of stone artefacts, grinding grooves. | | |
| Are sites in NPWS Register? Yes/ <input checked="" type="checkbox"/> | | Unregistered sites-plans for future recording? Yes/No. | | |
| Have artefacts been removed from site? <input checked="" type="checkbox"/> No / <input checked="" type="checkbox"/> Yes When? By whom? Deposited where? | | | | |
| Is site important to local Aborigines? Yes/No/don't know. Statement of interest in the project prepared by the Sites Committee of the Wanaruah Local Aboriginal Land Council. | | | | |
| Give contact(s) name(s) + address(es) | | | | |
| Contacted for this recording? Yes/No. (Attach additional information separately) If not, why not? | | | | |
| Verbal/written reference sources: | | | | |
| Site recorded by: M. Koettig Date: January 1984 | | | | |
| Address/institution: ANUTECH Pty Ltd, GPO Box 4, CANBERRA CITY ACT 2601 | | | | |

37-2-415.

HUNTER VALLEY - OPEN SITES

Site No. MAS 71 Survey Area H. Asher South

Map Sheet Name & Grid Ref _____ Name(s) of recorder(s) _____

1:250,000 3850 9925 S. S. S. S. S.

1:25,000 987 119 Jungs Plains

Level of Recording: Total Sample Summary

ENVIRONMENTAL SETTING

| | Cross | Name | | Cross |
|-----------------------------|-------------------------------------|------|------------------------------------|---|
| Topographic Location | | | Vegetation Cover | |
| major creek/river | <input type="checkbox"/> | | Surrounding site | <input type="checkbox"/> |
| minor creek | <input checked="" type="checkbox"/> | | dense woodland | <input type="checkbox"/> |
| diffuse drainage | <input type="checkbox"/> | | open woodland | <input type="checkbox"/> |
| line | <input type="checkbox"/> | | parkland | <input type="checkbox"/> |
| creek flats | <input type="checkbox"/> | | scrub thicket | <input type="checkbox"/> |
| creek banks | <input checked="" type="checkbox"/> | | grassland | <input checked="" type="checkbox"/> cultivated. |
| creek junction | <input type="checkbox"/> | | other (specify) | <input type="checkbox"/> <u>excavated - add one</u> |
| valley floor | <input type="checkbox"/> | | CONSENT TO DESTROY | |
| footslope | <input checked="" type="checkbox"/> | | ISSUED | |
| hillslope | <input type="checkbox"/> | | Distance to nearest <u>37000 2</u> | |
| ridgetop | <input type="checkbox"/> | | creek/river | |
| saddle | <input type="checkbox"/> | | 0-50m | <input checked="" type="checkbox"/> |
| knoll | <input type="checkbox"/> | | 50-100m | <input type="checkbox"/> |
| spur | <input type="checkbox"/> | | 100-200m | <input type="checkbox"/> |
| Slope | | | 200-300m | <input type="checkbox"/> |
| Flat (2°) | <input type="checkbox"/> | | more than 300m | <input type="checkbox"/> |
| gentle (2-5°) | <input checked="" type="checkbox"/> | | (specify) | |
| moderate (5-10°) | <input type="checkbox"/> | | SITE DESTROYED | |
| steep (10°) | <input type="checkbox"/> | | | |

Aspect, i.e. direction of site faces _____

Distance to, and nature of nearest drinking water source _____

SITE CONTEXT AND CONDITION

Visibility of Ground Surface on the Site _____

Vegetation cover, nature & extent grass beyond site

Organic litter cover, nature & extent _____

1



Aboriginal Site Recording Form



AHIMS Registrar
PO Box 1967, Hurstville NSW 2220

Office Use Only

Site Number - -

Date received / / Date entered into system / / Date catalogued / /

Entered by (I.D.)

Information Access

Gender/male Gender/female Location restriction General restriction No access

For Further Information Contact:

Nominated Trustee

Title Surname First Name Initials

Organisation

Address

Phone number Fax

Knowledge Holder

Title Surname First Name Initials

Organisation

Address

Phone number Fax

Aboriginal Heritage Unit or Cultural Heritage Division Contacts

Office Use Only

Client on system

Client on system

Geographic Location

Site Name

Easting Northing AGD/GDA

Mapsheet

Zone Location Method

Other Registration

Primary Recorder

Title Surname First Name Initials

Organisation

Address

Phone number Fax

Date recorded

Client on system

General Site Information

Closed Site

Shelter/Cave Formation

- Boulder
- Wind erosion
- Water erosion
- Rock collapse

Rock Surface Condition

- Boulder
- Sandstone platform
- Silica gloss
- Tessellated
- Weathered
- Other platform

Open Site

Site Orientation

- N-S
- NE-SW
- E-W
- SE-NW
- N/A

Condition of Ceiling

- Boulder
- Sandstone platform
- Silica gloss
- Tessellated
- Weathered
- Other platform

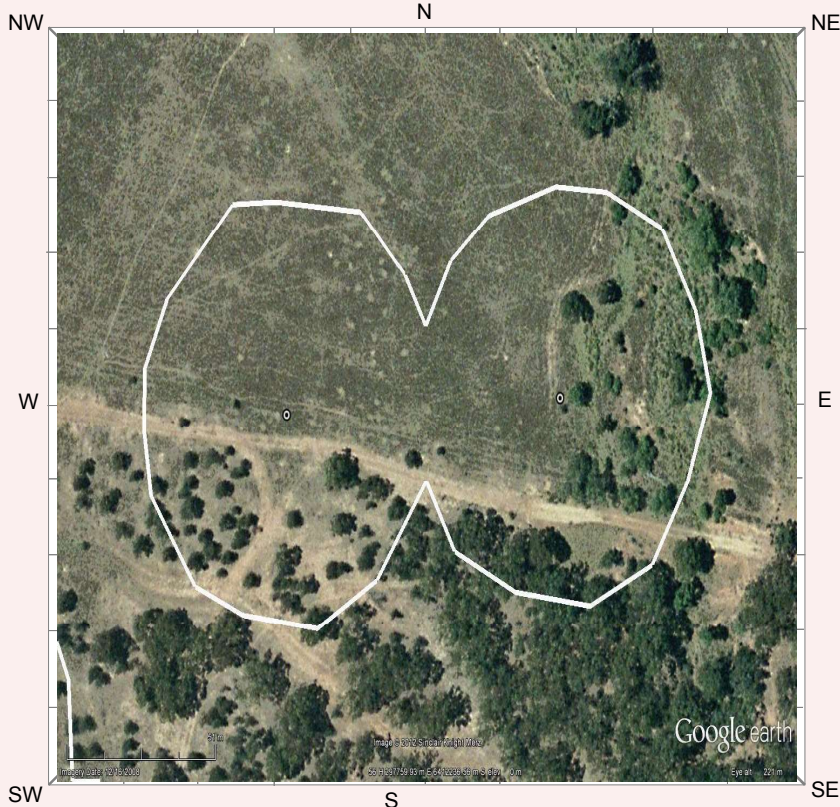
Shelter Aspect

- North
- North East
- East
- South East
- South
- South West
- West
- North West

Features

- 1. Aboriginal Ceremony & Dreaming
- 2. Aboriginal Resource & Gathering
- 3. Art
- 4. Artefact
- 5. Burial
- 6. Ceremonial Ring
- 7. Conflict
- 8. Earth Mound
- 9. Fish Trap
- 10. Grinding Groove
- 11. Habitation Structure
- 12. Hearth
- 13. Non Human Bone & Organic Material
- 14. Ochre quarry
- 15. Potential Archaeological Deposit
- 16. Stone Quarry
- 17. Shell
- 18. Stone Arrangement
- 19. Modified Tree
- 20. Water Hole

Site Plan Indicate scale, boundaries of site, features



Site Dimensions

Closed Site Dimensions (m)

- Internal length
- Internal width
- Shelter height
- Shelter floor area

Open Site Dimensions (m)

- Total length of visible site
- Average width of visible site
- Estimated area of visible site
- Length of assessed site area

Aboriginal Community Interpretation and Management Recommendations

Multiple horizontal lines for text entry.

Preliminary Site Assessment

Site Cultural & Scientific Analysis and Preliminary Management Recommendations

Low scientific significance
Common site type. No rare artefacts. Limited research potential. Moderate site integrity.

Multiple horizontal lines for text entry.

This section should only be filled in by the Endorsees

Endorsed by: Knowledge Holder Nominated Trustee Native Title Holder Community Consensus

Form fields for Title, Surname, First Name, Initials, Organisation, Address, Phone number, Fax.

Attachments (No.)

- Checkboxes for A4 location map, B/W photographs, Colour photographs, Slides, Aerial photographs, Site plans, drawings, Recording tables, Other, Feature inserts-No.

Comments

Text box containing comment: DS-AS70-11 is an artefact scatter located on the western bank of a feeder creek of Saddlers Creek approximately 2.2 km east of Edderton Road. The scatter consists of one silcrete and one mudstone flake.



Aboriginal Site Recording Form



AHIMS Registrar
PO Box 1967, Hurstville NSW 2220

Office Use Only

Site Number - -

Date received / / Date entered into system / / Date catalogued / /

Entered by (I.D.)

Information Access

Gender/male Gender/female Location restriction General restriction No access

For Further Information Contact:

Nominated Trustee

Title Surname First Name Initials

Organisation

Address

Phone number Fax

Knowledge Holder

Title Surname First Name Initials

Organisation

Address

Phone number Fax

Aboriginal Heritage Unit or Cultural Heritage Division Contacts

Office Use Only

Client on system

Client on system

Geographic Location

Site Name

Easting Northing AGD/GDA

Mapsheet

Zone Location Method

Other Registration

Primary Recorder

Title Surname First Name Initials

Organisation

Address

Phone number Fax

Date recorded

Client on system

General Site Information

Closed Site

Shelter/Cave Formation

- Boulder
- Wind erosion
- Water erosion
- Rock collapse

Rock Surface Condition

- Boulder
- Sandstone platform
- Silica gloss
- Tessellated
- Weathered
- Other platform

Condition of Ceiling

- Boulder
- Sandstone platform
- Silica gloss
- Tessellated
- Weathered
- Other platform

Shelter Aspect

- North
- North East
- East
- South East
- South
- South West
- West
- North West

Open Site

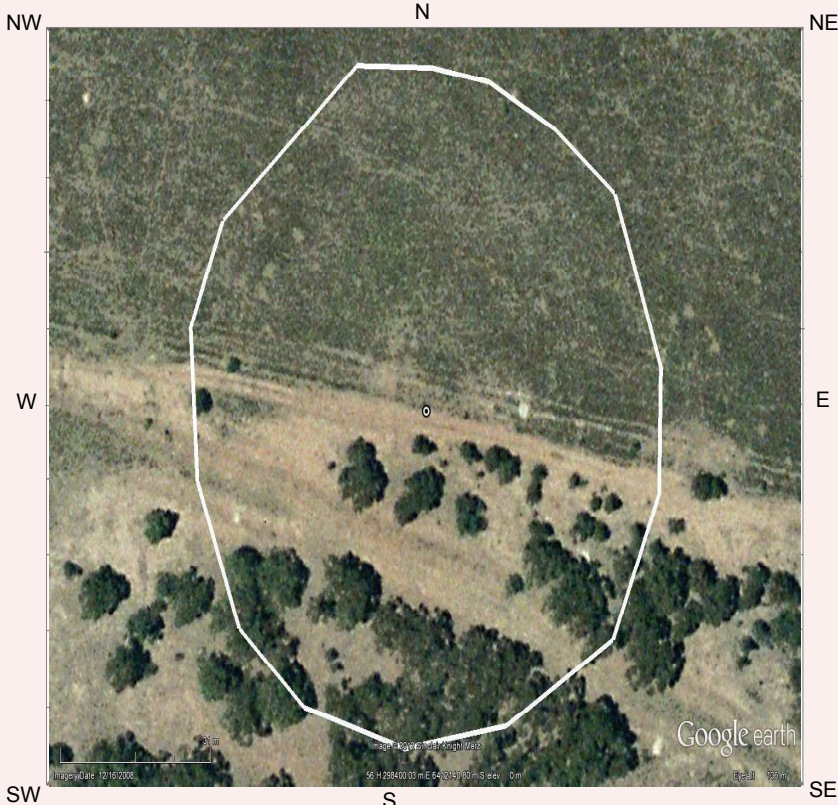
Site Orientation

- N-S
- NE-SW
- E-W
- SE-NW
- N/A

Features

- 1. Aboriginal Ceremony & Dreaming
- 2. Aboriginal Resource & Gathering
- 3. Art
- 4. Artefact
- 5. Burial
- 6. Ceremonial Ring
- 7. Conflict
- 8. Earth Mound
- 9. Fish Trap
- 10. Grinding Groove
- 11. Habitation Structure
- 12. Hearth
- 13. Non Human Bone & Organic Material
- 14. Ochre quarry
- 15. Potential Archaeological Deposit
- 16. Stone Quarry
- 17. Shell
- 18. Stone Arrangement
- 19. Modified Tree
- 20. Water Hole

Site Plan Indicate scale, boundaries of site, features



Site Dimensions

Closed Site Dimensions (m)

- Internal length
- Internal width
- Shelter height
- Shelter floor area

Open Site Dimensions (m)

- Total length of visible site
- Average width of visible site
- Estimated area of visible site
- Length of assessed site area

Aboriginal Community Interpretation and Management Recommendations

Preliminary Site Assessment

Site Cultural & Scientific Analysis and Preliminary Management Recommendations

Low scientific significance
 Common site type. No rare artefacts. Limited research potential. Moderate site integrity.

This section should only be filled in by the Endorsees

Endorsed by: Knowledge Holder Nominated Trustee Native Title Holder Community Consensus

| | | | |
|----------------------|----------------------|----------------------|----------------------|
| Title | Surname | First Name | Initials |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Organisation | <input type="text"/> | | |
| Address | <input type="text"/> | | |
| Phone number | <input type="text"/> | Fax | <input type="text"/> |

Attachments (No.)

- A4 location map
- B/W photographs
- Colour photographs
- Slides
- Aerial photographs
- Site plans, drawings
- Recording tables
- Other
- Feature inserts-No.

Comments

DS-AS70-11 is an artefact scatter located on the western bank of a feeder creek of Saddlers Creek approximately 2.2 km east of Edderton Road. The scatter consists of one silcrete and one mudstone flake.

Appendix F

Salvage Methodology

Appendix F Salvage Methodology

1.0 Introduction

This research design and archaeological salvage methodology has been prepared to guide the archaeological salvage program recommended for sites 37-2-4294, 37-2-4358 and 37-2-0415 as well as the area of archaeological sensitivity impacted by the ventilation shaft and access track. Surface collection is recommended as an appropriate mitigation measure for 37-2-4294, 37-2-4358 and part of 37-2-0415 on the basis of their scientific significance. Salvage excavation has been recommended for the area of high archaeological sensitivity impacted by the ventilation shaft and access track (Figure 26).

2.0 Objectives of the Salvage Program

The overarching objectives of the salvage program are as follows:

- To record and collect all visible surface artefacts within the impacted portions of 37-2-4294, 37-2-4358 and 37-2-0415;
- To salvage a representative and statistically viable subsurface assemblage of stone artefacts from the area of archaeological sensitivity impacted by the vent shaft and access track;
- To undertake post-excavation analyses that will produce and conserve knowledge of past Aboriginal occupation of the area of sensitivity; and
- To investigate the broader archaeological and cultural context of the area through comparative analyses of the results of the current salvage program with those conducted in the greater Upper Hunter region.

3.0 Research Questions

The following general research questions will be used to guide the post-excavation analysis component of the salvage program:

1. When and how was the area being utilised by Aboriginal people?
2. Are there naturally occurring deposits of silcrete/tuff gravels present associated with Saddlers Creek? If so, is there any evidence of quarrying of these materials by Aboriginal people?
3. If there is evidence of quarrying, how does that compare to other quarry sites in the Upper Hunter?
4. What, if any, evidence exists to indicate that Aboriginal people were deliberately heat treating stone?
5. What types of tools were being produced?
6. What raw materials are being utilised and where are they being obtained/quarried?
7. What technological and/or typological similarities/differences are apparent between the excavated stone artefact assemblages and those from other local and sub-regional contexts?

4.0 Methodology

A four phase archaeological salvage program is proposed with the following phases.

Phase 1 Surface Collection

Phase 1 will involve the surface collection of all Aboriginal objects located within the impacted portions of sites 37-2-4294, 37-2-4358 and 37-2-0415. The field methodology for surface collection is as follows:

1. Inspection of the impacted portion of the site by a combined field team of at least one qualified archaeologist and an appropriate number RAP representatives;
2. Flagging of all visible Aboriginal objects;
3. Detailed photographic recording of collection area;
4. The recording of individual artefact locations using a hand-held differential GPS; and
5. Collection and bagging of identified artefacts.

All surface collected artefacts will be assigned Unique Reference Numbers (URNs) for accessioning and data analysis purposes.

Phase 2 Geophysical Survey

Phase 2 of the salvage program will involve geophysical survey of the area of archaeological sensitivity for the purposes of identifying geophysical anomalies of potential Aboriginal archaeological significance (eg, burials, hearths, ground ovens and heat treatment pits). The survey will be undertaken by suitably qualified geophysical survey specialist who will be responsible for determining the most appropriate type of survey in view of available environmental data and a site inspection. The specialist, in consultation with the lead archaeologist, will also be responsible for selecting sample areas, if required.

Phase 3 Open Area Excavation

In view of the subsurface potential of the area of archaeological sensitivity up to 100 m² of open area excavation will be undertaken across the area. The extent of open plan excavation at the sites will be driven by observed lithic distributions and the presence/absence of inset archaeological features such as raw material deposits, hearths and heat treatment pits.

The placement of the open area excavation within the area (if required) will be guided by an initial program of test excavation with a series of 1 m² pits placed on a 20 m grid within the portion of the area of sensitivity impacted by the Project (Figure 26). In addition, geophysical anomalies of potential Aboriginal archaeological significance identified in Phase 2 will be subject to test excavation. Open area excavation will be centred on locations where artefact counts are equal to or above 30 artefacts/m², archaeological features, or the test pit with high richness values are intercepted.

The proposed excavation methodology is as follows:

- All excavation will be carried out manually using trowels, shovels and mattocks;
- Open area excavation will proceed in 1 m² units at only at test pit locations where the artefact counts are equal to or above 30 artefacts/m² archaeological features, or the test pit with high richness values are intercepted.
- Should no test pit locations contain artefact counts equal to or over 30 artefacts/m², archaeological features, or high richness values, then open area excavations would not be required.
- At locations where the open area excavation trigger is met, excavation will commence with 1 m x 1 m units placed at cardinal points (N,S,E,W) to the units that meet the 30 artefacts/m² trigger. Should any additional cardinal 1 m x 1 m satisfy the 30 artefacts/m² trigger, excavation will continue in this manner to a maximum of 100 m² of open area excavation is completed for the entire area.
- All excavation units will be excavated in 10 cm spits down to the base of the identified A₂ soil horizon;
- Photographic and scale-drawn records of representative soil profiles will be made;
- If specific archaeological features (e.g., hearths, heat treatment pits) are identified, the entire feature will be excavated and recorded prior to the continuation of excavation. Features will be photographed and scale plans drawn;
- Where encountered, charcoal deemed suitable for radiocarbon dating will be collected using 'best practice' guidelines (e.g., Burke and Smith 2004: 154);
- Soil samples will be retained for pH testing and soil description;
- Soil samples for OSL dating will be collected from selected strata using best practice guidelines (e.g., United States Geological Survey 2015);
- All excavated soils will be wet-sieved through 5 mm gauge sieves; and
- Artefacts recovered from sieving will be retained in plastic zip-lock bags and labelled with appropriate provenance date.

Phase 4 Geomorphological Assessment

A suitably qualified geomorphologist will be engaged to undertake a geomorphological assessment of excavated soils and soil profiles within the excavation areas. This assessment will, at a minimum, involve the following:

- A desktop review of existing soil data and historic aerial photographs for the areas;
- A visual inspection of excavated soils and soil profiles during the salvage excavation; and
- Characterisation of extant soils and soil profiles using standard sedimentological techniques and terminology.

The engaged geomorphologist will provide a stand-alone report detailing the results of their assessment.

5.0 Post-Salvage Analyses & Reporting

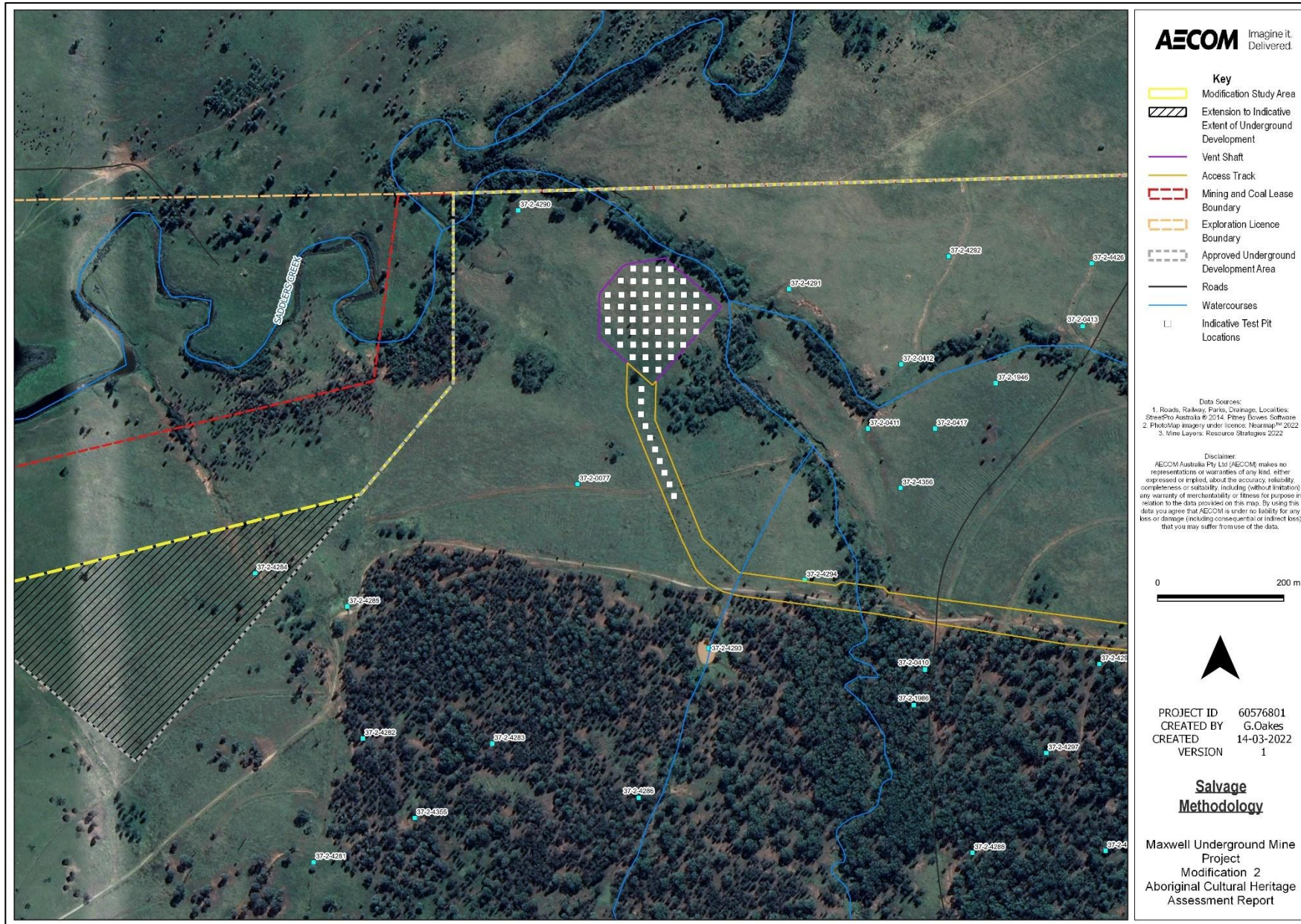
All stone artefacts recovered during the excavation program will be subject to detailed technological analysis by a qualified archaeologist. Artefacts will be analysed to a level comparable to that achieved in previous analyses of excavated lithic assemblages in the Hunter Valley so as to facilitate a rigorous and meaningful comparative analysis of intra-regional assemblage composition.

Results from the above archaeological salvage program will be included in the broader Archaeological Salvage Report (ASR) that will be prepared following completion of all salvage activities for the Project as per the Project's approved ACHMP. The ASR will be completed within one year of the fieldwork component of the program. Reporting will be consistent with the best practice guidelines suggested by the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010b) and the *Aboriginal Cultural Heritage Standards & Guidelines Kit* (NSW NPWS 1997). Copies of the final salvage report will be provided to all RAPs and the Heritage NSW within 14 days of completion.

6.0 Care & Control of Recovered Artefacts

All Aboriginal objects recovered from the study area as part of the salvage program would be stored temporarily at AECOM's head office (Level 8, 420 George Street, Sydney, NSW) while post-excavation analyses are being completed. Upon completion of post-excavation analyses, the artefacts will be managed in accordance with the Project's approved ACHMP.

Figure 26 Salvage methodology



Appendix G

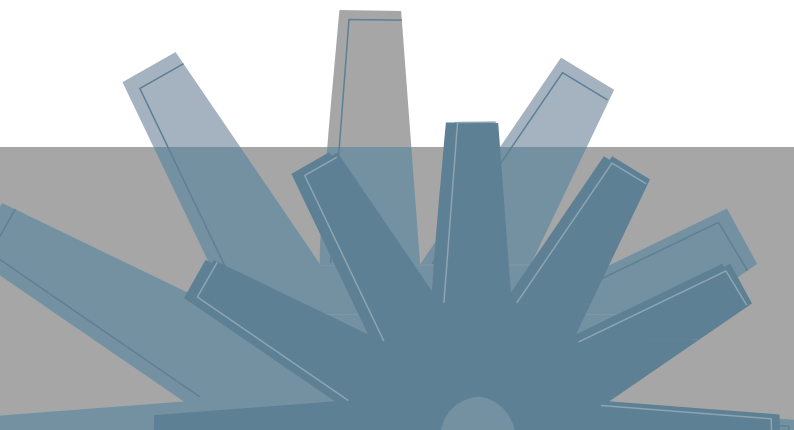
ACHMP

Appendix G ACHMP



ABORIGINAL CULTURAL HERITAGE MANAGEMENT PLAN

| | |
|-------------------------|--------------|
| Document Number: | MXC_MP_EC_03 |
| Status: | Final |
| Version: | 2 |
| Effective: | 9/02/2022 |
| Review: | 2 |



Aboriginal Cultural Heritage Management Plan

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1 INTRODUCTION

1.1 Background

Maxwell Ventures (Management) Pty Ltd (Maxwell), a wholly owned subsidiary of Malabar Resources Limited (Malabar) owns and operates the Maxwell Underground Project (the site). The site is located in the Upper Hunter Valley of New South Wales (NSW), east-southeast of Denman and south-southwest of Muswellbrook. The site is approved to extract a maximum of 8 million tonnes of run-of-mine coal per year over a period of 26 years. The site boundary is shown in **Figure 1**.

The site consists of the following areas:

- Underground area comprising the proposed area of underground mining operations and the mine entry area to support underground mining and coal handling activities and provide for personnel and materials access;
- Maxwell Infrastructure (formerly Drayton mine) comprising previous open cut mining areas, existing coal handling and preparation plant (CHPP), train load-out facilities and rail loop, Antiene rail spur and other infrastructure and services; and
- Transport and services corridor between the underground area and Maxwell Infrastructure comprising the proposed site access road, covered overland conveyor, power supply and other ancillary infrastructure and services.

The area within and surrounding the site, which has previously been known as Mt Arthur South, Saddlers Creek and Drayton South, has long been identified as having a significant in-situ coal resource. Prospecting for coal commenced in the late 1940s, with exploration intensifying during the 1960s and 1970s. Open cut coal extraction and mining activities commenced at Maxwell Infrastructure in 1983 and ceased in October 2016. The previous open cut mining area is currently in the rehabilitation phase of the mine operations.

The Development Consent for State Significant Development 9526 (SSD 9526) was granted on 22 December 2020 under clause 8A of the *State Environmental Planning Policy (State and Regional Development) 2011* and section 4.5(a) of the *Environmental Planning and Assessment (EP&A) Act 1979*. The development consent was modified on 19 November 2021 to allow for the repositioning of infrastructure primarily at the MEA and realignment of a section of the site access road.

The site also incorporates the development formerly authorised under the Maxwell Infrastructure Project Approval (PA) 06_0202. Development Consent DA 106-04-00 for the existing rail loop and Antiene Rail Spur was granted on 2 November 2000 under Section 76(A)9 and 80 of the EP&A Act and is still current.

1.2 Purpose and Scope

The purpose of this Aboriginal Cultural Heritage Management Plan (ACHMP) is to detail the statutory requirements and provide a framework for the management of Aboriginal cultural heritage associated with the site and accompanying offset areas. This ACHMP is one of a series of Environmental Management Plans that together form the Environmental Management System for the site.

This ACHMP applies to all activities within the SSD 9526 development application area and accompanying offset areas, and the Antiene Rail Spur Development Consent DA 106-04-00 boundary. There are no specific requirements regarding the management of Aboriginal cultural heritage within the Antiene Rail Spur Development Consent DA 106-04-00 or within Environment Protection Licence 1323.

Maxwell will not commence construction until the ACHMP is approved by the Planning Secretary. Maxwell will notify the Department of Planning, Industry and Environment (DPIE) in writing of the date of commencement of construction at least two weeks before the commencement date in accordance with Schedule 2, Condition A13(b) of the SSD 9526. Maxwell will implement this ACHMP, following approval by the Planning Secretary.

1.3 Objectives

The objectives of this ACHMP are to:

- Detail all relevant statutory requirements.
- Provide protocols to protect, monitor and manage Aboriginal objects and places.
- Detail measures to be implemented if any new Aboriginal objects, places or potential human skeletal remains are found.
- Detail the archaeological salvage program required as part of the conditions of consent prior to the commencement of any ground disturbance.
- Provide a strategy for the care, control and storage of Aboriginal objects salvaged during the life of the mine.
- Provide a protocol for ongoing consultation with the Aboriginal community.
- Provide a protocol for reasonable access to Aboriginal objects and places (outside of the approved disturbance area).
- Detail the Aboriginal cultural heritage training requirements for relevant personnel.
- Detail the procedure for reporting Aboriginal cultural heritage related incidents and non-compliances to relevant stakeholders.
- Manage complaints related to Aboriginal cultural heritage in a timely and effective manner.

2 PLANNING

2.1 Regulatory Requirements

This ACHMP describes the management of Aboriginal cultural heritage to meet relevant statutory requirements within SSD 9526. The various conditions that relate to the management of Aboriginal cultural heritage and where they are addressed in this document are detailed in **Appendix 2**.

The *National Parks and Wildlife (NP&W) Act 1974*, administered by the Minister for Energy and Environment and the Special Minister of State, Minister for the Public Service and Employee Relations, Aboriginal Affairs, and the Arts, is the primary legislation for the protection of Aboriginal cultural heritage in NSW. As detailed in Section 4.41 of the EP&A Act, an Aboriginal Heritage Impact Permit under Section 90 of the NP&W Act is not required for SSD's authorised by a development consent granted under Division 4.7 of Part 4. In these cases, Aboriginal cultural heritage is managed in accordance with the conditions of consent which requires the preparation of an ACHMP.

2.2 Maxwell Project EIS and Supporting Document Commitments

Commitments in the Maxwell UG Project Environment Impact Statement (EIS) (published on 14 August 2019) and supporting documents that relate to the management of Aboriginal cultural heritage, and where they are addressed in this document are detailed in **Appendix 3**.

2.3 Preparation and Consultation

Schedule 2, Condition B57(a) of SSD 9526, requires that this plan be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary. Maxwell has engaged Geordie Oakes (Principal Heritage Specialist at AECOM) to assist with the preparation of this plan. A copy of the endorsement by the Planning Secretary is included in **Appendix 4**.

In accordance with Schedule 2, Condition B57(b) of SSD 9526, this plan has been prepared in consultation with Registered Aboriginal Parties (RAPs), Aboriginal Affairs NSW and Heritage NSW. Outcomes of the consultation are presented in **Appendix 5**.

2.4 Extraction Plan

In accordance with Schedule 2, Condition C8 of SSD 9526, an Extraction Plan will be prepared for all second workings to the satisfaction of the Planning Secretary. The Extraction Plan will include a Heritage Management Plan which must address the requirements under conditions B54 to B57 inclusive and have

regard to the subsidence impact performance measures in Table 9 of SSD 9526. Conditions B54 to B57 have been addressed in this ACHMP. Subsidence monitoring and performance measures have also been included in **Section 5.1** of this ACHMP.

2.5 Previous Archaeological Assessments

Numerous Aboriginal archaeological investigations incorporating survey and/or test excavation have been undertaken within or directly adjacent to the site. Summaries of these assessments are provided below.

In 1980, Dyall undertook a survey of an area immediately south of the Bayswater Colliery and partially within the Maxwell Infrastructure site. Three Aboriginal sites, all artefact scatters, were recorded on the banks of Saddlers Creek however these were located outside of the Drayton Mine site. The sites comprised flakes, cores and backed blades of chert, rhyolite (tuff) and quartz.

In 1985, Koettig and Hughes undertook archaeological surveys and excavations within three separate development areas in the Hunter Valley. The areas included the Plashett Reservoir site and water storage area on Saltwater Creek, a coal mine development on Mount Arthur North and a coal mine development on Mount Arthur South. Within the Plashett Reservoir area, a total of 86 open campsites consisting of stone artefacts scatters were recorded. The sites were concentrated along creeklines, especially Saltwater Creek, with artefacts recorded on bare, eroded exposures. Six of these sites were excavated. Within the Mount Arthur South study area, a total of 136 archaeological sites were located and recorded. These comprised 135 open campsites with stone artefact scatters and one site consisting of grinding grooves. The survey focused on areas adjacent to Saddlers Creek. The artefact scatters were identified eroding out of the A soil horizon. The general pattern of site distribution was one of higher numbers of sites along major creeklines, with numbers decreasing along tributaries. Artefact densities along the whole of Saddlers Creek were typified by sites of high average densities, with a marked increase in the lower section of the creek. Indurated mudstone/tuff and silcrete were the most frequently recorded raw material. Survey of the Mount Arthur North area identified 93 open campsites consisting of stone artefact scatters. A program of excavation and collection was carried out. The survey focused on areas adjacent to Whites Creek. Very few sites were recorded on hill slopes, ridges or along the upper portions of some creeklines where there were large areas of eroded ground.

In 2000, Mills undertook an archaeological survey to identify Aboriginal sites, and areas of potential archaeological sensitivity within the proposed mine and haul road areas for the Saddlers Creek Mine. The focus of the survey was Saddlers Creek however, several its tributaries were also surveyed. Forty Aboriginal sites were identified, including seven isolated artefacts, 29 artefact scatters (nine with potential archaeological deposit (PAD)), two quarry sites, and two scarred trees. The two quarry sites Aboriginal Heritage Information Management System (AHIMS) site 37-3-1954 assessed as having high significance and AHIMS site 37- 2-1955 which was also assessed as having high significance but could not be located during surveys in 2012 and 2018. Most artefact scatters and isolated finds were identified along ephemeral feeder creeks of Saddlers Creek. Mills found that evidence of Aboriginal activity was associated with the full length of these creeklines from their headwaters to the floodplain. In addition, at least two sites were identified on ridges and eight sites were identified at least 200 metres from creeklines. A total of 238 artefacts were recorded, including 127 flakes, 41 block fracture fragments, 28 cores, 19 flake fragments, seven scrapers, five manuports, four hammerstones, three backed blades, one sharpening stone, one millstone, one anvil and one pebble axe. Indurated mudstone/tuff was the dominant material, followed by silcrete, quartzite, chert, quartz, porcellanite, siltstone, sandstone, basalt, fossilised wood and glass.

In 2002, HLA Envirosiences completed an archaeological survey for the Drayton Mine Extension. A total of 14 artefact scatters were located during the survey, all of which were located outside of the Drayton Mine site. Indurated mudstone/tuff was the dominant material, followed by silcrete, quartz and porcellanite. Artefacts comprised flakes, flaked pieces, cores and backed blades. All sites were located along creeklines, ridgelines or crests.

In 2006, ARAS was engaged to undertake an assessment of the Aboriginal archaeology and cultural heritage values associated with the proposed Drayton Extension Project. The assessment located and recorded a total of 480 Aboriginal objects. The Aboriginal objects were recorded against 39 sites consisting of 22 stone artefact scatters and 17 stone artefact isolated finds. Most sites contained less than 10 artefacts, though five sites had over 50 artefacts and were associated with drainage lines or gullies. Of the 480 artefacts identified, 38 per cent were complete flakes, 31 per cent broken flakes, 26 per cent flaked pieces and 5 per cent cores. Most artefacts were of indurated mudstone/tuff, followed by silcrete, porcellanite and quartz.

In 2010, ARAS undertook a program of salvage excavation for 26 Aboriginal sites proposed to be impacted by the Drayton Mine Extension. The salvage included surface collection of artefacts at 22 sites, mechanical grader scrapes at 11 locations and hand excavations at three locations. A total of 8,505 artefacts were recovered as part of the works. Of these, 7,500 artefacts were recovered from three distinct knapping locations at Ramrod Creek, identifying the creek as archaeologically sensitive. Optically stimulated luminescence dating of deposits at Ramrod Creek and Delpah returned dates of 3-1.4 thousand years ago, placing them in the Late Holocene. Raw materials utilised included porcellanite, silcrete, tuff and chert.

At Ramrod Creek, porcellanite was the dominant raw material, while at Delpah, silcrete and tuff were dominant. ARAS (2010) proposed that two main site types, reflecting two differing site functions, were present within the study area: fringe sites representing short-term occupation, and sites principally focused on the manufacture of backed artefacts. On the basis of site size (i.e., number of artefacts) and the ratio of discarded tools to waste material, ARAS (2010) proposed that sites adjacent to ridgelines and overlooking ephemeral water systems were the result of 'short term settlement'. Conversely, ARAS (2010) found that sites associated with Ramrod Creek were specific to stone tool manufacturing activities, with particular emphasis on producing Bondi points from porcellanite.

In 2012, AECOM completed an archaeological survey of the Drayton South study area. A total of 205 discrete sites were identified during the assessment, including both the existing AHIMS sites and newly recorded sites. Sites comprised 143 artefact scatters, eight of which have associated areas of PAD, 59 isolated artefact sites and three stone quarries. High significance was attributed to four sites, based on their rarity and research potential. Moderate significance was attributed to 18 sites and low significance to 183 sites. Complete flakes dominated the assemblage, accounting for 50.2 per cent of the combined survey assemblage, followed by broken flakes and flake shatter fragments. Raw material most commonly associated with both complete flakes and flake debitage consisted of indurated mudstone/tuff.

In 2015, AECOM were engaged to undertake an updated archaeological survey for the Drayton South Coal Project with the study area comprising the original area assessed as part of the previous Drayton South mine application. As a result of a reduced project disturbance footprint, the survey found that there was an 11 per cent reduction in the number of sites that would be impacted due to the project.

In 2019, AECOM completed an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed Maxwell Underground Project. The study area overlapped with the survey area completed for the Drayton South project in 2012 so only the areas not previously surveyed were subject to survey as part of the Project. During the survey, a total of 47 new Aboriginal archaeological sites, comprising artefact scatters and isolated artefacts, were identified. Combined, a total of 275 Aboriginal archaeological sites, comprising 274 open artefact sites and one stone quarry were identified within the study area. A total of 545 individual stone surface artefacts were recorded during the archaeological survey. In addition, a Cultural Values Report (CVR) was prepared. For the CVR, RAPs indicated that the study area sits within a broader cultural landscape that has cultural significance for Aboriginal people. Forming part of this cultural landscape were important landscape features such as Mount Arthur, the Hunter River, and Saddlers Creek which as well as the Aboriginal objects (i.e., stone artefacts) identified during the archaeological survey for the Project.

In 2021, AECOM completed an ACHA for the Maxwell UG Project Mine Entry Area Modification (referred to as Modification 1). Consideration of previously recorded "valid" Aboriginal sites based on AHIMS site coordinates and associated site cards/reports indicated four AHIMS sites were located within or partially

within the areas associated with Modification 1, with all four comprising open artefact sites (i.e., isolated artefacts and artefact scatters).

3 IMPLEMENTATION

3.1 Impacts

An ACHA was undertaken as part of the EIS for SSD 9526. The assessment indicated that although the site is situated within a broader landscape of high historical significance for contemporary Aboriginal people, the site itself is assessed as having a low historical significance, with no evidence of post-contact Aboriginal occupation identified within the area.

The ACHA completed for SSD 9526 identified 39 open artefact sites (i.e., isolated artefact or artefact scatters containing Aboriginal objects) that would be wholly or partially disturbed (i.e., direct impact) within the surface development area (shown in **Figure 4**). Following the completion of the ACHA, it was determined that two of these artefact sites (AHIMS sites 37-2-2329 and 37-2-2330) were in fact located within the existing Maxwell Infrastructure Northern Offset area and will not be disturbed. However, two new artefact sites (AHIMS sites 37-2-6042 and 37-2-6041) were identified during an Aboriginal due diligence assessment and will be disturbed by the proposed surface development works. Avoidance of impacts to all previously and newly identified Aboriginal objects within the surface development area was not feasible given the respective locations of these objects in relation to the Maxwell UG Project. However, potential impacts have been reduced through critical placement of surface infrastructure.

Surface collection of these 39 open artefact sites was completed in July 2021 in accordance with **Section 3.2.3.1** (*Surface Collection*) of this ACHMP. The results of the surface collection will be documented in the broader Archaeological Salvage Report that will be prepared following completion of all salvage activities for the Project. Aboriginal Site Impact Records (ASIR) were submitted to Heritage NSW's AHIMS register in 2021.

In August 2021, following the surface collection described above, AECOM completed an ACHA for Modification 1. Consideration of the location of Aboriginal sites in relation to the proposed Modification indicated a total loss of value for two additional open artefact sites (37-2-4359 and 37-2-0415) that were recommended for surface collection.

A further 234 Aboriginal objects or places comprising 233 open artefact sites and one stone quarry, are located directly above the underground area (shown in **Figure 2**). In accordance with the ACHA, these artefact sites may potentially be affected by cracking of the surface soils due to the effects of mining-induced subsidence from secondary workings (i.e., indirect impact). Stone quarry sites including AHIMS site 3-37-2-1954 and the previously recorded location of AHIMS site 37-2-1955 will not be directly impacted and are not expected to experience any measurable subsidence. Impacts to Aboriginal objects from underground mining activities will be minimal, with soil cracking as a result of subsidence expected to be typically between 25 millimetres (mm) and 50 mm across much of the area where the Aboriginal objects are present. In accordance with the Subsidence Assessment undertaken as part of the Maxwell UG Project EIS, based on experience at similar operations, less than 0.02 per cent of the surface area above the underground will be affected by surface cracking (Mine Subsidence Engineering Consultants, 2019). The direct and indirect impacts discussed above have been predicted in the documents/s listed in Schedule 2, Condition A2(c) of SSD 9526.

A list of all AHIMS sites within the SSD 9526 development application area is provided in **Appendix 5** and shown in **Figure 3**.

3.2 Management Measures

The following management measures have been prepared in consultation with RAPs to ensure that the Maxwell UG Project does not cause any direct or indirect impact on any identified heritage item beyond those predicted in the documents/s listed in Schedule 2, Condition A2(c) of SSD 9526. These measures are also detailed in **Section 11** of the ACHA.

3.2.1 Ground Disturbance Permit

Ground disturbance is defined as any activity that will result in disturbance to land, including but not limited to vegetation removal, topsoil stripping, fencing relocation, change to drainage, impact to cultural heritage sites and disturbance to previously rehabilitated areas.

Prior to ground disturbance occurring within the development application area (including within the surface development area, outside the approved disturbance area and within any offset area), an approved Ground Disturbance Permit (GDP) will be obtained from the Maxwell Environment department in accordance with Maxwell's *Ground Disturbance Permit Procedure*.

The GDP will assess any impacts to Aboriginal objects and places resulting from the proposed activity and specify any further works or controls required to mitigate any potential unapproved disturbance. Further works or controls will be prepared on a case-by-case basis and may include measures such as additional fencing and signage whilst disturbance works are being undertaken or the installation of sediment fencing to reduce the movement of soil from a disturbed area.

3.2.2 Due Diligence Assessment

An Aboriginal archaeological due diligence assessment may be required to identify any Aboriginal heritage constraints prior to a proposed activity occurring. All Aboriginal archaeological due diligence assessments will be prepared in accordance with the *NSW Minerals Industry Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW 2010* (New South Wales Minerals Council Ltd, 2010). Due diligence inspections will be undertaken by a person with expertise in locating and identifying Aboriginal objects. Recommendations from the Aboriginal archaeological due diligence assessment will be included as conditions under the relevant GDP.

3.2.3 Archaeological Salvage Program

An archaeological salvage program will be undertaken for all Aboriginal objects within the approved disturbance area (identified in accordance with Schedule 2, Condition A12 of SSD 9526) prior to the commencement of any ground disturbance within the area. This will involve the surface collection of 39 open artefact sites, as well as open area salvage excavation of AHIMS sites 37-2-0004 and 37-2-0505. The salvage program will be undertaken progressively and in line with the progression of surface disturbance. Additionally, in accordance with the ACHA recommendations, if subsidence monitoring indicates significant impacts have occurred to the ground surface within the boundary of a known Aboriginal object/s, including instances where soil remediation is required, archaeological salvage of the impacted Aboriginal object/s will be undertaken. The management measures required for each AHIMS site is detailed in Appendix 6.

The overarching objectives of the salvage program are to:

- To record and collect all visible surface Aboriginal objects impacted by the project.
- Salvage a representative and statistically viable subsurface assemblage from subsurface salvaged sites including AHIMS sites 37-2-0004 and 37-2-0505.
- To undertake post-excavation analyses of salvaged sites that will produce and conserve knowledge of past Aboriginal occupation.

All archaeological salvage programs will be undertaken in accordance with the subsections detailed below.

3.2.3.1 Surface Collection

The objective of the surface collection component of a salvage program is to systematically record and recover all visible Aboriginal objects (i.e., surface artefacts). Surface collection will be undertaken in accordance with the following procedure:

- A qualified archaeologist and RAPs will be engaged to complete the salvage.
- Surface artefacts will be flagged in situ.
- The locations of flagged artefacts will be appropriately recorded.

- Flagged artefacts will be numbered and collected into a bag labelled with the site number, date and collection details.
- Artefacts will be retained for recording purposes and report preparation.
- Basic attributes of collected artefacts will be recorded including, but not limited to, raw material, technological type, implement type, weight and maximum dimension.
- Some artefacts may be subject to further analysis such as use-wear and residue analysis. This will be discussed with RAPs in the field.

3.2.3.2 Open Area Excavation

Based on the subsurface potential of AHIMS sites 37-2-0004 and 37-2-0505 up to 100 square metres (m²) of open area excavation will be undertaken. The extent of the open plan excavation will be driven by observed lithic distributions and the presence/absence of inset archaeological features such as raw material deposits, hearths and heat treatment pits. This will be undertaken in consultation with RAPs in the field.

The placement of the open area excavation will be guided by a program of test excavation with a series of 1 m² pits generally placed on a 20-metre grid within the portion of the site boundaries impacted by the project. The exact placement of pits will be discussed with RAPs in the field. The indicative test pit locations are shown in **Figure 5**. The open area excavation will be centred on one or more locations where higher counts of artefacts, archaeological features, or the test pit with high richness values are intercepted (i.e., triggers for excavation).

Open area excavation will be undertaken in accordance with the following procedure:

- A qualified archaeologist and RAPs will be engaged to complete the excavations.
- All excavation will be carried out manually using trowels, shovels and mattocks.
- Test excavation will proceed in 1 m² units placed on a 20-metre grid across the impacted portion of the site.
- Open area excavation will proceed in 1 m² units, each of which will be assigned an alphanumeric identifier.
- All excavation units will be excavated in 10-centimetre splits down to the base of the identified A2 soil horizon.
- Photographic and scale-drawn records of representative soil profiles will be made.
- If specific archaeological features (e.g. hearths or heat treatment pits) are identified, the entire feature will be excavated and recorded prior to the continuation of excavation.
- Features will be photographed and scale plans drawn.
- Where encountered, charcoal deemed suitable for radiocarbon dating will be collected using best practice guidelines (e.g., Burke and Smith 2004).
- Soil samples will be retained for pH testing and soil description.
- Soil samples for optical stimulated luminescence dating will be collected from selected strata using best practice guidelines (e.g., United States Geological Survey 2015).
- All excavated soils will be either dry-sieved through a 5 millimetre gauge sieve or wet sieved through a 3 millimetre gauge sieve.
- Artefact counts would be reviewed throughout each day of excavation and used to guide the excavations.
- Artefacts recovered from sieving will be retained in plastic zip-lock bags and labelled with appropriate provenance data.

3.2.3.3 Geomorphological Assessment

A suitably qualified geomorphologist will be engaged to undertake a geomorphological assessment of excavated soils and soil profiles within excavation areas. The engaged geomorphologist will provide a stand-alone report detailing the results of their assessment. This assessment will involve the following:

- A desktop review of existing soil data and historic aerial photographs for the sites.
- A visual inspection of excavated soils and soil profiles during the salvage excavation.
- Characterisation of extant soils and soil profiles using standard sedimentological techniques and terminology.

3.2.3.4 Post-Salvage Analyses and Reporting

All stone Aboriginal objects recovered during the salvage program will be subject to detailed technological analysis by a qualified lithics specialist with RAPs given the opportunity view the Aboriginal objects and discuss the results of the analysis with the specialist. Contact details for the trained lithics specialist will be provided to all RAPs. Artefacts will be analysed to a level comparable to that achieved in previous analyses of excavated lithic assemblages in the Hunter Valley, so as to facilitate a rigorous and meaningful comparative analysis of intra-regional assemblage composition.

The following general research questions will be used to guide the post-excavation analysis component of the salvage program:

- When and how were the sites being utilised by Aboriginal people?
- Are any sources of silcrete/tuff located within proximity to sites 37-2- 0004 and 37-2-0505?
- Are there naturally occurring deposits of silcrete/tuff gravels present associated with Saddlers Creek? If so, is there any evidence of quarrying of these materials by Aboriginal people?
- If there is evidence of quarrying, how does that compare to other quarry sites in the Upper Hunter?
- What, if any, evidence exists to indicate that Aboriginal people were deliberately heat treating stone at the sites?
- What types of tools were being produced?
- What raw materials are being utilised and where are they being obtained/quarried?
- What technological and/or typological similarities/differences are apparent between the excavated stone artefact assemblages recovered from these sites and those from other local and sub-regional contexts?
- What are the broader archaeological and cultural contexts of salvaged sites?

A report detailing the results of the archaeological salvage program undertaken (including the results of any post-excavation analyses) will be completed within one year of the fieldwork component of the program. Aboriginal Site Impact Recording (ASIR) forms for all salvaged sites will be submitted to Heritage NSW at the completion of the salvage program.

Reporting will be consistent with the best practice guidelines suggested by the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (NSW Department of Environment Climate Change & Water (DECCW) 2010a) and the *Aboriginal Cultural Heritage Standards & Guidelines Kit* (NSW National Parks and Wildlife Service (NPWS) 1997). Copies of the final salvage report will be provided to all RAPs and Heritage NSW within 14 days of completion.

3.2.3.5 Care, Control and Storage of Aboriginal Objects

Salvaged Aboriginal objects will be moved as soon as practicable to the temporary storage location. The temporary storage location is a locked and fire-proof room within the main administration building at the Maxwell Infrastructure site. The site coordinates for the temporary storage location are provided below in **Table 1**. Access to the temporary storage location is managed by the Maxwell Environment department and is further discussed in **Section 3.2.9**.

All Aboriginal objects will be labelled and contained within a waterproof storage container. All aboriginal objects salvaged as part of the excavation program will be curated in an appropriate manner, as determined through consultations with RAPs, Heritage NSW and the DPIE.

A long-term management strategy has not yet been established by Maxwell or the RAPs. As such, salvaged Aboriginal objects will remain in the temporary storage location until a decision is made. Any decisions regarding the long-term management of Aboriginal objects will be made in consultation with RAPs and Heritage NSW. A long-term management strategy will be prepared prior to mine closure.

Temporary off-site storage of salvaged objects will be allowed for the purposes of analysis and recording.

Table 1. Temporary storage location details

| Location | Easting (GDA 94 Zone 56) | Northing (GDA 94 Zone 56) |
|----------------|--------------------------|---------------------------|
| Room number 21 | 305074 | 6420000 |

3.2.4 Previously Unrecorded Aboriginal Objects and Places

Previously unrecorded Aboriginal objects and places identified within the SSD 9526 development application area (including within the surface development area, outside the approved disturbance area and within any offset area), throughout the life of the mine, will be managed in accordance with the protocol detailed below. Management actions will vary according to the type of site identified, its significance and the nature of potential impacts. The unanticipated finds protocol should include the following steps if an Aboriginal site is identified or harmed:

1. All works will cease immediately and the area will be secured to avoid further harm.
2. Notification will be made to the Healthy Safety Environment and Community (HSEC) Manager.
3. A suitably qualified archaeologist and one or more RAPs will be engaged to determine the nature, extent and significance of the find and provide appropriate management advice.
4. Should it be determined that the object is Aboriginal, it will be registered on the AHIMS database as soon as practicable.
5. Details of any new site will be added to the Maxwell Aboriginal Heritage Database and also to **Figure 3** and **Appendix 6** of the ACHMP once it has been registered on the AHIMS database.

The following management will apply for previously unrecorded Aboriginal objects and places identified within the approved disturbance area:

- a. Open artefact sites (which includes both isolate artefacts and artefact scatters) subject to impacts or disturbance would be managed in the following way:
 - o Sites assessed of low scientific significance will be subject to surface collection in accordance with **Section 3.2.3**. A qualified archaeologist and RAPs will be engaged to complete the surface collection.
 - o Sites assessed of moderate scientific significance will be subject to surface collection and other forms of mitigation (i.e., detailed recording, test or open area excavation) in accordance with **Section 3.2.3**. This will be undertaken in consultation with RAP's.
 - o Management of sites assessed of high scientific significance will be determined through consultation between Maxwell and RAPs.
- b. Scarred trees subject to impacts or disturbance would be managed through discussions between a qualified archaeologist, Maxwell and RAPs and may include removal and relocation.
- c. Grinding grooves identified within the site and subject to impacts or disturbance would be managed through discussions between a qualified archaeologist, Maxwell and RAPs and may include removal and relocation.
- d. Other sites (i.e. stone quarries, ochre quarries, stone arrangements, engravings) identified within the site and subject to impacts or disturbance would be managed through discussions between a qualified archaeologist, Maxwell and RAPs.

Previously unrecorded Aboriginal objects and places identified within the development application area but not within the approved disturbance area will be managed in accordance with **Sections 0** and **3.2.7** of this ACHMP.

A record of the find and management completed will be included in the Annual Review. Aboriginal archaeological evidence identified within the development application area that will not be impacted or disturbed will be managed in accordance with **Section 3.2.6**.

3.2.5 Management of Subsidence Impacts

Underground mining includes both first and secondary workings. The first workings comprise a network of access roadways (i.e., drifts and main headings) that will be designed to remain stable for the life of the mine (i.e., no subsidence). The secondary workings are associated with the partial pillar extraction and longwalls which will result in subsidence that develops predominately above the area of secondary extraction. The subsidence assessment completed for the Maxwell UG Project EIS suggests that based on the previous longwall mining experience in NSW, surface cracking in the flatter areas above the proposed mining areas is expected to be typically between 25 millimetres (mm) and 50 mm, with some isolated cracking around 100 mm or greater. Surface cracking along the steep slopes is expected to be typically in the order of 50 mm to 100 mm, with isolated cracking around 200 mm or greater.

Surface cracking within the boundary of an existing open artefact site, resulting from subsidence, has the potential to displace soils, including archaeological deposits, and move Aboriginal objects. Moreover, if remediation of the surface is required after mining, these works could potentially impact any Aboriginal objects on the surface.

Subsidence from underground mining operations cannot be prevented however the following mitigation measures, prepared in consultation with RAPs, would be implemented so that there is no greater subsidence impacts or loss of heritage values other than what was predicted in Schedule 2, Condition A2(c) of SSD 9526:

- Subsidence monitoring will be conducted during mining and for a specified period post-mining, with a digital record kept of the nature, location and extent of all subsidence-related surface impacts within the site.
- Where subsidence-related impacts, such as surface cracking, are identified within the boundary of an existing Aboriginal object or place of moderate (or high) scientific significance, or where remediation works (i.e., reshaping, recontouring and revegetation of the land surface) are required to address subsidence impacts, the Aboriginal object or place would be inspected by a qualified archaeologist to determine the nature and extent of impacts, and whether mitigation is required.
- Mitigation measures for subsidence may include further monitoring, surface collection or open area salvage excavation.

Stone quarry AHIMS site 3-37-2-1954 and the previously recorded location of stone quarry AHIMS site 37- 2-1955) may be indirectly impacted by subsidence. Management of AHIMS site 3-37-2-1954 is detailed in the ACHA and includes monitoring (as described in Section 5.1) and if impacted, salvage excavation. No management is proposed for AHIMS site 37- 2-1955 as it was unable to be relocated.

3.2.6 Conservation of Non-Impacted Aboriginal Objects and Places

In accordance with the ACHA, all Aboriginal objects and places within the development application area that will not be impacted (directly or indirectly) by SSD 9526 will be conserved in-situ.

Boundary fencing will be installed along the southern portion of the transport and services corridor and surrounding the mine entry area to restrict any unauthorised access once the permanent road and facilities are constructed. Temporary fencing will be used prior to this. All relevant employees and contractors will be made aware of the nature and location of sites as well as their legal obligations with respect to them. Non-impacted Aboriginal objects and places will be identified on all relevant site plans.

Due to the number of Aboriginal objects and places to remain in-situ, fencing and signage around individual Aboriginal objects and places is not considered practical and was not requested by the RAPs during the development of the ACHA or the ACHMP. Aboriginal objects and places at the Maxwell Infrastructure site that were fenced for conservation under preceding PA 06_0202 will continue to remain fenced. A list of these sites and sites that were salvaged under PA 06_0202 are provided in **Appendix 7**.

3.2.7 Aboriginal Objects and Places Outside the Disturbance Boundary

A check of the Maxwell Aboriginal Heritage Database and the AHIMS register will be undertaken prior to any disturbance outside of the approved disturbance area (identified in accordance with Schedule 2, Part

A, Condition A12 of SSD 9526). If there are known Aboriginal objects or places within the area to be disturbed, an Aboriginal archaeological due diligence assessment will be undertaken. If impacts to a site in this area cannot be avoided, an Aboriginal Heritage Impact Permit (AHIP) will be prepared and submitted to Heritage NSW.

3.2.8 Management of Potential Human Remains

In the event that potential human skeletal remains are identified, the following standard procedure (New South Wales Police Force 2015; NSW Health 2013) will be followed:

1. All work surrounding the area will cease immediately.
2. The location will be secured - work can continue outside of the surrounding area as long as there is no risk of interference to the remains or the assessment of the remains.
3. Where it is reasonably obvious from the remains that they are human, the HSEC Manager (or a delegate) will immediately notify the NSW Police and Heritage NSW by telephone.
4. Where uncertainty over the origin (i.e. human or non-human) of the remains exists, a physical or forensic anthropologist will be commissioned to inspect the exposed remains in situ and make a determination of origin, ancestry (Aboriginal or non-Aboriginal) and antiquity (pre-contact, historic or modern).
5. If the remains are identified as modern and human, the NSW Police will be notified.
6. If the remains are identified as pre-contact or historic Aboriginal, Heritage NSW and RAPs will be notified.
7. If the remains are identified as historic (non-Aboriginal), Heritage NSW will be notified.
8. Where impacts to exposed Aboriginal skeletal remains cannot be avoided, an appropriate management mitigation strategy will be developed in consultation with Heritage NSW and RAPs.
9. Work will not recommence in the area until authorised by NSW Police Force and Heritage NSW.

An Aboriginal community representative will be present where it is reasonably suspected burials or human remains may be encountered. If human remains are unexpectedly encountered and they are thought to be Aboriginal, the Aboriginal community will be notified.

Recording of Aboriginal ancestral remains must be undertaken by, or be conducted under the direct supervision of, a specialist physical anthropologist or other suitably qualified person.

Archaeological reporting of Aboriginal ancestral remains will be undertaken by, or reviewed by, a specialist physical anthropologist or other suitably qualified person, with the intent of using respectful and appropriate language and treating the ancestral remains as the remains of Aboriginal people rather than as scientific specimens.

3.2.9 Reasonable Access

Members of the Aboriginal community may wish to access Aboriginal objects or places (outside of the approved disturbance area) or visit the temporary storage location for cultural purposes. Maxwell is committed to maintaining reasonable access to Aboriginal objects and Aboriginal places (outside of the approved disturbance area) that is consistent with workplace health and safety requirements. Access will be subject to relevant operational and safety considerations.

A request for access can be made in writing to the Maxwell Environment and Community Coordinator at Private Mail Bag 9, Muswellbrook NSW 2333 or by emailing info@malabarresources.com.au. Alternatively, if a written request is unable to be made, contact can be made by phone by calling (02) 6542 0283. The request for access should be made at least five days in advance and include the following information:

- The proposed time and date of the visit.
- The purpose of the visit.
- The area of interest.
- The name of all persons proposed to take part in the visit.

4 ABORIGINAL COMMUNITY ENGAGEMENT

4.1 Principles of RAP engagement

Maxwell recognises the importance of cultural protocols in the engagement of RAPs and more broadly the Aboriginal community. As such, Maxwell has adopted the principals outlined in the Australian Heritage Commission's guidelines *Ask First: A guide to respecting Indigenous heritage places and values* (Australian Heritage Commission, 2002). These principals require that all parties concerned with identifying, conserving and managing Aboriginal heritage should acknowledge, accept and act on the principles that Aboriginal people:

- Are the primary source of information on the value of their heritage and how this is best conserved;
- Must have an active role in any Aboriginal heritage planning process;
- Must have input into primary decision-making in relation to Aboriginal heritage so they can continue to fulfil their obligations towards this heritage; and
- Have a right to retain control of their cultural knowledge, including intellectual property and other information relating specifically to their heritage.

4.2 Welcome to Country and Acknowledging Traditional Owners

A Welcome to Country is a formal welcome to Aboriginal land given by an Elder or person from the Country the meeting or event is taking place on. It is commonly in the form of a short speech, but also may include a performance. An Acknowledgement of Country can be given by an Indigenous or non-Indigenous person and is a way of paying respect to the Traditional Owners of the Country the meeting or event is taking place on.

Welcome to Country and Acknowledgement of Country are important practices because they continue the longstanding tradition of formally recognising Aboriginal and Torres Strait Islander traditional ownership and connection to Country (NTSCORP Limited, 2013). Maxwell proposes that any meetings and events associated with the preparation of this ACHMP, and with the ongoing management of Aboriginal objects and places associated with this ACHMP, begin with the opportunity for an Elder or Traditional Owner to undertake a Welcome to Country and/or Acknowledgement of Country.

4.3 Assessment Consultation

Consultation with RAPs during completion of the ACHA was undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010b). A total of 27 Aboriginal parties registered their interest. These parties are listed in **Table 2**.

Table 2. Registered Aboriginal Parties involved during the ACHA

| Group Name |
|--|
| Didge Ngunawal Clan (DNC) |
| Wanaruah Local Aboriginal Land Council (WLALC) |
| Margaret Mathews |
| Divine Diggers |
| Wallagan Cultural Services |
| Culturally Aware |
| ELM Corp |
| Wattaka Wonnarua Cultural Consultancy Services |
| Ungooroo Aboriginal Corporation |
| Tocomwall Pty Ltd/ Scott Franks and Anor on behalf of the Plains Clans of the Wonnarua People (PCWP) |

| |
|--|
| AGA Services |
| Cacatua |
| Hunter Valley Aboriginal Corporation |
| Lower Hunter Wonnarua Cultural Services |
| Murra Bidgee Mullangari |
| Ungooroo culture & community service |
| Gidawaa Walang Cultural Heritage Consultancy |
| Yinarr Cultural Services |
| Merrigarn |
| Muragadi |
| Wailwan Aboriginal Digging Group |
| Amanda Hickey Cultural Services |
| A1 Indigenous Services |
| Widescope |
| Kauwul Wonn1 |
| Gomeroy Cultural Consultants |
| Aliera French Trading |

4.4 ACHMP Consultation

The draft ACHMP was distributed to all RAPs listed in **Table 2** on the 4 January 2021, for consultation and comment. RAPs were provided with a minimum 28-day period to provide comments on the plan. Four written responses to the draft ACHMP were received. A copy of the RAP correspondence including written responses and the outcome is provided in **Appendix 5**.

4.5 Ongoing RAP Consultation

Notification will be provided in writing to RAPs in the following instances:

- There are significant changes to approved operations at the site resulting in potential implications for Aboriginal heritage management.
- There is a discovery of a significant Aboriginal site (e.g. burial, grinding groove or scarred tree in accordance with the process described in **Section 3.5**).
- There is an opportunity to participate in Aboriginal archaeological survey or salvage works.
- There are discussions regarding the long-term management of Aboriginal heritage items at the site.

5 MEASUREMENT AND EVALUATION

5.1 Subsidence Monitoring

Subsidence monitoring will be undertaken during and post-secondary workings to measure the subsidence impacts or loss of heritage values against predictions in the document/s listed in condition Schedule 2, Part A, Condition A2(c) of SSD 9526. Monitoring will also be undertaken to determine if any Aboriginal archaeological sites have or will be impacted above the underground mining area. A summary of the monitoring will be provided in the Annual Review.

Monitoring during secondary workings will consist of the following:

- Monthly visual inspections of potentially affected Aboriginal archaeological sites when the longwall face is approaching within 100 metres and continuing until at least 200 metres past that point.
- Records of the nature, location and extent of all subsidence-related surface impacts and a photo of any detected damage.

Monitoring post-secondary workings will consist of the following:

- Visual inspections of potentially affected archaeological sites once the longwall face has retreated at least 500 metres past that point.
- Records of the nature, location and extent of all subsidence-related surface impacts and a photo of any detected damage.

Where subsidence-related impacts are identified within the boundary of an existing site, or where remediation works are required to address subsidence impacts, the following will be undertaken:

- An inspection will be undertaken by a qualified archaeologist and RAP to determine the nature and extent of impacts, and whether mitigation (which may include further monitoring, surface collection or open area salvage excavation).
- If subsidence monitoring identifies cracking or erosion proximal to a site, the site will be salvaged in accordance with **Section 3.4**.
- If a site will be impacted by surface remediation activities, the site will be salvaged in accordance with **Section 3.4**.

5.2 Three Yearly Inspections

An inspection of the Aboriginal archaeological sites surrounding the CHPP and train loading facility that were conserved under preceding PA 06_0202 and stone quarry AHIMS site 3-37-2-1954 and the previously recorded location of stone quarry AHIMS site 37- 2-1955, will be undertaken every three years. The inspection will also check that the boundary fence/temporary fencing installed along the southern portion of the transport and services corridor and mine entry area to restrict any unauthorised access is adequate and functional. The inspection will be completed by a qualified archaeologist and a RAP representative and include a review of the condition of the sites, potential impacts and condition of any associated fencing and signage. Results will be documented in a short conditions report and reported in the Annual Review.

5.3 Heritage Database and AHIMS Register

A comprehensive Aboriginal Heritage Database has been developed for the site. The database includes as a minimum the name, type, size (where applicable), status and coordinates of all known Aboriginal objects and places on the site and within any offset area. The database will be reviewed on a regular basis and updated as required. Printed site lists and maps will be made available to RAPs upon request.

In accordance with Schedule 2, Condition B56 of SSD 9526, Aboriginal objects and places on the site and within any offset area will be properly recorded and kept up to date in the AHIMS Register.

5.4 Incidents, Non-Compliances and Exceedances

An incident is defined in SSD 9526 as an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance.

In accordance with Schedule 2, Part E, Condition E9 of SSD 9526, Maxwell shall notify RAP's, DPIE and any other relevant agencies, immediately after it becomes aware of an incident regarding Aboriginal cultural heritage. The notification to DPIE shall be in writing via the Department's Major Projects Website and identify the development (including the development application number and name) and set out the location and nature of the incident. RAP's will be notified by email or phone of the incident.

In accordance with Schedule 2, Part E, Condition E10 of SSD 9526, Maxwell shall notify DPIE within seven days of becoming aware of a non-compliance regarding Aboriginal cultural heritage. The

notification shall be in writing via the Department's Major Projects Website and identify the development (including the development application number and name), set out the condition of SSD 9526 that the Project is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

The following protocol will be implemented to manage any incidents, non-compliances and exceedances of performance criteria related to Aboriginal heritage:

1. All works will cease immediately (where required), and the area will be secured to avoid further harm.
2. Notification will be made to the Healthy Safety Environment and Community (HSEC) Manager.
3. A suitably qualified archaeologist and one or more RAPs will be engaged (if required) to determine the nature and extent of any impacts and whether remedial and or mitigation work is required (i.e., salvage, excavation or installation of additional fencing).
4. Any relevant permits will be prepared prior to undertaking any remedial and or mitigation works.
5. The management of potential human remains will be managed in accordance with **Section 3.2.8**.
6. Previously unrecorded Aboriginal objects and places will be managed in accordance with **Section 3.2.4**.
7. A final report will be provided to RAP's, DPIE and any other relevant agencies once the mitigation work is completed.

A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

5.5 Adaptive Management and Contingency

In accordance with Schedule 2, Condition E4 of SSD 9526, where any exceedance of performance measures has occurred (i.e., an unauthorised impact to an Aboriginal object or Aboriginal Place or a direct or indirect impact beyond those predicted in the documents/s listed in Schedule 2, Condition A2(c) of the development consent), Maxwell shall, at the earliest opportunity:

- Take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur. Steps may include (where appropriate):
 - A review of the *Ground Disturbance Permit Procedure*.
 - A review of the Aboriginal Heritage Database and updating of AHIMS register.
 - Additional Aboriginal cultural heritage management training for personnel.
 - Additional fencing to show the limits of disturbance or to protect Aboriginal objects or places to be conserved in situ.
 - Implementation of additional monitoring
 - Archaeological salvage programs
- Consider all reasonable and feasible options for remediation (where relevant) and submit a report to DPIE describing those options and any preferred remediation measures or other course of action; and
- Implement reasonable remediation measures as directed by the Planning Secretary.

In accordance with Schedule 2, Part E, Condition E5 (f) of SSD 9526, the following contingency plan is used to manage any unpredicted impacts and their consequences:

- Review the unpredicted impact with consideration of any relevant activities and monitoring data;
- Identify the most likely source of the unpredicted impact;
- Review the existing process and current controls; and
- Implement appropriate mitigation measures.

5.6 Complaints Handling

The Maxwell UG Project maintains a 24-hour community hotline (1800 653 960) for any issues or enquiries. In addition to the community hotline, the site can also be contacted by emailing info@malabarresources.com.au.

If a complaint or enquiry is received regarding Aboriginal cultural heritage, it is investigated as soon as reasonably practicable and managed in accordance with Maxwell's *Community Complaints and Enquiries Procedure*. Details such as complainant name, contact details, nature of concern, date, time and method of receipt are recorded. While details of the enquiry vary depending on the nature and source of the enquiry, the following actions may result:

- Confirmation of whether the complainant would like the matter raised as a complaint or an enquiry.
- Identify further details which may assist in determining the cause of the complaint.
- Carry out an inspection of the site or conduct an assessment of monitoring results to identify the source.
- Identify if there is an exceedance or non-compliance with any consent or licence condition.
- Identify, where necessary and practical, methods to manage the source of the complaint and minimise the chance of a recurrence or the potential to generate further complaints.

All enquiries and/or complaints are recorded in an enquiries database. A summary of complaints is presented to the CCC and included in the Annual Review and EPL Annual Return.

6 AUDIT, REVIEW AND IMPROVEMENT

6.1 Review Schedule

The suitability of this ACHMP will be reviewed in accordance with Schedule 2, Part E, Condition E7 of SSD 9526, that is within three months of:

- the submission of an incident notification under condition E9;
- the submission of an Annual Review under condition E11;
- the submission of an Independent Environmental Audit under condition E13;
- the approval of any modification of the conditions of SSD 9526; or
- notification of a change in development phase under condition A13.

In accordance with Condition E8, if necessary, to improve the environmental performance of the site, cater for a modification or comply with a direction, this plan will be revised. The revised plan will be submitted to DPIE for approval within six weeks of the review. If any significant modifications to the plan are required as an outcome of the review, relevant government agencies and RAPs will be consulted regarding the changes prior to the plan being submitted to DPIE for approval.

6.2 Reporting

In accordance with Schedule 2, Part E, Condition E11 of SSD 9526, by the end of March in each year after the commencement of the development, or other timeframe agreed by the Planning Secretary, an Annual Review report will be submitted to DPIE. The Annual Review will include the following:

- A description of the development that was carried out in the previous calendar year and the development proposed to be carried out over the current calendar year.
- A comprehensive review of any Aboriginal cultural heritage activities and complaints over the previous calendar year.
- A description of non-compliances which occurred in the previous calendar year and actions that were (or are being) taken to rectify the non-compliance and avoid reoccurrence.
- Evaluation of the effectiveness of the Aboriginal cultural heritage management measures.
- Trends in monitoring data and any discrepancies between predicted and actual impacts.
- Measures to be implemented over the next calendar year to improve the environmental performance of the development.

In accordance with Schedule 2, Part E, Condition E12 of SSD 9526 copies of the Annual Review shall be submitted to Muswellbrook Shire Council and made available to the CCC and any interested person upon request.

In accordance with Schedule 2, Part E, Condition E17(a) of SSD 9526, the Annual review will be publicly available on Malabar’s website at <https://malabarresources.com.au/sustainability/documentation#annual-reports>.

6.3 Auditing

In accordance with Schedule 2, Part E, Condition E13 of SSD 9526 within one year of commencement of development under this consent, and every three years after, unless the Planning Secretary directs otherwise, Maxwell will commission and pay the full cost of an Independent Environmental Audit of the development.

6.4 Access to Information

In accordance with Schedule 2, Part E, Condition E17 of SSD 9526 before the commencement of construction until the completion of all rehabilitation required under SSD 9526, Maxwell will make the following information and documents (as they are obtained, approved or as otherwise stipulated within the conditions of SSD 9526) that are relevant to this plan publicly available on Malabar’s website:

- this ACHMP;
- the proposed staging plans for the development if the construction, operation or decommissioning of the development is to be staged;
- minutes of CCC meetings;
- regular reporting on the environmental performance of the development in accordance with the reporting requirements in any plans or programs approved under the conditions of this consent;
- a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs;
- a summary of the current phase and progress of the development;
- contact details to enquire about the development or to make a complaint;
- a complaints register, updated monthly;
- the Annual Reviews of the development; and
- audit reports prepared as part of any Independent Environmental Audit of the development and the Applicant’s response to the recommendations in any audit report.

This information shall be kept up to date, to the satisfaction of the Planning Secretary.

6.5 Records Management

In accordance with Schedule 2, Part B, Condition B56 of SSD 9526 records will be kept up to date in the AHIMS Register of all known Aboriginal objects or Aboriginal places on site and within any offset area.

6.6 Continuous Improvement

Maxwell will continuously investigate and implement Aboriginal cultural heritage management measures on site. Feedback from RAPs, monitoring results and any complaints may be used to assess impacts and determine where improvements or mitigation measures are required. These measures will be reviewed and reported on in the Annual Review.

6.7 Document Review History

A summary of the document history is outlined in **Table 3**.

Table 3. Document Revision Status

| Issue | Issue Date | Review Team | Details of Change / Communication |
|-------|------------|--|--|
| 1 | Feb 2021 | Geordie Oakes Robyn Skinner Donna McLaughlin | Document prepared following approval of SSD Consent 9526 for the Maxwell UG Project. |

| Issue | Issue Date | Review Team | Details of Change / Communication |
|-------|------------|--|--|
| 1.1 | May 2021 | Geordie Oakes Robyn Skinner Donna McLaughlin | Document updated following review by DPIE. |
| 2 | Feb 2022 | Geordie Oakes Donna McLaughlin | Document updated following approval of Modification 1 and to reflect the surface collection undertaken in July 2021. |

7 INFORMATION, TRAINING AND INSTRUCTION

7.1 Competent persons

Suitably qualified, competent and experienced persons shall be involved in the design, planning and implementation of this plan and related procedures.

7.2 Training

Generic Aboriginal cultural heritage management training is provided to all employees and contractors through the site induction process. Employees and contractors will also be made aware of the ground disturbance permit process and their legal responsibilities under the NP&W Act 1974. From time to time, workforce communication and toolbox talks allow for discussion of the objectives and requirements of this and any other relevant Management Plans.

All employees, contractors and supervisors carrying out any activities that may cause impacts to an Aboriginal object or Aboriginal place will undertake a more detailed awareness training package prior to the commencement of their work, to avoid any inadvertent impacts. Where possible, Wonnarua knowledge holders would be used to facilitate awareness training. Training packages will be updated regularly to be relevant to the type of works being completed. Records of training will be kept and maintained in a site database.

8 RESPONSIBILITIES

Responsibilities associated with this management plan are outlined **Table 4**.

Table 4. Responsibilities

| Position | Responsibilities |
|--|--|
| General Manager | <ul style="list-style-type: none"> Provide adequate resources for the implementation of this Plan. |
| HSEC Manager | <ul style="list-style-type: none"> Oversee the implementation of this Plan Notify regulatory authorities and affected stakeholders of incidents in accordance with this Plan. Coordinate ongoing RAP consultation. Coordinate periodic reviews of this Plan. Facilitate training of all employees and contractors in accordance with this Plan. |
| Environment and Community Coordinator | <ul style="list-style-type: none"> Assist the HSEC Manager as required in the implementation of this Plan. Review GDP's. Coordinate archaeological salvage programs. Coordinate inspections of relevant Aboriginal heritage sites. Manage and coordinate reasonable access for the Aboriginal community. Coordinate investigations of Aboriginal cultural heritage related incidents or complaints. Coordinate the management of records required under this Plan. Provide training to all relevant personnel. |

| Position | Responsibilities |
|----------------------|--|
| Supervisors | <ul style="list-style-type: none"> Participate in awareness training when working near Aboriginal heritage sites. Assist the Environment and Community Coordinator with investigations into non-compliances, incidents or complaints. |
| All Personnel | <ul style="list-style-type: none"> Undertake works in accordance with the objectives and principles of this Plan. All workers prior to carrying out any activities which may cause impacts to Aboriginal objects or Aboriginal Places will receive suitable Aboriginal cultural heritage training. |

9 DOCUMENT INFORMATION

9.1 References

Archaeological Risk Assessment Services (2006) Aboriginal Archaeology & Cultural Heritage Assessment Report on Drayton Mine Extension

Archaeological Risk Assessment Services (2010) Cultural Heritage Management Report on Drayton Mine Extension Project Open Cut & Services Corridor Areas

Australian Heritage Commission (2002) Ask First: A guide to respecting Indigenous heritage places and values

Community Complaints and Enquiries Procedure

Dyall (1980) Aboriginal Relics on the Drayton Coal Lease, Muswellbrook

Ground Disturbance Permit Procedure

HLA - Envirosiences Pty Ltd (2002) - Archaeological Assessment of Proposed Drayton Mine Extension Supplementary Report. Prepared for Drayton Coal Pty Ltd.

Mine Subsidence Engineering Consultants (2019) - Environment Impact Statement - Subsidence Assessment

National Parks and Wildlife Service (1997) Aboriginal Cultural Heritage Standards & Guidelines Kit

NSW Minerals Council Ltd (2010) - NSW Minerals Due Diligence Code of Practice for the Protection of Aboriginal Objects.

NSW Department of Environment Climate Change & Water (2010a) Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales

NSW Department of Environment Climate Change & Water (2010b) Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010

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

State Significant Development 9526

9.2 Definitions and abbreviations

| Term | Definition |
|------|------------|
|------|------------|

| | |
|--------------|--|
| ACHA | Aboriginal Cultural Heritage Assessment |
| ACHMP | Aboriginal Cultural Heritage Management Plan |
| AHIMS | Aboriginal Heritage Information Management System |
| ASIR | Aboriginal Site Impact Recording |
| BCD | Biodiversity and Conservation Division |
| CCC | Community Consultative Committee |
| CVR | Cultural Values Report |
| DA | Development Approval |
| DPIE | NSW Department of Planning, Industry and Environment |
| EIS | Environmental Impact Statement |
| EP&A | Environmental Planning and Assessment |
| EPL | Environment Protection Licence |
| GDP | Ground Disturbance Permit |
| HSEC | Health, Safety, Environment and Community |
| NPW | National Parks and Wildlife |
| NSW | New South Wales |
| PAD | Potential Archaeological Deposit |
| RAP | Registered Aboriginal Party |
| SSD | State Significant Development |
| Toolbox Talk | A forum where information is presented to the crews |

APPENDIX 1 – FIGURES

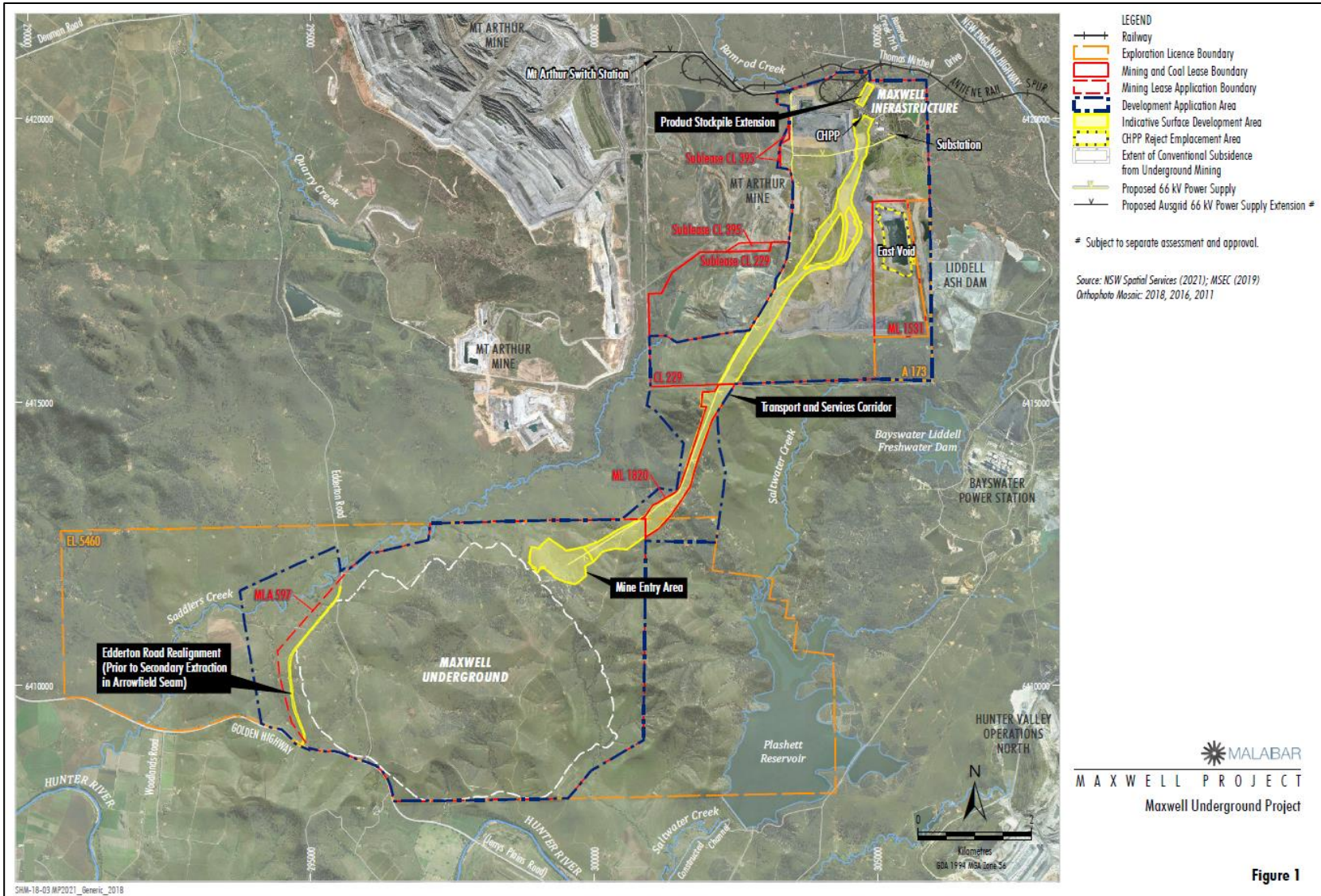


Figure 1. Maxwell Underground Project

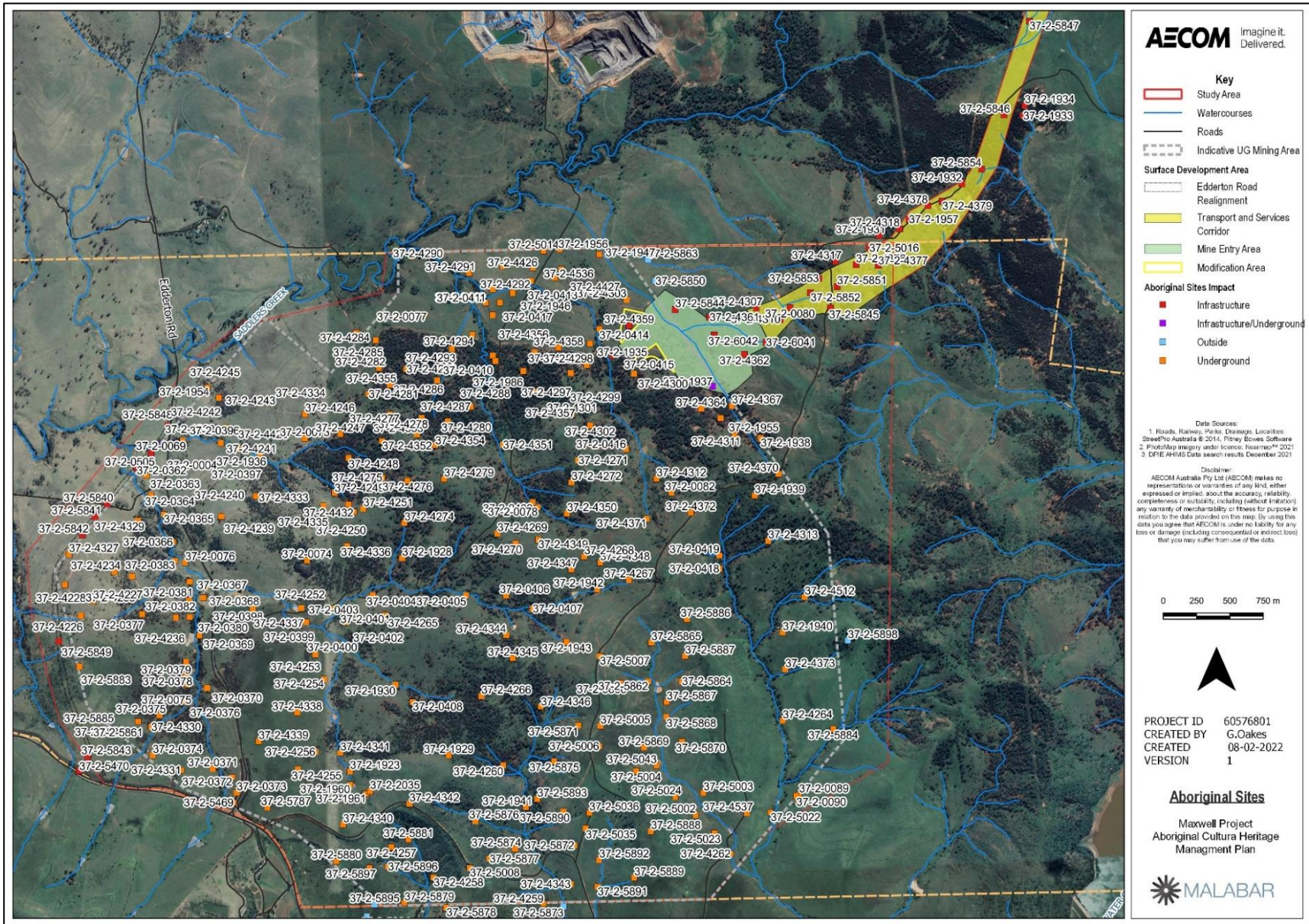


Figure 2. AHIMS sites by area

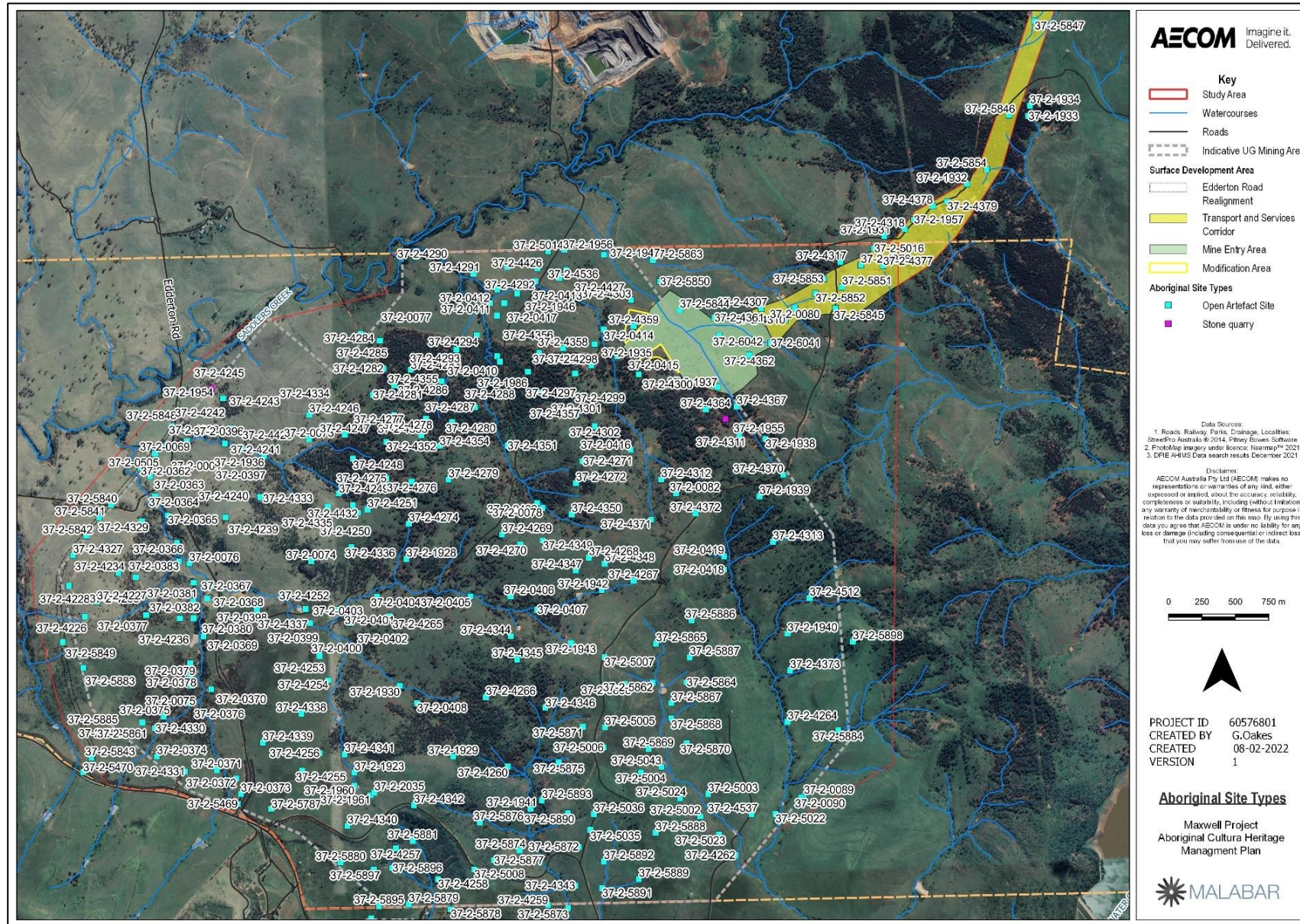


Figure 3. AHIMS sites by type

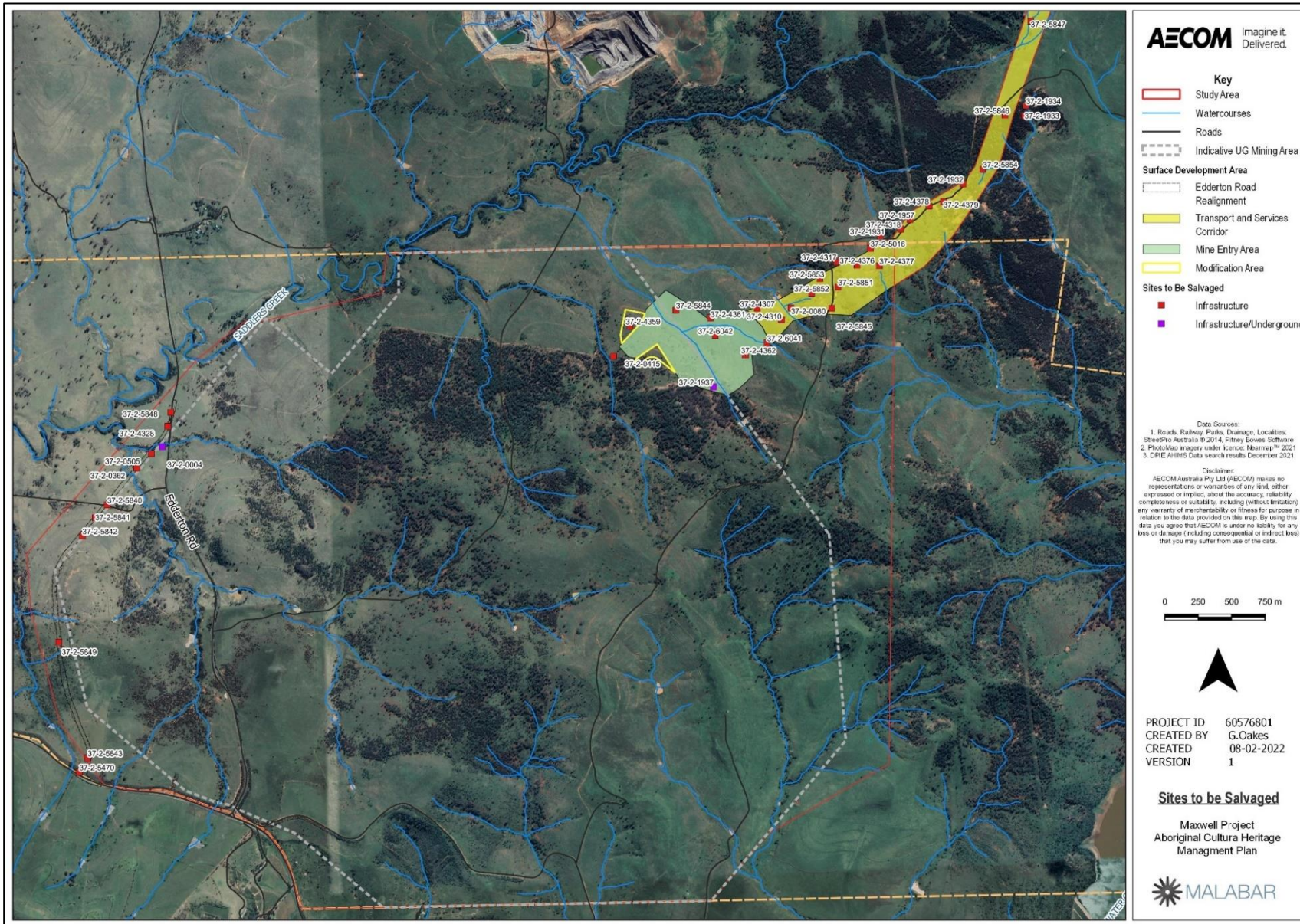


Figure 4. AHIMS sites to be salvaged

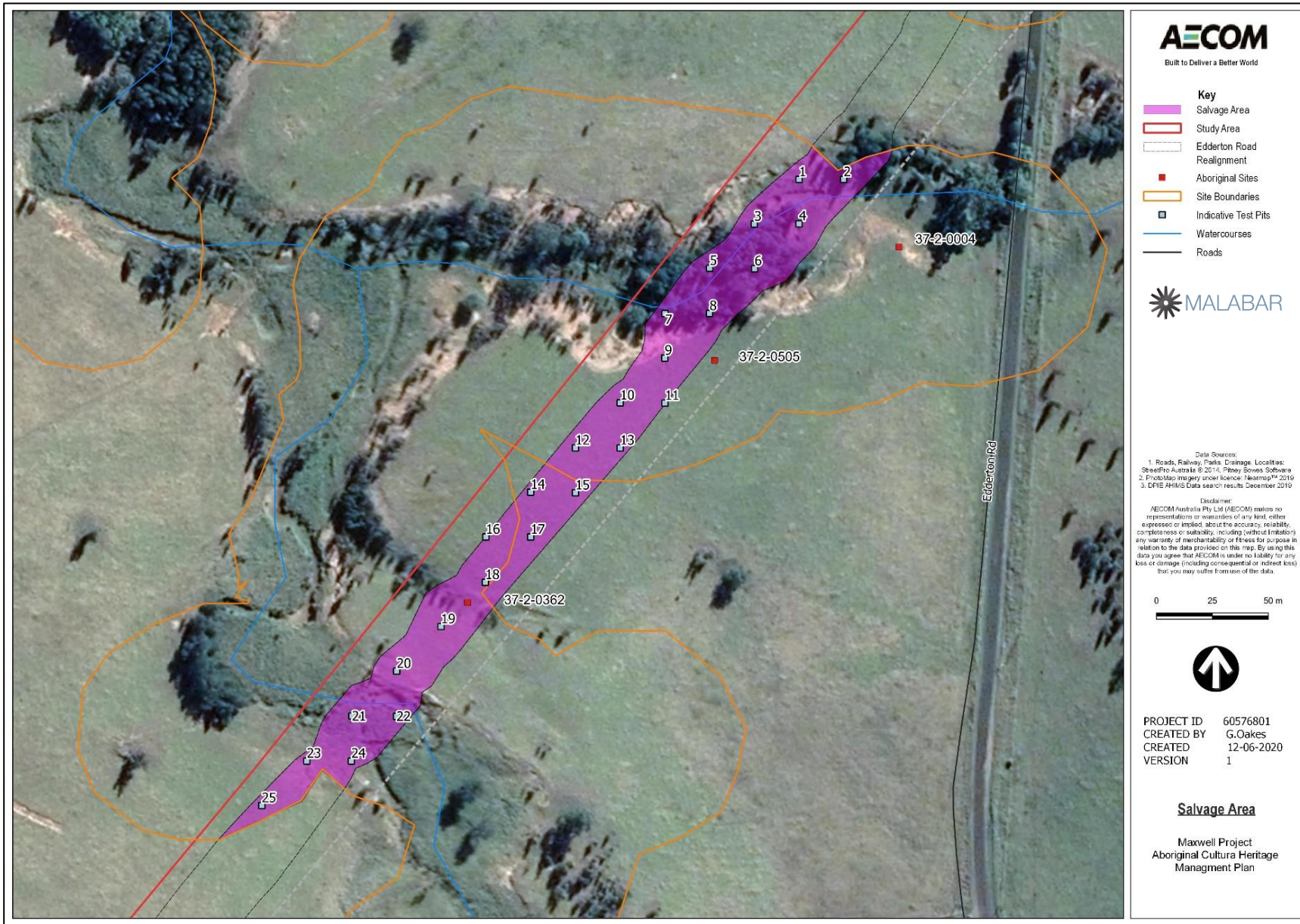


Figure 5. Indicative test pit locations

APPENDIX 2 – REGULATORY REQUIREMENTS

State Significant Development Consent 9526

| Clause | Requirement | Section of Plan |
|------------|--|---|
| B54 | <p>Protection of Aboriginal Heritage</p> <p>The Applicant must ensure that the development does not cause any direct or indirect impact on any identified heritage item, beyond those predicted in the document/s listed in condition A2(c).</p> <p>Note: Identified heritage items are shown in Figure 8 in Appendix 4</p> | 3.2 |
| B55 | If suspected human remains are discovered on the site, then all work surrounding the area must cease, and the area must be secured. The Applicant must immediately notify NSW Police Force and Heritage NSW, and work must not recommence in the area until authorised by NSW Police Force and Heritage NSW. | 3.2.8 |
| B56 | The Applicant must ensure that all known Aboriginal objects or Aboriginal places on the site and within any offset areas are properly recorded, and those records are kept up to date, in the Aboriginal Heritage Information Management System (AHIMS) Register. | 5.3 |
| B57 | <p>Aboriginal Cultural Heritage Management Plan</p> <p>The Applicant must prepare an Aboriginal Cultural Heritage Management Plan for the development. The plan must:</p> <ul style="list-style-type: none"> (a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Planning Secretary; (b) be prepared in consultation with Aboriginal Affairs NSW, Heritage NSW and Registered Aboriginal Parties; (c) describe the measures to be implemented on the site or within any offset area to: <ul style="list-style-type: none"> (i) comply with conditions B54 to B55 of this Schedule; (ii) ensure all workers receive suitable Aboriginal cultural heritage training/inductions prior to carrying out any activities which may cause impacts to Aboriginal objects or Aboriginal places, and that suitable records are kept of these inductions; (iii) protect, monitor and manage identified Aboriginal objects and Aboriginal places (including AHIMS Site #37-2-1954 and the previously recorded location of AHIMS Site #37-2-1955) in accordance with the commitments made in the document/s listed in condition A2(c); (iv) protect Aboriginal objects and Aboriginal places located outside the approved disturbance area from impacts of the development; (v) manage the discovery of suspected human remains and any new Aboriginal objects or Aboriginal places, including provisions for burials, over the life of the development; (vi) maintain and manage reasonable access for relevant Aboriginal stakeholders to visit Aboriginal objects and Aboriginal places (outside of the approved disturbance area); and (vii) facilitate ongoing consultation and involvement of Registered Aboriginal Parties in the conservation and management of Aboriginal cultural heritage on the site; and (d) include a strategy for the care, control and storage of Aboriginal objects salvaged on the site, both during the life of the development and in the long term. | <p>Appendix 4</p> <p>4.4 and Appendix 5</p> <p>3.2</p> <p>7.2</p> <p>3.2.3, 3.2.5, 3.2.6 and 3.2.7</p> <p>3.2.7</p> <p>3.2.4 and 3.2.8</p> <p>3.2.9</p> <p>4.5</p> <p>3.2.3.5</p> |

| Clause | Requirement | Section of Plan | | | | | | |
|--|---|--|---------------------|-----------------------|--|--|---|------------------|
| B58 | The Applicant must not commence construction until the Aboriginal Cultural Heritage Management Plan is approved by the Planning Secretary. | 1.2 | | | | | | |
| B59 | The Applicant must implement the Aboriginal Cultural Heritage Management Plan approved by the Planning Secretary. | 1.2 | | | | | | |
| C1 | <p>The Applicant must ensure that the development does not cause any exceedances of the performance measures in Table 9.</p> <p>Table 9: Subsidence impact performance measures – natural and heritage features etc</p> <table border="1"> <thead> <tr> <th>Feature</th> <th>Performance Measure</th> </tr> </thead> <tbody> <tr> <td colspan="2"><i>Heritage sites</i></td> </tr> <tr> <td>Aboriginal cultural heritage sites shown in Figure 7 in Appendix 4</td> <td> <ul style="list-style-type: none"> No greater subsidence impacts or loss of heritage values than predicted in the document/s listed in condition A2(c) </td> </tr> </tbody> </table> <p>Notes:</p> <ul style="list-style-type: none"> These performance measures apply to all mining taking place after the date of this consent. The Applicant is required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this consent (see condition C8). | Feature | Performance Measure | <i>Heritage sites</i> | | Aboriginal cultural heritage sites shown in Figure 7 in Appendix 4 | <ul style="list-style-type: none"> No greater subsidence impacts or loss of heritage values than predicted in the document/s listed in condition A2(c) | 3 and 5.1 |
| Feature | Performance Measure | | | | | | | |
| <i>Heritage sites</i> | | | | | | | | |
| Aboriginal cultural heritage sites shown in Figure 7 in Appendix 4 | <ul style="list-style-type: none"> No greater subsidence impacts or loss of heritage values than predicted in the document/s listed in condition A2(c) | | | | | | | |
| E5 | <p>Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:</p> <p>(a) a summary of relevant background or baseline data;</p> <p>(b) details of:</p> <p>(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions);</p> <p>(ii) any relevant limits or performance measures and criteria; and</p> <p>(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;</p> <p>(c) any relevant commitments or recommendations identified in the document/s listed in condition A2(c);</p> <p>(d) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;</p> <p>(e) a program to monitor and report on the:</p> <p>(i) impacts and environmental performance of the development; and</p> <p>(ii) effectiveness of the management measures set out pursuant to condition E5(c);</p> <p>(f) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;</p> <p>(g) a program to investigate and implement ways to improve the environmental performance of the development over time;</p> <p>(h) a protocol for managing and reporting any:</p> <p>(i) incident, non-compliance or exceedance of any impact assessment criterion or performance criterion);</p> | <p>2.5</p> <p>2.1 and Appendix 2</p> <p>2.1 5</p> <p>3, 4 and 5</p> <p>3, 4 and 5</p> <p>5 5</p> <p>5.5</p> <p>6.6</p> <p>5.4</p> | | | | | | |

| Clause | Requirement | Section of Plan |
|--------|--|---|
| | <p>(ii) complaint; or</p> <p>(iii) failure to comply with other statutory requirements;</p> <p>(i) public sources of information and data to assist stakeholders in understanding environmental impacts of the development; and</p> <p>(j) a protocol for periodic review of the plan.</p> <p>Note: <i>The Planning Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</i></p> | <p>5.6</p> <p>5.4</p> <p>6.4</p> <p>6.1</p> |
| E6 | The Applicant must ensure that management plans prepared for the development are consistent with the conditions of this consent and any EPL issued for the site. | Section 1.2 and Appendix 2 |
| E7 | <p>Revision of Strategies, Plans and Programs</p> <p>Within three months of:</p> <p>(i) the submission of an incident report under condition E9;</p> <p>(ii) the submission of an Annual Review under condition E11;</p> <p>(iii) the submission of an Independent Environmental Audit under condition E12;</p> <p>(iv) the approval of any modification of the conditions of this consent (unless the conditions require otherwise); or</p> <p>(v) notification of a change in development phase under condition A13;</p> <p>The suitability of existing strategies, plans and programs required under this consent must be reviewed by the Applicant.</p> | 6.1 |
| E8 | <p>If necessary, to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Planning Secretary. Where revisions are required, the revised document must be submitted to the Planning Secretary for approval within six weeks of the review.</p> <p>Note: <i>This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.</i></p> | 6.1 |
| E9 | The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be in writing to compliance@planning.nsw.gov.au and identify the development (including the development application number and name) and set out the location and nature of the incident | 5.4 |
| E10 | <p>Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be in writing to compliance@planning.nsw.gov.au and identify the development (including the development application number and name), set out the condition of this consent that the development is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.</p> <p>Note: <i>A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.</i></p> | 5.4 |

APPENDIX 3 – MAXWELL PROJECT EIS AND SUPPORTING DOCUMENT COMMITMENTS

| Clause | Requirement | Section of Plan |
|---------------------------|--|---|
| EIS Section 6.12.4 | <p>Surface Development</p> <p>An archaeological salvage program would be documented in the ACHMP to manage potential impacts to Aboriginal heritage from surface disturbance, including:</p> <ul style="list-style-type: none"> • Creation and maintenance of an Aboriginal Site Database for known Aboriginal heritage sites within the Project area and surrounds. • Progressive surface collection of Aboriginal objects/sites potentially impacted by surface development. • A program of open area salvage excavation for sites AHIMS #37-2-0004 and AHIMS #37-2-0505, representing the only sites assessed of moderate scientific significance that would be directly impacted by the Project (these sites lie within 100 m of each other and essentially comprise a single archaeological site). • Involvement of a qualified archaeologist and field representative(s) from registered Aboriginal parties in salvage works. • Submission of Aboriginal Site Impact Recording forms for all salvaged sites. | <p>3.2.3</p> <p>5.3</p> <p>3.2.3</p> <p>3.2.3</p> <p>3.2.3</p> <p>3.2.3.4</p> |
| EIS Section 6.12.4 | Sites assessed of moderate significance would be subject to surface collection and other forms of mitigation (such as detailed recording, test or open area excavation). | 3.2.4 |
| EIS Section 6.12.4 | During the development of the ACHMP, registered Aboriginal parties would be requested to provide advice on the curation of all the Aboriginal objects salvaged as part of the excavation program. | 3.2.3.5 |
| EIS Section 6.12.4 | <p>Potential Impacts from Subsidence</p> <p>The following measures would be undertaken to manage potential impacts to Aboriginal heritage from subsidence throughout the life of the Project:</p> <ul style="list-style-type: none"> • Subsidence monitoring would be conducted during mining and for a specified period post-mining, with a digital record kept of the nature, location and extent of all subsidence-related surface impacts within the Project area. • Where subsidence-related impacts, such as surface cracking, are identified within the boundary of an existing site of moderate (or high) scientific significance, or where remediation works are required to address subsidence impacts, the site would be inspected by a qualified archaeologist to determine the nature and extent of impacts, and whether mitigation is required. • Mitigation measures for subsidence may include further monitoring, surface collection or open area salvage excavation. | <p>3.2.5</p> <p>3.2.5</p> <p>3.2.5</p> |
| | <p>General Mitigation Measures</p> <p>In additional to the above, Maxwell would implement the following general measures that have been formulated in consultation with the registered Aboriginal parties:</p> <ul style="list-style-type: none"> • An Aboriginal cultural heritage awareness package would be developed, and all relevant contractors and staff engaged on the Project who may have interactions with Aboriginal heritage would receive awareness training prior to commencing work on-site. • Sites would be identified on relevant site plans, with details for the care of sites that would be conserved in-situ incorporated into the ACHMP. | <p>7.2</p> <p>3.2.6</p> |

| Clause | Requirement | Section of Plan |
|--|--|---|
| | <ul style="list-style-type: none"> • AHIMS site cards would be lodged in a timely manner with the DPIE for any previously unidentified Aboriginal heritage site(s) that are discovered during the course of Project operations and/or further heritage assessments. • The ACHMP would outline provisions to guide the management of any previously unrecorded Aboriginal heritage sites that may be identified during future investigations or works consistent with the protocol in the ACHA (Appendix G). • Should any skeletal remains be identified during the course of the Project, work in that location would cease immediately and the find would be notified to the relevant authorities (including the NSW Police). Subject to the NSW Police requiring no further involvement, the management of any Aboriginal skeletal remains would be determined in consultation with the DPIE and the registered Aboriginal parties. | <p>3.2.4</p> <p>3.2.4</p> <p>3.2.8</p> |
| <p>Maxwell Project Submissions Report, Section 6.1.7</p> | <p>Notwithstanding, Maxwell would manage potential impacts on Aboriginal heritage sites through consultation with the Aboriginal community, salvage of sites and other management measures.</p> | <p>3, 4.1 and 4.5</p> |
| <p>Maxwell Project Submissions Report, Section 6.1.8</p> | <p>Notwithstanding, Maxwell would manage potential impacts on Aboriginal heritage sites through consultation with the Aboriginal community, salvage of sites and other management measures.</p> | <p>3, 4.1 and 4.5</p> |
| <p>EIS Appendix G – Aboriginal Cultural Heritage Assessment, Appendix N</p> | <p>Open Area Excavation</p> <p>In view of the demonstrated subsurface potential of sites 37-2-0004/37-2-0505 up to 100 m² of open area excavation will be undertaken at the site. The extent of open plan excavation at the sites will be driven by observed lithic distributions and the presence/absence of inset archaeological features such as raw material deposits, hearths and heat treatment pits.</p> <p>The placement of the open area excavation within the site will be guided by a program of test excavation with a series of 1 m² pits placed on a 20 m grid within the portion of the site boundaries impacted by the project. The open area excavation will be centred on one or more locations where higher counts of artefacts, archaeological features, or the test pit with high richness values are intercepted.</p> <p>The proposed excavation methodology is as follows:</p> <ul style="list-style-type: none"> • All excavation will be carried out manually using trowels, shovels and mattocks; • Test excavation will proceed in 1 m² units placed on a 20 m grid across the impacted portion of the site; • Open area excavation will proceed in 1 m² units, each of which will be assigned an alphanumeric identifier; • All excavation units will be excavated in 10 cm spits down to the base of the identified A2 soil horizon; • Photographic and scale-drawn records of representative soil profiles will be made; • If specific archaeological features (e.g., hearths, heat treatment pits) are identified, the entire feature will be excavated and recorded prior to the continuation of excavation. Features will be photographed and scale plans drawn; • Where encountered, charcoal deemed suitable for radiocarbon dating will be collected using 'best practice' guidelines (e.g., Burke and Smith 2004: 154); • Soil samples will be retained for pH testing and soil description; | <p>3.2.3.2</p> |

| Clause | Requirement | Section of Plan |
|---|---|-----------------|
| | <ul style="list-style-type: none"> • Soil samples for OSL dating will be collected from selected strata using best practice guidelines (e.g., United States Geological Survey 2015); • All excavated soils will be wet-sieved through 5 mm gauge sieves; • Artefacts recovered from sieving will be retained in plastic zip-lock bags and labelled with appropriate provenance data; and • All excavation units will be backfilled upon conclusion of excavation. The proponent will be responsible for arranging and undertaking this. | |
| EIS Appendix G – Aboriginal Cultural Heritage Assessment, Appendix N | <p>Geomorphological Assessment</p> <p>A suitably qualified geomorphologist will be engaged to undertake a geomorphological assessment of excavated soils and soil profiles within excavation areas. This assessment will, at a minimum, involve the following:</p> <ul style="list-style-type: none"> • A desktop review of existing soil data and historic aerial photographs for the sites; • A visual inspection of excavated soils and soil profiles during the salvage excavation; and • Characterisation of extant soils and soil profiles using standard sedimentological techniques and terminology. <p>The engaged geomorphologist will provide a stand-alone report detailing the results of their assessment.</p> | 3.2.3.3 |
| EIS Appendix G – Aboriginal Cultural Heritage Assessment, Appendix N | <p>Post-Salvage Analyses & Reporting</p> <p>All stone artefacts recovered during the salvage program will be subject to detailed technological analysis by a qualified archaeologist. Artefacts will be analysed to a level comparable to that achieved in previous analyses of excavated lithic assemblages in the Hunter Valley so as to facilitate a rigorous and meaningful comparative analysis of intra-regional assemblage composition.</p> <p>A report detailing the results of the archaeological salvage program undertaken (including the results of any post-excavation analyses) will be completed within one year of the fieldwork component of the program. Reporting will be consistent with the best practice guidelines suggested by the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (DECCW 2010b) and the Aboriginal Cultural Heritage Standards & Guidelines Kit (NSW NPWS 1997). Copies of the final salvage report will be provided to all RAPs and the OEH within 14 days of completion.</p> | 3.2.3.4 |
| EIS Appendix G – Aboriginal Cultural Heritage Assessment, Appendix N | <p>Care & Control of Recovered Artefacts</p> <p>All Aboriginal objects salvaged as part of the excavation program should be curated in an appropriate manner, as determined through consultation with RAPs, the OEH and the DP&E during preparation of the ACHMP. Temporary off-site storage of salvaged objects should be allowed for the purposes of analysis and recording.</p> | 3.2.3.5 |



Planning,
Industry &
Environment

Ms Donna McLaughlin
HSE and Community Manager
Thomas Mitchell Drive
Muswellbrook, NSW, 2333

19/02/2021

Dear Ms McLoughlin

**Maxwell Underground (SSD-9526-PA-3)
Aboriginal Cultural Heritage Management Plan (ACHMP)**

I refer to your request (SSD-9526-PA-3) for the Planning Secretary's approval of suitably qualified persons to prepare the ACHMP for the Maxwell Underground (SSD-9526-PA-3).

The Department has reviewed the nominations and information you have provided and is satisfied that these experts are suitably qualified and experienced. Consequently, I can advise that the Planning Secretary approves the appointment of Geordie Oakes to prepare the ACHMP.

If you wish to discuss the matter further, please contact Charissa Pillay on 02 99955944.

Yours sincerely

A handwritten signature in black ink, appearing to read 'M Sprott'.

Matthew Sprott
Director
Resource Assessments (Coal & Quarries)

As nominee of the Planning Secretary

APPENDIX 5 – CONSULTATION WITH RAP'S, ABORIGINAL AFFAIRS NSW AND HERITAGE NSW

| Raised By | Consultation Feedback | Outcome |
|---|--|--|
| Arthur Fletcher (Kauwul Wonn1) | As far as this D A C H M P we are ready to support it. Our concern at this point in time is who and or whom should and or will be delivering said Cultural inductions for the workers-employees etc. We would hope that proposed instructors would be Wonnarua Knowledge Holders etc. | Additional text has been added to section 7.2 noting that, where possible, Wonnarua knowledge holders would be used to facilitate awareness training. |
| Tracey Skene (Culturally Aware) | 3.4 Archaeological Salvage Program | |
| | The value being spoken about is the scientific value only, it mentions collection of a representative sample. Given these items are being removed due to complete destruction, the cultural value should be considered. All Aboriginal objects hold significant value for the Wanarruwa people, it is therefore important that all of the Aboriginal objects located within 37-2-0004 and 37-2-0505 are collected during the surface collection. | Cultural values information provided by RAPs during the salvage program will be captured in the final salvage report. A copy of the final salvage report will be provided to all RAPs. The surface collection will recover all surface artefacts associated with AHIMS sites 37-2-0004 and 37-2-0505, as well as all other surface sites impacted by the project. Up to 100m ² of open area excavation will be undertaken across AHIMS sites 37-2-0004 and 37-2-0505. The extent of open area excavation will be driven by observed lithic distributions and the presence or absence of inset archaeological features, such as raw material deposits, hearths and heat treatment pits. Additional text has been added to section 3.2.3.2 noting that the above process will be undertaken in consultation with RAPs in the field. |
| | The survey should include identification of any sensitive landscapes within the Malabar Mine. | A full coverage archaeological survey was completed for the ACHA. In addition, an Aboriginal Cultural Values Report (CVR) was also prepared (this is Appendix A of the ACHA). The CVR documents the results of AECOM's consultation with RAPs as well as background historical research. Cultural landscapes are discussed in section 3.1 of the CVR. |
| | 3.4.1 Surface Collection | |
| | Community is to be included in the analysis of Aboriginal objects. | Additional text has been added to section 3.2.3.4 noting that a trained lithics specialist will be engaged to undertake the post-salvage analysis and that the contact details of the trained lithics specialist will be provided to all RAPs so that they can discuss the analysis being undertaken. Furthermore, should RAPs wish to view the artefacts and discuss the results with the trained lithics specialist this would be arranged. |
| Residue and usewear analysis of Aboriginal objects is to be determined in | Additional text has been added to section 3.2.3.1 noting that the requirement to complete | |

| Raised By | Consultation Feedback | Outcome |
|---|---|--|
| | consultation with Aboriginal community (RAPs). | use-wear and residue analysis will be discussed with RAPs in the field. |
| 3.4.2 Open Area Excavation | | |
| | Fine for it to be done loosely on a 20 metre grid, if objects are on the surface or the area is a culturally sensitive landscape then the pit locations should be determined with Aboriginal community (RAPs). | Additional text has been added to section 3.2.3.2 noting that while test pits will be generally placed on a 20 metre grid the exact location of pits will be guided by consultation with RAPs in the field. |
| | The 1mx1m pits should be excavated in quadrants to provide more accurate locations of the Aboriginal objects. | <p>This level of archaeological detail is not considered appropriate for open artefact sites that lack a deeply stratified deposit.</p> <p>Open artefact sites in texture contrast soils located adjacent to watercourses will have been heavily bioturbated resulting in vertical and horizontal movement of artefacts over time. A large body of archaeological literature for the Hunter Valley region has demonstrated that 1 m² test pits provide sufficient information for identifying and analysing past use of past activity areas.</p> |
| | No triggers are listed to setout parameters for further investigation need to be setout with clear methodology. Eg. If Aboriginal objects are located within the pits (triggers should be determined in consultation with community) need to have methodology to open more pits. For example if a pit has a specialised Aboriginal object this should instantly trigger another 4 pits around the outside of the pit. To further determine pit locations around the salvaged pits these pits should be excavated in quadrants and artefact counts done daily to determine where the artefacts are coming from to chase the artefacts. | <p>As discussed in Section 3.2.3.2, a systematic sampling strategy will be undertaken initially to guide the location of open area excavations.</p> <p>The triggers for open area excavation are defined in section 3.2.3.2 where it states, “open area excavation will be centred on one or more locations where higher counts of artefacts, archaeological features, or the test pit with high richness values are intercepted”.</p> <p>Additional text has been added to section 3.2.3.2 to further highlight the triggers and note that locations for further excavation will be selected through discussions with RAPs in the field.</p> <p>Additional text has been added to section 3.2.3.2 noting that artefact counts would be continuously assessed throughout each day.</p> |
| | Wet sieving will mean that residue analysis can not be done, should be dry sieved unless there is no other option | Text within section 3.2.3.2 has been amended to indicate dry sieving only. |
| 3.4.4 Post Salvage Analysis and Reporting | | |
| | Analysing temporal data should be part of the methodology, soils can be dated. | Section 3.2.3.2 includes provisions for radiocarbon and optical stimulated luminescence dating using best practice guidelines. |
| 3.5 Previously Unrecorded Aboriginal Archaeological Evidence | | |
| | These protocols do not include Aboriginal community (RAPs) early enough! Protocol 3 should be contact the local | Additional text has been added to section 3.2.4 noting that in addition to a qualified archaeologist, a RAP will also be engaged to |

| Raised By | Consultation Feedback | Outcome |
|------------------------|--|--|
| | LALC to provide a LALC representative and a qualified Archaeologist. Protocol 4 not good enough, Aboriginal community (RAPs) are to be included in the determination of Aboriginal objects. | determine the nature, extent and significance of the find. |
| | <i>Specific to Open Artefact Site</i> - All Aboriginal object collection should be determined in consultation with Aboriginal community (RAPs). | Additional text has been added to section 3.2.4 noting that: <ul style="list-style-type: none"> • A qualified archaeologist and RAP's will be engaged to complete the surface collection of sites assessed of low scientific significance; and • The assessment of moderate scientific significant sites will be undertaken in consultation with RAP's. |
| Other | | |
| | Every time an archaeologist goes out to site to do survey of any kind Aboriginal community (RAPs) should also be present, this should be part of the methodology. | In accordance with this plan, RAP's will be included in any salvage program for the Maxwell UG Project. In addition, RAP's will also be included in any survey works to extend mining operations (beyond what is approved under SSD 9526). Due diligence inspections will be undertaken by a person with expertise in locating and identifying Aboriginal objects. This may include, a RAP experienced in locating and identifying Aboriginal objects or a qualified Archaeologist with appropriate qualifications or training in locating and identifying Aboriginal objects. |
| | Also any economic benefits the community should be offered contract eg: fencing, vegetation management, employment & Training opportunities and community funding /Grants for community to apply for for business opportunities etc. | As discussed in the Social Impact Assessment for the Maxwell UG Project, Maxwell would target employment of 10 percent of the Project's operational workforce that are new to the underground mining sector being of Aboriginal and/or Torres Strait Islander descent. To maximise access to employment for local Indigenous residents, Maxwell would also promote employment and business opportunities through Indigenous community leaders, existing Indigenous employment agencies and organisations. In addition, Maxwell would also promote available services to assist Indigenous candidates in preparing their applications and supporting documentation. |
| Lilly Carroll (DNC) | DNC is happy with the ACHA for the Maxwell Underground Project. | Noted - no further action required. |

| Raised By | Consultation Feedback | Outcome |
|---|--|--|
| <p>Phillip Boney (Wailwan Aboriginal Digging Group)</p> | <p>I do not have a problem with the methodology on this project or measures to be taken on treatment of aboriginal artefacts. Overall, I am happy with your approach to this project.</p> | <p>Noted - no further action required.</p> |
| <p>Aboriginal Affairs NSW</p> | <p>Regarding the plan, it should be based on the principles of OCHRE – as should any preliminary or implementations actions:</p> <ul style="list-style-type: none"> • Government working with Aboriginal communities differently <ul style="list-style-type: none"> ○ Address trust deficit ○ Trauma informed ○ Healing and Truth Telling ○ Timing and design of engagement to take account of community needs and timeframes ○ Government learning from past policy/program/funding/legislative failures ○ Positive narrative, not deficit focus, outcome focus • Governments, peak bodies, NGOs and private sector engaging with Aboriginal communities, not just “consulting” • Co-design the basis of engagement, service/policy design and agreement making (also see Close the Gap) • Co-delivery where possible • Co-design/co-delivery if done properly can only be done on the basis of an agreement with Aboriginal people. <p>AANSW also recommends detailed consultations with Heritage NSW.</p> | <p>Maxwell Understands that OCHRE is a commitment from the NSW Government to a different way of working with, and in support of, Aboriginal communities by building strong working partnerships that have at their heart respect for local Aboriginal culture, leadership and decision making.</p> <p>Where possible Maxwell has tried to incorporate aspects of OCHRE into the ACHMP by:</p> <ul style="list-style-type: none"> • Engaging with all RAPs in the preparation of this plan. • Providing access to members of the Aboriginal community to visit Aboriginal archaeological sites or the temporary storage location for cultural purposes. • Recognising the importance of cultural protocols in the engagement of RAPs and more broadly the Aboriginal community. • Involving RAPs in the management of Aboriginal cultural heritage and cultural awareness training. <p>In addition, Maxwell has established targets for indigenous employment of the operational workforce. Maxwell also supports and promotes cultural awareness and activities in the local community through the funding of programs with local schools.</p> <p>Heritage NSW have been consulted during the preparation of the plan. Evidence of consultation is included in Appendix 5.</p> |
| <p>Heritage NSW</p> | <p>Section 3.4.2 Open Area Excavation – the methodology procedures in the ACHMP should include an option for wet sieving and 3 millimetre gauge sieves to be used if required.</p> | <p>Additional text has been added to section 3.4.2 to include wet sieving with a 3 millimetre gauge sieve.</p> |

| Raised By | Consultation Feedback | Outcome |
|-----------|--|--|
| | <p>Section 3.5 Previously Unrecorded Aboriginal Archaeological Sites - an additional step (Step 5) in the unanticipated finds protocol in the ACHMP is required. Details of any new sites identified must be added to Appendix 6, and Figure 3 should be amended to show the location of the site, once the new site has been registered with AHIMS. HNSW notes that the site will also be recorded on the Maxwell Aboriginal Site Database (Section 5.3).</p> | <p>Additional text has been added to section 3.2.4 to include to include an additional step 5 in the unanticipated finds protocol.</p> |
| | <p>Provision in the ACHMP must include an Extraction Plan in accordance with Consent Condition C8 which requires that an approved Extraction Plan for Second Mine Workings must be prepared. The Extraction Plan must include a Heritage Management Plan for the management of potential impacts and/or environmental consequences of the proposed second working on Aboriginal cultural heritage values and include all requirements under conditions B54 to B57 and subsidence performance measures.</p> | <p>Additional text has been added to section 2.4 to include provision of an Extraction Management Plan.</p> |

From: Arthur Fletcher <wonn1sites@gmail.com>

Sent: Friday, 8 January 2021 4:54 PM

To: Oakes, Geordie <Geordie.Oakes@aecom.com>

Subject: [EXTERNAL] Re: Maxwell Underground Project - Draft Aboriginal Cultural Heritage Management Plan

Ala Geordie. We hope all is well with you guys. As far as this D A C H M P we are ready to support it. Our concern at this point in time is who and or whom should and or will be delivering said Cultural inductions for the workers-employees etc. We would hope that proposed instructors would be Wonnarua Knowledge Holders etc. Ps Stay Safe and will catch up with you soon. Regards Arthur- Kauwul Wonnarua Elder.

Sent from my iPad

On 8 Jan 2021, at 9:33 am, Oakes, Geordie <Geordie.Oakes@aecom.com> wrote:

Dear RAP,

Please find attached the draft Aboriginal Cultural Heritage Management Plan (ACHMP) for the Maxwell Underground Project for your review and comment. Should you have any comments on the draft please provide these by email, mail or fax to Geordie Oakes via the contact details on this email. Please note that the closing date for comments is Saturday 6 February 2021.

All the best,

Geordie

Geordie Oakes

Principal Heritage Specialist

D +61 2 8934 0610 M 0410 513 509

Geordie.Oakes@aecom.com

AECOM

Level 21, 420 George Street, Sydney, NSW 2000

PO Box Q410, QVB PO, Sydney, NSW, 1230

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www.aecom.com

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<210106 Maxwell UG Project - ACHMP (Draft).pdf>

From: Tracey Skene <tracey@marrung-pa.com.au>
Sent: Tuesday, 12 January 2021 5:33 PM
To: Oakes, Geordie <Geordie.Oakes@aecom.com>
Subject: [EXTERNAL] Re: Maxwell Underground Project - Draft Aboriginal Cultural Heritage Management Plan

Hi Geordie,

I have read through the ACHA and have made the following recommendations

3.4 Archaeological Salvage Program

- The value being spoken about is the scientific value only, it mentions collection of a representative sample. Given these items are being removed due to complete destruction, the cultural value should be considered. All Aboriginal objects hold significant value for the Wanarruwa people, it is therefore important that all of the Aboriginal objects located within 37-2-0004 and 37-2-0505 are collected during the surface collection.

- The survey should include identification of any sensitive landscapes within the Malabar Mine.

3.4.1 Surface Collection

- Community is to be included in the analysis of Aboriginal objects.

- Residue and usewear analysis of Aboriginal objects is to be determined in consultation with Aboriginal community (RAPs).

3.4.2 Open Area Excavation

- Fine for it to be done loosely on a 20 metre grid, if objects are on the surface or the area is a culturally sensitive landscape then the pit locations should be determined with Aboriginal community (RAPs).

- The 1mx1m pits should be excavated in quadrants to provide more accurate locations of the Aboriginal objects.

- No triggers are listed to setout parameters for further investigation need to be setout with clear methodology.

Eg. If Aboriginal objects are located within the pits (triggers should be determined in consultation with community) need to have methodology to open more pits. For example if a pit has a specialised Aboriginal object this should instantly trigger another 4 pits around the outside of the pit. To further determine pit locations around the salvaged pits these pits should be excavated in quadrants and artefact counts done daily to determine where the artefacts are coming from to chase the artefacts.

- Wet sieving will mean that residue analysis can not be done, should be dry sieved unless there is no other option.

3.4.4 Post Salvage Analysis and Reporting

- Analysing temporal data should be part of the methodology, soils can be dated.

3.5 Previously unrecorded Aboriginal Archaeological Evidence

These protocols do not include Aboriginal community (RAPs) early enough!

Protocol 3 should be contact the local LALC to provide a LALC representative and a qualified Archaeologist.

Protocol 4 not good enough, Aboriginal community (RAPs) are to be included in the determination of Aboriginal objects.

Open Artefact Sites

- All Aboriginal object collection should be determined in consultation with Aboriginal community (RAPs).

Every time an archaeologist goes out to site to do survey of any kind Aboriginal community (RAPs) should also be present, this should be part of the methodology.

Also any economic benefits the community should be offered contract eg: fencing, vegetation management, employment & Training opportunities and community funding /Grants for community to apply for for business opportunities etc.

Thanks

Tracey Skene

Culturally Aware

On Fri, 8 Jan 2021 at 9:33 am, Oakes, Geordie <Geordie.Oakes@aecom.com> wrote:

Dear RAP,

Please find attached the draft Aboriginal Cultural Heritage Management Plan (ACHMP) for the Maxwell Underground Project for your review and comment. Should you have any comments on the draft please provide these by email, mail or fax to Geordie Oakes via the contact details on this email. Please note that the closing date for comments is Saturday 6 February 2021.

All the best,

Geordie

Geordie Oakes
Principal Heritage Specialist
D +61 2 8934 0610 M 0410 513 509
Geordie.Oakes@aecom.com

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From: lilly carroll <didgengunawalclan@yahoo.com.au>
Sent: Tuesday, 12 January 2021 9:32 PM
To: Oakes, Georgie
Subject: [EXTERNAL] Re: Maxwell Underground Project - Draft Aboriginal Cultural Heritage Management Plan

Hi Georgie

DNC is happy with the ACHA for the Maxwell Underground Project and it's still going in my Spam grrrrrrrrr

Thanks Georgie

[Sent from Yahoo Mail for iPhone](#)

On Friday, January 8, 2021, 9:34 am, Oakes, Georgie <Geordie.Oakes@aecom.com> wrote:

Dear RAP,

Please find attached the draft Aboriginal Cultural Heritage Management Plan (ACHMP) for the Maxwell Underground Project for your review and comment. Should you have any comments on the draft please provide these by email, mail or fax to Georgie Oakes via the contact details on this email. Please note that the closing date for comments is Saturday 6 February 2021.

All the best,

Geordie

Geordie Oakes
Principal Heritage Specialist
D +61 2 8934 0610 M 0410 513 509
Geordie.Oakes@aecom.com

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www.aecom.com

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From: Phillip Boney <Waarlan12@outlook.com>
Sent: Tuesday, 12 January 2021 10:40 PM
To: Oakes, Geordie
Subject: [EXTERNAL] Re: Maxwell Underground Project - Draft Aboriginal Cultural Heritage Management Plan

Hi Geordie,

Phil Boney here. I do not have a problem with the methodology on this project or measures to be taken on treatment of aboriginal artefacts. Overall, I am happy with your approach to this project.

Regards, Phil Boney
Wailwan Aboriginal Group

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From: Oakes, Geordie <Geordie.Oakes@aecom.com>
Sent: Friday, January 8, 2021 9:32:28 AM
To: Oakes, Geordie <Geordie.Oakes@aecom.com>
Subject: Maxwell Underground Project - Draft Aboriginal Cultural Heritage Management Plan

Dear RAP,

Please find attached the draft Aboriginal Cultural Heritage Management Plan (ACHMP) for the Maxwell Underground Project for your review and comment. Should you have any comments on the draft please provide these by email, mail or fax to Geordie Oakes via the contact details on this email. Please note that the closing date for comments is Saturday 6 February 2021.

All the best,

Geordie

Geordie Oakes
Principal Heritage Specialist
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Please consider the environment before printing this email.

From: Cameron White <Cameron.White46@aboriginalaffairs.nsw.gov.au>
Sent: Tuesday, 23 March 2021 10:00 AM
To: Donna McLaughlin
Subject: FW: URGENT Maxwell UG Project - ACHMP for review and comment

Hi Donna, regarding the plan, it should be based on the principles of OCHRE – as should any preliminary or implementations actions:

- Government working with Aboriginal communities differently
 - Address trust deficit
 - Trauma informed
 - Healing and Truth Telling
 - Timing and design of engagement to take account of community needs and timeframes
 - Government learning from past policy/program/funding/legislative failures
 - Positive narrative, not deficit focus, outcome focus
- Governments, peak bodies, NGOs and private sector *engaging* with Aboriginal communities, not just “consulting”
- Co-design the basis of engagement, service/policy design and agreement making (also see Close the Gap)
- Co-delivery where possible
- Co-design/co-delivery if done properly can only be done on the basis of an *agreement* with Aboriginal people.

AANSW also recommends detailed consultations with Heritage NSW.

Cameron White | Manager Land, Planning and Heritage | Aboriginal Affairs
Level 6, 201 Coward Street Mascot NSW 2000 (PO Box 207 Mascot NSW 1460)
☎: 02 8362 6659 | M: 0439 316 334 | ✉: Cameron.white46@aboriginalaffairs.nsw.gov.au



Aboriginal
Affairs



Dharawal

Njunaliin ngaralanga dharawalwulawala nguradhanhay ngaliya
We respect Aboriginal peoples as the first peoples and custodians of NSW



Donna McLaughlin
Health, Safety, Environment and Community Manager
Malabar Resources
Maxwell Ventures (Management) Pty Ltd
Thomas Mitchell Drive (PMB 9)
Muswellbrook NSW 2333

Submitted via the Major Projects Website

Dear Ms McLaughlin,

RE: Maxwell Underground Coal Mine Project SSD-9526 – Review of ACHMP

Thank you for your referral dated 23 February 2021 requesting Heritage NSW (HNSW) review the Aboriginal Cultural Heritage Management Plan (ACHMP) in relation to the State Significant Development (SSD) at Maxwell Underground Coal Mine Project (Maxwell Underground) SSD-9526 in the Muswellbrook Local Government Area.

Maxwell Underground SSD-9526 was approved by the Independent Planning Commission of New South Wales. Maxwell Ventures (Management) Pty Ltd (Maxwell) are required to prepare an ACHMP in accordance with Schedule 2, Part B, Condition B57 of SSD 9526 of the Development Consent for Maxwell Underground SSD-9526.

HNSW has reviewed the ACHMP and associated documents and additional information supplied for the Maxwell ACHMP including:

- *Malabar Aboriginal Cultural Heritage Management Plan V1* dated 22 February 2021
- *Development Consent SSD-9526 Maxwell Underground Coal Project* approved by the Independent Planning Commission of NSW on 22 December 2020

HNSW Recommended ACHMP Updates

1. Section 3.4.2 Open Area Excavation – the methodology procedures in the ACHMP should include an option for wet sieving and 3 millimetre gauge sieves to be used if required.
2. Section 3.5 Previously Unrecorded Aboriginal Archaeological Sites - an additional step (Step 5) in the unanticipated finds protocol in the ACHMP is required. Details of any new sites identified must be added to Appendix 6, and Figure 3 should be amended to show the location of the site, once the new site has been registered with AHIMS. HNSW notes that the site will also be recorded on the Maxwell Aboriginal Site Database (Section 5.3).
3. Provision in the ACHMP must include an Extraction Plan in accordance with Consent Condition C8 which requires that an approved Extraction Plan for Second Mine Workings must be prepared. The Extraction Plan must include a Heritage Management Plan for the management of potential impacts and/or environmental consequences of the proposed second working on Aboriginal cultural heritage values and include all requirements under conditions B54 to B57 and subsidence performance measures.

The inclusion of the above recommendations will ensure that the Aboriginal Cultural Heritage Management Plan provides for the management of Aboriginal cultural heritage in accordance with the Conditions of Consent.

If you require any further information regarding this matter. Please contact Gillian Goode on 0499 588 790.

Yours sincerely



Dr Samantha Higgs
Senior Team Leader – Aboriginal Cultural Heritage Regulation - North
Heritage NSW
Department of Premier and Cabinet

15 April 2021

APPENDIX 6 – AHIMS SITES (MANAGED UNDER SSD 9526)

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-1954 | Quarry | High | Potential subsidence | Monitoring. If impacted, salvage excavation |
| 37-2-1955 | Quarry | High | n/a | Not relocated |
| 37-2-0004 | Artefact scatter + PAD | Moderate | Direct | Surface collection completed. Salvage excavation required |
| 37-2-0069 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0073 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0074 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0075 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0076 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0077 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0078 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0080 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-0082 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0089 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0090 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0362 | Artefact scatter + PAD | Low | Direct | Surface collection completed |
| 37-2-0363 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0364 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0365 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0366 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0367 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0368 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0369 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0370 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0371 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0372 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-0373 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0374 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0375 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0376 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0377 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0378 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0379 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0380 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0381 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0382 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0383 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0396 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0397 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0398 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0399 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0400 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0401 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0402 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0403 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0404 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0405 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0406 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0407 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0408 | Artefact scatter | Low | Potential subsidence | Monitoring. If impacted, surface collection |
| 37-2-0409 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0410 | Artefact scatter | Low | Potential subsidence | Monitoring. If impacted, surface collection |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-0411 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0412 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0413 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0414 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0415 | Artefact scatter + PAD | Low | Direct | Surface collection |
| 37-2-0416 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0417 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0418 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-0419 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-0505 | Artefact scatter + PAD | Moderate | Direct | Surface collection completed. Salvage excavation required |
| 37-2-1923 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1928 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-1929 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1930 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-1931 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-1932 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-1933 | Artefact scatter + PAD | Low | Direct | Surface collection completed |
| 37-2-1934 | Artefact scatter + PAD | Low | Direct | Surface collection completed |
| 37-2-1935 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1936 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted, surface collection |
| 37-2-1937 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-1938 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1939 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1940 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1941 | Artefact scatter + PAD | Moderate | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1942 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-1943 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1946 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1947 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1956 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1957 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-1960 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1961 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-1986 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-2035 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-2329 | Artefact scatter | Low | Not impacted | Conservation |
| 37-2-2330 | Artefact scatter | Low | Not impacted | Conservation |
| 37-2-4226 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4227 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4228 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4234 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4235 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4236 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4239 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4240 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4241 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4242 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4243 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4245 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4246 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4247 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4248 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4249 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-4250 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4251 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4252 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4253 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4254 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4255 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4256 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4257 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4258 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-4259 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4260 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4262 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4264 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4265 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4266 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4267 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4268 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4269 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4270 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4271 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4272 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4274 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4275 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4276 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4277 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4278 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4279 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-4280 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4281 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4282 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4283 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4284 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4285 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4286 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4287 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4288 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4290 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4291 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4292 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4293 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4294 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4296 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4297 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4298 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4299 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4300 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4301 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4302 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4303 | Artefact scatter + PAD | Moderate | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4307 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-4310 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-4311 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4312 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4313 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------|--------------|----------------------|---|
| 37-2-4317 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-4318 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-4327 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4328 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-4329 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4330 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4331 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4333 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4334 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4335 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4336 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4337 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4338 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4339 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4340 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4341 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4342 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4343 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4344 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4345 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4346 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4347 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4348 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4349 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4350 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4351 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4352 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-4353 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4354 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4355 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4356 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4357 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4358 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4359 | Artefact scatter | Low | Direct | Surface collection |
| 37-2-4361 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-4362 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-4364 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4367 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4370 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4371 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4372 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4373 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4376 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-4377 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-4378 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-4379 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-4426 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4427 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4428 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4432 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4512 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4536 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-4537 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5002 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-5003 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5004 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5005 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5006 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5007 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5008 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5014 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5016 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-5022 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5023 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5024 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5035 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5036 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5043 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5469 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5470 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-5787 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5848 | Isolated artefact | Low | Direct | Surface collection completed |
| 37-2-5849 | Isolated artefact | Low | Direct | Surface collection completed |
| 37-2-5883 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5861 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5897 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5896 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5893 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5891 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5892 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5890 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-5889 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5888 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5886 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5887 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5868 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5884 | Isolated artefact | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5851 | Isolated artefact | Low | Direct | Surface collection completed |
| 37-2-5852 | Isolated artefact | Low | Direct | Surface collection completed |
| 37-2-5854 | Isolated artefact | Low | Direct | Surface collection completed |
| 37-2-5853 | Isolated artefact | Low | Direct | Surface collection completed |
| 37-2-5840 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-5841 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-5842 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-5885 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5882 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5843 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-5881 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5880 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5879 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5878 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5877 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5876 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5875 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5874 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5872 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5871 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5869 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |

| Site | Type | Significance | Impacts | Management |
|-----------|------------------------|--------------|----------------------|---|
| 37-2-5870 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5867 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5866 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5865 | Artefact scatter + PAD | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5864 | Artefact scatter | Low | Potential subsidence | Surface collection if soil remediation required |
| 37-2-5844 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-5845 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-5846 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-5847 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-5862 | Artefact scatter + PAD | Moderate | Potential subsidence | Monitoring. If impacted surface collection and potential salvage excavation |
| 37-2-6042 | Artefact scatter | Low | Direct | Surface collection completed |
| 37-2-6041 | Artefact scatter | Low | Direct | Surface collection completed |

APPENDIX 7 – AHIMS SITES (PREVIOUSLY MANAGED UNDER PA 06_0202)

| AHIMS No. | Site Name | Site Type | Easting (GDA 94 Zone 56) | Northing (GDA 94 Zone 56) | Status |
|-----------|-----------|------------------|-----------------------------|------------------------------|----------------------------|
| 37-2-2325 | D1 | Artefact Scatter | 305074 | 6416069 | Salvaged |
| 37-2-2320 | D2 | Isolated Find | 305176 | 6460550 | Salvaged |
| 37-2-2321 | D3 | Artefact Scatter | 305279 | 6416047 | Salvaged |
| 37-2-2322 | D4 | Artefact Scatter | 305230 | 6415960 | Salvaged |
| 37-2-2326 | D5 | Artefact Scatter | 305215 | 6415891 | Salvaged |
| 37-2-2327 | D6 | Isolated Find | 305583 | 6416460 | Salvaged |
| 37-2-2328 | D7 | Isolated Find | 304469 | 6416633 | Salvaged |
| 37-2-2348 | D8 | Artefact Scatter | 305350 | 6415942 | Salvaged |
| 37-2-2349 | D9 | Artefact Scatter | 305504 | 6415960 | Salvaged |
| 37-2-2350 | D10 | Artefact Scatter | 305660 | 6415981 | Salvaged |
| 37-2-2351 | D11 | Artefact Scatter | 305421 | 6416050 | Salvaged |
| 37-2-2352 | D12 | Isolated Find | 305283 | 6415888 | Salvaged |
| 37-2-2353 | D13 | Isolated Find | 305337 | 6415875 | Salvaged |
| 37-2-2354 | D14 | Artefact Scatter | 305781 | 6415786 | Salvaged |
| 37-2-2355 | D15 | Artefact Scatter | 306003 | 6415415 | Salvaged |
| 37-2-2356 | D16 | Artefact Scatter | 304942 | 6415925 | Salvaged |
| 37-2-2357 | D17 | Isolated Find | 304809 | 6415854 | Salvaged |
| 37-2-2358 | D18 | Isolated Find | 304847 | 6415798 | Salvaged |
| 37-2-2359 | D19 | Artefact Scatter | 304940 | 6415628 | Salvaged |
| 37-2-2360 | D20 | Artefact Scatter | 305054 | 6415475 | Salvaged |
| 37-2-2361 | D21 | Artefact Scatter | 304680 | 6415390 | Salvaged |
| 37-2-2362 | D22 | Artefact Scatter | 304491 | 6415684 | Salvaged |
| 37-2-2338 | R1 | Artefact Scatter | 303622 | 6420533 | Salvaged |
| 37-2-2339 | R2 | Isolated Find | 303676 | 6420568 | Salvaged |
| 37-2-2340 | R3 | Artefact Scatter | 303739 | 6420466 | Salvaged |
| 37-2-2341 | R4 | Artefact Scatter | 303691 | 6420285 | Salvaged |
| 37-2-2342 | R5 | Isolated find | 305541 | 6420814 | Conserved in-situ (fenced) |
| 37-2-2343 | R6 | Artefact scatter | 305781 | 6420794 | Conserved in-situ (fenced) |
| 37-2-2344 | R7 | Isolated find | 305340 | 6420804 | Conserved in-situ (fenced) |
| 37-2-2345 | R8 | Isolated find | 305423 | 6420729 | Conserved in-situ (fenced) |
| 37-2-2346 | R9 | Isolated find | 305387 | 6420827 | Conserved in-situ (fenced) |
| 37-2-2347 | R10 | Isolated find | 305655 | 6420655 | Conserved in-situ (fenced) |
| 37-2-2329 | R11 | Artefact scatter | 305309 | 6420861 | Conserved in-situ (fenced) |
| 37-2-2330 | R12 | Artefact scatter | 305256 | 6420814 | Conserved in-situ (fenced) |
| 37-2-2331 | R13 | Isolated find | 304190 | 6420593 | Conserved in-situ (fenced) |
| 37-2-2332 | R14 | Isolated find | 304197 | 6420635 | Conserved in-situ (fenced) |
| 37-2-2333 | R15 | Isolated find | 304350 | 6420584 | Conserved in-situ (fenced) |
| 37-2-2323 | R16 | Isolated find | 304353 | 6420590 | Conserved in-situ (fenced) |
| 37-2-2324 | R17 | Isolated find | 304333 | 6420486 | Conserved in-situ (fenced) |



Planning,
Industry &
Environment

Donna McLaughlin
Manager Environment & Community
Maxwell Ventures (Management) Pty Ltd
Thomas Mitchell Drive
Muswellbrook, NSW, 2333

10/02/2022

Dear Ms. McLaughlin

**Maxwell Underground (SSD-9526)
Aboriginal Cultural Heritage Management Plan**

I refer to the Aboriginal Cultural Heritage Management Plan submitted in accordance with Condition B57 of Schedule B of the Development Consent for the Maxwell Underground Coal Mine Project (SSD-9526).

The Department has carefully reviewed the document and is satisfied that it is consistent with the relevant conditions of consent.

Accordingly, the Secretary has approved the Aboriginal Cultural Heritage Management Plan (Version 2, dated 9 February 2022). Please ensure that the approved plan is placed on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact Wayne Jones on (02) 6575 3406.

Yours sincerely

A handwritten signature in black ink, appearing to be 'S O'Donoghue'.

Stephen O'Donoghue
Director
Resource Assessments
As nominee of the Secretary

4 Parramatta Square, 12 Darcy Street Parramatta 2150 | dpie.nsw.gov.au | 1